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This document's normative language is English. Translation into other languages is permitted.

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1 Overview

The Redfish standard comprises a set of specifications maintained by the Redfish Forum, a working group within DMTF. The standard defines a protocol that uses RESTful interfaces to provide access to data and operations associated with the management of systems and networks. One of the strengths of the Redfish protocol is that it works with a wide range of servers: from stand-alone servers to rack-mount and bladed environments to large-scale data centers and cloud environments.

The Redfish standard addresses several key issues for infrastructures that require scalability. Large infrastructures often consist of many simple servers of different makes and types. This hyper-scale usage model requires a new approach to systems management. The Redfish protocol addresses these needs by providing a standard protocol based on out-of-band systems management.

With these goals in mind, the Redfish protocol was designed as an open-industry standard to meet scalability requirements in multi-vendor deployments. It easily integrates with commonly used tools, using RESTful interfaces to perform operations and using JSON for data payloads.

1.1 Who should read this document?

This document is for Redfish service developers or application software developers that interface with a Redfish service. This document includes the informative and normative descriptions copied from the description and long description annotations in the *Redfish Schema Bundle* (DSP8010), and adds supplemental normative text to further explain the usage of particular properties or resources.

If mistakes or discrepancies arise in this document, the *Redfish Schema Bundle* (DSP8010) is the primary normative document.

1.2 How can I provide feedback?

Feedback on all Redfish specifications and documents is encouraged. Feedback can be directed to DMTF and the Redfish Forum by the following means:

- **Redfish User Forum:** <https://redfishforum.com> - User forum monitored by DMTF Redfish Forum personnel to answer questions about any Redfish-related topics.
- **DMTF Feedback Portal:** <https://www.dmtf.org/standards/feedback> - Formal submission portal for enhancements or proposals to DMTF and the Redfish Forum.

1.3 Where can I find more information?

The following web sites provide more information about the Redfish standard:

- **Redfish Developer Hub**

Resources for developers who use Redfish to build applications. Contains an interactive schema explorer, hosted schema, and other links.

- **Redfish Specification Forum**

DMTF Redfish-monitored user forum. Answers questions about Redfish-related topics.

- **DMTF GitHub repositories**

Open source tools and libraries for working with Redfish.

- **Redfish standards**

Schemas, specifications, mockups, white papers, FAQ, educational material, and more.

- **DMTF Redfish Forum**

Working group that maintains the Redfish standard. Site lists member companies, future work and schedules, charter, and information about joining.

1.4 Related documents

The following documents are part of the Redfish development effort. They can be accessed or downloaded from DMTF's Redfish Standards web site: <https://www.dmtf.org/standards/redfish>

- **DSP0218** - Platform Level Data Model (PLDM) for Redfish Device Enablement Specification - Binary-encoded JSON (BEJ) and dictionary-based mapping of Redfish schemas and properties into PLDM messages.
- **DSP0266** - Redfish Specification - Main Redfish Specification.
- **DSP0268** - Redfish Data Model Specification - Normative descriptions and additional text for every schema defined in DSP8010 and example payloads for every resource.
- **DSP0270** - Redfish Host Interface Specification - "In-band" or "OS-based" Redfish host interface.
- **DSP0272** - Redfish Interoperability Profiles Specification - Structure and JSON document that is used to define and publish an interoperability profile that checks an implementation's conformance to a defined minimum set of functionality.
- **DSP2043** - Redfish Mockups Bundle - Set of mockups that can be used as sample output from `GET` responses from a Redfish service. Informative in nature, it was used to develop the schema. A person can set up an NGINX or similar server and configure it to output JSON format and then use this directory for demonstration purposes.
- **DSP2044** - Redfish White Paper - Non-normative document helping those new to Redfish understand how to interact with the Redfish service and understand common functions and tasks.
- **DSP2046** - Redfish Resource and Schema Guide - Informative documentation regarding common Redfish

resource properties and a listing of properties that can be found in each of the Redfish resources.

- [DSP2053](#) - Redfish Property Guide - Informative documentation providing an index to individual property definitions across all Redfish schema.
- [DSP2065](#) - Redfish Message Registry Guide - Informative documentation providing details regarding the messages defined in Redfish standard message registries.
- [DSP8010](#) - Redfish Schema - Redfish schema definitions. These files are normative in nature and are normatively referenced by the *Redfish Specification*. The three schema formats are CSDL (OData Common Schema Definition Language format, which is in XML), JSON Schema, and OpenAPI schema. These schema definitions should be functionally equivalent, thus specifying the schema in three different languages.
- [DSP8011](#) - Redfish Standard Registries - Redfish registry definitions. This bundle of Redfish registries includes message registries used for Redfish-defined messages including events and privilege maps.
- [DSP8013](#) - Redfish Interoperability Profiles Bundle - Bundle of published Redfish interoperability profile documents and supporting schema and sample documents used for creating profiles.

1.5 Terms, definitions, symbols, and abbreviated terms

Some terms and phrases in this document have specific meanings beyond their typical English meanings. This clause defines those terms and phrases.

The terms "shall" ("required"), "shall not", "should" ("recommended"), "should not" ("not recommended"), "may", "need not" ("not required"), "can" and "cannot" in this document are to be interpreted as described in ISO/IEC Directives, Part 2, Clause 7. The terms in parenthesis are alternatives for the preceding term, for use in exceptional cases when the preceding term cannot be used for linguistic reasons. Note that ISO/IEC Directives, Part 2, Clause 7 specifies additional alternatives. Occurrences of such additional alternatives shall be interpreted in their normal English meaning.

The terms "clause", "subclause", "paragraph", and "annex" in this document are to be interpreted as described in ISO/IEC Directives, Part 2, Clause 6.

The terms "normative" and "informative" in this document are to be interpreted as described in ISO/IEC Directives, Part 2, Clause 3. In this document, clauses, subclauses, or annexes labeled "(informative)" do not contain normative content. Notes and examples are always informative elements.

The term "deprecated" in this document is to be interpreted as material that is not recommended for use in new development efforts. Existing and new implementations may use this material, but they should move to the favored approach. Deprecated material may be implemented in order to achieve backwards compatibility. Deprecated material should contain references to the last published version that included the deprecated material as normative material and to a description of the favored approach. Deprecated material may be removed from the next major version of the specification.

2 Using this document

Every Redfish response consists of a JSON payload containing properties that are strictly defined by a schema for that resource. The schema that defines a resource can be determined from the value of the `@odata.type` property returned in every Redfish response. This document details the definitions for every Redfish standard schema.

Each schema section contains:

- The name, current version, and description of the schema.
- The release history of the schema. Lists each minor schema version and the DSP8010 release bundle that included it.
- List of the possible URIs where schema-defined resources can appear in a Redfish service following specification version v1.6 or later. See [URI listings](#).
- Table that defines each property. Shows additional details for those properties when needed.
- List of available actions defined for the schema.
- Example JSON payload for a resource using the schema.

The property-level details include:

Column	Purpose
Property	The case-sensitive name of the JSON property as it appears in the JSON payload. Lists the schema version in parentheses when properties were added to or deprecated in the schema after the initial v1.0.0 release.
Type	The JSON data types for the property, which can include boolean, number, string, or object. • The <code>string (enum)</code> tag identifies enumerated strings. • String types with a <code>(URI)</code> tag will contain a URI. • Number types may specify the units, which are usually included as part of the property name. • Number types specifying "%" units or including "Percent" in the property name will have values typically in the range of <code>0 - 100</code>. • Boolean types will have a value of <code>true</code> or <code>false</code>.

Column	Purpose
Attributes	Designates whether: • The property is read-only or read-write, if supported by the implementation. • The property is required to be returned in the resource payload or is required when creating a resource of that type. • The service might return a <code>null</code> value if the property value is temporarily unavailable.
Descriptions	The descriptions of the property, as copied directly from the schema's definition of the property. The informational description of the property is listed first. The normative "long description" is shown as a separate, bulleted list.

2.1 URI listings

The *Redfish Specification v1.6.0* added mandatory support for the *OpenAPI Specification v3.0*. As part of this support, the URIs for every Redfish resource are defined to appear at known, fixed locations. Resource collections also appear at fixed locations, with the members of each collection appearing at URIs constructed by using a fixed path structure, with appropriate path segments equal to the value of `Id` properties of members along the path.

Support for v1.6.0 and OpenAPI can be determined by comparing the value of the `RedfishVersion` property in the service root (`/redfish/v1/`). Services that report a `1.6.0` or higher value, such as `1.6.1` or `1.7.0` , adhere to the URI definitions.

The URI listings do not apply to Redfish services that support specification versions earlier than v1.6.0. For those services, clients must use the hypermedia features of the API to discover hyperlinks from the service root to each resource. While services typically match the URIs listed in this document for many of their resources, this match is not guaranteed and results in errors.

3 Common properties

3.1 Properties that all Redfish schemas define

The following properties are defined for inclusion in every Redfish schema and therefore may be encountered in any response payload. They are documented here in this guide to avoid repetition in the [Reference guide](#) property tables.

Note: Several of these properties are payload annotations but appear here because they are required for all Redfish resources.

3.1.1 Properties

Property	Type	Attributes	Notes
@odata.context	string (URI)	<i>read-only</i>	The value of this property shall be the context URL that describes the resource according to OData-Protocol and shall be of the form defined in the Redfish specification.
@odata.etag	string	<i>read-only</i>	The value of this property shall be a string that is defined by the ETag HTTP header definition in RFC7232.
@odata.id	string (URI)	<i>read-only required</i>	The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
@odata.type	string	<i>read-only required</i>	The value of this property shall be a URI fragment that specifies the type of the resource and it shall be of the form defined in the Redfish specification.
Description	string	<i>read-only</i>	This property shall contain the description of this resource. The value shall conform with the 'Description' clause of the Redfish Specification.
Id	string	<i>read-only required</i>	This property shall contain the identifier for this resource. The value shall conform with the 'Id' clause of the Redfish Specification.
Name	string	<i>read-only required</i>	This property shall contain the name of this resource or array member. The value shall conform with the 'Name' clause of the Redfish Specification.
Oem {}	object		The manufacturer- or provider-specific extension moniker that divides the <code>Oem</code> object into sections.

3.2 Frequently used properties

In addition, the following properties are frequently defined in Redfish schemas. Their definition and usage is the same throughout the Redfish data model.

3.2.1 Properties

Property	Type	Attributes	Notes
Actions {}	object		The Redfish actions available for this Resource.
Links {}	object		The links associated with the Resource, as defined by that Resource's schema definition. All associated reference properties defined for a Resource are nested under the Links property. Find all directly referenced, or subordinate, Resource properties from the root of the Resource.
RelatedItem [{}	array		An array of links. Each link points to a Resource or part of a Resource as defined by that Resource's schema. This representation is not intended to be a strong linking methodology like other references. Instead, it shows a relationship between elements or subelements in disparate parts of the service. For example, fans might be in one area of the system and processors in another. The relationship between the two might not be obvious. This property can show that one is related to the other. In this example, it might indicate that a specific fan cools a specific processor.
@odata.id	string (URI)	<i>read-only</i>	The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			

3.3 Payload annotations

Payload annotations are a mechanism in which a service provides additional information about a given property or object. Redfish limits usage of these annotations to OData core terms, Redfish extensions, or Redfish messages.

3.3.1 Property-level annotations

A payload annotation for a single property takes the form of an additional property named `Property@Schema.Term`, where `Property` is the JSON property being annotated, `Schema` is the schema file where the definition for the annotation is found, and `Term` is the name of the annotation.

3.3.2 Properties

Property	Type	Attributes	Notes
@Message.ExtendedInfo {}	object		The additional information for a set of message structures for a property. These messages can be useful when a property is <code>null</code> due to an error condition and the service wants to convey why the property is <code>null</code> .

Property	Type	Attributes	Notes
@odata.count	integer	read-only	The value of this property shall be an integer representing the number of items in a collection.
@Redfish.AllowableNumbers []	array (string)	read-only	The numeric values or duration values, inclusive ranges of values, and (optional) incremental step values for a read-write property or action parameter, in a <code><min>:<max>:<step></code> format.
@Redfish.AllowablePattern	string	read-only	A regular expression that describes the allowable values for a read-write property or action parameter as supported by the service.
@Redfish.AllowableValues []	array (string)	read-only	The string values that a service accepts for a property or action parameter.
@Redfish.Deprecated	string	read-only	Specifies that the property or value is deprecated. The string value explains the deprecation, including new property or properties or value to use.

In the following example, the property `ResetType` is annotated with the `Redfish` schema-defined `AllowableValues` term. `Redfish` is an alias for `RedfishExtensions`. This term indicates to the client that the service supports the values `On` and `ForceOff` for `ResetType`.

```
{
  "ResetType@Redfish.AllowableValues": [
    "On",
    "ForceOff"
  ]
}
```

3.3.3 Resource-level or object-level annotations

A payload annotation for an entire Resource or a JSON object takes the `@Schema.Term` form, where `Schema` is the schema file where the definition is found and `Term` is the name of the annotation. These payload annotations are used to provide further information about the object itself.

3.3.4 Properties

Property	Type	Attributes	Notes
@Redfish.ActionInfo	string (URI)	read-only	The URI to an ActionInfo Resource, which describes the parameters that this Action instance supports.

Property	Type	Attributes	Notes
@Redfish.CollectionCapabilities {}	object		This type shall describe any capabilities of a resource collection in terms of how a client can create resources within the resource collection. For property details, see CollectionCapabilities .
@Redfish.MaintenanceWindow {}	object		This type shall indicate that a resource has a maintenance window assignment for applying settings or operations. Other resources can link to this object to convey a common control surface for the configuration of the maintenance window. For property details, see MaintenanceWindow .
@Redfish.OperationApplyTime	string (enum)	<i>read-write</i>	The client's requested apply time to complete a create, delete, or action operation. <i>For the possible property values, see @Redfish.OperationApplyTime in Property details.</i>
@Redfish.OperationApplyTimeSupport {}	object		This type shall indicate that a client can request a specific apply time of a create, delete, or action operation of a resource. For property details, see OperationApplyTimeSupport .
@Redfish.Settings {}	object		This type shall describe any settings of a resource. For property details, see Settings .
@Redfish.SettingsApplyTime {}	object		This type shall be specified by client to indicate the preferred time to apply the configuration settings. For property details, see PreferredApplyTime .
@Redfish.WritableProperties []	array (string)	<i>read-only</i>	Specifies the properties supported as read-write. The values contained are the names of the writable properties as defined in the Redfish schema that are available as read-write given the implementation, current configuration, and state of the resource.

3.3.5 Property details

3.3.5.1 @Redfish.OperationApplyTime

The client's requested apply time to complete a create, delete, or action operation.

string	Description
AtMaintenanceWindowStart	This value shall indicate the requested create, delete, or action operation is applied during the maintenance window that the <code>MaintenanceWindowStartTime</code> and <code>MaintenanceWindowDurationInSeconds</code> properties specify. A service can complete resets during this maintenance window.
Immediate	This value shall indicate the requested create, delete, or action operation is applied immediately. This value may result in an immediate host reset, manager reset, or other side effects.

string	Description
InMaintenanceWindowOnReset	This value shall indicate the requested create, delete, or action operation is applied during the maintenance window that the <code>MaintenanceWindowStartTime</code> and <code>MaintenanceWindowDurationInSeconds</code> properties specify, and if a reset occurs within the maintenance window.
OnReset	This value shall indicate the requested create, delete, or action operation is applied when the system or service is reset.
OnStartUpdateRequest	This value shall indicate the requested create, delete, or action operation is applied when the <code>StartUpdate</code> action of the update service is invoked.
OnTargetReset	This value shall indicate the requested create, delete, or action operation is applied when the target is reset.

This example annotates the object with the `Redfish` schema-defined action info term. `Redfish` is an alias for `RedfishExtensions`. This term indicates that the client can find more information about the `#ComputerSystem.Reset` action at the `/redfish/v1/Systems/1/ResetActionInfo` URI:

```
{
  "#ComputerSystem.Reset": {
    "target": "/redfish/v1/Systems/1/Actions/ComputerSystem.Reset",
    "@Redfish.ActionInfo": "/redfish/v1/Systems/1/ResetActionInfo"
  }
}
```

4 Common objects

Redfish schemas frequently define the following JSON objects. Like the individual common properties listed above, these objects share a common definition that is shown here to avoid repetition in the [Reference guide](#) property tables.

4.1 Actions

The `Actions` object contains the available actions for a resource.

4.1.1 Properties

Property	Type	Attributes	Notes
<code>#{action name} {</code>	object		A single Redfish action.
<code> @Redfish.ActionInfo</code>	string	<i>read-only</i>	The URI for an ActionInfo Resource that describes this action.
<code> target</code>	string	<i>read-only</i>	The target URI for the POST operation to invoke the action.
<code>}</code>			

4.2 Condition

4.2.1 Description

A condition that requires attention.

- This type shall contain the description and details of a condition that exists within this resource or a related resource that requires attention.

4.2.2 Properties

Property	Type	Attributes	Notes
ConditionType (v1.22+)	string (enum)	<i>read-only</i> (null)	The type of condition. • This property shall contain the type of condition. <i>For the possible property values, see ConditionType in Property details.</i>

Property	Type	Attributes	Notes
LogEntry {	object		The link to the log entry created for this condition. This property shall contain a link to a resource of type <code>LogEntry</code> that represents the log entry created for this condition. See the <i>LogEntry</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a LogEntry resource. See the Links section and the <i>LogEntry</i> schema for details.
}			
Message	string	<i>read-only</i>	The human-readable message for this condition. This property shall contain a human-readable message describing this condition.
MessageArgs []	array (string)	<i>read-only</i>	An array of message arguments that are substituted for the arguments in the message when looked up in the message registry. This property shall contain an array of message arguments that are substituted for the arguments in the message when looked up in the message registry. It has the same semantics as the <code>MessageArgs</code> property in the Redfish <i>MessageRegistry</i> schema.
MessageId	string	<i>read-only required</i>	The identifier for the message. This property shall contain a <code>MessageId</code>, as defined in the 'MessageId format' clause of the Redfish Specification.
Oem (v1.21+) {	object		See the OEM object definition in the Using this guide clause.
(pattern) {}	object		Property names follow regular expression pattern <code>"^[A-Za-z0-9_]+\$"</code>
}			
OriginOfCondition {	object		A link to the resource or object that originated the condition. This property shall contain a link to the resource or object that originated the condition. This property shall not be present if the condition was caused by this resource.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			

Property	Type	Attributes	Notes
Resolution (v1.14+)	string	<i>read-only</i>	Suggestions on how to resolve the condition. This property shall contain the resolution of the condition. Services should replace the resolution defined in the message registry with a more specific resolution.
ResolutionSteps (v1.18+) [{}]	array (object)		This type describes a recommended step of the service-defined resolution. - The list of recommended steps to resolve the condition. - This property shall contain an array of recommended steps to resolve the condition. A client can stop executing the resolution steps once the condition is removed from the resource. For property details, see ResolutionStep.
Severity	string (enum)	<i>read-only</i>	The severity of the condition. This property shall contain the severity of the condition. Services can replace the value defined in the message registry with a value more applicable to the implementation. <i>For the possible property values, see Severity in Property details.</i>
Timestamp	string (date-time)	<i>read-only</i>	The time the condition occurred. This property shall indicate the time the condition occurred.
UserAuthenticationSource (v1.20+)	string	<i>read-only (null)</i>	The source of authentication for the username property associated with the condition. This property shall contain the URL to the authentication service that is associated with the username property. This should be used for conditions that result from a user action.
Username (v1.20+)	string	<i>read-only (null)</i>	The username of the account associated with the condition. This property shall contain the username of the account associated with the condition. This should be used for conditions that result from a user action.

4.2.3 Property details

4.2.3.1 ConditionType

The type of condition.

- This property shall contain the type of condition.

string	Description
Alert	The condition is an alert. This value shall indicate a condition that requires correction, such as a fault.
Informational	The condition is informational. This value shall indicate a condition that requires attention, maintenance, or some other user intervention, such as performing a reset to activate new firmware.
Subsystem	The condition is the health of a subsystem. This value shall indicate a condition that contains the health of a subsystem. If supported by the service, the service shall always provide this condition in responses.

4.2.3.2 Severity

The severity of the condition.

- This property shall contain the severity of the condition. Services can replace the value defined in the message registry with a value more applicable to the implementation.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

4.3 Identifier

4.3.1 Description

Any additional identifiers for a resource.

- This type shall contain any additional identifiers for a resource.

4.3.2 Properties

Property	Type	Attributes	Notes
DurableName (v1.1+)	string	<i>read-only</i> (null)	The world-wide, persistent name of the resource. This property shall contain the world-wide unique identifier for the resource. The string shall be in the format described by the value in the <code>DurableNameFormat</code> property.
DurableNameFormat (v1.1+)	string (enum)	<i>read-only</i> (null)	The format of the durable name property. This property shall represent the format of the <code>DurableName</code> property. <i>For the possible property values, see DurableNameFormat in Property details.</i>

4.3.3 Property details

4.3.3.1 DurableNameFormat

The format of the durable name property.

- This property shall represent the format of the `DurableName` property.

string	Description
EUI	The IEEE-defined 64-bit Extended Unique Identifier (EUI). This durable name shall contain the hexadecimal representation of the IEEE-defined 64-bit Extended Unique Identifier (EUI), as defined in the IEEE's Guidelines for 64-bit Global Identifier (EUI-64) Specification. The <code>DurableName</code> property shall follow the regular expression pattern <code>^([0-9A-Fa-f]{2}[:-]){7}([0-9A-Fa-f]{2})\$</code>, where the most significant octet is first.
FC_WWN	The Fibre Channel (FC) World Wide Name (WWN). This durable name shall contain a hexadecimal representation of the World-Wide Name (WWN) format, as defined in the T11 Fibre Channel Physical and Signaling Interface Specification. The <code>DurableName</code> property shall follow the regular expression pattern <code>^([0-9A-Fa-f]{2}[:-]){7}([0-9A-Fa-f]{2})\$</code>, where the most significant octet is first.

string	Description
GCXLID (v1.15+)	The globally unique CXL logical device identifier (GCXLID). This durable name shall be in the globally unique CXL logical device identifier (GCXLID). The <code>DurableName</code> property shall follow the regular expression pattern <code>^([0-9A-Fa-f]{2}-){7}[0-9A-Fa-f]{2}:([0-9A-Fa-f]{4})\$</code>, where the first eight hyphen-delimited octets contain the PCIe serial number, where the most significant octet is first, and the remaining 16-bit field contains the CXL Logical Device Identifier, with the most significant byte first.
iQN	The iSCSI Qualified Name (iQN). This durable name shall be in the iSCSI Qualified Name (iQN) format, as defined in RFC3720 and RFC3721.
MACAddress (v1.14+)	The media access control address (MAC address). This durable name shall be a media access control address (MAC address), which is a unique identifier assigned to a network interface controller (NIC) for use as a network address. This value should not be used if a more specific type of identifier is available. The <code>DurableName</code> property shall follow the regular expression pattern <code>^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})\$</code>, where the most significant octet is first.
NAA	The Name Address Authority (NAA) format. This durable name shall contain a hexadecimal representation of the Name Address Authority structure, as defined in the T11 Fibre Channel - Framing and Signaling - 3 (FC-FS-3) specification. The <code>DurableName</code> property shall follow the regular expression pattern <code>^(([0-9A-Fa-f]{2}){8}){1,2}\$</code>, where the most significant octet is first.
NGUID (v1.10+)	The Namespace Globally Unique Identifier (NGUID). This durable name shall be in the Namespace Globally Unique Identifier (NGUID), as defined in the NVN Express Specification. The <code>DurableName</code> property shall follow the regular expression pattern <code>^([0-9A-Fa-f]{2}){16}\$</code>, where the most significant octet is first.
NQN (v1.6+)	The NVMe Qualified Name (NQN). This durable name shall be in the NVMe Qualified Name (NQN) format, as defined in the NVN Express over Fabric Specification.
NSID (v1.6+, <i>deprecated</i> v1.12)	The NVM Namespace Identifier (NSID). This durable name shall be in the NVM Namespace Identifier (NSID) format, as defined in the NVN Express Specification. <i>Deprecated in v1.12 and later. This value has been deprecated due to its non-uniqueness and <code>NGUID</code> should be used.</i>

string	Description
UUID	The Universally Unique Identifier (UUID). This durable name shall contain the hexadecimal representation of the UUID, as defined by RFC4122. The <code>DurableName</code> property shall follow the regular expression pattern '([0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12})'.

4.4 IOStatistics

4.4.1 Description

The properties of this type represent IO statistics.

- The properties of this type shall be used to represent the IO statistics of the requested object.

4.4.2 Properties

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to another IOStatistics resource.

4.5 IPv4Address

4.5.1 Description

This type describes an IPv4 address.

- This type shall describe an IPv4 address assigned to an interface.

4.5.2 Properties

Property	Type	Attributes	Notes
Address	string	<i>read-write (null)</i>	The IPv4 address. This property shall contain an IPv4 address assigned to this interface. If DHCPv4 is enabled on the interface, this property becomes read-only. Pattern: <code>^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$</code>

Property	Type	Attributes	Notes
AddressOrigin	string (enum)	<i>read-only</i> (null)	This indicates how the address was determined. This property shall contain the IP address origin for this network interface. <i>For the possible property values, see AddressOrigin in Property details.</i>
Gateway	string	<i>read-write</i> (null)	The IPv4 gateway for this address. This property shall contain the IPv4 default gateway address for this interface. If DHCPv4 is enabled on the interface and is configured to set the IPv4 default gateway address, this property becomes read-only. If multiple IPv4 addresses are present on the same interface, only a single default gateway is allowed. Any additional IPv4 addresses shall not have a default gateway specified. Pattern: <code>^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$</code>
Oem {}	object		See the OEM object definition in the Using this guide clause.
SubnetMask	string	<i>read-write</i> (null)	The IPv4 subnet mask. This property shall contain the IPv4 subnet mask for this address. If DHCPv4 is enabled on the interface, this property becomes read-only. Pattern: <code>^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$</code>

4.5.3 Property details

4.5.3.1 AddressOrigin

This indicates how the address was determined.

- This property shall contain the IP address origin for this network interface.

string	Description
BOOTP	A BOOTP service-provided address.
DHCP	A DHCPv4 service-provided address.
IPv4LinkLocal	The address is valid for only this network segment, or link.
Static	A user-configured static address.

4.6 IPv6Address

4.6.1 Description

This type describes an IPv6 address.

- This type shall describe an IPv6 address assigned to an interface.

4.6.2 Properties

Property	Type	Attributes	Notes
Address	string	<i>read-write (null)</i>	The IPv6 address. • This property lists an IPv6 address that is currently assigned on this interface.
AddressOrigin	string (enum)	<i>read-only (null)</i>	This indicates how the address was determined. • This property shall contain the IPv6 address origin for this interface. <i>For the possible property values, see AddressOrigin in Property details.</i>
AddressState	string (enum)	<i>read-only (null)</i>	The current RFC4862-defined state of this address. • This property shall contain the current RFC4862-defined state of this address. Preferred and Deprecated states follow the definitions in RFC4862, section 5.5.4. The Tentative state indicates that the address is undergoing Duplicate Address Detection (DAD), as defined in RFC4862, section 5.4. The Failed state indicates a static address that did not pass DAD. A static address in the Failed state is not in use on the network stack, and corrective action is required to remedy this condition. <i>For the possible property values, see AddressState in Property details.</i>
Oem {}	object		See the OEM object definition in the Using this guide clause.
PrefixLength	integer	<i>read-only (null)</i>	The IPv6 address prefix Length. • This property shall contain the IPv6 address prefix length for this interface.

4.6.3 Property details

4.6.3.1 AddressOrigin

This indicates how the address was determined.

- This property shall contain the IPv6 address origin for this interface.

string	Description
DHCPv6	A DHCPv6 service-provided address.
LinkLocal	The address is valid for only this network segment, or link.
SLAAC	A stateless autoconfiguration (SLAAC) service-provided address.
Static	A static user-configured address.

4.6.3.2 AddressState

The current RFC4862-defined state of this address.

- This property shall contain the current RFC4862-defined state of this address. Preferred and Deprecated states follow the definitions in RFC4862, section 5.5.4. The Tentative state indicates that the address is undergoing Duplicate Address Detection (DAD), as defined in RFC4862, section 5.4. The Failed state indicates a static address that did not pass DAD. A static address in the Failed state is not in use on the network stack, and corrective action is required to remedy this condition.

string	Description
Deprecated	This address is currently within its valid lifetime but is now outside its RFC4862-defined preferred lifetime.
Failed	This address has failed Duplicate Address Detection (DAD) testing, as defined in RFC4862, section 5.4, and is not currently in use.
Preferred	This address is currently within both its RFC4862-defined valid and preferred lifetimes.
Tentative	This address is currently undergoing Duplicate Address Detection (DAD) testing, as defined in RFC4862, section 5.4.

4.7 IPv6GatewayStaticAddress

4.7.1 Description

This type represents a single IPv6 static address to be assigned on a network interface.

- This type shall represent a single IPv6 static address to be assigned on a network interface.

4.7.2 Properties

Property	Type	Attributes	Notes
Address (v1.1+)	string	<i>read-write required (null)</i>	A valid IPv6 address. This property provides access to a static IPv6 address that is currently assigned on a network interface.
Oem (v1.1+) { }	object		See the OEM object definition in the Using this guide clause.
PrefixLength (v1.1+)	integer	<i>read-write (null)</i>	The IPv6 network prefix length, in bits, for this address. Provides the IPv6 network prefix length, in bits, for this address.

4.8 IPv6StaticAddress

4.8.1 Description

This type represents a single IPv6 static address to be assigned on a network interface.

- This type shall represent a single IPv6 static address to be assigned on a network interface.

4.8.2 Properties

Property	Type	Attributes	Notes
Address	string	<i>read-write required (null)</i>	A valid IPv6 address. This property provides access to a static IPv6 address that is currently assigned on a network interface.
Oem { }	object		See the OEM object definition in the Using this guide clause.
PrefixLength	integer	<i>read-write required (null)</i>	The prefix length, in bits, of this IPv6 address. This property shall contain the IPv6 network prefix length, in bits, for this address.

4.9 Location

4.9.1 Description

The location of a resource.

- This type shall describe the location of a resource.

4.9.2 Properties

Property	Type	Attributes	Notes
AltitudeMeters (v1.6+)	number (meters)	<i>read-write</i> (null)	The altitude of the resource in meters. • This property shall contain the altitude of the resource, in meter units, defined as the elevation above sea level.
Contacts (v1.7+) [{	array		An array of contact information. • This property shall contain an array of contact information for an individual or organization responsible for this resource.
ContactName (v1.7+)	string	<i>read-write</i> (null)	Name of this contact. • This property shall contain the name of a person or organization to contact for information about this resource.
EmailAddress (v1.7+)	string	<i>read-write</i> (null)	Email address for this contact. • This property shall contain the email address for a person or organization to contact for information about this resource.
PhoneNumber (v1.7+)	string	<i>read-write</i> (null)	Phone number for this contact. • This property shall contain the phone number for a person or organization to contact for information about this resource.
}]			
Info (v1.1+, deprecated v1.5)	string	<i>read-only</i> (null)	The location of the resource. • This property shall represent the location of the resource. <i>Deprecated in v1.5 and later. This property has been deprecated in favor of the <code>PostalAddress</code>, <code>Placement</code>, and <code>PartLocation</code> properties.</i>

Property	Type	Attributes	Notes
InfoFormat (v1.1+, deprecated v1.5)	string	read-only (null)	The format of the <code>Info</code> property. This property shall represent the <code>Info</code> property format. <i>Deprecated in v1.5 and later. This property has been deprecated in favor of the <code>PostalAddress</code>, <code>Placement</code>, and <code>PartLocation</code> properties.</i>
Latitude (v1.6+)	number (deg)	read-write (null)	The latitude of the resource. This property shall contain the latitude of the resource specified in degree units using a decimal format and not minutes or seconds.
Longitude (v1.6+)	number (deg)	read-write (null)	The longitude of the resource in degree units. This property shall contain the longitude of the resource specified in degree units using a decimal format and not minutes or seconds.
Oem (v1.1+) {	object		See the OEM object definition in the Using this guide clause.
(pattern) {}	object		Property names follow regular expression pattern "[A-Za-z0-9_]+\$"
}			
PartLocation (v1.5+) {	object		The part location for a resource within an enclosure. This property shall contain the part location for a resource within an enclosure. This representation shall indicate the location of a part within a location specified by the <code>Placement</code> property.
LocationOrdinalValue (v1.5+)	integer	read-only (null)	The number that represents the location of the part. For example, if <code>LocationType</code> is <code>Slot</code> and this unit is in slot 2, the <code>LocationOrdinalValue</code> is <code>2</code>. This property shall contain the number that represents the location of the part based on the <code>LocationType</code>. <code>LocationOrdinalValue</code> shall be measured based on the <code>Orientation</code> value starting with <code>0</code>.
LocationType (v1.5+)	string (enum)	read-only (null)	The type of location of the part. This property shall contain the type of location of the part. <i>For the possible property values, see <code>LocationType</code> in Property details.</i>
Orientation (v1.5+)	string (enum)	read-only (null)	The orientation for the ordering of the slot enumeration used by the <code>LocationOrdinalValue</code> property. This property shall contain the orientation for the ordering used by the <code>LocationOrdinalValue</code> property. <i>For the possible property values, see <code>Orientation</code> in Property details.</i>

Property	Type	Attributes	Notes
Reference (v1.5+)	string (enum)	<i>read-only</i> (null)	The reference point for the part location. Provides guidance about the general location of the part. This property shall contain the general location within the unit of the part. <i>For the possible property values, see Reference in Property details.</i>
ServiceLabel (v1.5+)	string	<i>read-only</i> (null)	The label of the part location, such as a silk-screened name or a printed label. This property shall contain the label assigned for service at the part location.
}			
PartLocationContext (v1.16+)	string	<i>read-only</i> (null)	Human-readable string to enable differentiation between <code>PartLocation</code> values for parts in the same enclosure, which might include hierarchical information of containing <code>PartLocation</code> values for the part. This property shall contain a human-readable string to enable differentiation between <code>PartLocation</code> values for parts in the same enclosure, which may include hierarchical information of containing <code>PartLocation</code> values for the part. The value of this property shall not include values of the <code>PartLocation</code> properties for the part itself. The purpose of this value, in conjunction with the <code>PartLocation</code> of the part itself, is to allow clients to determine the physical location of the part without tracing through the <code>PartLocation</code> of multiple resources.
PhysicalAddress (v1.17+) {	object		The physical address for a resource. This property shall contain a physical address for a resource. This property should be present for resources that represent physical objects that can operate without requiring physical containment by another resource. For example, a server chassis might be contained by a rack, but it might also be deployed individually, while a drive is always contained by a chassis and therefore is described by the containing resource.
City (v1.17+)	string	<i>read-write</i> (null)	City, township, or shi (JP). This property shall contain the city, township, or shi (JP) location for this resource.
Country (v1.17+)	string	<i>read-write</i> (null)	The country. This property shall contain the country location for this resource.
ISOCountryCode (v1.17+)	string	<i>read-write</i> (null)	The ISO 3166-1 country code. This property shall contain the ISO 3166-1-defined alpha-2 or alpha-3 country code. Pattern: <code>^([A-Z]{2} [A-Z]{3})\$</code>

Property	Type	Attributes	Notes
ISOSubdivisionCode (v1.17+)	string	<i>read-write</i> (null)	ISO 3166-2 subdivision code. This property shall contain the ISO 3166-2-defined state, province, or territory subdivision code for this resource. Pattern: <code>^[A-Z0-9]{1,3}\$</code>
PostalCode (v1.17+)	string	<i>read-write</i> (null)	The postal code. The property shall contain the postal code for this resource. The value shall conform to the RFC5139-defined requirements of the PC field.
StateOrProvince (v1.17+)	string	<i>read-write</i> (null)	State or province. This property shall contain the state, province, or territory location within the country for this resource.
StreetAddress (v1.17+)	string	<i>read-write</i> (null)	The street-level address, including building, room, or other identifiers. This property shall contain the street-level physical address of the resource, including identifiers such as apartment, room, or building to further locate the resource within a given street address.
}			
Placement (v1.3+) {	object		A place within the addressed location. This property shall contain a place within the addressed location.
AdditionalInfo (v1.7+)	string	<i>read-write</i> (null)	Area designation or other additional info. This property shall contain additional information, such as Tile, Column (Post), Wall, or other designation that describes a location that cannot be conveyed with other properties defined for the Placement object.
Rack (v1.3+)	string	<i>read-write</i> (null)	The name of a rack location within a row. This property shall contain the name of the rack within a row.
RackOffset (v1.3+)	integer	<i>read-write</i> (null)	The vertical location of the item, in terms of RackOffsetUnits. The vertical location of the item in the rack. Rack offset units shall be measured from bottom to top, starting with 0.
RackOffsetUnits (v1.3+)	string (enum)	<i>read-write</i> (null)	The type of rack units in use. This property shall contain a RackUnit enumeration literal that indicates the type of rack units in use. For the possible property values, see RackOffsetUnits in Property details.

Property	Type	Attributes	Notes
Row (v1.3+)	string	<i>read-write</i> (null)	The name of the row. This property shall contain the name of the row.
}			
PostalAddress (v1.3+, deprecated v1.17) {	object		The postal address of the addressed resource. This property shall contain a postal address of the resource. <i>Deprecated in v1.17 and later. This object and its properties have been deprecated in favor of <code>PhysicalAddress</code>.</i>
AdditionalCode (v1.3+)	string	<i>read-write</i> (null)	The additional code. The value shall conform to the RFC5139-defined requirements of the ADDCODE field.
AdditionalInfo (v1.7+)	string	<i>read-write</i> (null)	The room designation or other additional information. The value shall conform to the requirements of the LOC field as defined in RFC5139. Provides additional information.
Building (v1.3+)	string	<i>read-write</i> (null)	The name of the building. The value shall conform to the RFC5139-defined requirements of the BLD field. Names the building.
City (v1.3+)	string	<i>read-write</i> (null)	City, township, or shi (JP). The value shall conform to the RFC5139-defined requirements of the A3 field. Names a city, township, or shi (JP).
Community (v1.3+)	string	<i>read-write</i> (null)	The postal community name. The value shall conform to the RFC5139-defined requirements of the PCN field. A postal community name.
Country (v1.3+)	string	<i>read-write</i> (null)	The country. The value shall conform to the RFC5139-defined requirements of the Country field.
District (v1.3+)	string	<i>read-write</i> (null)	A county, parish, gun (JP), or district (IN). The value shall conform to the RFC5139-defined requirements of the A2 field. Names a county, parish, gun (JP), or district (IN).

Property	Type	Attributes	Notes
Division (v1.3+)	string	<i>read-write</i> (null)	City division, borough, city district, ward, or chou (JP). The value shall conform to the RFC5139-defined requirements of the A4 field. Names a city division, borough, city district, ward, or chou (JP).
Floor (v1.3+)	string	<i>read-write</i> (null)	The floor. The value shall conform to the RFC5139-defined requirements of the FLR field. Provides a floor designation.
GPSCoords (v1.3+, deprecated v1.6)	string	<i>read-write</i> (null)	The GPS coordinates of the part. The value shall conform to the RFC5139-defined requirements of the ADDCODE field. Shall contain the GPS coordinates of the location. If furnished, expressed in the <code>[-][nn]n.nnnnnn</code>, <code>[-][nn]n.nnnnn</code> format. For example, two comma-separated positive or negative numbers with six decimal places of precision. <i>Deprecated in v1.6 and later. This property has been deprecated in favor of the Longitude and Latitude properties.</i>
HouseNumber (v1.3+)	integer	<i>read-write</i> (null)	The numeric portion of house number. The value shall conform to the RFC5139-defined requirements of the HNO field. The numeric portion of the house number.
HouseNumberSuffix (v1.3+)	string	<i>read-write</i> (null)	The house number suffix. The value shall conform to the RFC5139-defined requirements of the HNS field. Provides a suffix to a house number, (F, B, or 1/2).
Landmark (v1.3+)	string	<i>read-write</i> (null)	The landmark. The value shall conform to the RFC5139-defined requirements of the LMK field. Identifies a landmark or vanity address.
LeadingStreetDirection (v1.3+)	string	<i>read-write</i> (null)	A leading street direction. The value shall conform to the requirements of the PRD field as defined in RFC5139. Names a leading street direction, (N, W, or SE).
Location (v1.3+, deprecated v1.7)	string	<i>read-write</i> (null)	The room designation or other additional information. The value shall conform to the RFC5139-defined requirements of the LOC field. Provides additional information. <i>Deprecated in v1.7 and later. This property has been deprecated in favor of the AdditionalInfo property.</i>

Property	Type	Attributes	Notes
Name (v1.3+)	string	<i>read-write</i> (null)	The name. The value shall conform to the RFC5139-defined requirements of the NAM field. Names the occupant.
Neighborhood (v1.3+)	string	<i>read-write</i> (null)	Neighborhood or block. The value shall conform to the RFC5139-defined requirements of the A5 field. Names a neighborhood or block.
PlaceType (v1.3+)	string	<i>read-write</i> (null)	The description of the type of place that is addressed. The value shall conform to the RFC5139-defined requirements of the PLC field. Examples include office and residence.
POBox (v1.3+)	string	<i>read-write</i> (null)	The post office box (PO box). The value shall conform to the RFC5139-defined requirements of the POBOX field. A post office box (PO box).
PostalCode (v1.3+)	string	<i>read-write</i> (null)	The postal code or zip code. The value shall conform to the RFC5139-defined requirements of the PC field. A postal code (or zip code).
Road (v1.3+)	string	<i>read-write</i> (null)	The primary road or street. The value shall conform to the RFC5139-defined requirements of the RD field. Designates a primary road or street.
RoadBranch (v1.3+)	string	<i>read-write</i> (null)	The road branch. The value shall conform to the RFC5139-defined requirements of the RDBR field. Shall contain a post office box (PO box) road branch.
RoadPostModifier (v1.3+)	string	<i>read-write</i> (null)	The road post-modifier. The value shall conform to the RFC5139-defined requirements of the POM field. For example, Extended.
RoadPreModifier (v1.3+)	string	<i>read-write</i> (null)	The road pre-modifier. The value shall conform to the RFC5139-defined requirements of the PRM field. For example, Old or New.
RoadSection (v1.3+)	string	<i>read-write</i> (null)	The road section. The value shall conform to the RFC5139-defined requirements of the RDSEC field. A road section.

Property	Type	Attributes	Notes
RoadSubBranch (v1.3+)	string	<i>read-write</i> (null)	The road sub branch. The value shall conform to the RFC5139-defined requirements of the RDSUBBR field.
Room (v1.3+)	string	<i>read-write</i> (null)	The name or number of the room. The value shall conform to the RFC5139-defined requirements of the ROOM field. A name or number of a room to locate the resource within the unit.
Seat (v1.3+)	string	<i>read-write</i> (null)	The seat, such as the desk, cubicle, or workstation. The value shall conform to the RFC5139-defined requirements of the SEAT field. A name or number of a seat, such as the desk, cubicle, or workstation.
Street (v1.3+)	string	<i>read-write</i> (null)	Street name. The value shall conform to the RFC5139-defined requirements of the A6 field. Names a street.
StreetSuffix (v1.3+)	string	<i>read-write</i> (null)	Avenue, Platz, Street, Circle. The value shall conform to the RFC5139-defined requirements of the STS field. Names a street suffix.
Territory (v1.3+)	string	<i>read-write</i> (null)	A top-level subdivision within a country. The value shall conform to the RFC5139-defined requirements of the A1 field when it names a territory, state, region, province, or prefecture within a country.
TrailingStreetSuffix (v1.3+)	string	<i>read-write</i> (null)	A trailing street suffix. The value shall conform to the RFC5139-defined requirements of the POD field. Names a trailing street suffix.
Unit (v1.3+)	string	<i>read-write</i> (null)	The name or number of the apartment unit or suite. The value shall conform to the RFC5139-defined requirements of the UNIT field. The name or number of a unit, such as the apartment or suite, to locate the resource.
}			

4.9.3 Property details

4.9.3.1 LocationType

The type of location of the part.

- This property shall contain the type of location of the part.

string	Description
Backplane (v1.12+)	A backplane. • This value shall indicate the part is a backplane in an enclosure.
Bay	A bay. • This value shall indicate the part is located in a bay.
Connector	A connector or port. • This value shall indicate the part is located in a connector or port.
Embedded (v1.13+)	Embedded within a part. • This value shall indicate the part is embedded or otherwise permanently incorporated into a larger part or device. This value shall not be used for parts that can be removed by a user or are considered field-replaceable.
Slot	A slot. • This value shall indicate the part is located in a slot.
Socket	A socket. • This value shall indicate the part is located in a socket.

4.9.3.2 Orientation

The orientation for the ordering of the slot enumeration used by the `LocationOrdinalValue` property.

- This property shall contain the orientation for the ordering used by the `LocationOrdinalValue` property.

string	Description
BackToFront	The ordering for the LocationOrdinalValue is back to front. This value shall indicate the ordering for LocationOrdinalValue is back to front.
BottomToTop	The ordering for LocationOrdinalValue is bottom to top. This value shall indicate the ordering for LocationOrdinalValue is bottom to top.
FrontToBack	The ordering for LocationOrdinalValue is front to back. This value shall indicate the ordering for LocationOrdinalValue is front to back.
LeftToRight	The ordering for the LocationOrdinalValue is left to right. This value shall indicate the ordering for LocationOrdinalValue is left to right.
RightToLeft	The ordering for the LocationOrdinalValue is right to left. This value shall indicate the ordering for LocationOrdinalValue is right to left.
TopToBottom	The ordering for the LocationOrdinalValue is top to bottom. This value shall indicate the ordering for LocationOrdinalValue is top to bottom.

4.9.3.3 RackOffsetUnits

The type of rack units in use.

- This property shall contain a RackUnit enumeration literal that indicates the type of rack units in use.

string	Description
EIA_310	A rack unit that is equal to 1.75 in (44.45 mm). Rack units shall conform to the EIA-310 standard.
OpenU	A rack unit that is equal to 48 mm (1.89 in). Rack units shall be specified in terms of the Open Compute Open Rack Specification.

4.9.3.4 Reference

The reference point for the part location. Provides guidance about the general location of the part.

- This property shall contain the general location within the unit of the part.

string	Description
Bottom	The part is in the bottom of the unit. This value shall indicate the part is in the bottom of the unit.
Front	The part is in the front of the unit. This value shall indicate the part is in the front of the unit.
Left	The part is on the left side of the unit. This value shall indicate the part is on the left side of the unit.
Middle	The part is in the middle of the unit. This value shall indicate the part is in the middle of the unit.
Rear	The part is in the rear of the unit. This value shall indicate the part is in the rear of the unit.
Right	The part is on the right side of the unit. This value shall indicate the part is on the right side of the unit.
Top	The part is in the top of the unit. This value shall indicate the part is in the top of the unit.

4.10 Message

4.10.1 Description

The message that the Redfish service returns.

- This type shall contain a message that the Redfish service returns, as described in the Redfish Specification.

4.10.2 Properties

Property	Type	Attributes	Notes
Message	string	<i>read-only</i>	The human-readable message. This property shall contain a human-readable message.

Property	Type	Attributes	Notes
MessageArgs []	array (string)	<i>read-only</i>	An array of message arguments that are substituted for the arguments in the message when looked up in the message registry. This property shall contain an array of message arguments that are substituted for the arguments in the message when looked up in the message registry. It has the same semantics as the <code>MessageArgs</code> property in the Redfish <code>MessageRegistry</code> schema. If the corresponding <code>ParamType</code> value contains <code>number</code>, the service shall convert the number to a string representation of the number.
MessageId	string	<i>read-only required</i>	The identifier for the message. This property shall contain a <code>MessageId</code>, as defined in the 'MessageId format' clause of the Redfish Specification.
MessageSeverity (v1.1+)	string (enum)	<i>read-only</i>	The severity of the message. This property shall contain the severity of the message. Services can replace the value defined in the message registry with a value more applicable to the implementation. <i>For the possible property values, see MessageSeverity in Property details.</i>
Oem {}	object		See the OEM object definition in the Using this guide clause.
RelatedProperties []	array (string)	<i>read-only</i>	A set of properties described by the message. This property shall contain an array of RFC6901-defined JSON pointers indicating the properties described by the message, if appropriate for the message.
Resolution	string	<i>read-only</i>	Used to provide suggestions on how to resolve the situation that caused the message. This property shall contain the resolution of the message. Services can replace the resolution defined in the message registry with a more specific resolution in message payloads.
ResolutionSteps (v1.2+) [{ }]	array (object)		This type describes a recommended step of the service-defined resolution. - The list of recommended steps to resolve the situation that caused the message. - This property shall contain an array of recommended steps to resolve the situation that caused the message. This property shall not be present if the <code>MessageSeverity</code> or <code>Severity</code> properties contain <code>OK</code>. For property details, see ResolutionStep.

Property	Type	Attributes	Notes
Severity <i>(deprecated v1.1)</i>	string	<i>read-only</i>	The severity of the message. This property shall contain the severity of the message, as defined in the 'Status' clause of the Redfish Specification. Services can replace the value defined in the message registry with a value more applicable to the implementation. <i>Deprecated in v1.1 and later. This property has been deprecated in favor of <code>MessageSeverity</code>, which ties the values to the enumerations defined for the <code>Health</code> property within <code>Status</code>.</i>
UserAuthenticationSource <i>(v1.3+)</i>	string	<i>read-only (null)</i>	The source of authentication for the username property associated with the message. This property shall contain the URL to the authentication service that is associated with the username property. This should be used for messages that result from a user action.
Username <i>(v1.3+)</i>	string	<i>read-only (null)</i>	The username of the account associated with the message. This property shall contain the username of the account associated with the message. This should be used for messages that result from a user action.

4.10.3 Property details

4.10.3.1 MessageSeverity

The severity of the message.

- This property shall contain the severity of the message. Services can replace the value defined in the message registry with a value more applicable to the implementation.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

4.11 Redundancy

4.11.1 Description

The common redundancy definition and structure used in other Redfish schemas.

- This object represents the redundancy element property.

4.11.2 Properties

Property	Type	Attributes	Notes
@odata.id	string (URI)	<i>read-only required</i>	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
Actions (v1.2+) {}	object		The available actions for this resource. • This property shall contain the available actions for this resource.
MaxNumSupported	integer	<i>read-only (null)</i>	The maximum number of members allowable for this particular redundancy group. • This property shall contain the maximum number of members allowed in the redundancy group.
MemberId	string	<i>read-only required</i>	The unique identifier for the member within an array. • This property shall contain the unique identifier for this member within an array. For services supporting Redfish v1.6 or higher, this value shall contain the zero-based array index.
MinNumNeeded	integer	<i>read-only required (null)</i>	The minimum number of members needed for this group to be redundant. • This property shall contain the minimum number of members allowed in the redundancy group for the current redundancy mode to still be fault tolerant.
Mode	string (enum)	<i>read-write required (null)</i>	The redundancy mode of the group. • This property shall contain the information about the redundancy mode of this subsystem. <i>For the possible property values, see Mode in Property details.</i>

Property	Type	Attributes	Notes
Name	string	<i>read-only required</i>	The name of the resource or array member. This object represents the name of this resource or array member. The resource values shall comply with the Redfish Specification-described requirements. This string value shall be of the 'Name' reserved word format.
Oem {}	object		See the OEM object definition in the Using this guide clause.
RedundancyEnabled (v1.1+)	boolean	<i>read-write (null)</i>	An indication of whether redundancy is enabled. This property shall indicate whether the redundancy is enabled.
RedundancySet [{}	array	<i>required</i>	The links to components of this redundancy set. This property shall contain the links to components that are part of this redundancy set.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
Status {}	object	<i>required</i>	The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

4.11.3 Property details

4.11.3.1 Mode

The redundancy mode of the group.

- This property shall contain the information about the redundancy mode of this subsystem.

string	Description
Failover	Failure of one unit automatically causes a standby or offline unit in the redundancy set to take over its functions.
N+m	Multiple units are available and active such that normal operation will continue if one or more units fail.
NotRedundant (v1.3+)	The subsystem is not configured in a redundancy mode, either due to configuration or the functionality has been disabled by the user.

string	Description
Sharing	Multiple units contribute or share such that operation will continue, but at a reduced capacity, if one or more units fail.
Sparing	One or more spare units are available to take over the function of a failed unit, but takeover is not automatic.

4.12 RedundantGroup

4.12.1 Description

The redundancy information for the devices in a redundancy group.

- This type shall contain redundancy information for the set of devices in this redundancy group.

4.12.2 Properties

Property	Type	Attributes	Notes
GroupName (v1.5+)	string	<i>read-only</i>	The name of the redundant group. This property shall contain the name of the redundant group used to identify the particular group of redundant resources. The value shall conform with the 'Name' clause of the Redfish Specification.
MaxSupportedInGroup (v1.4+)	integer	<i>read-only</i> (null)	The maximum number of devices supported in this redundancy group. This property shall contain the maximum number of devices allowed in the redundancy group.
MinNeededInGroup (v1.4+)	integer	<i>read-only</i> <i>required</i> (null)	The minimum number of devices needed for this group to be redundant. This property shall contain the minimum number of functional devices needed in the redundancy group for the current redundancy mode to be fault tolerant.
RedundancyGroup (v1.4+) [{	array	<i>required</i>	The links to the devices included in this redundancy group. This property shall contain the links to the resources that represent the devices that are part of this redundancy group.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.

Property	Type	Attributes	Notes
}]			
RedundancyType (v1.4+)	string (enum)	<i>read-write required (null)</i>	The redundancy mode of the group. This property shall contain the information about the redundancy mode of this redundancy group. <i>For the possible property values, see RedundancyType in Property details.</i>
Status (v1.4+) {}	object	<i>required</i>	The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

4.12.3 Property details

4.12.3.1 RedundancyType

The redundancy mode of the group.

- This property shall contain the information about the redundancy mode of this redundancy group.

string	Description
Failover	Failure of one unit automatically causes a standby or offline unit in the redundancy set to take over its functions. This value shall indicate that a failure of one unit automatically causes a standby or offline unit in the redundancy set to take over its functions.
NotRedundant	The subsystem is not configured in a redundancy mode, either due to configuration or the functionality has been disabled by the user.
NPlusM	Multiple units are available and active such that normal operation will continue if one or more units fail. This value shall indicate that the capacity or services provided by the set of N+M devices can withstand failure of up to M units, with all units in the group normally providing capacity or service.
Sharing	Multiple units contribute or share such that operation will continue, but at a reduced capacity, if one or more units fail.
Sparing	One or more spare units are available to take over the function of a failed unit, but takeover is not automatic.

4.13 ReplicaInfo

4.13.1 Description

Defines the characteristics of a replica of a source.

- The value shall define the characteristics of a replica of a source.

4.13.2 Properties

Property	Type	Attributes	Notes
ConsistencyEnabled	boolean	<i>read-only</i> (null)	True if consistency is enabled. • If true, consistency shall be enabled across the source and its associated target replica(s). The default value for this property is false.
ConsistencyState	string (enum)	<i>read-only</i> (null)	The current state of consistency. • The ConsistencyState enumeration literal shall indicate the current state of consistency. <i>For the possible property values, see ConsistencyState in Property details.</i>
ConsistencyStatus	string (enum)	<i>read-only</i> (null)	The current status of consistency. • The ConsistencyStatus enumeration literal shall specify the current status of consistency. Consistency may have been disabled or is experiencing an error condition. <i>For the possible property values, see ConsistencyStatus in Property details.</i>
ConsistencyType	string (enum)	<i>read-only</i> (null)	Indicates the consistency type used by the source and its associated target group. • The ConsistencyType enumeration literal shall indicate the consistency type used by the source and its associated target group. <i>For the possible property values, see ConsistencyType in Property details.</i>
DataProtectionLineOfService (v1.1+) {	object		A pointer to the DataProtection line of service element that describes this replica. • The value shall be a pointer to the data protection line of service that describes this replica.

Property	Type	Attributes	Notes
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
FailedCopyStopsHostIO	boolean	<i>read-only</i> (null)	If true, the storage array tells host to stop sending data to source element if copying to a remote element fails. If true, the storage array shall stop receiving data to the source element if copying to a remote element fails. The default value for this property is false.
PercentSynced	integer (%)	<i>read-only</i> (null)	Specifies the percent of the work completed to reach synchronization. Specifies the percent of the work completed to reach synchronization. Shall not be instantiated if implementation is not capable of providing this information. If related to a group, then PercentSynced shall be an average of the PercentSynced across all members of the group.
RemoteSourceReplica (v1.4+)	string	<i>read-only</i> (null)	ReplicaFaultDomain describes the fault domain (local or remote) of the replica relationship. The ReplicaFaultDomain enumeration literal shall describe the fault domain (local or remote) of the replica relationship.
Replica {	object		Deprecated - Use Source Replica. The resource that is the source of this replica. Deprecated - Use Source Replica. The value shall reference the resource that is the source of this replica.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
ReplicaFaultDomain (v1.3+)	string (enum)	<i>read-only</i> (null)	ReplicaFaultDomain describes the fault domain (local or remote) of the replica relationship. The ReplicaFaultDomain enumeration literal shall describe the fault domain (local or remote) of the replica relationship. <i>For the possible property values, see ReplicaFaultDomain in Property details.</i>

Property	Type	Attributes	Notes
ReplicaPriority	string (enum)	<i>read-only</i> (null)	The priority of background copy engine I/O to be managed relative to host I/O operations during a sequential background copy operation. The enumeration literal shall specify the priority of background copy engine I/O to be managed relative to host I/O operations during a sequential background copy operation. <i>For the possible property values, see ReplicaPriority in Property details.</i>
ReplicaProgressStatus	string (enum)	<i>read-only</i> (null)	The status of the session with respect to Replication activity. The ReplicaProgressStatus enumeration literal shall specify the status of the session with respect to Replication activity. <i>For the possible property values, see ReplicaProgressStatus in Property details.</i>
ReplicaReadOnlyAccess	string (enum)	<i>read-only</i> (null)	This property specifies whether the source, the target, or both elements are read only to the host. The enumeration literal shall specify whether the source, the target, or both elements are read only to the host. <i>For the possible property values, see ReplicaReadOnlyAccess in Property details.</i>
ReplicaRecoveryMode	string (enum)	<i>read-only</i> (null)	Describes whether the copy operation continues after a broken link is restored. The enumeration literal shall specify whether the copy operation continues after a broken link is restored. <i>For the possible property values, see ReplicaRecoveryMode in Property details.</i>
ReplicaRole	string (enum)	<i>read-only</i> (null)	The source or target role of this replica. The ReplicaRole enumeration literal shall represent the source or target role of this replica as known to the containing resource. <i>For the possible property values, see ReplicaRole in Property details.</i>
ReplicaSkewBytes	integer (bytes)	<i>read-only</i> (null)	Applies to Adaptive mode and it describes maximum number of bytes the SyncedElement (target) can be out of sync. Applies to Adaptive mode and it describes maximum number of bytes the SyncedElement (target) can be out of sync. If the number of out-of-sync bytes exceeds the skew value, ReplicaUpdateMode shall be switched to synchronous.

Property	Type	Attributes	Notes
ReplicaState	string (enum)	<i>read-only</i> (null)	ReplicaState describes the state of the relationship with respect to Replication activity. The ReplicaState enumeration literal shall specify the state of the relationship with respect to Replication activity. <i>For the possible property values, see ReplicaState in Property details.</i>
ReplicaType	string (enum)	<i>read-only</i> (null)	ReplicaType describes the intended outcome of the replication. The ReplicaType enumeration literal shall describe the intended outcome of the replication. <i>For the possible property values, see ReplicaType in Property details.</i>
ReplicaUpdateMode	string (enum)	<i>read-only</i> (null)	Describes whether the target elements will be updated synchronously or asynchronously. The enumeration literal shall specify whether the target elements will be updated synchronously or asynchronously. <i>For the possible property values, see ReplicaUpdateMode in Property details.</i>
RequestedReplicaState	string (enum)	<i>read-only</i> (null)	The last requested or desired state for the relationship. The last requested or desired state for the relationship. The actual state of the relationship shall be represented by ReplicaState. When RequestedState reaches the requested state, this property shall be null. <i>For the possible property values, see RequestedReplicaState in Property details.</i>
SourceReplica (v1.2+) {	object		The URI to the source replica when located on a different Swordfish service instance. The value shall contain the URI to the source replica when located on a different Swordfish service instance.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
SyncMaintained	boolean	<i>read-only</i> (null)	Synchronization is maintained. If true, Synchronization shall be maintained. The default value for this property is false.

Property	Type	Attributes	Notes
UndiscoveredElement	string (enum)	<i>read-only</i> (null)	This property specifies whether the source, the target, or both elements involved in a copy operation are undiscovered. The enumeration literal shall specify whether the source, the target, or both elements involved in a copy operation are undiscovered. An element is considered undiscovered if its object model is not known to the service performing the copy operation. <i>For the possible property values, see UndiscoveredElement in Property details.</i>
WhenActivated	string (%)	<i>read-only</i> (null)	Specifies when point-in-time copy was taken or when the replication relationship is activated, reactivated, resumed or re-established. The value shall be an ISO 8601 conformant time of day that specifies when the point-in-time copy was taken or when the replication relationship is activated, reactivated, resumed or re-established. This property shall be null if the implementation is not capable of providing this information.
WhenDeactivated	string (%)	<i>read-only</i> (null)	Specifies when the replication relationship is deactivated. The value shall be an ISO 8601 conformant time of day that specifies when the replication relationship is deactivated. Do not instantiate this property if implementation is not capable of providing this information.
WhenEstablished	string (%)	<i>read-only</i> (null)	Specifies when the replication relationship is established. The value shall be an ISO 8601 conformant time of day that specifies when the replication relationship is established. Do not instantiate this property if implementation is not capable of providing this information.
WhenSuspended	string (%)	<i>read-only</i> (null)	Specifies when the replication relationship is suspended. The value shall be an ISO 8601 conformant time of day that specifies when the replication relationship is suspended. Do not instantiate this property if implementation is not capable of providing this information.
WhenSynced	string	<i>read-only</i> (null)	The point in time that the Elements were synchronized. The value shall be an ISO 8601 conformant time of day that specifies when the elements were synchronized.
WhenSynchronized	string (%)	<i>read-only</i> (null)	Specifies when the replication relationship is synchronized. The value shall be an ISO 8601 conformant time of day that specifies when the replication relationship is synchronized. Do not instantiate this property if implementation is not capable of providing this information.

4.13.3 Property details

4.13.3.1 ConsistencyState

The current state of consistency.

- The ConsistencyState enumeration literal shall indicate the current state of consistency.

string	Description
Consistent	Consistent. • This enumeration literal shall indicate that the source and target shall be consistent.
Inconsistent	Not consistent. • This enumeration literal shall indicate that the source and target are not required to be consistent.

4.13.3.2 ConsistencyStatus

The current status of consistency.

- The ConsistencyStatus enumeration literal shall specify the current status of consistency. Consistency may have been disabled or is experiencing an error condition.

string	Description
Consistent	Consistent. • This enumeration literal shall indicate that the source and target are consistent.
Disabled	Consistency disabled. • This enumeration literal shall indicate that the source and target have consistency disabled.
InError	Consistency error. • This enumeration literal shall indicate that the source and target are not consistent.
InProgress	Becoming consistent. • This enumeration literal shall indicate that the source and target are becoming consistent.

4.13.3.3 ConsistencyType

Indicates the consistency type used by the source and its associated target group.

- The ConsistencyType enumeration literal shall indicate the consistency type used by the source and its associated target group.

string	Description
SequentiallyConsistent	Sequentially consistent. • This enumeration literal shall indicate that the source and target shall be sequentially consistent.

4.13.3.4 ReplicaFaultDomain

ReplicaFaultDomain describes the fault domain (local or remote) of the replica relationship.

- The ReplicaFaultDomain enumeration literal shall describe the fault domain (local or remote) of the replica relationship.

string	Description
Local	Local indicates that the source and target replicas are contained within a single fault domain. • This enumeration literal shall indicate that the source and target replicas are contained within a single fault domain.
Remote	Remote indicates that the source and target replicas are in separate fault domains. • This enumeration literal shall indicate that the source and target replicas are in separate fault domains.

4.13.3.5 ReplicaPriority

The priority of background copy engine I/O to be managed relative to host I/O operations during a sequential background copy operation.

- The enumeration literal shall specify the priority of background copy engine I/O to be managed relative to host I/O operations during a sequential background copy operation.

string	Description
High	Copy engine I/O has higher priority than host I/O. Copy engine I/O shall have a higher priority than host I/O.
Low	Copy engine I/O lower priority than host I/O. Copy engine I/O shall have a lower priority than host I/O.
Same	Copy engine I/O has the same priority as host I/O. Copy engine I/O shall have the same priority as host I/O.
Urgent	Copy operation to be performed as soon as possible, regardless of the host I/O requests. Regardless of the host I/O requests, the Copy operation shall be performed as soon as possible.

4.13.3.6 ReplicaProgressStatus

The status of the session with respect to Replication activity.

- The ReplicaProgressStatus enumeration literal shall specify the status of the session with respect to Replication activity.

string	Description
Aborting	Abort in progress. This enumeration literal shall indicate that replication has an abort in progress.
Completed	The request is completed. Data flow is idle. This enumeration literal shall indicate that the request is completed. Data flow is idle.
Detaching	Detach in progress. This enumeration literal shall indicate that replication has a detach in progress.
Dormant	Indicates that the data flow is inactive, suspended or quiesced. This enumeration literal shall indicate that the data flow is inactive, suspended or quiesced.
FailingBack	Undoing the result of failover. This enumeration literal shall indicate that replication is undoing the result of failover.

string	Description
FailingOver	In the process of switching source and target. This enumeration literal shall indicate that replication is in the process of switching source and target.
Fracturing	Fracture in progress. This enumeration literal shall indicate that replication has a fracture in progress.
Initializing	In the process of establishing source/replica relationship and the data flow has not started. This enumeration literal shall indicate that replication is in the process of establishing source/replica relationship and the data flow has not started.
Mixed	Applies to groups with element pairs with different statuses. Generally, the individual statuses need to be examined. This enumeration literal shall indicate that replication status is mixed across element pairs in a replication group. Generally, the individual statuses need to be examined.
Pending	The flow of data has stopped momentarily due to limited bandwidth or a busy system. This enumeration literal shall indicate that the flow of data has stopped momentarily due to limited bandwidth or a busy system.
Preparing	Preparation in progress. This enumeration literal shall indicate that replication has preparation in progress.
RequiresActivate	The requested operation has completed, however, the synchronization relationship needs to be activated before further copy operations can be issued. This enumeration literal shall indicate that the requested operation has completed, however, the synchronization relationship needs to be activated before further copy operations can be issued.
RequiresDetach	The requested operation has completed, however, the synchronization relationship needs to be detached before further copy operations can be issued. This enumeration literal shall indicate that the requested operation has completed, however, the synchronization relationship needs to be detached before further copy operations can be issued.
RequiresFracture	The requested operation has completed, however, the synchronization relationship needs to be fractured before further copy operations can be issued. This enumeration literal shall indicate that the requested operation has completed, however, the synchronization relationship needs to be fractured before further copy operations can be issued.

string	Description
RequiresResume	The requested operation has completed, however, the synchronization relationship needs to be resumed before further copy operations can be issued. This enumeration literal shall indicate that the requested operation has completed, however, the synchronization relationship needs to be resumed before further copy operations can be issued.
RequiresResync	The requested operation has completed, however, the synchronization relationship needs to be resynced before further copy operations can be issued. This enumeration literal shall indicate that the requested operation has completed, however, the synchronization relationship needs to be resynced before further copy operations can be issued.
RequiresSplit	The requested operation has completed, however, the synchronization relationship needs to be split before further copy operations can be issued. This enumeration literal shall indicate that the requested operation has completed, however, the synchronization relationship needs to be split before further copy operations can be issued.
Restoring	Restore in progress. This enumeration literal shall indicate that replication has a restore in progress.
Resyncing	Resync in progress. This enumeration literal shall indicate that replication has resynchronization in progress.
Splitting	Split in progress. This enumeration literal shall indicate that replication has a split in progress.
Suspending	The copy operation is in the process of being suspended. This enumeration literal shall indicate that replication has a copy operation in the process of being suspended.
Synchronizing	Sync in progress. This enumeration literal shall indicate that replication has synchronization in progress.
Terminating	The relationship is in the process of terminating. This enumeration literal shall indicate that the replication relationship is in the process of terminating.

4.13.3.7 ReplicaReadOnlyAccess

This property specifies whether the source, the target, or both elements are read only to the host.

- The enumeration literal shall specify whether the source, the target, or both elements are read only to the host.

string	Description
Both	Both the source and the target elements are read only to the host. Both the source and the target elements shall be read only to the host.
ReplicaElement	The replica element. The replica element shall be read-only to the host.
SourceElement	The source element. The source element shall be read-only to the host.

4.13.3.8 ReplicaRecoveryMode

Describes whether the copy operation continues after a broken link is restored.

- The enumeration literal shall specify whether the copy operation continues after a broken link is restored.

string	Description
Automatic	Copy operation resumes automatically. The copy operation shall resume automatically.
Manual	ReplicaState is set to Suspended after the link is restored. It is required to issue the Resume operation to continue. The ReplicaState shall be set to Suspended after the link is restored. It is required to issue the Resume operation to continue.

4.13.3.9 ReplicaRole

The source or target role of this replica.

- The ReplicaRole enumeration literal shall represent the source or target role of this replica as known to the containing resource.

string	Description
Source	The source element. This enumeration literal shall indicate a source element.

string	Description
Target	The target element. This enumeration literal shall indicate target element.

4.13.3.10 ReplicaState

ReplicaState describes the state of the relationship with respect to Replication activity.

- The ReplicaState enumeration literal shall specify the state of the relationship with respect to Replication activity.

string	Description
Aborted	The copy operation is aborted with the Abort operation. Use the Resync Replica operation to restart the copy operation. This enumeration literal shall indicate that the copy operation is aborted with the Abort operation. The Resync Replica operation can be used to restart the copy operation.
Broken	The relationship is non-functional due to errors in the source, the target, the path between the two or space constraints. This enumeration literal shall indicate that the relationship is non-functional due to errors in the source, the target, the path between the two or space constraints.
Failedover	Reads and writes are sent to the target element. Source element is not reachable. This enumeration literal shall indicate that the reads and writes are sent to the target element. The source element may not be reachable.
Fractured	Target is split from the source. This enumeration literal shall indicate that the Target is split from the source. The target may not be consistent.
Inactive	Data flow has stopped, writes to source element will not be sent to target element. This enumeration literal shall indicate that data flow has stopped, writes to source element shall not be sent to target element.
Initialized	The link to enable replication is established and source/replica elements are associated, but the data flow has not started. This enumeration literal shall indicate that the link to enable replication is established and source/replica elements are associated, but the data flow has not started.

string	Description
Invalid	The array is unable to determine the state of the replication relationship, for example, after the connection is restored; however, either source or target elements have an unknown status. This enumeration literal shall indicate that the storage server is unable to determine the state of the replication relationship, for example, after the connection is restored; however, either source or target elements have an unknown status.
Mixed	Applies to the ReplicaState of GroupSynchronized. It indicates the StorageSynchronized relationships of the elements in the groups have different ReplicaState values. This enumeration literal shall indicate the ReplicaState of GroupSynchronized. The value indicates the StorageSynchronized relationships of the elements in the group have different ReplicaState values.
Partitioned	State of replication relationship can not be determined, for example, due to a connection problem. This enumeration literal shall indicate that the state of replication relationship can not be determined, for example, due to a connection problem.
Prepared	Initialization is completed, however, the data flow has not started. This enumeration literal shall indicate that initialization is completed, however, the data flow has not started.
Restored	It indicates the source element was restored from the target element. This enumeration literal shall indicate that the source element was restored from the target element.
Skewed	The target has been modified and is no longer synchronized with the source element or the point-in-time view. This enumeration literal shall indicate that the target has been modified and is no longer synchronized with the source element or the point-in-time view.
Split	The target element was gracefully (or systematically) split from its source element -- consistency is guaranteed. This enumeration literal shall indicate that the target element was gracefully (or systematically) split from its source element -- consistency shall be guaranteed.
Suspended	Data flow between the source and target elements has stopped. Writes to source element are held until the relationship is Resumed. This enumeration literal shall indicate that the data flow between the source and target elements has stopped. Writes to source element shall be held until the relationship is Resumed.
Synchronized	For the Mirror, Snapshot, or Clone replication, the target represents a copy of the source. This enumeration literal shall indicate that for Mirror, Snapshot, or Clone replication, the target represents a copy of the source.

string	Description
Unsynchronized	Not all the source element data has been copied to the target element. This enumeration literal shall indicate that not all the source element data has been copied to the target element.

4.13.3.11 ReplicaType

ReplicaType describes the intended outcome of the replication.

- The ReplicaType enumeration literal shall describe the intended outcome of the replication.

string	Description
Clone	Create a point in time, full copy the source. This enumeration literal shall indicate that replication shall create a point in time, full copy the source.
Mirror	Create and maintain a copy of the source. This enumeration literal shall indicate that replication shall create and maintain a copy of the source.
Snapshot	Create a point in time, virtual copy of the source. This enumeration literal shall indicate that replication shall create a point in time, virtual copy of the source.
TokenizedClone	Create a token based clone. This enumeration literal shall indicate that replication shall create a token based clone.

4.13.3.12 ReplicaUpdateMode

Describes whether the target elements will be updated synchronously or asynchronously.

- The enumeration literal shall specify whether the target elements will be updated synchronously or asynchronously.

string	Description
Active	Active-Active (i.e. bidirectional) synchronous updates. This enumeration literal shall indicate Active-Active (i.e. bidirectional) synchronous updates.

string	Description
Adaptive	Allows implementation to switch between synchronous and asynchronous modes. This enumeration literal shall indicate that an implementation may switch between synchronous and asynchronous modes.
Asynchronous	Asynchronous updates. This enumeration literal shall indicate Asynchronous updates.
Synchronous	Synchronous updates. This enumeration literal shall indicate Synchronous updates.

4.13.3.13 RequestedReplicaState

The last requested or desired state for the relationship.

- The last requested or desired state for the relationship. The actual state of the relationship shall be represented by ReplicaState. When RequestedState reaches the requested state, this property shall be null.

string	Description
Aborted	The copy operation is aborted with the Abort operation. Use the Resync Replica operation to restart the copy operation. This enumeration literal shall indicate that the copy operation is aborted with the Abort operation. The Resync Replica operation can be used to restart the copy operation.
Broken	The relationship is non-functional due to errors in the source, the target, the path between the two or space constraints. This enumeration literal shall indicate that the relationship is non-functional due to errors in the source, the target, the path between the two or space constraints.
Failedover	Reads and writes are sent to the target element. Source element is not reachable. This enumeration literal shall indicate that the reads and writes are sent to the target element. The source element may not be reachable.
Fractured	Target is split from the source. This enumeration literal shall indicate that the Target is split from the source. The target may not be consistent.

string	Description
Inactive	Data flow has stopped, writes to source element will not be sent to target element. This enumeration literal shall indicate that data flow has stopped, writes to source element shall not be sent to target element.
Initialized	The link to enable replication is established and source/replica elements are associated, but the data flow has not started. This enumeration literal shall indicate that the link to enable replication is established and source/replica elements are associated, but the data flow has not started.
Invalid	The array is unable to determine the state of the replication relationship, for example, after the connection is restored; however, either source or target elements have an unknown status. This enumeration literal shall indicate that the storage server is unable to determine the state of the replication relationship, for example, after the connection is restored; however, either source or target elements have an unknown status.
Mixed	Applies to the ReplicaState of GroupSynchronized. It indicates the StorageSynchronized relationships of the elements in the groups have different ReplicaState values. This enumeration literal shall indicate the ReplicaState of GroupSynchronized. The value indicates the StorageSynchronized relationships of the elements in the group have different ReplicaState values.
Partitioned	State of replication relationship can not be determined, for example, due to a connection problem. This enumeration literal shall indicate that the state of replication relationship can not be determined, for example, due to a connection problem.
Prepared	Initialization is completed, however, the data flow has not started. This enumeration literal shall indicate that initialization is completed, however, the data flow has not started.
Restored	It indicates the source element was restored from the target element. This enumeration literal shall indicate that the source element was restored from the target element.
Skewed	The target has been modified and is no longer synchronized with the source element or the point-in-time view. This enumeration literal shall indicate that the target has been modified and is no longer synchronized with the source element or the point-in-time view.
Split	The target element was gracefully (or systematically) split from its source element -- consistency is guaranteed. This enumeration literal shall indicate that the target element was gracefully (or systematically) split from its source element -- consistency shall be guaranteed.

string	Description
Suspended	Data flow between the source and target elements has stopped. Writes to source element are held until the relationship is Resumed. This enumeration literal shall indicate that the data flow between the source and target elements has stopped. Writes to source element shall be held until the relationship is Resumed.
Synchronized	For the Mirror, Snapshot, or Clone replication, the target represents a copy of the source. This enumeration literal shall indicate that for Mirror, Snapshot, or Clone replication, the target represents a copy of the source.
Unsynchronized	Not all the source element data has been copied to the target element. This enumeration literal shall indicate that not all the source element data has been copied to the target element.

4.13.3.14 UndiscoveredElement

This property specifies whether the source, the target, or both elements involved in a copy operation are undiscovered.

- The enumeration literal shall specify whether the source, the target, or both elements involved in a copy operation are undiscovered. An element is considered undiscovered if its object model is not known to the service performing the copy operation.

string	Description
ReplicaElement	The replica element is undiscovered. This enumeration literal shall indicate that the replica element is undiscovered.
SourceElement	The source element is undiscovered. This enumeration literal shall indicate that the source element is undiscovered.

4.14 ResolutionStep

4.14.1 Description

This type describes a recommended step of the service-defined resolution.

- This type shall describe a recommended step of the service-defined resolution. The set of recommended steps

are used to resolve the cause of a log entry, an event, a condition, or an error message.

4.14.2 Properties

Property	Type	Attributes	Notes
ActionParameters [{	array		The parameters of the action URI for a resolution step. This property shall contain the parameters of the action URI for a resolution step.
@odata.id	string	<i>read-only</i>	Link to a Parameters resource. See the Links section and the <i>ActionInfo</i> schema for details.
}]			
ActionURI	string (URI)	<i>read-only</i>	The action URI for a resolution step. This property shall contain the action URI for a resolution step.
Oem {}	object		See the OEM object definition in the Using this guide clause.
Priority	integer	<i>read-only</i> (null)	The priority in the set of resolution steps. This property shall contain the priority in the set of resolution steps. The value 0 shall indicate the highest priority. Increasing values shall represent decreasing priority. If two or more resolution steps have the same priority, the execution order of the resolution steps shall be in array order. If a resolution step does not have a priority assignment, the default is 0. The priority is used to determine the execution order of the resolution steps.
ResolutionType	string (enum)	<i>read-only</i> <i>required</i> (null)	The type of the resolution step. This property shall contain the type of the resolution step. <i>For the possible property values, see ResolutionType in Property details.</i>
RetryCount	integer	<i>read-only</i> (null)	The number of retries for a resolution step. This property shall contain the number of the retries for a resolution step.
RetryIntervalSeconds	integer (seconds)	<i>read-only</i> (null)	The interval between retries for a resolution step. This property shall contain the interval, in seconds, between the retries for a resolution step.
TargetComponentURI	string (URI)	<i>read-only</i> (null)	The target URI of the component for a resolution step. This property shall contain the target URI of the component for a resolution step. This property shall be present if the <i>ActionURI</i> property is not supported.

4.14.3 Property details

4.14.3.1 ResolutionType

The type of the resolution step.

- This property shall contain the type of the resolution step.

string	Description
CollectDiagnosticData	Collect diagnostic data.
ContactVendor	Contact vendor for service.
FirmwareUpdate	Perform a firmware update operation.
OEM	Perform an OEM-defined resolution step.
PowerCycle	Perform a power cycle operation.
ReplaceComponent	Replace a component.
Reset	Perform a reset operation.
ResetToDefaults	Reset the settings to factory defaults.

4.15 Schedule

4.15.1 Description

Schedule a series of occurrences.

- The properties of this type shall schedule a series of occurrences.

4.15.2 Properties

Property	Type	Attributes	Notes
EnabledDaysOfMonth []	array (integer, null)	read-write	Days of the month when scheduled occurrences are enabled. <code>0</code> indicates that every day of the month is enabled. This property shall contain the days of the month when scheduled occurrences are enabled, for enabled days of week and months of year. If the array contains a single value of <code>0</code>, or if the property is not present, all days of the month shall be enabled.
EnabledDaysOfWeek []	array (string (enum))	read-write (null)	Days of the week. - Days of the week when scheduled occurrences are enabled, for enabled days of the month and months of the year. If not present, all days of the week are enabled. - Days of the week when scheduled occurrences are enabled. If not present, all days of the week shall be enabled. <i>For the possible property values, see EnabledDaysOfWeek in Property details.</i>
EnabledIntervals (v1.1+) []	array (string, null)	read-write	Intervals when scheduled occurrences are enabled. Each value shall be an ISO 8601 conformant interval specifying when occurrences are enabled.
EnabledMonthsOfYear []	array (string (enum))	read-write (null)	Months of the year. - The months of the year when scheduled occurrences are enabled. If not present, all months of the year are enabled. - This property shall contain the months of the year when scheduled occurrences are enabled, for enabled days of week and days of month. If not present, all months of the year shall be enabled. <i>For the possible property values, see EnabledMonthsOfYear in Property details.</i>
InitialStartTime	string (date-time)	read-write (null)	The date and time when the initial occurrence is scheduled to occur. This property shall contain the date and time when the initial occurrence is scheduled to occur.
Lifetime	string (duration)	read-write (null)	The time after provisioning when the schedule as a whole expires. This property shall contain a Redfish Duration that describes the time after provisioning when the schedule expires. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(. \d+)?)S)?)?\$</code>
MaxOccurrences	integer	read-write (null)	The maximum number of scheduled occurrences. This property shall contain the maximum number of scheduled occurrences.

Property	Type	Attributes	Notes
Name	string	<i>read-write</i> (null)	The schedule name. The name of the schedule, which is constructed as OrgID:ScheduleName. Examples include ACME:Daily, ACME:Weekly, and ACME:FirstTuesday.
RecurrenceInterval	string (duration)	<i>read-write</i> (null)	The duration between consecutive occurrences. This property shall contain the duration between consecutive occurrences. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\. \d+)?)S)?)?\$</code>

4.15.3 Property details

4.15.3.1 EnabledDaysOfWeek

Days of the week.

- Days of the week when scheduled occurrences are enabled, for enabled days of the month and months of the year. If not present, all days of the week are enabled.
 - Days of the week when scheduled occurrences are enabled. If not present, all days of the week shall be enabled.

string	Description
Every	Every day of the week. This value indicates that every day of the week has been selected. When used in array properties, such as for enabling a function on certain days, it shall be the only member in the array.
Friday	Friday.
Monday	Monday.
Saturday	Saturday.
Sunday	Sunday.
Thursday	Thursday.
Tuesday	Tuesday.
Wednesday	Wednesday.

4.15.3.2 EnabledMonthsOfYear

Months of the year.

- The months of the year when scheduled occurrences are enabled. If not present, all months of the year are enabled.
 - This property shall contain the months of the year when scheduled occurrences are enabled, for enabled days of week and days of month. If not present, all months of the year shall be enabled.

string	Description
April	April.
August	August.
December	December.
Every	Every month of the year. • This value indicates that every month of the year has been selected. When used in array properties, such as for enabling a function for certain months, it shall be the only member in the array.
February	February.
January	January.
July	July.
June	June.
March	March.
May	May.
November	November.
October	October.
September	September.

4.16 Status

4.16.1 Description

The status and health of a resource and its children.

- This type shall contain any status or health properties of a resource.

4.16.2 Properties

Property	Type	Attributes	Notes
Conditions (v1.11+) [{	array		Conditions in this resource that require attention. This property shall represent the active conditions requiring attention in this or a related resource. The conditions may affect the <code>Health</code> or <code>HealthRollup</code> of this resource. The service may roll up multiple conditions originating from a resource, using the <code>ConditionInRelatedResource</code> message from the Base Message Registry. The array order of conditions may change as new conditions occur or as conditions are resolved by the service.
ConditionType (v1.22+)	string (enum)	<i>read-only</i> (null)	The type of condition. This property shall contain the type of condition. <i>For the possible property values, see ConditionType in Property details.</i>
LogEntry {	object		The link to the log entry created for this condition. This property shall contain a link to a resource of type <code>LogEntry</code> that represents the log entry created for this condition. See the <i>LogEntry</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>LogEntry</i> resource. See the Links section and the <i>LogEntry</i> schema for details.
}			
Message	string	<i>read-only</i>	The human-readable message for this condition. This property shall contain a human-readable message describing this condition.
MessageArgs []	array (string)	<i>read-only</i>	An array of message arguments that are substituted for the arguments in the message when looked up in the message registry. This property shall contain an array of message arguments that are substituted for the arguments in the message when looked up in the message registry. It has the same semantics as the <code>MessageArgs</code> property in the Redfish <code>MessageRegistry</code> schema.
MessageId	string	<i>read-only</i> <i>required</i>	The identifier for the message. This property shall contain a <code>MessageId</code>, as defined in the 'MessageId format' clause of the Redfish Specification.
Oem (v1.21+) {	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
(pattern) {}	object		Property names follow regular expression pattern <code>^[A-Za-z0-9_]+\$</code>
}			
OriginOfCondition {	object		A link to the resource or object that originated the condition. This property shall contain a link to the resource or object that originated the condition. This property shall not be present if the condition was caused by this resource.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
Resolution (v1.14+)	string	<i>read-only</i>	Suggestions on how to resolve the condition. This property shall contain the resolution of the condition. Services should replace the resolution defined in the message registry with a more specific resolution.
ResolutionSteps (v1.18+) [{}]	array (object)		This type describes a recommended step of the service-defined resolution. - The list of recommended steps to resolve the condition. - This property shall contain an array of recommended steps to resolve the condition. A client can stop executing the resolution steps once the condition is removed from the resource. For property details, see ResolutionStep.
Severity	string (enum)	<i>read-only</i>	The severity of the condition. This property shall contain the severity of the condition. Services can replace the value defined in the message registry with a value more applicable to the implementation. <i>For the possible property values, see Severity in Property details.</i>
Timestamp	string (date-time)	<i>read-only</i>	The time the condition occurred. This property shall indicate the time the condition occurred.
UserAuthenticationSource (v1.20+)	string	<i>read-only</i> (null)	The source of authentication for the username property associated with the condition. This property shall contain the URL to the authentication service that is associated with the username property. This should be used for conditions that result from a user action.

Property	Type	Attributes	Notes
Username (v1.20+)	string	<i>read-only</i> (null)	The username of the account associated with the condition. This property shall contain the username of the account associated with the condition. This should be used for conditions that result from a user action.
}]			
Health	string (enum)	<i>read-only</i> (null)	The health state of this resource in the absence of its dependent resources. This property shall represent the health state of the resource without considering its dependent resources. The values shall conform to those defined in the Redfish Specification. <i>For the possible property values, see Health in Property details.</i>
HealthRollup	string (enum)	<i>read-only</i> (null)	The overall health state from the view of this resource. This property shall represent the health state of the resource and its dependent resources. The values shall conform to those defined in the Redfish Specification. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification. <i>For the possible property values, see HealthRollup in Property details.</i>
Oem {	object		See the OEM object definition in the Using this guide clause.
(pattern) {}	object		Property names follow regular expression pattern "[A-Za-z0-9_]+\$"
}			
State	string (enum)	<i>read-only</i> (null)	The state of the resource. This property shall indicate the state of the resource. <i>For the possible property values, see State in Property details.</i>

4.16.3 Property details

4.16.3.1 ConditionType

The type of condition.

- This property shall contain the type of condition.

string	Description
Alert	The condition is an alert. This value shall indicate a condition that requires correction, such as a fault.
Informational	The condition is informational. This value shall indicate a condition that requires attention, maintenance, or some other user intervention, such as performing a reset to activate new firmware.
Subsystem	The condition is the health of a subsystem. This value shall indicate a condition that contains the health of a subsystem. If supported by the service, the service shall always provide this condition in responses.

4.16.3.2 Health

The health state of this resource in the absence of its dependent resources.

- This property shall represent the health state of the resource without considering its dependent resources. The values shall conform to those defined in the Redfish Specification.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

4.16.3.3 HealthRollup

The overall health state from the view of this resource.

- This property shall represent the health state of the resource and its dependent resources. The values shall conform to those defined in the Redfish Specification. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification.

Methods used to determine the value of this property can vary between different architectures and requirements of the underlying product. This property does not necessarily surface the most degraded health from all subordinate resources. For example, if a `PowerSupply` resource contains `Critical` for its `Health` property, but belongs to a redundancy group that is still able to power the parent `Chassis` resource, the `Chassis` resource could report `Warning` for the `HealthRollup` property, depending on the redundancy policy for the `Chassis` resource. Using the same `PowerSupply` example, the `ComputerSystem` resource associated with this `Chassis` resource could degrade its

`HealthRollup` , even though the `PowerSupply` resource is not subordinate to the `ComputerSystem` resource. In this case, the `ComputerSystem` resource is dependent on the `PowerSupply` , but are in two different resource hierarchies.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

4.16.3.4 Severity

The severity of the condition.

- This property shall contain the severity of the condition. Services can replace the value defined in the message registry with a value more applicable to the implementation.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

4.16.3.5 State

The state of the resource.

- This property shall indicate the state of the resource.

string	Description
Absent	This function or device is not currently present or detected. This resource represents a capability or an available location where a device can be installed. • This value shall indicate that the function or device is absent as defined in the 'Absent resources' clause of the Redfish Specification.
Deferring (v1.2+)	The element does not process any commands but queues new requests. • This value shall indicate the element does not process any commands but queues new requests.

string	Description
Degraded (v1.19+)	The function or resource is degraded. This value shall indicate the resource is enabled but operating in a degraded mode.
Disabled	This function or resource is disabled. This value shall indicate that a function or resource is unavailable.
Enabled	This function or resource is enabled. This value shall indicate that a function or resource is capable of operating.
InTest	This function or resource is undergoing testing or is in the process of capturing information for debugging. This value shall indicate that the component is undergoing testing or is in the process of capturing information for debugging.
Qualified (v1.9+, deprecated v1.19)	The element quality is within the acceptable range of operation. This value shall indicate the element is within the acceptable range of operation. <i>Deprecated in v1.19 and later. This value has been deprecated in favor of StandbySpare.</i>
Quiesced (v1.2+)	The element is enabled but only processes a restricted set of commands. This value shall indicate the element is enabled but only processes a restricted set of commands.
StandbyOffline	This function or resource is enabled but awaits an external action to activate it. This value shall indicate that a resource is temporarily unavailable but may become available through an external action.
StandbySpare	This function or resource is part of a redundancy set and awaits a failover or other external action to activate it. This value shall indicate that a resource is unavailable but may become available automatically as part of a failover, through an external action, or in response to the change in state of another device or resource.
Starting	This function or resource is starting. This value shall indicate that the resource is attempting to transition to <code>Enabled</code>.
UnavailableOffline (v1.1+)	This function or resource is present but cannot be used. This value shall indicate that a function or resource is present but not able to be used.

string	Description
Updating (v1.2+)	The element is updating and might be unavailable or degraded. • This value shall indicate the element is updating. The element may become unavailable or operate at a degraded level of performance or functionality.

5 Resource collections

A resource collection is a core concept in Redfish. A resource collection is a group of like resources where the number of instances in the group can shrink or grow depending on the scope of the Redfish service or the configuration of the devices being managed. Every resource collection contains the same set of supported properties, and all contain `Collection` in the name of their schema. Every resource linked in the `Members` array within a resource collection will have the same resource type with the same major version but can vary in minor or errata schema versions.

The properties of a resource collection are:

5.0.1 Properties

Property	Type	Attributes	Notes
@odata.context	string (URI)	<i>read-only</i>	The value of this property shall be the context URL that describes the resource according to OData-Protocol and shall be of the form defined in the Redfish specification.
@odata.id	string (URI)	<i>read-only required</i>	The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
@odata.type	string	<i>read-only required</i>	The value of this property shall be a URI fragment that specifies the type of the resource and it shall be of the form defined in the Redfish specification.
Description	string	<i>read-only (null)</i>	This property shall contain the description of this resource. The value shall conform with the 'Description' clause of the Redfish Specification.
Members [{	array	<i>required</i>	The members of this collection.
@odata.id	string (URI)	<i>read-only</i>	The link to a Resource instance, which is a member of this collection.
}]			
Members@odata.count	integer	<i>read-only</i>	The value of this property shall be an integer representing the number of items in a collection.
Members@odata.nextLink	string (URI)	<i>read-only</i>	The value of this property shall be a URI to a resource, with the same <code>@odata.type</code> , containing the next set of partial members.
Name	string	<i>read-only required</i>	This property shall contain the name of this resource or array member. The value shall conform with the 'Name' clause of the Redfish Specification.
Oem {}	object		This string property shall be in the <code>Oem</code> reserved word format.

As shown in the following example, a Redfish service may provide management functionality for several `ComputerSystem` resources, and therefore a `ComputerSystemCollection` resource is provided. This example shows a service with four `ComputerSystem` instances inside the `Members` array.

```
{
  "@odata.type": "#ComputerSystemCollection.ComputerSystemCollection",
  "Name": "Computer System Collection",
  "Members@odata.count": 4,
  "Members": [
    {
      "@odata.id": "/redfish/v1/Systems/529QB9450R6"
    },
    {
      "@odata.id": "/redfish/v1/Systems/529QB9451R6"
    },
    {
      "@odata.id": "/redfish/v1/Systems/529QB9452R6"
    },
    {
      "@odata.id": "/redfish/v1/Systems/529QB9453R6"
    }
  ],
  "@odata.id": "/redfish/v1/Systems"
}
```

5.1 Collection capabilities annotation (#CollectionCapabilities)

This annotation is used to inform the client how to form the request body for a create (`POST`) operation to a given collection based on a specified use case, which will result in a new member being added to the given collection.

5.1.1 Properties

Property	Type	Attributes	Notes
Capabilities { {	array		This property shall contain an array of objects that describe the capabilities of this resource collection.
CapabilitiesObject {	object	<i>required</i>	This property shall contain a link to a resource that matches the type for a resource collection and shall contain annotations that describe the properties allowed in the POST request.
@odata.id	string (URI)	<i>read-only</i>	The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			

Property	Type	Attributes	Notes
Links {	object	<i>required</i>	This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		This property shall contain the OEM extensions. All values for properties contained in this object shall conform to the Redfish Specification-described requirements. For property details, see Oem.
RelatedItem [{	array		This property shall contain an array of links to resources that are related to this capability.
@odata.id	string (URI)	<i>read-only</i>	The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
RelatedItem@odata.count	integer	<i>read-only</i>	The value of this property shall be an integer representing the number of items in a collection.
TargetCollection {	object	<i>required</i>	This property shall contain a link to a resource collection that this structure describes. A client can use this structure to understand how to form the POST request for the collection.
@odata.id	string (URI)	<i>read-only</i>	The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
}			
UseCase	string (enum)	<i>read-only required</i>	This property shall contain an enumerated value that describes the use case for this capability instance. <i>For the possible property values, see UseCase in Property details.</i>
}]			
MaxMembers (v1.2+)	integer	<i>read-only</i>	This property shall contain the maximum number of members allowed in this resource collection.

5.1.2 Property details

5.1.2.1 UseCase

This property shall contain an enumerated value that describes the use case for this capability instance.

string	Description
ComputerSystemComposition	This capability describes a client creating a new computer system resource from a set of disaggregated hardware.
ComputerSystemConstrainedComposition (v1.1+)	This capability describes a client creating a new computer system resource from a set of constraints.
ResourceBlockComposition (v1.3+)	This capability describes a client creating a new resource block from a set of other resource blocks.
ResourceBlockConstrainedComposition (v1.3+)	This capability describes a client creating a new resource block from a set of constraints.
VolumeCreation	This capability describes a client creating a new volume resource as part of an existing storage subsystem.

5.1.3 Example collection capabilities annotation

```

{
  "@Redfish.CollectionCapabilities": {
    "@odata.type": "#CollectionCapabilities.v1_1_0.CollectionCapabilities",
    "Capabilities": [
      {
        "CapabilitiesObject": {
          "@odata.id": "/redfish/v1/Systems/Capabilities"
        },
        "UseCase": "ComputerSystemComposition",
        "Links": {
          "TargetCollection": {
            "@odata.id": "/redfish/v1/Systems"
          }
        }
      },
      {
        "CapabilitiesObject": {
          "@odata.id": "/redfish/v1/Systems/ConstrainedCompositionCapabilities"
        },
        "UseCase": "ComputerSystemConstrainedComposition",
        "Links": {
          "TargetCollection": {
            "@odata.id": "/redfish/v1/Systems"
          }
        }
      }
    ]
  },
  ...
}
```

5.2 Resource collection URIs in Redfish v1.6 and later

The following table lists all Redfish-defined resource collections and the URIs where they can appear.

Note: The URIs listed are valid for Redfish services that conform to the *Redfish Specification v1.6.0* or higher. Services built on earlier specification versions might use different URIs, which must be discovered by following the hyperlinks from the service root (`/redfish/v1/`).

Collection Type	URIs
AccelerationFunctionCollection	<code>/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/AccelerationFunctions</code> <code>/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/AccelerationFunctions</code> <code>/redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/AccelerationFunctions</code> <code>/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/AccelerationFunctions</code> <code>/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/AccelerationFunctions</code>
AddressPoolCollection	<code>/redfish/v1/Fabrics/{FabricId}/AddressPools</code>
AggregateCollection	<code>/redfish/v1/AggregationService/Aggregates</code>
AggregationSourceCollection	<code>/redfish/v1/AggregationService/AggregationSources</code>
AllowDenyCollection	<code>/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/NetworkDeviceFunctions/{NetworkDeviceFunctionId}/AllowDeny</code> <code>/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/NetworkInterfaces/{NetworkInterfaceId}/NetworkDeviceFunctions/{NetworkDeviceFunctionId}/AllowDeny</code> <code>/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/NetworkInterfaces/{NetworkInterfaceId}/NetworkDeviceFunctions/{NetworkDeviceFunctionId}/AllowDeny</code> <code>/redfish/v1/ResourceBlocks/{ResourceBlockId}/NetworkInterfaces/{NetworkInterfaceId}/NetworkDeviceFunctions/{NetworkDeviceFunctionId}/AllowDeny</code> <code>/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/NetworkInterfaces/{NetworkInterfaceId}/NetworkDeviceFunctions/{NetworkDeviceFunctionId}/AllowDeny</code> <code>/redfish/v1/Systems/{ComputerSystemId}/NetworkInterfaces/{NetworkInterfaceId}/NetworkDeviceFunctions/{NetworkDeviceFunctionId}/AllowDeny</code>
ApplicationCollection	<code>/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/OperatingSystem/Applications</code> <code>/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/OperatingSystem/Applications</code> <code>/redfish/v1/Systems/{ComputerSystemId}/OperatingSystem/Applications</code>
AutomationNodeCollection	<code>/redfish/v1/AutomationNodes</code>
BatteryCollection	<code>/redfish/v1/Chassis/{ChassisId}/PowerSubsystem/Batteries</code>

Collection Type	URIs
BootOptionCollection	/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/BootOptions /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/BootOptions /redfish/v1/Systems/{ComputerSystemId}/BootOptions
CableCollection	/redfish/v1/Cables

Collection Type	URIs
CertificateCollection	/redfish/v1/AccountService/Accounts/{ManagerAccountId}/Certificates /redfish/v1/AccountService/ActiveDirectory/Certificates /redfish/v1/AccountService/ExternalAccountProviders/{ExternalAccountProviderId}/Certificates /redfish/v1/AccountService/LDAP/Certificates /redfish/v1/AccountService/MultiFactorAuth/ClientCertificate/Certificates /redfish/v1/AccountService/MultiFactorAuth/SecurID/Certificates /redfish/v1/AccountService/OutboundConnections/{OutboundConnectionId}/Certificates /redfish/v1/AccountService/OutboundConnections/{OutboundConnectionId}/ClientCertificates /redfish/v1/Chassis/{ChassisId}/Certificates /redfish/v1/Chassis/{ChassisId}/Drives/{DriveId}/Certificates /redfish/v1/Chassis/{ChassisId}/Memory/{MemoryId}/Certificates /redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Certificates /redfish/v1/Chassis/{ChassisId}/PowerSubsystem/PowerSupplies/{PowerSupplyId}/Certificates /redfish/v1/Chassis/{ChassisId}/TrustedComponents/{TrustedComponentId}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Drives/{DriveId}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Memory/{MemoryId}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Drives/{DriveId}/Certificates (deprecated) /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Boot/Certificates /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/KeyManagement/KMIPCertificates /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Memory/{MemoryId}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/SecureBoot/SecureBootDatabases/{DatabaseId}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Drives/{DriveId}/Certificates (deprecated) /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/VirtualMedia/{VirtualMediaId}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/VirtualMedia/{VirtualMediaId}/ClientCertificates /redfish/v1/EventService/Subscriptions/{EventDestinationId}/Certificates /redfish/v1/EventService/Subscriptions/{EventDestinationId}/ClientCertificates /redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Certificates

Collection Type	URIs
	/Redfish/v1/Managers/{ManagerId}/Certificates /Redfish/v1/Managers/{ManagerId}/NetworkProtocol/HTTPS/Certificates /Redfish/v1/Managers/{ManagerId}/RemoteAccountService/Accounts/{ManagerAccountId}/Certificates /Redfish/v1/Managers/{ManagerId}/RemoteAccountService/ActiveDirectory/Certificates /Redfish/v1/Managers/{ManagerId}/RemoteAccountService/ExternalAccountProviders/{ExternalAccountProviderId}/Certificates /Redfish/v1/Managers/{ManagerId}/RemoteAccountService/LDAP/Certificates /Redfish/v1/Managers/{ManagerId}/RemoteAccountService/MultiFactorAuth/ClientCertificate/Certificates /Redfish/v1/Managers/{ManagerId}/RemoteAccountService/MultiFactorAuth/SecurID/Certificates /Redfish/v1/Managers/{ManagerId}/SecurityPolicy/SPDM/RevokedCertificates /Redfish/v1/Managers/{ManagerId}/SecurityPolicy/SPDM/TrustedCertificates /Redfish/v1/Managers/{ManagerId}/SecurityPolicy/TLS/Client/RevokedCertificates /Redfish/v1/Managers/{ManagerId}/SecurityPolicy/TLS/Client/TrustedCertificates /Redfish/v1/Managers/{ManagerId}/SecurityPolicy/TLS/Server/RevokedCertificates /Redfish/v1/Managers/{ManagerId}/SecurityPolicy/TLS/Server/TrustedCertificates /Redfish/v1/ResourceBlocks/{ResourceBlockId}/Drives/{DriveId}/Certificates /Redfish/v1/ResourceBlocks/{ResourceBlockId}/Memory/{MemoryId}/Certificates /Redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/Certificates /Redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Certificates /Redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Drives/{DriveId}/Certificates (deprecated) /Redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Certificates /Redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Boot/Certificates /Redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Certificates /Redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/KeyManagement/KMIPCertificates /Redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Memory/{MemoryId}/Certificates /Redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/Certificates /Redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/SecureBoot/SecureBootDatabases/{DatabaseId}/Certificates /Redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Certificates /Redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Drives/{DriveId}/Certificates (deprecated) /Redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Certificates /Redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/VirtualMedia/{VirtualMediaId}/Certificates /Redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/VirtualMedia/{VirtualMediaId}/ClientCertificates /Redfish/v1/Storage/{StorageId}/Controllers/{StorageControllerId}/Certificates /Redfish/v1/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Certificates /Redfish/v1/Systems/{ComputerSystemId}/Boot/Certificates /Redfish/v1/Systems/{ComputerSystemId}/Certificates /Redfish/v1/Systems/{ComputerSystemId}/KeyManagement/KMIPCertificates

Collection Type	URIs
	/redfish/v1/Systems/{ComputerSystemId}/Memory/{MemoryId}/Certificates /redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/Certificates /redfish/v1/Systems/{ComputerSystemId}/SecureBoot/SecureBootDatabases/{DatabaseId}/Certificates /redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Certificates /redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Drives/{DriveId}/Certificates (deprecated) /redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Certificates /redfish/v1/Systems/{ComputerSystemId}/VirtualMedia/{VirtualMediaId}/Certificates /redfish/v1/Systems/{ComputerSystemId}/VirtualMedia/{VirtualMediaId}/ClientCertificates /redfish/v1/UpdateService/ClientCertificates /redfish/v1/UpdateService/RemoteServerCertificates
ChassisCollection	/redfish/v1/Chassis
CircuitCollection	/redfish/v1/PowerEquipment/ElectricalBuses/{PowerDistributionId}/Branches /redfish/v1/PowerEquipment/ElectricalBuses/{PowerDistributionId}/Mains /redfish/v1/PowerEquipment/FloorPDUs/{PowerDistributionId}/Branches /redfish/v1/PowerEquipment/FloorPDUs/{PowerDistributionId}/Mains /redfish/v1/PowerEquipment/FloorPDUs/{PowerDistributionId}/Subfeeds /redfish/v1/PowerEquipment/PowerShelves/{PowerDistributionId}/Branches /redfish/v1/PowerEquipment/PowerShelves/{PowerDistributionId}/Mains /redfish/v1/PowerEquipment/RackPDUs/{PowerDistributionId}/Branches /redfish/v1/PowerEquipment/RackPDUs/{PowerDistributionId}/Mains /redfish/v1/PowerEquipment/Switchgear/{PowerDistributionId}/Branches /redfish/v1/PowerEquipment/Switchgear/{PowerDistributionId}/Feeders /redfish/v1/PowerEquipment/Switchgear/{PowerDistributionId}/Mains /redfish/v1/PowerEquipment/Switchgear/{PowerDistributionId}/Subfeeds /redfish/v1/PowerEquipment/TransferSwitches/{PowerDistributionId}/Branches /redfish/v1/PowerEquipment/TransferSwitches/{PowerDistributionId}/Feeders /redfish/v1/PowerEquipment/TransferSwitches/{PowerDistributionId}/Mains
ComponentIntegrityCollection	/redfish/v1/ComponentIntegrity
CompositionReservationCollection	/redfish/v1/CompositionService/CompositionReservations
ComputerSystemCollection	/redfish/v1/Systems
ConnectionCollection	/redfish/v1/Fabrics/{FabricId}/Connections /redfish/v1/Storage/{StorageId}/Connections
ConnectionMethodCollection	/redfish/v1/AggregationService/ConnectionMethods
ContainerCollection	/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/OperatingSystem/Containers /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/OperatingSystem/Containers /redfish/v1/Systems/{ComputerSystemId}/OperatingSystem/Containers

Collection Type	URIs
ContainerImageCollection	/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/OperatingSystem/ContainerImages /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/OperatingSystem/ContainerImages /redfish/v1/Systems/{ComputerSystemId}/OperatingSystem/ContainerImages
ControlCollection	/redfish/v1/Chassis/{ChassisId}/Controls
CoolantConnectorCollection	/redfish/v1/Chassis/{ChassisId}/ThermalSubsystem/CoolantConnectors /redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/PrimaryCoolantConnectors /redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/SecondaryCoolantConnectors /redfish/v1/ThermalEquipment/CoolingLoops/{CoolingUnitId}/PrimaryCoolantConnectors /redfish/v1/ThermalEquipment/CoolingLoops/{CoolingUnitId}/SecondaryCoolantConnectors /redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/PrimaryCoolantConnectors /redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/SecondaryCoolantConnectors /redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/PrimaryCoolantConnectors /redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/SecondaryCoolantConnectors /redfish/v1/ThermalEquipment/RPUs/{CoolingUnitId}/PrimaryCoolantConnectors
CoolingLoopCollection	/redfish/v1/ThermalEquipment/CoolingLoops
CoolingUnitCollection	/redfish/v1/ThermalEquipment/CDUs /redfish/v1/ThermalEquipment/HeatExchangers /redfish/v1/ThermalEquipment/ImmersionUnits /redfish/v1/ThermalEquipment/RPUs
CXLLLogicalDeviceCollection	/redfish/v1/Chassis/{ChassisId}/PCleDevices/{PCleDeviceId}/CXLLLogicalDevices
DriveCollection	/redfish/v1/Chassis/{ChassisId}/Drives /redfish/v1/Storage/{StorageId}/FileSystems/{FileSystemId}/CapacitySources/{CapacitySourceId}/ProvidingDrives /redfish/v1/Storage/{StorageId}/StoragePools/{StoragePoolId}/CapacitySources/{CapacitySourceId}/ProvidingDrives /redfish/v1/Storage/{StorageId}/Volumes/{VolumeId}/CapacitySources/{CapacitySourceId}/ProvidingDrives /redfish/v1/StorageServices/{StorageServiceId}/Drives /redfish/v1/StorageServices/{StorageServiceId}/FileSystems/{FileSystemId}/CapacitySources/{CapacitySourceId}/ProvidingDrives /redfish/v1/StorageServices/{StorageServiceId}/StoragePools/{StoragePoolId}/CapacitySources/{CapacitySourceId}/ProvidingDrives /redfish/v1/StorageServices/{StorageServiceId}/Volumes/{VolumeId}/CapacitySources/{CapacitySourceId}/ProvidingDrives /redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/FileSystems/{FileSystemId}/CapacitySources/{CapacitySourceId}/ProvidingDrives /redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/StoragePools/{StoragePoolId}/CapacitySources/{CapacitySourceId}/ProvidingDrives /redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Volumes/{VolumeId}/CapacitySources/{CapacitySourceId}/ProvidingDrives

Collection Type	URIs
EndpointCollection	/redfish/v1/Fabrics/{FabricId}/Endpoints /redfish/v1/Storage/{StorageId}/Endpoints (deprecated) /redfish/v1/StorageServices/{StorageServiceId}/Endpoints
EndpointGroupCollection	/redfish/v1/Fabrics/{FabricId}/EndpointGroups /redfish/v1/Storage/{StorageId}/EndpointGroups /redfish/v1/StorageServices/{StorageServiceId}/EndpointGroups /redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/EndpointGroups
EthernetInterfaceCollection	/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/NetworkDeviceFunctions/{NetworkDeviceFunctionId}/EthernetInterfaces /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/EthernetInterfaces /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/OperatingSystem/Containers/EthernetInterfaces /redfish/v1/Managers/{ManagerId}/EthernetInterfaces /redfish/v1/Managers/{ManagerId}/HostInterfaces/{HostInterfaceId}/HostEthernetInterfaces /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/EthernetInterfaces /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/OperatingSystem/Containers/EthernetInterfaces /redfish/v1/Systems/{ComputerSystemId}/EthernetInterfaces /redfish/v1/Systems/{ComputerSystemId}/OperatingSystem/Containers/EthernetInterfaces
EventDestinationCollection	/redfish/v1/EventService/Subscriptions
ExternalAccountProviderCollection	/redfish/v1/AccountService/ExternalAccountProviders /redfish/v1/Managers/{ManagerId}/RemoteAccountService/ExternalAccountProviders
FabricAdapterCollection	/redfish/v1/Chassis/{ChassisId}/FabricAdapters /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters /redfish/v1/Systems/{ComputerSystemId}/FabricAdapters
FabricCollection	/redfish/v1/Fabrics
FacilityCollection	/redfish/v1/Facilities
FanCollection	/redfish/v1/Chassis/{ChassisId}/ThermalSubsystem/Fans

Collection Type	URIs
FilterCollection	/redfish/v1/Chassis/{ChassisId}/ThermalSubsystem/Filters /redfish/v1/Chassis/{ChassisId}/ThermalSubsystem/Pumps/{PumpId}/Filters /redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/Filters /redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/Pumps/{PumpId}/Filters /redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/Reservoirs/{ReservoirId}/Filters /redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/Filters /redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/Pumps/{PumpId}/Filters /redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/Reservoirs/{ReservoirId}/Filters /redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/Filters /redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/Pumps/{PumpId}/Filters /redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/Reservoirs/{ReservoirId}/Filters /redfish/v1/ThermalEquipment/RPUs/{CoolingUnitId}/Filters /redfish/v1/ThermalEquipment/RPUs/{CoolingUnitId}/Pumps/{PumpId}/Filters /redfish/v1/ThermalEquipment/RPUs/{CoolingUnitId}/Reservoirs/{ReservoirId}/Filters
GraphicsControllerCollection	/redfish/v1/Systems/{ComputerSystemId}/GraphicsControllers
HeaterCollection	/redfish/v1/Chassis/{ChassisId}/ThermalSubsystem/Heaters
HostInterfaceCollection	/redfish/v1/Managers/{ManagerId}/HostInterfaces
JobCollection	/redfish/v1/JobService/Jobs /redfish/v1/JobService/Jobs/{JobId}/Steps
JobDocumentCollection	/redfish/v1/JobService/Documents
JobExecutorCollection	/redfish/v1/JobService/Executors
JsonSchemaFileCollection	/redfish/v1/JsonSchemas
KeyCollection	/redfish/v1/AccountService/Accounts/{ManagerAccountId}/Keys /redfish/v1/AggregationService/AggregationSources/{AggregationSourceId}/TrustedPublicHostKeys /redfish/v1/KeyService/NVMeoFSecrets /redfish/v1/Managers/{ManagerId}/RemoteAccountService/Accounts/{ManagerAccountId}/Keys /redfish/v1/UpdateService/RemoteServerSSHKeys
KeyPolicyCollection	/redfish/v1/KeyService/NVMeoFKeyPolicies
LeakDetectorCollection	/redfish/v1/Chassis/{ChassisId}/LeakDetectors /redfish/v1/Chassis/{ChassisId}/ThermalSubsystem/LeakDetection/LeakDetectors (deprecated) /redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/LeakDetection/LeakDetectors (deprecated) /redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/LeakDetection/LeakDetectors/ (deprecated) /redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/LeakDetection/LeakDetectors (deprecated)
LicenseCollection	/redfish/v1/LicenseService/Licenses

Collection Type	URIs
LogEntryCollection	/redfish/v1/Chassis/{ChassisId}/LogServices/{LogServiceId}/Entries /redfish/v1/Chassis/{ChassisId}/PCleDevices/{PCleDeviceId}/CXLLogicalDevices/ {CXLLogicalDeviceId}/DeviceLog/Entries /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ LogServices/{LogServiceId}/Entries /redfish/v1/JobService/Log/Entries /redfish/v1/Managers/{ManagerId}/LogServices/{LogServiceId}/Entries /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/LogServices/ {LogServiceId}/Entries /redfish/v1/Systems/{ComputerSystemId}/LogServices/{LogServiceId}/Entries /redfish/v1/Systems/{ComputerSystemId}/Memory/{MemoryId}/DeviceLog/Entries /redfish/v1/TelemetryService/LogService/Entries
LogServiceCollection	/redfish/v1/Chassis/{ChassisId}/LogServices /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ LogServices /redfish/v1/Managers/{ManagerId}/LogServices /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/LogServices /redfish/v1/Systems/{ComputerSystemId}/LogServices
ManagerAccountCollection	/redfish/v1/AccountService/Accounts /redfish/v1/Managers/{ManagerId}/RemoteAccountService/Accounts
ManagerCollection	/redfish/v1/Managers
MediaControllerCollection	/redfish/v1/Chassis/{ChassisId}/MediaControllers (deprecated)
MemoryChunksCollection	/redfish/v1/Chassis/{ChassisId}/MemoryDomains/{MemoryDomainId}/MemoryChunks /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ MemoryDomains/{MemoryDomainId}/MemoryChunks /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/MemoryDomains/ {MemoryDomainId}/MemoryChunks /redfish/v1/Systems/{ComputerSystemId}/MemoryDomains/{MemoryDomainId}/MemoryChunks
MemoryCollection	/redfish/v1/Chassis/{ChassisId}/Memory /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ Memory /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Memory /redfish/v1/Systems/{ComputerSystemId}/Memory /redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/CacheMemory
MemoryDomainCollection	/redfish/v1/Chassis/{ChassisId}/MemoryDomains /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ MemoryDomains /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/MemoryDomains /redfish/v1/Systems/{ComputerSystemId}/MemoryDomains
MemoryRegionCollection	/redfish/v1/Chassis/{ChassisId}/PCleDevices/{PCleDeviceId}/CXLLogicalDevices/ {CXLLogicalDeviceId}/MemoryRegions

Collection Type	URIs
MessageRegistryCollection	
MessageRegistryFileCollection	/redfish/v1/Registries
MetricDefinitionCollection	/redfish/v1/TelemetryService/MetricDefinitions
MetricReportCollection	/redfish/v1/TelemetryService/MetricReports
MetricReportDefinitionCollection	/redfish/v1/TelemetryService/MetricReportDefinitions
NetworkAdapterCollection	/redfish/v1/Chassis/{ChassisId}/NetworkAdapters
NetworkDeviceFunctionCollection	/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/NetworkDeviceFunctions /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/NetworkInterfaces/{NetworkInterfaceId}/NetworkDeviceFunctions /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/NetworkInterfaces/{NetworkInterfaceId}/NetworkDeviceFunctions /redfish/v1/ResourceBlocks/{ResourceBlockId}/NetworkInterfaces/{NetworkInterfaceId}/NetworkDeviceFunctions /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/NetworkInterfaces/{NetworkInterfaceId}/NetworkDeviceFunctions /redfish/v1/Systems/{ComputerSystemId}/NetworkInterfaces/{NetworkInterfaceId}/NetworkDeviceFunctions
NetworkInterfaceCollection	/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/NetworkInterfaces /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/NetworkInterfaces /redfish/v1/Systems/{ComputerSystemId}/NetworkInterfaces
NetworkPortCollection	/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/NetworkPorts (deprecated) /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/NetworkInterfaces/{NetworkInterfaceId}/NetworkPorts (deprecated) /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/NetworkInterfaces/{NetworkInterfaceId}/NetworkPorts (deprecated) /redfish/v1/ResourceBlocks/{ResourceBlockId}/NetworkInterfaces/{NetworkInterfaceId}/NetworkPorts (deprecated) /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/NetworkInterfaces/{NetworkInterfaceId}/NetworkPorts (deprecated) /redfish/v1/Systems/{ComputerSystemId}/NetworkInterfaces/{NetworkInterfaceId}/NetworkPorts (deprecated)
OperatingConfigCollection	/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/OperatingConfigs
OutboundConnectionCollection	/redfish/v1/AccountService/OutboundConnections
OutletCollection	/redfish/v1/PowerEquipment/ElectricalBuses/{PowerDistributionId}/Outlets /redfish/v1/PowerEquipment/PowerShelves/{PowerDistributionId}/Outlets /redfish/v1/PowerEquipment/RackPDUs/{PowerDistributionId}/Outlets /redfish/v1/PowerEquipment/TransferSwitches/{PowerDistributionId}/Outlets

Collection Type	URIs
OutletGroupCollection	/redfish/v1/PowerEquipment/ElectricalBuses/{PowerDistributionId}/OutletGroups /redfish/v1/PowerEquipment/PowerShelves/{PowerDistributionId}/OutletGroups /redfish/v1/PowerEquipment/RackPDUs/{PowerDistributionId}/OutletGroups /redfish/v1/PowerEquipment/TransferSwitches/{PowerDistributionId}/OutletGroups
PCleDeviceCollection	/redfish/v1/Chassis/{ChassisId}/PCleDevices /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/PCleDevices /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/PCleDevices /redfish/v1/Systems/{ComputerSystemId}/PCleDevices
PCleFunctionCollection	/redfish/v1/Chassis/{ChassisId}/PCleDevices/{PCleDeviceId}/PCleFunctions /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/PCleDevices/{PCleDeviceId}/PCleFunctions /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/PCleDevices/{PCleDeviceId}/PCleFunctions /redfish/v1/Systems/{ComputerSystemId}/PCleDevices/{PCleDeviceId}/PCleFunctions

Collection Type	URIs
PortCollection	<pre> /redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/Ports /redfish/v1/Chassis/{ChassisId}/MediaControllers/{MediaControllerId}/Ports /redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Ports /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/NetworkInterfaces/ {NetworkInterfaceId}/Ports /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/Ports /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/ {StorageControllerId}/Ports /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/ StorageControllers/{StorageControllerId}/Ports /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ FabricAdapters/{FabricAdapterId}/Ports /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ GraphicsControllers/{GraphicsControllerId}/Ports /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ NetworkInterfaces/{NetworkInterfaceId}/Ports /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ Processors/{ProcessorId}/Ports /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ Storage/{StorageId}/Controllers/{StorageControllerId}/Ports /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ Storage/{StorageId}/StorageControllers/{StorageControllerId}/Ports /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ USBControllers/{USBControllerId}/Ports /redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Ports /redfish/v1/Managers/{ManagerId}/DedicatedNetworkPorts /redfish/v1/Managers/{ManagerId}/SharedNetworkPorts /redfish/v1/Managers/{ManagerId}/USBPorts /redfish/v1/ResourceBlocks/{ResourceBlockId}/NetworkInterfaces/{NetworkInterfaceId}/Ports /redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/Ports /redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/{StorageControllerId}/ Ports /redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/StorageControllers/ {StorageControllerId}/Ports /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/ {FabricAdapterId}/Ports /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/GraphicsControllers/ {GraphicsControllerId}/Ports /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/NetworkInterfaces/ {NetworkInterfaceId}/Ports /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/ {ProcessorId}/Ports /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/ Controllers/{StorageControllerId}/Ports /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/ StorageControllers/{StorageControllerId}/Ports /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/USBControllers/ {USBControllerId}/Ports /redfish/v1/Storage/{StorageId}/Controllers/{StorageControllerId}/Ports </pre>

Collection Type	URIs
	/redfish/v1/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Ports /redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/Ports /redfish/v1/Systems/{ComputerSystemId}/GraphicsControllers/{GraphicsControllerId}/Ports /redfish/v1/Systems/{ComputerSystemId}/NetworkInterfaces/{NetworkInterfaceId}/Ports /redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/Ports /redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Ports /redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Ports /redfish/v1/Systems/{ComputerSystemId}/USBControllers/{USBControllerId}/Ports
PowerDistributionCollection	/redfish/v1/PowerEquipment/ElectricalBuses /redfish/v1/PowerEquipment/FloorPDUs /redfish/v1/PowerEquipment/PowerShelves /redfish/v1/PowerEquipment/RackPDUs /redfish/v1/PowerEquipment/Switchgear /redfish/v1/PowerEquipment/TransferSwitches
PowerDomainCollection	/redfish/v1/Facilities/{FacilityId}/PowerDomains
PowerSupplyCollection	/redfish/v1/Chassis/{ChassisId}/PowerSubsystem/PowerSupplies /redfish/v1/PowerEquipment/PowerShelves/{PowerDistributionId}/PowerSupplies (deprecated)

Collection Type	URIs
ProcessorCollection	/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Processors /redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Processors/{ProcessorId}/SubProcessors /redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}/SubProcessors /redfish/v1/Chassis/{ChassisId}/Processors /redfish/v1/Chassis/{ChassisId}/Processors/{ProcessorId}/SubProcessors /redfish/v1/Chassis/{ChassisId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}/SubProcessors /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/SubProcessors /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}/SubProcessors /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/SubProcessors /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}/SubProcessors /redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/SubProcessors /redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}/SubProcessors /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/SubProcessors /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}/SubProcessors /redfish/v1/Systems/{ComputerSystemId}/Processors /redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/SubProcessors /redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}/SubProcessors
PumpCollection	/redfish/v1/Chassis/{ChassisId}/ThermalSubsystem/Pumps /redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/Pumps /redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/Pumps /redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/Pumps /redfish/v1/ThermalEquipment/RPUs/{CoolingUnitId}/Pumps
RegisteredClientCollection	/redfish/v1/RegisteredClients
ReservoirCollection	/redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/Reservoirs /redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/Reservoirs /redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/Reservoirs /redfish/v1/ThermalEquipment/RPUs/{CoolingUnitId}/Reservoirs
ResourceBlockCollection	/redfish/v1/CompositionService/ActivePool /redfish/v1/CompositionService/FreePool /redfish/v1/CompositionService/ResourceBlocks /redfish/v1/ResourceBlocks

Collection Type	URIs
RoleCollection	/redfish/v1/AccountService/Roles /redfish/v1/Managers/{ManagerId}/RemoteAccountService/Roles

Collection Type	URIs
RouteEntryCollection	<pre> /redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/GenZ/MSDT /redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/GenZ/SSDT /redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/MSDT (deprecated) /redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/GenZ/LPRT /redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/GenZ/MPRT /redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/LPRT (deprecated) /redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/MPRT (deprecated) /redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/SSDT (deprecated) /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ FabricAdapters/{FabricAdapterId}/GenZ/MSDT /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ FabricAdapters/{FabricAdapterId}/GenZ/SSDT /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ FabricAdapters/{FabricAdapterId}/MSDT (deprecated) /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ FabricAdapters/{FabricAdapterId}/Ports/{PortId}/GenZ/LPRT /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ FabricAdapters/{FabricAdapterId}/Ports/{PortId}/GenZ/MPRT /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ FabricAdapters/{FabricAdapterId}/Ports/{PortId}/LPRT (deprecated) /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ FabricAdapters/{FabricAdapterId}/Ports/{PortId}/MPRT (deprecated) /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ FabricAdapters/{FabricAdapterId}/SSDT (deprecated) /redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Ports/{PortId}/GenZ/LPRT /redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Ports/{PortId}/GenZ/MPRT /redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Ports/{PortId}/LPRT (deprecated) /redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Ports/{PortId}/MPRT (deprecated) /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/ {FabricAdapterId}/GenZ/MSDT /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/ {FabricAdapterId}/GenZ/SSDT /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/ {FabricAdapterId}/MSDT (deprecated) /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/ {FabricAdapterId}/Ports/{PortId}/GenZ/LPRT /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/ {FabricAdapterId}/Ports/{PortId}/GenZ/MPRT /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/ {FabricAdapterId}/Ports/{PortId}/LPRT (deprecated) /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/ {FabricAdapterId}/Ports/{PortId}/MPRT (deprecated) /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/ {FabricAdapterId}/SSDT (deprecated) /redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/GenZ/MSDT /redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/GenZ/SSDT /redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/MSDT (deprecated) /redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/GenZ/LPRT /redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/GenZ/MPRT </pre>

Collection Type	URIs
	/redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/LPRT (deprecated) /redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/MPRT (deprecated) /redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/SSDT (deprecated)
RouteSetEntryCollection	/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/MSDT/{MSDTId}/RouteSet /redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/LPRT/{LPRTId}/RouteSet /redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/MPRT/{MPRTId}/RouteSet /redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/SSDT/{SSDTId}/RouteSet /redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Ports/{PortId}/LPRT/{LPRTId}/RouteSet /redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Ports/{PortId}/MPRT/{MPRTId}/RouteSet /redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/MSDT/{MSDTId}/RouteSet /redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/LPRT/{LPRTId}/RouteSet /redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/MPRT/{MPRTId}/RouteSet /redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/SSDT/{SSDTId}/RouteSet
SecureBootDatabaseCollection	/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/SecureBoot/SecureBootDatabases /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/SecureBoot/SecureBootDatabases /redfish/v1/Systems/{ComputerSystemId}/SecureBoot/SecureBootDatabases
SensorCollection	/redfish/v1/Chassis/{ChassisId}/Sensors /redfish/v1/PowerEquipment/FloorPDUs/{PowerDistributionId}/Sensors (deprecated) /redfish/v1/PowerEquipment/PowerShelves/{PowerDistributionId}/Sensors (deprecated) /redfish/v1/PowerEquipment/RackPDUs/{PowerDistributionId}/Sensors (deprecated) /redfish/v1/PowerEquipment/Switchgear/{PowerDistributionId}/Sensors (deprecated) /redfish/v1/PowerEquipment/TransferSwitches/{PowerDistributionId}/Sensors (deprecated)
SerialInterfaceCollection	/redfish/v1/Managers/{ManagerId}/SerialInterfaces
SessionCollection	/redfish/v1/SessionService/Sessions
SignatureCollection	/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/SecureBoot/SecureBootDatabases/{DatabaseId}/Signatures /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/SecureBoot/SecureBootDatabases/{DatabaseId}/Signatures /redfish/v1/Systems/{ComputerSystemId}/SecureBoot/SecureBootDatabases/{DatabaseId}/Signatures
SimpleStorageCollection	/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/SimpleStorage /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/SimpleStorage /redfish/v1/Systems/{ComputerSystemId}/SimpleStorage

Collection Type	URIs
SoftwareInventoryCollection	/redfish/v1/UpdateService/FirmwareInventory /redfish/v1/UpdateService/SoftwareInventory
StorageCollection	/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage /redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage /redfish/v1/Storage /redfish/v1/Systems/{ComputerSystemId}/Storage
StorageControllerCollection	/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers /redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers /redfish/v1/Storage/{StorageId}/Controllers /redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers
SwitchCollection	/redfish/v1/Fabrics/{FabricId}/Switches
TaskCollection	/redfish/v1/TaskService/Tasks /redfish/v1/TaskService/Tasks/{TaskId}/SubTasks
TelemetryDataCollection	/redfish/v1/TelemetryService/TelemetryData
TriggersCollection	/redfish/v1/TelemetryService/Triggers
TrustedComponentCollection	/redfish/v1/Chassis/{ChassisId}/TrustedComponents
USBControllerCollection	/redfish/v1/Systems/{ComputerSystemId}/USBControllers

Collection Type	URIs
VCATEntryCollection	<pre> /redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/GenZ/REQ-VCAT /redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/GenZ/RSP-VCAT /redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/GenZ/VCAT /redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/VCAT (deprecated) /redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/REQ-VCAT (deprecated) /redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/RSP-VCAT (deprecated) /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/ FabricAdapters/{FabricAdapterId}/GenZ/REQ-VCAT /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/ FabricAdapters/{FabricAdapterId}/GenZ/RSP-VCAT /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/ FabricAdapters/{FabricAdapterId}/Ports/{PortId}/GenZ/VCAT /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/ FabricAdapters/{FabricAdapterId}/Ports/{PortId}/VCAT (deprecated) /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/ FabricAdapters/{FabricAdapterId}/REQ-VCAT (deprecated) /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/ FabricAdapters/{FabricAdapterId}/RSP-VCAT (deprecated) /redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Ports/{PortId}/GenZ/VCAT /redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Ports/{PortId}/VCAT (deprecated) /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/ GenZ/REQ-VCAT /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/ GenZ/RSP-VCAT /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/ Ports/{PortId}/GenZ/VCAT /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/ Ports/{PortId}/VCAT (deprecated) /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/ REQ-VCAT (deprecated) /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/ RSP-VCAT (deprecated) /redfish/v1/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/GenZ/REQ-VCAT /redfish/v1/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/GenZ/RSP-VCAT /redfish/v1/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/GenZ/VCAT /redfish/v1/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/VCAT (deprecated) /redfish/v1/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/REQ-VCAT (deprecated) /redfish/v1/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/RSP-VCAT (deprecated) </pre>
VirtualCXLSwitchCollection	<pre> /redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/VCSs </pre>
VirtualMediaCollection	<pre> /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ VirtualMedia /redfish/v1/Managers/{ManagerId}/VirtualMedia (deprecated) /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/VirtualMedia /redfish/v1/Systems/{ComputerSystemId}/VirtualMedia </pre>
VirtualPCI2PCIBridgeCollection	<pre> /redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/VCSs/{VirtualCXLSwitchId}/VPPBs </pre>

Collection Type	URIs
VlanNetworkInterfaceCollection	<pre> /redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/NetworkDeviceFunctions/ {NetworkDeviceFunctionId}/Ethernet/VLANs (deprecated) /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/EthernetInterfaces/ {EthernetInterfaceId}/VLANs (deprecated) /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ EthernetInterfaces/{EthernetInterfaceId}/VLANs (deprecated) /redfish/v1/Managers/{ManagerId}/EthernetInterfaces/{EthernetInterfaceId}/VLANs (deprecated) /redfish/v1/ResourceBlocks/{ResourceBlockId}/EthernetInterfaces/{EthernetInterfaceId}/VLANs (deprecated) /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/EthernetInterfaces/ {EthernetInterfaceId}/VLANs (deprecated) /redfish/v1/Systems/{ComputerSystemId}/EthernetInterfaces/{EthernetInterfaceId}/VLANs (deprecated) </pre>
VolumeCollection	<pre> /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Volumes /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ Storage/{StorageId}/Volumes /redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Volumes /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/ Volumes /redfish/v1/Storage/{StorageId}/ConsistencyGroups/{ConsistencyGroupId}/Volumes /redfish/v1/Storage/{StorageId}/FileSystems/{FileSystemId}/CapacitySources/{CapacitySourceId}/ ProvidingVolumes /redfish/v1/Storage/{StorageId}/StoragePools/{StoragePoolId}/AllocatedVolumes /redfish/v1/Storage/{StorageId}/StoragePools/{StoragePoolId}/CapacitySources/{CapacitySourceId}/ ProvidingVolumes /redfish/v1/Storage/{StorageId}/Volumes /redfish/v1/StorageServices/{StorageServiceId}/ConsistencyGroups/{ConsistencyGroupId}/Volumes /redfish/v1/StorageServices/{StorageServiceId}/FileSystems/{FileSystemId}/CapacitySources/ {CapacitySourceId}/ProvidingVolumes /redfish/v1/StorageServices/{StorageServiceId}/StoragePools/{StoragePoolId}/AllocatedVolumes /redfish/v1/StorageServices/{StorageServiceId}/StoragePools/{StoragePoolId}/CapacitySources/ {CapacitySourceId}/ProvidingVolumes /redfish/v1/StorageServices/{StorageServiceId}/Volumes /redfish/v1/StorageServices/{StorageServiceId}/Volumes/{VolumeId}/CapacitySources/ {CapacitySourceId}/ProvidingVolumes /redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/ConsistencyGroups/ {ConsistencyGroupId}/Volumes /redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/FileSystems/{FileSystemId}/ CapacitySources/{CapacitySourceId}/ProvidingVolumes /redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/StoragePools/{StoragePoolId}/ AllocatedVolumes /redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/StoragePools/{StoragePoolId}/ CapacitySources/{CapacitySourceId}/ProvidingVolumes /redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Volumes </pre>
ZoneCollection	<pre> /redfish/v1/CompositionService/ResourceZones /redfish/v1/Fabrics/{FabricId}/Zones </pre>

6 Schema reference

To produce this guide, DMTF's [Redfish Documentation Generator](#) merges DMTF's Redfish Schema Bundle (DSP8010) contents with supplemental text.

6.1 AccelerationFunction 1.0.5

Version	v1.0
Release	2018.3

6.1.1 Description

The `AccelerationFunction` schema describes an acceleration function that a processor implements. This can include functions such as audio processing, compression, encryption, packet inspection, packet switching, scheduling, or video processing.

- This resource shall represent the acceleration function that a processor implements in a Redfish implementation. This can include functions such as audio processing, compression, encryption, packet inspection, packet switching, scheduling, or video processing.

6.1.2 URIs

```
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/AccelerationFunctions/  
{AccelerationFunctionId}  
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/  
{ProcessorId}/AccelerationFunctions/{AccelerationFunctionId}  
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/AccelerationFunctions/  
{AccelerationFunctionId}  
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/  
AccelerationFunctions/{AccelerationFunctionId}  
/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/AccelerationFunctions/{AccelerationFunctionId}
```

6.1.3 Properties

Property	Type	Attributes	Notes
AccelerationFunctionType	string (enum)	<i>read-only</i> (null)	The acceleration function type. This property shall contain the string that identifies the acceleration function type. <i>For the possible property values, see <code>AccelerationFunctionType</code> in Property details.</i>
FpgaReconfigurationSlots []	array (string)	<i>read-only</i>	An array of the reconfiguration slot identifiers of the FPGA that this acceleration function occupies. This property shall contain an array of the FPGA reconfiguration slot identifiers that this acceleration function occupies.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Endpoints [{	array		An array of links to the endpoints that connect to this acceleration function. This property shall contain an array of links to resources type <code>Endpoint</code> that are associated with this acceleration function.
@odata.id	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCleFunctions [{	array		An array of links to the PCIe functions associated with this acceleration function. This property shall contain an array of links to resources of type <code>PCleFunction</code> that represent the PCIe functions associated with this acceleration function.
@odata.id	string	<i>read-only</i>	Link to a PCleFunction resource. See the Links section and the <i>PCleFunction</i> schema for details.
}]			
}			

Property	Type	Attributes	Notes
Manufacturer	string	<i>read-only</i>	The acceleration function code manufacturer. This property shall contain a string that identifies the manufacturer of the acceleration function.
PowerWatts	integer (Watts)	<i>read-only</i>	The acceleration function power consumption, in watt units. This property shall contain the total acceleration function power consumption, in watt units.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
UUID	string (uuid)	<i>read-only</i> (null)	The UUID for this acceleration function. This property shall contain a UUID for the acceleration function. RFC4122 describes methods that can create the value. The value should be considered to be opaque. Client software should only treat the overall value as a UUID and should not interpret any subfields within the UUID. Pattern: <code>^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\$</code>
Version	string	<i>read-only</i>	The acceleration function version. This property shall describe the acceleration function version.

6.1.4 Property details

6.1.4.1 AccelerationFunctionType

The acceleration function type.

- This property shall contain the string that identifies the acceleration function type.

string	Description
AudioProcessing	An audio processing function.
Compression	A compression function.
Encryption	An encryption function.

string	Description
OEM	An OEM-defined acceleration function.
PacketInspection	A packet inspection function.
PacketSwitch	A packet switch function.
Scheduler	A scheduler function.
VideoProcessing	A video processing function.

6.1.5 Example response

```
{
  "@odata.type": "#AccelerationFunction.v1_0_5.AccelerationFunction",
  "Id": "Compression",
  "Name": "Compression Accelerator",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "FpgaReconfigurationSlots": [
    "AFU0"
  ],
  "AccelerationFunctionType": "Compression",
  "Manufacturer": "Intel (R) Corporation",
  "Version": "Green Compression Type 1 v.1.00.86",
  "PowerWatts": 15,
  "Links": {
    "Endpoints": [],
    "PCIeFunctions": []
  },
  "@odata.id": "/redfish/v1/Systems/1/Processors/FPGA1/AccelerationFunctions/Compression"
}
```

6.2 AccountService 1.18.0

Version	v1.18	v1.17	v1.16	v1.15	v1.14	v1.13	v1.12	v1.11	v1.10	v1.9	v1.8	...
Release	2025.1	2024.4	2024.3	2023.3	2023.2	2023.1	2022.3	2022.1	2021.2	2021.1	2020.4	...

6.2.1 Description

The `AccountService` schema defines an account service. The properties are common to, and enable management of, all user accounts. The properties include the password requirements and control features, such as account lockout. Properties and actions in this service specify general behavior that should be followed for typical accounts, however implementations might override these behaviors for special accounts or situations to avoid denial of service or other deadlock situations.

- This resource shall represent an account service for a Redfish implementation. The properties are common to, and enable management of, all user accounts. The properties include the password requirements and control features, such as account lockout. Properties and actions in this service specify general behavior that should be followed for typical accounts, however implementations may override these behaviors for special accounts or situations to avoid denial of service or other deadlock situations.

6.2.2 URIs

/redfish/v1/AccountService
/redfish/v1/Managers/{ManagerId}/RemoteAccountService

6.2.3 Properties

Property	Type	Attributes	Notes
AccountLockoutCounterResetAfter	integer (seconds)	read-write	The period of time, in seconds, between the last failed login attempt and the reset of the lockout threshold counter. This value must be less than or equal to the <code>AccountLockoutDuration</code> value. A reset sets the counter to <code>0</code>. • This property shall contain the period of time, in seconds, from the last failed login attempt when the <code>AccountLockoutThreshold</code> counter, which counts the number of failed login attempts, is reset to <code>0</code>. Then, <code>AccountLockoutThreshold</code> failures are required before the account is locked. This value shall be less than or equal to the <code>AccountLockoutDuration</code> value. The threshold counter also resets to <code>0</code> after each successful login. If the <code>AccountLockoutCounterResetEnabled</code> value is <code>false</code>, this property shall be ignored.

Property	Type	Attributes	Notes
AccountLockoutCounterResetEnabled (v1.5+)	boolean	<i>read-write</i>	An indication of whether the threshold counter is reset after <code>AccountLockoutCounterResetAfter</code> expires. If <code>true</code>, it is reset. If <code>false</code>, only a successful login resets the threshold counter and if the user reaches the <code>AccountLockoutThreshold</code> limit, the account will be locked out indefinitely and only an administrator-issued reset clears the threshold counter. If this property is absent, the default is <code>true</code>. This property shall indicate whether the threshold counter is reset after the <code>AccountLockoutCounterResetAfter</code> expires. If <code>true</code>, it is reset. If <code>false</code>, only a successful login resets the threshold counter and if the user reaches the <code>AccountLockoutThreshold</code> limit, the account shall be locked out indefinitely and only an administrator-issued reset clears the threshold counter. If this property is absent, the default is <code>true</code>.
AccountLockoutDuration	integer (seconds)	<i>read-write</i> (null)	The period of time, in seconds, that an account is locked after the number of failed login attempts reaches the account lockout threshold, within the period between the last failed login attempt and the reset of the lockout threshold counter. If this value is <code>0</code>, no lockout will occur. If the <code>AccountLockoutCounterResetEnabled</code> value is <code>false</code>, this property is ignored. This property shall contain the period of time, in seconds, that an account is locked after the number of failed login attempts reaches the <code>AccountLockoutThreshold</code> value, within the <code>AccountLockoutCounterResetAfter</code> window of time. The value shall be greater than or equal to the <code>AccountLockoutCounterResetAfter</code> value. If this value is <code>0</code>, no lockout shall occur. If <code>AccountLockoutCounterResetEnabled</code> value is <code>false</code>, this property shall be ignored.
AccountLockoutThreshold	integer	<i>read-write</i> (null)	The number of allowed failed login attempts before a user account is locked for a specified duration. If <code>0</code>, the account is never locked. This property shall contain the threshold of failed login attempts before a user account is locked. If <code>0</code>, the account shall never be locked.
Accounts {	object		The collection of manager accounts. This property shall contain a link to a resource collection of type <code>ManagerAccountCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>ManagerAccount</i> . See the <i>ManagerAccount</i> schema for details.
}			

Property	Type	Attributes	Notes
ActiveDirectory (v1.3+) {}	object		The first Active Directory external account provider that this account service supports. This property shall contain the first Active Directory external account provider that this account service supports. If the account service supports one or more Active Directory services as an external account provider, this entity shall be populated by default. This entity shall not be present in the additional external account providers resource collection. For more information about this property, see ExternalAccountProvider in Property Details.
AdditionalExternalAccountProviders (v1.3+) {}	object		The additional external account providers that this account service uses. This property shall contain a link to a resource collection of type ExternalAccountProviderCollection that represents the additional external account providers that this account service uses. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>ExternalAccountProvider</i> . See the ExternalAccountProvider schema for details.
}			
AuthFailureLoggingThreshold	integer	<i>read-write</i>	The number of authorization failures per account that are allowed before the failed attempt is logged to the manager log. This property shall contain the threshold for when an authorization failure is logged. Logging shall occur after every <code>n</code> occurrences of an authorization failure on the same account, where <code>n</code> represents the value of this property. If the value is <code>0</code>, logging of authorization failures shall be disabled.
EnforcePasswordHistoryCount (v1.17+)	integer	<i>read-write</i>	The number of unique new passwords that need to be associated with a user account before a previous password is accepted when modifying the password. If <code>0</code>, a user does not need to provide a unique new password. This property shall contain the number of unique new passwords that need to be associated with a user account before a previous password is accepted when modifying the password. If not <code>0</code>, services shall reject modification requests of the Password property and ChangePassword actions that contain a previously used password in the specified count. If <code>0</code>, services shall not require the user to provide a unique new password. This property does not apply to accounts from external account providers.

Property	Type	Attributes	Notes
HTTPBasicAuth (v1.15+)	string (enum)	<i>read-write</i> (null)	Indicates if HTTP Basic authentication is enabled for this service. This property shall indicate whether clients are able to authenticate to the Redfish service with HTTP Basic authentication. This property should default to <code>Enabled</code> for client compatibility. If this property is not present in responses, the value shall be assumed to be <code>Enabled</code>. <i>For the possible property values, see HTTPBasicAuth in Property details.</i>
LDAP (v1.3+) {}	object		The first LDAP external account provider that this account service supports. This property shall contain the first LDAP external account provider that this account service supports. If the account service supports one or more LDAP services as an external account provider, this entity shall be populated by default. This entity shall not be present in the additional external account providers resource collection. For more information about this property, see ExternalAccountProvider in Property Details.
LocalAccountAuth (v1.3+)	string (enum)	<i>read-write</i>	An indication of how the service uses the accounts collection within this account service as part of authentication. The enumerated values describe the details for each mode. This property shall govern how the service uses the manager accounts resource collection within this account service as part of authentication. The enumerated values describe the details for each mode. <i>For the possible property values, see LocalAccountAuth in Property details.</i>
MaxPasswordLength	integer	<i>read-write</i>	The maximum password length for this account service. This property shall contain the maximum password length that the implementation allows for this account service. This property does not apply to accounts from external account providers.
MinPasswordLength	integer	<i>read-write</i>	The minimum password length for this account service. This property shall contain the minimum password length that the implementation allows for this account service. This property does not apply to accounts from external account providers.

Property	Type	Attributes	Notes
MultiFactorAuth (v1.12+) {	object	(null)	The multi-factor authentication settings that this account service supports. This property shall contain the multi-factor authentication settings that this account service supports.
ClientCertificate (v1.12+) {	object	(null)	The settings related to client certificate authentication schemes such as mTLS or CAC/PIV. This property shall contain the settings related to client certificate authentication.
CertificateMappingAttribute (v1.12+)	string (enum)	read-write (null)	The client certificate attribute to map to a user. This property shall contain the client certificate attribute to map to a user. <i>For the possible property values, see CertificateMappingAttribute in Property details.</i>
Certificates (v1.12+) {	object		The link to a collection of CA certificates used to validate client certificates. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that represents the CA certificates used to validate client certificates during TLS handshaking. Regardless of the contents of this collection, services may perform additional verification based on other factors, such as the configuration of the <code>SecurityPolicy</code> resource. If the service supports the <code>RevokedCertificates</code> or <code>TrustedCertificates</code> properties within the <code>Server</code> property within the <code>TLS</code> property of the <code>SecurityPolicy</code> resource, the service shall verify the provided client certificate with the <code>SecurityPolicy</code> resource prior to verifying it with this collection. Contains a link to a resource.
@odata.id	string	read-only	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
Enabled (v1.12+)	boolean	read-write (null)	An indication of whether client certificate authentication is enabled. This property shall indicate whether client certificate authentication is enabled.

Property	Type	Attributes	Notes
RespondToUnauthenticatedClients (v1.12+)	boolean	<i>read-write</i> (null)	An indication of whether the service responds to clients that do not successfully authenticate. This property shall indicate whether the service responds to clients that do not successfully authenticate. If this property is not supported by the service, it shall be assumed to be <code>true</code>. See the 'Client certificate authentication' clause in the Redfish Specification.
}			
GoogleAuthenticator (v1.12+) {	object	(null)	The settings related to Google Authenticator multi-factor authentication. For generic Time-Based One-Time Password (TOTP) multi-factor authentication, use the <code>TimeBasedOneTimePassword</code> property. This property shall contain the settings related to Google Authenticator multi-factor authentication.
Enabled (v1.12+)	boolean	<i>read-write</i> (null)	An indication of whether multi-factor authentication with Google Authenticator is enabled. This property shall indicate whether multi-factor authentication with Google Authenticator is enabled.
SecretKey (v1.12+)	string	<i>read-write</i> (null)	The secret key to use when communicating with the Google Authenticator server. This property is <code>null</code> in responses. This property shall contain the client key to use when communicating with the Google Authenticator Server. The value shall be <code>null</code> in responses.
SecretKeySet (v1.12+)	boolean	<i>read-only</i>	Indicates if the <code>SecretKey</code> property is set. This property shall contain <code>true</code> if a valid value was provided for the <code>SecretKey</code> property. Otherwise, the property shall contain <code>false</code>.
}			
MicrosoftAuthenticator (v1.12+) {	object	(null)	The settings related to Microsoft Authenticator multi-factor authentication. For generic Time-Based One-Time Password (TOTP) multi-factor authentication, use the <code>TimeBasedOneTimePassword</code> property. This property shall contain the settings related to Microsoft Authenticator multi-factor authentication.

Property	Type	Attributes	Notes
Enabled (v1.12+)	boolean	<i>read-write</i> (null)	An indication of whether multi-factor authentication with Microsoft Authenticator is enabled. This property shall indicate whether multi-factor authentication with Microsoft Authenticator is enabled.
SecretKey (v1.12+)	string	<i>read-write</i> (null)	The secret key to use when communicating with the Microsoft Authenticator server. This property is <code>null</code> in responses. This property shall contain the client key to use when communicating with the Microsoft Authenticator server. The value shall be <code>null</code> in responses.
SecretKeySet (v1.12+)	boolean	<i>read-only</i>	Indicates if the <code>SecretKey</code> property is set. This property shall contain <code>true</code> if a valid value was provided for the <code>SecretKey</code> property. Otherwise, the property shall contain <code>false</code>.
}			
OneTimePasscode (v1.14+) {	object	(null)	The settings related to one-time passcode (OTP) multi-factor authentication. This property shall contain the settings related to one-time passcode multi-factor authentication.
Enabled (v1.14+)	boolean	<i>read-write</i> (null)	An indication of whether multi-factor authentication using a one-time passcode is enabled. This property shall indicate whether multi-factor authentication using a one-time passcode is enabled. The passcode is sent to the delivery address associated with the account credentials provided in the request. If the credentials are associated with a <code>ManagerAccount</code> resource, the delivery address is specified by the <code>OneTimePasscodeDeliveryAddress</code> property. If the credentials are associated with a user from an LDAP account provider, the delivery address is contained in the LDAP attribute specified by the <code>EmailAttribute</code> property. An attempt to create a session when the <code>Token</code> property is not included in the request shall generate a message sent to the delivery address, using the SMTP settings from the Redfish event service, containing a one-time passcode. The service shall accept the one-time passcode as the valid value for the <code>Token</code> property in the next <code>POST</code> operation to create a session for the respective account.
}			

Property	Type	Attributes	Notes
SecurID (v1.12+) {	object	(null)	The settings related to RSA SecurID multi-factor authentication. This property shall contain the settings related to RSA SecurID multi-factor authentication.
Certificates (v1.12+) {	object		The link to a collection of server certificates for the RSA SecurID server referenced by the <code>ServerURI</code> property. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that represent the server certificates for the RSA SecurID server referenced by the <code>ServerURI</code> property. Regardless of the contents of this collection, services may perform additional verification based on other factors, such as the configuration of the <code>SecurityPolicy</code> resource. Contains a link to a resource.
@odata.id	string	read-only	Link to Collection of <code>Certificate</code> . See the Certificate schema for details.
}			
ClientId (v1.12+)	string	read-write (null)	The client ID to use when communicating with the RSA SecurID server. This property shall contain the client ID to use when communicating with the RSA SecurID server.
ClientSecret (v1.12+)	string	read-write (null)	The client secret to use when communicating with the RSA SecurID server. This property is <code>null</code> in responses. This property shall contain the client secret to use when communicating with the RSA SecurID server. The value shall be <code>null</code> in responses.
ClientSecretSet (v1.12+)	boolean	read-only	Indicates if the <code>ClientSecret</code> property is set. This property shall contain <code>true</code> if a valid value was provided for the <code>ClientSecret</code> property. Otherwise, the property shall contain <code>false</code>.
Enabled (v1.12+)	boolean	read-write (null)	An indication of whether multi-factor authentication with RSA SecurID is enabled. This property shall indicate whether multi-factor authentication with RSA SecurID is enabled.
ServerURI (v1.12+)	string (URI)	read-write (null)	The URI of the RSA SecurID server. This property shall contain the URI of the RSA SecurID server.

Property	Type	Attributes	Notes
}			
TimeBasedOneTimePassword (v1.16+) {	object	(null)	The settings related to Time-based One-Time Password (TOTP) multi-factor authentication. This property shall contain the settings related to RFC6238-defined Time-based One-Time Password (TOTP) multi-factor authentication.
Enabled (v1.16+)	boolean	read-write (null)	An indication of whether multi-factor authentication with a Time-based One-Time Password (TOTP) is enabled. This property shall indicate whether multi-factor authentication with an RFC6238-defined Time-based One-Time Password (TOTP) is enabled.
TimeStepSeconds (v1.16+)	integer	read-write (null)	The time step, in seconds, for calculating the one-time password. This property shall contain the RFC6238-defined time step, in seconds, for calculating the one-time password. If this property is not supported by the service, it shall be assumed to be 30.
}			
}			
OAuth2 (v1.10+) {}	object	(null)	The first OAuth 2.0 external account provider that this account service supports. This property shall contain the first OAuth 2.0 external account provider that this account service supports. If the account service supports one or more OAuth 2.0 services as an external account provider, this entity shall be populated by default. This entity shall not be present in the additional external account providers resource collection. For more information about this property, see ExternalAccountProvider in Property Details.
OutboundConnections (v1.14+) {	object	(null)	The collection of outbound connection configurations. This property shall contain a resource collection of type <code>OutboundConnectionCollection</code>. Contains a link to a resource.
@odata.id	string	read-only	Link to Collection of <i>OutboundConnection</i> . See the OutboundConnection schema for details.
}			

Property	Type	Attributes	Notes
PasswordExpirationDays (v1.9+)	integer	<i>read-write (null)</i>	The number of days before account passwords in this account service will expire. This property shall contain the number of days before account passwords in this account service will expire. The value shall be applied during account creation and password modification unless the <code>PasswordExpiration</code> property is provided. The value <code>null</code> shall indicate that account passwords never expire. This property does not apply to accounts from external account providers.
PasswordGuidanceMessage (v1.18+)	string	<i>read-only</i>	Password creation guidance for manager accounts. This property shall contain guidance for creating passwords that meet the password complexity or other related requirements for this service.
PasswordGuidanceMessageId (v1.18+)	string	<i>read-only (null)</i>	A <code>MessageId</code> that contains password creation guidance for manager accounts. This property shall contain a <code>MessageId</code> value that contains guidance for creating passwords that meet the password complexity or other related requirements for this service. The value shall contain a <code>MessageId</code>, as defined in the 'MessageId format' clause of the Redfish Specification.
PrivilegeMap (v1.1+) {	object		The link to the mapping of the privileges required to complete a requested operation on a URI associated with this service. This property shall contain a link to a resource of type <code>PrivilegeMapping</code> that contains the privileges that are required for a user context to complete a requested operation on a URI associated with this service. See the <i>PrivilegeRegistry</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>PrivilegeRegistry</i> resource. See the Links section and the <i>PrivilegeRegistry</i> schema for details.
}			
RequireChangePasswordAction (v1.14+)	boolean	<i>read-write (null)</i>	An indication of whether clients are required to invoke the <code>ChangePassword</code> action to modify account passwords. This property shall indicate whether clients are required to invoke the <code>ChangePassword</code> action to modify the <code>Password</code> property in <code>ManagerAccount</code> resources. If <code>true</code>, services shall reject <code>PATCH</code> and <code>PUT</code> requests to modify the <code>Password</code> property in <code>ManagerAccount</code> resources.

Property	Type	Attributes	Notes
RestrictedOemPrivileges (v1.8+) []	array (string)	<i>read-only</i>	The set of restricted OEM privileges. This property shall contain an array of OEM privileges that are restricted by the service.
RestrictedPrivileges (v1.8+) []	array (string (enum))	<i>read-only</i>	- The set of restricted Redfish privileges. - This property shall contain an array of Redfish privileges that are restricted by the service. <i>For the possible property values, see RestrictedPrivileges in Property details.</i>
Roles {	object		The collection of Redfish roles. This property shall contain a link to a resource collection of type <code>RoleCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Role</i> . See the Role schema for details.
}			
ServiceEnabled	boolean	<i>read-write (null)</i>	An indication of whether the account service is enabled. If <code>true</code>, it is enabled. If <code>false</code>, it is disabled and users cannot be created, deleted, or modified, and new sessions cannot be started. However, established sessions might still continue to run. Any service, such as the session service, that attempts to access the disabled account service fails. However, this does not affect HTTP Basic Authentication connections. This property shall indicate whether the account service is enabled. If <code>true</code>, it is enabled. If <code>false</code>, it is disabled and users cannot be created, deleted, or modified, and new sessions cannot be started. However, established sessions may still continue to run. Any service, such as the session service, that attempts to access the disabled account service fails. However, this does not affect HTTP Basic Authentication connections.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

Property	Type	Attributes	Notes
SupportedAccountTypes (v1.8+) []	array (string (enum))	<i>read-only</i>	- The account types supported by the service. - This property shall contain an array of the account types supported by the service. <i>For the possible property values, see SupportedAccountTypes in Property details.</i>
SupportedOEMAccountTypes (v1.8+) []	array (string)	<i>read-only</i>	The OEM account types supported by the service. This property shall contain an array of the OEM account types supported by the service.
TACACSplus (v1.8+) {}	object	(null)	The first TACACS+ external account provider that this account service supports. This property shall contain the first TACACS+ external account provider that this account service supports. If the account service supports one or more TACACS+ services as an external account provider, this entity shall be populated by default. This entity shall not be present in the additional external account providers resource collection. For more information about this property, see ExternalAccountProvider in Property Details.

6.2.4 Property details

6.2.4.1 AccountProviderType

The type of external account provider to which this service connects.

- This property shall contain the type of external account provider to which this service connects.

string	Description
ActiveDirectoryService	An external Active Directory service. The external account provider shall be a Microsoft Active Directory Technical Specification-conformant service. The <code>ServiceAddresses</code> property shall contain fully qualified domain names (FQDN) or NetBIOS names that link to the domain servers for the Active Directory service.

string	Description
LDAPService	A generic external LDAP service. The external account provider shall be an RFC4511-conformant service. The <code>ServiceAddresses</code> property shall contain RFC3986-defined URIs in the format <code>scheme://host:port</code>, where <code>scheme://</code> and <code>:port</code> are optional, that link to the LDAP servers for the service. If the scheme is not specified, services shall assume it is <code>ldaps://</code>. If the port is not specified, services shall assume it is <code>636</code>. For example, <code>ldaps://contoso.com:636</code> or <code>contoso.com</code>.
OAuth2 (v1.10+)	An external OAuth 2.0 service. The external account provider shall be an RFC6749-conformant service. The <code>ServiceAddresses</code> property shall contain RFC3986-defined URIs that correspond to the RFC8414-defined metadata for the OAuth 2.0 service. For example, <code>https://contoso.org/.well-known/oauth-authorization-server</code>.
OEM	An OEM-specific external authentication or directory service.
RedfishService	An external Redfish service. The external account provider shall be a DMTF Redfish Specification-conformant service. The <code>ServiceAddresses</code> property shall contain URIs to <code>AccountService</code> resources that correspond to Redfish services. For example, <code>https://192.168.1.50/redfish/v1/AccountService</code>.
TACACSplus (v1.8+)	An external TACACS+ service. The external account provider shall be an RFC8907-conformant service. The <code>ServiceAddresses</code> property shall contain RFC3986-defined URIs in the format <code>host:port</code> that correspond to the TACACS+ services.

6.2.4.2 Authentication

The information required to authenticate to the external service.

AuthenticationType (v1.3+)	string (enum)	read-write (null)	The type of authentication used to connect to the external account provider. This property shall contain the type of authentication used to connect to the external account provider. <i>For the possible property values, see <code>AuthenticationType</code> in Property details.</i>
EncryptionKey (v1.8+)	string	read-write (null)	Specifies the encryption key. This property shall contain the value of a symmetric encryption key for account services that support some form of encryption, obfuscation, or authentication such as TACACS+. The value shall be <code>null</code> in responses. The property shall accept a hexadecimal string whose length depends on the external account service, such as TACACS+. A TACACS+ service shall use this property to specify the secret key as defined in RFC8907. Pattern: <code>^[0-9a-fA-F]+\$</code>

EncryptionKeySet (v1.8+)	boolean	read-only (null)	Indicates if the <code>EncryptionKey</code> property is set. This property shall contain <code>true</code> if a valid value was provided for the <code>EncryptionKey</code> property. Otherwise, the property shall contain <code>false</code>. For a TACACS+ service, the value <code>false</code> shall indicate data obfuscation, as defined in section 4.5 of RFC8907, is disabled.
KerberosKeytab (v1.3+)	string	read-write (null)	The Base64-encoded Kerberos keytab for this service. A <code>PATCH</code> or <code>PUT</code> operation writes the keytab. This property is <code>null</code> in responses. This property shall contain a Base64-encoded string, with padding characters, of the Kerberos keytab for this service. A <code>PATCH</code> or <code>PUT</code> operation writes the keytab. The value shall be <code>null</code> in responses.
Oem (v1.3+) {}	object		See the OEM object definition in the Using this guide clause.
Password (v1.3+)	string	read-write (null)	The password for this service. A <code>PATCH</code> or <code>PUT</code> request writes the password. This property is <code>null</code> in responses. This property shall contain the password for this service. A <code>PATCH</code> or <code>PUT</code> operation writes the password. The value shall be <code>null</code> in responses.
Token (v1.3+)	string	read-write (null)	The token for this service. A <code>PATCH</code> or <code>PUT</code> operation writes the token. This property is <code>null</code> in responses. This property shall contain the token for this service. A <code>PATCH</code> or <code>PUT</code> operation writes the token. The value shall be <code>null</code> in responses.
Username (v1.3+)	string	read-write	The username for the service. This property shall contain the username for this service.

6.2.4.3 AuthenticationType

The type of authentication used to connect to the external account provider.

- This property shall contain the type of authentication used to connect to the external account provider.

string	Description
KerberosKeytab	A Kerberos keytab.
OEM	An OEM-specific authentication mechanism.
Token	An opaque authentication token.
UsernameAndPassword	A username and password combination.

6.2.4.4 BypassTypes

- The types of multi-factor authentication this account or role mapping is allowed to bypass.
 - This property shall contain the types of multi-factor authentication this account or role mapping is allowed to bypass. An empty array shall indicate this account or role mapping cannot bypass any multi-factor authentication types that are currently enabled.

string	Description
All	Bypass all multi-factor authentication types. This value shall indicate an account or role mapping can bypass all multi-factor authentication types including OEM-defined types.
ClientCertificate	Bypass client certificate authentication. This value shall indicate an account or role mapping can bypass client certificate authentication. Authentication with client certificates is configured with the <code>ClientCertificate</code> property.
GoogleAuthenticator	Bypass Google Authenticator. This value shall indicate an account or role mapping can bypass Google Authenticator. Authentication with Google Authenticator is configured with the <code>GoogleAuthenticator</code> property.
MicrosoftAuthenticator	Bypass Microsoft Authenticator. This value shall indicate an account or role mapping can bypass Microsoft Authenticator. Authentication with Microsoft Authenticator is configured with the <code>MicrosoftAuthenticator</code> property.
OEM	Bypass OEM-defined multi-factor authentication. This value shall indicate an account or role mapping can bypass OEM-defined multi-factor authentication.
OneTimePasscode	Bypass one-time passcode authentication. This value shall indicate an account or role mapping can bypass one-time passcode authentication. Authentication with a one-time passcode is configured with the <code>OneTimePasscode</code> property.
SecurID	Bypass RSA SecurID. This value shall indicate an account or role mapping can bypass RSA SecurID. Authentication with RSA SecurID is configured with the <code>SecurID</code> property.
TimeBasedOneTimePassword	Bypass Time-based One-Time Password (TOTP) authentication. This value shall indicate an account or role mapping can bypass RFC6238-defined Time-based One-Time Password (TOTP) authentication. Authentication with a Time-based One-Time Password is configured with the <code>TimeBasedOneTimePassword</code> property.

6.2.4.5 CertificateMappingAttribute

The client certificate attribute to map to a user.

- This property shall contain the client certificate attribute to map to a user.

string	Description
CommonName	Match the Common Name (CN) field in the provided certificate to the username. • This value shall indicate the service matches the RFC5280-defined 'commonName' attribute in the provided certificate to the <code>UserName</code> property in a <code>ManagerAccount</code> resource or the appropriate field from an external account provider.
UserPrincipalName	Match the User Principal Name (UPN) field in the provided certificate to the username. • This value shall indicate the service matches the User Principal Name (UPN) field in the provided certificate to the <code>UserName</code> property in a <code>ManagerAccount</code> resource or the appropriate field from an external account provider.
Whole	Match the whole certificate. • This value shall indicate the service matches the entire certificate with a <code>Certificate</code> resource subordinate to a <code>ManagerAccount</code> resource or the entire certificate matches the appropriate field from an external account provider.

6.2.4.6 ExternalAccountProvider

The external account provider services that can provide accounts for this manager to use for authentication.

AccountProviderType <i>(v1.3+, deprecated v1.5)</i>	string (enum)	<i>read-only (null)</i>	The type of external account provider to which this service connects. • This property shall contain the type of external account provider to which this service connects. <i>For the possible property values, see AccountProviderType in Property details. Deprecated in v1.5 and later. This property is deprecated because the account provider type is known when used in the LDAP and ActiveDirectory objects.</i>
Authentication (v1.3+) {}	object		The authentication information for the external account provider. • This property shall contain the authentication information for the external account provider. For more information about this property, see Authentication in Property Details.

Certificates (v1.4+) {	object		The link to a collection of certificates that the external account provider uses. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that contains certificates the external account provider uses. Contains a link to a resource.
@odata.id	string	read-only	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
LDAPService (v1.3+) {}	object		The additional mapping information needed to parse a generic LDAP service. This property shall contain any additional mapping information needed to parse a generic LDAP service. This property should only be present inside the <code>LDAP</code> property. For more information about this property, see LDAPService in Property Details.
OAuth2Service (v1.10+) {}	object	(null)	The additional information needed to parse an OAuth 2.0 service. This property shall contain additional information needed to parse an OAuth 2.0 service. This property should only be present inside an <code>OAuth2</code> property. For more information about this property, see OAuth2Service in Property Details.
PasswordSet (v1.7+)	boolean	read-only	Indicates if the <code>Password</code> property is set. This property shall contain <code>true</code> if a valid value was provided for the <code>Password</code> property. Otherwise, the property shall contain <code>false</code>.
Priority (v1.8+)	integer	read-write (null)	The authentication priority for the external account provider. This property shall contain the assigned priority for the specified external account provider. The value <code>0</code> shall indicate the highest priority. Increasing values shall represent decreasing priority. If an external provider does not have a priority assignment or two or more external providers have the same priority, the behavior shall be determined by the Redfish service. The priority is used to determine the order of authentication and authorization for each external account provider.
RemoteRoleMapping (v1.3+) [{	array		The mapping rules to convert the external account providers account information to the local Redfish role. This property shall contain a set of the mapping rules that are used to convert the external account providers account information to the local Redfish role.

LocalAccountTypes (v1.16+) []	array (string (enum))	read- write (null)	- The list of local services in the manager that the remote user or group is allowed to access. - This property shall contain an array of the various local manager services that the remote user or group is allowed to access. This shall not include functionality for receiving events or other notifications. If this property is not supported, the value shall be assumed to be an array that contains the value <code>Redfish</code>. <i>For the possible property values, see LocalAccountTypes in Property details.</i>
LocalOEMAccountTypes (v1.16+) []	array (string, null)	read- write	The OEM account types for the remote user or group. This property shall contain an array of the OEM account types for the remote user or group when <code>LocalAccountTypes</code> contains <code>OEM</code>.
LocalRole (v1.3+)	string	read- write (null)	The name of the local Redfish role to which to map the remote user or group. This property shall contain the <code>RoleId</code> property value within a role resource on this Redfish service to which to map the remote user or group.
MFABypass (v1.12+) {	object	(null)	The multi-factor authentication bypass settings. This property shall contain the multi-factor authentication bypass settings.
BypassTypes (v1.12+) []	array (string (enum))	read- write (null)	- The types of multi-factor authentication this account or role mapping is allowed to bypass. - This property shall contain the types of multi-factor authentication this account or role mapping is allowed to bypass. An empty array shall indicate this account or role mapping cannot bypass any multi-factor authentication types that are currently enabled. <i>For the possible property values, see BypassTypes in Property details.</i>
}			
Oem (v1.3+) {}	object		See the OEM object definition in the Using this guide clause.
RemoteGroup (v1.3+)	string	read- write (null)	The name of the remote group, or the remote role in the case of a Redfish service, that maps to the local Redfish role to which this entity links. This property shall contain the name of the remote group, or the remote role in the case of a Redfish service, that maps to the local Redfish role to which this entity links.
RemoteUser (v1.3+)	string	read- write (null)	The name of the remote user that maps to the local Redfish role to which this entity links. This property shall contain the name of the remote user that maps to the local Redfish role to which this entity links.
}]			

Retries (v1.13+)	integer	read-write (null)	The number of times to retry connecting to an address in the <code>ServiceAddresses</code> property before attempting the next address in the array. This property shall contain the number of retries to attempt a connection to an address in the <code>ServiceAddresses</code> property before attempting a connection to the next address in the array or giving up. If this property is not present, the service has internal policies for handling retries.
ServiceAddresses (v1.3+) []	array (string, null)	read-write	The addresses of the user account providers to which this external account provider links. The format of this field depends on the type of external account provider. This property shall contain the addresses of the account providers to which this external account provider links. The format of this field depends on the type of external account provider. Each item in the array shall contain a single address. Services can define their own behavior for managing multiple addresses.
ServiceEnabled (v1.3+)	boolean	read-write (null)	An indication of whether this service is enabled. This property shall indicate whether this service is enabled.
TACACSPplusService (v1.8+) { }	object	(null)	The additional information needed to parse a TACACS+ services. This property shall contain additional information needed to parse a TACACS+ services. This property should only be present inside a <code>TACACSPplus</code> property. For more information about this property, see TACACSPplusService in Property Details.
TimeoutSeconds (v1.13+)	integer	read-write (null)	The period of time, in seconds, this account service will wait for a response from an address of a user account provider before timing out. This property shall contain the period of time, in seconds, this account service will wait for a response from an address of a user account provider before timing out. If this property is not present, the service has internal policies for handling timeouts.

6.2.4.7 HTTPBasicAuth

Indicates if HTTP Basic authentication is enabled for this service.

- This property shall indicate whether clients are able to authenticate to the Redfish service with HTTP Basic authentication. This property should default to `Enabled` for client compatibility. If this property is not present in responses, the value shall be assumed to be `Enabled`.

string	Description
Disabled	HTTP Basic authentication is disabled. This value shall indicate that HTTP Basic authentication is disabled for the service.

string	Description
Enabled	HTTP Basic authentication is enabled. This value shall indicate that HTTP Basic authentication is enabled for the service. The service shall include the <code>WWW-Authenticate</code> HTTP response header with the value including <code>Basic</code> when returning the HTTP <code>401 Unauthorized</code> status code.
Unadvertised	HTTP Basic authentication is enabled, but is not advertised with the <code>WWW-Authenticate</code> response header. This value shall indicate that HTTP Basic authentication is enabled for the service. The service shall not include <code>Basic</code> in the value of the <code>WWW-Authenticate</code> HTTP response header and may omit the header entirely from responses. The lack of advertisement prevents some clients from accessing the service with HTTP Basic authentication, such as web browsers.

6.2.4.8 LDAPService

The settings required to parse a generic LDAP service.

Oem (v1.3+) {}	object		See the OEM object definition in the Using this guide clause.
SearchSettings (v1.3+) {	object		The required settings to search an external LDAP service. This property shall contain the required settings to search an external LDAP service.
BaseDistinguishedNames (v1.3+) []	array (string, null)	read-write	The base distinguished names to use to search an external LDAP service. This property shall contain an array of base distinguished names to use to search an external LDAP service.
EmailAttribute (v1.14+)	string	read-write (null)	The attribute name that contains the LDAP user's email address. This property shall contain the attribute name that contains the LDAP user's email address. If this value is not set by the user, or the property is not present, the value shall be <code>mail</code>.
GroupNameAttribute (v1.3+)	string	read-write (null)	The attribute name that contains the LDAP group name entry. This property shall contain the attribute name that contains the LDAP group name.
GroupsAttribute (v1.3+)	string	read-write (null)	The attribute name that contains the groups for a user on the LDAP user entry. This property shall contain the attribute name that contains the groups for an LDAP user entry.

SSHKeyAttribute (v1.11+)	string	<i>read-write</i> (null)	The attribute name that contains the LDAP user's SSH public key entry. This property shall contain the attribute name that contains the LDAP user's SSH public key.
UsernameAttribute (v1.3+)	string	<i>read-write</i> (null)	The attribute name that contains the LDAP username entry. This property shall contain the attribute name that contains the LDAP username.
}			

6.2.4.9 LocalAccountAuth

An indication of how the service uses the accounts collection within this account service as part of authentication. The enumerated values describe the details for each mode.

- This property shall govern how the service uses the manager accounts resource collection within this account service as part of authentication. The enumerated values describe the details for each mode.

string	Description
Disabled	The service never authenticates users based on the account service-defined accounts collection. The service shall never authenticate users based on the account service-defined manager accounts resource collection.
Enabled	The service authenticates users based on the account service-defined accounts collection. The service shall authenticate users based on the account service-defined manager accounts resource collection.
Fallback	The service authenticates users based on the account service-defined accounts collection only if any external account providers are currently unreachable. The service shall authenticate users based on the account service-defined manager accounts resource collection only if any external account providers are currently unreachable.
LocalFirst (v1.6+)	The service first authenticates users based on the account service-defined accounts collection. If authentication fails, the service authenticates by using external account providers. The service shall first authenticate users based on the account service-defined manager accounts resource collection. If authentication fails, the service shall authenticate by using external account providers.

6.2.4.10 LocalAccountTypes

- The list of local services in the manager that the remote user or group is allowed to access.

- This property shall contain an array of the various local manager services that the remote user or group is allowed to access. This shall not include functionality for receiving events or other notifications. If this property is not supported, the value shall be assumed to be an array that contains the value `Redfish`.

string	Description
ControlPanel	Allow PIN-based access via an external control panel, such as a keypad, touchscreen, or other human interface. This value shall indicate the account is used to allow PIN-based access via an external control panel. If this value is specified, the <code>AccountTypes</code> property should not contain other values for the same <code>ManagerAccount</code> resource. If this value is specified, <code>Password</code> shall contain the PIN to enable access, and may not follow other password-related rules. The <code>ChangePassword</code> action, if supported, may be used to update the PIN.
HostConsole	Allow access to the host's console, which could be connected through Telnet, SSH, or another protocol. This value shall indicate the account is allowed to access the host console.
IPMI	Allow access to the Intelligent Platform Management Interface service. This value shall indicate the account is allowed to access the Intelligent Platform Management Interface service.
KVMIP	Allow access to a Keyboard-Video-Mouse over IP session. This value shall indicate the account is allowed to access the Keyboard-Video-Mouse over IP session service.
ManagerConsole	Allow access to the manager's console, which could be connected through Telnet, SSH, SM CLP, or another protocol. This value shall indicate the account is allowed to access the manager console.
OEM	OEM account type. See the <code>OEMAccountTypes</code> property. This value shall indicate the account is allowed to access the services listed in the <code>OEMAccountTypes</code> property.
Redfish	Allow access to the Redfish service. This value shall indicate the account is allowed to access Redfish services. If the version of the <code>ManagerAccount</code> resource is lower than the schema version when another enumeration value in this list was added, the implementation may include that functionality as part of the <code>Redfish</code> value.
SNMP	Allow access to SNMP services. This value shall indicate the account is allowed to access SNMP services.

string	Description
VirtualMedia	Allow access to control virtual media. This value shall indicate the account is allowed to control virtual media.
WebUI	Allow access to a web user interface session, such as a graphical interface or another web-based protocol. This value shall indicate the account is allowed to access the web interface.

6.2.4.11 Mode

The mode of operation for token validation.

- This property shall contain the mode of operation for token validation.

string	Description
Discovery	OAuth 2.0 service information for token validation is downloaded by the service. This value shall indicate the service performs token validation from information found at the URIs specified by the <code>ServiceAddresses</code> property. Services shall implement a caching method of this information so it's not necessary to retrieve metadata and key information for every request containing a token.
Offline	OAuth 2.0 service information for token validation is configured by a client. Clients should configure the <code>Issuer</code> and <code>OAuthServiceSigningKeys</code> properties for this mode. This value shall indicate the service performs token validation from properties configured by a client. Clients should configure the <code>Issuer</code> and <code>OAuthServiceSigningKeys</code> properties for this mode.

6.2.4.12 OAuth2Service

Various settings to parse an OAuth 2.0 service.

Audience (v1.10+) []	array (string)	read-only	The allowable audience strings of the Redfish service. This property shall contain an array of allowable RFC7519-defined audience strings of the Redfish service. The values shall uniquely identify the Redfish service. For example, a MAC address or UUID for the manager can uniquely identify the service.

Issuer (v1.10+)	string	read-write (null)	The issuer string of the OAuth 2.0 service. Clients should configure this property if <code>Mode</code> contains <code>Offline</code>. This property shall contain the RFC8414-defined issuer string of the OAuth 2.0 service. If the <code>Mode</code> property contains the value <code>Discovery</code>, this property shall contain the value of the <code>issuer</code> string from the OAuth 2.0 service's metadata and this property shall be read-only. Clients should configure this property if <code>Mode</code> contains <code>Offline</code>.
Mode (v1.10+)	string (enum)	read-write	The mode of operation for token validation. This property shall contain the mode of operation for token validation. <i>For the possible property values, see Mode in Property details.</i>
OAuthServiceSigningKeys (v1.10+)	string	read-write (null)	The Base64-encoded signing keys of the issuer of the OAuth 2.0 service. Clients should configure this property if <code>Mode</code> contains <code>Offline</code>. This property shall contain a Base64-encoded string, with padding characters, of the RFC7517-defined signing keys of the issuer of the OAuth 2.0 service. Services shall verify the token provided in the <code>Authorization</code> header of the request with the value of this property. If the <code>Mode</code> property contains the value <code>Discovery</code>, this property shall contain the keys found at the URI specified by the <code>jwks_uri</code> string from the OAuth 2.0 service's metadata and this property shall be read-only. Clients should configure this property if <code>Mode</code> contains <code>Offline</code>.
Oem (v1.13+) {}	object		See the OEM object definition in the Using this guide clause.

6.2.4.13 PasswordExchangeProtocols

- Indicates the allowed TACACS+ password exchange protocols.
 - This property shall indicate all the allowed TACACS+ password exchange protocol described under section 5.4.2 of RFC8907.

string	Description
ASCII	The ASCII Login method. This value shall indicate the ASCII Login flow as described under section 5.4.2 of RFC8907.
CHAP	The CHAP Login method. This value shall indicate the CHAP Login flow as described under section 5.4.2 of RFC8907.
MSCHAPv1	The MS-CHAP v1 Login method. This value shall indicate the MS-CHAP v1 Login flow as described under section 5.4.2 of RFC8907.

string	Description
MSCHAPv2	The MS-CHAP v2 Login method. This value shall indicate the MS-CHAP v2 Login flow as described under section 5.4.2 of RFC8907.
PAP	The PAP Login method. This value shall indicate the PAP Login flow as described under section 5.4.2 of RFC8907.

6.2.4.14 RestrictedPrivileges

- The set of restricted Redfish privileges.
 - This property shall contain an array of Redfish privileges that are restricted by the service.

string	Description
AdministrateStorage	Administrator for storage subsystems and storage systems found in the storage collection and storage system collection respectively.
AdministrateSystems	Administrator for systems found in the systems collection. Able to manage boot configuration, keys, and certificates for systems.
ConfigureComponents	Can configure components that this service manages.
ConfigureCompositionInfrastructure	Can view and configure composition service resources. This value shall be used to indicate the user can view and configure composition service resources without matching the <code>Client</code> property in the <code>ResourceBlock</code> or <code>CompositionReservation</code> resources.
ConfigureManager	Can configure managers.
ConfigureSelf	Can change the password for the current user account, log out of their own sessions, and perform operations on resources they created. Services will need to be aware of resource ownership to map this privilege to an operation from a particular user.
ConfigureUsers	Can configure users and their accounts.
Login	Can log in to the service and read resources.
NoAuth	Authentication is not required. This value shall be used to indicate an operation does not require authentication. This privilege shall not be used in Redfish roles.
OperateStorageBackup	Operator for storage backup functionality for storage subsystems and storage systems found in the storage collection and storage system collection respectively.

string	Description
OperateSystems	Operator for systems found in the systems collection. Able to perform resets and configure interfaces.

6.2.4.15 SupportedAccountTypes

- The account types supported by the service.
 - This property shall contain an array of the account types supported by the service.

string	Description
ControlPanel	Allow PIN-based access via an external control panel, such as a keypad, touchscreen, or other human interface. This value shall indicate the account is used to allow PIN-based access via an external control panel. If this value is specified, the <code>AccountTypes</code> property should not contain other values for the same <code>ManagerAccount</code> resource. If this value is specified, <code>Password</code> shall contain the PIN to enable access, and may not follow other password-related rules. The <code>ChangePassword</code> action, if supported, may be used to update the PIN.
HostConsole	Allow access to the host's console, which could be connected through Telnet, SSH, or another protocol. This value shall indicate the account is allowed to access the host console.
IPMI	Allow access to the Intelligent Platform Management Interface service. This value shall indicate the account is allowed to access the Intelligent Platform Management Interface service.
KVMIP	Allow access to a Keyboard-Video-Mouse over IP session. This value shall indicate the account is allowed to access the Keyboard-Video-Mouse over IP session service.
ManagerConsole	Allow access to the manager's console, which could be connected through Telnet, SSH, SM CLP, or another protocol. This value shall indicate the account is allowed to access the manager console.
OEM	OEM account type. See the <code>OEMAccountTypes</code> property. This value shall indicate the account is allowed to access the services listed in the <code>OEMAccountTypes</code> property.

string	Description
Redfish	Allow access to the Redfish service. This value shall indicate the account is allowed to access Redfish services. If the version of the <code>ManagerAccount</code> resource is lower than the schema version when another enumeration value in this list was added, the implementation may include that functionality as part of the <code>Redfish</code> value.
SNMP	Allow access to SNMP services. This value shall indicate the account is allowed to access SNMP services.
VirtualMedia	Allow access to control virtual media. This value shall indicate the account is allowed to control virtual media.
WebUI	Allow access to a web user interface session, such as a graphical interface or another web-based protocol. This value shall indicate the account is allowed to access the web interface.

6.2.4.16 TACACSplusService

Various settings to parse a TACACS+ service.

AuthorizationService (v1.13+)	string	read-write	The TACACS+ service authorization argument. This property shall contain the TACACS+ service authorization argument as defined by section 8.2 of RFC8907. If this property is not present, the service defines the value to provide to the TACACS+ server.
Oem (v1.13+) {}	object		See the OEM object definition in the Using this guide clause.
PasswordExchangeProtocols (v1.8+) []	array (string enum)	read-write (null)	- Indicates the allowed TACACS+ password exchange protocols. - This property shall indicate all the allowed TACACS+ password exchange protocol described under section 5.4.2 of RFC8907. <i>For the possible property values, see PasswordExchangeProtocols in Property details.</i>
PrivilegeLevelArgument (v1.8+)	string	read-write (null)	Indicates the name of the TACACS+ argument name in an authorization request. This property shall specify the name of the argument in a TACACS+ Authorization REPLY packet body, as defined in RFC8907, that contains the user's privilege level.

6.2.5 Example response

```
{
  "@odata.type": "#AccountService.v1_18_0.AccountService",
  "Id": "AccountService",
  "Name": "Account Service",
  "Description": "Local Manager Account Service",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "ServiceEnabled": true,
  "AuthFailureLoggingThreshold": 3,
  "MinPasswordLength": 8,
  "EnforcePasswordHistoryCount": 5,
  "PasswordGuidanceMessageId": "ContosoService.1.2.PasswordComplexity",
  "PasswordGuidanceMessage": "Password must contain at least three of the following: an uppercase character, a lowercase character, a numeric digit, or a punctuation character",
  "AccountLockoutThreshold": 5,
  "AccountLockoutDuration": 30,
  "AccountLockoutCounterResetAfter": 30,
  "AccountLockoutCounterResetEnabled": true,
  "Accounts": {
    "@odata.id": "/redfish/v1/AccountService/Accounts"
  },
  "Roles": {
    "@odata.id": "/redfish/v1/AccountService/Roles"
  },
  "LocalAccountAuth": "Enabled",
  "LDAP": {
    "AccountProviderType": "LDAPService",
    "ServiceEnabled": false,
    "ServiceAddresses": [
      "ldaps://ldap.example.org:636"
    ],
    "Authentication": {
      "AuthenticationType": "UsernameAndPassword",
      "Username": "cn=Manager,dc=example,dc=org",
      "Password": null
    },
    "LDAPService": {
      "SearchSettings": {
        "BaseDistinguishedNames": [
          "dc=example,dc=org"
        ],
        "UsernameAttribute": "uid",
        "GroupsAttribute": "memberof"
      }
    }
  }
}
```

```

    "RemoteRoleMapping": [
      {
        "RemoteUser": "cn=Manager,dc=example,dc=org",
        "LocalRole": "Administrator"
      },
      {
        "RemoteGroup": "cn=Admins,ou=Groups,dc=example,dc=org",
        "LocalRole": "Administrator"
      },
      {
        "RemoteGroup": "cn=PowerUsers,ou=Groups,dc=example,dc=org",
        "LocalRole": "Operator"
      },
      {
        "RemoteGroup": "(cn=*)",
        "LocalRole": "ReadOnly"
      }
    ]
  },
  "ActiveDirectory": {
    "AccountProviderType": "ActiveDirectoryService",
    "ServiceEnabled": true,
    "ServiceAddresses": [
      "ad1.example.org",
      "ad2.example.org",
      null,
      null
    ],
    "Authentication": {
      "AuthenticationType": "KerberosKeytab",
      "KerberosKeytab": null
    },
    "RemoteRoleMapping": [
      {
        "RemoteGroup": "Administrators",
        "LocalRole": "Administrator"
      },
      {
        "RemoteUser": "DOMAIN\\Bob",
        "LocalRole": "Operator"
      },
      {
        "RemoteGroup": "PowerUsers",
        "LocalRole": "Operator"
      },
      {
        "RemoteGroup": "Everybody",
        "LocalRole": "ReadOnly"
      }
    ]
  }
]

```

```
    },
    "AdditionalExternalAccountProviders": {
      "@odata.id": "/redfish/v1/AccountService/ExternalAccountProviders"
    },
    "RequireChangePasswordAction": false,
    "@odata.id": "/redfish/v1/AccountService"
  }
```

6.3 ActionInfo 1.4.2

Version	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2023.2	2022.2	2021.2	2018.2	2016.2

6.3.1 Description

The `ActionInfo` schema defines the supported parameters and other information for a Redfish action. Supported parameters can differ among vendors and even among resource instances. This data can ensure that action requests from applications contain supported parameters.

- This resource shall represent the supported parameters and other information for a Redfish action on a target within a Redfish implementation. Supported parameters can differ among vendors and even among resource instances. This data can ensure that action requests from applications contain supported parameters.

6.3.2 Properties

Property	Type	Attributes	Notes
Parameters [{	array		The list of parameters included in the specified Redfish action. • This property shall list the parameters included in the specified Redfish action for this resource.

Property	Type	Attributes	Notes
AllowableNumbers (v1.3+) []	array (string, null)	<i>read-only</i>	The allowable numeric values or duration values, inclusive ranges of values, and incremental step values for this parameter as applied to this action target. This property shall indicate the allowable numeric values, inclusive ranges of values, and incremental step values for this parameter as applied to this action target, as defined in the 'Allowable values for numbers and durations' clause of the Redfish Specification. For arrays, this property shall represent the allowable values for each array member. This property shall only be present for numeric parameters or string parameters that specify a duration.
AllowablePattern (v1.3+)	string	<i>read-only</i> (null)	The allowable pattern for this parameter as applied to this action target. This property shall contain a regular expression that describes the allowable values for this parameter as applied to this action target. For arrays, this property shall represent the allowable values for each array member. This property shall only be present for string parameters.
AllowableValueDescriptions (v1.4+) []	array (string, null)	<i>read-only</i>	Descriptions of allowable values for this parameter. This property shall contain the descriptions of allowable values for this parameter. The descriptions shall appear in the same array order as the <code>AllowableValues</code> property. For arrays, this property shall represent the descriptions of allowable values for each array member.
AllowableValues []	array (string, null)	<i>read-only</i>	The allowable values for this parameter as applied to this action target. This property shall indicate the allowable values for this parameter as applied to this action target. For arrays, this property shall represent the allowable values for each array member.
ArraySizeMaximum (v1.2+)	integer	<i>read-only</i> (null)	The maximum number of array elements allowed for this parameter. This property shall contain the maximum number of array elements that this service supports for this parameter. This property shall not be present for non-array parameters.
ArraySizeMinimum (v1.2+)	integer	<i>read-only</i> (null)	The minimum number of array elements required for this parameter. This property shall contain the minimum number of array elements required by this service for this parameter. This property shall not be present for non-array parameters.
DataType	string (enum)	<i>read-only</i> (null)	The JSON property type for this parameter. This property shall contain the JSON property type for this parameter. <i>For the possible property values, see <code>DataType</code> in Property details.</i>

Property	Type	Attributes	Notes
MaximumValue (v1.1+)	number	<i>read-only</i> (null)	The maximum supported value for this parameter. This integer or number property shall contain the maximum value that this service supports. For arrays, this property shall represent the maximum value for each array member. This property shall not be present for non-integer or number parameters.
MinimumValue (v1.1+)	number	<i>read-only</i> (null)	The minimum supported value for this parameter. This integer or number property shall contain the minimum value that this service supports. For arrays, this property shall represent the minimum value for each array member. This property shall not be present for non-integer or number parameters.
Name	string	<i>read-only</i> <i>required</i>	The name of the parameter for this action. This property shall contain the name of the parameter included in a Redfish action.
ObjectDataType	string	<i>read-only</i> (null)	The data type of an object-based parameter. This property shall describe the entity type definition in <code>@odata.type</code> format for the parameter. This property shall be required for parameters with a data type of <code>Object</code> or <code>ObjectArray</code>, and shall not be present for parameters with other data types.
Required	boolean	<i>read-only</i>	An indication of whether the parameter is required to complete this action. This property shall indicate whether the parameter is required to complete this action.
}]			

6.3.3 Property details

6.3.3.1 DataType

The JSON property type for this parameter.

- This property shall contain the JSON property type for this parameter.

string	Description
Boolean	A boolean.

string	Description
Number	A number.
NumberArray	An array of numbers.
Object	An embedded JSON object.
ObjectArray	An array of JSON objects.
String	A string.
StringArray	An array of strings.

6.3.4 Example response

```
{
  "@odata.type": "#ActionInfo.v1_4_2.ActionInfo",
  "Id": "ResetActionInfo",
  "Name": "Reset Action Info",
  "Parameters": [
    {
      "Name": "ResetType",
      "Required": true,
      "DataType": "String",
      "AllowableValues": [
        "On",
        "ForceOff",
        "GracefulShutdown",
        "GracefulRestart",
        "ForceRestart",
        "Nmi",
        "ForceOn",
        "PushPowerButton"
      ]
    }
  ],
  "@odata.id": "/redfish/v1/Systems/1/ResetActionInfo"
}
```

6.4 AddressPool 1.3.0

Version	v1.3	v1.2	v1.1	v1.0
Release	2024.1	2021.2	2020.3	2019.4

6.4.1 Description

The `AddressPool` schema contains the definition of an address pool and its configuration.

- This resource shall represent an address pool in a Redfish implementation.

6.4.2 URIs

/redfish/v1/Fabrics/{FabricId}/AddressPools/{AddressPoolId}

6.4.3 Properties

Property	Type	Attributes	Notes
Ethernet (v1.1+) {	object		The Ethernet-related properties for this address pool. This property shall contain the Ethernet-related properties for this address pool.
BFDSingleHopOnly (v1.1+) {	object		Bidirectional Forwarding Detection (BFD) related properties for this Ethernet fabric. This property shall contain the Bidirectional Forwarding Detection (BFD) related properties for this Ethernet fabric.
DemandModeEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Bidirectional Forwarding Detection (BFD) Demand Mode status. This property shall indicate if Bidirectional Forwarding Detection (BFD) Demand Mode is enabled. In Demand mode, no periodic BFD Control packets will flow in either direction.
DesiredMinTxIntervalMilliseconds (v1.1+)	integer	<i>read-write</i> (null)	Desired Bidirectional Forwarding Detection (BFD) minimal transmit interval. This property shall contain the minimum interval, in milliseconds, that the local system would like to use when transmitting Bidirectional Forwarding Detection (BFD) Control packets, less any jitter applied.
KeyChain (v1.1+)	string	<i>read-write</i> (null)	Bidirectional Forwarding Detection (BFD) Key Chain name. This property shall contain the name of the Bidirectional Forwarding Detection (BFD) Key Chain.

Property	Type	Attributes	Notes
LocalMultiplier (v1.1+)	integer	<i>read-write</i> (null)	Bidirectional Forwarding Detection (BFD) multiplier value. This property shall contain the Bidirectional Forwarding Detection (BFD) multiplier value. A BFD multiplier consists of the number of consecutive BFD packets that shall be missed from a BFD peer before declaring that peer unavailable and informing the higher-layer protocols of the failure.
MeticulousModeEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Meticulous MD5 authentication of the Bidirectional Forwarding Detection (BFD) session. This property shall indicate whether the keyed MD5 sequence number is updated with every packet. If <code>true</code>, the keyed MD5 sequence number is updated with every packet. If <code>false</code>, it is updated periodically.
RequiredMinRxIntervalMilliseconds (v1.1+)	integer	<i>read-write</i> (null)	Bidirectional Forwarding Detection (BFD) receive value. This property shall contain the Bidirectional Forwarding Detection (BFD) receive value. The BFD receive value determines how frequently (in milliseconds) BFD packets will be expected to be received from BFD peers.
SourcePort (v1.1+)	integer	<i>read-write</i> (null)	Bidirectional Forwarding Detection (BFD) source port. This property shall contain the Bidirectional Forwarding Detection (BFD) source port.
}			
BGPevpn (v1.1+) {	object		BGP Ethernet Virtual Private Network (EVPN) related properties for this Ethernet fabric. This property shall contain the BGP Ethernet Virtual Private Network (EVPN) related properties for this Ethernet fabric.
AnycastGatewayIPAddress (v1.1+)	string	<i>read-write</i> (null)	The anycast gateway IPv4 address. This property shall contain the anycast gateway IPv4 address for a host subnet. Pattern: <code>^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$</code>
AnycastGatewayMACAddress (v1.1+)	string	<i>read-write</i> (null)	The anycast gateway MAC address. This property shall contain the anycast gateway MAC address for a host subnet. Pattern: <code>^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})\$</code>

Property	Type	Attributes	Notes
ARPProxyEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Address Resolution Protocol (ARP) proxy status. This property shall indicate whether proxy Address Resolution Protocol (ARP) is enabled.
ARPSuppressionEnabled (v1.3+)	boolean	<i>read-write</i> (null)	Address Resolution Protocol (ARP) suppression status. This property shall indicate whether Address Resolution Protocol (ARP) suppression is enabled.
ARPSuppressionEnabled (v1.1+, deprecated v1.3)	boolean	<i>read-write</i> (null)	Address Resolution Protocol (ARP) suppression status. This property shall indicate whether Address Resolution Protocol (ARP) suppression is enabled. <i>Deprecated in v1.3 and later. This property has been deprecated in favor of the <code>ARPSuppressionEnabled</code> property.</i>
ESINumberRange (v1.1+) {	object		The Ethernet Segment Identifier (ESI) number range for the fabric. This property shall contain Ethernet Segment Identifier (ESI) number ranges for allocation in supporting functions such as multihoming.
Lower (v1.1+)	integer	<i>read-write</i>	Lower Ethernet Segment Identifier (ESI) number. This property shall contain the lower Ethernet Segment Identifier (ESI) number to be used as part of a range of ESI numbers.
Upper (v1.1+)	integer	<i>read-write</i>	Upper Ethernet Segment Identifier (ESI) number. This property shall contain the upper Ethernet Segment Identifier (ESI) number to be used as part of a range of ESI numbers.
}			
EVINumberRange (v1.1+) {	object		The Ethernet Virtual Private Network (EVPN) Instance number (EVI) number range for the fabric. This property shall contain the Ethernet Virtual Private Network (EVPN) Instance number (EVI) range for EVPN-based fabrics.

Property	Type	Attributes	Notes
Lower (v1.1+)	integer	<i>read-write</i>	Lower Ethernet Virtual Private Network (EVPN) Instance (EVI) number. This property shall contain the lower Ethernet Virtual Private Network (EVPN) Instance (EVI) number to be used as part of a range of EVI numbers.
Upper (v1.1+)	integer	<i>read-write</i>	Upper Ethernet Virtual Private Network (EVPN) Instance (EVI) number. This property shall contain the upper Ethernet Virtual Private Network (EVPN) Instance (EVI) number to be used as part of a range of EVI numbers.
}			
GatewayIPAddress (v1.1+)	string	<i>read-write (null)</i>	The gateway IPv4 address. This property shall contain the Gateway IPv4 address for a host subnet. Pattern: <code>^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$</code>
GatewayIPAddressRange (v1.2+) {	object		The IPv4 address range for gateways. This property shall contain the IPv4 address range for gateway nodes on this subnet.
Lower (v1.2+)	string	<i>read-write (null)</i>	The lower IPv4 address. This property shall contain the lower IP address to be used as part of a range of addresses for gateway nodes in Ethernet Virtual Private Network (EVPN) based fabrics. Pattern: <code>^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$</code>
Upper (v1.2+)	string	<i>read-write (null)</i>	The upper IPv4 address. This property shall contain the upper IP address to be used as part of a range of addresses for gateway nodes in Ethernet Virtual Private Network (EVPN) based fabrics. Pattern: <code>^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$</code>
}			
NDPProxyEnabled (v1.1+)	boolean	<i>read-write (null)</i>	Network Discovery Protocol (NDP) proxy status. This property shall indicate whether Network Discovery Protocol (NDP) proxy is enabled.

Property	Type	Attributes	Notes
NDPSuppressionEnabled (v1.3+)	boolean	<i>read-write</i> (null)	Network Discovery Protocol (NDP) suppression status. This property shall indicate whether Network Discovery Protocol (NDP) suppression is enabled.
NDPSuppressionEnabled (v1.1+, deprecated v1.3)	boolean	<i>read-write</i> (null)	Network Discovery Protocol (NDP) suppression status. This property shall indicate whether Network Discovery Protocol (NDP) suppression is enabled. <i>Deprecated in v1.3 and later. This property has been deprecated in favor of the <code>NDPSuppressionEnabled</code> property.</i>
RouteDistinguisherAdministratorSubfield (v1.2+)	string	<i>read-write</i> (null)	The Route Distinguisher (RD) Administrator subfield. This property shall contain the RFC4364-defined Route Distinguisher (RD) Administrator subfield.
RouteDistinguisherRange (v1.1+) {	object		The Route Distinguisher (RD) number range for the fabric. This property shall contain the Route Distinguisher (RD) Instance number range for Ethernet Virtual Private Network (EVPN) based fabrics.
Lower (v1.1+)	integer	<i>read-write</i>	Lower Route Distinguisher (RD) number. This property shall contain the lower Route Distinguisher (RD) number to be used as part of a range of Route Distinguisher values.
Upper (v1.1+)	integer	<i>read-write</i>	Upper Route Distinguisher (RD) number. This property shall contain the upper Route Distinguisher (RD) number to be used as part of a range of Route Distinguisher values.
}			
RouteTargetAdministratorSubfield (v1.2+)	string	<i>read-write</i> (null)	The Route Target (RT) Administrator Subfield. This property shall contain the RFC4364-defined Route Target (RT) Administrator subfield.
RouteTargetRange (v1.1+) {	object		The Route Target (RT) number range for the fabric. This property shall contain the Route Target (RT) Instance number range for Ethernet Virtual Private Network (EVPN) based fabrics.

Property	Type	Attributes	Notes
Lower (v1.1+)	integer	<i>read-write</i> (null)	Lower Route Target (RT) number. This property shall contain the lower Route Target (RT) number to be used as part of a range of Route Target values.
Upper (v1.1+)	integer	<i>read-write</i> (null)	Upper Route Target (RT) number. This property shall contain the upper Route Target (RT) number to be used as part of a range of Route Target values.
}			
UnderlayMulticastEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Underlay multicast status. This property shall indicate whether multicast is enabled on the Ethernet fabric underlay.
UnknownUnicastSuppressionEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Suppression of unknown unicast packets. This property shall indicate whether unknown unicast packets should be suppressed.
VLANIdentifierAddressRange (v1.1+) {	object		Virtual LAN (VLAN) tag related address range applicable to this Ethernet fabric or for end-host subnets. This property shall contain the Virtual LAN (VLAN) tag related address range applicable to this Ethernet fabric or for endpoint host subnets. VLAN tags can be used for the purpose of identifying packets belonging to different networks.
Lower (v1.1+)	integer	<i>read-write</i> (null)	Virtual LAN (VLAN) tag lower value. This property shall contain the Virtual LAN (VLAN) tag lower value.
Upper (v1.1+)	integer	<i>read-write</i> (null)	Virtual LAN (VLAN) tag upper value. This property shall contain the Virtual LAN (VLAN) tag upper value.
}			
}			

Property	Type	Attributes	Notes
EBGP (v1.1+) {	object		External BGP (eBGP) related properties for this Ethernet fabric. This property shall contain the External BGP (eBGP) related properties for this Ethernet fabric.
AllowDuplicateASEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Allow duplicate Autonomous System (AS) path. This property shall indicate whether duplicate Autonomous System (AS) numbers are allowed. If <code>true</code>, routes with the same AS number as the receiving router should be allowed. If <code>false</code>, routes should be dropped if the router receives its own AS number in a Border Gateway Protocol (BGP) update.
AllowOverrideASEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Option to override an Autonomous System (AS) number with the AS number of the sending peer. This property shall indicate whether Autonomous System (AS) numbers should be overridden. If <code>true</code>, AS number should be overridden with the AS number of the sending peer. If <code>false</code>, AS number override is disabled.
AlwaysCompareMEDEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Compare Multi Exit Discriminator (MED) status. This property shall indicate whether neighbor Multi Exit Discriminator (MED) attributes should be compared.
ASNumberRange (v1.1+) {	object		Autonomous System (AS) number range. This property shall contain the range of Autonomous System (AS) numbers assigned to each Border Gateway Protocol (BGP) peer within the fabric.
Lower (v1.1+)	integer	<i>read-write</i>	Lower Autonomous System (AS) number. This property shall contain the lower Autonomous System (AS) number to be used as part of a range of ASN values.
Upper (v1.1+)	integer	<i>read-write</i>	Upper Autonomous System (AS) number. This property shall contain the upper Autonomous System (AS) number to be used as part of a range of ASN values.
}			

Property	Type	Attributes	Notes
BGPLocalPreference (v1.1+)	integer	<i>read-write</i> (null)	Local preference value. This property shall contain the local preference value. Highest local preference value is preferred for Border Gateway Protocol (BGP) best path selection.
BGPNeighbor (v1.1+) {	object		Border Gateway Protocol (BGP) neighbor related properties. This property shall contain all Border Gateway Protocol (BGP) neighbor related properties.
Address (v1.1+)	string	<i>read-write</i> (null)	Border Gateway Protocol (BGP) neighbor address. This property shall contain the IPv4 address assigned to a Border Gateway Protocol (BGP) neighbor. Pattern: <code>^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$</code>
AllowOwnASEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Allow own Autonomous System (AS) status. This property shall indicate whether the Autonomous System (AS) of the receiving router is permitted in a Border Gateway Protocol (BGP) update. If <code>true</code>, routes should be received and processed even if the router detects its own ASN in the AS-Path. If <code>false</code>, they should be dropped.
CIDR (v1.2+)	integer	<i>read-write</i>	The Classless Inter-Domain Routing (CIDR) value used for neighbor communication. This is the number of ones before the first zero in the subnet mask. The value of this property shall contain the RFC4271-defined Classless Inter-Domain Routing (CIDR) value.
ConnectRetrySeconds (v1.1+)	integer	<i>read-write</i> (null)	Border Gateway Protocol (BGP) retry timer in seconds. This property shall contain the Border Gateway Protocol (BGP) Retry Timer. The BGP Retry Timer allows the administrator to set the amount of time in seconds between retries to establish a connection to configured peers that have gone down.
Enabled (v1.2+)	boolean	<i>read-write</i>	An indication of whether BGP neighbor communication is enabled. The value of this property shall indicate whether BGP neighbor communication is enabled.

Property	Type	Attributes	Notes
HoldTimeSeconds (v1.1+)	integer	<i>read-write</i> (null)	Border Gateway Protocol (BGP) hold timer in seconds. This property shall contain the Border Gateway Protocol (BGP) Hold Timer agreed upon between peers.
KeepaliveIntervalSeconds (v1.1+)	integer	<i>read-write</i> (null)	Border Gateway Protocol (BGP) Keepalive timer in seconds. This property shall contain the Keepalive timer in seconds. It is used in conjunction with the Border Gateway Protocol (BGP) hold timer.
LocalAS (v1.1+)	integer	<i>read-write</i> (null)	Local Autonomous System (AS) number. This property shall contain the Autonomous System (AS) number of the local Border Gateway Protocol (BGP) peer.
LogStateChangesEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Border Gateway Protocol (BGP) neighbor log state change status. This property shall indicate whether Border Gateway Protocol (BGP) neighbor state changes are logged.
MaxPrefix (v1.1+) {	object		Border Gateway Protocol (BGP) max prefix properties. These properties are applicable to configuring Border Gateway Protocol (BGP) max prefix related properties.
MaxPrefixNumber (v1.1+)	integer	<i>read-write</i> (null)	Maximum prefix number. This property shall contain the maximum number of prefixes allowed from the neighbor.
RestartTimerSeconds (v1.1+)	integer	<i>read-write</i> (null)	Border Gateway Protocol (BGP) restart timer in seconds. This property determines how long peer routers will wait to delete stale routes before a Border Gateway Protocol (BGP) open message is received. This timer should be less than the BGP HoldTimeSeconds property.
ShutdownThresholdPercentage (v1.1+)	number (%)	<i>read-write</i> (null)	Shutdown threshold status. This property shall contain the percentage of the maximum prefix received value, 1 to 100, at which the router starts to generate a warning message.

Property	Type	Attributes	Notes
ThresholdWarningOnlyEnabled (v1.1+)	boolean	read-write (null)	Threshold warning only status. This property shall indicate what action to take if the Border Gateway Protocol (BGP) route threshold is reached. If <code>true</code>, when the Maximum-Prefix limit is exceeded, a log message is generated. If <code>false</code>, when the Maximum-Prefix limit is exceeded, the peer session is terminated.
}			
MinimumAdvertisementIntervalSeconds (v1.1+)	integer	read-write (null)	Minimum Border Gateway Protocol (BGP) advertisement interval in seconds. This property shall contain the minimum time between Border Gateway Protocol (BGP) route advertisements in seconds.
PassiveModeEnabled (v1.1+)	boolean	read-write (null)	Border Gateway Protocol (BGP) passive mode status. This property shall indicate whether Border Gateway Protocol (BGP) passive mode is enabled.
PathMTUDiscoveryEnabled (v1.1+)	boolean	read-write (null)	Path MTU discovery status. This property shall indicate whether MTU discovery is permitted.
PeerAS (v1.1+)	integer	read-write (null)	Peer Autonomous System (AS) number. This property shall contain the Autonomous System (AS) number of the external Border Gateway Protocol (BGP) peer.
ReplacePeerASEnabled (v1.1+)	boolean	read-write (null)	Replace Border Gateway Protocol (BGP) peer Autonomous System (AS) status. This property shall indicate whether peer Autonomous System (AS) numbers should be replaced. If <code>true</code>, private ASNs are removed and replaced with the peer AS. If <code>false</code>, they remain unchanged.
TCPMaxSegmentSizeBytes (v1.1+)	integer	read-write (null)	TCP max segment size in bytes. This property shall contain the TCP max segment size in bytes signifying the number of bytes that shall be transported in a single packet.

Property	Type	Attributes	Notes
TreatAsWithdrawEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Border Gateway Protocol (BGP) treat as withdraw status. This property shall indicate Border Gateway Protocol (BGP) withdraw status. If <code>true</code>, the UPDATE message containing the path attribute shall be treated as though all contained routes had been withdrawn. If <code>false</code>, they should remain.
}			
BGPRoute (v1.1+) {	object		Border Gateway Protocol (BGP) route-related properties. This property shall contain Border Gateway Protocol (BGP) route-related properties.
AdvertiseInactiveRoutesEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Advertise inactive route status. This property shall indicate whether inactive routes should be advertised. If <code>true</code>, advertise the best Border Gateway Protocol (BGP) route that is inactive because of Interior Gateway Protocol (IGP) preference. If <code>false</code>, do not use as part of BGP best path selection.
DistanceExternal (v1.1+)	integer	<i>read-write</i> (null)	Route distance for external routes. This property shall modify the administrative distance for routes learned via External BGP (eBGP).
DistanceInternal (v1.1+)	integer	<i>read-write</i> (null)	Route distance for internal routes. This property shall modify the administrative distance for routes learned via Internal BGP (iBGP).
DistanceLocal (v1.1+)	integer	<i>read-write</i> (null)	Route distance for local routes. This property shall modify the administrative distance for routes configured on a local router.
ExternalCompareRouterIdEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Compare router identifier status. This property shall indicate whether external router identifiers should be compared. If <code>true</code>, prefer the route that comes from the Border Gateway Protocol (BGP) router with the lowest router identifier. If <code>false</code>, do not use as part of BGP best path selection.

Property	Type	Attributes	Notes
FlapDampingEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Route flap dampening status. This property shall indicate whether route flap dampening should be enabled.
SendDefaultRouteEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Send default route status. This property shall indicate whether the default route should be advertised. If <code>true</code>, the default route is advertised to all Border Gateway Protocol (BGP) neighbors unless specifically denied. If <code>false</code>, the default route is not advertised.
}			
BGPWeight (v1.1+)	integer	<i>read-write</i> (null)	BGP weight attribute. This property shall contain the Border Gateway Protocol (BGP) weight attribute value for external peers. A higher BGP weight value is preferred for BGP best path selection.
GracefulRestart (v1.1+) {	object		Graceful restart related properties. This property shall contain all graceful restart related properties.
GracefulRestartEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Border Gateway Protocol (BGP) graceful restart status. This property shall indicate whether to enable Border Gateway Protocol (BGP) graceful restart features.
HelperModeEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Graceful restart helper mode status. This property shall indicate what to do with stale routes. If <code>true</code>, the router continues to be forward packets to stale routes. If <code>false</code>, it does not forward packets to stale routes.
StaleRoutesTimeSeconds (v1.1+)	integer	<i>read-write</i> (null)	Stale route timer in seconds. This property shall contain the time in seconds to hold stale routes for a restarting peer.
TimeSeconds (v1.1+)	integer	<i>read-write</i> (null)	Graceful restart timer in seconds. This property shall contain the time in seconds to wait for a graceful restart capable neighbor to re-establish Border Gateway Protocol (BGP) peering.

Property	Type	Attributes	Notes
}			
MED (v1.1+)	integer	<i>read-write</i> (null)	BGP Multi Exit Discriminator (MED) value. This property shall contain the Border Gateway Protocol (BGP) Multi Exit Discriminator (MED) value. A lower MED value is preferred for BGP best path selection.
MultihopEnabled (v1.1+)	boolean	<i>read-write</i> (null)	External BGP (eBGP) multihop status. This property shall indicate whether External BGP (eBGP) multihop is enabled.
MultihopTTL (v1.1+)	integer	<i>read-write</i> (null)	External BGP (eBGP) multihop Time to Live (TTL) value. This property shall contain the External BGP (eBGP) multihop Time to Live (TTL) value.
MultiplePaths (v1.1+) {	object		Multiple path related properties. This property shall contain all multiple path related properties.
MaximumPaths (v1.1+)	integer	<i>read-write</i> (null)	Maximum paths number. This property shall contain the maximum number of paths for multiple path operation.
UseMultiplePathsEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Border Gateway Protocol (BGP) multiple paths status. This property shall indicate whether multiple paths should be advertised. If <code>true</code>, Border Gateway Protocol (BGP) advertises multiple paths for the same prefix for path diversity. If <code>false</code>, it advertises based on best path selection.
}			
SendCommunityEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Indicates whether community attributes are sent. This property shall indicate whether community attributes are sent to BGP neighbors.
}			
IPv4 (v1.1+) {	object		IPv4 and Virtual LAN (VLAN) related addressing for this Ethernet fabric. This property shall contain IPv4 and Virtual LAN (VLAN) addressing-related properties for this Ethernet fabric.

Property	Type	Attributes	Notes
AnycastGatewayIPAddress (v1.1+)	string	<i>read-write</i> (null)	The anycast gateway IPv4 address. This property shall contain the anycast gateway IPv4 address for a host subnet. Pattern: <code>^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$</code>
AnycastGatewayMACAddress (v1.1+)	string	<i>read-write</i> (null)	The anycast gateway MAC address. This property shall contain the anycast gateway MAC address for a host subnet. Pattern: <code>^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})\$</code>
DHCP (v1.1+) {	object		The Dynamic Host Configuration Protocol (DHCP) related addressing for this Ethernet fabric. This property shall contain the primary and secondary Dynamic Host Configuration Protocol (DHCP) server addressing for this Ethernet fabric.
DHCPInterfaceMTUBytes (v1.1+)	integer	<i>read-write</i> (null)	Dynamic Host Configuration Protocol (DHCP) interface Maximum Transmission Unit (MTU). This property shall contain the Maximum Transmission Unit (MTU) to use on this interface in bytes.
DHCPRelayEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Dynamic Host Configuration Protocol (DHCP) relay status. This property shall indicate whether Dynamic Host Configuration Protocol (DHCP) Relay is enabled.
DHCPServer (v1.1+) []	array (string, null)	<i>read-write</i>	The Dynamic Host Configuration Protocol (DHCP) IPv4 addresses for this Ethernet fabric. This property shall contain an array of addresses assigned to the Dynamic Host Configuration Protocol (DHCP) server for this Ethernet fabric.
}			
DistributeIntoUnderlayEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Indicates if host subnets should be distributed into the fabric underlay. This property shall indicate whether host subnets are distributed into the fabric underlay.

Property	Type	Attributes	Notes
DNSDomainName (v1.1+)	string	<i>read-write</i> (null)	The Domain Name Service (DNS) domain name for this Ethernet fabric. This property shall contain the Domain Name Service (DNS) domain name for this Ethernet fabric.
DNSServer (v1.1+) []	array (string, null)	<i>read-write</i>	The Domain Name Service (DNS) servers for this Ethernet fabric. This property shall contain an array of the Domain Name Service (DNS) servers for this Ethernet fabric. Pattern: <code>^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$</code>
EBGPAddressRange (v1.1+) {}	object		External BGP (eBGP) related addressing for this Ethernet fabric. This property shall contain the range of IPv4 addresses assigned to External BGP (eBGP) neighbors belonging to different ASes (Autonomous Systems). For more information about this property, see IPv4AddressRange in Property Details.
FabricLinkAddressRange (v1.1+) {}	object		Link-related IPv4 addressing for this Ethernet fabric typically applied to connections between spine and leaf Ethernet switches. This property shall contain link-related IPv4 addressing for this Ethernet fabric typically applied to connections between spine and leaf Ethernet switches. For more information about this property, see IPv4AddressRange in Property Details.
GatewayIPAddress (v1.1+)	string	<i>read-write</i> (null)	The gateway IPv4 address. This property shall contain the gateway IPv4 address for a host subnet. Pattern: <code>^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$</code>

Property	Type	Attributes	Notes
HostAddressRange (v1.1+) {}	object		IPv4-related host subnet addressing for physical device endpoints that connect to this Ethernet fabric. This property shall contain the IP subnet range for host addressing for physical device endpoints that connect to this Ethernet fabric. An endpoint shall be allocated an IP address from this host address range. The Ethernet fabric should provide IP unicast or multicast connectivity for host device endpoints belonging to this host address range. For more information about this property, see IPv4AddressRange in Property Details.
IBGPAddressRange (v1.1+) {}	object		Internal BGP (iBGP) related addressing for this Ethernet fabric. This property shall contain the range of IPv4 addresses assigned to Internal BGP (iBGP) neighbors belonging to the same AS (Autonomous System). For more information about this property, see IPv4AddressRange in Property Details.
LoopbackAddressRange (v1.1+) {}	object		Loopback-related IPv4 addressing for this Ethernet fabric. This property shall contain the range of loopback-related IPv4 addresses assigned to this Ethernet fabric's Ethernet switches. A loopback interface provides a stable interface to which an IP address is then assigned. This address can be configured as the source address when the networking device needs to send data for control-plane protocols such as BGP and OSPF. For more information about this property, see IPv4AddressRange in Property Details.
ManagementAddressRange (v1.1+) {}	object		Management-related addressing for this Ethernet fabric. This property shall contain the range of management IPv4 addresses assigned to manage this Ethernet fabric's Ethernet switches. For more information about this property, see IPv4AddressRange in Property Details.
NativeVLAN (v1.1+)	integer	<i>read-write (null)</i>	The untagged Virtual LAN (VLAN) ID value. This property shall contain the Virtual LAN (VLAN) ID value for untagged traffic.

Property	Type	Attributes	Notes
NTPOffsetHoursMinutes (v1.1+)	integer	<i>read-write</i> (null)	The Network Time Protocol (NTP) offset configuration. This property shall contain the Network Time Protocol (NTP) offset. The NTP offset property is used to calculate the time from UTC (Universal Time Coordinated) time in hours and minutes.
NTPServer (v1.1+) []	array (string, null)	<i>read-write</i>	The Network Time Protocol (NTP) servers for this Ethernet fabric. This property shall contain an array of the Network Time Protocol (NTP) servers for this Ethernet fabric.
NTPTimezone (v1.1+)	string	<i>read-write</i> (null)	The Network Time Protocol (NTP) time zone for this Ethernet fabric. This property shall contain the Network Time Protocol (NTP) time zone name assigned to this Ethernet fabric.
SystemMACRange (v1.2+) {	object		The MAC address range for systems in this subnet. This property shall contain the Media Access Control (MAC) address range for systems in Ethernet Virtual Private Network (EVPN) based fabrics.
Lower (v1.2+)	string	<i>read-write</i> (null)	The lower system MAC address. This property shall contain the lower system Media Access Control (MAC) address to be used as part of a range of system MAC addresses. Pattern: <code>^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})\$</code>
Upper (v1.2+)	string	<i>read-write</i> (null)	The upper system MAC address. This property shall contain the upper system Media Access Control (MAC) address to be used as part of a range of system MAC addresses. Pattern: <code>^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})\$</code>
}			
VLANIdentifierAddressRange (v1.1+) {	object		Virtual LAN (VLAN) tag related addressing for this Ethernet fabric or for end-host networks. This property shall contain Virtual LAN (VLAN) tags for the entire fabric as well as to end hosts.

Property	Type	Attributes	Notes
Lower (v1.1+)	integer	<i>read-write</i> (null)	Virtual LAN (VLAN) tag lower value. This property shall contain the Virtual LAN (VLAN) tag lower value.
Upper (v1.1+)	integer	<i>read-write</i> (null)	Virtual LAN (VLAN) tag upper value. This property shall contain the Virtual LAN (VLAN) tag upper value.
}			
}			
MultiProtocolEBGP (v1.1+) {	object		Multi Protocol eBGP (MP eBGP) related properties for this Ethernet fabric. This property shall contain the Multi Protocol eBGP (MP eBGP) related properties for this Ethernet fabric.
AllowDuplicateASEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Allow duplicate Autonomous System (AS) path. This property shall indicate whether duplicate Autonomous System (AS) numbers are allowed. If <code>true</code>, routes with the same AS number as the receiving router should be allowed. If <code>false</code>, routes should be dropped if the router receives its own AS number in a Border Gateway Protocol (BGP) update.
AllowOverrideASEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Option to override an Autonomous System (AS) number with the AS number of the sending peer. This property shall indicate whether Autonomous System (AS) numbers should be overridden. If <code>true</code>, AS number should be overridden with the AS number of the sending peer. If <code>false</code>, AS number override is disabled.
AlwaysCompareMEDEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Compare Multi Exit Discriminator (MED) status. This property shall indicate whether neighbor Multi Exit Discriminator (MED) attributes should be compared.
ASNumberRange (v1.1+) {	object		Autonomous System (AS) number range. This property shall contain the range of Autonomous System (AS) numbers assigned to each Border Gateway Protocol (BGP) peer within the fabric.

Property	Type	Attributes	Notes
Lower (v1.1+)	integer	<i>read-write</i>	Lower Autonomous System (AS) number. This property shall contain the lower Autonomous System (AS) number to be used as part of a range of ASN values.
Upper (v1.1+)	integer	<i>read-write</i>	Upper Autonomous System (AS) number. This property shall contain the upper Autonomous System (AS) number to be used as part of a range of ASN values.
}			
BGPLocalPreference (v1.1+)	integer	<i>read-write</i> (null)	Local preference value. This property shall contain the local preference value. Highest local preference value is preferred for Border Gateway Protocol (BGP) best path selection.
BGPNeighbor (v1.1+) {	object		Border Gateway Protocol (BGP) neighbor related properties. This property shall contain all Border Gateway Protocol (BGP) neighbor related properties.
Address (v1.1+)	string	<i>read-write</i> (null)	Border Gateway Protocol (BGP) neighbor address. This property shall contain the IPv4 address assigned to a Border Gateway Protocol (BGP) neighbor. Pattern: <code>^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$</code>
AllowOwnASEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Allow own Autonomous System (AS) status. This property shall indicate whether the Autonomous System (AS) of the receiving router is permitted in a Border Gateway Protocol (BGP) update. If <code>true</code>, routes should be received and processed even if the router detects its own ASN in the AS-Path. If <code>false</code>, they should be dropped.
CIDR (v1.2+)	integer	<i>read-write</i>	The Classless Inter-Domain Routing (CIDR) value used for neighbor communication. This is the number of ones before the first zero in the subnet mask. The value of this property shall contain the RFC4271-defined Classless Inter-Domain Routing (CIDR) value.

Property	Type	Attributes	Notes
ConnectRetrySeconds (v1.1+)	integer	<i>read-write</i> (null)	Border Gateway Protocol (BGP) retry timer in seconds. This property shall contain the Border Gateway Protocol (BGP) Retry Timer. The BGP Retry Timer allows the administrator to set the amount of time in seconds between retries to establish a connection to configured peers that have gone down.
Enabled (v1.2+)	boolean	<i>read-write</i>	An indication of whether BGP neighbor communication is enabled. The value of this property shall indicate whether BGP neighbor communication is enabled.
HoldTimeSeconds (v1.1+)	integer	<i>read-write</i> (null)	Border Gateway Protocol (BGP) hold timer in seconds. This property shall contain the Border Gateway Protocol (BGP) Hold Timer agreed upon between peers.
KeepaliveIntervalSeconds (v1.1+)	integer	<i>read-write</i> (null)	Border Gateway Protocol (BGP) Keepalive timer in seconds. This property shall contain the Keepalive timer in seconds. It is used in conjunction with the Border Gateway Protocol (BGP) hold timer.
LocalAS (v1.1+)	integer	<i>read-write</i> (null)	Local Autonomous System (AS) number. This property shall contain the Autonomous System (AS) number of the local Border Gateway Protocol (BGP) peer.
LogStateChangesEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Border Gateway Protocol (BGP) neighbor log state change status. This property shall indicate whether Border Gateway Protocol (BGP) neighbor state changes are logged.
MaxPrefix (v1.1+) {	object		Border Gateway Protocol (BGP) max prefix properties. These properties are applicable to configuring Border Gateway Protocol (BGP) max prefix related properties.
MaxPrefixNumber (v1.1+)	integer	<i>read-write</i> (null)	Maximum prefix number. This property shall contain the maximum number of prefixes allowed from the neighbor.

Property	Type	Attributes	Notes
RestartTimerSeconds (v1.1+)	integer	<i>read-write</i> (null)	Border Gateway Protocol (BGP) restart timer in seconds. This property determines how long peer routers will wait to delete stale routes before a Border Gateway Protocol (BGP) open message is received. This timer should be less than the BGP HoldTimeSeconds property.
ShutdownThresholdPercentage (v1.1+)	number (%)	<i>read-write</i> (null)	Shutdown threshold status. This property shall contain the percentage of the maximum prefix received value, 1 to 100, at which the router starts to generate a warning message.
ThresholdWarningOnlyEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Threshold warning only status. This property shall indicate what action to take if the Border Gateway Protocol (BGP) route threshold is reached. If <code>true</code>, when the Maximum-Prefix limit is exceeded, a log message is generated. If <code>false</code>, when the Maximum-Prefix limit is exceeded, the peer session is terminated.
}			
MinimumAdvertisementIntervalSeconds (v1.1+)	integer	<i>read-write</i> (null)	Minimum Border Gateway Protocol (BGP) advertisement interval in seconds. This property shall contain the minimum time between Border Gateway Protocol (BGP) route advertisements in seconds.
PassiveModeEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Border Gateway Protocol (BGP) passive mode status. This property shall indicate whether Border Gateway Protocol (BGP) passive mode is enabled.
PathMTUDiscoveryEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Path MTU discovery status. This property shall indicate whether MTU discovery is permitted.
PeerAS (v1.1+)	integer	<i>read-write</i> (null)	Peer Autonomous System (AS) number. This property shall contain the Autonomous System (AS) number of the external Border Gateway Protocol (BGP) peer.

Property	Type	Attributes	Notes
ReplacePeerASEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Replace Border Gateway Protocol (BGP) peer Autonomous System (AS) status. This property shall indicate whether peer Autonomous System (AS) numbers should be replaced. If <code>true</code>, private ASNs are removed and replaced with the peer AS. If <code>false</code>, they remain unchanged.
TCPMaxSegmentSizeBytes (v1.1+)	integer	<i>read-write</i> (null)	TCP max segment size in bytes. This property shall contain the TCP max segment size in bytes signifying the number of bytes that shall be transported in a single packet.
TreatAsWithdrawEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Border Gateway Protocol (BGP) treat as withdraw status. This property shall indicate Border Gateway Protocol (BGP) withdraw status. If <code>true</code>, the UPDATE message containing the path attribute shall be treated as though all contained routes had been withdrawn. If <code>false</code>, they should remain.
}			
BGPRoute (v1.1+) {	object		Border Gateway Protocol (BGP) route-related properties. This property shall contain Border Gateway Protocol (BGP) route-related properties.
AdvertiseInactiveRoutesEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Advertise inactive route status. This property shall indicate whether inactive routes should be advertised. If <code>true</code>, advertise the best Border Gateway Protocol (BGP) route that is inactive because of Interior Gateway Protocol (IGP) preference. If <code>false</code>, do not use as part of BGP best path selection.
DistanceExternal (v1.1+)	integer	<i>read-write</i> (null)	Route distance for external routes. This property shall modify the administrative distance for routes learned via External BGP (eBGP).
DistanceInternal (v1.1+)	integer	<i>read-write</i> (null)	Route distance for internal routes. This property shall modify the administrative distance for routes learned via Internal BGP (iBGP).

Property	Type	Attributes	Notes
DistanceLocal (v1.1+)	integer	<i>read-write</i> (null)	Route distance for local routes. This property shall modify the administrative distance for routes configured on a local router.
ExternalCompareRouterIdEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Compare router identifier status. This property shall indicate whether external router identifiers should be compared. If <code>true</code>, prefer the route that comes from the Border Gateway Protocol (BGP) router with the lowest router identifier. If <code>false</code>, do not use as part of BGP best path selection.
FlapDampingEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Route flap dampening status. This property shall indicate whether route flap dampening should be enabled.
SendDefaultRouteEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Send default route status. This property shall indicate whether the default route should be advertised. If <code>true</code>, the default route is advertised to all Border Gateway Protocol (BGP) neighbors unless specifically denied. If <code>false</code>, the default route is not advertised.
}			
BGPWeight (v1.1+)	integer	<i>read-write</i> (null)	BGP weight attribute. This property shall contain the Border Gateway Protocol (BGP) weight attribute value for external peers. A higher BGP weight value is preferred for BGP best path selection.
GracefulRestart (v1.1+) {	object		Graceful restart related properties. This property shall contain all graceful restart related properties.
GracefulRestartEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Border Gateway Protocol (BGP) graceful restart status. This property shall indicate whether to enable Border Gateway Protocol (BGP) graceful restart features.

Property	Type	Attributes	Notes
HelperModeEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Graceful restart helper mode status. This property shall indicate what to do with stale routes. If <code>true</code>, the router continues to be forward packets to stale routes. If <code>false</code>, it does not forward packets to stale routes.
StaleRoutesTimeSeconds (v1.1+)	integer	<i>read-write</i> (null)	Stale route timer in seconds. This property shall contain the time in seconds to hold stale routes for a restarting peer.
TimeSeconds (v1.1+)	integer	<i>read-write</i> (null)	Graceful restart timer in seconds. This property shall contain the time in seconds to wait for a graceful restart capable neighbor to re-establish Border Gateway Protocol (BGP) peering.
}			
MED (v1.1+)	integer	<i>read-write</i> (null)	BGP Multi Exit Discriminator (MED) value. This property shall contain the Border Gateway Protocol (BGP) Multi Exit Discriminator (MED) value. A lower MED value is preferred for BGP best path selection.
MultihopEnabled (v1.1+)	boolean	<i>read-write</i> (null)	External BGP (eBGP) multihop status. This property shall indicate whether External BGP (eBGP) multihop is enabled.
MultihopTTL (v1.1+)	integer	<i>read-write</i> (null)	External BGP (eBGP) multihop Time to Live (TTL) value. This property shall contain the External BGP (eBGP) multihop Time to Live (TTL) value.
MultiplePaths (v1.1+) {	object		Multiple path related properties. This property shall contain all multiple path related properties.
MaximumPaths (v1.1+)	integer	<i>read-write</i> (null)	Maximum paths number. This property shall contain the maximum number of paths for multiple path operation.

Property	Type	Attributes	Notes
UseMultiplePathsEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Border Gateway Protocol (BGP) multiple paths status. This property shall indicate whether multiple paths should be advertised. If <code>true</code>, Border Gateway Protocol (BGP) advertises multiple paths for the same prefix for path diversity. If <code>false</code>, it advertises based on best path selection.
}			
SendCommunityEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Indicates whether community attributes are sent. This property shall indicate whether community attributes are sent to BGP neighbors.
}			
MultiProtocolIBGP (v1.1+) {	object		Multi Protocol iBGP (MP iBGP) related properties for this Ethernet fabric. This property shall contain the Multi Protocol iBGP (MP iBGP) related properties for this Ethernet fabric.
ASNumberRange (v1.1+) {	object		Autonomous System (AS) number range. This property shall contain the range of Autonomous System (AS) numbers assigned to each Border Gateway Protocol (BGP) peer within the fabric.
Lower (v1.1+)	integer	<i>read-write</i>	Lower Autonomous System (AS) number. This property shall contain the lower Autonomous System (AS) number to be used as part of a range of ASN values.
Upper (v1.1+)	integer	<i>read-write</i>	Upper Autonomous System (AS) number. This property shall contain the upper Autonomous System (AS) number to be used as part of a range of ASN values.
}			
BGPNeighbor (v1.1+) {	object		Border Gateway Protocol (BGP) neighbor related properties. This property shall contain all Border Gateway Protocol (BGP) neighbor related properties.

Property	Type	Attributes	Notes
Address (v1.1+)	string	<i>read-write</i> (null)	Border Gateway Protocol (BGP) neighbor address. This property shall contain the IPv4 address assigned to a Border Gateway Protocol (BGP) neighbor. Pattern: <code>^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$</code>
AllowOwnASEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Allow own Autonomous System (AS) status. This property shall indicate whether the Autonomous System (AS) of the receiving router is permitted in a Border Gateway Protocol (BGP) update. If <code>true</code>, routes should be received and processed even if the router detects its own ASN in the AS-Path. If <code>false</code>, they should be dropped.
CIDR (v1.2+)	integer	<i>read-write</i>	The Classless Inter-Domain Routing (CIDR) value used for neighbor communication. This is the number of ones before the first zero in the subnet mask. The value of this property shall contain the RFC4271-defined Classless Inter-Domain Routing (CIDR) value.
ConnectRetrySeconds (v1.1+)	integer	<i>read-write</i> (null)	Border Gateway Protocol (BGP) retry timer in seconds. This property shall contain the Border Gateway Protocol (BGP) Retry Timer. The BGP Retry Timer allows the administrator to set the amount of time in seconds between retries to establish a connection to configured peers that have gone down.
Enabled (v1.2+)	boolean	<i>read-write</i>	An indication of whether BGP neighbor communication is enabled. The value of this property shall indicate whether BGP neighbor communication is enabled.
HoldTimeSeconds (v1.1+)	integer	<i>read-write</i> (null)	Border Gateway Protocol (BGP) hold timer in seconds. This property shall contain the Border Gateway Protocol (BGP) Hold Timer agreed upon between peers.
KeepaliveIntervalSeconds (v1.1+)	integer	<i>read-write</i> (null)	Border Gateway Protocol (BGP) Keepalive timer in seconds. This property shall contain the Keepalive timer in seconds. It is used in conjunction with the Border Gateway Protocol (BGP) hold timer.

Property	Type	Attributes	Notes
LocalAS (v1.1+)	integer	<i>read-write</i> (null)	Local Autonomous System (AS) number. This property shall contain the Autonomous System (AS) number of the local Border Gateway Protocol (BGP) peer.
LogStateChangesEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Border Gateway Protocol (BGP) neighbor log state change status. This property shall indicate whether Border Gateway Protocol (BGP) neighbor state changes are logged.
MaxPrefix (v1.1+) {	object		Border Gateway Protocol (BGP) max prefix properties. These properties are applicable to configuring Border Gateway Protocol (BGP) max prefix related properties.
MaxPrefixNumber (v1.1+)	integer	<i>read-write</i> (null)	Maximum prefix number. This property shall contain the maximum number of prefixes allowed from the neighbor.
RestartTimerSeconds (v1.1+)	integer	<i>read-write</i> (null)	Border Gateway Protocol (BGP) restart timer in seconds. This property determines how long peer routers will wait to delete stale routes before a Border Gateway Protocol (BGP) open message is received. This timer should be less than the BGP HoldTimeSeconds property.
ShutdownThresholdPercentage (v1.1+)	number (%)	<i>read-write</i> (null)	Shutdown threshold status. This property shall contain the percentage of the maximum prefix received value, 1 to 100, at which the router starts to generate a warning message.
ThresholdWarningOnlyEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Threshold warning only status. This property shall indicate what action to take if the Border Gateway Protocol (BGP) route threshold is reached. If <code>true</code>, when the Maximum-Prefix limit is exceeded, a log message is generated. If <code>false</code>, when the Maximum-Prefix limit is exceeded, the peer session is terminated.
}			

Property	Type	Attributes	Notes
MinimumAdvertisementIntervalSeconds (v1.1+)	integer	<i>read-write</i> (null)	Minimum Border Gateway Protocol (BGP) advertisement interval in seconds. This property shall contain the minimum time between Border Gateway Protocol (BGP) route advertisements in seconds.
PassiveModeEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Border Gateway Protocol (BGP) passive mode status. This property shall indicate whether Border Gateway Protocol (BGP) passive mode is enabled.
PathMTUDiscoveryEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Path MTU discovery status. This property shall indicate whether MTU discovery is permitted.
PeerAS (v1.1+)	integer	<i>read-write</i> (null)	Peer Autonomous System (AS) number. This property shall contain the Autonomous System (AS) number of the external Border Gateway Protocol (BGP) peer.
ReplacePeerASEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Replace Border Gateway Protocol (BGP) peer Autonomous System (AS) status. This property shall indicate whether peer Autonomous System (AS) numbers should be replaced. If <code>true</code>, private ASNs are removed and replaced with the peer AS. If <code>false</code>, they remain unchanged.
TCPMaxSegmentSizeBytes (v1.1+)	integer	<i>read-write</i> (null)	TCP max segment size in bytes. This property shall contain the TCP max segment size in bytes signifying the number of bytes that shall be transported in a single packet.
TreatAsWithdrawEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Border Gateway Protocol (BGP) treat as withdraw status. This property shall indicate Border Gateway Protocol (BGP) withdraw status. If <code>true</code>, the UPDATE message containing the path attribute shall be treated as though all contained routes had been withdrawn. If <code>false</code>, they should remain.
}			

Property	Type	Attributes	Notes
BGPRoute (v1.1+) {	object		Border Gateway Protocol (BGP) route-related properties. This property shall contain Border Gateway Protocol (BGP) route-related properties.
AdvertiseInactiveRoutesEnabled (v1.1+)	boolean	read-write (null)	Advertise inactive route status. This property shall indicate whether inactive routes should be advertised. If <code>true</code>, advertise the best Border Gateway Protocol (BGP) route that is inactive because of Interior Gateway Protocol (IGP) preference. If <code>false</code>, do not use as part of BGP best path selection.
DistanceExternal (v1.1+)	integer	read-write (null)	Route distance for external routes. This property shall modify the administrative distance for routes learned via External BGP (eBGP).
DistanceInternal (v1.1+)	integer	read-write (null)	Route distance for internal routes. This property shall modify the administrative distance for routes learned via Internal BGP (iBGP).
DistanceLocal (v1.1+)	integer	read-write (null)	Route distance for local routes. This property shall modify the administrative distance for routes configured on a local router.
ExternalCompareRouterIdEnabled (v1.1+)	boolean	read-write (null)	Compare router identifier status. This property shall indicate whether external router identifiers should be compared. If <code>true</code>, prefer the route that comes from the Border Gateway Protocol (BGP) router with the lowest router identifier. If <code>false</code>, do not use as part of BGP best path selection.
FlapDampingEnabled (v1.1+)	boolean	read-write (null)	Route flap dampening status. This property shall indicate whether route flap dampening should be enabled.
SendDefaultRouteEnabled (v1.1+)	boolean	read-write (null)	Send default route status. This property shall indicate whether the default route should be advertised. If <code>true</code>, the default route is advertised to all Border Gateway Protocol (BGP) neighbors unless specifically denied. If <code>false</code>, the default route is not advertised.

Property	Type	Attributes	Notes
}			
GracefulRestart (v1.1+) {	object		Graceful restart related properties. This property shall contain all graceful restart related properties.
GracefulRestartEnabled (v1.1+)	boolean	read-write (null)	Border Gateway Protocol (BGP) graceful restart status. This property shall indicate whether to enable Border Gateway Protocol (BGP) graceful restart features.
HelperModeEnabled (v1.1+)	boolean	read-write (null)	Graceful restart helper mode status. This property shall indicate what to do with stale routes. If <code>true</code>, the router continues to be forward packets to stale routes. If <code>false</code>, it does not forward packets to stale routes.
StaleRoutesTimeSeconds (v1.1+)	integer	read-write (null)	Stale route timer in seconds. This property shall contain the time in seconds to hold stale routes for a restarting peer.
TimeSeconds (v1.1+)	integer	read-write (null)	Graceful restart timer in seconds. This property shall contain the time in seconds to wait for a graceful restart capable neighbor to re-establish Border Gateway Protocol (BGP) peering.
}			
MultiplePaths (v1.1+) {	object		Multiple path related properties. This property shall contain all multiple path related properties.
MaximumPaths (v1.1+)	integer	read-write (null)	Maximum paths number. This property shall contain the maximum number of paths for multiple path operation.
UseMultiplePathsEnabled (v1.1+)	boolean	read-write (null)	Border Gateway Protocol (BGP) multiple paths status. This property shall indicate whether multiple paths should be advertised. If <code>true</code>, Border Gateway Protocol (BGP) advertises multiple paths for the same prefix for path diversity. If <code>false</code>, it advertises based on best path selection.

Property	Type	Attributes	Notes
}			
SendCommunityEnabled (v1.1+)	boolean	<i>read-write</i> (null)	Indicates whether community attributes are sent. This property shall indicate whether community attributes are sent to BGP neighbors.
}			
}			
GenZ {	object		The Gen-Z related properties for this address pool. This property shall contain the Gen-Z related properties for this address pool.
AccessKey	string	<i>read-write</i> (null)	The Access Key required for this address pool. This property shall contain the Gen-Z Core Specification-defined Access Key required for this address pool. Pattern: <code>^0[xX]([a-fA-F] [0-9]){2}\$</code>
MaxCID	integer	<i>read-write</i> (null)	The maximum value for the Component Identifier (CID). This property shall contain the maximum value for the Gen-Z Core Specification-defined Component Identifier (CID).
MaxSID	integer	<i>read-write</i> (null)	The maximum value for the Subnet Identifier (SID). This property shall contain the maximum value for the Gen-Z Core Specification-defined Subnet Identifier (SID).
MinCID	integer	<i>read-write</i> (null)	The minimum value for the Component Identifier (CID). This property shall contain the minimum value for the Gen-Z Core Specification-defined Component Identifier (CID).
MinSID	integer	<i>read-write</i> (null)	The minimum value for the Subnet Identifier (SID). This property shall contain the minimum value for the Gen-Z Core Specification-defined Subnet Identifier (SID).
}			

Property	Type	Attributes	Notes
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Endpoints [{	array		An array of links to the endpoints that this address pool contains. This property shall contain an array of links to resources of type <code>Endpoint</code> that this address pool contains.
@odata.id	string	<i>read-write</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}]			
Oem {	object		See the OEM object definition in the Using this guide clause.
Zones [{	array		An array of links to the zones that this address pool contains. This property shall contain an array of links to resources of type <code>Zone</code> that this address pool contains.
@odata.id	string	<i>read-write</i>	Link to a Zone resource. See the Links section and the <i>Zone</i> schema for details.
}]			
}			
Status {	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

6.4.4 Property details

6.4.4.1 IPv4AddressRange

IPv4-related address range for an Ethernet fabric.

Lower (v1.1+)	string	read-write (null)	Lower IPv4 network address. This property shall contain the lower IPv4 network address to be used as part of a subnet. Pattern: <code>^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$</code>
Upper (v1.1+)	string	read-write (null)	Upper IPv4 network address. This property shall contain the upper IPv4 network address to be used as part of a host subnet. Pattern: <code>^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$</code>

6.4.5 Example response

```

{
  "@odata.type": "#AddressPool.v1_3_0.AddressPool",
  "Id": "AP1",
  "Name": "Address Pool 1",
  "Description": "Address Pool 1",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "GenZ": {
    "MinCID": 1,
    "MaxCID": 4096,
    "MinSID": 100,
    "MaxSID": 8192,
    "AccessKey": "0x1A"
  },
  "Links": {
    "Endpoints": [
      {
        "@odata.id": "/redfish/v1/Fabrics/GenZ/Endpoints/1"
      }
    ]
  },
  "@odata.id": "/redfish/v1/Fabrics/GenZ/AddressPools/AP1"
}

```

6.5 Aggregate 1.0.3

Version	v1.0
Release	2020.2

6.5.1 Description

The `Aggregate` schema describes a grouping method for an aggregation service. Aggregates are formal groups of resources that are more persistent than ad hoc groupings.

- This resource shall represent an aggregation service grouping method for a Redfish implementation.

6.5.2 URIs

/redfish/v1/AggregationService/Aggregates/{AggregateId}

6.5.3 Properties

Property	Type	Attributes	Notes
Elements [{	array	<i>required</i>	The elements of this aggregate. • This property shall contain an array of links to the elements of this aggregate.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
ElementsCount	integer	<i>read-only</i> (null)	The number of entries in the <code>Elements</code> array. • This property shall contain the number of entries in the <code>Elements</code> array.

6.5.4 Actions

6.5.4.1 AddElements

Description

This action is used to add one or more resources to the aggregate.

- This action shall add one or more resources to the aggregate, with the result that the resources are included in the `Elements` array of the aggregate.

Action URI

{Base URI of target resource}/Actions/Aggregate.AddElements

Action parameters

Parameter Name	Type	Attributes	Notes
Elements [{	array	<i>required</i>	An array of resource links to add to the <code>Elements</code> array. This parameter shall contain an array of links to the specified resources to add to the aggregate's <code>Elements</code> array.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			

Request Example

```
{
  "Elements": [
    {
      "@odata.id": "/redfish/v1/Systems/cluster-node7"
    },
    {
      "@odata.id": "node8.intranet.contoso.com/redfish/v1/Systems/1"
    }
  ]
}
```

6.5.4.2 RemoveElements

Description

This action is used to remove one or more resources from the aggregate.

- This action shall remove one or more resources from the aggregate, with the result that the resources are removed from the `Elements` array of the aggregate.

Action URI

{Base URI of target resource}/Actions/Aggregate.RemoveElements

Action parameters

Parameter Name	Type	Attributes	Notes
Elements [{	array	required	An array of resource links to remove from the Elements array. This parameter shall contain an array of links to the specified resources to remove from the aggregate's Elements array.
@odata.id	string (URI)	read-only	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			

Request Example

```
{
  "Elements": [
    {
      "@odata.id": "node8.intranet.contoso.com/redfish/v1/Systems/1"
    }
  ]
}
```

6.5.4.3 Reset

Description

This action is used to reset a collection of resources. For example, this could be an aggregate or a list of computer systems.

- This action shall perform a reset of a collection of resources.

Action URI

{Base URI of target resource}/Actions/Aggregate.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
BatchSize	integer	<i>optional</i>	The number of elements in each batch being reset. This parameter shall contain the number of elements in each batch simultaneously being issued a reset.
DelayBetweenBatchesInSeconds	integer (seconds)	<i>optional</i>	The delay of the batches of elements being reset in seconds. This parameter shall contain the delay of the batches of elements being reset in seconds.
ResetType	string (enum)	<i>optional</i>	The type of reset. This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset. <i>For the possible property values, see ResetType in Property details.</i>

Request Example

```
{
  "ResetType": "ForceRestart",
  "BatchSize": 5,
  "DelayBetweenBatchesInSeconds": 30
}
```

6.5.4.4 SetDefaultBootOrder

Description

This action is used to restore the boot order to the default state for the computer systems that are members of this aggregate.

- This action shall restore the boot order to the default state for the computer systems that are members of this aggregate.

Action URI

{Base URI of target resource}/Actions/Aggregate.SetDefaultBootOrder

Action parameters

This action takes no parameters.

6.5.5 Property details

6.5.5.1 ResetType

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.
ForceOn	Turn on the unit immediately. This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property shall contain the value <code>on</code>.
ForceRestart	Shut down immediately and non-gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>on</code>.
FullPowerCycle	Full power cycle the unit. Behaves like removing utility lines, followed by restoring utility lines to the resource. This value shall indicate the resource will perform a full power cycle as if utility lines to the resource are removed and restored. This is different from <code>PowerCycle</code> in that it's as close to a true power cycle as possible. For example, removing AC power cables from an enclosure and then restoring the AC power cables. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>on</code>. If a service supports this value but there are no other distinct power cycle flows, the service shall support <code>PowerCycle</code> as an alias to <code>FullPowerCycle</code>. This type of reset may cause the manager providing the Redfish service to power cycle. If the manager providing the Redfish service is affected by this type of reset, the service shall send the action response before resetting to prevent client timeouts.

string	Description
GracefulRestart	Shut down gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
GracefulShutdown	Shut down gracefully and power off. This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a paused state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Paused</code>.
PowerCycle	Power cycle the unit. Behaves like a power removal, followed by a power restore to the resource. This value shall indicate the resource will perform a power cycle. This is different from <code>FullPowerCycle</code> in that it typically performs localized power sequencing of the resource while external power is still present. For example, turning DC voltage regulators off and then turning DC voltage regulators back on. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
PushPowerButton	Simulate the pressing of the physical power button on this unit. This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.

string	Description
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.

6.5.6 Example response

```
{
  "@odata.type": "#Aggregate.v1_0_3.Aggregate",
  "Id": "Aggregate1",
  "Name": "Aggregate One",
  "ElementsCount": 2,
  "Elements": [
    {
      "@odata.id": "/redfish/v1/Systems/cluster-node3"
    },
    {
      "@odata.id": "/redfish/v1/Systems/cluster-node4"
    }
  ],
  "Actions": {
    "#Aggregate.Reset": {
      "target": "/redfish/v1/AggregationService/Aggregates/Aggregate1/Actions/Aggregate.Reset",
      "@Redfish.ActionInfo": "/redfish/v1/AggregationService/Aggregates/Aggregate1/ResetActionInfo"
    },
    "#Aggregate.SetDefaultBootOrder": {
      "target": "/redfish/v1/AggregationService/Aggregates/Aggregate1/Actions/Aggregate.SetDefaultBootOrder",
      "@Redfish.ActionInfo": "/redfish/v1/AggregationService/Aggregates/Aggregate1/SetDefaultBootOrderActionInfo"
    },
    "#Aggregate.AddElements": {
      "target": "/redfish/v1/AggregationService/Aggregates/Aggregate1/Actions/Aggregate.AddElements",
      "@Redfish.ActionInfo": "/redfish/v1/AggregationService/Aggregates/Aggregate1/AddElementsActionInfo"
    },
    "#Aggregate.RemoveElements": {
      "target": "/redfish/v1/AggregationService/Aggregates/Aggregate1/Actions/Aggregate.RemoveElements",

```

```
        "@Redfish.ActionInfo": "/redfish/v1/AggregationService/Aggregates/Aggregate1/  
        RemoveElementsActionInfo"  
      },  
      "@odata.id": "/redfish/v1/AggregationService/Aggregates/Aggregate1"  
    }  
  }  
}
```

6.6 AggregationService 1.0.3

Version	v1.0
Release	2020.2

6.6.1 Description

The `AggregationService` schema contains properties for managing aggregation operations, either on ad hoc combinations of resources or on defined sets of resources called aggregates. Access points define the properties needed to access the entity being aggregated and connection methods describe the protocol or other semantics of the connection.

- This resource shall represent an aggregation service for a Redfish implementation.

6.6.2 URIs

/redfish/v1/AggregationService

6.6.3 Properties

Property	Type	Attributes	Notes
Aggregates {	object		The link to the collection of aggregates associated with this service. • This property shall contain a link to a resource collection of type <code>AggregateCollection</code>. Contains a link to a resource.
@odata.id	string	read-only	Link to Collection of <i>Aggregate</i> . See the Aggregate schema for details.
}			

Property	Type	Attributes	Notes
AggregationSources {	object		The link to the collection of aggregation sources associated with this service. This property shall contain a link to a resource collection of type <code>AggregationSourceCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>AggregationSource</i> . See the <i>AggregationSource</i> schema for details.
}			
ConnectionMethods {	object		The link to the collection of connection methods associated with this service. This property shall contain a link to a resource collection of type <code>ConnectionMethodCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>ConnectionMethod</i> . See the <i>ConnectionMethod</i> schema for details.
}			
ServiceEnabled	boolean	<i>read-write</i> (<i>null</i>)	An indication of whether the aggregation service is enabled. This property shall indicate whether the aggregation service is enabled.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <i>Status</i>.

6.6.4 Actions

6.6.4.1 Reset

Description

This action is used to reset a set of resources. For example this could be a list of computer systems.

- This action shall perform a reset of a set of resources.

Action URI

{Base URI of target resource}/Actions/AggregationService.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
BatchSize	integer	<i>optional</i>	The number of elements in each batch being reset. This parameter shall contain the number of elements in each batch simultaneously being issued a reset.
DelayBetweenBatchesInSeconds	integer (seconds)	<i>optional</i>	The delay of the batches of elements being reset in seconds. This parameter shall contain the delay of the batches of elements being reset in seconds.
ResetType	string (enum)	<i>optional</i>	The type of reset. This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset. <i>For the possible property values, see ResetType in Property details.</i>
TargetURIs [{	array	<i>required</i>	An array of links to the resources being reset. This parameter shall contain an array of links to the resources being reset.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			

Request Example

```
{
  "ResetType": "ForceRestart",
  "BatchSize": 1,
  "DelayBetweenBatchesInSeconds": 30,
  "TargetURIs": [
    {
      "@odata.id": "/redfish/v1/Systems/cluster-node3"
    },
    {
      "@odata.id": "/redfish/v1/Systems/cluster-node4"
    },
    {
      "@odata.id": "node7.intranet.contoso.com/redfish/v1/Systems/1"
    }
  ]
}
```

```
}

```

6.6.4.2 SetDefaultBootOrder

Description

This action is used to restore the boot order to the default state for the specified computer systems.

- This action shall restore the boot order to the default state for the specified computer systems.

Action URI

{Base URI of target resource}/Actions/AggregationService.SetDefaultBootOrder

Action parameters

Parameter Name	Type	Attributes	Notes
Systems [{	array	required	The computer systems to restore. • This parameter shall contain an array of links to resources of type <code>ComputerSystem</code>.
@odata.id	string	read-only	Link to a ComputerSystem resource. See the Links section and the <i>ComputerSystem</i> schema for details.
}]			

Request Example

```
{
  "Systems": [
    {
      "@odata.id": "/redfish/v1/Systems/cluster-node3"
    },
    {
      "@odata.id": "/redfish/v1/Systems/cluster-node4"
    },
    {
      "@odata.id": "node7.intranet.contoso.com/redfish/v1/Systems/1"
    }
  ]
}
```

6.6.5 Property details

6.6.5.1 ResetType

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property shall contain the value <code>on</code>.
ForceRestart	Shut down immediately and non-gracefully and restart the unit. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>on</code>.
FullPowerCycle	Full power cycle the unit. Behaves like removing utility lines, followed by restoring utility lines to the resource. • This value shall indicate the resource will perform a full power cycle as if utility lines to the resource are removed and restored. This is different from <code>PowerCycle</code> in that it's as close to a true power cycle as possible. For example, removing AC power cables from an enclosure and then restoring the AC power cables. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>on</code>. If a service supports this value but there are no other distinct power cycle flows, the service shall support <code>PowerCycle</code> as an alias to <code>FullPowerCycle</code>. This type of reset may cause the manager providing the Redfish service to power cycle. If the manager providing the Redfish service is affected by this type of reset, the service shall send the action response before resetting to prevent client timeouts.

string	Description
GracefulRestart	Shut down gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
GracefulShutdown	Shut down gracefully and power off. This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a paused state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Paused</code>.
PowerCycle	Power cycle the unit. Behaves like a power removal, followed by a power restore to the resource. This value shall indicate the resource will perform a power cycle. This is different from <code>FullPowerCycle</code> in that it typically performs localized power sequencing of the resource while external power is still present. For example, turning DC voltage regulators off and then turning DC voltage regulators back on. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
PushPowerButton	Simulate the pressing of the physical power button on this unit. This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.

string	Description
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.

6.6.6 Example response

```
{
  "@odata.type": "#AggregationService.v1_0_3.AggregationService",
  "Id": "AggregationService",
  "Description": "Aggregation Service",
  "Name": "Aggregation Service",
  "ServiceEnabled": true,
  "Status": {
    "Health": "OK",
    "HealthRollup": "OK",
    "State": "Enabled"
  },
  "Aggregates": {
    "@odata.id": "/redfish/v1/AggregationService/Aggregates"
  },
  "AggregationSources": {
    "@odata.id": "/redfish/v1/AggregationService/AggregationSources"
  },
  "ConnectionMethods": {
    "@odata.id": "/redfish/v1/AggregationService/ConnectionMethods"
  },
  "Actions": {
    "#AggregationService.Reset": {
      "target": "/redfish/v1/AggregationService/Actions/AggregationService.Reset",
      "@Redfish.ActionInfo": "/redfish/v1/AggregationService/ResetActionInfo"
    },
    "#AggregationService.SetDefaultBootOrder": {
      "target": "/redfish/v1/AggregationService/Actions/AggregationService.SetDefaultBootOrder",
      "@Redfish.ActionInfo": "/redfish/v1/AggregationService/SetDefaultBootOrderActionInfo"
    }
  },
  "@odata.id": "/redfish/v1/AggregationService/"
}
```

6.7 AggregationSource 1.5.0

Version	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2025.2	2023.3	2022.3	2021.3	2020.4	2020.2

6.7.1 Description

The `AggregationSource` schema is used to represent the source of information for a subset of the resources provided by a Redfish service. It can be thought of as a provider of information. As such, most such interfaces have requirements to support the gathering of information like address and account used to access the information.

- This resource shall represent an aggregation source for a Redfish implementation.

6.7.2 URIs

/redfish/v1/AggregationService/AggregationSources/{*AggregationSourceId*}

6.7.3 Properties

Property	Type	Attributes	Notes
AggregationType (v1.2+)	string (enum)	<i>read-write</i>	The type of aggregation used towards the aggregation source. This property shall contain the type of aggregation used for the connection method towards the aggregation source. If this property is not present, the value shall be assumed to be <code>Full</code>. <i>For the possible property values, see <code>AggregationType</code> in Property details.</i>
HostName	string (URI)	<i>read-write</i> (null)	The URI of the system to be accessed. This property shall contain the URI of the system to be aggregated. This property shall not be required when the aggregation source is configured to only receive notifications from the aggregated system and the <code>AggregationType</code> property contains the value <code>NotificationsOnly</code>.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.

Property	Type	Attributes	Notes
ConnectionMethod {	object		A link to the connection method used to contact this aggregation source. This property shall a link to a resource of type <code>ConnectionMethod</code> that represents the method used to connect to the aggregation source. See the <i>ConnectionMethod</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>ConnectionMethod</i> resource. See the Links section and the <i>ConnectionMethod</i> schema for details.
}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
ResourcesAccessed [{	array		An array links to the resources added to the service through this aggregation source. It is recommended that this be the minimal number of properties needed to find the resources that would be lost when the aggregation source is deleted. This property shall contain an array of links to the resources added to the service through the aggregation source. It is recommended that this be the minimal number of properties needed to find the resources that would be lost when the aggregation source is deleted. For example, this could be the pointers to the members of the root-level collections or the manager of a BMC.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
}			
ModbusTargetServerId (v1.5+)	integer	<i>read-write</i> (null)	The Modbus identifier of this aggregation source. This property shall contain the Modbus identifier of this aggregation source.
Password	string	<i>read-write</i> (null)	The password for accessing the aggregation source. The value is <code>null</code> in responses. This property shall contain a password for accessing the aggregation source. The value shall be <code>null</code> in responses.

Property	Type	Attributes	Notes
Port (v1.5+)	integer	<i>read-write</i> (null)	The network port. This property shall contain the network port used to connect to this aggregation source.
SNMP (v1.1+) {	object		SNMP settings of the aggregation source. This property shall contain the SNMP settings of the aggregation source.
AuthenticationKey (v1.1+)	string	<i>read-write</i> (null)	The secret authentication key for SNMPv3. This property shall contain the key for SNMPv3 authentication. The value shall be <code>null</code> in responses. This property accepts a passphrase or a hex-encoded key. If the string starts with <code>Passphrase: </code>, the remainder of the string shall be the passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. If the string starts with <code>Hex: </code>, then the remainder of the string shall be the key encoded in hexadecimal notation. If the string starts with neither, the full string shall be a passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. Pattern: <code>(^[~~]+\$) (^Passphrase:[~~]+\$) (^Hex:[0-9A-Fa-f]{24,96}\$) (^*+\$)</code>
AuthenticationKeySet (v1.1+)	boolean	<i>read-only</i>	Indicates if the <code>AuthenticationKey</code> property is set. This property shall contain <code>true</code> if a valid value was provided for the <code>AuthenticationKey</code> property. Otherwise, the property shall contain <code>false</code>.
AuthenticationProtocol (v1.1+)	string (enum)	<i>read-write</i> (null)	The authentication protocol for SNMPv3. This property shall contain the SNMPv3 authentication protocol. <i>For the possible property values, see AuthenticationProtocol in Property details.</i>

Property	Type	Attributes	Notes
EncryptionKey (v1.1+)	string	<i>read-write</i> (null)	The secret authentication key for SNMPv3. This property shall contain the key for SNMPv3 encryption. The value shall be <code>null</code> in responses. This property accepts a passphrase or a hex-encoded key. If the string starts with <code>Passphrase:</code>, the remainder of the string shall be the passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. If the string starts with <code>Hex:</code>, then the remainder of the string shall be the key encoded in hexadecimal notation. If the string starts with neither, the full string shall be a passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. Pattern: <code>(^[-~]+\$) (^Passphrase:[-~]+\$) (^Hex:[0-9A-Fa-f]{16,64}\$) (^*+\$)</code>
EncryptionKeySet (v1.1+)	boolean	<i>read-only</i>	Indicates if the <code>EncryptionKey</code> property is set. This property shall contain <code>true</code> if a valid value was provided for the <code>EncryptionKey</code> property. Otherwise, the property shall contain <code>false</code>.
EncryptionProtocol (v1.1+)	string (enum)	<i>read-write</i> (null)	The encryption protocol for SNMPv3. This property shall contain the SNMPv3 encryption protocol. <i>For the possible property values, see EncryptionProtocol in Property details.</i>
TrapCommunity (v1.2+)	string	<i>read-write</i> (null)	The SNMP trap community string. This property shall contain the SNMP trap community string. The value shall be <code>null</code> in responses. Services may provide a common trap community if not specified by the client when creating the aggregation source.
}			
SSHSettings (v1.3+) {	object		Settings for an aggregation source using SSH as part of the associated connection method. This property shall contain the settings for an aggregation source using SSH as part of the associated connection method.

Property	Type	Attributes	Notes
PresentedPublicKey (v1.3+) {	object		A link to the last public host key presented by the remote service corresponding to the aggregation source. A client that trusts this public host key can add the public host key to the TrustedPublicKeyKeys collection to allow SSH communication with the aggregation source. This property shall contain a link to a resource of type <code>Key</code> that represents the last public host key presented by the remote service corresponding to the aggregation source. This property shall not be present if a public host key has not yet been presented by the remote service. See the <code>Key</code> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>Key</code> resource. See the Links section and the <code>Key</code> schema for details.
}			
PresentedPublicKeyTimestamp (v1.3+)	string (date-time)	<i>read-only</i> (null)	The date and time when the key referenced by the <code>PresentedPublicKey</code> property was last updated. This property shall contain the date and time when the key referenced by the <code>PresentedPublicKey</code> property was last updated.
PublicIdentityKey (v1.3+) {	object		A link to the public key that is used with the aggregation source when the authentication method is configured to use a public key. The <code>GenerateSSHIdentityKeyPair</code> and <code>RemoveSSHIdentityKeyPair</code> are used to update the key for this aggregation source. This property shall contain a link to a resource of type <code>Key</code> that represents the public key that is used with the aggregation source when <code>UserAuthenticationMethod</code> contains <code>PublicKey</code>. This property shall not be present if a key-pair is not available. The <code>State</code> property within <code>Status</code> shall contain <code>Disabled</code> if a key-pair is not available and <code>UserAuthenticationMethod</code> contains <code>PublicKey</code>. See the <code>Key</code> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>Key</code> resource. See the Links section and the <code>Key</code> schema for details.
}			

Property	Type	Attributes	Notes
TrustedPublicHostKeys (v1.3+) {	object		A link to the trusted public host keys of the remote service corresponding to the aggregation source. These trusted public host keys are used for authentication of the remote service with SSH. An SSH public host key of the remote service can be added to this collection to allow for public key-based SSH authentication. This property shall contain a link to a resource collection of type <code>KeyCollection</code> that represents the trusted public host keys of the remote service corresponding to the aggregation source. If the associated connection method specifies SSH tunneling, the service shall compare the public host key presented by the remote service with members of this collection to determine if the remote service can be trusted. If the remote service cannot be trusted, the <code>State</code> property within <code>Status</code> shall contain <code>Disabled</code> and the service shall not connect to the remote service. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Key</i> . See the <i>Key</i> schema for details.
}			
UserAuthenticationMethod (v1.3+)	string (enum)	<i>read-write</i> (null)	The client user authentication method. This property shall contain the client user authentication method. <i>For the possible property values, see UserAuthenticationMethod in Property details.</i>
}			
Status (v1.3+) {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <i>Status</i>.
UserName	string	<i>read-write</i> (null)	The username for accessing the aggregation source. This property shall contain the username for accessing the aggregation source.

6.7.4 Actions

6.7.4.1 GenerateSSHIdentityKeyPair (v1.3+)

Description

This action generates a new SSH identity key-pair to be used with this aggregation source. The generated public key is stored in the `Key` resource referenced by the `PublicIdentityKey` property in `SSHSettings`. Any existing key-pair is deleted and replaced by the new key-pair.

- This action shall generate a new SSH identity key-pair to be used with this aggregation source. The service shall store the generated public key in the `Key` resource referenced by the `PublicIdentityKey` property in `SSHSettings`. If the aggregation source already has an associated SSH identity key-pair, the service shall delete the key-pair and replace it with the new key-pair.

Action URI

{Base URI of target resource}/Actions/AggregationSource.GenerateSSHIdentityKeyPair

Action parameters

Parameter Name	Type	Attributes	Notes
Curve	string (enum)	<i>optional</i>	The curve to use with the SSH key if the <code>KeyType</code> parameter contains <code>ECDSA</code>. This parameter shall contain the curve to use with the SSH key. This parameter shall be required if the <code>KeyType</code> parameter contains <code>ECDSA</code> and shall be rejected for other values. <i>For the possible property values, see Curve in Property details.</i>
KeyLength	integer	<i>optional</i>	The length of the SSH key, in bits, if the <code>KeyType</code> parameter contains <code>RSA</code>. This parameter shall contain the length of the SSH key, in bits. This parameter shall be required if the <code>KeyType</code> parameter contains <code>RSA</code> and shall be rejected for other values.
KeyType	string (enum)	<i>required</i>	The type of SSH key. This parameter shall contain the type of SSH key. <i>For the possible property values, see KeyType in Property details.</i>

Request Example

```
{
  "KeyType": "Ed25519"
}
```

6.7.4.2 RemoveSSHIdentityKeyPair (v1.3+)

Description

This action removes the SSH identity key-pair used with this aggregation source.

- This action shall remove the private SSH identity key-pair used with this aggregation source.

Action URI

{Base URI of target resource}/Actions/AggregationSource.RemoveSSHIdentityKeyPair

Action parameters

This action takes no parameters.

6.7.5 Property details

6.7.5.1 AggregationType

The type of aggregation used towards the aggregation source.

- This property shall contain the type of aggregation used for the connection method towards the aggregation source. If this property is not present, the value shall be assumed to be `Full`.

string	Description
Full	Full aggregation according to connection method. • This value shall indicate that the aggregator is performing full aggregation according to the connection method without any limitation such as only receiving notifications.
NotificationsOnly	Only notifications are aggregated. • This value shall indicate that the aggregator is only aggregating notifications or events from the aggregation source according to the connection method used. This value shall not be used with connection methods that do not include notifications.

6.7.5.2 AuthenticationProtocol

The authentication protocol for SNMPv3.

- This property shall contain the SNMPv3 authentication protocol.

string	Description
CommunityString	Trap community string authentication. This value shall indicate authentication using SNMP community strings and the value of <code>TrapCommunity</code>.
HMAC128_SHA224	HMAC-128-SHA-224 authentication. This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined <code>usmHMAC128SHA224AuthProtocol</code>.
HMAC192_SHA256	HMAC-192-SHA-256 authentication. This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined <code>usmHMAC192SHA256AuthProtocol</code>.
HMAC256_SHA384	HMAC-256-SHA-384 authentication. This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined <code>usmHMAC256SHA384AuthProtocol</code>.
HMAC384_SHA512	HMAC-384-SHA-512 authentication. This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined <code>usmHMAC384SHA512AuthProtocol</code>.
HMAC_MD5	HMAC-MD5-96 authentication. This value shall indicate authentication conforms to the RFC3414-defined HMAC-MD5-96 authentication protocol.
HMAC_SHA96	HMAC-SHA-96 authentication. This value shall indicate authentication conforms to the RFC3414-defined HMAC-SHA-96 authentication protocol.
None	No authentication. This value shall indicate authentication is not required.

6.7.5.3 Curve

The curve to use with the SSH key if the `KeyType` parameter contains `ECDSA`.

- This parameter shall contain the curve to use with the SSH key. This parameter shall be required if the `KeyType` parameter contains `ECDSA` and shall be rejected for other values.

string	Description
NISTB233	NIST B-233. This value shall indicate the 'nistb233' curve in RFC5656.
NISTB409	NIST B-409. This value shall indicate the 'nistb409' curve in RFC5656.
NISTK163	NIST K-163. This value shall indicate the 'nistk163' curve in RFC5656.
NISTK233	NIST K-233. This value shall indicate the 'nistk233' curve in RFC5656.
NISTK283	NIST K-283. This value shall indicate the 'nistk283' curve in RFC5656.
NISTK409	NIST K-409. This value shall indicate the 'nistk409' curve in RFC5656.
NISTP192	NIST P-192. This value shall indicate the 'nistp192' curve in RFC5656.
NISTP224	NIST P-224. This value shall indicate the 'nistp224' curve in RFC5656.
NISTP256	NIST P-256. This value shall indicate the 'nistp256' curve in RFC5656.
NISTP384	NIST P-384. This value shall indicate the 'nistp384' curve in RFC5656.
NISTP521	NIST P-521. This value shall indicate the 'nistp521' curve in RFC5656.
NISTT571	NIST T-571. This value shall indicate the 'nistt571' curve in RFC5656.

6.7.5.4 EncryptionProtocol

The encryption protocol for SNMPv3.

- This property shall contain the SNMPv3 encryption protocol.

string	Description
CBC_DES	CBC-DES encryption. • This value shall indicate encryption conforms to the RFC3414-defined CBC-DES encryption protocol.
CFB128_AES128	CFB128-AES-128 encryption. • This value shall indicate encryption conforms to the RFC3826-defined CFB128-AES-128 encryption protocol.
CFB128_AES192 (v1.4+)	CFB128-AES-192 encryption. • This value shall indicate encryption conforms to the CFB128-AES-192 encryption protocol, extended from RFC3826.
CFB128_AES256 (v1.4+)	CFB128-AES-256 encryption. • This value shall indicate encryption conforms to the CFB128-AES-256 encryption protocol, extended from RFC3826.
None	No encryption. • This value shall indicate there is no encryption.

6.7.5.5 KeyType

The type of SSH key.

- This parameter shall contain the type of SSH key.

string	Description
DSA	DSA. • This value shall indicate an RFC4253-defined 'ssh-dss' key type.
ECDSA	ECDSA. • This value shall indicate an RFC5656-defined ECDSA key type.

string	Description
Ed25519	Ed25519. This value shall indicate an RFC8709-defined 'ssh-ed25519' key type.
RSA	RSA. This value shall indicate an RFC4253-defined 'ssh-rsa' key type.

6.7.5.6 UserAuthenticationMethod

The client user authentication method.

- This property shall contain the client user authentication method.

string	Description
Password	SSH user authentication with a password. This value shall indicate SSH user authentication with a password specified by the <code>Password</code> property.
PublicKey	SSH user authentication with a public key. This value shall indicate SSH user authentication with a public key specified by the <code>PublicIdentityKey</code> property in <code>SSHSettings</code>.

6.7.6 Example response

```
{
  "@odata.type": "#AggregationSource.v1_5_0.AggregationSource",
  "Id": "AggregationSource1",
  "Name": "AggregationSource One",
  "HostName": "https://Someserver.Contoso.com/redfish/v1",
  "UserName": "root",
  "Password": null,
  "Links": {
    "ConnectionMethod": {
      "@odata.id": "/redfish/v1/AggregationService/ConnectionMethods/ConnectionMethod1"
    },
    "ResourcesAccessed": [
      {
        "@odata.id": "/redfish/v1/Managers/1"
      }
    ]
  }
}
```

```

    ],
    "@odata.id": "/redfish/v1/AggregationService/AggregationSources/AggregationSource1"
  }

```

6.8 AllowDeny 1.0.3

Version	v1.0
Release	2021.2

6.8.1 Description

The `AllowDeny` schema represents a set of allow or deny configurations.

- This resource shall represent an AllowDeny resource in a Redfish implementation.

6.8.2 URIs

```

/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/NetworkDeviceFunctions/
{NetworkDeviceFunctionId}/AllowDeny/{AllowDenyId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/NetworkInterfaces/{NetworkInterfaceId}/
NetworkDeviceFunctions/{NetworkDeviceFunctionId}/AllowDeny/{AllowDenyId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/
NetworkInterfaces/{NetworkInterfaceId}/NetworkDeviceFunctions/{NetworkDeviceFunctionId}/AllowDeny/
{AllowDenyId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/NetworkInterfaces/{NetworkInterfaceId}/NetworkDeviceFunctions/
{NetworkDeviceFunctionId}/AllowDeny/{AllowDenyId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/NetworkInterfaces/
{NetworkInterfaceId}/NetworkDeviceFunctions/{NetworkDeviceFunctionId}/AllowDeny/{AllowDenyId}
/redfish/v1/Systems/{ComputerSystemId}/NetworkInterfaces/{NetworkInterfaceId}/NetworkDeviceFunctions/
{NetworkDeviceFunctionId}/AllowDeny/{AllowDenyId}

```

6.8.3 Properties

Property	Type	Attributes	Notes
AllowType	string (enum)	<i>read-write</i> (null)	Indicates the type of permission. This property shall indicate the type of permission. <i>For the possible property values, see AllowType in Property details.</i>
DestinationPortLower	integer	<i>read-write</i> (null)	The TCP, UDP, or other destination port to which this rule begins application, inclusive. This property shall contain the TCP, UDP, or other destination port to which this rule begins application, inclusive.
DestinationPortUpper	integer	<i>read-write</i> (null)	The TCP, UDP, or other destination port to which this rule ends application, inclusive. This property shall contain the TCP, UDP, or other destination port to which this rule ends application, inclusive.
Direction	string (enum)	<i>read-write</i> (null)	Indicates the direction of the data to which this permission applies. This value shall indicate the direction of the data to which this permission applies for this network device function. <i>For the possible property values, see Direction in Property details.</i>
IANAProtocolNumber	integer	<i>read-write</i> (null)	The IANA protocol number to which this permission applies. For TCP, this is 6 . For UDP, this is 17 . This property shall contain the IANA protocol number to which this permission applies.
IPAddressLower	string	<i>read-write</i> (null)	The lower IP address to which this permission applies. This property shall contain the lower IP address to which this permission applies.
IPAddressType	string (enum)	<i>read-write</i> (null)	The type of IP address populated in the <code>IPAddressLower</code> and <code>IPAddressUpper</code> properties. This property shall contain the type of IP address populated in the <code>IPAddressLower</code> and <code>IPAddressUpper</code> properties. Services shall not permit mixing IPv6 and IPv4 addresses on the same resource. <i>For the possible property values, see IPAddressType in Property details.</i>

Property	Type	Attributes	Notes
IPAddressUpper	string	<i>read-write (null)</i>	The upper IP address to which this permission applies. This property shall contain the upper IP address to which this permission applies.
SourcePortLower	integer	<i>read-write (null)</i>	The TCP, UDP, or other source port to which this rule begins application, inclusive. This property shall contain the TCP, UDP, or other source port to which this rule begins application, inclusive.
SourcePortUpper	integer	<i>read-write (null)</i>	The TCP, UDP or other source port to which this rule ends application, inclusive. This property shall contain the TCP, UDP, or other source port to which this rule ends application, inclusive.
StatefulSession	boolean	<i>read-write (null)</i>	Indicates if this is a permission that only applies to stateful connections. This property shall indicate if this permission only applies to stateful connections, which are those using SYN, ACK, and FIN.

6.8.4 Property details

6.8.4.1 AllowType

Indicates the type of permission.

- This property shall indicate the type of permission.

string	Description
Allow	Indicates that traffic that matches the criteria in this resource is permitted.
Deny	Indicates that traffic that matches the criteria in this resource is not permitted.

6.8.4.2 Direction

Indicates the direction of the data to which this permission applies.

- This value shall indicate the direction of the data to which this permission applies for this network device function.

string	Description
Egress	Indicates that this limit is enforced on packets and bytes transmitted by the network device function.
Ingress	Indicates that this limit is enforced on packets and bytes received by the network device function.

6.8.4.3 IPAddressType

The type of IP address populated in the `IPAddressLower` and `IPAddressUpper` properties.

- This property shall contain the type of IP address populated in the `IPAddressLower` and `IPAddressUpper` properties. Services shall not permit mixing IPv6 and IPv4 addresses on the same resource.

string	Description
IPv4	IPv4 addressing is used for all IP-fields in this object.
IPv6	IPv6 addressing is used for all IP-fields in this object.

6.8.5 Example response

```
{
  "@odata.type": "#AllowDeny.v1_0_3.AllowDeny",
  "Id": "AllowDeny Rule 1",
  "Name": "Allow Rule 1",
  "Direction": "Ingress",
  "AllowType": "Allow",
  "StatefulSession": true,
  "IPAddressType": "IPv4",
  "IPAddressLower": "192.168.1.1",
  "IPAddressUpper": "192.168.1.100",
  "IANAProtocolNumber": 6,
  "SourcePortLower": 5,
  "SourcePortUpper": 65535,
  "DestinationPortLower": 5,
  "DestinationPortUpper": 65535,
  "@odata.id": "/redfish/v1/Chassis/Card1/NetworkAdapters/Slot1/NetworkDeviceFunctions/SC2KP1F0/AllowDeny/Rule1"
}
```

6.9 Application 1.0.1

Version	v1.0
Release	2023.2

6.9.1 Description

The `Application` schema represents an application or service running on a computer system.

- This resource shall represent an application or service running on a computer system.

6.9.2 URIs

`/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/OperatingSystem/Applications/{ApplicationId}`

`/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/OperatingSystem/Applications/{ApplicationId}`

`/redfish/v1/Systems/{ComputerSystemId}/OperatingSystem/Applications/{ApplicationId}`

6.9.3 Properties

Property	Type	Attributes	Notes
DestinationURIs []	array (URI) (string, null)	<i>read-only</i>	The URIs to which this application pushes data. This property shall contain an array of URIs to which this application pushes data. This is typically for applications that act as logging or metric agents that transmit data captured to remote servers.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
SoftwareImage {	object		The link to the software image for this application. This property shall contain a link to a resource of type <code>SoftwareInventory</code> that represents the software image from which this application runs. See the <i>SoftwareInventory</i> schema for details on this property.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a SoftwareInventory resource. See the Links section and the <i>SoftwareInventory</i> schema for details.
}			
}			
MetricsURIs []	array (URI) (string, null)	<i>read-only</i>	The URIs that provide access to data or other information in this application. This property shall contain an array of URIs that provide access to data or other information in this application. This is typically for applications that allow external users to perform requests to pull data from the application.
StartTime	string (date-time)	<i>read-only</i> (null)	The date and time when the application started running. This property shall indicate the date and time when the application started running.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
Vendor	string	<i>read-only</i> (null)	The vendor of this application. This property shall contain the name of the company that provides this application.
Version	string	<i>read-only</i> (null)	The version of this application. This property shall contain the version of this application.

6.9.4 Actions

6.9.4.1 Reset

Description

This action resets the application.

- This action shall reset the application.

Action URI

{Base URI of target resource}/Actions/Application.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	<i>optional</i>	The type of reset. This parameter shall contain the type of reset. <code>GracefulRestart</code> and <code>ForceRestart</code> shall indicate requests to restart the application. <code>GracefulShutdown</code> and <code>ForceOff</code> shall indicate requests to stop or disable the application. <code>On</code> and <code>ForceOn</code> shall indicate requests to start or enable the application. The service can accept a request without the parameter and shall perform a <code>GracefulRestart</code>. <i>For the possible property values, see <code>ResetType</code> in Property details.</i>

Request Example

```
{  
  "ResetType": "GracefulRestart"  
}
```

6.9.5 Property details

6.9.5.1 ResetType

The type of reset.

- This parameter shall contain the type of reset. `GracefulRestart` and `ForceRestart` shall indicate requests to restart the application. `GracefulShutdown` and `ForceOff` shall indicate requests to stop or disable the application. `On` and `ForceOn` shall indicate requests to start or enable the application. The service can accept a request without the parameter and shall perform a `GracefulRestart`.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.
ForceOn	Turn on the unit immediately. This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property shall contain the value <code>On</code>.

string	Description
ForceRestart	Shut down immediately and non-gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
FullPowerCycle	Full power cycle the unit. Behaves like removing utility lines, followed by restoring utility lines to the resource. This value shall indicate the resource will perform a full power cycle as if utility lines to the resource are removed and restored. This is different from <code>PowerCycle</code> in that it's as close to a true power cycle as possible. For example, removing AC power cables from an enclosure and then restoring the AC power cables. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>. If a service supports this value but there are no other distinct power cycle flows, the service shall support <code>PowerCycle</code> as an alias to <code>FullPowerCycle</code>. This type of reset may cause the manager providing the Redfish service to power cycle. If the manager providing the Redfish service is affected by this type of reset, the service shall send the action response before resetting to prevent client timeouts.
GracefulRestart	Shut down gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
GracefulShutdown	Shut down gracefully and power off. This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.

string	Description
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a paused state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Paused</code>.
PowerCycle	Power cycle the unit. Behaves like a power removal, followed by a power restore to the resource. This value shall indicate the resource will perform a power cycle. This is different from <code>FullPowerCycle</code> in that it typically performs localized power sequencing of the resource while external power is still present. For example, turning DC voltage regulators off and then turning DC voltage regulators back on. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
PushPowerButton	Simulate the pressing of the physical power button on this unit. This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.

6.9.6 Example response

```
{
  "@odata.type": "#Application.v1_0_1.Application",
  "Id": "Logger",
  "Name": "Logging Agent",
  "Version": "1.5.1",
  "Vendor": "Contoso",
  "StartTime": "2021-10-29T10:42:38+06:00",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  }
}
```

```
    },
    "DestinationURIs": [
      "https://listeners.contoso.org:8000/handler"
    ],
    "MetricsURIs": [
      "https://192.168.0.12:7000"
    ],
    "Actions": {
      "#Application.Reset": {
        "target": "/redfish/v1/Systems/VM1/OperatingSystem/Applications/Logger/Actions/
Application.Reset",
        "ResetType@Redfish.AllowableValues": [
          "On",
          "ForceOff",
          "GracefulShutdown",
          "GracefulRestart",
          "ForceRestart",
          "ForceOn"
        ]
      }
    },
    "@odata.id": "/redfish/v1/Systems/VM1/OperatingSystem/Applications/Logger"
  }
}
```

6.10 Assembly 1.5.1

Version	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2022.3	2022.2	2020.3	2018.2	2018.1	2017.3

6.10.1 Description

The `Assembly` schema defines an assembly. Assembly information contains details about a device, such as part number, serial number, manufacturer, and production date. It also provides access to the original data for the assembly.

- This resource shall represent an assembly for a Redfish implementation. Assembly information contains details about a device, such as part number, serial number, manufacturer, and production date. It also provides access to the original data for the assembly.

6.10.2 URIs

/redfish/v1/Chassis/{ChassisId}/Assembly

```

/redfish/v1/Chassis/{ChassisId}/Drives/{DriveId}/Assembly
/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Assembly
/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Processors/{ProcessorId}/Assembly
/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Processors/{ProcessorId}/SubProcessors/
{ProcessorId2}/Assembly
/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Processors/{ProcessorId}/SubProcessors/
{ProcessorId2}/SubProcessors/{ProcessorId3}/Assembly
/redfish/v1/Chassis/{ChassisId}/PCleDevices/{PCleDeviceId}/Assembly
/redfish/v1/Chassis/{ChassisId}/Power/PowerSupplies/{PowerSupplyId}/Assembly
/redfish/v1/Chassis/{ChassisId}/PowerSubsystem/Batteries/{BatteryId}/Assembly
/redfish/v1/Chassis/{ChassisId}/PowerSubsystem/PowerSupplies/{PowerSupplyId}/Assembly
/redfish/v1/Chassis/{ChassisId}/Thermal/Fans/{FanId}/Assembly
/redfish/v1/Chassis/{ChassisId}/ThermalSubsystem/Fans/{FanId}/Assembly
/redfish/v1/Chassis/{ChassisId}/ThermalSubsystem/Heaters/{HeaderId}/Assembly
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Drives/{DriveId}/Assembly
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Memory/{MemoryId}/Assembly
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/Assembly
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/SubProcessors/
{ProcessorId2}/Assembly
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/SubProcessors/
{ProcessorId2}/SubProcessors/{ProcessorId3}/Assembly
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/
{StorageControllerId}/Assembly
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Drives/{DriveId}/Assembly
(deprecated)
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/StorageControllers/
{StorageControllerId}/Assembly
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Memory/
{MemoryId}/Assembly
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/
{ProcessorId}/Assembly
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/
{ProcessorId}/SubProcessors/{ProcessorId2}/Assembly
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/
{ProcessorId}/SubProcessors/{ProcessorId2}/SubProcessors/{ProcessorId3}/Assembly
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/
{StorageId}/Controllers/{StorageControllerId}/Assembly
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/
{StorageId}/Drives/{DriveId}/Assembly (deprecated)
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/
{StorageId}/StorageControllers/{StorageControllerId}/Assembly
/redfish/v1/PowerEquipment/PowerShelves/{PowerDistributionId}/PowerSupplies/{PowerSupplyId}/Assembly
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Drives/{DriveId}/Assembly
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Memory/{MemoryId}/Assembly

```

/redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/Assembly
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}/Assembly
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}/
SubProcessors/{ProcessorId3}/Assembly
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Assembly
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Drives/{DriveId}/Assembly (deprecated)
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/StorageControllers/{StorageControllerId}/
Assembly
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Memory/{MemoryId}/Assembly
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/Assembly
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/
SubProcessors/{ProcessorId2}/Assembly
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/
SubProcessors/{ProcessorId2}/SubProcessors/{ProcessorId3}/Assembly
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/
{StorageControllerId}/Assembly
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Drives/{DriveId}/
Assembly (deprecated)
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/
StorageControllers/{StorageControllerId}/Assembly
/redfish/v1/Storage/{StorageId}/Controllers/{StorageControllerId}/Assembly
/redfish/v1/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Assembly
/redfish/v1/Systems/{ComputerSystemId}/Memory/{MemoryId}/Assembly
/redfish/v1/Systems/{ComputerSystemId}/PCleDevices/{PCleDeviceId}/Assembly
/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/Assembly
/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}/Assembly
/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}/SubProcessors/
{ProcessorId3}/Assembly
/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Assembly
/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Drives/{DriveId}/Assembly (deprecated)
/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Assembly
/redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/Assembly
/redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/Filters/{FilterId}/Assembly
/redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/Pumps/{PumpId}/Assembly
/redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/Pumps/{PumpId}/Filters/{FilterId}/Assembly
/redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/Reservoirs/{ReservoirId}/Assembly
/redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/Reservoirs/{ReservoirId}/Filters/{FilterId}/Assembly
/redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/Assembly
/redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/Filters/{FilterId}/Assembly
/redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/Pumps/{PumpId}/Assembly
/redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/Pumps/{PumpId}/Filters/{FilterId}/Assembly
/redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/Reservoirs/{ReservoirId}/Assembly
/redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/Reservoirs/{ReservoirId}/Filters/{FilterId}/Assembly
/redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/Assembly

```

/redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/Filters/{FilterId}/Assembly
/redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/Pumps/{PumpId}/Assembly
/redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/Pumps/{PumpId}/Filters/{FilterId}/Assembly
/redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/Reservoirs/{ReservoirId}/Assembly
/redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/Reservoirs/{ReservoirId}/Filters/{FilterId}/Assembly
/redfish/v1/ThermalEquipment/RPUs/{CoolingUnitId}/Assembly
/redfish/v1/ThermalEquipment/RPUs/{CoolingUnitId}/Filters/{FilterId}/Assembly
/redfish/v1/ThermalEquipment/RPUs/{CoolingUnitId}/Pumps/{PumpId}/Assembly
/redfish/v1/ThermalEquipment/RPUs/{CoolingUnitId}/Pumps/{PumpId}/Filters/{FilterId}/Assembly
/redfish/v1/ThermalEquipment/RPUs/{CoolingUnitId}/Reservoirs/{ReservoirId}/Assembly
/redfish/v1/ThermalEquipment/RPUs/{CoolingUnitId}/Reservoirs/{ReservoirId}/Filters/{FilterId}/Assembly

```

6.10.3 Properties

Property	Type	Attributes	Notes
Assemblies [{	array		The assembly records. These properties shall define assembly records for a Redfish implementation.
@odata.id	string (URI)	<i>read-only required</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
Actions { }	object		The available actions for this resource. This property shall contain the available actions for this resource.
BinaryDataURI	string (URI)	<i>read-only (null)</i>	The URI at which to access an image of the assembly information. This property shall contain the URI at which to access an image of the assembly information, using the Redfish protocol and authentication methods. The service provides this URI for the download of the OEM-specific binary image of the assembly data. An HTTP <code>GET</code> from this URI shall return a response payload of MIME type <code>application/octet-stream</code>. If the service supports it, an HTTP <code>PUT</code> to this URI shall replace the binary image of the assembly.
Description	string	<i>read-only (null)</i>	The description of the assembly. This property shall contain the description of the assembly.
EngineeringChangeLevel	string	<i>read-only (null)</i>	The engineering change level of the assembly. This property shall contain the engineering change level or revision of the assembly.

Property	Type	Attributes	Notes
ISOCountryCodeOfOrigin (v1.5+)	string	<i>read-only</i> (null)	The manufacturing country of origin, using the ISO 3166-1 country code. This property shall contain the ISO 3166-1-defined alpha-2 or alpha-3 country code that reflects the manufacturing country of origin. Pattern: <code>^([A-Z]{2} [A-Z]{3})\$</code>
Location (v1.3+) {}	object		The location of the assembly. This property shall contain the location information of the associated assembly. For property details, see Location.
LocationIndicatorActive (v1.3+)	boolean	<i>read-write</i> (null)	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource.
MemberId	string	<i>read-only</i> <i>required</i>	The unique identifier for the member within an array. This property shall contain the unique identifier for this member within an array. For services supporting Redfish v1.6 or higher, this value shall contain the zero-based array index.
Model	string	<i>read-only</i> (null)	The model number of the assembly. This property shall contain the name by which the manufacturer generally refers to the assembly.
Name	string	<i>read-only</i> (null)	The name of the assembly. This property shall contain the name of the assembly.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PartNumber	string	<i>read-only</i> (null)	The part number of the assembly. This property shall contain the part number of the assembly.
PhysicalContext (v1.2+)	string (enum)	<i>read-only</i>	The area or device to which the assembly data applies. This property shall contain a description of the physical context for the assembly data. For the possible property values, see <i>PhysicalContext</i> in <i>Property details</i>.

Property	Type	Attributes	Notes
Producer	string	<i>read-only</i> (null)	The producer or manufacturer of the assembly. This property shall contain the name of the company that produced or manufactured the assembly. This value shall be equal to the 'Manufacturer' field value in a PLDM FRU structure, if applicable, for the assembly.
ProductionDate	string (date-time)	<i>read-only</i> (null)	The production date of the assembly. This property shall contain the date of production or manufacture for the assembly. The time of day portion of the property shall be <code>00:00:00Z</code>, if the time of day is unknown.
Replaceable (v1.4+)	boolean	<i>read-only</i> (null)	An indication of whether the component associated this assembly can be independently replaced as allowed by the vendor's replacement policy. This property shall indicate whether the component associated this assembly can be independently replaced as allowed by the vendor's replacement policy. A value of <code>false</code> indicates the component needs to be replaced by policy as part of another component. If the <code>LocationType</code> property of this assembly contains <code>Embedded</code>, this property shall contain <code>false</code>.
SerialNumber (v1.2+)	string	<i>read-only</i> (null)	The serial number of the assembly. This property shall contain a manufacturer-allocated number that identifies the assembly.
SKU	string	<i>read-only</i> (null)	The SKU of the assembly. This property shall contain the SKU of the assembly.
SparePartNumber	string	<i>read-only</i> (null)	The spare part number of the assembly. This property shall contain the spare part number of the assembly.
Status (v1.1+) {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
Vendor	string	<i>read-only</i> (null)	The vendor of the assembly. This property shall contain the name of the company that provides the final product that includes this assembly. This value shall be equal to the 'Vendor' field value in a PLDM FRU structure, if applicable, for the assembly.

Property	Type	Attributes	Notes
Version	string	<i>read-only</i> (null)	The hardware version of the assembly. This property shall contain the hardware version of the assembly as determined by the vendor or supplier.
}}]			

6.10.4 Property details

6.10.4.1 PhysicalContext

The area or device to which the assembly data applies.

- This property shall contain a description of the physical context for the assembly data.

string	Description
Accelerator	An accelerator.
ACInput	An AC electrical input or input-related circuit.
ACMaintenanceBypassInput	An AC electrical maintenance bypass input.
ACOutput	An AC electrical output or output-related circuit. This value shall indicate an electrical output or an output-related circuit, such as a branch output, which is not terminated as a power outlet.
ACStaticBypassInput	An AC electrical static bypass input.
ACUtilityInput	An AC electrical utility input. This value shall indicate an electrical input, where the source is an electrical utility as opposed to a backup or locally-generated power source. This value is intended to differentiate multiple electrical inputs between utility, maintenance bypass, or static bypass values. For general purpose usage, the value of <code>ACInput</code> is preferred.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.

string	Description
Board	A circuit board. This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	A compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC electrical bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	An expansion bay. This value shall indicate a location that provides for the expansion of functionality of a system, such as a PCIe slot that can accept an option card.
ExpansionSubsystem	A group of expansion bays. This value shall indicate a group of expansion bays and the devices installed in those bays.
Fan	A fan.
Filter	A filter.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Manager	A management controller, such as a BMC (baseboard management controller).
Memory	A memory device.

string	Description
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	A networking bay. This value shall indicate a location that provides for the expansion of networking functionality of a system, by the addition of networking devices.
NetworkingDevice	A networking device.
PowerOutlet	An electrical outlet. This value shall indicate an electrical outlet or receptacle.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	A power supply bay. This value shall indicate a location that provides for the installation of a power supply or similar devices.
Pump	A pump.
Rectifier	A rectifier device.
Reservoir	A reservoir.
Room	The room.
StorageBay	A storage bay. This value shall indicate a location that provides for the expansion of storage functionality of a system, by the addition of storage devices.
StorageDevice	A storage device.
StorageSubsystem	A storage subsystem. This value shall indicate a storage subsystem, which may consist of one or more storage controllers, storage devices, or related components.
Switch	A switch device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. This value shall indicate a transceiver attached to a device.

string	Description
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.10.5 Example response

```
{
  "@odata.type": "#Assembly.v1_5_1.Assembly",
  "Id": "Assembly",
  "Name": "System-related Assembly data",
  "Assemblies": [
    {
      "@odata.id": "/redfish/v1/Chassis/1/Assembly#/Assemblies/0",
      "MemberId": "0",
      "Name": "System Board",
      "Description": "PCA System Board",
      "Model": "345TTT",
      "PartNumber": "923943",
      "SparePartNumber": "55-434",
      "SKU": "55ZZATR",
      "SerialNumber": "345394834",
      "Vendor": "Contoso",
      "ProductionDate": "2017-04-01T14:55:33+03:00",
      "Producer": "Contoso Supply Co.",
      "Version": "1.44B",
      "EngineeringChangeLevel": "9",
      "BinaryDataURI": "/dumpster/434",
      "Oem": {
        "Contoso": {
          "Region": "C",
          "Packaging": "Retail"
        }
      }
    },
    {
      "@odata.id": "/redfish/v1/Chassis/1/Assembly#/Assemblies/1",
      "MemberId": "1",
      "Name": "Fan Controller",
      "Description": "PCA Fan Controller",
      "Model": "F58AS",
      "PartNumber": "3434-149",
      "Vendor": "Contoso",
      "Version": "2.4.481",
    }
  ]
}
```

```
      "BinaryDataURI": "/dumpster/422",
      "Status": {
        "State": "Enabled",
        "Health": "Warning"
      }
    },
    "@odata.id": "/redfish/v1/Chassis/1/Assembly"
  }
}
```

6.11 AttributeRegistry 1.3.9

Version	v1.3	v1.2	v1.1	v1.0
Release	2018.3	2018.1	2017.1	2016.1

6.11.1 Description

The `AttributeRegistry` schema contains a set of key-value pairs that represent the structure of an attribute registry. It includes mechanisms for building user interfaces, or menus, allowing consistent navigation of the contents. The attribute registry is specific to an implementation or product. The attributes and property names are not standardized.

- This resource shall represent an attribute registry for a Redfish implementation.

6.11.2 Properties

Property	Type	Attributes	Notes
Language	string	<i>read-only required</i>	The RFC5646-conformant language code for the attribute registry. • This property shall contain an RFC5646-conformant language code.
OwningEntity	string	<i>read-only required</i>	The organization or company that publishes this attribute registry. • This property shall represent the publisher of this attribute registry.
RegistryEntries {	object		The list of all attributes and their metadata for this component. • This property shall list attributes for this component, along with their possible values, dependencies, and other metadata.

Property	Type	Attributes	Notes
Attributes [{	array		An array of attributes and their possible values in the attribute registry. This property shall contain an array containing the attributes and their possible values and other metadata in the attribute registry.
AttributeName	string	<i>read-only required</i>	The unique name for the attribute. This property shall contain the name of this attribute that is unique in this attribute registry. Pattern: <code>^[A-Za-z][A-Za-z0-9_]+\$</code>
CurrentValue	string, boolean, number	<i>read-only (null)</i>	The placeholder of the current value for the attribute. This property shall contain the placeholder of the current value for the attribute, to aid in evaluating dependencies. The evaluation results of the <code>Dependencies</code> array may affect the current attribute value.
DefaultValue	string, boolean, number	<i>read-only (null)</i>	The default value for the attribute. This property shall contain the default value for the attribute.
DisplayName	string	<i>read-only (null)</i>	The user-readable display string for the attribute in the defined language. This property shall contain the user-readable display string for the attribute in the defined language.
DisplayOrder	integer	<i>read-only (null)</i>	The ascending order, as a number, in which this attribute appears relative to other attributes. This property shall contain the ascending order, as a number, in which this attribute appears relative to other attributes.
GrayOut	boolean	<i>read-only (null)</i>	An indication of whether this attribute is grayed out. A grayed-out attribute is not active and is grayed out in user interfaces but the attribute value can be modified. This property shall indicate whether this attribute is grayed out. A grayed-out attribute is not active and is grayed out in user interfaces but the attribute value can be modified. The evaluation results of the <code>Dependencies</code> array may affect the grayed-out state of an attribute.
HelpText	string	<i>read-only (null)</i>	The help text for the attribute. This property shall contain the help text for the attribute.

Property	Type	Attributes	Notes
Hidden	boolean	<i>read-only</i> (null)	An indication of whether this attribute is hidden in user interfaces. This property shall indicate whether this attribute is hidden in user interfaces. The evaluation results of the <code>Dependencies</code> array may affect the hidden state of an attribute.
Immutable	boolean	<i>read-only</i> (null)	An indication of whether this attribute is immutable. Immutable attributes cannot be modified and typically reflect a hardware state. This property shall indicate whether this attribute is immutable. Immutable attributes shall not be modified and typically reflect a hardware state.
IsSystemUniqueProperty	boolean	<i>read-only</i> (null)	An indication of whether this attribute is unique for this system and should not be replicated. This property shall indicate whether this attribute is unique.
LowerBound	integer	<i>read-only</i> (null)	The lower limit for an integer attribute. This property shall contain a number indicating the lower limit for an integer attribute.
MaxLength	integer	<i>read-only</i> (null)	The maximum character length of a string attribute. This numeric property shall contain the maximum character length of an attribute of the String type.
MenuPath	string	<i>read-only</i> (null)	The path that describes the menu hierarchy of this attribute. This property shall contain the menu hierarchy of this attribute, in the form of a path to the menu names. It shall start with <code>./</code> to indicate the root menu, followed by the menu names with <code>/</code> characters to delineate the menu traversal. Pattern: <code>^\.\.\/([^\/]+\([^\/]+\)+)*\)?\$</code>
MinLength	integer	<i>read-only</i> (null)	The minimum character length of the string attribute. This property shall contain a number indicating the minimum character length of an attribute of the String type.
Oem (v1.3+) {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
ReadOnly	boolean	<i>read-only (null)</i>	An indication of whether this attribute is read-only. A read-only attribute cannot be modified, and should be grayed out in user interfaces. This property shall indicate whether this attribute is read-only. A read-only attribute cannot be modified, and should be grayed out in user interfaces. The evaluation results of the <code>Dependencies</code> array may affect the read-only state of an attribute.
ResetRequired (v1.2+)	boolean	<i>read-only (null)</i>	An indication of whether a system or device reset is required for this attribute value change to take effect. This property shall indicate whether a system or device reset is required for this attribute value change to take effect.
ScalarIncrement	integer	<i>read-only (null)</i>	The amount to increment or decrement an integer attribute each time a user requests a value change. The <code>0</code> value indicates a free-form numeric user-input attribute. This property shall contain a number indicating the amount to increment or decrement an integer attribute each time a user requests a value change. The <code>0</code> value indicates a free-form numeric user-input attribute.
Type	string (enum)	<i>read-only</i>	The attribute type. This property shall contain an enumeration that describes the attribute type. <i>For the possible property values, see <code>Type</code> in Property details.</i>
UefiDevicePath (v1.2+)	string	<i>read-only (null)</i>	The UEFI device path that qualifies this attribute. This property shall contain the UEFI Specification-defined UEFI device path that qualifies and locates this device for this attribute.
UefiKeywordName (v1.2+)	string	<i>read-only</i>	The UEFI keyword string for this attribute. This property shall contain the UEFI Specification-defined keyword for this attribute.
UefiNamespaceId (v1.2+)	string	<i>read-only</i>	The UEFI namespace ID for the attribute. This property shall contain the UEFI Specification-defined namespace ID for this attribute.
UpperBound	integer	<i>read-only (null)</i>	The upper limit for an integer attribute. This property shall contain a number indicating the upper limit for an integer attribute.

Property	Type	Attributes	Notes
Value [{	array		An array of the possible values for enumerated attribute values. This property shall contain an array containing the possible values of an attribute of the <code>Enumeration</code> type.
ValueDisplayName	string	<i>read-only (null)</i>	A user-readable display string of the value for the attribute in the defined language. This property shall contain a string representing the user-readable display string of the value for the attribute in the defined language.
ValueName	string	<i>read-only required</i>	The unique value name for the attribute. This property shall contain a string representing the value name for the attribute. <code>ValueName</code> is a unique string within the list of possible values in the <code>Value</code> array for an attribute.
}]			
ValueExpression	string	<i>read-only (null)</i>	A valid regular expression, according to the Perl regular expression dialect, that validates the attribute value. Applies to only string and integer attributes. This property shall contain a valid regular expression, according to the Perl regular expression dialect, that validates the attribute value. Applies to only string and integer attributes.
WarningText	string	<i>read-only (null)</i>	The warning text for the attribute. This property shall contain the warning text for the attribute.
WriteOnly	boolean	<i>read-only (null)</i>	An indication of whether this attribute is write-only. A write-only attribute reverts to its initial value after settings are applied. This property shall indicate whether this attribute is write-only. A write-only attribute reverts to its initial value after settings are applied.
}]			
Dependencies [{	array		An array of dependencies of attributes on this component. This property shall contain an array containing a list of dependencies of attributes on this component.
Dependency {	object		The dependency expression for one or more attributes in this attribute registry. This property shall contain the dependency expression for one or more attributes in this attribute registry.

Property	Type	Attributes	Notes
MapFrom [{	array		An array of the map-from conditions for a mapping dependency. This property shall contain an array containing the map-from conditions for a dependency of the <code>Map</code> type.
MapFromAttribute	string	<i>read-only</i>	The attribute to use to evaluate this dependency expression. This property shall contain the <code>AttributeName</code> for the attribute to use to evaluate this dependency expression term. Pattern: <code>^[A-Za-z][A-Za-z0-9_]+\$</code>
MapFromCondition	string (enum)	<i>read-only</i>	The condition to use to evaluate this dependency expression. This property shall contain the condition to use to evaluate this dependency expression. For example, <code>EQU</code> or <code>NEQ</code>. <i>For the possible property values, see MapFromCondition in Property details.</i>
MapFromProperty	string (enum)	<i>read-only</i>	The metadata property for the attribute that the <code>MapFromAttribute</code> property specifies to use to evaluate this dependency expression. This property shall contain the metadata property for the attribute that the <code>MapFromAttribute</code> property specifies to use to evaluate this dependency expression. For example, this value could be the <code>MapFromAttribute</code> <code>CurrentValue</code>, or <code>ReadOnly</code> state. <i>For the possible property values, see MapFromProperty in Property details.</i>
MapFromValue	string, boolean, number	<i>read-only (null)</i>	The value to use to evaluate this dependency expression. The value that the property in <code>MapFromProperty</code> in the attribute in <code>MapFromAttribute</code> to use to evaluate this dependency expression.
MapTerms	string (enum)	<i>read-only</i>	The logical term that combines two or more map-from conditions in this dependency expression. For example, <code>AND</code> for logical AND, or <code>OR</code> for logical OR. This property shall contain the logical term that combines two or more <code>MapFrom</code> conditions in this dependency expression. For example, <code>AND</code> for logical AND, or <code>OR</code> for logical OR. If multiple logical terms are present in a dependency expression, they should be evaluated in array order, meaning they are evaluated left-to-right when displayed as a logic expression. <i>For the possible property values, see MapTerms in Property details.</i>
}]			

Property	Type	Attributes	Notes
MapToAttribute	string	<i>read-only</i>	The <code>AttributeName</code> of the attribute that is affected by this dependency expression. This property shall contain the <code>AttributeName</code> of the attribute that is affected by this dependency expression. Pattern: <code>^[A-Za-z][A-Za-z0-9_]+\$</code>
MapToProperty	string (enum)	<i>read-only</i>	The metadata property for the attribute that contains the map-from condition that evaluates this dependency expression. This property shall contain the metadata property for the attribute that the <code>MapFromAttribute</code> property specifies that evaluates this dependency expression. For example, this value could be the <code>MapFromAttribute</code> <code>CurrentValue</code> or <code>ReadOnly</code> state. <i>For the possible property values, see <code>MapToProperty</code> in Property details.</i>
MapToValue	string, boolean, number	<i>read-only</i> (null)	The value that the map-to property changes to if the dependency expression evaluates to <code>true</code>. The value that the property in <code>MapToProperty</code> in the attribute specified in <code>MapToAttribute</code> changes to if the dependency expression evaluates to <code>true</code>.
}			
DependencyFor	string	<i>read-only</i>	The <code>AttributeName</code> of the attribute whose change triggers the evaluation of this dependency expression. This property shall contain the <code>AttributeName</code> of the attribute whose change triggers the evaluation of this dependency expression. Pattern: <code>^[A-Za-z][A-Za-z0-9_]+\$</code>
Type	string (enum)	<i>read-only</i>	The type of the dependency structure. This property shall contain an enumeration that describes the type for the attribute dependency. <i>For the possible property values, see <code>Type</code> in Property details.</i>
}}			
Menus [{	array		An array for the attributes menus and their hierarchy in the attribute registry. This property shall contain an array containing the attributes menus and their hierarchy in the attribute registry.

Property	Type	Attributes	Notes
DisplayName	string	<i>read-only</i> (null)	The user-readable display string of this menu in the defined language. This property shall contain the user-readable display string of the menu in the defined language.
DisplayOrder	integer	<i>read-only</i> (null)	The ascending order, as a number, in which this menu appears relative to other menus. This property shall contain the ascending order, as a number, in which this menu appears relative to other menus.
GrayOut	boolean	<i>read-only</i> (null)	An indication of whether this menu is grayed out. A grayed-only menu is not accessible in user interfaces. This property shall indicate whether this menu is grayed out. A grayed-only menu is not accessible in user interfaces.
Hidden (v1.3+)	boolean	<i>read-only</i> (null)	An indication of whether this menu is hidden in user interfaces. This property shall indicate whether this menu is hidden in user interfaces. The evaluation results of the <code>Dependencies</code> array may affect the hidden state of a menu.
MenuName	string	<i>read-only</i>	The unique name string of this menu. This property shall contain the name of this menu that is unique in this attribute registry. Pattern: <code>^[^/]+\$</code>
MenuPath	string	<i>read-only</i> (null)	The path to the menu names that describes this menu hierarchy relative to other menus. This property shall contain the menu hierarchy of this menu, in the form of a path to the menu names. It shall start with <code>./</code> to indicate the root menu, followed by the menu names with <code>/</code> characters to delineate the menu traversal. Pattern: <code>^\./\([^/]+\(\./[^/]+\)*\)?\$</code>
Oem (v1.3+) {}	object		See the OEM object definition in the Using this guide clause.
ReadOnly	boolean	<i>read-only</i> (null)	An indication of whether this menu is read-only. A read-only menu, its properties, and sub-menus are not accessible in user interfaces. This property shall indicate whether this menu is read-only. A read-only menu is not accessible in user interfaces, and all properties contained in that menu and its sub-menus are read-only.
}]			

Property	Type	Attributes	Notes
}			
RegistryVersion	string	read-only required	The attribute registry version. This property shall contain the version of this attribute registry. Pattern: <code>^\d+\.\d+\.\d+\$</code>
SupportedSystems [{	array		An array of systems that this attribute registry supports. This property shall contain an array containing a list of systems that this attribute registry supports.
FirmwareVersion (v1.1+)	string	read-only (null)	Firmware version. The version of the component firmware image to which this attribute registry applies.
ProductName	string	read-only (null)	The product name of the computer system to which this attribute registry applies. This property shall contain the product name of the computer system to which this attribute registry applies.
SystemId	string	read-only (null)	The ID of the systems to which this attribute registry applies. This property shall contain the system ID that identifies the systems to which this attribute registry applies. This can be identified by one or more properties in the computer system resource, such as Model, SubModel, or SKU. Pattern: <code>^[A-Za-z0-9]+\$</code>
}]			

6.11.3 Property details

6.11.3.1 MapFromCondition

The condition to use to evaluate this dependency expression.

- This property shall contain the condition to use to evaluate this dependency expression. For example, `EQU` or `NEQ`.

string	Description
EQU	The logical operation for 'Equal'.

string	Description
GEQ	The logical operation for 'Greater than or Equal'.
GTR	The logical operation for 'Greater than'.
LEQ	The logical operation for 'Less than or Equal'.
LSS	The logical operation for 'Less than'.
NEQ	The logical operation for 'Not Equal'.

6.11.3.2 MapFromProperty

The metadata property for the attribute that the `MapFromAttribute` property specifies to use to evaluate this dependency expression.

- This property shall contain the metadata property for the attribute that the `MapFromAttribute` property specifies to use to evaluate this dependency expression. For example, this value could be the `MapFromAttribute` `CurrentValue`, or `ReadOnly` state.

string	Description
CurrentValue	The dependency on an attribute's <code>CurrentValue</code> .
DefaultValue	The dependency on an attribute's <code>DefaultValue</code> .
GrayOut	The dependency on an attribute's <code>GrayOut</code> state.
Hidden	The dependency on an attribute's <code>Hidden</code> state.
LowerBound	The dependency on an attribute's <code>LowerBound</code> .
MaxLength	The dependency on an attribute's <code>MaxLength</code> .
MinLength	The dependency on an attribute's <code>MinLength</code> .
ReadOnly	The dependency on an attribute's <code>ReadOnly</code> state.
ScalarIncrement	The dependency on an attribute's <code>ScalarIncrement</code> .
UpperBound	The dependency on an attribute's <code>UpperBound</code> .
WriteOnly	The dependency on an attribute's <code>WriteOnly</code> state.

6.11.3.3 MapTerms

The logical term that combines two or more map-from conditions in this dependency expression. For example, `AND` for logical AND, or `OR` for logical OR.

- This property shall contain the logical term that combines two or more `MapFrom` conditions in this dependency expression. For example, `AND` for logical AND, or `OR` for logical OR. If multiple logical terms are present in a dependency expression, they should be evaluated in array order, meaning they are evaluated left-to-right when displayed as a logic expression.

string	Description
AND	The operation used for logical 'AND' of dependency terms.
OR	The operation used for logical 'OR' of dependency terms.

6.11.3.4 MapToProperty

The metadata property for the attribute that contains the map-from condition that evaluates this dependency expression.

- This property shall contain the metadata property for the attribute that the `MapFromAttribute` property specifies that evaluates this dependency expression. For example, this value could be the `MapFromAttribute` `CurrentValue` or `ReadOnly` state.

string	Description
CurrentValue	The dependency that affects an attribute's <code>CurrentValue</code> .
DefaultValue	The dependency that affects an attribute's <code>DefaultValue</code> .
DisplayName	The dependency that affects an attribute's <code>DisplayName</code> .
DisplayOrder	The dependency that affects an attribute's <code>DisplayName</code> .
GrayOut	The dependency that affects an attribute's <code>GrayOut</code> state.
HelpText	The dependency that affects an attribute's <code>HelpText</code> .
Hidden	The dependency that affects an attribute's <code>Hidden</code> state.
Immutable	The dependency that affects an attribute's <code>Immutable</code> state.
LowerBound	The dependency that affects an attribute's <code>LowerBound</code> .

string	Description
MaxLength	The dependency that affects an attribute's <code>MaxLength</code> .
MinLength	The dependency that affects an attribute's <code>MinLength</code> .
ReadOnly	The dependency that affects an attribute's <code>ReadOnly</code> state.
ScalarIncrement	The dependency that affects an attribute's <code>ScalarIncrement</code> .
UpperBound	The dependency that affects an attribute's <code>UpperBound</code> .
ValueExpression	The dependency that affects an attribute's <code>ValueExpression</code> .
WarningText	The dependency that affects an attribute's <code>WarningText</code> .
WriteOnly	The dependency that affects an attribute's <code>WriteOnly</code> state.

6.11.3.5 Type

6.11.3.5.1 In RegistryEntries: Attributes:

The attribute type.

- This property shall contain an enumeration that describes the attribute type.

string	Description
Boolean	A flag with a <code>true</code> or <code>false</code> value.
Enumeration	A list of the known possible enumerated values.
Integer	An integer value.
Password	Password values that do not appear as plain text. The value is <code>null</code> in responses.
String	Free-form text in their values.

6.11.3.5.2 In RegistryEntries: Dependencies:

The type of the dependency structure.

- This property shall contain an enumeration that describes the type for the attribute dependency.

string	Description
Map	A simple mapping dependency. If the condition evaluates to <code>true</code> , the attribute or state changes to the mapped value.

6.11.4 Example response

```
{
  "@odata.type": "#AttributeRegistry.v1_3_9.AttributeRegistry",
  "Description": "This registry defines a representation of BIOS Attribute instances",
  "Id": "BiosAttributeRegistryG9000.v1_0_0",
  "Language": "en",
  "Name": "G9000 BIOS Attribute Registry",
  "OwningEntity": "Contoso",
  "RegistryVersion": "1.0.0",
  "SupportedSystems": [
    {
      "ProductName": "Contoso Server GLH9000",
      "SystemId": "G9000",
      "FirmwareVersion": "v1.00 (06/02/2014)"
    }
  ],
  "RegistryEntries": {
    "Attributes": [
      {
        "CurrentValue": null,
        "DisplayName": "Embedded NIC 1 Boot",
        "DisplayOrder": 5,
        "HelpText": "Select this option to enable network boot (PXE, iSCSI, or FCoE) for the selected NIC. You may need to configure the NIC firmware for the boot option to be active.",
        "MenuPath": "./SystemOptions/NetworkBootOptions",
        "AttributeName": "NicBoot1",
        "ReadOnly": false,
        "Hidden": false,
        "Type": "Enumeration",
        "Value": [
          {
            "ValueDisplayName": "Network Boot",
            "ValueName": "NetworkBoot"
          },
          {
            "ValueDisplayName": "Disabled",
            "ValueName": "Disabled"
          }
        ],
        "WarningText": "Important: When enabling network boot support for an embedded NIC, the NIC boot option does not appear in the UEFI Boot Order or Legacy IPL lists until the next system reboot."
      }
    ]
  }
}
```

```

    {
      "CurrentValue": null,
      "DisplayName": "Embedded SATA Configuration",
      "DisplayOrder": 74,
      "HelpText": "Important: Select this option to configure the embedded chipset SATA
controller.",
      "MenuPath": "./SystemOptions/SataOptions",
      "AttributeName": "EmbeddedSata",
      "ReadOnly": false,
      "Hidden": false,
      "Type": "Enumeration",
      "Value": [
        {
          "ValueDisplayName": "Enable SATA AHCI Support",
          "ValueName": "Ahci"
        },
        {
          "ValueDisplayName": "Enable Software RAID Support",
          "ValueName": "Raid"
        }
      ],
      "WarningText": "Important: Software RAID is not supported when the Boot Mode is
configured in Legacy BIOS Mode."
    }
  ],
  "Dependencies": [
    {
      "Dependency": {
        "MapFrom": [
          {
            "MapFromAttribute": "BootMode",
            "MapFromCondition": "EQU",
            "MapFromProperty": "CurrentValue",
            "MapFromValue": "LegacyBios"
          }
        ],
        "MapToAttribute": "EmbeddedSata",
        "MapToProperty": "ReadOnly",
        "MapToValue": true
      },
      "DependencyFor": "EmbeddedSata",
      "Type": "Map"
    }
  ],
  "Menus": [
    {
      "DisplayName": "BIOS Configuration",
      "DisplayOrder": 1,
      "MenuPath": "./",
      "MenuName": "BiosMainMenu",
      "Hidden": false,

```

```
        "ReadOnly": false
      },
      {
        "DisplayName": "System Options",
        "DisplayOrder": 2,
        "MenuPath": "./SystemOptions",
        "MenuName": "SystemOptions",
        "Hidden": false,
        "ReadOnly": false
      }
    ]
  }
}
```

6.12 AutomationInstrumentation 1.0.0

Version	v1.0
Release	2025.2

6.12.1 Description

The `AutomationInstrumentation` schema contains measurements and set points for an automation node.

- This resource shall represent automation node instrumentation for a Redfish implementation.

6.12.2 URIs

`/redfish/v1/AutomationNodes/{AutomationNodeId}/AutomationInstrumentation`

6.12.3 Properties

Property	Type	Attributes	Notes
CurrentAmps {	object (excerpt)		The current (A) for this node. This property shall contain the current, in ampere units, for this automation node. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Current</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
CrestFactor (v1.1+)	number	<i>read-only</i> (null)	The crest factor for this sensor. This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
THDPercent (v1.1+)	number (%)	<i>read-only</i> (null)	The total harmonic distortion percent (% THD). This property shall contain the total harmonic distortion of the <code>Reading</code> property in percent units, typically 0 to 100.
}			
NodeControl {	object (excerpt)		The control for this node. This property shall contain the control for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Control</code>. This object is an excerpt of the <code>Control</code> resource located at the URI shown in <code>DataSourceUri</code>.
AllowableMax	number	<i>read-only</i> (null)	The maximum possible setting for this control. This property shall indicate the maximum possible value of the <code>SetPoint</code> or <code>SettingMax</code> properties for this control. Services shall not accept values for <code>SetPoint</code> or <code>SettingMax</code> above this value.

Property	Type	Attributes	Notes
AllowableMin	number	<i>read-only (null)</i>	The minimum possible setting for this control. This property shall indicate the minimum possible value of the <code>SetPoint</code> or <code>SettingMin</code> properties for this control. Services shall not accept values for <code>SetPoint</code> or <code>SettingMin</code> below this value.
ControlMode	string (enum)	<i>read-write (null)</i>	The current operating mode of the control. This property shall contain the operating mode of the control. <i>For the possible property values, see <code>ControlMode</code> in Property details.</i>
DataSourceUri	string (URI)	<i>read-only (null)</i>	The link to the resource that provides the data for this control. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy. If no source resource is implemented, meaning the excerpt represents the only available data, this property shall not be present.
Reading	number	<i>read-only (null)</i>	The reading of the sensor associated with this control. This property shall contain the value of the <code>Reading</code> property of the <code>Sensor</code> resource directly associated with this control. This property shall not be present if multiple sensors are associated with a single control.
ReadingUnits	string	<i>read-only (null)</i>	The units of the sensor reading associated with this control. This property shall contain the units of the sensor's reading and thresholds. This property shall not be present if multiple sensors are associated with a single control.
SetPoint	number	<i>read-write (null)</i>	The desired set point of the control. This property shall contain the desired set point control value. The units shall follow the value of <code>SetPointUnits</code>. If the <code>DefaultSetPoint</code> property is not supported and if a user-defined set point is not configured, the property may contain <code>null</code> in responses.
SetPointUnits	string	<i>read-only (null)</i>	The units of the set point and related properties in UCUM c/s format. This property shall contain the units of the control's set point and related properties. The value shall follow the case-sensitive symbol format defined by the Unified Code for Units of Measure (UCUM), as specified by the 'Units of measure annotation' clause of the Redfish Specification.
}			

Property	Type	Attributes	Notes
NodeState	string (enum)	<i>read-only</i>	The current state of the node. This parameter shall specify the current state of the automation node. <i>For the possible property values, see NodeState in Property details.</i>
PID {	object (excerpt)		A PID control loop. This property shall contain a PID-based control loop for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Control</code>. This object is an excerpt of the <code>Control</code> resource located at the URI shown in <code>DataSourceUri</code>.
AllowableMax	number	<i>read-only (null)</i>	The maximum possible setting for this control. This property shall indicate the maximum possible value of the <code>SetPoint</code> or <code>SettingMax</code> properties for this control. Services shall not accept values for <code>SetPoint</code> or <code>SettingMax</code> above this value.
AllowableMin	number	<i>read-only (null)</i>	The minimum possible setting for this control. This property shall indicate the minimum possible value of the <code>SetPoint</code> or <code>SettingMin</code> properties for this control. Services shall not accept values for <code>SetPoint</code> or <code>SettingMin</code> below this value.
ControlLoop {	object		The control loop details. This property shall contain the details for the control loop described by this resource.
CoefficientUpdateTime	string (date-time)	<i>read-only (null)</i>	The date and time that the control loop coefficients were changed. This property shall contain the date and time that any of the coefficients for the control loop were last changed.
Differential	number	<i>read-write (null)</i>	The differential coefficient. This property shall contain the coefficient for the differential factor in a control loop.
Integral	number	<i>read-write (null)</i>	The integral coefficient. This property shall contain the coefficient for the integral factor in a control loop.
Proportional	number	<i>read-write (null)</i>	The proportional coefficient. This property shall contain the coefficient for the proportional factor in a control loop.

Property	Type	Attributes	Notes
}			
ControlMode	string (enum)	<i>read-write</i> (null)	The current operating mode of the control. This property shall contain the operating mode of the control. <i>For the possible property values, see ControlMode in Property details.</i>
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this control. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy. If no source resource is implemented, meaning the excerpt represents the only available data, this property shall not be present.
Reading	number	<i>read-only</i> (null)	The reading of the sensor associated with this control. This property shall contain the value of the <code>Reading</code> property of the <code>Sensor</code> resource directly associated with this control. This property shall not be present if multiple sensors are associated with a single control.
SetPoint	number	<i>read-write</i> (null)	The desired set point of the control. This property shall contain the desired set point control value. The units shall follow the value of <code>SetPointUnits</code>. If the <code>DefaultSetPoint</code> property is not supported and if a user-defined set point is not configured, the property may contain <code>null</code> in responses.
}			
Status {}	object		The status and health of a resource and its children. This type shall contain any status or health properties of a resource. For property details, see Status.
TemperatureCelsius {	object (excerpt)		Temperature (Celsius). This property shall contain the temperature, in degree Celsius units, for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Temperature</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.

Property	Type	Attributes	Notes
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			
Voltage {	object (excerpt)		The voltage (V) for this node. This property shall contain the voltage, in volt units, for this automation node. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Voltage</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
CrestFactor (v1.1+)	number	<i>read-only</i> (null)	The crest factor for this sensor. This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
THDPercent (v1.1+)	number (%)	<i>read-only</i> (null)	The total harmonic distortion percent (% THD). This property shall contain the total harmonic distortion of the <code>Reading</code> property in percent units, typically <code>0</code> to <code>100</code>.
}			

6.12.4 Property details

6.12.4.1 ControlMode

The current operating mode of the control.

- This property shall contain the operating mode of the control.

string	Description
Automatic	Automatically adjust control to meet the set point.
Disabled	The control has been disabled.
Manual	No automatic adjustments are made to the control.
Override	User override of the automatic set point value.

6.12.4.2 NodeState

The current state of the node.

- This parameter shall specify the current state of the automation node.

string	Description
ConditionStop	The node's controller has stopped due to a condition fault.
Done	The node's controller has reached its destination position.
ErrorStop	The node's controller has stopped due to an error.
Idle	The node's controller is idle.
Running	The node's controller is running.
Waiting	The node's controller is waiting to start.

6.12.5 Example response

```
{
  "@odata.type": "#AutomationInstrumentation.v1_0_0.AutomationInstrumentation",
  "Id": "Instrumentation",
  "Name": "Instrumentation for X-Axis Motion Controller",
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "Conditions": []
  },
  "NodeState": "Running",
  "NodeControl": {
    "DataSourceUri": "/redfish/v1/Chassis/Node1/Controls/XOutput",
    "SetPoint": 0.75,
    "Reading": 0.51
  }
}
```

```
    },
    "Voltage": {
      "DataSourceUri": "/redfish/v1/Chassis/Node1/Sensors/Voltage",
      "Reading": 24.3
    },
    "TemperatureCelsius": {
      "DataSourceUri": "/redfish/v1/Chassis/Node1/Sensors/Temperature",
      "Reading": 39.8
    },
    "@odata.id": "/redfish/v1/AutomationNodes/XAxisMover/AutomationInstrumentation"
  }
}
```

6.13 AutomationNode 1.0.0

Version	v1.0
Release	2025.2

6.13.1 Description

The `AutomationNode` schema describes a node that carries out instructions in industrial automation environments.

- This resource shall represent an automation node for a Redfish implementation.

6.13.2 URIs

/redfish/v1/AutomationNodes/{AutomationNodeId}

6.13.3 Properties

Property	Type	Attributes	Notes
Instrumentation {	object		A link to the instrumentation for this node. • This property shall contain a link to a resource of type <code>AutomationInstrumentation</code> that represents the instrumentation for this automation node. See the <i>AutomationInstrumentation</i> schema for details on this property.
@odata.id	string	read-only	Link to a <i>AutomationInstrumentation</i> resource. See the Links section and the <i>AutomationInstrumentation</i> schema for details.

Property	Type	Attributes	Notes
}			
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
AutomationNodeGroup [{	array		An array of links to the automation nodes that are included in an automation node group. This property shall contain an array of links to resources of type <code>AutomationNode</code> that represent the nodes that provide the functionality of this group.
@odata.id	string	<i>read-only</i>	Link to another AutomationNode resource.
}]			
Chassis [{	array		An array of links to the chassis that contain this equipment. This property shall contain an array of links to resources of type <code>Chassis</code> that represent the physical containers that contain this equipment.
@odata.id	string	<i>read-only</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.
}]			
Oem {	object		See the OEM object definition in the Using this guide clause.
OutputControl {	object		A link to the output control. This property shall contain a link to a resource of type <code>Control</code> that represent the output control associated with this node. See the <i>Control</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Control resource. See the Links section and the <i>Control</i> schema for details.
}			
PidFeedbackSensor {	object		A link to the PID feedback sensor. This property shall contain a link to a resource of type <code>Sensor</code> that represents the feedback sensor associated with this node. The feedback sensor is intended to return controlled value output in a PID system. See the <i>Sensor</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Sensor resource. See the Links section and the <i>Sensor</i> schema for details.

Property	Type	Attributes	Notes
}			
PositionSensor {	object		A link to the position sensor. This property shall contain a link to a resource of type <code>Sensor</code> that represents the position sensor associated with this node. See the <code>Sensor</code> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>Sensor</code> resource. See the Links section and the <code>Sensor</code> schema for details.
}			
VelocitySensor {	object		A link to the velocity sensor. This property shall contain a link to a resource of type <code>Sensor</code> that represents the velocity sensor associated with this node. See the <code>Sensor</code> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>Sensor</code> resource. See the Links section and the <code>Sensor</code> schema for details.
}			
}			
MotionAxis	string (enum)	<i>read-write</i> (null)	The primary axis of motion for this motion-related node. This property shall contain the primary axis of motion for this motion-related node. <i>For the possible property values, see MotionAxis in Property details.</i>
MotionProfile	string (enum)	<i>read-write</i> (null)	The motion profile type used for this node. This property shall contain the type of motion profile used for this motion-based node. <i>For the possible property values, see MotionProfile in Property details.</i>
NodeState	string (enum)	<i>read-only</i>	The current state of the node. This property shall contain the current state of the automation node. <i>For the possible property values, see NodeState in Property details.</i>
NodeType	string (enum)	<i>read-only</i>	The type of automation node. This property shall contain the type for the automation node. <i>For the possible property values, see NodeType in Property details.</i>

Property	Type	Attributes	Notes
Status {}	object		The status and health of a resource and its children. This type shall contain any status or health properties of a resource. For property details, see Status.

6.13.4 Actions

6.13.4.1 Reset

Description

Resets the node.

- This action shall reset the node to its power-on state.

Action URI

{Base URI of target resource}/Actions/AutomationNode.Reset

Action parameters

This action takes no parameters.

6.13.4.2 SendTrigger

Description

Sends a trigger to the node.

- This action shall pulse the trigger signal for the node.

Action URI

{Base URI of target resource}/Actions/AutomationNode.SendTrigger

Action parameters

This action takes no parameters.

6.13.4.3 Start

Description

Starts the node.

- This action shall transition the node to the `Running` state. This action shall pulse the trigger signal to other connected nodes that are in the `Waiting` state.

Action URI

{Base URI of target resource}/Actions/AutomationNode.Start

Action parameters

This action takes no parameters.

6.13.4.4 Stop**Description**

Stops the node.

- This action shall transition the node to the `Idle` state.

Action URI

{Base URI of target resource}/Actions/AutomationNode.Stop

Action parameters

This action takes no parameters.

6.13.4.5 Wait**Description**

Signals the node to wait for the next instruction.

- This action shall transition the node to the `Waiting` state.

Action URI

{Base URI of target resource}/Actions/AutomationNode.Wait

Action parameters

This action takes no parameters.

6.13.5 Property details

6.13.5.1 MotionAxis

The primary axis of motion for this motion-related node.

- This property shall contain the primary axis of motion for this motion-related node.

string	Description
ThreeAxis	3-axis.
TwoAxis	2-axis.
X	X axis.
Y	Y axis.
Z	Z axis.

6.13.5.2 MotionProfile

The motion profile type used for this node.

- This property shall contain the type of motion profile used for this motion-based node.

string	Description
None	No profile specified.
SCurve	S-curve profile.
Trapezoidal	Trapezoidal profile.

6.13.5.3 NodeState

The current state of the node.

- This property shall contain the current state of the automation node.

string	Description
ConditionStop	The node's controller has stopped due to a condition fault.
Done	The node's controller has reached its destination position.
ErrorStop	The node's controller has stopped due to an error.
Idle	The node's controller is idle.
Running	The node's controller is running.
Waiting	The node's controller is waiting to start.

6.13.5.4 NodeType

The type of automation node.

- This property shall contain the type for the automation node.

string	Description
MotionPosition	A position-based profiled motion node where position, velocity, and acceleration are all controlled.
MotionPositionGroup	A multi-axis position-based profiled motion node where position, velocity and acceleration are all controlled.
MotionVelocity	A velocity-based profiled motion node where position, velocity and acceleration are all controlled.
PID	A node that attempts to match a set point using a PID control algorithm.
Simple	A simple node that incorporates no automated control function.

6.13.6 Example response

```
{
  "@odata.type": "#AutomationNode.v1_0_0.AutomationNode",
  "Id": "XAxisMover",
  "Name": "X-Axis positioner",
  "Description": "The X axis automation node for the machine.",
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "Conditions": []
  },
  "NodeState": "Running",
}
```

```

    "NodeType": "MotionPosition",
    "MotionProfile": "Trapezoidal",
    "MotionAxis": "X",
    "Instrumentation": {
      "@odata.id": "/redfish/v1/AutomationNodes/XAxisMover/AutomationInstrumentation"
    },
    "Links": {
      "Chassis": [
        {
          "@odata.id": "/redfish/v1/Chassis/3AxisMotion"
        }
      ]
    },
    "Actions": {
      "#AutomationNode.Reset": {
        "target": "/redfish/v1/AutomationNodes/XAxisMover/Actions/AutomationNode.Reset"
      },
      "#AutomationNode.SendTrigger": {
        "target": "/redfish/v1/AutomationNodes/XAxisMover/Actions/AutomationNode.SendTrigger"
      },
      "#AutomationNode.Start": {
        "target": "/redfish/v1/AutomationNodes/XAxisMover/Actions/AutomationNode.Start"
      },
      "#AutomationNode.Stop": {
        "target": "/redfish/v1/AutomationNodes/XAxisMover/Actions/AutomationNode.Stop"
      },
      "#AutomationNode.Wait": {
        "target": "/redfish/v1/AutomationNodes/XAxisMover/Actions/AutomationNode.Wait"
      }
    },
    "@odata.id": "/redfish/v1/AutomationNodes/XAxisMover"
  }
}

```

6.14 Battery 1.4.0

Version	v1.4	v1.3	v1.2	v1.1
Release	2025.2	2024.1	2022.2	2021.2

6.14.1 Description

The `Battery` schema describes a unit of energy storage, including batteries and supercapacitors, used to provide systems or components within a system with power during a power-loss event or to store energy for later use. It also describes the location, such as a slot, socket, or bay, where a unit can be installed by populating a resource instance with an absent state if a unit is not present.

- This resource shall represent an energy storage device for a Redfish implementation. It may also represent a location, such as a slot, socket, or bay, where a unit may be installed if the `State` property within the `Status` property contains `Absent`.

6.14.2 URIs

/redfish/v1/Chassis/{ChassisId}/PowerSubsystem/Batteries/{BatteryId}

6.14.3 Properties

Property	Type	Attributes	Notes
Assembly {	object		The link to the assembly associated with this battery. • This property shall contain a link to a resource of type <code>Assembly</code>. See the <i>Assembly</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>Assembly</i> resource. See the Links section and the <i>Assembly</i> schema for details.
}			
BatteryChemistryType (v1.4+)	string (enum)	<i>read-only</i> (null)	The chemistry of the battery. • This property shall contain the chemistry of the battery. This property shall only be present if the <code>EnergyStorageType</code> property contains <code>Battery</code>. <i>For the possible property values, see BatteryChemistryType in Property details.</i>
CapacityActualAmpHours	number (A.h)	<i>read-only</i> (null)	The actual maximum capacity of this battery in amp-hour units. • This property shall contain the actual maximum capacity of this battery in amp-hour units.
CapacityActualWattHours	number (W.h)	<i>read-only</i> (null)	The actual maximum capacity of this battery in watt-hour units. • This property shall contain the actual maximum capacity of this battery in watt-hour units.
CapacityRatedAmpHours	number (A.h)	<i>read-only</i> (null)	The rated maximum capacity of this battery in amp-hour units. • This property shall contain the rated maximum capacity of this battery in amp-hour units.
CapacityRatedWattHours	number (W.h)	<i>read-only</i> (null)	The rated maximum capacity of this battery in watt-hour units. • This property shall contain the rated maximum capacity of this battery in watt-hour units.

Property	Type	Attributes	Notes
ChargeState	string (enum)	<i>read-only</i> (<i>null</i>)	The charge state of this battery. This property shall contain the charge state of this battery. <i>For the possible property values, see ChargeState in Property details.</i>
EnergyStorageType (v1.4+)	string (enum)	<i>read-only</i> (<i>null</i>)	The type of energy storage technology used in the battery. This property shall contain the energy storage technology used in the battery. <i>For the possible property values, see EnergyStorageType in Property details.</i>
FirmwareVersion	string	<i>read-only</i> (<i>null</i>)	The firmware version for this battery. This property shall contain the firmware version as defined by the manufacturer for this battery.
HotPluggable	boolean	<i>read-only</i> (<i>null</i>)	An indication of whether this device can be inserted or removed while the equipment is in operation. This property shall indicate whether the device can be inserted or removed while the underlying equipment otherwise remains in its current operational state. Devices indicated as hot-pluggable shall allow the device to become operable without altering the operational state of the underlying equipment. Devices that cannot be inserted or removed from equipment in operation, or devices that cannot become operable without affecting the operational state of that equipment, shall be indicated as not hot-pluggable.
Links (v1.1+) {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Memory (v1.1+) [{	array		An array of links to the memory devices to which this battery provides power during a power-loss event. This property shall contain an array of links to resources of type <code>Memory</code> that represent the memory devices to which this battery provides power during a power-loss event, such as battery-backed NVDIMMs. This property shall not be present if the battery powers the containing chassis as a whole rather than individual components in a chassis.
@odata.id	string	<i>read-only</i>	Link to a Memory resource. See the Links section and the <i>Memory</i> schema for details.
}]			
Oem {	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
StorageControllers (v1.1+) [{	array		An array of links to the storage controllers to which this battery provides power during a power-loss event. This property shall contain an array of links to resources of type <code>StorageController</code> that represent the storage controllers to which this battery provides power during a power-loss event, such as battery-backed RAID controllers. This property shall not be present if the battery powers the containing chassis as a whole rather than individual components in a chassis.
@odata.id	string	<i>read-only</i>	Link to a StorageController resource. See the Links section and the <i>StorageController</i> schema for details.
]}			
Location {}	object		The location of the battery. This property shall contain the location information of this battery. For property details, see Location.
LocationIndicatorActive	boolean	<i>read-write (null)</i>	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource.
Manufacturer	string	<i>read-only (null)</i>	The manufacturer of this battery. This property shall contain the name of the organization responsible for producing the battery. This organization may be the entity from whom the battery is purchased, but this is not necessarily true.
MaxChargeRateAmps	number (A)	<i>read-only (null)</i>	The maximum charge rate at the input of this battery in amp units. This property shall contain the maximum charge rate at the input of this battery in amp units.
MaxChargeVoltage	number (Volts)	<i>read-only (null)</i>	The maximum charge voltage across the cell pack of this battery when it is fully charged. This property shall contain the maximum charge voltage across the cell pack of this battery when it is fully charged. This property should not be present if the battery contains an internal charger that regulates the voltage applied to the cell pack from the input of the battery.

Property	Type	Attributes	Notes
MaxDischargeRateAmps	number (A)	<i>read-only</i> (null)	The maximum discharge rate at the output of this battery in amp units. This property shall contain the maximum discharge rate at the output of this battery in amp units.
Metrics {	object		The link to the battery metrics resource associated with this battery. This property shall contain a link to a resource of type <code>BatteryMetrics</code>. See the <i>BatteryMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a BatteryMetrics resource. See the Links section and the <i>BatteryMetrics</i> schema for details.
}			
Model	string	<i>read-only</i> (null)	The model number for this battery. This property shall contain the model information as defined by the manufacturer for this battery.
NominalOutputVoltage (v1.3+)	number (Volts)	<i>read-only</i> (null)	The nominal output voltage of this battery. This property shall contain the nominal output voltage of this battery.
PartNumber	string	<i>read-only</i> (null)	The part number for this battery. This property shall contain the part number as defined by the manufacturer for this battery.
ProductionDate	string (date-time)	<i>read-only</i> (null)	The production or manufacturing date of this battery. This property shall contain the date of production or manufacture for this battery.
Replaceable (v1.2+)	boolean	<i>read-only</i> (null)	An indication of whether this component can be independently replaced as allowed by the vendor's replacement policy. This property shall indicate whether this component can be independently replaced as allowed by the vendor's replacement policy. A value of <code>false</code> indicates the component needs to be replaced by policy as part of another component. If the <code>LocationType</code> property of this component contains <code>Embedded</code>, this property shall contain <code>false</code>.
SerialNumber	string	<i>read-only</i> (null)	The serial number for this battery. This property shall contain the serial number as defined by the manufacturer for this battery.

Property	Type	Attributes	Notes
SparePartNumber	string	<i>read-only</i> (null)	The spare part number for this battery. This property shall contain the spare or replacement part number as defined by the manufacturer for this battery.
StateOfHealthPercent {	object (excerpt)		The state of health (percent) of this battery. This property shall contain the state of health, in percent units, of this battery. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Percent</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <code>Status</code>.
Version	string	<i>read-only</i> (null)	The hardware version of this battery. This property shall contain the hardware version of this battery as determined by the vendor or supplier.

6.14.4 Actions

6.14.4.1 Calibrate

Description

This action performs a self-calibration, or learn cycle, of the battery.

- This action shall perform a self-calibration, or learn cycle, of the battery.

Action URI

{Base URI of target resource}/Actions/Battery.Calibrate

Action parameters

This action takes no parameters.

6.14.4.2 Reset

Description

This action resets the battery.

- This action shall reset the battery.

Action URI

{Base URI of target resource}/Actions/Battery.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	optional	The type of reset. • This parameter shall contain the type of reset. The service can accept a request without the parameter and shall perform a <code>GracefulRestart</code> . <i>For the possible property values, see ResetType in Property details.</i>

Request Example

```
{
  "ResetType": "PowerCycle"
}
```

6.14.4.3 SelfTest

Description

This action performs a self-test of the battery.

- This action shall perform a self-test of the battery.

Action URI

{Base URI of target resource}/Actions/Battery.SelfTest

Action parameters

This action takes no parameters.

6.14.5 Property details**6.14.5.1 BatteryChemistryType**

The chemistry of the battery.

- This property shall contain the chemistry of the battery. This property shall only be present if the `EnergyStorageType` property contains `Battery`.

string	Description
LeadAcid	Chemical energy stored through lead and acid electrochemical reactions. • The value shall indicate that the battery stores chemical energy using lead and acid electrochemical reactions.
LithiumIon	Chemical energy stored through lithium ion intercalation reactions. • The value shall indicate that the battery stores chemical energy using lithium ion intercalation.
NickelCadmium	Chemical energy stored through nickel and cadmium electrochemical reactions. • The value shall indicate that the battery stores chemical energy using nickel and cadmium electrochemical reactions.

6.14.5.2 ChargeState

The charge state of this battery.

- This property shall contain the charge state of this battery.

string	Description
Charging	The battery is charging. • This value shall indicate the battery is charging and energy is entering the battery.

string	Description
Discharging	The battery is discharging. This value shall indicate the battery is discharging and energy is leaving the battery.
Idle	The battery is idle. This value shall indicate the battery is idle and energy is not entering or leaving the battery. Small amounts of energy may enter or leave the battery while in this state if the battery is regulating itself.

6.14.5.3 EnergyStorageType

The type of energy storage technology used in the battery.

- This property shall contain the energy storage technology used in the battery.

string	Description
Battery	Energy stored through one or more electrochemical cells. The value shall indicate that the battery stores energy using one or more electrochemical cells.
Supercapacitor	Energy stored through electrostatic double-layer capacitors or electrodes with electrochemical pseudocapacitance. The value shall indicate that the battery stores energy using electrostatic double-layer capacitors or electrodes with electrochemical pseudocapacitance.

6.14.5.4 ResetType

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and shall perform a `GracefulRestart`.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.

string	Description
ForceOn	Turn on the unit immediately. This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property shall contain the value <code>On</code>.
ForceRestart	Shut down immediately and non-gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
FullPowerCycle	Full power cycle the unit. Behaves like removing utility lines, followed by restoring utility lines to the resource. This value shall indicate the resource will perform a full power cycle as if utility lines to the resource are removed and restored. This is different from <code>PowerCycle</code> in that it's as close to a true power cycle as possible. For example, removing AC power cables from an enclosure and then restoring the AC power cables. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>. If a service supports this value but there are no other distinct power cycle flows, the service shall support <code>PowerCycle</code> as an alias to <code>FullPowerCycle</code>. This type of reset may cause the manager providing the Redfish service to power cycle. If the manager providing the Redfish service is affected by this type of reset, the service shall send the action response before resetting to prevent client timeouts.
GracefulRestart	Shut down gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
GracefulShutdown	Shut down gracefully and power off. This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. This value shall indicate the resource will generate a diagnostic interrupt.

string	Description
On	Turn on the unit. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a paused state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Paused</code>.
PowerCycle	Power cycle the unit. Behaves like a power removal, followed by a power restore to the resource. This value shall indicate the resource will perform a power cycle. This is different from <code>FullPowerCycle</code> in that it typically performs localized power sequencing of the resource while external power is still present. For example, turning DC voltage regulators off and then turning DC voltage regulators back on. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
PushPowerButton	Simulate the pressing of the physical power button on this unit. This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.

6.14.6 Example response

```
{
  "@odata.type": "#Battery.v1_4_0.Battery",
  "Id": "Module1",
  "Name": "Battery 1",
  "Status": {
```

```
    "State": "Enabled",
    "Health": "OK"
  },
  "Actions": {
    "#Battery.SelfTest": {
      "target": "/redfish/v1/Chassis/1U/PowerSubsystem/Batteries/Module1/Actions/Battery.SelfTest"
    },
    "#Battery.Calibrate": {
      "target": "/redfish/v1/Chassis/1U/PowerSubsystem/Batteries/Module1/Actions/Battery.Calibrate"
    }
  },
  "Location": {
    "PartLocation": {
      "ServiceLabel": "Battery 1",
      "LocationType": "Bay",
      "LocationOrdinalValue": 0
    }
  },
  "Model": "RKS-440DC",
  "Manufacturer": "Contoso Power",
  "FirmwareVersion": "1.00",
  "Version": "A05",
  "ProductionDate": "2019-10-01T06:00:00Z",
  "SerialNumber": "3488247",
  "PartNumber": "23456-133",
  "SparePartNumber": "93284-133",
  "LocationIndicatorActive": false,
  "HotPluggable": true,
  "CapacityRatedWattHours": 20,
  "CapacityActualWattHours": 19.41,
  "MaxDischargeRateAmps": 10,
  "StateOfHealthPercent": {
    "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/Battery1StateOfHealth",
    "Reading": 91
  },
  "ChargeState": "Idle",
  "Metrics": {
    "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/Batteries/Module1/Metrics"
  },
  "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/Batteries/Module1"
}
```

6.15 BatteryMetrics 1.0.4

Version	v1.0
Release	2021.2

6.15.1 Description

The `BatteryMetrics` schema contains definitions for the metrics of a battery unit.

- This resource shall be used to represent the metrics of a battery unit for a Redfish implementation.

6.15.2 URIs

/redfish/v1/Chassis/{ChassisId}/PowerSubsystem/Batteries/{BatteryId}/Metrics

6.15.3 Properties

Property	Type	Attributes	Notes
CellVoltages [{	array (excerpt)		The cell voltages (V) for this battery. This property shall contain the cell voltages, in volt units, for this battery. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Voltage</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
CrestFactor (v1.1+)	number	<i>read-only</i> (null)	The crest factor for this sensor. This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
THDPercent (v1.1+)	number (%)	<i>read-only</i> (null)	The total harmonic distortion percent (% THD). This property shall contain the total harmonic distortion of the <code>Reading</code> property in percent units, typically <code>0</code> to <code>100</code>.
}]			

Property	Type	Attributes	Notes
ChargePercent {}	object		The amount of charge available (percent) in this battery. This property shall contain the amount of charge available, in percent units, typically 0 to 100, in this battery. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Percent</code>. For more information about this property, see <code>SensorExcerpt</code> in Property Details.
DischargeCycles	number	<i>read-only</i> (null)	The number of discharges this battery has sustained. This property shall contain the number of discharges this battery has sustained.
InputCurrentAmps {	object (excerpt)		The input current (A) for this battery. This property shall contain the input current, in ampere units, for this battery. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Current</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
CrestFactor (v1.1+)	number	<i>read-only</i> (null)	The crest factor for this sensor. This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
THDPercent (v1.1+)	number (%)	<i>read-only</i> (null)	The total harmonic distortion percent (% THD). This property shall contain the total harmonic distortion of the <code>Reading</code> property in percent units, typically 0 to 100.
}			

Property	Type	Attributes	Notes
InputVoltage {	object (excerpt)		The input voltage (V) for this battery. This property shall contain the input voltage, in volt units, for this battery. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Voltage</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
CrestFactor (v1.1+)	number	<i>read-only</i> (null)	The crest factor for this sensor. This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
THDPercent (v1.1+)	number (%)	<i>read-only</i> (null)	The total harmonic distortion percent (% THD). This property shall contain the total harmonic distortion of the <code>Reading</code> property in percent units, typically <code>0</code> to <code>100</code>.
}			
OutputCurrentAmps [{	array (excerpt)		The output currents (A) for this battery. This property shall contain the output currents, in ampere units, for this battery. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Current</code>. The sensors shall appear in the same array order as the <code>OutputVoltages</code> property. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
CrestFactor (v1.1+)	number	<i>read-only</i> (null)	The crest factor for this sensor. This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.

Property	Type	Attributes	Notes
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
THDPercent (v1.1+)	number (%)	<i>read-only</i> (null)	The total harmonic distortion percent (% THD). This property shall contain the total harmonic distortion of the <code>Reading</code> property in percent units, typically <code>0</code> to <code>100</code>.
}]			
OutputVoltages [{	array (excerpt)		The output voltages (V) for this battery. This property shall contain the output voltages, in volt units, for this battery. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Voltage</code>. The sensors shall appear in the same array order as the <code>OutputCurrentAmps</code> property. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
CrestFactor (v1.1+)	number	<i>read-only</i> (null)	The crest factor for this sensor. This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
THDPercent (v1.1+)	number (%)	<i>read-only</i> (null)	The total harmonic distortion percent (% THD). This property shall contain the total harmonic distortion of the <code>Reading</code> property in percent units, typically <code>0</code> to <code>100</code>.
}]			

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
StoredChargeAmpHours {}	object		The charge (Ah) stored in this battery. This property shall contain the stored charge, in ampere-hour units, for this battery. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>ChargeAh</code>. For more information about this property, see SensorExcerpt in Property Details.
StoredEnergyWattHours {}	object		The energy (Wh) stored in this battery. This property shall contain the stored energy, in watt-hour units, for this battery. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>EnergyWh</code>. For more information about this property, see SensorExcerpt in Property Details.
TemperatureCelsius {}	object		The temperature (C) for this battery. This property shall contain the temperature, in degree Celsius units, for this battery. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Temperature</code>. For more information about this property, see SensorExcerpt in Property Details.

6.15.4 Property details

6.15.4.1 SensorExcerpt

The `Sensor` schema describes a sensor and its properties. This object is an excerpt of the `Sensor` resource located at the URI shown in `DataSourceUri`.

DataSourceUri	string (URI)	<i>read-only (null)</i>	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only (null)</i>	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.

6.15.5 Example response

```
{
  "@odata.type": "#BatteryMetrics.v1_0_4.BatteryMetrics",
  "Id": "Metrics",
  "Name": "Metrics for Battery 1",
  "DischargeCycles": 8.67,
  "InputVoltage": {
    "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/Battery1InputVoltage",
    "Reading": 12.22
  },
  "InputCurrentAmps": {
    "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/Battery1InputCurrent",
    "Reading": 0
  },
  "OutputVoltages": [
    {
      "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/Battery1OutputVoltage",
      "Reading": 12.22
    }
  ],
  "OutputCurrentAmps": [
    {
      "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/Battery1OutputCurrent",
      "Reading": 0
    }
  ],
  "StoredEnergyWattHours": {
    "Reading": 19.41
  },
  "TemperatureCelsius": {
    "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/Battery1Temp",
    "Reading": 33
  },
  "ChargePercent": {
    "Reading": 100
  },
  "CellVoltages": [
    {
      "Reading": 3.44
    },
    {
      "Reading": 3.45
    },
    {
      "Reading": 3.43
    },
    {
      "Reading": 3.43
    }
  ]
}
```

```
    },
    {
      "Reading": 3.45
    },
    {
      "Reading": 3.44
    },
    {
      "Reading": 3.43
    },
    {
      "Reading": 3.44
    }
  ],
  "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/Batteries/Module1/Metrics"
}
```

6.16 Bios 1.2.3

Version	v1.2	v1.1	v1.0
Release	2021.1	2019.2	2016.1

6.16.1 Description

The `Bios` schema contains properties related to the BIOS attribute registry. The attribute registry describes the system-specific BIOS attributes and actions for changing to BIOS settings. Changes to the BIOS typically require a system reset before they take effect. It is likely that a client finds the `@Redfish.Settings` term in this resource, and if it is found, the client makes requests to change BIOS settings by modifying the resource identified by the `@Redfish.Settings` term.

- This resource shall represent BIOS attributes for a Redfish implementation.

6.16.2 URIs

`/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Bios`
`/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Bios`
`/redfish/v1/Systems/{ComputerSystemId}/Bios`

6.16.3 Properties

Property	Type	Attributes	Notes
AttributeRegistry	string	<i>read-only</i> (null)	The resource ID of the attribute registry that has the system-specific information about a BIOS resource. The link to the attribute registry that lists the metadata describing the BIOS attribute settings in this resource.
Attributes {	object		The list of BIOS attributes specific to the manufacturer or provider. This property shall contain the list of BIOS attributes specific to the manufacturer or provider. BIOS attribute settings appear as additional properties in this object and can be looked up in the attribute registry by their <code>AttributeName</code>.
(pattern)	string, boolean, number	<i>read-write</i> (null)	Property names follow regular expression pattern "[A-Za-z][A-Za-z0-9_]+\$"
}			
Links (v1.1+) {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
ActiveSoftwareImage (v1.1+) {	object		The link to the software inventory that represents the active BIOS firmware image. This property shall contain a link a resource of type <code>SoftwareInventory</code> that represents the active BIOS firmware image. See the <i>SoftwareInventory</i> schema for details on this property.
@odata.id	string	<i>read-write</i>	Link to a <i>SoftwareInventory</i> resource. See the Links section and the <i>SoftwareInventory</i> schema for details.
}			
Oem {	object		See the OEM object definition in the Using this guide clause.
SoftwareImages (v1.1+) [{	array		The images that are associated with this BIOS. This property shall contain an array of links to resources of type <code>SoftwareInventory</code> that represent the firmware images that apply to this BIOS.
@odata.id	string	<i>read-only</i>	Link to a <i>SoftwareInventory</i> resource. See the Links section and the <i>SoftwareInventory</i> schema for details.

Property	Type	Attributes	Notes
}]			
}			
ResetBiosToDefaultsPending (v1.2+)	boolean	<i>read-only</i> (null)	An indication of whether there is a pending request to reset the BIOS attributes to default values. This property shall indicate whether there is a pending request to reset the BIOS attributes to default values. A successful completion of the <code>ResetBios</code> action shall set this property to <code>true</code>. Applying the default attribute values to this resource shall set this property to <code>false</code>. Services may reject modification requests to the settings resource if this property contains <code>true</code>.

6.16.4 Actions

6.16.4.1 ChangePassword

Description

This action changes a BIOS password.

- This action shall change the selected BIOS password.

Action URI

{Base URI of target resource}/Actions/Bios.ChangePassword

Action parameters

Parameter Name	Type	Attributes	Notes
NewPassword	string	<i>required</i>	The new BIOS password. This parameter shall contain the new BIOS password.
OldPassword	string	<i>required</i>	The existing BIOS password. This parameter shall contain the existing BIOS password to change.
PasswordName	string	<i>required</i>	The name of the BIOS password to change. This parameter shall contain the name of the BIOS password to change. For instance, <code>AdminPassword</code> or <code>UserPassword</code>.

Request Example

```
{
  "OldPassword": "secret123",
  "NewPassword": "B3tt3rS3cur1tY!",
  "PasswordName": "Admin"
}
```

6.16.4.2 ResetBios

Description

This action resets the BIOS attributes to default.

- This action shall reset the BIOS attributes to their default values. To apply the default values, a system reset may be required. This action can impact other resources. This action may clear pending values in the settings resource.

Action URI

{Base URI of target resource}/Actions/Bios.ResetBios

Action parameters

This action takes no parameters.

6.16.5 Example response

```
{
  "@odata.type": "#Bios.v1_2_3.Bios",
  "Id": "BIOS",
  "Name": "BIOS Configuration Current Settings",
  "AttributeRegistry": "BiosAttributeRegistryP89.v1_0_0",
  "Attributes": {
    "AdminPhone": "",
    "BootMode": "Uefi",
    "EmbeddedSata": "Raid",
    "NicBoot1": "NetworkBoot",
    "NicBoot2": "Disabled",
    "PowerProfile": "MaxPerf",
    "ProcCoreDisable": 0,
    "ProcHyperthreading": "Enabled",
    "ProcTurboMode": "Enabled",
    "UsbControl": "UsbEnabled"
  },
}
```

```

"@Redfish.Settings": {
  "@odata.type": "#Settings.v1_4_0.Settings",
  "ETag": "9234ac83b9700123cc32",
  "Messages": [
    {
      "MessageId": "Base.1.0.SettingsFailed",
      "RelatedProperties": [
        "/Attributes/ProcTurboMode"
      ]
    }
  ],
  "SettingsObject": {
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/Bios/Settings"
  },
  "Time": "2016-03-07T14:44.30-05:00"
},
"Actions": {
  "#Bios.ResetBios": {
    "target": "/redfish/v1/Systems/437XR1138R2/Bios/Actions/Bios.ResetBios"
  },
  "#Bios.ChangePassword": {
    "target": "/redfish/v1/Systems/437XR1138R2/Bios/Actions/Bios.ChangePassword"
  }
},
"@odata.id": "/redfish/v1/Systems/437XR1138R2/Bios"
}

```

6.17 BootOption 1.0.6

Version	v1.0
Release	2017.3

6.17.1 Description

The `BootOption` schema reports information about a single boot option in a system. It represents the properties of a bootable device available in the system.

- This resource shall represent a single boot option within a system.

6.17.2 URIs

```

/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/BootOptions/{BootOptionId}

```


/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/BootOptions/{BootOptionId}
 /redfish/v1/Systems/{ComputerSystemId}/BootOptions/{BootOptionId}

6.17.3 Properties

Property	Type	Attributes	Notes
Alias	string (enum)	<i>read-only</i> (null)	The alias of this boot source. This property shall contain the string alias of this boot source that describes the type of boot. <i>For the possible property values, see Alias in Property details.</i>
BootOptionEnabled	boolean	<i>read-write</i> (null)	An indication of whether the boot option is enabled. If <code>true</code>, it is enabled. If <code>false</code>, the boot option that the boot order array on the computer system contains is skipped. In the UEFI context, this property influences the load option active flag for the boot option. This property shall indicate whether the boot option is enabled. If <code>true</code>, it is enabled. If <code>false</code>, the boot option that the boot order array on the computer system contains shall be skipped. In the UEFI context, this property shall influence the load option active flag for the boot option.
BootOptionReference	string	<i>read-only</i> <i>required</i> (null)	The unique boot option. This property shall correspond to the boot option or device. For UEFI systems, this string shall match the UEFI boot option variable name, such as <code>Boot####</code>. The BootOrder array of a computer system resource contains this value.
DisplayName	string	<i>read-only</i> (null)	The user-readable display name of the boot option that appears in the boot order list in the user interface. This property shall contain a user-readable boot option name, as it should appear in the boot order list in the user interface.
RelatedItem [{	array		An array of links to resources or objects associated with this boot option. This property shall contain an array of links to resources or objects that are associated with this boot option.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			

Property	Type	Attributes	Notes
UefiDevicePath	string	<i>read-only (null)</i>	The UEFI device path to access this UEFI boot option. This property shall contain the UEFI Specification-defined UEFI device path that identifies and locates the device for this boot option.

6.17.4 Property details

6.17.4.1 Alias

The alias of this boot source.

- This property shall contain the string alias of this boot source that describes the type of boot.

string	Description
BiosSetup	Boot to the BIOS setup utility.
Cd	Boot from the CD or DVD.
Diags	Boot to the manufacturer's diagnostics program.
Floppy	Boot from the floppy disk drive.
Hdd	Boot from a hard drive.
None	Boot from the normal boot device.
Pxe	Boot from the Pre-boot eXecution Environment (PXE).
Recovery	Boot to a system-designated recovery process or image.
RemoteDrive	Boot from a remote drive, such as an iSCSI target.
SDCard	Boot from an SD card.
UefiBootNext	Boot to the UEFI device that the <code>BootNext</code> property specifies.
UefiHttp	Boot from a UEFI HTTP network location.
UefiShell	Boot to the UEFI Shell.
UefiTarget	Boot to the UEFI device specified in the <code>UefiTargetBootSourceOverride</code> property.
Usb	Boot from a system BIOS-specified USB device.
Utilities	Boot to the manufacturer's utilities program or programs.

6.17.5 Example response

```
{
  "@odata.type": "#BootOption.v1_0_6.BootOption",
  "Id": "1",
  "Name": "Boot Option",
  "Description": "UEFI Boot Option",
  "BootOptionReference": "Boot0000",
  "DisplayName": "Windows Boot Manager",
  "UefiDevicePath":
    "PciRoot(0x0)/Pci(0x1,0x0)/Pci(0x0,0x0)/Scsi(0x0,0x0)/HD(2,GPT,B02BF459-8975-4222-A1C4-17915C29E5E5,0x96800,0x31800),
  "Alias": "Hdd",
  "RelatedItem": [
    {
      "@odata.id": "/redfish/v1/Systems/1/SimpleStorage/1"
    }
  ],
  "@odata.id": "/redfish/v1/Systems/1/BootOptions/1"
}
```

6.18 Cable 1.2.4

Version	v1.2	v1.1	v1.0
Release	2021.4	2021.3	2021.2

6.18.1 Description

The `Cable` schema contains properties that describe a cable connecting endpoints of a chassis, port, or any other cable-compatible endpoint.

- This resource contains a simple cable for a Redfish implementation.

6.18.2 URIs

/redfish/v1/Cables/{CableId}

6.18.3 Properties

Property	Type	Attributes	Notes
Assembly {	object		The link to the assembly associated with this cable. This property shall contain a link to a resource of type <code>Assembly</code>. See the <i>Assembly</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>Assembly</i> resource. See the Links section and the <i>Assembly</i> schema for details.
}			
AssetTag	string	<i>read-write (null)</i>	The user-assigned asset tag for this cable. This property shall track the cable for inventory purposes.
CableClass	string (enum)	<i>read-write (null)</i>	The identifier for the downstream resource. The property shall contain the cable class for this cable. <i>For the possible property values, see CableClass in Property details.</i>
CableStatus	string (enum)	<i>read-write</i>	The user-reported status of this resource. This property shall contain the user-reported status of this resource. <i>For the possible property values, see CableStatus in Property details.</i>
CableType	string	<i>read-write (null)</i>	The type of this cable. This property shall contain a user-defined type for this cable.
DownstreamConnectorTypes []	array (string (enum))	<i>read-write</i>	- The connector types this cable supports. - The property shall contain an array of connector types this cable supports. <i>For the possible property values, see DownstreamConnectorTypes in Property details.</i>
DownstreamName	string	<i>read-write (null)</i>	The identifier for the downstream resource. This property shall contain any identifier for a downstream resource.
LengthMeters	number	<i>read-write (null)</i>	The length of the cable in meters. This property shall contain the length of the cable in meters.

Property	Type	Attributes	Notes
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
DownstreamChassis [{	array		An array of links to the downstream chassis connected to this cable. This property shall contain an array of links to resources of type <code>Chassis</code> that represent the physical downstream containers connected to this cable.
@odata.id	string	<i>read-write</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.
}]			
DownstreamPorts [{	array		An array of links to the downstream ports connected to this cable. This property shall contain an array of links to resources of type <code>Port</code> that represent the physical downstream connections connected to this cable.
@odata.id	string	<i>read-write</i>	Link to a Port resource. See the Links section and the <i>Port</i> schema for details.
}]			
DownstreamResources [{	array		An array of links to the downstream resources connected to this cable. This property shall contain an array of links to resources that represent the physical downstream connections connected to this cable. Even if the resource is already referenced in another property within <code>Links</code>, such as <code>DownstreamPorts</code> OR <code>DownstreamChassis</code>, it shall also be referenced in this property.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
Oem {	object		See the OEM object definition in the Using this guide clause.
UpstreamChassis [{	array		An array of links to the upstream chassis connected to this cable. This property shall contain an array of links to resources of type <code>Chassis</code> that represent the physical upstream containers connected to this cable.
@odata.id	string	<i>read-write</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.

Property	Type	Attributes	Notes
}]			
UpstreamPorts [{	array		An array of links to the upstream ports connected to this cable. This property shall contain an array of links to resources of type <code>Port</code> that represent the physical upstream connections connected to this cable.
@odata.id	string	<i>read-write</i>	Link to a Port resource. See the Links section and the <i>Port</i> schema for details.
}]			
UpstreamResources [{	array		An array of links to the upstream resources connected to this cable. This property shall contain an array of links to resources that represent the physical upstream connections connected to this cable. Even if the resource is already referenced in another property within <code>Links</code>, such as <code>UpstreamPorts</code> or <code>UpstreamChassis</code>, it shall also be referenced in this property.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
}			
Location {}	object		The location of the assembly. This property shall contain the location information of the associated assembly. For property details, see Location.
Manufacturer	string	<i>read-write (null)</i>	The manufacturer of this cable. This property shall contain the name of the organization responsible for producing the cable. This organization might be the entity from whom the cable is purchased, but this is not necessarily true.
Model	string	<i>read-write (null)</i>	The model number of the cable. This property shall contain the name by which the manufacturer generally refers to the cable.
PartNumber	string	<i>read-write (null)</i>	The part number for this cable. This property shall contain the part number assigned by the organization that is responsible for producing or manufacturing the cable.

Property	Type	Attributes	Notes
SerialNumber	string	<i>read-write (null)</i>	The serial number for this cable. This property shall contain the manufacturer-allocated number that identifies the cable.
SKU	string	<i>read-write (null)</i>	The SKU for this cable. This property shall contain the stock-keeping unit (SKU) number for this cable.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
UpstreamConnectorTypes []	array (string (enum))	<i>read-write</i>	- The connector types this cable supports. - The property shall contain an array of connector types this cable supports. For the possible property values, see <i>UpstreamConnectorTypes</i> in Property details.
UpstreamName	string	<i>read-write (null)</i>	The identifier for the downstream resource. This property shall contain any identifier for an upstream resource.
UserDescription	string	<i>read-write (null)</i>	The description of this cable. This property shall contain a user-defined description for this cable.
UserLabel (v1.1+)	string	<i>read-write</i>	A user-assigned label. This property shall contain a user-assigned label used to identify this resource. If a value has not been assigned by a user, the value of this property shall be an empty string.
Vendor	string	<i>read-write (null)</i>	The manufacturer of this cable. This property shall contain the name of the company that provides the final product that includes this cable.

6.18.4 Property details

6.18.4.1 CableClass

The identifier for the downstream resource.

- The property shall contain the cable class for this cable.

string	Description
Fabric	This cable is used for connecting to a fabric.
Fan	This cable is used for connecting to a fan system.
General	This cable is used for providing general connectivity.
Network	This cable is used for connecting to a networking system.
PCIe	This cable is used for connecting to a PCIe endpoint.
Power	This cable is used for connecting to a power system.
Serial	This cable is used for connecting to a serial endpoint.
Storage	This cable is used for connecting to a storage system.
USB	This cable is used for connecting to a USB endpoint.
Video	This cable is used for connecting to a video system.

6.18.4.2 CableStatus

The user-reported status of this resource.

- This property shall contain the user-reported status of this resource.

string	Description
Degraded	The cable is degraded. • This value shall indicate the cable is degraded. The <code>State</code> property in <code>Status</code> shall contain the value <code>Enabled</code> and the <code>Health</code> property in <code>Status</code> shall contain the value <code>Warning</code>.
Disabled	The cable is disabled. • This value shall indicate the cable is disabled. The <code>State</code> property in <code>Status</code> shall contain the value <code>Disabled</code>.
Failed	The cable has failed. • This value shall indicate the cable has failed. The <code>State</code> property in <code>Status</code> shall contain the value <code>Enabled</code> and the <code>Health</code> property in <code>Status</code> shall contain the value <code>Critical</code>.

string	Description
Normal	The cable is operating normally. This value shall indicate the cable is operating normally. The <code>State</code> property in <code>Status</code> shall contain the value <code>Enabled</code> and the <code>Health</code> property in <code>Status</code> shall contain the value <code>OK</code>.
SetByService	The cable status is set by the service. This value shall indicate the status for the cable is not defined by the user. If implemented, the service shall determine the value of the <code>State</code> and <code>Health</code> properties in <code>Status</code>.
Testing	The cable is under test. This value shall indicate the cable is under test. The <code>State</code> property in <code>Status</code> shall contain the value <code>InTest</code>.

6.18.4.3 DownstreamConnectorTypes

- The connector types this cable supports.
 - The property shall contain an array of connector types this cable supports.

string	Description
ACPower	This cable connects to an AC power connector.
CDFP	This cable connects to a CDFP connector.
DB9	This cable connects to a DB9 connector.
DCPower	This cable connects to a DC power connector.
DisplayPort	This cable connects to a DisplayPort power connector.
HDMI	This cable connects to an HDMI connector.
ICI	This cable connects to an ICI connector.
IPASS	This cable connects to an IPASS connector.
OSFP	This cable connects to an OSFP connector.
PCIe	This cable connects to a PCIe connector.
Proprietary	This cable connects to a proprietary connector.
QSFP	This cable connects to a QSFP connector.
RJ45	This cable connects to an RJ45 connector.

string	Description
SATA	This cable connects to a SATA connector.
SCSI	This cable connects to a SCSI connector.
SFP	This cable connects to an SFP connector.
SFPPlus	This cable connects to an SFPPlus connector.
SlimSAS	This cable connects to a SlimSAS connector.
USBA	This cable connects to a USB-A connector.
USBC	This cable connects to a USB-C connector.

6.18.4.4 UpstreamConnectorTypes

- The connector types this cable supports.
 - The property shall contain an array of connector types this cable supports.

string	Description
ACPower	This cable connects to an AC power connector.
CDFP	This cable connects to a CDFP connector.
DB9	This cable connects to a DB9 connector.
DCPower	This cable connects to a DC power connector.
DisplayPort	This cable connects to a DisplayPort power connector.
HDMI	This cable connects to an HDMI connector.
ICI	This cable connects to an ICI connector.
IPASS	This cable connects to an IPASS connector.
OSFP	This cable connects to an OSFP connector.
PCIe	This cable connects to a PCIe connector.
Proprietary	This cable connects to a proprietary connector.
QSFP	This cable connects to a QSFP connector.
RJ45	This cable connects to an RJ45 connector.
SATA	This cable connects to a SATA connector.

string	Description
SCSI	This cable connects to a SCSI connector.
SFP	This cable connects to an SFP connector.
SFPPlus	This cable connects to an SFPPlus connector.
SlimSAS	This cable connects to a SlimSAS connector.
USBA	This cable connects to a USB-A connector.
USBC	This cable connects to a USB-C connector.

6.18.5 Example response

```
{
  "@odata.type": "#Cable.v1_2_4.Cable",
  "Id": "hdmi_dp",
  "Name": "HDMI to DP Cable",
  "UserDescription": "HDMI to DisplayPort Cable",
  "UpstreamName": "HDMI0",
  "DownstreamName": "Video Out",
  "CableType": "HDMI",
  "LengthMeters": 0.1,
  "CableClass": "Video",
  "UpstreamConnectorTypes": [
    "HDMI"
  ],
  "DownstreamConnectorTypes": [
    "DisplayPort"
  ],
  "Links": {
    "UpstreamChassis": [
      {
        "@odata.id": "/redfish/v1/Chassis/bmc"
      }
    ]
  },
  "PartNumber": "934AMS02X",
  "Manufacturer": "Cable Co.",
  "SerialNumber": "2345791",
  "Vendor": "Cablestore",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "CableStatus": "Normal",
  "@odata.id": "/redfish/v1/Cables/hdmi_dp"
```

```
}
```

6.19 Certificate 1.10.0

Version	v1.10	v1.9	v1.8	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2025.2	2024.3	2023.2	2023.1	2022.1	2021.3	2021.2	2021.1	2020.1	2019.1	2018.3

6.19.1 Description

The `Certificate` schema describes a certificate that proves the identity of a component, account, or service.

- This resource shall represent a certificate for a Redfish implementation.

6.19.2 URIs

```
/redfish/v1/AccountService/Accounts/{ManagerAccountId}/Certificates/{CertificateId}
/redfish/v1/AccountService/ActiveDirectory/Certificates/{CertificateId}
/redfish/v1/AccountService/ExternalAccountProviders/{ExternalAccountProviderId}/Certificates/{CertificateId}
/redfish/v1/AccountService/LDAP/Certificates/{CertificateId}
/redfish/v1/AccountService/MultiFactorAuth/ClientCertificate/Certificates/{CertificateId}
/redfish/v1/AccountService/MultiFactorAuth/SecurID/Certificates/{CertificateId}
/redfish/v1/AccountService/OutboundConnections/{OutboundConnectionId}/Certificates/{CertificateId}
/redfish/v1/AccountService/OutboundConnections/{OutboundConnectionId}/ClientCertificates/{CertificateId}
/redfish/v1/Chassis/{ChassisId}/Certificates/{CertificateId}
/redfish/v1/Chassis/{ChassisId}/Drives/{DriveId}/Certificates/{CertificateId}
/redfish/v1/Chassis/{ChassisId}/Memory/{MemoryId}/Certificates/{CertificateId}
/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Certificates/{CertificateId}
/redfish/v1/Chassis/{ChassisId}/PowerSubsystem/PowerSupplies/{PowerSupplyId}/Certificates/{CertificateId}
/redfish/v1/Chassis/{ChassisId}/TrustedComponents/{TrustedComponentId}/Certificates/{CertificateId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Drives/{DriveId}/Certificates/{CertificateId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Memory/{MemoryId}/Certificates/{CertificateId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/Certificates/
{CertificateId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/
{StorageControllerId}/Certificates/{CertificateId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Drives/{DriveId}/Certificates/
{CertificateId} (deprecated)
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/StorageControllers/
```

{StorageControllerId}/Certificates/{CertificateId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Boot/Certificates/{CertificateId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Certificates/{CertificateId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/KeyManagement/KMIPCertificates/{CertificateId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Memory/{MemoryId}/Certificates/{CertificateId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/Certificates/{CertificateId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/SecureBoot/SecureBootDatabases/{DatabaseId}/Certificates/{CertificateId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Certificates/{CertificateId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Drives/{DriveId}/Certificates/{CertificateId} (deprecated)
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Certificates/{CertificateId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/VirtualMedia/{VirtualMediaId}/Certificates/{CertificateId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/VirtualMedia/{VirtualMediaId}/ClientCertificates/{CertificateId}
/redfish/v1/EventService/Subscriptions/{EventDestinationId}/Certificates/{CertificateId}
/redfish/v1/EventService/Subscriptions/{EventDestinationId}/ClientCertificates/{CertificateId}
/redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Certificates/{CertificateId}
/redfish/v1/Managers/{ManagerId}/Certificates/{CertificateId}
/redfish/v1/Managers/{ManagerId}/NetworkProtocol/HTTPS/Certificates/{CertificateId}
/redfish/v1/Managers/{ManagerId}/RemoteAccountService/Accounts/{ManagerAccountId}/Certificates/{CertificateId}
/redfish/v1/Managers/{ManagerId}/RemoteAccountService/ActiveDirectory/Certificates/{CertificateId}
/redfish/v1/Managers/{ManagerId}/RemoteAccountService/ExternalAccountProviders/{ExternalAccountProviderId}/Certificates/{CertificateId}
/redfish/v1/Managers/{ManagerId}/RemoteAccountService/LDAP/Certificates/{CertificateId}
/redfish/v1/Managers/{ManagerId}/RemoteAccountService/MultiFactorAuth/ClientCertificate/Certificates/{CertificateId}
/redfish/v1/Managers/{ManagerId}/RemoteAccountService/MultiFactorAuth/SecurID/Certificates/{CertificateId}
/redfish/v1/Managers/{ManagerId}/SecurityPolicy/SPDM/RevokedCertificates/{CertificateId}
/redfish/v1/Managers/{ManagerId}/SecurityPolicy/SPDM/TrustedCertificates/{CertificateId}
/redfish/v1/Managers/{ManagerId}/SecurityPolicy/TLS/Client/RevokedCertificates/{CertificateId}
/redfish/v1/Managers/{ManagerId}/SecurityPolicy/TLS/Client/TrustedCertificates/{CertificateId}
/redfish/v1/Managers/{ManagerId}/SecurityPolicy/TLS/Server/RevokedCertificates/{CertificateId}
/redfish/v1/Managers/{ManagerId}/SecurityPolicy/TLS/Server/TrustedCertificates/{CertificateId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Drives/{DriveId}/Certificates/{CertificateId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Memory/{MemoryId}/Certificates/{CertificateId}

/redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/Certificates/{CertificateId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Certificates/
{CertificateId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Drives/{DriveId}/Certificates/{CertificateId}
(deprecated)
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/StorageControllers/{StorageControllerId}/
Certificates/{CertificateId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Boot/Certificates/{CertificateId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Certificates/{CertificateId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/KeyManagement/KMIPCertificates/
{CertificateId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Memory/{MemoryId}/Certificates/
{CertificateId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/Certificates/
{CertificateId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/SecureBoot/SecureBootDatabases/
{DatabaseId}/Certificates/{CertificateId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/
{StorageControllerId}/Certificates/{CertificateId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Drives/{DriveId}/
Certificates/{CertificateId} (deprecated)
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/
StorageControllers/{StorageControllerId}/Certificates/{CertificateId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/VirtualMedia/{VirtualMediaId}/
Certificates/{CertificateId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/VirtualMedia/{VirtualMediaId}/
ClientCertificates/{CertificateId}
/redfish/v1/Storage/{StorageId}/Controllers/{StorageControllerId}/Certificates/{CertificateId}
/redfish/v1/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Certificates/{CertificateId}
/redfish/v1/Systems/{ComputerSystemId}/Boot/Certificates/{CertificateId}
/redfish/v1/Systems/{ComputerSystemId}/Certificates/{CertificateId}
/redfish/v1/Systems/{ComputerSystemId}/KeyManagement/KMIPCertificates/{CertificateId}
/redfish/v1/Systems/{ComputerSystemId}/Memory/{MemoryId}/Certificates/{CertificateId}
/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/Certificates/{CertificateId}
/redfish/v1/Systems/{ComputerSystemId}/SecureBoot/SecureBootDatabases/{DatabaseId}/Certificates/{CertificateId}
/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Certificates/
{CertificateId}
/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Drives/{DriveId}/Certificates/{CertificateId}
(deprecated)
/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Certificates/
{CertificateId}
/redfish/v1/Systems/{ComputerSystemId}/VirtualMedia/{VirtualMediaId}/Certificates/{CertificateId}
/redfish/v1/Systems/{ComputerSystemId}/VirtualMedia/{VirtualMediaId}/ClientCertificates/{CertificateId}

/redfish/v1/UpdateService/ClientCertificates/{CertificateId}

/redfish/v1/UpdateService/RemoteServerCertificates/{CertificateId}

6.19.3 Properties

Property	Type	Attributes	Notes
CertificateString	string	<i>read-only required on create (null)</i>	The string for the certificate. This property shall contain the certificate, and the format shall follow the requirements specified by the <code>CertificateType</code> property value. If the certificate contains any private keys, they shall be removed from the string in responses. If the service does not know the private key for the certificate and is needed to use the certificate, the client shall provide the private key as part of the string in the <code>POST</code> request. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification. <i>For more information about this property, see Property details.</i>
CertificateType	string (enum)	<i>read-only required on create (null)</i>	The format of the certificate. This property shall contain the format type for the certificate. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification. <i>For the possible property values, see CertificateType in Property details.</i>
CertificateUsageTypes (v1.4+) []	array (string (enum))	<i>read-only (null)</i>	- The types or purposes for this certificate. - The value of this property shall contain an array describing the types or purposes for this certificate. <i>For the possible property values, see CertificateUsageTypes in Property details.</i>
Fingerprint (v1.3+)	string	<i>read-only</i>	The fingerprint of the certificate. The value of this property shall be a string containing the ASCII representation of the fingerprint of the certificate. The hash algorithm used to generate this fingerprint shall be specified by the <code>FingerprintHashAlgorithm</code> property. Pattern: <code>^([0-9A-Fa-f]{2}:){0,}([0-9A-Fa-f]{2})\$</code>
FingerprintHashAlgorithm (v1.3+)	string	<i>read-only</i>	The hash algorithm for the fingerprint of the certificate. The value of this property shall be a string containing the hash algorithm used for generating the <code>Fingerprint</code> property. The value shall be one of the strings in the 'Algorithm Name' field of the 'TPM_ALG_ID Constants' table within the 'Trusted Computing Group Algorithm Registry'.

Property	Type	Attributes	Notes
Issuer {	object		The issuer of the certificate. This property shall contain an object containing information about the issuer of the certificate.
AdditionalCommonNames (v1.6+) []	array (string, null)	<i>read-only</i>	Additional common names of the entity. The value of this property shall contain an array of additional common names for the entity, as defined by the RFC5280 'commonName' attribute, in array order as they appear in the certificate. This property shall not be present if only one common name is found. The first common name shall not appear in this property.
AdditionalOrganizationalUnits (v1.6+) []	array (string, null)	<i>read-only</i>	Additional organizational units of the entity. The value of this property shall contain an array of additional organizational units for the entity, as defined by the RFC5280 'organizationalUnitName' attribute, in array order as they appear in the certificate. This property shall not be present if only one organizational unit is found. The first organizational unit shall not appear in this property.
AlternativeNames (v1.7+) []	array (string, null)	<i>read-only</i>	The additional host names of the entity. This property shall contain the additional host names of the entity, as defined by the RFC5280 'subjectAltName' attribute. This property shall not be present in the <code>Issuer</code> property.
City	string	<i>read-only</i>	The city or locality of the organization of the entity. This property shall contain the city or locality of the organization of the entity, as defined by the RFC5280 'localityName' attribute.
CommonName	string	<i>read-only</i>	The common name of the entity. This property shall contain the common name of the entity, as defined by the RFC5280 'commonName' attribute.
Country	string	<i>read-only</i>	The country of the organization of the entity. This property shall contain the two-letter ISO code for the country of the organization of the entity, as defined by the RFC5280 'countryName' attribute.

Property	Type	Attributes	Notes
DisplayString (v1.6+)	string	<i>read-only</i> (null)	A human-readable string for this identifier. The value of this property shall contain a display string that represents the entire identifier. The string should be formatted using industry conventions, such as the single-line human-readable string described by RFC2253 and preserving the field order as shown in the certificate.
DomainComponents (v1.6+) []	array (string, null)	<i>read-only</i>	The domain components of the entity. The value of this property shall contain an array of domain component fields for the entity, as defined by the RFC4519 'domainComponent' attribute, in array order as they appear in the certificate.
Email	string	<i>read-only</i> (null)	The email address of the contact within the organization of the entity. This property shall contain the email address of the contact within the organization of the entity, as defined by the RFC2985 'emailAddress' attribute.
Organization	string	<i>read-only</i>	The name of the organization of the entity. This property shall contain the name of the organization of the entity, as defined by the RFC5280 'organizationName' attribute.
OrganizationalUnit	string	<i>read-only</i>	The name of the unit or division of the organization of the entity. This property shall contain the name of the unit or division of the organization of the entity, as defined by the RFC5280 'organizationalUnitName' attribute.
State	string	<i>read-only</i>	The state, province, or region of the organization of the entity. This property shall contain the state, province, or region of the organization of the entity, as defined by the RFC5280 'stateOrProvinceName' attribute.
}			
KeyUsage []	array (string (enum))	<i>read-only</i> (null)	The usages of a key contained within a certificate. - The key usage extension, which defines the purpose of the public keys in this certificate. - This property shall contain the key usage extension, which defines the purpose of the public keys in this certificate. <i>For the possible property values, see KeyUsage in Property details.</i>

Property	Type	Attributes	Notes
Links (v1.4+) {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Issuer (v1.4+) {	object	(null)	A link to the certificate of the CA that issued this certificate. This property shall contain a link to a resources of type <code>Certificate</code> that represents the certificate of the CA that issued this certificate.
@odata.id	string	read-write	Link to another Certificate resource.
}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
Subjects (v1.4+) [{	array		An array of links to certificates that were issued by the CA that is represented by this certificate. This property shall contain an array of links to resources of type <code>Certificate</code> that were issued by the CA that is represented by this certificate.
@odata.id	string	read-write	Link to another Certificate resource.
}]			
}			
Password (v1.10+)	string	read-write (null)	The password for the certificate. This property shall contain the password for the certificate contained in the <code>CertificateString</code> property. This property shall be required in create requests if the <code>CertificateType</code> property contains <code>PKCS12</code> and the client-provided certificate is password protected. This property shall not be present in responses.
SerialNumber (v1.3+)	string	read-only	The serial number of the certificate. The value of this property shall be a string containing the ASCII representation of the serial number of the certificate, as defined by the RFC5280 'serialNumber' field. Pattern: <code>^([0-9A-Fa-f]{2}:){0,}([0-9A-Fa-f]{2})\$</code>

Property	Type	Attributes	Notes
SignatureAlgorithm (v1.3+)	string	<i>read-only</i>	The algorithm used for creating the signature of the certificate. The value of this property shall be a string containing the algorithm used for generating the signature of the certificate, as defined by the RFC5280 'signatureAlgorithm' field. The value shall be a string representing the ASN.1 OID of the signature algorithm as defined in, but not limited to, RFC3279, RFC4055, or RFC4491.
SPDM (v1.5+) {	object		SPDM-related information for the certificate. The value of this property shall contain SPDM-related information for the certificate. This property shall only be present for SPDM certificates.
SlotId (v1.5+)	integer	<i>read-only</i> (null)	Slot identifier of the certificate. The value of this property shall contain an integer between 0 and 7, inclusive, that represents the slot identifier for an SPDM-provided certificate.
}			
Status (v1.10+) {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
Subject {	object		The subject of the certificate. This property shall contain an object containing information about the subject of the certificate.
AdditionalCommonNames (v1.6+) []	array (string, null)	<i>read-only</i>	Additional common names of the entity. The value of this property shall contain an array of additional common names for the entity, as defined by the RFC5280 'commonName' attribute, in array order as they appear in the certificate. This property shall not be present if only one common name is found. The first common name shall not appear in this property.

Property	Type	Attributes	Notes
AdditionalOrganizationalUnits (v1.6+) []	array (string, null)	<i>read-only</i>	Additional organizational units of the entity. The value of this property shall contain an array of additional organizational units for the entity, as defined by the RFC5280 'organizationalUnitName' attribute, in array order as they appear in the certificate. This property shall not be present if only one organizational unit is found. The first organizational unit shall not appear in this property.
AlternativeNames (v1.7+) []	array (string, null)	<i>read-only</i>	The additional host names of the entity. This property shall contain the additional host names of the entity, as defined by the RFC5280 'subjectAltName' attribute. This property shall not be present in the <i>Issuer</i> property.
City	string	<i>read-only</i>	The city or locality of the organization of the entity. This property shall contain the city or locality of the organization of the entity, as defined by the RFC5280 'localityName' attribute.
CommonName	string	<i>read-only</i>	The common name of the entity. This property shall contain the common name of the entity, as defined by the RFC5280 'commonName' attribute.
Country	string	<i>read-only</i>	The country of the organization of the entity. This property shall contain the two-letter ISO code for the country of the organization of the entity, as defined by the RFC5280 'countryName' attribute.
DisplayString (v1.6+)	string	<i>read-only</i> (null)	A human-readable string for this identifier. The value of this property shall contain a display string that represents the entire identifier. The string should be formatted using industry conventions, such as the single-line human-readable string described by RFC2253 and preserving the field order as shown in the certificate.
DomainComponents (v1.6+) []	array (string, null)	<i>read-only</i>	The domain components of the entity. The value of this property shall contain an array of domain component fields for the entity, as defined by the RFC4519 'domainComponent' attribute, in array order as they appear in the certificate.
Email	string	<i>read-only</i> (null)	The email address of the contact within the organization of the entity. This property shall contain the email address of the contact within the organization of the entity, as defined by the RFC2985 'emailAddress' attribute.

Property	Type	Attributes	Notes
Organization	string	<i>read-only</i>	The name of the organization of the entity. This property shall contain the name of the organization of the entity, as defined by the RFC5280 'organizationName' attribute.
OrganizationalUnit	string	<i>read-only</i>	The name of the unit or division of the organization of the entity. This property shall contain the name of the unit or division of the organization of the entity, as defined by the RFC5280 'organizationalUnitName' attribute.
State	string	<i>read-only</i>	The state, province, or region of the organization of the entity. This property shall contain the state, province, or region of the organization of the entity, as defined by the RFC5280 'stateOrProvinceName' attribute.
}			
UefiSignatureOwner (v1.2+)	string (uuid)	<i>read-only</i> (null)	The UEFI signature owner for this certificate. The value of this property shall contain the GUID of the UEFI signature owner for this certificate as defined by the UEFI Specification. This property shall only be present for certificates managed by UEFI. Pattern: <code>^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\$</code>
ValidNotAfter	string (date-time)	<i>read-only</i>	The date when the certificate is no longer valid. This property shall contain the date when the certificate validity period ends.
ValidNotBefore	string (date-time)	<i>read-only</i>	The date when the certificate becomes valid. This property shall contain the date when the certificate validity period begins.

6.19.4 Actions

6.19.4.1 Rekey (v1.1+)

Description

This action generates a new key-pair for a certificate and produces a certificate signing request.

- This action shall use the certificate data to generate a new key-pair for a certificate. The response shall contain a signing request that a certificate authority (CA) will sign. The service should retain the private key that generated

this request for installation of the certificate. The private key should not be part of the response. The private key should not be part of the response.

Action URI

{Base URI of target resource}/Actions/Certificate.Rekey

Action parameters

Parameter Name	Type	Attributes	Notes
ChallengePassword	string	<i>optional</i>	The challenge password to apply to the certificate for revocation requests. This property shall contain the challenge password to apply to the certificate for revocation requests as defined by the RFC2985 'challengePassword' attribute.
KeyBitLength	integer	<i>optional</i>	The length of the key, in bits, if needed based on the <code>KeyPairAlgorithm</code> parameter value. This parameter shall contain the length of the key, in bits, if needed based on the <code>KeyPairAlgorithm</code> parameter value.
KeyCurveId	string	<i>optional</i>	The curve ID to use with the key, if needed based on the <code>KeyPairAlgorithm</code> parameter value. This parameter shall contain the curve ID to use with the key, if needed based on the <code>KeyPairAlgorithm</code> parameter value. The allowable values for this parameter shall be the strings in the 'Name' field of the 'TPM_ECC_CURVE Constants' table within the 'Trusted Computing Group Algorithm Registry'.
KeyPairAlgorithm	string	<i>optional</i>	The type of key-pair for use with signing algorithms. This parameter shall contain the type of key-pair for use with signing algorithms. The allowable values for this parameter shall be the strings in the 'Algorithm Name' field of the 'TPM_ALG_ID Constants' table within the 'Trusted Computing Group Algorithm Registry'.

Response Payload

{			
Certificate (v1.1+) {	object	<i>required</i>	The link to the certificate being rekeyed. This property shall contain a link to a resource of type <code>Certificate</code> that is replaced after the certificate authority (CA) signs the certificate.

@odata.id	string	read-only	Link to another Certificate resource.
}			
CSRString (v1.1+)	string	read-only required	The string for the certificate signing request. This property shall contain the certificate signing request as a PEM-encoded string, containing structures specified by RFC2986. The private key should not be part of the string.
}			

Request Example

```
{
  "KeyPairAlgorithm": "TPM_ALG_RSA",
  "KeyBitLength": 4096
}
```

Response Example

```
{
  "CSRString": "-----BEGIN CERTIFICATE REQUEST-----...-----END CERTIFICATE REQUEST-----",
  "Certificate": {
    "@odata.id": "/redfish/v1/Managers/BMC/NetworkProtocol/HTTPS/Certificates/1"
  }
}
```

6.19.4.2 Renew (v1.1+)

Description

This action generates a certificate signing request by using the existing information and key-pair of the certificate.

- This action shall generate a certificate signing request using the existing information and key-pair of the certificate. The response shall contain a signing request that a certificate authority (CA) will sign. The service should retain the private key that this request generates for when the certificate is installed. The private key should not be part of the response.

Action URI

{Base URI of target resource}/Actions/Certificate.Renew

Action parameters

Parameter Name	Type	Attributes	Notes
ChallengePassword	string	<i>optional</i>	The challenge password to apply to the certificate for revocation requests. This property shall contain the challenge password to apply to the certificate for revocation requests as defined by the RFC2985 'challengePassword' attribute.

Response Payload

{			
Certificate (v1.1+) {	object	<i>required</i>	The link to the certificate being renewed. This property shall contain a link to a resource of type <code>Certificate</code> that is replaced after the certificate authority (CA) signs the certificate.
@odata.id	string	<i>read-only</i>	Link to another Certificate resource.
}			
CSRString (v1.1+)	string	<i>read-only required</i>	The string for the certificate signing request. This property shall contain the certificate signing request as a PEM-encoded string, containing structures specified by RFC2986. The private key should not be part of the string.
}			

Request Example

```
{
  "ChallengePassword": "p4ssw0rd"
}
```

Response Example

```
{
  "CSRString": "-----BEGIN CERTIFICATE REQUEST-----...-----END CERTIFICATE REQUEST-----",
  "Certificate": {
    "@odata.id": "/redfish/v1/Managers/BMC/NetworkProtocol/HTTPS/Certificates/1"
  }
}
```


6.19.5 Property details

6.19.5.1 CertificateString

The string for the certificate.

- This property shall contain the certificate, and the format shall follow the requirements specified by the `CertificateType` property value. If the certificate contains any private keys, they shall be removed from the string in responses. If the service does not know the private key for the certificate and is needed to use the certificate, the client shall provide the private key as part of the string in the `POST` request. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification.

When a certificate of type `PEMchain` or `PKCS7` is installed, the service may create multiple resources to represent each of the certificates found in the string. If the service divides the request into multiple resources, the service:

- Shall provide the response with the resource that represents the first certificate in the string.
- Shall apply the appropriate value for `CertificateType` for each of the new resources.
- Should populate the `Issuer` property within the `Links` property.
- May populate the `Subjects` property within the `Links` property.

To satisfy JSON encoding requirements, newlines in the string shall be replaced with `\n`. Standard JSON libraries typically manage this conversion automatically.

6.19.5.2 CertificateType

The format of the certificate.

- This property shall contain the format type for the certificate. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification.

6.19.5.2.1 PEMchain

When the value of `CertificateType` is `PEMchain`, the format represents a series of certificates. The format shall be a concatenation, in order, of the following:

- The private key of the leaf certificate.
 - The private key may be omitted.
- The leaf certificate for the end entity.
 - The leaf certificate may be omitted.
 - If the leaf certificate is omitted, the private key shall be omitted.
- A set of certificate authority (CA) certificates in order of issuance.

The private key shall be encoded as described in section 10 of [RFC7468](#).

The leaf certificate and CA certificates shall be certificates as defined by [RFC5280](#) and shall be encoded as described in section 5 of RFC7468.

Each certificate in the set of CA certificates shall be the issuer of the preceding certificate. For example, the first CA certificate is the issuer of the leaf certificate, the second CA certificate is the issuer of the first CA certificate, and so on. The last CA certificate typically represents the root CA and is self-signed. The set of certificates should contain all certificates leading to the root CA.

The following example for a `PEMchain` certificate contains three certificates: the leaf certificate for `"*.dmtf.org"`, the CA certificate `"Go Daddy Secure Certificate Authority - G2"`, and the root CA certificate `"Go Daddy Root Certificate Authority - G2"`.

```
-----BEGIN CERTIFICATE-----
MIIGPzCCBY+gAwIBAgIJA03nRphCG8xGMA0GCSqGSIb3DQEBCwUAMIG0MQswCQYD
VQQGEwJVUzEQMA4GA1UECBMHQXJpem9uYTETMBEGA1UEBxMKU2NvdHRzZGFsZTEa
MBGGA1UECHMRRT29EYWRkeS5jb20sIEluYy4xLTArBgNVBAsTJGh0dHA6Ly9jZXJ0
cy5nb2RhZGR5LmNvbS9yZXBvc2l0b3J5LzEzMDEGA1UEAxMQR28gRGFkZHZkU2Vj
dXJlIENlcnRpZm1jYXR1IEF1dGhvcml0eSAtIEcyMB4XDTE5MDYxNTE1MDIyNFoX
DTIxMDgxNDE5MDQ0M1owODEhMB8GA1UECzMjYWRG9tYy4xLTArBgNVBAsTJGh0dHA6
Ly9jZXJ0cy5nb2RhZGR5LmNvbS9yZXBvc2l0b3J5LzEzMDEGA1UEAxMQR28gRGFkZHZk
U2VjZGVkMRMwEQYDVQDDA0QmRtdGYub3JnMIIBIjANBgkqhkiG9w0BAQEFAAQCAQ8A
MIIBCgKCAQEAvEVrgkWo0z0kAEMqa3mna38M1N41vztntdE3G1m1IB5cHL1igJm0
PKn1vF0ShxBCOXKRMn8Z3HsbFQ4IQRD20meT6LWnMHCHE5+DKHdDzvz6SSlwmOF+
arAQdBRXKryvVVvpw2YLGTwc572t2WqhKORC7eaT9D/kxJmhVIt4NwNGj4Aw16
5fqNxxqWLDJE9wHYgxMYv78gZaV66wZmE0MiyPSKI0Vt1Zs8gryHdDG8iWbP0At
n098jcrkOkIE5ewDq/jBHXdfFtgJtSkBIR4wpgmM+tl8pgEplYntWM/0xPBphJf6k
Ljcou1HeW8r5Fv6I85fnNR7gw5pxnFz1wIDAQAB04IDNTCCAzEwDAYDVR0TAQH/
BAIwADAdBgNVHSUEFjAUBggrBgEFBQcDAQYIKwYBBQUHAWIwDgYDVDR0PAQH/BAQD
AgWgMDgGA1UdHwQMC8wLaAroCmGJ2h0dHA6Ly9jcmwuZ29kYWRkeS5jb20vZ2Rp
ZzJzMS0xMTc1LmNybDBdBgNVHSAEYjBUMEgGC2CGSAGG/W0BBxcBMDkwnWYIKwYB
BQUHAgEwK2h0dHA6Ly9jZXJ0awZpY2F0ZXMuZ29kYWRkeS5jb20vcmVwb3NpdG9y
eS8wCAYGZ4EMAQIBMHYGCCsGAQUFBwEBBGowaDAkBggrBgEFBQcwAYYYaHR0cDov
L29jc3AuZ29kYWRkeS5jb20vMEAGCCsGAQUFBzACHjRodHRwOi8vY2VydG1maWNh
dGVzLmdvZGFkZHZkU29tL3JlcG9zaXRvcnkVZ2RpZzIuY3J0MB8GA1UdIwYMBAA
FEDCvSe0zDSDMKIz1/tss/C0LIDOMB8GA1UdEQQYMBaCCiouZG10Zi5vcmeCCGRt
dGYub3JnMB0GA1UdDgQWBQZ2F2Fj14M4081b615o+91idrySDCCAX4GCisGAQQB
1nkCBAIEggFuBIIBagFoAHYAPlKJkLQYWSHux0izGdwCjw1mAT5G9+443fNDsgN
3BAAAAFrW6lKdGAABAMARzBFAiAJcq0n6x917jSYgE1Dot7wcN//5Xmbi6ZV04Ke
D5tEdAIhAK8iYDLb6rHEscWcPOu7XHUj3l/oqtez4KBh4wvCsn3GAHYA7ku9t3X0
YLrhQmkf+GeZqMPf1+wctiDAMR7iXqo/csAAAFrW6lQQQAABAMARzBFAiEAqohS
sS1GBdXgemmfXuthuox/T8kKNwqmsTwtMNG2J9MCIBQBQTwmO/C7W4g+U/J0B4vU
LKWPGOYrnoOwHLdwpXQAHYARJR1LrDuzq/EQAFYqP4owNrmgr7YyzG1P9Mz1rW2
gagAAAFrW6lSdwAABAMARzBFAiEA44PR+UD/fXG57Edi/WdAiuTvu03xsN2dJKA2
yG16TVMCIEP4D0A4C/3avvjo+Tc7IAPm98yF4gQhpxyevFFVGw+YMA0GCSqGSIb3
DQEBCwUAA4IBAQCx/1p1gal19B0+jg+0SdtFtSC81pF1Fkp/QQ2/9cvo6ek1C3H1
kvAizu4+mzB77o+y47WJICX90F1k/xVWXKp3Nq6XoQQGJc9hbzdLHERZqE0t+3bB
4/ZNBpxeE2a01/80hKiA0ibYuAJn8ach5dVfk7Yy7Uv1LqyGw/YyRdPtuka4s7NA
8YLhFK5LfMKm/9HAi4Q7XJ6b1nFKppemhqSdardJ48u6q1LUcm64EmhZjwjUaE6f
```

Version 2025.2

```
LPAvTK33sefOT6jEm0pUBsV/fdUID+Ic/n4XuKxe9tQWskMJDE32p2u0mYR1ynqI
4uJEv1z36hz1
-----END CERTIFICATE-----
```

6.19.5.2.2 PEM

When the value of `CertificateType` is `PEM`, the format represents a single certificate and an optional private key. The format shall be an order independent concatenation of the following:

- The private key of the leaf certificate.
 - The private key may be omitted.
- The leaf certificate for the end entity.

The private key shall be encoded as described in section 10 of [RFC7468](#).

The leaf certificate shall be a certificate as defined by [RFC5280](#) and shall be encoded as described in section 5 of RFC7468.

6.19.5.2.3 PKCS7

When the value of `CertificateType` is `PKCS7`, the format represents a PKCS7 bundle and an optional private key. The format shall be an order independent concatenation of the following:

- The private key of the PKCS7 bundle.
 - The private key may be omitted.
- The PKCS7 bundle containing one or more certificates.

The private key shall be encoded as described in section 10 of [RFC7468](#).

The PKCS7 bundle shall contain one or more certificates as defined by [RFC5280](#) and shall be encoded as described in section 8 of RFC7468.

6.19.5.2.4 PKCS12

When the value of `CertificateType` is `PKCS12`, the format represents a PKCS12 binary file defined by [RFC7292](#). The binary file shall be represented as a Base64-encoded string, with padding characters. The binary file may be password-protected.

string	Description
PEM	A Privacy Enhanced Mail (PEM)-encoded single certificate. This value shall indicate the format of the certificate shall contain a Privacy Enhanced Mail (PEM)-encoded string, containing RFC5280-defined structures, representing a single certificate.
PEMchain (v1.4+)	A Privacy Enhanced Mail (PEM)-encoded certificate chain. This value shall indicate the format of the certificate shall contain a Privacy Enhanced Mail (PEM)-encoded string, containing RFC5280-defined structures, representing a certificate chain. When this value is specified, the properties of the resource, except for <code>CertificateString</code>, shall contain the information from the leaf certificate. When this value is specified, <code>CertificateString</code> shall contain the entire PEM chain.
PKCS12 (v1.10+)	A Base64-encoded PKCS12 certificate bundle. This value shall indicate the format of the certificate shall contain a Base64-encoded string, with padding characters, containing RFC7292-defined structures, representing a PKCS12 archive of one or more certificates, keys, or other cryptographic data. The service may discard additional certificates or other data in the structure.
PKCS7	A Privacy Enhanced Mail (PEM)-encoded PKCS7 certificate. The format of the certificate shall contain a Privacy Enhanced Mail (PEM)-encoded string, containing RFC5280-defined and RFC2315-defined structures. The service may discard additional certificates or other data in the structure.

6.19.5.3 CertificateUsageTypes

- The types or purposes for this certificate.
 - The value of this property shall contain an array describing the types or purposes for this certificate.

string	Description
BIOS	This certificate is a BIOS certificate like those associated with UEFI.
Device	This certificate is a device type certificate like those associated with SPDM and other standards.
EK	This certificate is an EK certificate like those associated with TCG TPMs.
IAK	This certificate is an IAK certificate like those associated with TCG TPMs.
IDevID	This certificate is an IDevID certificate like those associated with TCG TPMs.
LAK	This certificate is an LAK certificate like those associated with TCG TPMs.
LDevID	This certificate is an LDevID certificate like those associated with TCG TPMs.

string	Description
Platform	This certificate is a platform type certificate like those associated with SPDm and other standards.
SSH	This certificate is used for SSH.
User	This certificate is a user certificate like those associated with a manager account.
Web	This certificate is a web or HTTPS certificate like those used for event destinations.

6.19.5.4 KeyUsage

The usages of a key contained within a certificate.

- The key usage extension, which defines the purpose of the public keys in this certificate.
 - This property shall contain the key usage extension, which defines the purpose of the public keys in this certificate.

string	Description
ClientAuthentication	TLS WWW client authentication.
CodeSigning	Signs downloadable executable code.
CRLSigning	Verifies signatures on certificate revocation lists (CRLs).
DataEncipherment	Directly enciphers raw user data without an intermediate symmetric cipher.
DecipherOnly	Deciphers data while performing a key agreement.
DigitalSignature	Verifies digital signatures, other than signatures on certificates and CRLs.
EmailProtection	Email protection.
EncipherOnly	Enciphers data while performing a key agreement.
KeyAgreement	Key agreement.
KeyCertSign	Verifies signatures on public key certificates.
KeyEncipherment	Enciphers private or secret keys.
NonRepudiation	Verifies digital signatures, other than signatures on certificates and CRLs, and provides a non-repudiation service that protects against the signing entity falsely denying some action.
OCSPSigning	Signs OCSP responses.
ServerAuthentication	TLS WWW server authentication.
Timestamping	Binds the hash of an object to a time.

6.19.6 Example response

```
{
  "@odata.type": "#Certificate.v1_10_0.Certificate",
  "Id": "1",
  "Name": "HTTPS Certificate",
  "CertificateString": "-----BEGIN CERTIFICATE-----\nMIIFsTCC [*truncated*] GXG5z1jlu\n-----END\nCERTIFICATE-----",
  "CertificateType": "PEM",
  "Issuer": {
    "Country": "US",
    "State": "Oregon",
    "City": "Portland",
    "Organization": "Contoso",
    "OrganizationalUnit": "ABC",
    "CommonName": "manager.contoso.org"
  },
  "Subject": {
    "Country": "US",
    "State": "Oregon",
    "City": "Portland",
    "Organization": "Contoso",
    "OrganizationalUnit": "ABC",
    "CommonName": "manager.contoso.org"
  },
  "ValidNotBefore": "2018-09-07T13:22:05Z",
  "ValidNotAfter": "2019-09-07T13:22:05Z",
  "KeyUsage": [
    "KeyEncipherment",
    "ServerAuthentication"
  ],
  "SerialNumber": "5d:7a:d8:df:f6:fc:c1:b3:ca:fe:fb:cc:38:f3:01:64:51:ea:05:cb",
  "Fingerprint": "A6:E9:D2:5C:DC:52:DA:4B:3B:14:97:F3:A4:53:D9:99:A1:0B:56:41",
  "FingerprintHashAlgorithm": "TPM_ALG_SHA1",
  "SignatureAlgorithm": "sha256WithRSAEncryption",
  "@odata.id": "/redfish/v1/Managers/BMC/NetworkProtocol/HTTPS/Certificates/1"
}
```

6.20 CertificateLocations 1.0.4

Version	v1.0
Release	2018.3

6.20.1 Description

The `CertificateLocations` schema describes a resource that an administrator can use in order to locate all certificates installed on a given service.

- This resource shall represent the certificate location properties for a Redfish implementation.

6.20.2 URIs

/redfish/v1/CertificateService/CertificateLocations

6.20.3 Properties

Property	Type	Attributes	Notes
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Certificates [{	array		An array of links to the certificates installed on this service. • This property shall contain an array of links to resources of type <code>Certificate</code> that are installed on this service.
@odata.id	string	<i>read-only</i>	Link to a Certificate resource. See the Links section and the <i>Certificate</i> schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			

6.20.4 Example response

```
{
  "@odata.type": "#CertificateLocations.v1_0_4.CertificateLocations",
  "Id": "CertificateLocations",
  "Name": "Certificate Locations",
  "Links": {
    "Certificates": [
      {
        "@odata.id": "/redfish/v1/Managers/BMC/NetworkProtocol/HTTPS/Certificates/1"
      }
    ]
  }
}
```



```
    }
  ],
},
"@odata.id": "/redfish/v1/CertificateService/CertificateLocations"
}
```

6.21 CertificateService 1.1.0

Version	v1.1	v1.0
Release	2025.1	2018.3

6.21.1 Description

The `CertificateService` schema describes a certificate service that represents the actions available to manage certificates and links to the certificates.

- This resource shall represent the certificate service properties for a Redfish implementation.

6.21.2 URIs

/redfish/v1/CertificateService

6.21.3 Properties

Property	Type	Attributes	Notes
CertificateLocations {	object		The information about the location of certificates. This property shall contain a link to a resource of type <code>CertificateLocations</code>. See the <i>CertificateLocations</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a CertificateLocations resource. See the Links section and the <i>CertificateLocations</i> schema for details.
}			

6.21.4 Actions

6.21.4.1 GenerateCSR

Description

This action makes a certificate signing request.

- This action shall make a certificate signing request. The response shall contain a signing request that a certificate authority (CA) will sign. The service should retain the private key that was generated during this request for installation of the certificate. The private key should not be part of the response.

Action URI

{Base URI of target resource}/Actions/CertificateService.GenerateCSR

Action parameters

Parameter Name	Type	Attributes	Notes
AlternativeNames []	array (string)	<i>optional</i>	The additional host names of the component to secure. • This parameter shall contain an array of additional host names of the component to secure, as defined by the RFC5280 'subjectAltName' attribute.
CertificateCollection {	object	<i>required</i>	The link to the certificate collection where the certificate is installed after the certificate authority (CA) signs the certificate. • This parameter shall contain a link to a resource collection of type <code>CertificateCollection</code> where the certificate is installed after the certificate authority (CA) signs the certificate. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
ChallengePassword	string	<i>optional</i>	The challenge password to apply to the certificate for revocation requests. • This property shall contain the challenge password to apply to the certificate for revocation requests as defined by the RFC2985 'challengePassword' attribute.
City	string	<i>optional</i>	The city or locality of the organization making the request. • This parameter shall contain the city or locality of the organization making the request, as defined by the RFC5280 'localityName' attribute.

Parameter Name	Type	Attributes	Notes
CommonName	string	<i>required</i>	The fully qualified domain name of the component to secure. This parameter shall contain the fully qualified domain name of the component to secure, as defined by the RFC5280 'commonName' attribute.
ContactPerson	string	<i>optional</i>	The name of the user making the request. This property shall contain the name of the user making the request, as defined by the RFC5280 'name' attribute.
Country	string	<i>optional</i>	The two-letter country code of the organization making the request. This parameter shall contain the two-letter ISO code for the country of the organization making the request, as defined by the RFC5280 'countryName' attribute.
Email	string	<i>optional</i>	The email address of the contact within the organization making the request. This parameter shall contain the email address of the contact within the organization making the request, as defined by the RFC2985 'emailAddress' attribute.
GivenName	string	<i>optional</i>	The given name of the user making the request. This parameter shall contain the given name of the user making the request, as defined by the RFC5280 'givenName' attribute.
Initials	string	<i>optional</i>	The initials of the user making the request. This parameter shall contain the initials of the user making the request, as defined by the RFC5280 'initials' attribute.
KeyBitLength	integer	<i>optional</i>	The length of the key, in bits, if needed based on the <code>KeyPairAlgorithm</code> parameter value. This parameter shall contain the length of the key, in bits, if needed based on the <code>KeyPairAlgorithm</code> parameter value.
KeyCurveId	string	<i>optional</i>	The curve ID to use with the key, if needed based on the <code>KeyPairAlgorithm</code> parameter value. This parameter shall contain the curve ID to use with the key, if needed based on the <code>KeyPairAlgorithm</code> parameter value. The allowable values for this parameter shall be the strings in the 'Name' field of the 'TPM_ECC_CURVE Constants' table within the 'Trusted Computing Group Algorithm Registry'.

Parameter Name	Type	Attributes	Notes
KeyPairAlgorithm	string	<i>optional</i>	The type of key-pair for use with signing algorithms. This parameter shall contain the type of key-pair for use with signing algorithms. The allowable values for this parameter shall be the strings in the 'Algorithm Name' field of the 'TPM_ALG_ID Constants' table within the 'Trusted Computing Group Algorithm Registry'.
KeyUsage []	array (string (enum))	<i>read-write</i>	The usages of a key contained within a certificate. - The usage of the key contained in the certificate. - This parameter shall contain the usage of the key contained in the certificate. If the client does not provide this value, the service can determine the appropriate key usage settings in the certificate signing request. <i>For the possible property values, see KeyUsage in Property details.</i>
Organization	string	<i>optional</i>	The name of the organization making the request. This parameter shall contain the name of the organization making the request, as defined by the RFC5280 'organizationName' attribute.
OrganizationalUnit	string	<i>optional</i>	The name of the unit or division of the organization making the request. This parameter shall contain the name of the unit or division of the organization making the request, as defined by the RFC5280 'organizationalUnitName' attribute.
State	string	<i>optional</i>	The state, province, or region of the organization making the request. This parameter shall contain the state, province, or region of the organization making the request, as defined by the RFC5280 'stateOrProvinceName' attribute.
Surname	string	<i>optional</i>	The surname of the user making the request. This parameter shall contain the surname of the user making the request, as defined by the RFC5280 'surname' attribute.
UnstructuredName	string	<i>optional</i>	The unstructured name of the subject. This property shall contain the unstructured name of the subject, as defined by the RFC2985 'unstructuredName' attribute.

Response Payload

{			

CertificateCollection	object	<i>required</i>	The link to the certificate collection where the certificate is installed. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> where the certificate is installed after the certificate authority (CA) has signed the certificate. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
CSRString	string	<i>read-only required</i>	The string for the certificate signing request. This property shall contain the Privacy Enhanced Mail (PEM)-encoded string, which contains RFC2986-specified structures, of the certificate signing request. The private key should not be part of the string.
}			

Request Example

```
{
  "Country": "US",
  "State": "Oregon",
  "City": "Portland",
  "Organization": "Contoso",
  "OrganizationalUnit": "ABC",
  "CommonName": "manager.contoso.org",
  "AlternativeNames": [
    "manager.contoso.org",
    "manager.contoso.com",
    "manager.contoso.us"
  ],
  "Email": "admin@contoso.org",
  "KeyPairAlgorithm": "TPM_ALG_RSA",
  "KeyBitLength": 4096,
  "KeyUsage": [
    "KeyEncipherment",
    "ServerAuthentication"
  ],
  "CertificateCollection": {
    "@odata.id": "/redfish/v1/Managers/BMC/NetworkProtocol/HTTPS/Certificates"
  }
}
```

Response Example

```
{
  "CSRString": "-----BEGIN CERTIFICATE REQUEST-----...-----END CERTIFICATE REQUEST-----",
  "CertificateCollection": {
    "@odata.id": "/redfish/v1/Managers/BMC/NetworkProtocol/HTTPS/Certificates"
  }
}
```

6.21.4.2 ReplaceCertificate

Description

This action replaces a certificate.

- This action shall replace a certificate. The `Location` header in the response shall contain the URI of the new certificate resource.

Action URI

{Base URI of target resource}/Actions/CertificateService.ReplaceCertificate

Action parameters

Parameter Name	Type	Attributes	Notes
CertificateString	string	<i>required</i>	The string for the certificate. This parameter shall contain the string of the certificate, and the format shall follow the requirements specified by the <code>CertificateType</code> parameter value. If the certificate contains any private keys, they shall be removed from the string in responses. If the service does not know the private key for the certificate and it is needed to use the certificate, the client shall provide the private key as part of the string in the <code>POST</code> request.
CertificateType	string (enum)	<i>required</i>	The format of the certificate. This parameter shall contain the format type for the certificate. <i>For the possible property values, see <code>CertificateType</code> in Property details.</i>
CertificateUri {	object	<i>required</i>	The link to the certificate that is being replaced. This parameter shall contain a link to a resource of type <code>Certificate</code> that is being replaced. See the <i>Certificate</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Certificate resource. See the Links section and the <i>Certificate</i> schema for details.

Parameter Name	Type	Attributes	Notes
}			
Password (v1.1+)	string	<i>optional</i>	The password for the certificate. This parameter shall contain the password for the certificate contained in the <code>CertificateString</code> parameter. This parameter shall be required if the <code>CertificateType</code> parameter contains <code>PKCS12</code> and the client-provided certificate is password protected.

Request Example

```
{
  "CertificateUri": {
    "@odata.id": "/redfish/v1/Managers/BMC/NetworkProtocol/HTTPS/Certificates/1"
  },
  "CertificateString": "-----BEGIN CERTIFICATE-----\n...\n-----END CERTIFICATE-----",
  "CertificateType": "PEM"
}
```

6.21.5 Property details

6.21.5.1 CertificateType

The format of the certificate.

- This parameter shall contain the format type for the certificate.

string	Description
PEM	A Privacy Enhanced Mail (PEM)-encoded single certificate. This value shall indicate the format of the certificate shall contain a Privacy Enhanced Mail (PEM)-encoded string, containing RFC5280-defined structures, representing a single certificate.
PEMchain	A Privacy Enhanced Mail (PEM)-encoded certificate chain. This value shall indicate the format of the certificate shall contain a Privacy Enhanced Mail (PEM)-encoded string, containing RFC5280-defined structures, representing a certificate chain. When this value is specified, the properties of the resource, except for <code>CertificateString</code>, shall contain the information from the leaf certificate. When this value is specified, <code>CertificateString</code> shall contain the entire PEM chain.

string	Description
PKCS12	A Base64-encoded PKCS12 certificate bundle. This value shall indicate the format of the certificate shall contain a Base64-encoded string, with padding characters, containing RFC7292-defined structures, representing a PKCS12 archive of one or more certificates, keys, or other cryptographic data. The service may discard additional certificates or other data in the structure.
PKCS7	A Privacy Enhanced Mail (PEM)-encoded PKCS7 certificate. The format of the certificate shall contain a Privacy Enhanced Mail (PEM)-encoded string, containing RFC5280-defined and RFC2315-defined structures. The service may discard additional certificates or other data in the structure.

6.21.5.2 KeyUsage

The usages of a key contained within a certificate.

- The usage of the key contained in the certificate.
 - This parameter shall contain the usage of the key contained in the certificate. If the client does not provide this value, the service can determine the appropriate key usage settings in the certificate signing request.

string	Description
ClientAuthentication	TLS WWW client authentication.
CodeSigning	Signs downloadable executable code.
CRLSigning	Verifies signatures on certificate revocation lists (CRLs).
DataEncipherment	Directly enciphers raw user data without an intermediate symmetric cipher.
DecipherOnly	Deciphers data while performing a key agreement.
DigitalSignature	Verifies digital signatures, other than signatures on certificates and CRLs.
EmailProtection	Email protection.
EncipherOnly	Enciphers data while performing a key agreement.
KeyAgreement	Key agreement.
KeyCertSign	Verifies signatures on public key certificates.
KeyEncipherment	Enciphers private or secret keys.
NonRepudiation	Verifies digital signatures, other than signatures on certificates and CRLs, and provides a non-repudiation service that protects against the signing entity falsely denying some action.

string	Description
OCSPSigning	Signs OCSP responses.
ServerAuthentication	TLS WWW server authentication.
Timestamping	Binds the hash of an object to a time.

6.21.6 Example response

```
{
  "@odata.type": "#CertificateService.v1_1_0.CertificateService",
  "Id": "CertificateService",
  "Name": "Certificate Service",
  "Actions": {
    "#CertificateService.GenerateCSR": {
      "target": "/redfish/v1/CertificateService/Actions/CertificateService.GenerateCSR",
      "@Redfish.ActionInfo": "/redfish/v1/CertificateService/GenerateCSRActionInfo"
    },
    "#CertificateService.ReplaceCertificate": {
      "target": "/redfish/v1/CertificateService/Actions/CertificateService.ReplaceCertificate",
      "@Redfish.ActionInfo": "/redfish/v1/CertificateService/ReplaceCertificateActionInfo"
    }
  },
  "CertificateLocations": {
    "@odata.id": "/redfish/v1/CertificateService/CertificateLocations"
  },
  "@odata.id": "/redfish/v1/CertificateService"
}
```

6.22 Chassis 1.27.0

Version	v1.27	v1.26	v1.25	v1.24	v1.23	v1.22	v1.21	v1.20	v1.19	v1.18	v1.17	...
Release	2025.2	2024.4	2023.3	2023.2	2023.1	2022.3	2022.2	2022.1	2021.4	2021.3	2021.2	...

6.22.1 Description

The `Chassis` schema represents the physical components of a system. This resource represents the sheet-metal confined spaces and logical zones such as racks, enclosures, chassis and all other containers. Subsystems, such as sensors, that operate outside of a system's data plane are linked either directly or indirectly through this resource. A subsystem that operates outside of a system's data plane are not accessible to software that runs on the system. It

also describes the location, such as a slot, socket, or bay, where a unit can be installed, by populating a resource instance with an absent state if a unit is not present.

- This resource shall represent a chassis or other physical enclosure for a Redfish implementation. It may also represent a location, such as a slot, socket, or bay, where a unit may be installed, but the `State` property within the `Status` property contains `Absent`.

6.22.2 URIs

/redfish/v1/Chassis/{ChassisId}

6.22.3 Properties

Property	Type	Attributes	Notes
Assembly (v1.6+) {	object		The link to the assembly associated with this chassis. • This property shall contain a link to a resource of type <code>Assembly</code>. See the <i>Assembly</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>Assembly</i> resource. See the Links section and the <i>Assembly</i> schema for details.
}			
AssetTag	string	<i>read-write</i> (null)	The user-assigned asset tag of this chassis. • This property shall contain an identifying string that tracks the chassis for inventory purposes. Modifying this property may modify the <code>AssetTag</code> in the resource that represents the functional view of this chassis, such as a <code>ComputerSystem</code> resource.
Certificates (v1.15+) {	object		The link to a collection of certificates for device identity and attestation. • This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that contains certificates for device identity and attestation. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
ChassisType	string (enum)	<i>read-only</i> <i>required</i>	The type of physical form factor of the chassis. • This property shall indicate the physical form factor for the type of chassis. <i>For the possible property values, see ChassisType in Property details.</i>

Property	Type	Attributes	Notes
Controls (v1.17+) {	object		The link to the collection of controls located in this chassis. This property shall contain a link to a resource collection of type <code>ControlCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Control</i> . See the Control schema for details.
}			
DepthMm (v1.4+)	number (mm)	<i>read-only</i> (null)	The depth of the chassis. This property shall represent the depth (length) of the chassis, in millimeter units, as specified by the manufacturer.
Doors (v1.24+) {	object		The doors or access panels of the chassis. This property shall contain information about the doors or access panels of the chassis.
Front (v1.24+) {	object	(null)	The front door of the chassis. This property shall contain information related to the front door, as defined by the manufacturer, of the chassis.
DoorState (v1.24+)	string (enum)	<i>read-only</i> (null)	The state of the door. This property shall contain the current state of the door. <i>For the possible property values, see DoorState in Property details.</i>
Locked (v1.24+)	boolean	<i>read-write</i> (null)	Indicates if the door is locked. This property shall indicate if the door is locked.
UserLabel (v1.24+)	string	<i>read-write</i>	A user-assigned label. This property shall contain a user-assigned label used to identify this resource. If a value has not been assigned by a user, the value of this property shall be an empty string.
}			
Rear (v1.24+) {	object	(null)	The rear door of the chassis. This property shall contain information related to the rear door, as defined by the manufacturer, of the chassis.

Property	Type	Attributes	Notes
DoorState (v1.24+)	string (enum)	<i>read-only</i> (null)	The state of the door. This property shall contain the current state of the door. <i>For the possible property values, see DoorState in Property details.</i>
Locked (v1.24+)	boolean	<i>read-write</i> (null)	Indicates if the door is locked. This property shall indicate if the door is locked.
UserLabel (v1.24+)	string	<i>read-write</i>	A user-assigned label. This property shall contain a user-assigned label used to identify this resource. If a value has not been assigned by a user, the value of this property shall be an empty string.
}			
}			
Drives (v1.14+) {	object		The link to the collection of drives within this chassis. This property shall contain a link to a resource collection of type <code>DriveCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Drive</i> . See the Drive schema for details.
}			
ElectricalSourceManagerURIs (v1.18+) []	array (URI) (string, null)	<i>read-write</i>	The URIs of the management interfaces for the external electrical source connections for this chassis. This property shall contain an array of URIs to the management applications or devices that provide monitoring or control of the external electrical sources that provide power to this chassis.
ElectricalSourceNames (v1.18+) []	array (string, null)	<i>read-write</i>	The names of the external electrical sources, such as circuits or outlets, connected to this chassis. This property shall contain an array of strings that identify the external electrical sources, such as the names of circuits or outlets, that provide power to this chassis.

Property	Type	Attributes	Notes
EnvironmentalClass (v1.9+)	string (enum)	<i>read-write</i> (null)	The ASHRAE Environmental Class for this chassis. This property shall contain the ASHRAE Environmental Class for this chassis, as defined by ASHRAE Thermal Guidelines for Data Processing Environments. These classes define respective environmental limits that include temperature, relative humidity, dew point, and maximum allowable elevation. <i>For the possible property values, see EnvironmentalClass in Property details.</i>
EnvironmentMetrics (v1.15+) {	object		The link to the environment metrics for this chassis. This property shall contain a link to a resource of type <code>EnvironmentMetrics</code> that specifies the environment metrics for this chassis, all containing chassis, and devices contained by any of these chassis instances. When determining power and energy readings, care should be taken to ensure any reported values do not overlap or result in double-counting. See the <i>EnvironmentMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>EnvironmentMetrics</i> resource. See the Links section and the <i>EnvironmentMetrics</i> schema for details.
}			
FabricAdapters (v1.20+) {	object		The link to the collection of fabric adapters located in this chassis that provide access to fabric-related resource pools. This property shall contain a link to a resource collection of type <code>FabricAdapterCollection</code> that represents fabric adapters in this chassis that provide access to fabric-related resource pools. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>FabricAdapter</i> . See the <i>FabricAdapter</i> schema for details.
}			
HeatingCoolingEquipmentNames (v1.25+) []	array (string, null)	<i>read-write</i>	The names of the external heating or cooling equipment, such as coolant distribution units, connected to this chassis. This property shall contain an array of strings that identify the external heating or cooling equipment, such as the names of specific coolant distribution units, that provide thermal management for this chassis.

Property	Type	Attributes	Notes
HeatingCoolingManagerURIs (v1.25+) []	array (URI) (string, null)	<i>read-write</i>	The URIs of the management interfaces for the external heating or cooling equipment for this chassis. This property shall contain an array of URIs to the management applications or devices that provide monitoring or control of the external heating or cooling equipment that provide thermal management for this chassis.
HeightMm (v1.4+)	number (mm)	<i>read-only</i> (null)	The height of the chassis. This property shall represent the height of the chassis, in millimeter units, as specified by the manufacturer.
HotPluggable (v1.21+)	boolean	<i>read-only</i> (null)	An indication of whether this component can be inserted or removed while the equipment is in operation. This property shall indicate whether the component can be inserted or removed while the underlying equipment otherwise remains in its current operational state. Components indicated as hot-pluggable shall allow the component to become operable without altering the operational state of the underlying equipment. Components that cannot be inserted or removed from equipment in operation, or components that cannot become operable without affecting the operational state of that equipment, shall be indicated as not hot-pluggable.
IndicatorLED (deprecated v1.14)	string (enum)	<i>read-write</i> (null)	The state of the indicator LED, which identifies the chassis. This property shall contain the indicator light state for the indicator light associated with this system. <i>For the possible property values, see IndicatorLED in Property details. Deprecated in v1.14 and later. This property has been deprecated in favor of the <code>LocationIndicatorActive</code> property.</i>
LeakDetectors (v1.26+) {	object		The link to the collection of leak detectors located in this chassis. This property shall contain a link to a resource collection of type <code>LeakDetectorCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>LeakDetector</i> . See the LeakDetector schema for details.
}			
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.

Property	Type	Attributes	Notes
AutomationNodes (v1.27+) [{	array		An array of links to the automation nodes contained in this chassis. This property shall contain an array of links to resources of type <code>AutomationNode</code> with which this physical container is associated.
@odata.id	string	<i>read-only</i>	Link to a <code>AutomationNode</code> resource. See the Links section and the <code>AutomationNode</code> schema for details.
}]			
Cables (v1.17+) [{	array		An array of links to the cables connected to this chassis. This property shall contain an array of links to resources of type <code>Cable</code> that represent the cables connected to this chassis.
@odata.id	string	<i>read-only</i>	Link to a <code>Cable</code> resource. See the Links section and the <code>Cable</code> schema for details.
}]			
ComputerSystems [{	array		An array of links to the computer systems that this chassis directly and wholly contains. This property shall contain an array of links to resources of type <code>ComputerSystem</code> with which this physical container is associated. If a chassis also links to a computer system to which this resource also links, this chassis shall not link to that computer system.
@odata.id	string	<i>read-only</i>	Link to a <code>ComputerSystem</code> resource. See the Links section and the <code>ComputerSystem</code> schema for details.
}]			
ConnectedCoolingLoops (v1.23+) [{	array		An array of links to cooling loops connected to this chassis. This property shall contain an array of links to resources of type <code>CoolingLoop</code> that represent the cooling loops connected to this chassis.
@odata.id	string	<i>read-write</i>	Link to a <code>CoolingLoop</code> resource. See the Links section and the <code>CoolingLoop</code> schema for details.
}]			
ContainedBy {	object		The link to the chassis that contains this chassis. This property shall contain a link to a resource of type <code>Chassis</code> that represents the chassis that contains this chassis.
@odata.id	string	<i>read-write</i>	Link to another <code>Chassis</code> resource.

Property	Type	Attributes	Notes
}			
Contains [{	array		An array of links to any other chassis that this chassis has in it. This property shall contain an array of links to resources of type <code>Chassis</code> that represent the chassis instances that this chassis contains.
@odata.id	string	<i>read-write</i>	Link to another Chassis resource.
}]			
CooledBy (<i>deprecated v1.20</i>) [{	array		An array of links to resources or objects that cool this chassis. Normally, the link is for either a chassis or a specific set of fans. This property shall contain an array of links to resources or objects that cool this chassis. <i>Deprecated in v1.20 and later. This property has been deprecated in favor of the <code>Fans</code> link property, and details provided in the <code>ThermalSubsystem</code> resource.</i>
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
CoolingUnits (<i>v1.23+</i>) [{	array		An array of links to cooling unit functionality contained in this chassis. This property shall contain an array of links to resources of type <code>CoolingUnit</code> that represent the cooling unit functionality contained within this chassis.
@odata.id	string	<i>read-write</i>	Link to a CoolingUnit resource. See the Links section and the <code>CoolingUnit</code> schema for details.
}]			
Drives (<i>v1.2+</i>) [{	array		An array of links to the drives located in this chassis. This property shall contain an array of links to resources of type <code>Drive</code> that are in this chassis.
@odata.id	string	<i>read-only</i>	Link to a Drive resource. See the Links section and the <code>Drive</code> schema for details.
}]			

Property	Type	Attributes	Notes
Facility (v1.11+) {	object		The link to the facility that contains this chassis. This property shall contain a link to the resource of type <code>Facility</code> and shall represent the smallest facility that contains this chassis. This property shall not appear in resources that include a <code>ContainedBy</code> property within the <code>Links</code> property. See the <i>Facility</i> schema for details on this property.
@odata.id	string	<i>read-write</i>	Link to a Facility resource. See the Links section and the <i>Facility</i> schema for details.
}			
Fans (v1.20+) [{	array		An array of links to the fans that cool this chassis. This property shall contain an array of links to resources of type <code>Fan</code> that represent the fans that provide cooling to this chassis. This property shall not be present if the <code>ThermalManagedByParent</code> property contains <code>true</code> or if the fans are contained in the <code>ThermalSubsystem</code> resource for this chassis.
@odata.id	string	<i>read-only</i>	Link to a Fan resource. See the Links section and the <i>Fan</i> schema for details.
}]			
ManagedBy [{	array		An array of links to the managers responsible for managing this chassis. This property shall contain an array of links to resources of type <code>Manager</code> that manage this chassis.
@odata.id	string	<i>read-only</i>	Link to a Manager resource. See the Links section and the <i>Manager</i> schema for details.
}]			
ManagersInChassis (v1.2+) [{	array		An array of links to the managers located in this chassis. This property shall contain an array of links to resources of type <code>Manager</code> that are in this chassis.
@odata.id	string	<i>read-only</i>	Link to a Manager resource. See the Links section and the <i>Manager</i> schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
PCleDevices (v1.4+, deprecated v1.10) [{	array		An array of links to the PCIe devices located in this chassis. This property shall contain an array of links to resources of type <code>PCleDevice</code>. <i>Deprecated in v1.10 and later. This property has been deprecated in favor of the <code>PCleDevices</code> resource collection in the root of this resource.</i>
@odata.id	string	read-only	Link to a <code>PCleDevice</code> resource. See the Links section and the <code>PCleDevice</code> schema for details.
}]			
PowerDistribution (v1.20+) {	object	(null)	A link to power distribution functionality contained in this chassis. This property shall contain a link to a resource of type <code>PowerDistribution</code> that represents the power distribution functionality contained within this chassis. See the <code>PowerDistribution</code> schema for details on this property.
@odata.id	string	read-only	Link to a <code>PowerDistribution</code> resource. See the Links section and the <code>PowerDistribution</code> schema for details.
}			
PoweredBy (deprecated v1.20) [{	array		An array of links to resources or objects that power this chassis. Normally, the link is for either a chassis or a specific set of power supplies. This property shall contain an array of links to resources or objects that power this chassis. <i>Deprecated in v1.20 and later. This property has been deprecated in favor of the <code>PowerOutlets</code> and <code>PowerSupplies</code> link properties, and details provided in the <code>PowerSubsystem</code> resource.</i>
@odata.id	string (URI)	read-only	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
PowerOutlets (v1.18+) [{	array		An array of links to the outlets that provide power to this chassis. This property shall contain an array of links to resources of type <code>Outlet</code> that represent the outlets that provide power to this chassis. This property shall not be present if the <code>PoweredByParent</code> property contains <code>true</code>.
@odata.id	string	read-write	Link to a <code>Outlet</code> resource. See the Links section and the <code>Outlet</code> schema for details.

Property	Type	Attributes	Notes
}]			
PowerSupplies (v1.20+) [{	array		An array of links to the power supplies that provide power to this chassis. This property shall contain an array of links to resources of type <code>PowerSupply</code> that represent the power supplies that provide power to this chassis. This property shall not be present if the <code>PoweredByParent</code> property contains <code>true</code> or if the power supplies are contained in the <code>PowerSubsystem</code> resource for this chassis.
@odata.id	string	<i>read-only</i>	Link to a <code>PowerSupply</code> resource. See the Links section and the <code>PowerSupply</code> schema for details.
}]			
Processors (v1.9+) [{	array		An array of links to the processors located in this chassis. This property shall contain an array of links to resources of type <code>Processor</code> type that this chassis contains.
@odata.id	string	<i>read-only</i>	Link to a <code>Processor</code> resource. See the Links section and the <code>Processor</code> schema for details.
}]			
ResourceBlocks (v1.5+) [{	array		An array of links to the resource blocks located in this chassis. This property shall contain an array of links to resources of type <code>ResourceBlock</code> that this chassis contains.
@odata.id	string	<i>read-only</i>	Link to a <code>ResourceBlock</code> resource. See the Links section and the <code>ResourceBlock</code> schema for details.
}]			
Storage (v1.2+) [{	array		An array of links to the storage subsystems connected to or inside this chassis. This property shall contain an array of links to resources of type <code>Storage</code> that are connected to or contained in this chassis.
@odata.id	string	<i>read-only</i>	Link to a <code>Storage</code> resource. See the Links section and the <code>Storage</code> schema for details.
}]			
Switches (v1.7+) [{	array		An array of links to the switches located in this chassis. This property shall contain an array of links to resources of type <code>Switch</code> that this chassis contains.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a Switch resource. See the Links section and the <i>Switch</i> schema for details.
}}			
}			
Location (v1.2+) {}	object		The location of the chassis. This property shall contain the location information of the associated chassis. For property details, see Location.
LocationIndicatorActive (v1.14+)	boolean	<i>read-write</i> (null)	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of <code>IndicatorLED</code> in this resource, if supported, to reflect the implementation of the locating function. Modifying this property may modify the <code>LocationIndicatorActive</code> in the resource that represents the functional view of this chassis, such as a <code>ComputerSystem</code> resource.
LogServices {	object		The link to the logs for this chassis. This property shall contain a link to a resource collection of type <code>LogServiceCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>LogService</i> . See the LogService schema for details.
}			
Manufacturer	string	<i>read-only</i> (null)	The manufacturer of this chassis. This property shall contain the name of the organization responsible for producing the chassis. This organization may be the entity from whom the chassis is purchased, but this is not necessarily true.
MaxPowerWatts (v1.12+)	number (Watts)	<i>read-only</i> (null)	The upper bound of the total power consumed by the chassis. This property shall contain the upper bound of the total power consumed by the chassis.
Measurements (v1.15+, deprecated v1.19) [{	array		An array of DSP0274-defined measurement blocks. This property shall contain an array of DSP0274-defined measurement blocks. <i>Deprecated in v1.19 and later. This property has been deprecated in favor of the <code>ComponentIntegrity</code> resource.</i>

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a MeasurementBlock resource. See the Links section and the <i>SoftwareInventory</i> schema for details.
}}			
MediaControllers (v1.11+, deprecated v1.20) {	object		The link to the collection of media controllers located in this chassis. This property shall contain a link to a resource collection of type <i>MediaControllerCollection</i>. Contains a link to a resource. <i>Deprecated in v1.20 and later. This property has been deprecated in favor of FabricAdapters.</i>
@odata.id	string	<i>read-only</i>	Link to Collection of <i>MediaController</i> . See the MediaController schema for details.
}			
Memory (v1.11+) {	object		The link to the collection of memory located in this chassis that belong to fabric-related resource pools. This property shall contain a link to a resource collection of type <i>MemoryCollection</i> that represents memory in this chassis that belong to fabric-related resource pools. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Memory</i> . See the Memory schema for details.
}			
MemoryDomains (v1.11+) {	object		The link to the collection of memory domains located in this chassis that belong to fabric-related resource pools. This property shall contain a link to a resource collection of type <i>MemoryDomainCollection</i> that represents memory domains in this chassis that belong to fabric-related resource pools. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>MemoryDomain</i> . See the MemoryDomain schema for details.
}			
MinPowerWatts (v1.12+)	number (Watts)	<i>read-only</i> (null)	The lower bound of the total power consumed by the chassis. This property shall contain the lower bound of the total power consumed by the chassis.

Property	Type	Attributes	Notes
Model	string	<i>read-only</i> (null)	The model number of the chassis. This property shall contain the name by which the manufacturer generally refers to the chassis.
NetworkAdapters (v1.4+) {	object		The link to the collection of network adapters associated with this chassis. This property shall contain a link to a resource collection of type <code>NetworkAdapterCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>NetworkAdapter</i> . See the NetworkAdapter schema for details.
}			
PartNumber	string	<i>read-only</i> (null)	The part number of the chassis. This property shall contain a part number assigned by the organization that is responsible for producing or manufacturing the chassis.
PCleDevices (v1.10+) {	object		The link to the collection of PCIe devices located in this chassis. This property shall contain a link to a resource collection of type <code>PCleDeviceCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>PCleDevice</i> . See the PCleDevice schema for details.
}			
PCleSlots (v1.8+, deprecated v1.24) {	object		The link to the PCIe slot properties for this chassis. This property shall contain a link to the resource of type <code>PCleSlots</code> that represents the PCIe slot information for this chassis. See the <i>PCleSlots</i> schema for details on this property. <i>Deprecated in v1.24 and later. This property has been deprecated in favor of the <code>PCleDevices</code> property. The <code>PCleSlots</code> schema has been deprecated in favor of the <code>PCleDevice</code> schema. Empty PCIe slots are represented by <code>PCleDevice</code> resources using the <code>Absent</code> value of the <code>State</code> property within <code>Status</code>.</i>
@odata.id	string	<i>read-only</i>	Link to a PCleSlots resource. See the Links section and the <i>PCleSlots</i> schema for details.
}			
PhysicalSecurity (v1.1+) {	object		The physical security state of the chassis. This property shall contain the physical security state of the chassis. Services may construct this state from multiple physical sensors.

Property	Type	Attributes	Notes
IntrusionSensor (v1.1+)	string (enum)	<i>read-write</i> (null)	The physical security state of the chassis, such as if hardware intrusion is detected. This property shall contain the physical security state of the chassis. If the <code>IntrusionSensorReArm</code> property contains <code>Manual</code>, a client may set this property to <code>Normal</code> to reset the physical security state. <i>For the possible property values, see <code>IntrusionSensor</code> in Property details.</i>
IntrusionSensorNumber (v1.1+, deprecated v1.22)	integer	<i>read-only</i> (null)	A numerical identifier to represent the physical security sensor. This property shall contain a numerical identifier for this physical security sensor that is unique within this resource. <i>Deprecated in v1.22 and later. This property has been deprecated in order to allow for multiple physical sensors to construct this object.</i>
IntrusionSensorReArm (v1.1+)	string (enum)	<i>read-write</i> (null)	The policy that describes how the physical security state of the chassis returns to a normal state. This property shall contain the policy that describes how the <code>IntrusionSensor</code> property returns to the <code>Normal</code> value. <i>For the possible property values, see <code>IntrusionSensorReArm</code> in Property details.</i>
}			
Power (deprecated v1.15) {	object		The link to the power properties, or power supplies, power policies, and sensors, for this chassis. This property shall contain a link to a resource of type <code>Power</code> that represents the power characteristics of this chassis. See the <code>Power</code> schema for details on this property. <i>Deprecated in v1.15 and later. This link has been deprecated in favor of the <code>PowerSubsystem</code> link property.</i>
@odata.id	string	<i>read-only</i>	Link to a <code>Power</code> resource. See the Links section and the <code>Power</code> schema for details.
}			
PoweredByParent (v1.20+)	boolean	<i>read-only</i> (null)	Indicates that the chassis receives power from the containing chassis. This property shall indicate whether the chassis receives power from the chassis that contains it. The value <code>true</code> shall indicate that the containing chassis provides power. The value <code>false</code> shall indicate the chassis receives power from its own power subsystem, another chassis instance's power supplies, or outlets.

Property	Type	Attributes	Notes
PowerState (v1.0.1+)	string (enum)	<i>read-only</i> (null)	The current power state of the chassis. This property shall contain the power state of the chassis. <i>For the possible property values, see PowerState in Property details.</i>
PowerSubsystem (v1.15+) {	object		The link to the power subsystem properties for this chassis. This property shall contain a link to a resource of type PowerSubsystem that represents the power subsystem information for this chassis. See the PowerSubsystem schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a PowerSubsystem resource. See the Links section and the PowerSubsystem schema for details.
}			
Processors (v1.22+) {	object		The link to the collection of processors located in this chassis that belong to fabric-related resource pools. This property shall contain a link to a resource collection of type ProcessorCollection that represents processors in this chassis that belong to fabric-related resource pools. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of Processor . See the Processor schema for details.
}			
Replaceable (v1.21+)	boolean	<i>read-only</i> (null)	An indication of whether this component can be independently replaced as allowed by the vendor's replacement policy. This property shall indicate whether this component can be independently replaced as allowed by the vendor's replacement policy. A value of false indicates the component needs to be replaced by policy as part of another component. If the LocationType property of this component contains Embedded, this property shall contain false.
Sensors (v1.9+) {	object		The link to the collection of sensors located in the equipment and sub-components. This property shall contain a link to a resource collection of type SensorCollection that contains the sensors located in the chassis and sub-components. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of Sensor . See the Sensor schema for details.
}			

Property	Type	Attributes	Notes
SerialNumber	string	<i>read-only</i> (null)	The serial number of the chassis. This property shall contain a manufacturer-allocated number that identifies the chassis.
SKU	string	<i>read-only</i> (null)	The SKU of the chassis. This property shall contain the stock-keeping unit number for this chassis.
SparePartNumber (v1.16+)	string	<i>read-only</i> (null)	The spare part number of the chassis. This property shall contain the spare part number of the chassis.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
Thermal (deprecated v1.15) {}	object		The link to the thermal properties, such as fans, cooling, and sensors, for this chassis. This property shall contain a link to a resource of type <code>Thermal</code> that represents the thermal characteristics of this chassis. See the <i>Thermal</i> schema for details on this property. <i>Deprecated in v1.15 and later. This link has been deprecated in favor of the <code>ThermalSubsystem</code> link property.</i>
@odata.id	string	<i>read-only</i>	Link to a Thermal resource. See the Links section and the <i>Thermal</i> schema for details.
}			
ThermalDirection (v1.20+)	string (enum)	<i>read-only</i> (null)	Indicates the thermal management path through the chassis. This property shall indicate the general direction of the thermal management path through the chassis. <i>For the possible property values, see ThermalDirection in Property details.</i>

Property	Type	Attributes	Notes
ThermalManagedByParent (v1.20+)	boolean	<i>read-only</i> (null)	Indicates that the chassis is thermally managed by the parent chassis. This property shall indicate whether the chassis relies on the containing chassis to provide thermal management. The value <code>true</code> shall indicate that the chassis relies on the containing chassis to provide thermal management. The value <code>false</code> shall indicate the chassis provides thermal management, and may provide details in a <code>ThermalSubsystem</code> resource, or by populating the <code>Fans</code> property in Links.
ThermalSubsystem (v1.15+) {	object		The link to the thermal subsystem properties for this chassis. This property shall contain a link to a resource of type <code>ThermalSubsystem</code> that represents the thermal subsystem information for this chassis. See the <i>ThermalSubsystem</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>ThermalSubsystem</code> resource. See the Links section and the <i>ThermalSubsystem</i> schema for details.
}			
TrustedComponents (v1.21+) {	object		The link to the trusted components in this chassis. This property shall contain a link to a resource collection of type <code>TrustedComponentCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>TrustedComponent</i> . See the <code>TrustedComponent</code> schema for details.
}			
UUID (v1.7+)	string (uuid)	<i>read-only</i> (null)	The UUID for this chassis. This property shall contain the universally unique identifier number for this chassis. Pattern: <code>^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\$</code>
Version (v1.21+)	string	<i>read-only</i> (null)	The hardware version of this chassis. This property shall contain the hardware version of this chassis as determined by the vendor or supplier.
WeightKg (v1.4+)	number (kg)	<i>read-only</i> (null)	The weight of the chassis. This property shall represent the published mass, commonly referred to as weight, of the chassis, in kilogram units.

Property	Type	Attributes	Notes
WidthMm (v1.4+)	number (mm)	<i>read-only</i> (null)	The width of the chassis. This property shall represent the width of the chassis, in millimeter units, as specified by the manufacturer.

6.22.4 Actions

6.22.4.1 Reset

Description

This action resets the chassis. Additionally, it could reset systems or other contained resources depending on the `ResetType` used to invoke this action.

- This action shall reset the chassis. Additionally, it may reset systems or other contained resources depending on the `ResetType` used to invoke this action.

Action URI

{Base URI of target resource}/Actions/Chassis.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	<i>optional</i>	The type of reset. This parameter shall contain the type of reset. The service can accept a request without the parameter and complete an implementation-specific default reset. Services should include the <code>@Redfish.AllowableValues</code> annotation for this parameter to ensure compatibility with clients, even when <code>ActionInfo</code> has been implemented. <i>For the possible property values, see <code>ResetType</code> in Property details.</i>

Request Example

```
{  
  "ResetType": "ForceRestart"  
}
```

6.22.5 Property details

6.22.5.1 ChassisType

The type of physical form factor of the chassis.

- This property shall indicate the physical form factor for the type of chassis.

string	Description
Blade	An enclosed or semi-enclosed, typically vertically-oriented, system chassis that must be plugged into a multi-system chassis to function normally.
Card	A loose device or circuit board intended to be installed in a system or other enclosure.
Cartridge	A small self-contained system intended to be plugged into a multi-system chassis.
Component	A small chassis, card, or device that contains devices for a particular subsystem or function.
Drawer	An enclosed or semi-enclosed, typically horizontally-oriented, system chassis that can be slid into a multi-system chassis.
Enclosure	A generic term for a chassis that does not fit any other description.
Expansion	A chassis that expands the capabilities or capacity of another chassis.
HeatExchanger (v1.23+)	A heat exchanger.
ImmersionTank (v1.23+)	An immersion cooling tank.
IPBasedDrive (v1.3+)	A chassis in a drive form factor with IP-based network connections.
Module	A small, typically removable, chassis or card that contains devices for a particular subsystem or function.
Other	A chassis that does not fit any of these definitions.
Pod	A collection of equipment racks in a large, likely transportable, container.
PowerStrip (v1.25+)	A power strip, typically placed in the zero-U space of a rack.
Rack	An equipment rack, typically a 19-inch wide freestanding unit.
RackGroup (v1.4+)	A group of racks that form a single entity or share infrastructure.
RackMount	A single-system chassis designed specifically for mounting in an equipment rack.
Row	A collection of equipment racks.
Shelf	An enclosed or semi-enclosed, typically horizontally-oriented, system chassis that must be plugged into a multi-system chassis to function normally.

string	Description
Sidecar	A chassis that mates mechanically with another chassis to expand its capabilities or capacity.
Sled	An enclosed or semi-enclosed, system chassis that must be plugged into a multi-system chassis to function normally similar to a blade type chassis.
StandAlone	A single, free-standing system, commonly called a tower or desktop chassis.
StorageEnclosure (v1.6+)	A chassis that encloses storage.
Zone	A logical division or portion of a physical chassis that contains multiple devices or systems that cannot be physically separated.

6.22.5.2 DoorState

The state of the door.

- This property shall contain the current state of the door.

string	Description
Closed	Door is closed. • This value shall indicate that the door is closed but unlocked.
Locked	Door is closed and locked. • This value shall indicate that the door is both closed and locked. In this state, the door cannot be opened unless the value of the <code>Locked</code> property is set to <code>false</code>.
LockedAndOpen	Door is open and locked. • This value shall indicate that the door is open but the lock has been engaged. It may be possible to close the door while in this state.
Open	Door is open. • This value shall indicate that the door is open.

6.22.5.3 EnvironmentalClass

The ASHRAE Environmental Class for this chassis.

- This property shall contain the ASHRAE Environmental Class for this chassis, as defined by ASHRAE Thermal Guidelines for Data Processing Environments. These classes define respective environmental limits that include temperature, relative humidity, dew point, and maximum allowable elevation.

string	Description
A1	ASHRAE Environmental Class 'A1'.
A2	ASHRAE Environmental Class 'A2'.
A3	ASHRAE Environmental Class 'A3'.
A4	ASHRAE Environmental Class 'A4'.

6.22.5.4 IndicatorLED

The state of the indicator LED, which identifies the chassis.

- This property shall contain the indicator light state for the indicator light associated with this system.

string	Description
Blinking	The indicator LED is blinking. This value shall represent the indicator LED is in a blinking state where the LED is being turned on and off in repetition. If the service does not support this value, it shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code.
Lit	The indicator LED is lit. This value shall represent the indicator LED is in a solid on state. If the service does not support this value, it shall return the HTTP <code>400 Bad Request</code> status code to reject <code>PATCH</code> or <code>PUT</code> requests that contain this value.
Off	The indicator LED is off. This value shall represent the indicator LED is in a solid off state. If the service does not support this value, it shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code.
Unknown (<i>deprecated v1.2</i>)	The state of the indicator LED cannot be determined. This value shall represent the indicator LED is in an unknown state. The service shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code. <i>Deprecated in v1.2 and later. This value has been deprecated in favor of returning <code>null</code> if the state is unknown.</i>

6.22.5.5 IntrusionSensor

The physical security state of the chassis, such as if hardware intrusion is detected.

- This property shall contain the physical security state of the chassis. If the `IntrusionSensorReArm` property contains `Manual`, a client may set this property to `Normal` to reset the physical security state.

string	Description
HardwareIntrusion	A door, lock, or other mechanism protecting the internal system hardware from being accessed is detected to be in an insecure state.
Normal	No physical security condition is detected at this time.
TamperingDetected	Physical tampering of the monitored entity is detected.

6.22.5.6 IntrusionSensorReArm

The policy that describes how the physical security state of the chassis returns to a normal state.

- This property shall contain the policy that describes how the `IntrusionSensor` property returns to the `Normal` value.

string	Description
Automatic	The sensor is automatically restored to the normal state when no security condition is detected. • This value shall indicate the service sets the <code>IntrusionSensor</code> property to <code>Normal</code> when no security condition is detected.
Manual	A user is required to clear the sensor to restore it to the normal state. • This value shall indicate a user is required to set the <code>IntrusionSensor</code> property to <code>Normal</code> to restore the sensor to its normal state.

6.22.5.7 PowerState

The current power state of the chassis.

- This property shall contain the power state of the chassis.

string	Description
Off	The resource is powered off. The components within the resource might continue to have AUX power.
On	The resource is powered on.
Paused	The resource is paused.

string	Description
PoweringOff	A temporary state between on and off. The components within the resource can take time to process the power off action.
PoweringOn	A temporary state between off and on. The components within the resource can take time to process the power on action.

6.22.5.8 ResetType

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and complete an implementation-specific default reset. Services should include the `@Redfish.AllowableValues` annotation for this parameter to ensure compatibility with clients, even when `ActionInfo` has been implemented.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property shall contain the value <code>On</code>.
ForceRestart	Shut down immediately and non-gracefully and restart the unit. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.

string	Description
FullPowerCycle	Full power cycle the unit. Behaves like removing utility lines, followed by restoring utility lines to the resource. This value shall indicate the resource will perform a full power cycle as if utility lines to the resource are removed and restored. This is different from <code>PowerCycle</code> in that it's as close to a true power cycle as possible. For example, removing AC power cables from an enclosure and then restoring the AC power cables. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>. If a service supports this value but there are no other distinct power cycle flows, the service shall support <code>PowerCycle</code> as an alias to <code>FullPowerCycle</code>. This type of reset may cause the manager providing the Redfish service to power cycle. If the manager providing the Redfish service is affected by this type of reset, the service shall send the action response before resetting to prevent client timeouts.
GracefulRestart	Shut down gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
GracefulShutdown	Shut down gracefully and power off. This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a paused state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Paused</code>.

string	Description
PowerCycle	Power cycle the unit. Behaves like a power removal, followed by a power restore to the resource. This value shall indicate the resource will perform a power cycle. This is different from <code>FullPowerCycle</code> in that it typically performs localized power sequencing of the resource while external power is still present. For example, turning DC voltage regulators off and then turning DC voltage regulators back on. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
PushPowerButton	Simulate the pressing of the physical power button on this unit. This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.

6.22.5.9 ThermalDirection

Indicates the thermal management path through the chassis.

- This property shall indicate the general direction of the thermal management path through the chassis.

string	Description
BackToFront	A chassis with the air intake in the back and exhaust out the front. This value shall indicate a chassis with the air intake generally from the back of the chassis and the air exhaust out the front of the chassis.
FrontToBack	A chassis with the air intake in the front and exhaust out the back. This value shall indicate a chassis with the air intake generally from the front of the chassis and the air exhaust out the back of the chassis.

string	Description
Sealed	A sealed chassis with no air pathway. This value shall indicate a sealed chassis with no air pathway through the chassis.
TopExhaust	A chassis with air exhaust on the top. This value shall indicate a chassis with the air exhaust out the top of the chassis.

6.22.6 Example response

```
{
  "@odata.type": "#Chassis.v1_27_0.Chassis",
  "Id": "1U",
  "Name": "Computer System Chassis",
  "ChassisType": "RackMount",
  "AssetTag": "Chicago-45Z-2381",
  "Manufacturer": "Contoso",
  "Model": "3500RX",
  "SKU": "8675309",
  "SerialNumber": "437XR1138R2",
  "PartNumber": "224071-J23",
  "PowerState": "On",
  "LocationIndicatorActive": true,
  "Location": {
    "Placement": {
      "Row": "North",
      "Rack": "WEB43",
      "RackOffsetUnits": "EIA_310",
      "RackOffset": 12
    }
  },
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "HeightMm": 44.45,
  "WidthMm": 431.8,
  "DepthMm": 711,
  "WeightKg": 15.31,
  "EnvironmentalClass": "A3",
  "Sensors": {
    "@odata.id": "/redfish/v1/Chassis/1U/Sensors"
  },
  "PowerSubsystem": {
    "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem"
  },
}
```

```

    "ThermalSubsystem": {
      "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem"
    },
    "EnvironmentMetrics": {
      "@odata.id": "/redfish/v1/Chassis/1U/EnvironmentMetrics"
    },
    "Links": {
      "ComputerSystems": [
        {
          "@odata.id": "/redfish/v1/Systems/437XR1138R2"
        }
      ],
      "ManagedBy": [
        {
          "@odata.id": "/redfish/v1/Managers/BMC"
        }
      ],
      "ManagersInChassis": [
        {
          "@odata.id": "/redfish/v1/Managers/BMC"
        }
      ]
    },
    "@odata.id": "/redfish/v1/Chassis/1U"
  }
}
```

6.23 Circuit 1.8.1

Version	v1.8	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2024.1	2022.2	2022.1	2021.4	2021.3	2021.2	2020.4	2020.3	2019.4

6.23.1 Description

This `Circuit` schema contains the definition for an electrical circuit.

- This resource shall be used to represent an electrical circuit for a Redfish implementation.

6.23.2 URIs

/redfish/v1/PowerEquipment/ElectricalBuses/{PowerDistributionId}/Branches/{CircuitId}
/redfish/v1/PowerEquipment/ElectricalBuses/{PowerDistributionId}/Mains/{CircuitId}
/redfish/v1/PowerEquipment/FloorPDUs/{PowerDistributionId}/Branches/{CircuitId}

```

/redfish/v1/PowerEquipment/FloorPDUs/{PowerDistributionId}/Mains/{CircuitId}
/redfish/v1/PowerEquipment/FloorPDUs/{PowerDistributionId}/Subfeeds/{CircuitId}
/redfish/v1/PowerEquipment/PowerShelves/{PowerDistributionId}/Branches/{CircuitId}
/redfish/v1/PowerEquipment/PowerShelves/{PowerDistributionId}/Mains/{CircuitId}
/redfish/v1/PowerEquipment/RackPDUs/{PowerDistributionId}/Branches/{CircuitId}
/redfish/v1/PowerEquipment/RackPDUs/{PowerDistributionId}/Mains/{CircuitId}
/redfish/v1/PowerEquipment/Switchgear/{PowerDistributionId}/Branches/{CircuitId}
/redfish/v1/PowerEquipment/Switchgear/{PowerDistributionId}/Feeders/{CircuitId}
/redfish/v1/PowerEquipment/Switchgear/{PowerDistributionId}/Mains/{CircuitId}
/redfish/v1/PowerEquipment/Switchgear/{PowerDistributionId}/Subfeeds/{CircuitId}
/redfish/v1/PowerEquipment/TransferSwitches/{PowerDistributionId}/Branches/{CircuitId}
/redfish/v1/PowerEquipment/TransferSwitches/{PowerDistributionId}/Feeders/{CircuitId}
/redfish/v1/PowerEquipment/TransferSwitches/{PowerDistributionId}/Mains/{CircuitId}

```

6.23.3 Properties

Property	Type	Attributes	Notes
BreakerState	string (enum)	read-only (null)	The state of the overcurrent protection device. This property shall contain the state of the overcurrent protection device. <i>For the possible property values, see BreakerState in Property details.</i>
CircuitType	string (enum)	read-only (null)	The type of circuit. This property shall contain the type of circuit. <i>For the possible property values, see CircuitType in Property details.</i>
ConfigurationLocked (v1.5+)	boolean	read-write	Indicates whether the configuration is locked. This property shall indicate whether modification requests to this resource are not permitted. If <code>true</code>, services shall reject modification requests to other properties in this resource.
CriticalCircuit	boolean	read-write (null)	Designates if this is a critical circuit. This property shall indicate whether the circuit is designated as a critical circuit, and therefore is excluded from autonomous logic that could affect the state of the circuit. The value shall be <code>true</code> if the circuit is deemed critical, and <code>false</code> if the circuit is not critical.

Property	Type	Attributes	Notes
CurrentAmps {}	object		The current (A) for this circuit. This property shall contain the current, in ampere units, for this circuit. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Current</code>. This property shall not be present if <code>PhaseWiringType</code> contains a value that indicates a 4-wire or greater configuration, such as <code>TwoPhase4Wire</code>. For more information about this property, see <code>SensorCurrentExcerpt</code> in Property Details.
ElectricalConsumerNames (v1.4+) []	array (string, null)	read-write	An array of names of downstream devices that are powered by this circuit. This property shall contain an array of user-assigned identifying strings that describe downstream devices that are powered by this circuit.
ElectricalContext	string (enum)	read-only (null)	The combination of current-carrying conductors. This property shall contain the combination of current-carrying conductors that distribute power. <i>For the possible property values, see <code>ElectricalContext</code> in Property details.</i>
ElectricalSourceManagerURI (v1.4+)	string (URI)	read-write	The URI of the management interface for the upstream electrical source connection for this circuit. This property shall contain a URI to the management application or device that provides monitoring or control of the upstream electrical source that provides power to this circuit. If a value has not been assigned by a user, the value of this property shall be an empty string.
ElectricalSourceName (v1.4+)	string	read-write	The name of the upstream electrical source, such as a circuit or outlet, connected to this circuit. This property shall contain a string that identifies the upstream electrical source, such as the name of a circuit or outlet, that provides power to this circuit. If a value has not been assigned by a user, the value of this property shall be an empty string.
EnergykWh {}	object		The energy (kWh) for this circuit. This property shall contain the total energy, in kilowatt-hour units, for this circuit that represents the <code>Total</code> <code>ElectricalContext</code> sensor when multiple energy sensors exist for this circuit. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>EnergykWh</code>. For more information about this property, see <code>SensorEnergykWhExcerpt</code> in Property Details.

Property	Type	Attributes	Notes
FrequencyHz {}	object		The frequency (Hz) for this circuit. This property shall contain the frequency, in hertz units, for this circuit. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Frequency</code>. For more information about this property, see <code>SensorExcerpt</code> in Property Details.
IndicatorLED (<i>deprecated v1.1</i>)	string (enum)	<i>read-write</i> (<i>null</i>)	The state of the indicator LED, which identifies the circuit. This property shall contain the indicator light state for the indicator light associated with this circuit. <i>For the possible property values, see <code>IndicatorLED</code> in Property details. Deprecated in v1.1 and later. This property has been deprecated in favor of the <code>LocationIndicatorActive</code> property.</i>
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
BranchCircuit {	object	(<i>null</i>)	A reference to the branch circuit related to this circuit. This property shall contain a link to a resource of type <code>Circuit</code> that represents the branch circuit associated with this circuit.
@odata.id	string	<i>read-only</i>	Link to another Circuit resource.
}			
DistributionCircuits (v1.4+) [{	array		An array of links to the circuits powered by this circuit. This property shall contain an array of links to resources of type <code>Circuit</code> that represent the circuits powered by this circuit.
@odata.id	string	<i>read-write</i>	Link to another Circuit resource.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
Outlets [{	array		An array of references to the outlets contained by this circuit. This property shall contain an array of links to resources of type <code>Outlet</code> that represent the outlets associated with this circuit.
@odata.id	string	<i>read-only</i>	Link to a Outlet resource. See the Links section and the <code>Outlet</code> schema for details.

Property	Type	Attributes	Notes
}]			
PowerOutlet (v1.4+) {	object	(null)	A link to the power outlet that provides power to this circuit. This property shall contain a link to a resource of type <code>Outlet</code> that represents the outlet that provides power to this circuit. See the <i>Outlet</i> schema for details on this property.
@odata.id	string	read-write	Link to a <i>Outlet</i> resource. See the Links section and the <i>Outlet</i> schema for details.
}			
SourceCircuit (v1.4+) {	object	(null)	A link to the circuit that provides power to this circuit. This property shall contain a link to a resource of type <code>Circuit</code> that represents the circuit that provides power to this circuit. This property should be used when the power source is not represented by an <i>Outlet</i> resource, such as a feeder circuit.
@odata.id	string	read-write	Link to another <i>Circuit</i> resource.
}			
}			
LocationIndicatorActive (v1.1+)	boolean	read-write (null)	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of <code>IndicatorLED</code> in this resource, if supported, to reflect the implementation of the locating function.
NominalFrequencyHz (v1.8+)	number	read-only (null)	The nominal frequency (Hz) for this circuit. This property shall contain the nominal frequency for this circuit, in hertz units.
NominalVoltage	string (enum)	read-only (null)	The nominal voltage for this circuit. This property shall contain the nominal voltage for this circuit, in volt units. <i>For the possible property values, see NominalVoltage in Property details.</i>
PhaseWiringType	string (enum)	read-only (null)	The number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires). This property shall contain the number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires). <i>For the possible property values, see PhaseWiringType in Property details.</i>

Property	Type	Attributes	Notes
PlugType	string (enum)	<i>read-only</i> (<i>null</i>)	The type of plug according to NEMA, IEC, or regional standards. This property shall contain the type of physical plug used for this circuit, as defined by IEC, NEMA, or regional standards. <i>For the possible property values, see PlugType in Property details.</i>
PolyPhaseCurrentAmps {	object	(<i>null</i>)	The current readings for this circuit. This property shall contain the current sensors for this circuit. For 3-wire circuits, this property shall contain a duplicate copy of the current sensor referenced in the <code>CurrentAmps</code> property, if present. For other circuits, this property should contain multiple current sensor readings used to fully describe the circuit.
Line1 {	object		Line 1 current (A). This property shall contain the line current, in ampere units, for L1. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Current</code>. This property shall not be present if the equipment does not include an L1 measurement. For more information about this property, see <code>SensorCurrentExcerpt</code> in Property Details.
Line2 {	object		Line 2 current (A). This property shall contain the line current, in ampere units, for L2. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Current</code>. This property shall not be present if the equipment does not include an L2 measurement. For more information about this property, see <code>SensorCurrentExcerpt</code> in Property Details.
Line3 {	object		Line 3 current (A). This property shall contain the line current, in ampere units, for L3. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Current</code>. This property shall not be present if the equipment does not include an L3 measurement. For more information about this property, see <code>SensorCurrentExcerpt</code> in Property Details.

Property	Type	Attributes	Notes
Neutral {}	object		Neutral line current (A). This property shall contain the line current, in ampere units, for the Neutral line. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Current</code>. This property shall not be present if the equipment does not include a Neutral line measurement. For more information about this property, see <code>SensorCurrentExcerpt</code> in Property Details.
}			
PolyPhaseEnergykWh {	object	(null)	The energy readings for this circuit. This property shall contain the energy sensors for this circuit. For 3-wire circuits, this property shall contain a duplicate copy of the energy sensor referenced in the <code>EnergykWh</code> property, if present. For other circuits, this property should contain multiple energy sensor readings used to fully describe the circuit.
Line1ToLine2 {}	object		The Line 1 to Line 2 energy (kWh) for this circuit. This property shall contain the energy, in kilowatt-hour units, between L1 and L2. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>EnergykWh</code>. This property shall not be present if the equipment does not include an L1-L2 measurement. For more information about this property, see <code>SensorEnergykWhExcerpt</code> in Property Details.
Line1ToNeutral {}	object		The Line 1 to Neutral energy (kWh) for this circuit. This property shall contain the energy, in kilowatt-hour units, between L1 and Neutral. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>EnergykWh</code>. This property shall not be present if the equipment does not include an L1-Neutral measurement. For more information about this property, see <code>SensorEnergykWhExcerpt</code> in Property Details.
Line2ToLine3 {}	object		The Line 2 to Line 3 energy (kWh) for this circuit. This property shall contain the energy, in kilowatt-hour units, between L2 and L3. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>EnergykWh</code>. This property shall not be present if the equipment does not include an L2-L3 measurement. For more information about this property, see <code>SensorEnergykWhExcerpt</code> in Property Details.

Property	Type	Attributes	Notes
Line2ToNeutral {}	object		The Line 2 to Neutral energy (kWh) for this circuit. This property shall contain the energy, in kilowatt-hour units, between L2 and Neutral. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>EnergykWh</code>. This property shall not be present if the equipment does not include an L2-Neutral measurement. For more information about this property, see <code>SensorEnergykWhExcerpt</code> in Property Details.
Line3ToLine1 {}	object		The Line 3 to Line 1 energy (kWh) for this circuit. This property shall contain the energy, in kilowatt-hour units, between L3 and L1. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>EnergykWh</code>. This property shall not be present if the equipment does not include an L3-L1 measurement. For more information about this property, see <code>SensorEnergykWhExcerpt</code> in Property Details.
Line3ToNeutral {}	object		The Line 3 to Neutral energy (kWh) for this circuit. This property shall contain the energy, in kilowatt-hour units, between L3 and Neutral. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>EnergykWh</code>. This property shall not be present if the equipment does not include an L3-Neutral measurement. For more information about this property, see <code>SensorEnergykWhExcerpt</code> in Property Details.
}			
PolyPhasePowerWatts {	object	(null)	The power readings for this circuit. This property shall contain the power sensors for this circuit. For 3-wire circuits, this property shall contain a duplicate copy of the power sensor referenced in the <code>PowerWatts</code> property, if present. For other circuits, this property should contain multiple power sensor readings used to fully describe the circuit.
Line1ToLine2 {}	object		The Line 1 to Line 2 power (W) for this circuit. This property shall contain the power, in watt units, between L1 and L2. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Power</code>. This property shall not be present if the equipment does not include an L1-L2 measurement. For more information about this property, see <code>SensorPowerExcerpt</code> in Property Details.

Property	Type	Attributes	Notes
Line1ToNeutral {}	object		The Line 1 to Neutral power (W) for this circuit. This property shall contain the power, in watt units, between L1 and Neutral. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Power</code>. This property shall not be present if the equipment does not include an L1-Neutral measurement. For more information about this property, see <code>SensorPowerExcerpt</code> in Property Details.
Line2ToLine3 {}	object		The Line 2 to Line 3 power (W) for this circuit. This property shall contain the power, in watt units, between L2 and L3. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Power</code>. This property shall not be present if the equipment does not include an L2-L3 measurement. For more information about this property, see <code>SensorPowerExcerpt</code> in Property Details.
Line2ToNeutral {}	object		The Line 2 to Neutral power (W) for this circuit. This property shall contain the power, in watt units, between L2 and Neutral. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Power</code>. This property shall not be present if the equipment does not include an L2-Neutral measurement. For more information about this property, see <code>SensorPowerExcerpt</code> in Property Details.
Line3ToLine1 {}	object		The Line 3 to Line 1 power (W) for this circuit. This property shall contain the power, in watt units, between L3 and L1. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Power</code>. This property shall not be present if the equipment does not include an L3-L1 measurement. For more information about this property, see <code>SensorPowerExcerpt</code> in Property Details.
Line3ToNeutral {}	object		The Line 3 to Neutral power (W) for this circuit. This property shall contain the power, in watt units, between L3 and Neutral. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Power</code>. This property shall not be present if the equipment does not include an L3-Neutral measurement. For more information about this property, see <code>SensorPowerExcerpt</code> in Property Details.

Property	Type	Attributes	Notes
}			
PolyPhaseVoltage {	object	(null)	The voltage readings for this circuit. This property shall contain the voltage sensors for this circuit. For 3-wire circuits, this property shall contain a duplicate copy of the voltage sensor referenced in the <code>voltage</code> property, if present. For other circuits, this property should contain multiple voltage sensor readings used to fully describe the circuit.
Line1ToLine2 {}	object		The Line 1 to Line 2 voltage (V) for this circuit. This property shall contain the line-to-line voltage, in volt units, between L1 and L2. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Voltage</code>. This property shall not be present if the equipment does not include an L1-L2 measurement. For more information about this property, see <code>SensorVoltageExcerpt</code> in Property Details.
Line1ToNeutral {}	object		The Line 1 to Neutral voltage (V) for this circuit. This property shall contain the line-to-line voltage, in volt units, between L1 and Neutral. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Voltage</code>. This property shall not be present if the equipment does not include an L1-Neutral measurement. For more information about this property, see <code>SensorVoltageExcerpt</code> in Property Details.
Line2ToLine3 {}	object		The Line 2 to Line 3 voltage (V) for this circuit. This property shall contain the line-to-line voltage, in volt units, between L2 and L3. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Voltage</code>. This property shall not be present if the equipment does not include an L2-L3 measurement. For more information about this property, see <code>SensorVoltageExcerpt</code> in Property Details.
Line2ToNeutral {}	object		The Line 2 to Neutral voltage (V) for this circuit. This property shall contain the line-to-line voltage, in volt units, between L2 and Neutral. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Voltage</code>. This property shall not be present if the equipment does not include an L2-Neutral measurement. For more information about this property, see <code>SensorVoltageExcerpt</code> in Property Details.

Property	Type	Attributes	Notes
Line3ToLine1 {}	object		The Line 3 to Line 1 voltage (V) for this circuit. This property shall contain the line-to-line voltage, in volt units, between L3 and L1. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Voltage</code>. This property shall not be present if the equipment does not include an L3-L1 measurement. For more information about this property, see <code>SensorVoltageExcerpt</code> in Property Details.
Line3ToNeutral {}	object		The Line 3 to Neutral voltage (V) for this circuit. This property shall contain the line-to-line voltage, in volt units, between L3 and Neutral. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Voltage</code>. This property shall not be present if the equipment does not include an L3-Neutral measurement. For more information about this property, see <code>SensorVoltageExcerpt</code> in Property Details.
}			
PowerControlLocked (v1.5+)	boolean	<i>read-write</i>	Indicates whether power control requests are locked. This property shall indicate whether requests to the <code>PowerControl</code> action are locked. If <code>true</code>, services shall reject requests to the <code>PowerControl</code> action.
PowerCycleDelaySeconds	number	<i>read-write (null)</i>	The number of seconds to delay power on after a <code>PowerControl</code> action to cycle power. Zero seconds indicates no delay. This property shall contain the number of seconds to delay power on after a <code>PowerControl</code> action to cycle power. The value <code>0</code> shall indicate no delay to power on.
PowerEnabled	boolean	<i>read-only (null)</i>	Indicates if the circuit can be powered. This property shall indicate the power enable state of the circuit. The value <code>true</code> shall indicate that the circuit can be powered on, and <code>false</code> shall indicate that the circuit cannot be powered.
PowerLoadPercent (v1.3+) {}	object		The power load (percent) for this circuit. This property shall contain the power load, in percent units, for this circuit that represents the <code>Total</code> <code>ElectricalContext</code> for this circuit. For more information about this property, see <code>SensorExcerpt</code> in Property Details.

Property	Type	Attributes	Notes
PowerOffDelaySeconds	number	<i>read-write (null)</i>	The number of seconds to delay power off after a <code>PowerControl</code> action. Zero seconds indicates no delay to power off. This property shall contain the number of seconds to delay power off after a <code>PowerControl</code> action. The value <code>0</code> shall indicate no delay to power off.
PowerOnDelaySeconds	number	<i>read-write (null)</i>	The number of seconds to delay power up after a power cycle or a <code>PowerControl</code> action. Zero seconds indicates no delay to power up. This property shall contain the number of seconds to delay power up after a power cycle or a <code>PowerControl</code> action. The value <code>0</code> shall indicate no delay to power up.
PowerRestoreDelaySeconds	number	<i>read-write (null)</i>	The number of seconds to delay power on after power has been restored. Zero seconds indicates no delay. This property shall contain the number of seconds to delay power on after a power fault. The value <code>0</code> shall indicate no delay to power on.
PowerRestorePolicy	string (enum)	<i>read-write</i>	The desired power state of the circuit when power is restored after a power loss. This property shall contain the desired <code>PowerState</code> of the circuit when power is applied. The value <code>LastState</code> shall return the circuit to the <code>PowerState</code> it was in when power was lost. <i>For the possible property values, see <code>PowerRestorePolicy</code> in Property details.</i>
PowerState	string (enum)	<i>read-only (null)</i>	The power state of the circuit. This property shall contain the power state of the circuit. <i>For the possible property values, see <code>PowerState</code> in Property details.</i>
PowerStateInTransition (v1.5+)	boolean	<i>read-only</i>	Indicates whether the power state is undergoing a delayed transition. This property shall indicate whether the <code>PowerState</code> property will undergo a transition between on and off states due to a configured delay. The transition may be due to the configuration of the power on, off, or restore delay properties. If <code>true</code>, the <code>PowerState</code> property will transition at the conclusion of a configured delay.
PowerWatts {}	object		The power (W) for this circuit. This property shall contain the total power, in watt units, for this circuit that represents the <code>Total</code> <code>ElectricalContext</code> sensor when multiple power sensors exist for this circuit. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Power</code>. For more information about this property, see <code>SensorPowerExcerpt</code> in Property Details.

Property	Type	Attributes	Notes
RatedCurrentAmps	number (A)	<i>read-only</i> (<i>null</i>)	The rated maximum current allowed for this circuit. This property shall contain the rated maximum current for this circuit, in ampere units, after any required de-rating, due to safety agency or other regulatory requirements, has been applied.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
UnbalancedCurrentPercent (v1.5+) {}	object		The current imbalance (percent) between phases. This property shall contain the current imbalance, in percent units, between phases in a poly-phase circuit. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Percent</code>. For more information about this property, see SensorExcerpt in Property Details.
UnbalancedVoltagePercent (v1.5+) {}	object		The voltage imbalance (percent) between phases. This property shall contain the voltage imbalance, in percent units, between phases in a poly-phase circuit. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Percent</code>. For more information about this property, see SensorExcerpt in Property Details.
UserLabel (v1.4+)	string	<i>read-write</i>	A user-assigned label. This property shall contain a user-assigned label used to identify this resource. If a value has not been assigned by a user, the value of this property shall be an empty string.
Voltage {}	object		The voltage (V) for this circuit. This property shall contain the voltage, in volt units, for this circuit. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Voltage</code>. This property shall not be present if <code>PhaseWiringType</code> contains a value that indicates a 4-wire or greater configuration, such as <code>TwoPhase4Wire</code>. For more information about this property, see SensorVoltageExcerpt in Property Details.

Property	Type	Attributes	Notes
VoltageType	string (enum)	<i>read-only</i> (<i>null</i>)	The type of voltage applied to the circuit. This property shall contain the type of voltage applied to the circuit. <i>For the possible property values, see VoltageType in Property details.</i>

6.23.4 Actions

6.23.4.1 BreakerControl

Description

This action attempts to reset the circuit breaker.

- This action shall control the state of the circuit breaker or over-current protection device.

Action URI

{Base URI of target resource}/Actions/Circuit.BreakerControl

Action parameters

Parameter Name	Type	Attributes	Notes
PowerState	string (enum)	<i>optional</i>	The desired power state of the circuit if the breaker is reset successfully. This parameter shall contain the desired power state of the circuit. <i>For the possible property values, see PowerState in Property details.</i>

Request Example

```
{  
  "PowerState": "On"  
}
```

6.23.4.2 PowerControl

Description

This action turns the circuit on or off.

- This action shall control the power state of the circuit.

Action URI

{Base URI of target resource}/Actions/Circuit.PowerControl

Action parameters

Parameter Name	Type	Attributes	Notes
PowerState	string (enum)	<i>optional</i>	The desired power state of the circuit. • This parameter shall contain the desired power state of the circuit. <i>For the possible property values, see PowerState in Property details.</i>

Request Example

```
{  
  "PowerState": "Off"  
}
```

6.23.4.3 ResetMetrics**Description**

This action resets metrics related to this circuit.

- This action shall reset any time intervals or counted values for this circuit.

Action URI

{Base URI of target resource}/Actions/Circuit.ResetMetrics

Action parameters

This action takes no parameters.

6.23.5 Property details**6.23.5.1 BreakerState**

The state of the overcurrent protection device.

- This property shall contain the state of the overcurrent protection device.

string	Description
Normal	The breaker is powered on.
Off	The breaker is off.
Tripped	The breaker has been tripped.

6.23.5.2 CircuitType

The type of circuit.

- This property shall contain the type of circuit.

string	Description
Branch	A branch (output) circuit.
Bus (v1.3+)	An electrical bus circuit.
Feeder	A feeder (output) circuit.
Mains	A mains input or utility circuit.
Subfeed	A subfeed (output) circuit.

6.23.5.3 ElectricalContext

The combination of current-carrying conductors.

- This property shall contain the combination of current-carrying conductors that distribute power.

string	Description
Line1	The circuits that share the L1 current-carrying conductor. • This value shall represent a circuit that shares the L1 current-carrying conductor, such as circuits with phase wiring types of Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.
Line1ToLine2	The circuit formed by L1 and L2 current-carrying conductors. • This value shall represent a circuit formed by L1 and L2 current-carrying conductors, such as circuits with phase wiring types of Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.

string	Description
Line1ToNeutral	The circuit formed by L1 and neutral current-carrying conductors. This value shall represent a circuit formed by L1 and neutral current-carrying conductors, such as circuits with phase wiring types of Single-phase / 3-Wire, Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.
Line1ToNeutralAndL1L2	The circuit formed by L1, L2, and neutral current-carrying conductors. This value shall represent a circuit formed by L1, L2, and neutral current-carrying conductors, such as circuits with phase wiring types of Two-phase/ 4-Wire or Three-phase / 5-Wire.
Line2	The circuits that share the L2 current-carrying conductor. This value shall represent a circuit that shares the L2 current-carrying conductor, such as circuits with phase wiring types of Two-phase / 4-Wire or Three-phase / 4-Wire or 5-Wire.
Line2ToLine3	The circuit formed by L2 and L3 current-carrying conductors. This value shall represent a circuit formed by L2 and L3 current-carrying conductors, such as circuits with phase wiring types of Three-phase / 4-Wire or 5-Wire.
Line2ToNeutral	The circuit formed by L2 and neutral current-carrying conductors. This value shall represent a circuit formed by L2 and neutral current-carrying conductors, such as circuits with phase wiring types of Two-phase / 4-Wire or Three-phase / 5-Wire.
Line2ToNeutralAndL1L2	The circuit formed by L1, L2, and Neutral current-carrying conductors. This value shall represent a circuit formed by L1, L2, and neutral current-carrying conductors, such as circuits with phase wiring types of Two-phase/ 4-Wire or Three-phase / 5-Wire.
Line2ToNeutralAndL2L3	The circuits formed by L2, L3, and neutral current-carrying conductors. This value shall represent a circuit formed by L2, L3, and neutral current-carrying conductors, such as circuits with a phase wiring type of Three-phase / 5-Wire.
Line3	The circuits that share the L3 current-carrying conductor. This value shall represent a circuit that shares the L3 current-carrying conductor, such as circuits with phase wiring types of Three-phase / 4-Wire or 5-Wire.
Line3ToLine1	The circuit formed by L3 and L1 current-carrying conductors. This value shall represent a circuit formed by L3 and L1 current-carrying conductors, such as circuits with phase wiring types of Three-phase / 4-Wire or 5-Wire.

string	Description
Line3ToNeutral	The circuit formed by L3 and neutral current-carrying conductors. This value shall represent a circuit formed by L3 and neutral current-carrying conductors, such as circuits with a phase wiring type of Three-phase / 5-Wire.
Line3ToNeutralAndL3L1	The circuit formed by L3, L1, and neutral current-carrying conductors. This value shall represent a circuit formed by L3, L1, and neutral current-carrying conductors, such as circuits with a phase wiring type of Three-phase / 5-Wire.
LineToLine	The circuit formed by two current-carrying conductors. This value shall represent a circuit formed by two current-carrying conductors, such as circuits with phase wiring types of Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.
LineToNeutral	The circuit formed by a line and neutral current-carrying conductor. This value shall represent a circuit formed by a line and neutral current-carrying conductor, such as circuits with phase wiring types of Single-phase / 3-Wire, Two-phase / 4-Wire, or Three-phase / 4-Wire or 5-Wire.
Neutral	The grounded current-carrying return circuit of current-carrying conductors. This value shall represent the grounded current-carrying return circuit of current-carrying conductors, such as circuits with phase wiring types of Single-phase / 3-Wire, Two-phase / 4-Wire, or Three-phase / 5-Wire.
Total	The circuit formed by all current-carrying conductors. This value shall represent the circuits formed by all current-carrying conductors for any phase wiring type.

6.23.5.4 IndicatorLED

The state of the indicator LED, which identifies the circuit.

- This property shall contain the indicator light state for the indicator light associated with this circuit.

string	Description
Blinking	The indicator LED is blinking. This value shall represent that the indicator LED is in a blinking state where the LED is being turned on and off in repetition. If the service does not support this value, it shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code.

string	Description
Lit	The indicator LED is lit. This value shall represent that the indicator LED is in a solid on state. If the service does not support this value, it shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code.
Off	The indicator LED is off. This value shall represent that the indicator LED is in a solid off state. If the service does not support this value, it shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code.

6.23.5.5 NominalVoltage

The nominal voltage for this circuit.

- This property shall contain the nominal voltage for this circuit, in volt units.

string	Description
AC100To127V (v1.6+)	AC 100-127V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 100-127VAC. Range values are generally used to describe support on device inputs or inlets.
AC100To240V	AC 100-240V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 100-240VAC. Range values are generally used to describe support on device inputs or inlets.
AC100To277V	AC 100-277V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 100-277VAC. Range values are generally used to describe support on device inputs or inlets.
AC120V	AC 120V nominal. This value shall indicate the device supports a nominal voltage of 120VAC. Specific values are generally used to describe support on device outputs or outlets.
AC200To240V	AC 200-240V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 200-240VAC. Range values are generally used to describe support on device inputs or inlets.

string	Description
AC200To277V	AC 200-277V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 200-277VAC. Range values are generally used to describe support on device inputs or inlets.
AC208V	AC 208V nominal. This value shall indicate the device supports a nominal voltage of 208VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC230V	AC 230V nominal. This value shall indicate the device supports a nominal voltage of 230VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC240AndDC380V	AC 200-240V and DC 380V. This value shall indicate the device supports a nominal voltage in the complete range of 200-240VAC or a value of 380VDC. Range values are generally used to describe support on device inputs or inlets.
AC240V	AC 240V nominal. This value shall indicate the device supports a nominal voltage of 240VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC277AndDC380V	AC 200-277V and DC 380V. This value shall indicate the device supports a nominal voltage in the complete range of 200-277VAC or a value of 380VDC. Range values are generally used to describe support on device inputs or inlets.
AC277V	AC 277V nominal. This value shall indicate the device supports a nominal voltage of 277VAC. Specific AC high-voltage values may be used to describe support on device inputs or outputs.
AC400V	AC 400V or 415V nominal. This value shall indicate the device supports a nominal voltage of 400VAC or 415VAC. Specific AC high-voltage values may be used to describe support on device inputs or outputs.
AC480V	AC 480V nominal. This value shall indicate the device supports a nominal voltage of 480VAC. Specific AC high-voltage values may be used to describe support on device inputs or outputs.
DC12V (v1.7+)	DC 12V nominal. This value shall indicate the device supports a nominal voltage of 12VDC.

string	Description
DC16V (v1.7+)	DC 16V nominal. This value shall indicate the device supports a nominal voltage of 16VDC.
DC1_8V (v1.7+)	DC 1.8V nominal. This value shall indicate the device supports a nominal voltage of 1.8VDC.
DC240V	DC 240V nominal. This value shall indicate the device supports a nominal voltage of 240VDC.
DC380V	High-voltage DC (380V). This value shall indicate the device supports a nominal voltage of 380VDC.
DC3_3V (v1.7+)	DC 3.3V nominal. This value shall indicate the device supports a nominal voltage of 3.3VDC.
DC48V (v1.2+)	DC 48V nominal. This value shall indicate the device supports a nominal voltage of 48VDC.
DC5V (v1.7+)	DC 5V nominal. This value shall indicate the device supports a nominal voltage of 5VDC.
DC9V (v1.7+)	DC 9V nominal. This value shall indicate the device supports a nominal voltage of 9VDC.
DCNeg48V	-48V DC. This value shall indicate the device supports a nominal voltage of -48VDC.

6.23.5.6 PhaseWiringType

The number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires).

- This property shall contain the number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires).

string	Description
OneOrTwoPhase3Wire	Single or two-phase / 3-wire (Line1, Line2 or Neutral, Protective Earth). This value shall represent a single or two-phase / 3-wire (Line1, Line2 or Neutral, Protective Earth) wiring. This value shall be used when both phase configurations are supported. This is most common where detachable cordsets are used. If poly-phase properties such as <code>PolyPhaseVoltage</code> are supported, the service should populate the measurements as if the circuit is wired as Line1, Neutral, and Protective Earth.
OnePhase3Wire	Single-phase / 3-wire (Line1, Neutral, Protective Earth). This value shall represent a single-phase / 3-wire (Line1, Neutral, Protective Earth) wiring.
ThreePhase4Wire	Three-phase / 4-wire (Line1, Line2, Line3, Protective Earth). This value shall represent a three-phase / 4-wire (Line1, Line2, Line3, Protective Earth) wiring.
ThreePhase5Wire	Three-phase / 5-wire (Line1, Line2, Line3, Neutral, Protective Earth). This value shall represent a three-phase / 5-wire (Line1, Line2, Line3, Neutral, Protective Earth) wiring.
TwoPhase3Wire	Two-phase / 3-wire (Line1, Line2, Protective Earth). This value shall represent a two-phase / 3-wire (Line1, Line2, Protective Earth) wiring.
TwoPhase4Wire	Two-phase / 4-wire (Line1, Line2, Neutral, Protective Earth). This value shall represent a two-phase / 4-wire (Line1, Line2, Neutral, Protective Earth) wiring.

6.23.5.7 PlugType

The type of plug according to NEMA, IEC, or regional standards.

- This property shall contain the type of physical plug used for this circuit, as defined by IEC, NEMA, or regional standards.

string	Description
California_CS8265	California Standard CS8265 (Single-phase 250V; 50A; 2P3W). This value shall represent a plug that matches the 'California Standard' CS8265 style plug (Single-phase 250V; 50A; 2P3W).

string	Description
California_CS8365	California Standard CS8365 (Three-phase 250V; 50A; 3P4W). This value shall represent a plug that matches the 'California Standard' CS8365 style plug (Three-phase 250V; 50A; 3P4W).
Field_208V_3P4W_60A	Field-wired; Three-phase 200-250V; 60A; 3P4W. This value shall represent field-wired input that is three-phase 200-250V; 60A; 3P4W.
Field_400V_3P5W_32A	Field-wired; Three-phase 200-240/346-415V; 32A; 3P5W. This value shall represent field-wired input that is three-phase 200-240/346-415V; 32A; 3P5W.
IEC_60309_316P6	IEC 60309 316P6 (Single-phase 200-250V; 16A; 1P3W; Blue, 6-hour). This value shall represent a plug that matches the IEC 60309 316P6 plug (Single-phase 200-250V; 16A; 1P3W; Blue, 6-hour).
IEC_60309_332P6	IEC 60309 332P6 (Single-phase 200-250V; 32A; 1P3W; Blue, 6-hour). This value shall represent a plug that matches the IEC 60309 332P6 plug (Single-phase 200-250V; 32A; 1P3W; Blue, 6-hour).
IEC_60309_363P6	IEC 60309 363P6 (Single-phase 200-250V; 63A; 1P3W; Blue, 6-hour). This value shall represent a plug that matches the IEC 60309 363P6 plug (Single-phase 200-250V; 63A; 1P3W; Blue, 6-hour).
IEC_60309_460P9	IEC 60309 460P9 (Three-phase 200-250V; 60A; 3P4W; Blue; 9-hour). This value shall represent a plug that matches the IEC 60309 460P9 plug (Three-phase 200-250V; 60A; 3P4W; Blue; 9-hour).
IEC_60309_516P6	IEC 60309 516P6 (Three-phase 200-240/346-415V; 16A; 3P5W; Red; 6-hour). This value shall represent a plug that matches the IEC 60309 516P6 plug (Three-phase 200-240/346-415V; 16A; 3P5W; Red; 6-hour).
IEC_60309_532P6	IEC 60309 532P6 (Three-phase 200-240/346-415V; 32A; 3P5W; Red; 6-hour). This value shall represent a plug that matches the IEC 60309 plug 532P6 (Three-phase 200-240/346-415V; 32A; 3P5W; Red; 6-hour).
IEC_60309_560P9	IEC 60309 560P9 (Three-phase 120-144/208-250V; 60A; 3P5W; Blue; 9-hour). This value shall represent a plug that matches the IEC 60309 plug 560P9 (Three-phase 120-144/208-250V; 60A; 3P5W; Blue; 9-hour).

string	Description
IEC_60309_563P6	IEC 60309 563P6 (Three-phase 200-240/346-415V; 63A; 3P5W; Red; 6-hour). This value shall represent a plug that matches the IEC 60309 563P6 plug (Three-phase 200-240/346-415V; 63A; 3P5W; Red; 6-hour).
IEC_60320_C14	IEC C14 (Single-phase 250V; 10A; 1P3W). This value shall represent a plug that matches the IEC 60320 specified C14 input (Single-phase 250V; 10A; 1P3W).
IEC_60320_C20	IEC C20 (Single-phase 250V; 16A; 1P3W). This value shall represent a plug that matches the IEC 60320 specified C20 input (Single-phase 250V; 16A; 1P3W).
NEMA_5_15P	NEMA 5-15P (Single-phase 125V; 15A; 1P3W). This value shall represent a plug that matches the NEMA specified 5-15 straight (non-locking) plug (Single-phase 125V; 15A; 1P3W).
NEMA_5_20P	NEMA 5-20P (Single-phase 125V; 20A; 1P3W). This value shall represent a plug that matches the NEMA specified 5-20 straight (non-locking) plug that exhibits a T-slot (Single-phase 125V; 20A; 1P3W).
NEMA_6_15P	NEMA 6-15P (Single-phase 250V; 15A; 2P3W). This value shall represent a plug that matches the NEMA specified 6-15 straight (non-locking) plug (Single-phase 250V; 15A; 2P3W).
NEMA_6_20P	NEMA 6-20P (Single-phase 250V; 20A; 2P3W). This value shall represent a plug that matches the NEMA specified 6-20 straight (non-locking) plug (Single-phase 250V; 20A; 2P3W).
NEMA_L14_20P	NEMA L14-20P (Split-phase 125/250V; 20A; 2P4W). This value shall represent a plug that matches the NEMA specified locking L14-20 plug (Split-phase 125/250V; 20A; 2P4W).
NEMA_L14_30P	NEMA L14-30P (Split-phase 125/250V; 30A; 2P4W). This value shall represent a plug that matches the NEMA specified locking L14-30 plug (Split-phase 125/250V; 30A; 2P4W).
NEMA_L15_20P	NEMA L15-20P (Three-phase 250V; 20A; 3P4W). This value shall represent a plug that matches the NEMA specified locking L15-20 plug (Three-phase 250V; 20A; 3P4W).

string	Description
NEMA_L15_30P	NEMA L15-30P (Three-phase 250V; 30A; 3P4W). This value shall represent a plug that matches the NEMA specified locking L15-30 plug (Three-phase 250V; 30A; 3P4W).
NEMA_L21_20P	NEMA L21-20P (Three-phase 120/208V; 20A; 3P5W). This value shall represent a plug that matches the NEMA specified locking L21-20 plug (Three-phase 120/208V; 20A; 3P5W).
NEMA_L21_30P	NEMA L21-30P (Three-phase 120/208V; 30A; 3P5W). This value shall represent a plug that matches the NEMA specified locking L21-30 plug (Three-phase 120/208V; 30A; 3P5W).
NEMA_L22_20P	NEMA L22-20P (Three-phase 277/480V; 20A; 3P5W). This value shall represent a plug that matches the NEMA specified locking L22-20 plug (Three-phase 277/480V; 20A; 3P5W).
NEMA_L22_30P	NEMA L22-30P (Three-phase 277/480V; 30A; 3P5W). This value shall represent a plug that matches the NEMA specified locking L22-30 plug (Three-phase 277/480V; 30A; 3P5W).
NEMA_L5_15P	NEMA L5-15P (Single-phase 125V; 15A; 1P3W). This value shall represent a plug that matches the NEMA specified locking L5-15 plug (Single-phase 125V; 15A; 1P3W).
NEMA_L5_20P	NEMA L5-20P (Single-phase 125V; 20A; 1P3W). This value shall represent a plug that matches the NEMA specified locking L5-20 plug (Single-phase 125V; 20A; 1P3W).
NEMA_L5_30P	NEMA L5-30P (Single-phase 125V; 30A; 1P3W). This value shall represent a plug that matches the NEMA specified locking L5-30 plug (Single-phase 125V; 30A; 1P3W).
NEMA_L6_15P	NEMA L6-15P (Single-phase 250V; 15A; 2P3W). This value shall represent a plug that matches the NEMA specified locking L6-15 plug (Single-phase 250V; 15A; 2P3W).
NEMA_L6_20P	NEMA L6-20P (Single-phase 250V; 20A; 2P3W). This value shall represent a plug that matches the NEMA specified locking L6-20 plug (Single-phase 250V; 20A; 2P3W).

string	Description
NEMA_L6_30P	NEMA L6-30P (Single-phase 250V; 30A; 2P3W). This value shall represent a plug that matches the NEMA specified locking L6-30 plug (Single-phase 250V; 30A; 2P3W).

6.23.5.8 PowerRestorePolicy

The desired power state of the circuit when power is restored after a power loss.

- This property shall contain the desired `PowerState` of the circuit when power is applied. The value `LastState` shall return the circuit to the `PowerState` it was in when power was lost.

string	Description
AlwaysOff	Always remain powered off when external power is applied.
AlwaysOn	Always power on when external power is applied.
LastState	Return to the last power state (on or off) when external power is applied.

6.23.5.9 PowerState

6.23.5.9.1 In top level:

The power state of the circuit.

- This property shall contain the power state of the circuit.

string	Description
Off	The resource is powered off. The components within the resource might continue to have AUX power.
On	The resource is powered on.
Paused	The resource is paused.
PoweringOff	A temporary state between on and off. The components within the resource can take time to process the power off action.
PoweringOn	A temporary state between off and on. The components within the resource can take time to process the power on action.

6.23.5.9.2 In Actions: BreakerControl, Actions: PowerControl:

The desired power state of the circuit if the breaker is reset successfully.

- This parameter shall contain the desired power state of the circuit.

string	Description
Off	Power off.
On	Power on.
PowerCycle (v1.5+)	Power cycle. • This value shall indicate the resource will transition to a power off state, then transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>on</code>.

6.23.5.10 SensorCurrentExcerpt

The `Sensor` schema describes a sensor and its properties. This object is an excerpt of the `Sensor` resource located at the URI shown in `DataSourceUri`.

CrestFactor (v1.1+)	number	read-only (null)	The crest factor for this sensor. • This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	read-only (null)	The sensor value. • This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
THDPercent (v1.1+)	number (%)	read-only (null)	The total harmonic distortion percent (% THD). • This property shall contain the total harmonic distortion of the <code>Reading</code> property in percent units, typically 0 to 100.

6.23.5.11 SensorEnergykWhExcerpt

The `Sensor` schema describes a sensor and its properties. This object is an excerpt of the `Sensor` resource located at the URI shown in `DataSourceUri`.

ApparentkVAh (v1.5+)	number (kV.A.h)	read-only (null)	Apparent energy (kVAh). This property shall contain the apparent energy, in kilovolt-ampere-hour units, for an electrical energy measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>EnergykWh</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
LifetimeReading (v1.1+)	number	read-only (null)	The total accumulation value for this sensor. This property shall contain the total accumulation of the <code>Reading</code> property over the sensor's lifetime. This value shall not be reset by the <code>ResetMetrics</code> action.
ReactivekVARh (v1.5+)	number (kV.A.h)	read-only (null)	Reactive energy (kVARh). This property shall contain the reactive energy, in kilovolt-ampere-hours (reactive) units, for an electrical energy measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>EnergykWh</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
Reading	number	read-only (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
SensorResetTime	string (date-time)	read-only (null)	The date and time when the time-based properties were last reset. This property shall contain the date and time when the <code>ResetMetrics</code> action was last performed or when the service last reset the time-based property values.

6.23.5.12 SensorExcerpt

The `Sensor` schema describes a sensor and its properties. This object is an excerpt of the `Sensor` resource located at the URI shown in `DataSourceUri`.

DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.

6.23.5.13 SensorPowerExcerpt

The `Sensor` schema describes a sensor and its properties. This object is an excerpt of the `Sensor` resource located at the URI shown in `DataSourceUri`.

ApparentVA	number (V.A)	<i>read-only</i> (null)	The product of voltage and current for an AC circuit, in volt-ampere units. This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
PhaseAngleDegrees (v1.5+)	number	<i>read-only</i> (null)	The phase angle (degrees) between the current and voltage waveforms. This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>Power</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
PowerFactor	number	<i>read-only</i> (null)	The power factor for this sensor. This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. <code>PowerFactor</code> is expressed in unit-less 1/100ths. This property can appear in sensors containing a <code>ReadingType</code> value of <code>Power</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
ReactiveVAR	number (V.A)	<i>read-only</i> (null)	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.

Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.

6.23.5.14 SensorVoltageExcerpt

The `Sensor` schema describes a sensor and its properties. This object is an excerpt of the `Sensor` resource located at the URI shown in `DataSourceUri`.

CrestFactor (v1.1+)	number	<i>read-only</i> (null)	The crest factor for this sensor. This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
THDPercent (v1.1+)	number (%)	<i>read-only</i> (null)	The total harmonic distortion percent (% THD). This property shall contain the total harmonic distortion of the <code>Reading</code> property in percent units, typically <code>0</code> to <code>100</code>.

6.23.5.15 VoltageType

The type of voltage applied to the circuit.

- This property shall contain the type of voltage applied to the circuit.

string	Description
AC	Alternating Current (AC) circuit.
DC	Direct Current (DC) circuit.

6.23.6 Example response

```
{
  "@odata.type": "#Circuit.v1_8_1.Circuit",
  "Id": "A",
  "Name": "Branch Circuit A",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "CircuitType": "Branch",
  "PhaseWiringType": "TwoPhase3Wire",
  "NominalVoltage": "AC200To240V",
  "RatedCurrentAmps": 16,
  "BreakerState": "Normal",
  "PolyPhaseVoltage": {
    "Line1ToNeutral": {
      "DataSourceUri": "/redfish/v1/Chassis/PDU/Sensors/VoltageAL1N",
      "Reading": 118.2
    },
    "Line1ToLine2": {
      "DataSourceUri": "/redfish/v1/Chassis/PDU/Sensors/VoltageAL1L2",
      "Reading": 203.5
    }
  },
  "CurrentAmps": {
    "DataSourceUri": "/redfish/v1/Chassis/PDU/Sensors/CurrentA",
    "Reading": 5.19
  },
  "PolyPhaseCurrentAmps": {
    "Line1": {
      "DataSourceUri": "/redfish/v1/Chassis/PDU/Sensors/CurrentA",
      "Reading": 5.19
    }
  },
  "PowerWatts": {
    "DataSourceUri": "/redfish/v1/Chassis/PDU/Sensors/PowerA",
    "Reading": 937.4,
    "ApparentVA": 937.4,
    "ReactiveVAR": 0,
    "PowerFactor": 1
  },
  "PolyPhasePowerWatts": {
    "Line1ToNeutral": {
      "DataSourceUri": "/redfish/v1/Chassis/PDU/Sensors/PowerA1",
      "Reading": 937.4,
      "PeakReading": 1000.5,
      "ApparentVA": 937.4,
      "ReactiveVAR": 0,
    }
  }
}
```

```
        "PowerFactor": 1
      },
      "FrequencyHz": {
        "DataSourceUri": "/redfish/v1/Chassis/PDU/Sensors/FrequencyA",
        "Reading": 60
      },
      "EnergykWh": {
        "DataSourceUri": "/redfish/v1/Chassis/PDU/Sensors/EnergyA",
        "Reading": 325675
      },
      "Links": {
        "Outlets": [
          {
            "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A1"
          },
          {
            "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A2"
          },
          {
            "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A3"
          }
        ]
      },
      "Actions": {
        "#Circuit.BreakerControl": {
          "target": "/redfish/v1/PowerEquipment/RackPDUs/1/Branches/A/Circuit.BreakerControl"
        },
        "#Circuit.ResetMetrics": {
          "target": "/redfish/v1/PowerEquipment/RackPDUs/1/Branches/A/Circuit.ResetMetrics"
        }
      },
      "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Branches/A"
    }
  }
```

6.24 ComponentIntegrity 1.3.1

Version	v1.3	v1.2	v1.1	v1.0
Release	2024.3	2022.2	2022.1	2021.4

6.24.1 Description

The `ComponentIntegrity` resource provides critical and pertinent security information about a specific device, system, software element, or other managed entity.

- This resource shall represent critical and pertinent security information about a specific device, system, software element, or other managed entity.

6.24.2 URIs

/redfish/v1/ComponentIntegrity/{ComponentIntegrityId}

6.24.3 Properties

Property	Type	Attributes	Notes
ComponentIntegrityEnabled	boolean	<i>read-write</i>	An indication of whether security protocols are enabled for the component. • This property shall indicate whether security protocols are enabled for the component. If <code>ComponentIntegrityType</code> contains <code>SPDM</code>, a value of <code>false</code> shall prohibit the SPDM Requester from using SPDM to communicate with the component identified by the <code>TargetComponentURI</code> property. If <code>ComponentIntegrityType</code> contains <code>TPM</code>, a value of <code>false</code> shall disable the TPM component identified by the <code>TargetComponentURI</code> property entirely. If <code>false</code>, services shall not provide the TPM and SPDM properties in response payloads for this resource. If <code>false</code>, services shall reject action requests to this resource. If <code>true</code>, services shall allow security protocols with the component identified by the <code>TargetComponentURI</code> property.
ComponentIntegrityType	string (enum)	<i>read-only required</i>	The type of security technology for the component. • This value of this property shall contain the underlying security technology providing integrity information for the component. <i>For the possible property values, see ComponentIntegrityType in Property details.</i>
ComponentIntegrityTypeVersion	string	<i>read-only required</i>	The version of the security technology. • This value of this property shall contain the version of the security technology indicated by the <code>ComponentIntegrityType</code> property. If the service has not established secure communication with the device or if security protocols are disabled, this property shall contain an empty string. If <code>ComponentIntegrityType</code> contains <code>SPDM</code>, this property shall contain the negotiated or selected SPDM protocol and shall follow the regular expression pattern <code>^\d+\.\d+\.\d+\$</code>. If <code>ComponentIntegrityType</code> contains <code>TPM</code>, this property shall contain the version of the TPM.

Property	Type	Attributes	Notes
LastUpdated	string (date-time)	<i>read-only</i> (<i>null</i>)	The date and time when information for the component was last updated. This property shall contain the date and time when information for the component was last updated.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
ComponentsProtected [{	array		An array of links to resources that the target component protects. This property shall contain an array of links to resources that the component identified by the <code>TargetComponentURI</code> property provides integrity protection. This property shall not contain the value of the <code>TargetComponentURI</code> property.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
Oem {	object		See the OEM object definition in the Using this guide clause.
}			
SPDM {	object		Integrity information about the SPDM Responder as reported by an SPDM Requester. This property shall contain integrity information about the SPDM Responder identified by the <code>TargetComponentURI</code> property as reported by an SPDM Requester. This property shall be present if <code>ComponentIntegrityType</code> contains <code>SPDM</code> and if <code>ComponentIntegrityEnabled</code> contains <code>true</code>. For other cases, this property shall be absent.
ComponentCommunication {	object	(<i>null</i>)	Information about communication between the SPDM Requester and SPDM Responder. This property shall contain information about communication between the SPDM Requester and SPDM Responder.

Property	Type	Attributes	Notes
Sessions [{	array		The active sessions or communication channels between two components. This property shall contain an array of the active sessions or communication channels between two components. The active sessions or communication channels do not reflect how future sessions or communication channels are established.
SessionId	integer	<i>read-only</i> (null)	The identifier for an active session or communication channel between two components. This property shall contain the unique identifier for the active session or communication channel between two components.
SessionType	string (enum)	<i>read-only</i> (null)	The type of session or communication channel between two components. This property shall contain the type of session or communication channel between two components. <i>For the possible property values, see SessionType in Property details.</i>
}]			
}			
IdentityAuthentication {	object	(null)	Identity authentication information about the SPDM Requester and SPDM Responder. This property shall contain identity authentication information about the SPDM Requester and SPDM Responder.
RequesterAuthentication {	object	(null)	Authentication information of the identity of the SPDM Requester. This property shall contain authentication information of the identity of the SPDM Requester.
ProvidedCertificate {	object		A link to the certificate that represents the identity of the SPDM Requester provided in mutual authentication. This property shall contain a link to a resource of type <code>Certificate</code> that represents the identity of the SPDM Requester provided in mutual authentication. See the <i>Certificate</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Certificate resource. See the Links section and the <i>Certificate</i> schema for details.
}			

Property	Type	Attributes	Notes
}			
ResponderAuthentication {	object	(null)	Authentication information of the identity of the SPDM Responder. This property shall contain authentication information of the identity of the SPDM Responder.
ComponentCertificate {	object		A link to the certificate that represents the identity of the component. This property shall contain a link to a resource of type <code>Certificate</code> that represents the identity of the component referenced by the <code>TargetComponentURI</code> property. See the <i>Certificate</i> schema for details on this property.
@odata.id	string	read-only	Link to a Certificate resource. See the Links section and the <i>Certificate</i> schema for details.
}			
VerificationStatus	string (enum)	read-only (null)	The status of the verification of the identity of the component. This property shall contain the status of the verification of the identity of the component referenced by the <code>TargetComponentURI</code> property. For the possible property values, see <i>VerificationStatus</i> in <i>Property details</i>.
}			
}			
MeasurementSet {	object	(null)	Measurement information about the SPDM Responder. This property shall contain measurement information for the SPDM Responder.
Measurements [{	array		Measurements from an SPDM Responder. This property shall contain measurements from an SPDM Responder.
LastUpdated	string (date-time)	read-only (null)	The date and time when information for the measurement was last updated. This property shall contain the date and time when information for the measurement was last updated.

Property	Type	Attributes	Notes
Measurement	string	<i>read-only</i> (null)	The measurement data. This property shall contain a Base64-encoded string, with padding characters, of the measurement using the hash algorithm indicated by the <code>MeasurementHashAlgorithm</code> property. This property shall not contain a raw bit stream as a measurement. If the SPDM Responder provides a raw bit stream, the SPDM Requester may apply a hash algorithm to the raw bit stream in order to report the measurement. Pattern: <code>^[A-Za-z0-9+/]{0,2}\$</code>
MeasurementHashAlgorithm	string	<i>read-only</i> (null)	The hash algorithm used to compute the measurement. This property shall contain the hash algorithm used to compute the measurement. The allowable values for this property shall be the hash algorithm names found in the 'BaseHashAlgo' field of the 'NEGOTIATE_ALGORITHMS' request message in DSP0274. If the algorithm is an extended algorithm, this property shall contain the value <code>OEM</code>. This property shall not be present if <code>MeasurementSpecification</code> does not contain <code>DMTF</code>.
MeasurementIndex	integer	<i>read-only</i> (null)	The index of the measurement. This property shall contain the index of the measurement.
MeasurementType	string (enum)	<i>read-only</i> (null)	The type or characteristics of the data that this measurement represents. This property shall contain the type or characteristics of the data that this measurement represents. This property shall not be present if <code>MeasurementSpecification</code> does not contain <code>DMTF</code>. <i>For the possible property values, see <code>MeasurementType</code> in Property details.</i>
Oem {}	object		See the OEM object definition in the Using this guide clause.
PartofSummaryHash	boolean	<i>read-only</i> (null)	Indicates whether this measurement is part of the measurement summary. This property shall indicate if this measurement is part of the measurement summary in the <code>MeasurementSummary</code> property. If this property is not present, it shall be assumed to be <code>false</code>.

Property	Type	Attributes	Notes
SecurityVersionNumber (v1.1+)	string	<i>read-only</i> (null)	The security version number the measurement represents. This property shall contain an 8-byte hex-encoded string of the security version number the measurement represents. This property shall only be present if <code>MeasurementType</code> contains the value <code>MutableFirmwareSecurityVersionNumber</code>. Pattern: <code>^[A-Za-z0-9]{16}\$</code>
}]			
MeasurementSpecification	string (enum)	<i>read-only</i> (null)	The measurement specification negotiated between the SPDМ Requester and SPDМ Responder. This property shall contain the measurement specification negotiated between the SPDМ Requester and SPDМ Responder. <i>For the possible property values, see <code>MeasurementSpecification</code> in Property details.</i>
MeasurementSummary	string	<i>read-only</i> (null)	The measurement summary data. This property shall contain a Base64-encoded string, with padding characters, of the measurement summary using the hash algorithm indicated by the <code>MeasurementSummaryHashAlgorithm</code> property. Pattern: <code>^[A-Za-z0-9+/]{0,2}\$</code>
MeasurementSummaryHashAlgorithm	string	<i>read-only</i> (null)	The hash algorithm used to compute the measurement summary. This property shall contain the hash algorithm used to compute the measurement summary. The allowable values for this property shall be the hash algorithm names found in the 'BaseHashAlgo' field of the 'NEGOTIATE_ALGORITHMS' request message in DSP0274. If the algorithm is an extended algorithm, this property shall contain the value <code>OEM</code>.
MeasurementSummaryType	string (enum)	<i>read-only</i> (null)	The type of measurement summary. This property shall contain the type of measurement summary. <i>For the possible property values, see <code>MeasurementSummaryType</code> in Property details.</i>
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			

Property	Type	Attributes	Notes
Requester {	object	<i>required</i>	The link to the component that is reporting the integrity information of the target component. This property shall contain a link to the resource representing the SPDm Responder that is reporting the integrity of the SPDm Responder identified by the <code>TargetComponentURI</code> property.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
TargetComponentURI	string (URI)	<i>read-only required</i>	The link to the component whose integrity that this resource reports. This value of this property shall contain a link to the resource whose integrity information is reported in this resource. If <code>ComponentIntegrityType</code> contains <code>SPDM</code>, this property shall contain a URI to the resource that represents the SPDm Responder. If <code>ComponentIntegrityType</code> contains <code>TPM</code>, this property shall contain a URI with RFC6901-defined JSON fragment notation to a member of the <code>TrustedModules</code> array in a <code>ComputerSystem</code> resource that represents the TPM or a resource of type <code>TrustedComponent</code> that represents the TPM.
TPM {	object		Integrity information about the Trusted Platform Module (TPM). This property shall contain integrity information about the Trusted Platform Module (TPM) identified by the <code>TargetComponentURI</code> property. This property shall be present if <code>ComponentIntegrityType</code> contains <code>TPM</code> and if <code>ComponentIntegrityEnabled</code> contains <code>true</code>. For other cases, this property shall be absent.

Property	Type	Attributes	Notes
ComponentCommunication {	object	(null)	Information about communication with the TPM. This property shall contain information about communication with the TPM.
Sessions [{	array		The active sessions or communication channels between two components. This property shall contain an array of the active sessions or communication channels between two components. The active sessions or communication channels do not reflect how future sessions or communication channels are established.
SessionId	integer	read-only (null)	The identifier for an active session or communication channel between two components. This property shall contain the unique identifier for the active session or communication channel between two components.
SessionType	string (enum)	read-only (null)	The type of session or communication channel between two components. This property shall contain the type of session or communication channel between two components. <i>For the possible property values, see SessionType in Property details.</i>
}]			
}			
IdentityAuthentication {	object	(null)	Identity authentication information about the TPM. This property shall contain identity authentication information about the TPM.
ComponentCertificate {	object		A link to the certificate that represents the identity of the component. This property shall contain a link to a resource of type <code>Certificate</code> that represents the identity of the component referenced by the <code>TargetComponentURI</code> property. See the <i>Certificate</i> schema for details on this property.
@odata.id	string	read-only	Link to a Certificate resource. See the Links section and the <i>Certificate</i> schema for details.
}			

Property	Type	Attributes	Notes
VerificationStatus	string (enum)	<i>read-only</i> (null)	The status of the verification of the identity of the component. This property shall contain the status of the verification of the identity of the component referenced by the <code>TargetComponentURI</code> property. <i>For the possible property values, see VerificationStatus in Property details.</i>
}			
MeasurementSet {	object	(null)	Measurement information from the TPM. This property shall contain measurement information from the TPM.
Measurements [{	array		Measurements from a TPM. This property shall contain measurements from a TPM.
LastUpdated	string (date-time)	<i>read-only</i> (null)	The date and time when information for the measurement was last updated. This property shall contain the date and time when information for the measurement was last updated.
Measurement	string	<i>read-only</i> (null)	The measurement data. This property shall contain a Base64-encoded string, with padding characters, of the PCR digest using the hashing algorithm indicated by the <code>MeasurementHashAlgorithm</code> property. Pattern: <code>^[A-Za-z0-9+/]{0,2}\$</code>
MeasurementHashAlgorithm	string	<i>read-only</i> (null)	The hash algorithm used to compute the measurement. This property shall contain the hash algorithm used to compute the measurement. The allowable values for this property shall be the strings in the 'Algorithm Name' field of the 'TPM_ALG_ID Constants' table within the 'Trusted Computing Group Algorithm Registry'.
PCR	integer	<i>read-only</i> (null)	The Platform Configuration Register (PCR) bank of the measurement. This property shall contain the Platform Configuration Register (PCR) bank of the measurement.
}]			

Property	Type	Attributes	Notes
}			
NonceSizeBytesMaximum (v1.2+)	integer	read-only (null)	The maximum number of bytes that can be specified in the <code>Nonce</code> parameter of the <code>TPMGetSignedMeasurements</code> action. This property shall contain the maximum number of bytes that can be specified in the <code>Nonce</code> parameter of the <code>TPMGetSignedMeasurements</code> action.
}			

6.24.4 Actions

6.24.4.1 SPDMSignedMeasurements

Description

This action generates an SPDMSignedMeasurements cryptographic signed statement over the given nonce and measurements of the SPDMSignedMeasurements Responder.

- This action shall generate a cryptographic signed statement over the given nonce and measurements corresponding to the SPDMSignedMeasurements Responder. This action shall not be present if the `ComponentIntegrityType` property does not contain the value `SPDMSignedMeasurements`. The SPDMSignedMeasurements Requester shall issue one or more SPDMSignedMeasurements 'GET_MEASUREMENTS' requests for each of the requested measurement indices to the SPDMSignedMeasurements Responder. When the SPDMSignedMeasurements 'GET_MEASUREMENTS' requests are made for version 1.2, the parameter 'RawBitStreamRequested' shall contain `0`. The SPDMSignedMeasurements Requester shall provide the nonce for the action to the SPDMSignedMeasurements Responder in the last SPDMSignedMeasurements 'GET_MEASUREMENTS' request. The SPDMSignedMeasurements Requester shall request a signature in the last SPDMSignedMeasurements 'GET_MEASUREMENTS' request.

Action URI

{Base URI of target resource}/Actions/ComponentIntegrity.SPDMSignedMeasurements

Action parameters

Parameter Name	Type	Attributes	Notes
MeasurementIndices []	array (integer)	<i>optional</i>	An array of indices that identify the measurement blocks to sign. This parameter shall contain an array of indices that identify the measurement blocks to sign. This array shall contain one or more unique values between 0 to 254 , inclusive, or contain a single value of 255 . If not provided by the client, the value shall be assumed to be an array containing a single value of 255 .
Nonce	string	<i>optional</i>	A 32-byte hex-encoded string that is signed with the measurements. The value should be unique. This parameter shall contain a 32-byte hex-encoded string that is signed with the measurements. If not provided by the client, the SPDM Requester shall generate the nonce. The value should be unique and generated using a random or a pseudo-random generator. The SPDM Requester shall send this value to the SPDM Responder in the SPDM 'GET_MEASUREMENTS' request. Pattern: <code>^[0-9a-fA-F]{64}\$</code>
SlotId	integer	<i>optional</i>	The slot identifier for the certificate containing the private key to generate the signature over the measurements. This parameter shall contain the SPDM slot identifier for the certificate containing the private key to generate the signature over the measurements. If not provided by the client, the value shall be assumed to be 0 . The SPDM Requester shall send this value to the SPDM Responder in the SPDM 'GET_MEASUREMENTS' request.

Response Payload

{			
Certificate {	object		A link to the certificate corresponding to the SPDM slot identifier that can be used to validate the signature. This property shall contain a link to a resource of type <code>Certificate</code> that represents the certificate corresponding to the SPDM slot identifier that can be used to validate the signature. This property shall not be present if the SlotId parameter contains the value 15 . See the <i>Certificate</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Certificate resource. See the Links section and the <i>Certificate</i> schema for details.
}			

HashingAlgorithm	string	read-only required	The hashing algorithm used for generating the cryptographic signed statement. This property shall contain the hashing algorithm negotiated between the SPDM Requester and the SPDM Responder. The allowable values for this property shall be the hash algorithm names found in the 'BaseHashAlgo' field of the 'NEGOTIATE_ALGORITHMS' request message in DSP0274. If the algorithm is an extended algorithm, this property shall contain the value <code>OEM</code>.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PublicKey	string	read-only	A Privacy Enhanced Mail (PEM)-encoded public key that can be used to validate the signature. This property shall contain a Privacy Enhanced Mail (PEM)-encoded public key, as defined in section 13 of RFC7468, that can be used to validate the signature. This property shall only be present when the SPDM Requester was pre-provisioned with the SPDM Responder's public key and the SlotId parameter contains the value <code>15</code>.
SignedMeasurements	string	read-only required	Base64-encoded cryptographic signed statement generated by the signer. This property shall contain the cryptographic signed statement over the given nonce and measurement blocks corresponding to the requested measurement indices. If the SPDM version is 1.2, this value shall be a concatenation of SPDM 'VCA' and 'GET_MEASUREMENTS' requests and responses exchanged between the SPDM Requester and the SPDM Responder. If SPDM version is 1.0 or 1.1, this value shall be a concatenation of SPDM 'GET_MEASUREMENTS' requests and responses exchanged between the SPDM Requester and the SPDM Responder. The last 'MEASUREMENTS' response shall contain a signature generated over the 'L2' string by the SPDM Responder.
SigningAlgorithm	string	read-only required	The asymmetric signing algorithm used for generating the cryptographic signed statement. This property shall contain the asymmetric signing algorithm negotiated between the SPDM Requester and the SPDM Responder. The allowable values for this property shall be the asymmetric key signature algorithm names found in the 'BaseAsymAlgo' field of the 'NEGOTIATE_ALGORITHMS' request message in DSP0274. If the algorithm is an extended algorithm, this property shall contain the value <code>OEM</code>.
Version	string	read-only required	The SPDM version used by the SPDM Responder to generate the cryptographic signed statement. This property shall contain the SPDM version negotiated between the SPDM Requester and the SPDM Responder to generate the cryptographic signed statement. For example, <code>1.0</code>, <code>1.1</code>, or <code>1.2</code>.
}			

Request Example

```
{
  "Nonce": "4f2359ee609824d33d35c2968b6c56b702a692ab0d8a441f25c7d81fbe833a78",
  "SlotId": 0,
  "MeasurementIndices": [
    0,
    1,
    2
  ]
}
```

Response Example

```
{
  "@odata.type": "#ComponentIntegrity.v1_0_0.SPDMGetSignedMeasurementsResponse",
  "Version": "1.1",
  "HashingAlgorithm": "SHA256",
  "SigningAlgorithm": "TPM_ALG_RSAPSS_3072",
  "SignedMeasurements": "EeAQx8PJWv9CbeGdm1PaARrrMw... TRUNCATED (TYPICALLY KB or MB)",
  "Certificate": {
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/Certificates/SScert"
  }
}
```

6.24.4.2 TPMGetSignedMeasurements (v1.2+)

Description

This action generates a TPM cryptographic signed statement over the given nonce and PCRs of the TPM for TPM 2.0 devices.

- This action shall generate a cryptographic signed statement over the given nonce and PCRs of the TPM for TPM 2.0 devices. This action shall not be present if the `ComponentIntegrityType` property does not contain the value `TPM`.

Action URI

{Base URI of target resource}/Actions/ComponentIntegrity.TPMGetSignedMeasurements

Action parameters

Parameter Name	Type	Attributes	Notes
Certificate {	object	<i>required</i>	The URI for the certificate that represents the TPM attestation key. This parameter shall contain the reference to the certificate installed on the TPM that represents the TPM's attestation key for the 'signHandle' parameter of the 'TPM2_Quote' command defined in the Trusted Platform Module Library Specification. See the <i>Certificate</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Certificate resource. See the Links section and the <i>Certificate</i> schema for details.
}			
Nonce	string	<i>optional</i>	A set of bytes as a hex-encoded string that is signed with the measurements. The value should be unique. This parameter shall contain a set of bytes as a hex-encoded string that is signed with the measurements. Services shall reject the action request if the number of bytes provided is larger than the value specified by the <i>NonceSizeBytesMaximum</i> property in the <i>TPM</i> property. If not provided by the client, the service shall generate the nonce. The value should be unique and generated using a random or a pseudo-random generator. The service shall send this value to the TPM in the 'qualifyingData' parameter of the 'TPM2_Quote' command defined in the Trusted Platform Module Library Specification. Pattern: <code>^[0-9a-fA-F]*\$</code>
PCRSelection	string	<i>required</i>	An object that identifies the PCRs to sign. This parameter shall contain a Base64-encoded string, with padding characters, of the 'TPML_PCR_SELECTION' object as defined by the Trusted Platform Module Library Specification, that identifies the PCRs to sign. The service shall send this value to the TPM in the 'PCRselect' parameter of the 'TPM2_Quote' command defined in the Trusted Platform Module Library Specification.
Scheme	string	<i>required</i>	The signing scheme to use for the TPM attestation key. This parameter shall contain a Base64-encoded string, with padding characters, of the 'TPMT_SIG_SCHEME' object as defined in the Trusted Platform Module Library Specification, that identifies the signing scheme to use for the TPM attestation key. The service shall send this value to the TPM in the 'inScheme' parameter of the 'TPM2_Quote' command defined in the Trusted Platform Module Library Specification.

Response Payload

{			

Oem (v1.2+) {}	object		See the OEM object definition in the Using this guide clause.
SignedMeasurements (v1.2+)	string	<i>read-only required</i>	The Base64-encoded cryptographic signed statement generated by the signer. This property shall contain a Base64-encoded string, with padding characters, of the cryptographic signed statement generated by the signer. This value shall be the concatenation of the 'quoted' and 'signature' response values of the 'TPM2_Quote' command defined in the Trusted Platform Module Library Specification.
}			

Request Example

```
{
  "Nonce": "4f2359ee609824d33d35c2968b6c56b702a692ab0d8a441f25c7d81fbe833a78",
  "Certificate": {
    "@odata.id": "/redfish/v1/Chassis/1/TrustedComponents/TPM1/Certificates/1"
  },
  "Scheme": "MzI5NDg=",
  "PCRSelection": "MjM3NDA4MjM5ODQ="
}
```

Response Example

```
{
  "SignedMeasurements": "EeAQx8PJWv9CbeGdm1PaARrrMw... TRUNCATED (TYPICALLY KB or MB)"
}
```

6.24.5 Property details

6.24.5.1 ComponentIntegrityType

The type of security technology for the component.

- This value of this property shall contain the underlying security technology providing integrity information for the component.

string	Description
OEM	OEM-specific. This value shall indicate the integrity information is OEM-specific and the OEM section may include additional information.
SPDM	Security Protocol and Data Model (SPDM) protocol. This value shall indicate the integrity information is obtained through the Security Protocol and Data Model (SPDM) protocol as defined in DMTF DSP0274.
TCM (v1.3+)	Trusted Cryptography Module (TCM). This value shall indicate the integrity information is related to a Trusted Cryptography Module (TCM) as defined by the China TCM Union (TCMU).
TPCM (v1.3+)	Trusted Platform Control Module (TPCM). This value shall indicate the integrity information is related to a Trusted Platform Control Module (TPCM) as defined by the Zhongguancun Trusted Computing Industry Alliance (ZTCIA).
TPM	Trusted Platform Module (TPM). This value shall indicate the integrity information is related to a Trusted Platform Module (TPM) as defined by the Trusted Computing Group (TCG).

6.24.5.2 MeasurementSpecification

The measurement specification negotiated between the SPDM Requester and SPDM Responder.

- This property shall contain the measurement specification negotiated between the SPDM Requester and SPDM Responder.

string	Description
DMTF	DMTF. This value shall indicate the measurement specification is defined by DMTF in DSP0274.

6.24.5.3 MeasurementSummaryType

The type of measurement summary.

- This property shall contain the type of measurement summary.

string	Description
All	The measurement summary covers all measurements in SPDm.
TCB	The measurement summary covers the TCB.

6.24.5.4 MeasurementType

The type or characteristics of the data that this measurement represents.

- This property shall contain the type or characteristics of the data that this measurement represents. This property shall not be present if MeasurementSpecification does not contain `DMTF`.

string	Description
FirmwareConfiguration	Firmware configuration, such as configurable firmware policy.
HardwareConfiguration	Hardware configuration, such as straps.
ImmutableROM	Immutable ROM.
MeasurementManifest	Measurement Manifest.
MutableFirmware	Mutable firmware or any mutable code.
MutableFirmwareSecurityVersionNumber	Mutable firmware security version number.
MutableFirmwareVersion	Mutable firmware version.

6.24.5.5 SessionType

The type of session or communication channel between two components.

- This property shall contain the type of session or communication channel between two components.

string	Description
AuthenticatedOnly	An established session where only authentication is protecting the communication.
EncryptedAuthenticated	An established session where both encryption and authentication are protecting the communication.
Plain	A plain text session without any protection.

6.24.5.6 VerificationStatus

The status of the verification of the identity of the component.

- This property shall contain the status of the verification of the identity of the component referenced by the `TargetComponentURI` property.

string	Description
Failed	Unsuccessful verification.
Success	Successful verification.

6.24.6 Example response

```
{
  "@odata.type": "#ComponentIntegrity.v1_3_1.ComponentIntegrity",
  "Id": "TPM-0",
  "Description": "TPM physically attached to a GPU.",
  "Status": {
    "Health": "OK",
    "State": "Enabled"
  },
  "ComponentIntegrityType": "TPM",
  "ComponentIntegrityTypeVersion": "1.2.0",
  "ComponentIntegrityEnabled": true,
  "LastUpdated": "2021-11-02T14:09:54-07:00",
  "TargetComponentURI": "/redfish/v1/Systems/437XR1138R2#/TrustedModules/0",
  "Links": {
    "ComponentsProtected": [
      {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/GraphicsControllers/GPU1"
      }
    ]
  },
  "TPM": {
    "MeasurementSet": {
      "Measurements": [
        {
          "PCR": 1,
          "Measurement": "h6spEuxbyOtGhP35UoGhTcVX3iRaZQGDw4Yk5oQcabw=",
          "LastUpdated": "2021-10-31T20:14:27-07:00",
          "MeasurementHashAlgorithm": "TPM_ALG_SHA256"
        },
        {
          "PCR": 3,
```

```

        "Measurement": "GnbzS4ToNQb+Y7SxXw4AvRDTf4Sz05eeA1A1Dca28AA=",
        "LastUpdated": "2021-10-31T20:14:27-07:00",
        "MeasurementHashAlgorithm": "TPM_ALG_SHA256"
    },
    {
        "PCR": 1,
        "Measurement":
        "pLJa5Dyh8CDYFZ1WN0rsiSG1eyCPB1re42CD7CTywg7VkcC4afw4ZG3gQxi2XEFCt5jxz6tN1/cbx/DNx2/t0g==",
        "LastUpdated": "2021-10-31T20:14:27-07:00",
        "MeasurementHashAlgorithm": "TPM_ALG_SHA512"
    },
    {
        "PCR": 3,
        "Measurement":
        "GBgEucATV8omirTmYqY+vvbbisHR1jBKfVAEK1XSifBHnnIYXopsc0NExURDSSyPj021NrPqnwiq5LhI1p6rzQ==",
        "LastUpdated": "2021-10-31T20:14:27-07:00",
        "MeasurementHashAlgorithm": "TPM_ALG_SHA512"
    }
]
},
"IdentityAuthentication": {
    "VerificationStatus": "Success",
    "ComponentCertificate": {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/Certificates/TPMcert"
    }
},
"ComponentCommunication": {
    "Sessions": [
        {
            "SessionId": 4556,
            "SessionType": "Plain"
        }
    ]
}
},
"@odata.id": "/redfish/v1/ComponentIntegrity/TPM-0"
}

```

6.25 CompositionReservation 1.0.2

Version	v1.0
Release	2021.1

6.25.1 Description

The `CompositionReservation` schema contains reservation information related to the `Compose` action defined in the `CompositionService` resource when the `RequestType` parameter contains the value `PreviewReserve`.

- This resource represents the composition reservation of the composition service for a Redfish implementation.

6.25.2 URIs

/redfish/v1/CompositionService/CompositionReservations/{*CompositionReservationId*}

6.25.3 Properties

Property	Type	Attributes	Notes
Client	string	<i>read-only</i>	The client that owns the reservation. This property shall contain the client that owns the reservation. The service shall determine this value based on the client that invoked the <code>Compose</code> action that resulted in the creation of this reservation.
Manifest {	object		The manifest document processed by the service that resulted in this reservation. This property shall contain the manifest document processed by the service that resulted in this reservation. This property shall be required if the <code>RequestFormat</code> parameter in the <code>Compose</code> action request contained the value <code>Manifest</code>.
Description	string	<i>read-write (null)</i>	The description of this manifest. This property shall contain the description of this manifest.
Expand	string (enum)	<i>read-write (null)</i>	The expansion control for references in manifest responses, similar to the <code>\$expand=.</code> query parameter. This property shall contain the expansion control for references in manifest responses. <i>For the possible property values, see Expand in Property details.</i>
Stanzas [{	array		An array of stanzas that describe the requests specified by this manifest. This property shall contain an array of stanzas that describe the requests specified by this manifest.

Property	Type	Attributes	Notes
OEMStanzaType	string	<i>read-write</i> (null)	The OEM-defined type of stanza. This property shall contain the OEM-defined type of stanza. This property shall be present if <code>StanzaType</code> is <code>OEM</code>.
Request {}	object	(null)	The request details for the stanza. This property shall contain the request details for the stanza, and the contents vary depending on the value of the <code>StanzaType</code> property.
Response {}	object	(null)	The response details for the stanza. This property shall contain the response details for the stanza, and the contents vary depending on the value of the <code>StanzaType</code> property.
Stanzald	string	<i>read-write</i> (null)	The identifier of the stanza. This is a unique identifier specified by the client and is not used by the service. This property shall contain the identifier of the stanza.
StanzaType	string (enum)	<i>read-write</i> (null)	The type of stanza. This property shall contain the type of stanza. <i>For the possible property values, see <code>StanzaType</code> in Property details.</i>
}}			
Timestamp	string (date-time)	<i>read-write</i> (null)	The date and time when the manifest was created. This property shall contain the date and time when the manifest was created.
}			
ReservationTime	string (date-time)	<i>read-only</i>	The date and time the service created the reservation. This property shall indicate the date and time when the reservation was created by the service.
ReservedResourceBlocks [{	array		The array of links to the reserved resource blocks. This property shall contain an array of links to resources of type <code>ResourceBlock</code> that represent the reserved resource blocks for this reservation. Upon deletion of the reservation or when the reservation is applied, the <code>Reserved</code> property in the referenced resource blocks shall change to <code>false</code>.
@odata.id	string	<i>read-only</i>	Link to a <code>ResourceBlock</code> resource. See the Links section and the <code>ResourceBlock</code> schema for details.
}}			

6.25.4 Property details

6.25.4.1 Expand

The expansion control for references in manifest responses, similar to the `$expand=.` query parameter.

- This property shall contain the expansion control for references in manifest responses.

string	Description
All	Expand all subordinate references. • This value shall indicate that all subordinate references in the manifest response will be expanded.
None	Do not expand any references. • This value shall indicate that references in the manifest response will not be expanded.
Relevant	Expand relevant subordinate references. Relevant references are those that are tied to a constrained composition request, such as a request for a quantity of processors. • This value shall indicate that relevant subordinate references in the manifest response will be expanded.

6.25.4.2 StanzaType

The type of stanza.

- This property shall contain the type of stanza.

string	Description
ComposeResource	A stanza that describes the desired end state for a composed resource block. The resources consumed by the composed resource block are moved to the active pool. • This value shall indicate a stanza that describes a composed resource block. The resource blocks assigned to the composed resource block shall be moved to the active pool. The <code>Request</code> property of the stanza shall contain a resource of type <code>ResourceBlock</code> that represents the composition request. The <code>Response</code> property of the stanza shall contain a resource of type <code>ResourceBlock</code> that represents the composed resource block or a Redfish Specification-defined error response.

string	Description
ComposeSystem	A stanza that describes the desired end state for computer system composition operation. The resources consumed by the composed computer system are moved to the active pool. This value shall indicate a stanza that describes the specific, constrained, or mixed resources required to compose a computer system. The resource blocks assigned to the computer system shall be moved to the active pool. The <code>Request</code> property of the stanza shall contain a resource of type <code>ComputerSystem</code> that represents the composition request. The <code>Response</code> property of the stanza shall contain a resource of type <code>ComputerSystem</code> that represents the composed system or a Redfish Specification-defined error response.
DecomposeResource	A stanza that references a composed resource block to decompose and return resources to the free pool. This value shall indicate a stanza that references a composed resource block to decompose and return the resource blocks to the free pool that are no longer contributing to composed resources. The <code>Request</code> property of the stanza shall be a reference object as defined by the 'Reference properties' clause of the Redfish Specification containing a reference to the resource of type <code>ResourceBlock</code> to decompose. The <code>Response</code> property of the stanza shall contain a resource of type <code>ResourceBlock</code> that represents the decomposed resource block or a Redfish Specification-defined error response.
DecomposeSystem	A stanza that references a computer system to decompose and return resources to the free pool. This value shall indicate a stanza that references a computer system to decompose and return the resource blocks to the free pool that are no longer contributing to composed resources. The <code>Request</code> property of the stanza shall be a Redfish Specification-defined reference object containing a reference to the resource of type <code>ComputerSystem</code> to decompose. The <code>Response</code> property of the stanza shall contain a resource of type <code>ComputerSystem</code> that represents the decomposed system or a Redfish Specification-defined error response.
OEM	A stanza that describes an OEM-specific request. This value shall indicate a stanza that describes an OEM-specific request. The <code>OEMStanzaType</code> property shall contain the specific OEM stanza type.
RegisterResourceBlock (v1.1+)	A stanza that references a resource, such as a computer system, in order to create a resource block that references the resource and add it to the free pool. This value shall indicate a stanza that references a resource to create a resource block that references the resource and add it to the free pool. The <code>Request</code> property of the stanza shall contain a resource of type <code>ResourceBlock</code> that represents the registration request. The <code>Response</code> property of the stanza shall contain a resource of type <code>ResourceBlock</code> that represents the composed system or a Redfish Specification-defined error response.

6.25.5 Example response

```
{
  "@odata.type": "#CompositionReservation.v1_0_2.CompositionReservation",
```

```

    "Id": "1",
    "Name": "Composition Reservation 1",
    "ReservationTime": "2019-08-22T10:35:16+06:00",
    "Client": "VCF1001",
    "ReservedResourceBlocks": [
      {
        "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/BladeServer-2"
      }
    ],
    "Manifest": {
      "Description": "Description for this Manifest document.",
      "Timestamp": "2019-08-22T10:35:16+06:00",
      "Expand": "None",
      "Stanzas": [
        {
          "StanzaType": "ComposeSystem",
          "StanzaId": "Compute1",
          "Request": {
            "Links": {
              "ResourceBlocks": [
                {
                  "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/
BladeServer-2"
                }
              ]
            }
          }
        }
      ]
    },
    "@odata.id": "/redfish/v1/CompositionService/CompositionReservations/1"
  }

```

6.26 CompositionService 1.2.3

Version	v1.2	v1.1	v1.0
Release	2021.1	2018.2	2017.1

6.26.1 Description

The `CompositionService` schema describes a composition service and its properties and links to the resources available for composition.

- This resource shall represent the composition service and its properties for a Redfish implementation.

6.26.2 URIs

/redfish/v1/CompositionService

6.26.3 Properties

Property	Type	Attributes	Notes
ActivePool (v1.2+) {	object		The link to the collection of resource blocks within the active pool. Resource blocks in the active pool are contributing to at least one composed resource as a result of a composition request. This property shall contain a link to a resource collection of type <code>ResourceBlockCollection</code>. The members of this collection shall represent the resource blocks in the active pool. Services shall filter members of this collection based on the requesting client. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>ResourceBlock</i> . See the ResourceBlock schema for details.
}			
AllowOverprovisioning (v1.1+)	boolean	<i>read-write (null)</i>	An indication of whether this service is allowed to overprovision a composition relative to the composition request. This property shall indicate whether this service is allowed to overprovision a composition relative to the composition request.
AllowZoneAffinity (v1.1+)	boolean	<i>read-only (null)</i>	An indication of whether a client can request that a specific resource zone fulfill a composition request. This property shall indicate whether a client can request that a specific resource zone fulfill a composition request.
CompositionReservations (v1.2+) {	object		The link to the collection of reservations with the composition reservation collection. This property shall contain a link to a resource collection of type <code>CompositionReservationCollection</code>. The members of this collection shall contain links to reserved resource blocks and the related document that caused the reservations. Services shall filter members of this collection based on the requesting client. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>CompositionReservation</i> . See the CompositionReservation schema for details.
}			

Property	Type	Attributes	Notes
FreePool (v1.2+) {	object		The link to the collection of resource blocks within the free pool. Resource blocks in the free pool are not contributing to any composed resources. This property shall contain a link to a resource collection of type <code>ResourceBlockCollection</code>. The members of this collection shall represent the resource blocks in the free pool. Services shall filter members of this collection based on the requesting client. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>ResourceBlock</i> . See the ResourceBlock schema for details.
}			
ReservationDuration (v1.2+)	string (duration)	<i>read-write</i> (null)	The length of time a composition reservation is held before the service deletes the reservation and marks any related resource blocks as no longer reserved. This property shall contain the length of time a composition reservation is held before the service deletes the reservation and marks any related resource blocks as no longer reserved. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?</code>
ResourceBlocks {	object		The resource blocks available on the service. This property shall contain a link to a resource collection of type <code>ResourceBlockCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>ResourceBlock</i> . See the ResourceBlock schema for details.
}			
ResourceZones {	object		The resource zones available on the service. This property shall contain a link to a resource collection of type <code>ZoneCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Zone</i> . See the Zone schema for details.
}			
ServiceEnabled	boolean	<i>read-write</i> (null)	An indication of whether this service is enabled. This property shall indicate whether this service is enabled.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

6.26.4 Actions

6.26.4.1 Compose (v1.2+)

Description

This action performs a set of operations specified by a manifest.

- This action shall perform a set of operations specified by a manifest. Services shall not apply any part of the manifest unless all operations specified by the manifest are successful.

Action URI

{Base URI of target resource}/Actions/CompositionService.Compose

Action parameters

Parameter Name	Type	Attributes	Notes
Manifest {	object	<i>optional</i>	The manifest containing the compose operation request. This parameter shall contain the manifest containing the compose operation request. This parameter shall be required if <code>RequestFormat</code> contains the value <code>Manifest</code>.
Description	string	<i>read-write (null)</i>	The description of this manifest. This property shall contain the description of this manifest.
Expand	string (enum)	<i>read-write (null)</i>	The expansion control for references in manifest responses, similar to the <code>\$expand=.</code> query parameter. This property shall contain the expansion control for references in manifest responses. <i>For the possible property values, see Expand in Property details.</i>
Stanzas [{	array		An array of stanzas that describe the requests specified by this manifest. This property shall contain an array of stanzas that describe the requests specified by this manifest.
OEMStanzaType	string	<i>read-write (null)</i>	The OEM-defined type of stanza. This property shall contain the OEM-defined type of stanza. This property shall be present if <code>StanzaType</code> is <code>OEM</code>.

Parameter Name	Type	Attributes	Notes
Request {}	object	(null)	The request details for the stanza. This property shall contain the request details for the stanza, and the contents vary depending on the value of the <code>StanzaType</code> property.
Response {}	object	(null)	The response details for the stanza. This property shall contain the response details for the stanza, and the contents vary depending on the value of the <code>StanzaType</code> property.
Stanzald	string	read-write (null)	The identifier of the stanza. This is a unique identifier specified by the client and is not used by the service. This property shall contain the identifier of the stanza.
StanzaType	string (enum)	read-write (null)	The type of stanza. This property shall contain the type of stanza. <i>For the possible property values, see <code>StanzaType</code> in Property details.</i>
}]			
Timestamp	string (date-time)	read-write (null)	The date and time when the manifest was created. This property shall contain the date and time when the manifest was created.
}			
RequestFormat	string (enum)	required	The format of the request. This parameter shall contain the format of the request. <i>For the possible property values, see <code>RequestFormat</code> in Property details.</i>
RequestType	string (enum)	required	The type of request. This parameter shall contain the type of request. <i>For the possible property values, see <code>RequestType</code> in Property details.</i>
ReservationId	string	optional	The identifier of the composition reservation if applying a reservation. The value for this parameter is obtained from the response of a <code>Compose</code> action where the <code>RequestType</code> parameter contains the value <code>PreviewReserve</code> . This parameter shall contain the value of the <code>Id</code> property of the <code>CompositionReservation</code> resource for applying a reservation.

Response Payload

{			
Manifest (v1.2+) {	object		The manifest containing the compose operation response. This property shall contain the manifest containing the compose operation response. This property shall be required if <code>RequestFormat</code> contains the value <code>Manifest</code>.
Description	string	read-write (null)	The description of this manifest. This property shall contain the description of this manifest.
Expand	string (enum)	read-write (null)	The expansion control for references in manifest responses, similar to the <code>\$expand=</code> query parameter. This property shall contain the expansion control for references in manifest responses. <i>For the possible property values, see <code>Expand</code> in Property details.</i>
Stanzas [{	array		An array of stanzas that describe the requests specified by this manifest. This property shall contain an array of stanzas that describe the requests specified by this manifest.
OEMStanzaType	string	read-write (null)	The OEM-defined type of stanza. This property shall contain the OEM-defined type of stanza. This property shall be present if <code>StanzaType</code> is <code>OEM</code>.
Request {}	object	(null)	The request details for the stanza. This property shall contain the request details for the stanza, and the contents vary depending on the value of the <code>StanzaType</code> property.
Response {}	object	(null)	The response details for the stanza. This property shall contain the response details for the stanza, and the contents vary depending on the value of the <code>StanzaType</code> property.
Stanzald	string	read-write (null)	The identifier of the stanza. This is a unique identifier specified by the client and is not used by the service. This property shall contain the identifier of the stanza.
StanzaType	string (enum)	read-write (null)	The type of stanza. This property shall contain the type of stanza. <i>For the possible property values, see <code>StanzaType</code> in Property details.</i>
}}			

Timestamp	string (date-time)	read-write (null)	The date and time when the manifest was created. This property shall contain the date and time when the manifest was created.
}			
RequestFormat (v1.2+)	string (enum)	read-only required	The format of the request. This property shall contain the format of the request. For the possible property values, see <i>RequestFormat</i> in <i>Property details</i> .
RequestType (v1.2+)	string (enum)	read-only required	The type of request. This property shall contain the type of request. For the possible property values, see <i>RequestType</i> in <i>Property details</i> .
ReservationId (v1.2+)	string	read-only	The identifier of the composition reservation that was created. This property shall contain the value of the <code>Id</code> property of the <code>CompositionReservation</code> resource that was created. This property shall be required if <code>RequestType</code> contains the value <code>PreviewReserve</code>.
}			

Request Example

```
{
  "RequestFormat": "Manifest",
  "RequestType": "Apply",
  "Manifest": {
    "Description": "Specific composition example",
    "Timestamp": "2019-08-22T10:35:16+06:00",
    "Expand": "None",
    "Stanzas": [
      {
        "StanzaType": "ComposeSystem",
        "StanzaId": "Compute1",
        "Request": {
          "Links": {
            "ResourceBlocks": [
              {
                "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/
BladeServer-1"
              },
              {
                "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/NVMe-
TargetsAppliance-1"
              }
            ]
          }
        }
      }
    ]
  }
}
```

```

        "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/NetworkCard1"
      }
    ]
  }
}

```

Response Example

```

{
  "RequestFormat": "Manifest",
  "RequestType": "Apply",
  "Manifest": {
    "Description": "Specific composition example",
    "Timestamp": "2019-08-22T10:35:16+06:00",
    "Expand": "None",
    "Stanzas": [
      {
        "StanzaType": "ComposeSystem",
        "StanzaId": "Compute1",
        "Request": {
          "Links": {
            "ResourceBlocks": [
              {
                "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/
BladeServer-1"
              },
              {
                "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/NVMe-
TargetsAppliance-1"
              },
              {
                "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/NetworkCard1"
              }
            ]
          }
        },
        "Response": {
          "@odata.id": "/redfish/v1/Systems/ComposedCompute1",
          "@odata.type": "#ComputerSystem.v1_14_0.ComputerSystem",
          "Id": "ComposedCompute1",
          "Name": "Computer system composed from Compute1",
          "Processors": {
            "@odata.id": "/redfish/v1/Systems/ComposedCompute1/Processors"
          }
        }
      }
    ]
  }
}

```

```

    "Memory": {
      "@odata.id": "/redfish/v1/Systems/ComposedCompute1/Memory"
    },
    "NetworkInterfaces": {
      "@odata.id": "/redfish/v1/Systems/ComposedCompute1/NetworkInterfaces"
    },
    "Storage": {
      "@odata.id": "/redfish/v1/Systems/ComposedCompute1/Storage"
    },
    "Links": {
      "ResourceBlocks": [
        {
          "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/
BladeServer-1"
        },
        {
          "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/NVMe-
TargetsAppliance-1"
        },
        {
          "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/NetworkCard1"
        }
      ]
    }
  }
}
}
}
}
}
```

6.26.5 Property details

6.26.5.1 Expand

The expansion control for references in manifest responses, similar to the `$expand=.` query parameter.

- This property shall contain the expansion control for references in manifest responses.

string	Description
All	Expand all subordinate references. • This value shall indicate that all subordinate references in the manifest response will be expanded.
None	Do not expand any references. • This value shall indicate that references in the manifest response will not be expanded.

string	Description
Relevant	Expand relevant subordinate references. Relevant references are those that are tied to a constrained composition request, such as a request for a quantity of processors. This value shall indicate that relevant subordinate references in the manifest response will be expanded.

6.26.5.2 RequestFormat

The format of the request.

- This parameter shall contain the format of the request.

string	Description
Manifest	The request body contains a manifest. This value shall indicate that the request contains a manifest as defined by the Redfish <code>Manifest</code> schema.

6.26.5.3 RequestType

The type of request.

- This parameter shall contain the type of request.

string	Description
Apply	Perform the requested operations specified by the manifest and modify resources as needed. This value shall indicate that the request is to apply the requested operations specified by the manifest and modify resources as needed.
Preview	Preview the outcome of the operations specified by the manifest. This value shall indicate that the request is to preview the outcome of the operations specified by the manifest to show what the service will do based on the contents of the request, and not affect any resources within the service.
PreviewReserve	Preview the outcome of the operations specified by the manifest and reserve resources. This value shall indicate that the request is to preview the outcome of the operations specified by the manifest to show what the service will do based on the contents of the request. Resources that would have been affected by this request shall be marked as reserved but otherwise shall not be affected.

6.26.5.4 StanzaType

The type of stanza.

- This property shall contain the type of stanza.

string	Description
ComposeResource	A stanza that describes the desired end state for a composed resource block. The resources consumed by the composed resource block are moved to the active pool. • This value shall indicate a stanza that describes a composed resource block. The resource blocks assigned to the composed resource block shall be moved to the active pool. The <code>Request</code> property of the stanza shall contain a resource of type <code>ResourceBlock</code> that represents the composition request. The <code>Response</code> property of the stanza shall contain a resource of type <code>ResourceBlock</code> that represents the composed resource block or a Redfish Specification-defined error response.
ComposeSystem	A stanza that describes the desired end state for computer system composition operation. The resources consumed by the composed computer system are moved to the active pool. • This value shall indicate a stanza that describes the specific, constrained, or mixed resources required to compose a computer system. The resource blocks assigned to the computer system shall be moved to the active pool. The <code>Request</code> property of the stanza shall contain a resource of type <code>ComputerSystem</code> that represents the composition request. The <code>Response</code> property of the stanza shall contain a resource of type <code>ComputerSystem</code> that represents the composed system or a Redfish Specification-defined error response.
DecomposeResource	A stanza that references a composed resource block to decompose and return resources to the free pool. • This value shall indicate a stanza that references a composed resource block to decompose and return the resource blocks to the free pool that are no longer contributing to composed resources. The <code>Request</code> property of the stanza shall be a reference object as defined by the 'Reference properties' clause of the Redfish Specification containing a reference to the resource of type <code>ResourceBlock</code> to decompose. The <code>Response</code> property of the stanza shall contain a resource of type <code>ResourceBlock</code> that represents the decomposed resource block or a Redfish Specification-defined error response.
DecomposeSystem	A stanza that references a computer system to decompose and return resources to the free pool. • This value shall indicate a stanza that references a computer system to decompose and return the resource blocks to the free pool that are no longer contributing to composed resources. The <code>Request</code> property of the stanza shall be a Redfish Specification-defined reference object containing a reference to the resource of type <code>ComputerSystem</code> to decompose. The <code>Response</code> property of the stanza shall contain a resource of type <code>ComputerSystem</code> that represents the decomposed system or a Redfish Specification-defined error response.
OEM	A stanza that describes an OEM-specific request. • This value shall indicate a stanza that describes an OEM-specific request. The <code>OEMStanzaType</code> property shall contain the specific OEM stanza type.

string	Description
RegisterResourceBlock (v1.1+)	A stanza that references a resource, such as a computer system, in order to create a resource block that references the resource and add it to the free pool. This value shall indicate a stanza that references a resource to create a resource block that references the resource and add it to the free pool. The <code>Request</code> property of the stanza shall contain a resource of type <code>ResourceBlock</code> that represents the registration request. The <code>Response</code> property of the stanza shall contain a resource of type <code>ResourceBlock</code> that represents the composed system or a Redfish Specification-defined error response.

6.26.6 Example response

```
{
  "@odata.type": "#CompositionService.v1_2_3.CompositionService",
  "Id": "CompositionService",
  "Name": "Composition Service",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "ServiceEnabled": true,
  "AllowOverprovisioning": true,
  "AllowZoneAffinity": true,
  "ResourceBlocks": {
    "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks"
  },
  "ResourceZones": {
    "@odata.id": "/redfish/v1/CompositionService/ResourceZones"
  },
  "@odata.id": "/redfish/v1/CompositionService"
}
```

6.27 ComputerSystem 1.25.0

Version	v1.25	v1.24	v1.23	v1.22	v1.21	v1.20	v1.19	v1.18	v1.17	v1.16	v1.15	...
Release	2025.2	2025.1	2024.3	2023.3	2023.2	2022.3	2022.2	2022.1	2021.4	2021.2	2021.1	...

6.27.1 Description

The `ComputerSystem` schema represents a computer or system instance and the software-visible resources, or items

within the data plane, such as memory, CPU, and other devices that it can access. Details of those resources or subsystems are also linked through this resource.

- This resource shall represent a computing system in the Redfish Specification.

6.27.2 URIs

/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}

/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}

/redfish/v1/Systems/{ComputerSystemId}

6.27.3 Properties

Property	Type	Attributes	Notes
AssetTag	string	<i>read-write</i> (null)	The user-definable tag that can track this computer system for inventory or other client purposes. • This property shall contain the system asset tag value. Modifying this property may modify the <code>AssetTag</code> in the containing <code>Chassis</code> resource.
Bios (v1.1+) {	object		The link to the BIOS settings associated with this system. • This property shall contain a link to a resource of type <code>Bios</code> that lists the BIOS settings for this system. See the <i>Bios</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Bios resource. See the Links section and the <i>Bios</i> schema for details.
}			
BiosVersion	string	<i>read-only</i> (null)	The version of the system BIOS or primary system firmware. • This property shall contain the version string of the currently installed and running BIOS for x86 systems. For other systems, the property may contain a version string that represents the primary system firmware.
Boot {	object		The boot settings for this system. • This property shall contain the boot settings for this system.

Property	Type	Attributes	Notes
AliasBootOrder (v1.6+) []	array (string (enum))	<i>read-write</i> (null)	- Ordered array of boot source aliases representing the persistent boot order associated with this computer system. - This property shall contain an ordered array of boot source aliases of the <code>BootSource</code> type that represents the persistent boot order of this computer system. This array shall not contain duplicate values. Virtual devices for an alias should take precedence over a physical device. Systems may attempt to boot from multiple devices that share an alias. <i>For the possible property values, see <code>AliasBootOrder</code> in Property details.</i>
AutomaticRetryAttempts (v1.11+)	integer	<i>read-write</i> (null)	The number of attempts the system will automatically retry booting. This property shall contain the number of attempts the system will automatically retry booting in the event the system enters an error state on boot.
AutomaticRetryConfig (v1.11+)	string (enum)	<i>read-write</i> (null)	The configuration of how the system retries booting automatically. This property shall contain the configuration of how the system retries booting automatically. <i>For the possible property values, see <code>AutomaticRetryConfig</code> in Property details.</i>
BootNext (v1.5+)	string	<i>read-write</i> (null)	The <code>BootOptionReference</code> of the Boot Option to perform a one-time boot from when <code>BootSourceOverrideTarget</code> is <code>UefiBootNext</code>. This property shall contain the <code>BootOptionReference</code> of the UEFI boot option for one time boot, as defined by the UEFI Specification. The valid values for this property are specified in the values of the <code>BootOrder</code> array. <code>BootSourceOverrideEnabled</code> set to <code>Continuous</code> is not supported for <code>BootSourceOverrideTarget</code> set to <code>UefiBootNext</code> because this setting is defined in UEFI as a one-time boot setting.
BootOptions (v1.5+) {	object		The link to the collection of the UEFI boot options associated with this computer system. This property shall contain a link to a resource collection of type <code>BootOptionCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <code>BootOption</code> . See the <code>BootOption</code> schema for details.
}			

Property	Type	Attributes	Notes
BootOrder (v1.5+) []	array (string, null)	<i>read-write</i>	An array of <code>BootOptionReference</code> strings that represent the persistent boot order for with this computer system. Changes to the boot order typically require a system reset before they take effect. It is likely that a client finds the <code>@Redfish.Settings</code> term in this resource, and if it is found, the client makes requests to change boot order settings by modifying the resource identified by the <code>@Redfish.Settings</code> term. This property shall contain an array of <code>BootOptionReference</code> strings that represent the persistent boot order for this computer system. For UEFI systems, this is the UEFI Specification-defined UEFI BootOrder.
BootOrderPropertySelection (v1.6+)	string (enum)	<i>read-write</i> (null)	The name of the boot order property that the system uses for the persistent boot order. This property shall indicate which boot order property the system uses for the persistent boot order. <i>For the possible property values, see <code>BootOrderPropertySelection</code> in Property details.</i>
BootSourceOverrideEnabled	string (enum)	<i>read-write</i> (null)	The state of the boot source override feature. This property shall contain <code>Once</code> for a one-time boot override, and <code>Continuous</code> for a remain-active-until-cancelled override. If set to <code>Once</code>, the value is reset to <code>Disabled</code> after the <code>BootSourceOverrideTarget</code> actions have completed successfully. Changes to this property do not alter the BIOS persistent boot order configuration. <i>For the possible property values, see <code>BootSourceOverrideEnabled</code> in Property details.</i>
BootSourceOverrideMode (v1.1+)	string (enum)	<i>read-write</i> (null)	The BIOS boot mode to use when the system boots from the <code>BootSourceOverrideTarget</code> boot source. This property shall contain the BIOS boot mode to use when the system boots from the <code>BootSourceOverrideTarget</code> boot source. <i>For the possible property values, see <code>BootSourceOverrideMode</code> in Property details.</i>

Property	Type	Attributes	Notes
BootSourceOverrideTarget	string (enum)	<i>read-write</i> (null)	The current boot source to use at the next boot instead of the normal boot device, if <code>BootSourceOverrideEnabled</code> does not contain <code>Disabled</code>. This property shall contain the source to boot the system from, overriding the normal boot order. The <code>@Redfish.AllowableValues</code> annotation specifies the valid values for this property. <code>UefiTarget</code> indicates to boot from the UEFI device path found in <code>UefiTargetBootSourceOverride</code>. <code>UefiBootNext</code> indicates to boot from the UEFI <code>BootOptionReference</code> found in <code>BootNext</code>. Virtual devices for a target should take precedence over a physical device. Systems may attempt to boot from multiple devices that share a target identifier. Changes to this property do not alter the BIOS persistent boot order configuration. <i>For the possible property values, see <code>BootSourceOverrideTarget</code> in Property details.</i>
Certificates (v1.7+) {	object		The link to a collection of certificates used for booting through HTTPS by this computer system. This property shall contain a link to a resource collection of type <code>CertificateCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
HttpBootUri (v1.9+)	string (URI)	<i>read-write</i> (null)	The URI to boot from when <code>BootSourceOverrideTarget</code> is set to <code>UefiHttp</code>. This property shall contain the URI to perform an HTTP or HTTPS boot when <code>BootSourceOverrideTarget</code> is set to <code>UefiHttp</code>. If this property is not configured or supported, the URI shall be provided by a DHCP server as specified by the UEFI Specification.
RemainingAutomaticRetryAttempts (v1.11+)	integer	<i>read-only</i> (null)	The number of remaining automatic retry boots. This property shall contain the number of attempts remaining the system will retry booting in the event the system enters an error state on boot. If <code>0</code>, the system has no remaining automatic boot retry attempts and shall not automatically retry booting if the system enters an error state. This property shall be reset to the value of <code>AutomaticRetryAttempts</code> upon a successful boot attempt.

Property	Type	Attributes	Notes
StopBootOnFault (v1.15+)	string (enum)	<i>read-write</i> (null)	If the boot should stop on a fault. This property shall contain the setting if the boot should stop on a fault. <i>For the possible property values, see StopBootOnFault in Property details.</i>
TrustedModuleRequiredToBoot (v1.14+)	string (enum)	<i>read-write</i> (null)	The Trusted Module boot requirement. This property shall contain the Trusted Module boot requirement. <i>For the possible property values, see TrustedModuleRequiredToBoot in Property details.</i>
UefiTargetBootSourceOverride	string	<i>read-write</i> (null)	The UEFI device path of the device from which to boot when <code>BootSourceOverrideTarget</code> is <code>UefiTarget</code>. This property shall contain the UEFI device path of the override boot target. Changes to this property do not alter the BIOS persistent boot order configuration.
}			
BootProgress (v1.13+) {	object	(null)	This object describes the last boot progress state. This object shall contain the last boot progress state and time.
LastBootTimeSeconds (v1.18+)	number	<i>read-only</i> (null)	The number of seconds the system spent booting to the operating system during the last boot. This property shall contain the number of seconds that elapsed between system reset or power on and <code>LastState</code> transitioning to <code>OSRunning</code>. If <code>LastState</code> contains <code>OSRunning</code>, this property shall contain the most recent boot time. For other values of <code>LastState</code>, this property shall contain the boot time for the previous boot.
LastState (v1.13+)	string (enum)	<i>read-only</i> (null)	The last boot progress state. This property shall contain the last boot progress state. <i>For the possible property values, see LastState in Property details.</i>
LastStateTime (v1.13+)	string (date-time)	<i>read-only</i> (null)	The date and time when the last boot state was updated. This property shall contain the date and time when the last boot state was updated.
Oem (v1.13+) {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
OemLastState (v1.13+)	string	<i>read-only</i> (null)	The OEM-specific last state, if the LastState type is <code>OEM</code> . This property shall represent the OEM-specific <code>LastState</code> of the <code>BootProgress</code>. This property shall only be present if <code>LastState</code> is <code>OEM</code>.
}			
Certificates (v1.14+) {	object		The link to a collection of certificates for device identity and attestation. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that contains certificates for device identity and attestation. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
Composition (v1.18+) {	object	(null)	Information about the composition capabilities and state of the computer system. This property shall contain information about the composition capabilities and state of the computer system.
UseCases (v1.18+) []	array (string (enum))	<i>read-only</i> (null)	- The composition use cases in which this computer system can participate. - This property shall contain the composition use cases in which this computer system can participate. <i>For the possible property values, see UseCases in Property details.</i>
}			
EthernetInterfaces {	object		The link to the collection of Ethernet interfaces associated with this system. This property shall contain a link to a resource collection of type <code>EthernetInterfaceCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>EthernetInterface</i> . See the EthernetInterface schema for details.
}			

Property	Type	Attributes	Notes
FabricAdapters (v1.10+) {	object		The link to the collection of fabric adapters associated with this system. This property shall contain a link to a resource collection of type <code>FabricAdapterCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>FabricAdapter</i> . See the <i>FabricAdapter</i> schema for details.
}			
GraphicalConsole (v1.13+) {	object		The information about the graphical console (KVM-IP) service of this system. This property shall contain the information about the graphical console (KVM-IP) service of this system.
ConnectTypesSupported (v1.13+) []	array (string (enum))	<i>read-only</i>	- This property enumerates the graphical console connection types that the implementation allows. - This property shall contain an array of the enumerations. <code>KVMIP</code> shall be included if a vendor-defined KVM-IP protocol is supported. <i>For the possible property values, see ConnectTypesSupported in Property details.</i>
MaxConcurrentSessions (v1.13+)	integer	<i>read-only</i>	The maximum number of service sessions, regardless of protocol, that this system can support. This property shall contain the maximum number of concurrent service sessions that this implementation supports.
Port (v1.13+)	integer	<i>read-write</i> (null)	The protocol port. This property shall contain the port assigned to the service.
ServiceEnabled (v1.13+)	boolean	<i>read-write</i>	An indication of whether the service is enabled for this system. This property shall indicate whether the protocol for the service is enabled.
}			

Property	Type	Attributes	Notes
GraphicsControllers (v1.15+) {	object		The link to a collection of graphics controllers that can output video for this system. This property shall contain a link to a resource collection of type <code>GraphicsControllerCollection</code> that contains graphics controllers that can output video for this system. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>GraphicsController</i> . See the <i>GraphicsController</i> schema for details.
}			
HostedServices (v1.2+) {	object		The services that this computer system supports. This property shall describe services that this computer system supports.
Oem (v1.2+) {}	object		See the OEM object definition in the Using this guide clause.
StorageServices (v1.2+) {	object		The link to a collection of storage services that this computer system supports. This property shall contain a link to a resource collection of type <code>HostedStorageServices</code>.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
}			
HostingRoles (v1.2+) []	array (string (enum))	<i>read-only</i>	The enumerations of <code>HostingRole</code> specify different features that the hosting computer system supports. - The hosting roles that this computer system supports. - This property shall contain the hosting roles that this computer system supports. <i>For the possible property values, see HostingRoles in Property details.</i>

Property	Type	Attributes	Notes
HostName	string	<i>read-write (null)</i>	The DNS host name, without any domain information. This property shall contain the host name for this system, as reported by the operating system or hypervisor. A service running in the host operating system typically reports this value to the manager. Modifying this property may modify the <code>HostName</code> in one or more <code>EthernetInterface</code> resources contained in this system.
HostWatchdogTimer (v1.5+) {}	object		The host watchdog timer functionality for this system. This object shall contain properties that describe the host watchdog timer functionality for this system.
FunctionEnabled (v1.5+)	boolean	<i>read-write required (null)</i>	An indication of whether a user has enabled the host watchdog timer functionality. This property indicates only that a user has enabled the timer. To activate the timer, installation of additional host-based software is necessary; an update to this property does not initiate the timer. This property shall indicate whether a user has enabled the host watchdog timer functionality. This property indicates only that a user has enabled the timer. To activate the timer, installation of additional host-based software is necessary; an update to this property does not initiate the timer.
Oem (v1.5+) {}	object		See the OEM object definition in the Using this guide clause.
Status (v1.5+) {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
TimeoutAction (v1.5+)	string (enum)	<i>read-write required (null)</i>	The action to perform when the watchdog timer reaches its timeout value. This property shall contain the action to perform when the watchdog timer reaches its timeout value. <i>For the possible property values, see TimeoutAction in Property details.</i>

Property	Type	Attributes	Notes
WarningAction (v1.5+)	string (enum)	<i>read-write</i> (null)	The action to perform when the watchdog timer is close to reaching its timeout value. This action typically occurs from three to ten seconds before to the timeout value, but the exact timing is dependent on the implementation. This property shall contain the action to perform before the watchdog timer expires. This action typically occurs from three to ten seconds before to the timeout value, but the exact timing is dependent on the implementation. <i>For the possible property values, see WarningAction in Property details.</i>
}			
IdlePowerSaver (v1.16+) {	object	(null)	The idle power saver settings of the computer system. This property shall contain the idle power saver settings of the computer system.
Enabled (v1.16+)	boolean	<i>read-write</i>	An indication of whether idle power saver is enabled. The value of this property shall indicate if idle power saver is enabled.
EnterDwellTimeSeconds (v1.16+)	integer (seconds)	<i>read-write</i> (null)	The duration in seconds the computer system is below the <code>EnterUtilizationPercent</code> value before the idle power save is activated. This property shall contain the duration in seconds the computer system is below the <code>EnterUtilizationPercent</code> value before the idle power save is activated.
EnterUtilizationPercent (v1.16+)	number (%)	<i>read-write</i> (null)	The percentage of utilization when the computer system enters idle power save. If the computer system's utilization goes below this value, it enters idle power save. This property shall contain the percentage of utilization, typically 0 to 100, when the computer system enters idle power save. If the computer system's utilization goes below this value for the duration specified by <code>EnterDwellTimeSeconds</code>, it shall enter idle power save.
ExitDwellTimeSeconds (v1.16+)	integer (seconds)	<i>read-write</i> (null)	The duration in seconds the computer system is above the <code>ExitUtilizationPercent</code> value before the idle power save is stopped. This property shall contain the duration in seconds the computer system is above the <code>ExitUtilizationPercent</code> value before the idle power save is stopped.

Property	Type	Attributes	Notes
ExitUtilizationPercent (v1.16+)	number (%)	read-write (null)	The percentage of utilization when the computer system exits idle power save. If the computer system's utilization goes above this value, it exits idle power save. This property shall contain the percentage of utilization, typically 0 to 100, when the computer system exits idle power save. If the computer system's utilization goes above this value for the duration specified by <code>ExitDwellTimeSeconds</code>, it shall exit idle power save.
}			
IndicatorLED (deprecated v1.13)	string (enum)	read-write (null)	The state of the indicator LED, which identifies the system. This property shall contain the state of the indicator light, which identifies this system. <i>For the possible property values, see IndicatorLED in Property details. Deprecated in v1.13 and later. This property has been deprecated in favor of the <code>LocationIndicatorActive</code> property.</i>
IPMIHostInterface (v1.25+) {	object		The information about the in-band IPMI service of this system. This property shall contain the information about the in-band IPMI service of this system.
ServiceEnabled (v1.25+)	boolean	read-write	An indication of whether the service is enabled for this system. This property shall indicate whether the protocol for the service is enabled.
}			
KeyManagement (v1.16+) {	object	(null)	The key management settings of the computer system. This property shall contain the key management settings of the computer system.
KMIPCertificates (v1.16+) {	object		The link to a collection of server certificates for the servers referenced by the <code>KMIPServers</code> property. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that represents the server certificates for the servers referenced by the <code>KMIPServers</code> property. Contains a link to a resource.
@odata.id	string	read-only	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			

Property	Type	Attributes	Notes
KMIPServers (v1.16+) [{	array		The KMIP servers to which this computer system is subscribed. This property shall contain the KMIP servers to which this computer system is subscribed for key management.
Address (v1.16+)	string	<i>read-write</i> (null)	The KMIP server address. This property shall contain the KMIP server address.
CacheDuration (v1.20+)	string (duration)	<i>read-write</i> (null)	The duration the system caches KMIP data. This property shall contain the duration that the system caches KMIP data. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?</code> \$
CachePolicy (v1.20+)	string (enum)	<i>read-write</i> (null)	The cache policy to control how KMIP data is cached. This property shall contain the cache policy to control how KMIP data is cached. <i>For the possible property values, see CachePolicy in Property details.</i>
Password (v1.16+)	string	<i>read-write</i> (null)	The password to access the KMIP server. The value is <code>null</code> in responses. This property shall contain the password to access the KMIP server. The value shall be <code>null</code> in responses.
Port (v1.16+)	integer	<i>read-write</i> (null)	The KMIP server port. This property shall contain the KMIP server port.
Username (v1.16+)	string	<i>read-write</i> (null)	The username to access the KMIP server. This property shall contain the username to access the KMIP server.
}]			
}			
LastResetCause (v1.23+)	string (enum)	<i>read-only</i>	The last reset cause of the system. This property shall contain the cause when the system last came out of a reset or was rebooted. <i>For the possible property values, see LastResetCause in Property details.</i>

Property	Type	Attributes	Notes
LastResetTime (v1.12+)	string (date-time)	<i>read-only</i>	The date and time when the system was last reset or rebooted. This property shall contain the date and time when the system last came out of a reset or was rebooted.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Chassis [{	array		An array of links to the chassis that contains this system. This property shall contain an array of links to resources of type <code>Chassis</code> that represent the physical containers associated with this resource.
@odata.id	string	<i>read-only</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.
}			
ConsumingComputerSystems (v1.5+) [{	array		An array of links to computer systems that are realized, in whole or in part, from this computer system. The value shall be an array of links to computer systems that are realized, in whole or in part, from this computer system.
@odata.id	string	<i>read-only</i>	Link to another ComputerSystem resource.
}			
CooledBy [{	array		An array of links to resources or objects that cool this computer system. Normally, the link is for either a chassis or a specific set of fans. This property shall contain an array of links to resources or objects that cool this computer system.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
Endpoints (v1.2+) [{	array		An array of links to the endpoints that connect to this system. This property shall contain an array of links to resources of type <code>Endpoint</code> with which this system is associated.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}}			
HostingComputerSystem (v1.21+) {	object	(null)	The link to the system that is hosting this virtual machine. This property shall contain a link to a resource of type <code>ComputerSystem</code> that represents the system that is hosting this virtual machine. This property shall only be present if <code>SystemType</code> contains <code>Virtual</code>.
@odata.id	string	<i>read-only</i>	Link to another ComputerSystem resource.
}			
ManagedBy [{	array		An array of links to the managers responsible for this system. This property shall contain an array of links to resources of type <code>Manager</code> that represent the resources with management responsibility for this resource.
@odata.id	string	<i>read-only</i>	Link to a Manager resource. See the Links section and the <i>Manager</i> schema for details.
}}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
OffloadedNetworkDeviceFunctions (v1.17+) [{	array		The network device functions to which this system performs offload computation, such as with a SmartNIC. This property shall contain an array of links to resources of type <code>NetworkDeviceFunction</code> that represent the network device functions to which this system performs offload computation, such as with a SmartNIC. This property shall not be present if the <code>SystemType</code> property does not contain <code>DPU</code>.
@odata.id	string	<i>read-only</i>	Link to a NetworkDeviceFunction resource. See the Links section and the <i>NetworkDeviceFunction</i> schema for details.
}}			
PoweredBy [{	array		An array of links to resources or objects that power this computer system. Normally, the link is for either a chassis or a specific set of power supplies. This property shall contain an array of links to resources or objects that power this computer system.

Property	Type	Attributes	Notes
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
ResourceBlocks (v1.4+) [{	array		An array of links to the resource blocks that are used in this computer system. This property shall contain an array of links to resources of type <code>ResourceBlock</code> that show the resource blocks that are used in this computer system.
@odata.id	string	<i>read-write</i>	Link to a ResourceBlock resource. See the Links section and the <i>ResourceBlock</i> schema for details.
}]			
SupplyingComputerSystems (v1.5+) [{	array		An array of links to computer systems that contribute, in whole or in part, to the implementation of this computer system. The value shall be an array of links to computer systems that contribute, in whole or in part, to the implementation of this computer system.
@odata.id	string	<i>read-only</i>	Link to another ComputerSystem resource.
}]			
TrustedComponents (v1.19+) [{	array		An array of links to the trusted components for this system. This property shall contain an array of links to resources of type <code>TrustedComponent</code>.
@odata.id	string	<i>read-only</i>	Link to a TrustedComponent resource. See the Links section and the <i>TrustedComponent</i> schema for details.
}]			
VirtualMachines (v1.21+) [{	array		An array of links to the virtual machines this system is hosting. This property shall contain an array of links to resources of type <code>ComputerSystem</code> that represent the virtual machines this system is hosting.
@odata.id	string	<i>read-only</i>	Link to another ComputerSystem resource.
}]			

Property	Type	Attributes	Notes
}			
LocationIndicatorActive (v1.13+)	boolean	<i>read-write</i> (null)	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of <code>IndicatorLED</code> in this resource, if supported, to reflect the implementation of the locating function. Modifying this property may modify the <code>LocationIndicatorActive</code> in the containing <code>Chassis</code> resource.
LogServices {	object		The link to the collection of log services associated with this system. This property shall contain a link to a resource collection of type <code>LogServiceCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <code>LogService</code> . See the <code>LogService</code> schema for details.
}			
Manufacturer	string	<i>read-only</i> (null)	The manufacturer or OEM of this system. This property shall contain a value that represents the manufacturer of the system.
ManufacturingMode (v1.18+)	boolean	<i>read-only</i> (null)	An indication of whether the system is in manufacturing mode. Manufacturing mode is a special boot mode, not normally available to end users, that modifies features and settings for use while the system is being manufactured and tested. This property shall indicate whether the system is in manufacturing mode. If the system supports SMBIOS, the value shall match the 'Manufacturing mode is enabled' setting from the 'BIOS Characteristics' entry.
Measurements (v1.14+, deprecated v1.17) [{	array		An array of DSP0274-defined measurement blocks. This property shall contain an array of DSP0274-defined measurement blocks. <i>Deprecated in v1.17 and later. This property has been deprecated in favor of the <code>ComponentIntegrity</code> resource.</i>
@odata.id	string	<i>read-only</i>	Link to a <code>MeasurementBlock</code> resource. See the Links section and the <code>SoftwareInventory</code> schema for details.
}]			

Property	Type	Attributes	Notes
Memory (v1.1+) {	object		The link to the collection of memory associated with this system. This property shall contain a link to a resource collection of type <code>MemoryCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Memory</i> . See the Memory schema for details.
}			
MemoryDomains (v1.2+) {	object		The link to the collection of memory domains associated with this system. This property shall contain a link to a resource collection of type <code>MemoryDomainCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>MemoryDomain</i> . See the MemoryDomain schema for details.
}			
MemorySummary {	object		The central memory of the system in general detail. This property shall describe the central memory for this resource.
MemoryMirroring (v1.1+)	string (enum)	<i>read-only</i> (null)	The ability and type of memory mirroring that this computer system supports. This property shall contain the ability and type of memory mirroring that this computer system supports. <i>For the possible property values, see MemoryMirroring in Property details.</i>
Metrics (v1.8+) {	object		The link to the metrics associated with all memory in this system. This property shall contain a link to the metrics associated with all memory in this system. See the <i>MemoryMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a MemoryMetrics resource. See the Links section and the <i>MemoryMetrics</i> schema for details.
}			

Property	Type	Attributes	Notes
Status (<i>deprecated v1.16</i>) {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status. <i>Deprecated in v1.16 and later. This property has been deprecated in favor of the <code>Conditions</code> property within <code>Status</code> in the root of this resource.</i>
TotalSystemMemoryGiB	number (GiBy)	<i>read-only</i> (<i>null</i>)	The total configured operating system-accessible memory (RAM), measured in GiB. This property shall contain the amount of configured system general purpose volatile (RAM) memory as measured in gibibytes.
TotalSystemPersistentMemoryGiB (v1.4+)	number (GiBy)	<i>read-only</i> (<i>null</i>)	The total configured, system-accessible persistent memory, measured in GiB. This property shall contain the total amount of configured persistent memory available to the system as measured in gibibytes.
}			
Model	string	<i>read-only</i> (<i>null</i>)	The product name for this system, without the manufacturer name. This property shall describe how the manufacturer refers to this system. Typically, this value is the product name for this system without the manufacturer name.
NetworkInterfaces (v1.3+) {	object		The link to the collection of Network Interfaces associated with this system. This property shall contain a link to a resource collection of type <code>NetworkInterfaceCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <code>NetworkInterface</code>. See the <code>NetworkInterface</code> schema for details.
}			
OperatingSystem (v1.21+) {	object		The link to the operating system information associated with this system. This property shall contain a link to a resource of type <code>OperatingSystem</code> that contains operating system information for this system. See the <code>OperatingSystem</code> schema for details on this property.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a <code>OperatingSystem</code> resource. See the Links section and the <code>OperatingSystem</code> schema for details.
}			
PartNumber	string	<i>read-only (null)</i>	The part number for this system. This property shall contain the manufacturer-defined part number for the system.
PCleDevices (v1.2+) [{	array		The link to a collection of PCIe devices that this computer system uses. This property shall contain an array of links to resources of type <code>PCleDevice</code>.
@odata.id	string	<i>read-only</i>	Link to a <code>PCleDevice</code> resource. See the Links section and the <code>PCleDevice</code> schema for details.
}]			
PCleFunctions (v1.2+) [{	array		The link to a collection of PCIe functions that this computer system uses. This property shall contain an array of links to resources of type <code>PCleFunction</code>.
@odata.id	string	<i>read-only</i>	Link to a <code>PCleFunction</code> resource. See the Links section and the <code>PCleFunction</code> schema for details.
}]			
PowerCycleDelaySeconds (v1.13+)	number	<i>read-write (null)</i>	The number of seconds to delay power on after a <code>Reset</code> action requesting <code>PowerCycle</code> or <code>FullPowerCycle</code> . Zero seconds indicates no delay. This property shall contain the number of seconds to delay power on after a <code>Reset</code> action requesting <code>PowerCycle</code> or <code>FullPowerCycle</code>. The value <code>0</code> shall indicate no delay to power on.
PowerMode (v1.15+)	string (enum)	<i>read-write (null)</i>	The power mode setting of the computer system. This property shall contain the computer system power mode setting. <i>For the possible property values, see <code>PowerMode</code> in Property details.</i>

Property	Type	Attributes	Notes
PowerOffDelaySeconds (v1.13+)	number	<i>read-write</i> (null)	The number of seconds to delay power off during a reset. Zero seconds indicates no delay to power off. This property shall contain the number of seconds to delay power off during a reset. The value 0 shall indicate no delay to power off.
PowerOnDelaySeconds (v1.13+)	number	<i>read-write</i> (null)	The number of seconds to delay power on after an externally performed power cycle or during a reset. Zero seconds indicates no delay to power up. This property shall contain the number of seconds to delay power on after an externally performed power cycle or during a reset. The value 0 shall indicate no delay to power on.
PowerRestorePolicy (v1.6+)	string (enum)	<i>read-write</i>	The desired power state of the system when power is restored after a power loss. This property shall indicate the desired power state of the system when power is applied to the system. The <code>LastState</code> value shall return the system to the <code>PowerState</code> property value it was in when power was lost. <i>For the possible property values, see PowerRestorePolicy in Property details.</i>
PowerState	string (enum)	<i>read-only</i> (null)	The current power state of the system. This property shall contain the power state of the system. <i>For the possible property values, see PowerState in Property details.</i>
Processors {	object		The link to the collection of processors associated with this system. This property shall contain a link to a resource collection of type <code>ProcessorCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Processor</i> . See the Processor schema for details.
}			
ProcessorSummary {	object		The central processors of the system in general detail. This property shall describe the central processors for this resource. Processors described by this property shall be limited to the processors that execute system code, and shall not include processors used for offload functionality.

Property	Type	Attributes	Notes
CoreCount (v1.14+)	integer	<i>read-only</i> (null)	The number of processor cores in the system. This property shall contain the total number of central processor cores in the system.
Count	integer	<i>read-only</i> (null)	The number of physical processors in the system. This property shall contain the total number of physical central processors in the system.
LogicalProcessorCount (v1.5+)	integer	<i>read-only</i> (null)	The number of logical processors in the system. This property shall contain the total number of logical central processors in the system.
Metrics (v1.7+) {	object		The link to the metrics associated with all processors in this system. This property shall contain a link to the metrics associated with all processors in this system. See the <i>ProcessorMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a ProcessorMetrics resource. See the Links section and the <i>ProcessorMetrics</i> schema for details.
}			
Model	string	<i>read-only</i> (null)	The processor model for the primary or majority of processors in this system. This property shall contain the processor model for the central processors in the system, per the description in the Processor Information - Processor Family section of the SMBIOS Specification DSP0134 2.8 or later.
Status (deprecated v1.16) {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status. <i>Deprecated in v1.16 and later. This property has been deprecated in favor of the <code>Conditions</code> property within <code>Status</code> in the root of this resource.</i>
ThreadingEnabled (v1.15+)	boolean	<i>read-write</i>	An indication of whether threading is enabled on all processors in this system. The value of this property shall indicate that all <code>Processor</code> resources in this system where the <code>ProcessorType</code> property contains <code>CPU</code> have multiple threading support enabled.

Property	Type	Attributes	Notes
}			
Redundancy (v1.5+) [{}]	array (object)		The common redundancy definition and structure used in other Redfish schemas. - The link to a collection of redundancy entities. Each entity specifies a kind and level of redundancy and a collection, or redundancy set, of other computer systems that provide the specified redundancy to this computer system. - This property shall contain a set of redundancy entities. Each entity specifies a kind and level of redundancy and a collection, or redundancy set, of other computer systems that provide the specified redundancy to this computer system. For property details, see Redundancy.
SecureBoot (v1.1+) {	object		The link to the UEFI Secure Boot associated with this system. This property shall contain a link to a resource of type <code>SecureBoot</code>. See the <i>SecureBoot</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a SecureBoot resource. See the Links section and the <i>SecureBoot</i> schema for details.
}			
SerialConsole (v1.13+) {	object		The serial console services that this system provides. This property shall contain information about the serial console services of this system.
IPMI (v1.13+) {}	object		The connection details for an IPMI Serial-over-LAN service. This property shall contain connection details for a serial console service that uses the IPMI Serial-over-LAN (SOL) protocol. For more information about this property, see SerialConsoleProtocol in Property Details.
MaxConcurrentSessions (v1.13+)	integer	<i>read-only</i>	The maximum number of service sessions, regardless of protocol, that this system can support. This property shall contain the maximum number of concurrent service sessions that this implementation supports.

Property	Type	Attributes	Notes
SSH (v1.13+) {}	object		The connection details for an SSH serial console service. This property shall contain connection details for a serial console service that uses the Secure Shell (SSH) protocol. For more information about this property, see <code>SerialConsoleProtocol</code> in Property Details.
Telnet (v1.13+) {}	object		The connection details for a Telnet serial console service. This property shall contain connection details for a serial console service that uses the Telnet protocol. For more information about this property, see <code>SerialConsoleProtocol</code> in Property Details.
}			
SerialNumber	string	<i>read-only</i> (null)	The serial number for this system. This property shall contain the serial number for the system.
SimpleStorage {	object		The link to the collection of storage devices associated with this system. This property shall contain a link to a resource collection of type <code>SimpleStorageCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>SimpleStorage</i> . See the <i>SimpleStorage</i> schema for details.
}			
SKU	string	<i>read-only</i> (null)	The manufacturer SKU for this system. This property shall contain the SKU for the system.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <code>Status</code>.
Storage (v1.1+) {	object		The link to the collection of storage devices associated with this system. This property shall contain a link to a resource collection of type <code>StorageCollection</code>. Contains a link to a resource.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Storage</i> . See the <i>Storage</i> schema for details.
}			
SubModel (v1.5+)	string	<i>read-only</i> (null)	The sub-model for this system. This property shall contain the information about the sub-model (or configuration) of the system. This shall not include the model/ product name or the manufacturer name.
SystemType	string (enum)	<i>read-only</i>	The type of computer system that this resource represents. An enumeration that indicates the kind of system that this resource represents. <i>For the possible property values, see SystemType in Property details.</i>
TrustedModules (v1.1+, deprecated v1.19) [{	array		An array of trusted modules in the system. This object shall contain an array of objects with properties that describe the trusted modules for this resource. <i>Deprecated in v1.19 and later. This property has been deprecated in favor of the <code>TrustedComponents</code> property in <code>Links</code>.</i>
FirmwareVersion (v1.1+)	string	<i>read-only</i> (null)	The firmware version of this Trusted Module. This property shall contain the firmware version as defined by the manufacturer for the Trusted Module.
FirmwareVersion2 (v1.3+)	string	<i>read-only</i> (null)	The second firmware version of this Trusted Module, if applicable. This property shall contain the 2nd firmware version, if applicable, as defined by the manufacturer for the Trusted Module.
InterfaceType (v1.1+)	string (enum)	<i>read-only</i> (null)	The interface type of the Trusted Module. This property shall contain the interface type of the installed Trusted Module. <i>For the possible property values, see InterfaceType in Property details.</i>
InterfaceTypeSelection (v1.3+)	string (enum)	<i>read-only</i> (null)	The interface type selection supported by this Trusted Module. This property shall contain the interface type <code>Selection</code> method (for example to switch between TPM1_2 and TPM2_0) that is supported by this Trusted Module. <i>For the possible property values, see InterfaceTypeSelection in Property details.</i>
Oem (v1.1+) {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
Status (v1.1+) {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
}]			
USBControllers (v1.15+) {	object		The link to a collection of USB controllers for this system. This property shall contain a link to a resource collection of type <code>USBControllerCollection</code> that contains USB controllers for this system. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>USBController</i> . See the USBController schema for details.
}			
UUID	string (uuid)	<i>read-only</i> (null)	The UUID for this system. This property shall contain the universally unique identifier number for this system. RFC4122 describes methods to create this value. The value should be considered to be opaque. Client software should only treat the overall value as a UUID and should not interpret any subfields within the UUID. If the system supports SMBIOS, the property value should follow the SMBIOS 2.6 and later recommendation for converting the SMBIOS 16-byte UUID structure into the Redfish canonical <code>xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx</code> string format, so that the property value matches the byte order presented by current OS APIs, such as WMI and dmidecode. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification. Pattern: <code>^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\$</code> For more information about this property, see <i>Property details</i>.
VirtualMedia (v1.13+) {	object		The link to the virtual media services for this system. This property shall contain a link to a resource collection of type <code>VirtualMediaCollection</code> that this system uses. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>VirtualMedia</i> . See the VirtualMedia schema for details.
}			

Property	Type	Attributes	Notes
VirtualMediaConfig (v1.13+) {	object		The information about the virtual media service of this system. This property shall contain the information about the virtual media service of this system.
Port (v1.13+)	integer	<i>read-write</i> (null)	The protocol port. This property shall contain the port assigned to the service.
ServiceEnabled (v1.13+)	boolean	<i>read-write</i>	An indication of whether the service is enabled for this system. This property shall indicate whether the protocol for the service is enabled.
}			

6.27.4 Actions

6.27.4.1 AddResourceBlock (v1.6+)

Description

This action adds a resource block to a system.

- This action shall add a resource block to a system.

Action URI

{Base URI of target resource}/Actions/ComputerSystem.AddResourceBlock

Action parameters

Parameter Name	Type	Attributes	Notes
ComputerSystemETag	string	<i>optional</i>	The current ETag of the system. This parameter shall contain the current ETag of the system. If the client-provided ETag does not match the current ETag of the system, the service shall return the HTTP 428 Precondition Required status code to reject the request.

Parameter Name	Type	Attributes	Notes
ResourceBlock {	object	required	The resource block to add to the system. This parameter shall contain a link to the specified resource block to add to the system. See the <i>ResourceBlock</i> schema for details on this property.
@odata.id	string	read-only	Link to a ResourceBlock resource. See the Links section and the <i>ResourceBlock</i> schema for details.
}			
ResourceBlockETag	string	optional	The current ETag of the resource block to add to the system. This parameter shall contain the current ETag of the resource block to add to the system. If the client-provided ETag does not match the current ETag of the resource block that the <i>ResourceBlock</i> parameter specifies, the service shall return the HTTP 428 Precondition Required status code to reject the request.

Request Example

```
{
  "ResourceBlock": {
    "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/Offload-GPU1"
  },
  "ResourceBlockETag": "W/\"19472363938\"",
  "ComputerSystemETag": "W/\"99374369273\""
}
```

6.27.4.2 Decommission (v1.21+)

Description

This action decommissions a system.

- This action shall remove all specified data from a system in preparation to decommission the system.

Action URI

{Base URI of target resource}/Actions/ComputerSystem.Decommission

Action parameters

Parameter Name	Type	Attributes	Notes
ComputerSystemETag	string	<i>optional</i>	The current ETag of the system. This parameter shall contain the current ETag of the system. If the client-provided ETag does not match the current ETag of the system, the service shall return the HTTP <code>428 Precondition Required</code> status code to reject the request.
DecommissionTypes []	array (string (enum))	<i>read-write</i>	- The types of data to remove from the system. - This parameter shall contain a list of the types of data to remove from the system. <i>For the possible property values, see DecommissionTypes in Property details.</i>
OEMDecommissionTypes []	array (string)	<i>optional</i>	The OEM-specific types of data to remove from the system. This parameter shall contain any OEM-specific types of data to remove from the system.
RequireSecureErase	boolean	<i>optional</i>	Ensure secure erasure of all devices and fail the request if not possible. This parameter shall indicate if a secure erase is required. If the parameter contains <code>true</code> and a secure erase to the level of NIST 800-88 Clear or Purge for all specified components cannot be performed the service shall return the HTTP <code>501 Not Implemented</code> status code. This failure may occur after the process has already started. If not provided by the client, the value shall be assumed to be <code>false</code>.

Request Example

```
{
  "DecommissionTypes": [
    "All"
  ],
  "RequireSecureErase": false
}
```

6.27.4.3 RemoveResourceBlock (v1.6+)

Description

This action removes a resource block from a system.

- This action shall remove a resource block from a system.

Action URI

{Base URI of target resource}/Actions/ComputerSystem.RemoveResourceBlock

Action parameters

Parameter Name	Type	Attributes	Notes
ComputerSystemETag	string	optional	The current ETag of the system. This parameter shall contain the current ETag of the system. If the client-provided ETag does not match the current ETag of the system, the service shall return the HTTP 428 Precondition Required status code to reject the request.
ResourceBlock {	object	required	The resource block to remove from the system. This parameter shall contain a link to the specified resource block to remove from the system. See the <i>ResourceBlock</i> schema for details on this property.
@odata.id	string	read-only	Link to a ResourceBlock resource. See the Links section and the <i>ResourceBlock</i> schema for details.
}			
ResourceBlockETag	string	optional	The current ETag of the resource block to remove from the system. This parameter shall contain the current ETag of the resource block to remove from the system. If the client-provided ETag does not match the current ETag of the resource block that the <i>ResourceBlock</i> parameter specifies, the service shall return the HTTP 428 Precondition Required status code to reject the request.

Request Example

```
{
  "ResourceBlock": {
    "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/Offload-GPU1"
  },
  "ResourceBlockETag": "W/\"19472363938\"",
  "ComputerSystemETag": "W/\"99374369273\""
}
```

6.27.4.4 Reset

Description

This action resets the system.

- This action shall reset the system represented by the resource. For systems that implement ACPI Power Button functionality, the `PushPowerButton` value shall perform or emulate an ACPI Power Button Push, and the `ForceOff` value shall perform an ACPI Power Button Override, commonly known as a four-second hold of the power button.

Action URI

{Base URI of target resource}/Actions/ComputerSystem.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	<i>optional</i>	The type of reset. • This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset. Services should include the <code>@Redfish.AllowableValues</code> annotation for this parameter to ensure compatibility with clients, even when <code>ActionInfo</code> has been implemented. <i>For the possible property values, see <code>ResetType</code> in Property details.</i>

Request Example

```
{
  "ResetType": "ForceRestart"
}
```

6.27.4.5 SetDefaultBootOrder (v1.5+)

Description

This action sets the `BootOrder` property to the default settings.

- This action shall set the `BootOrder` array to the default settings.

Action URI

{Base URI of target resource}/Actions/ComputerSystem.SetDefaultBootOrder

Action parameters

This action takes no parameters.

6.27.5 Property details

6.27.5.1 AliasBootOrder

- Ordered array of boot source aliases representing the persistent boot order associated with this computer system.
 - This property shall contain an ordered array of boot source aliases of the `BootSource` type that represents the persistent boot order of this computer system. This array shall not contain duplicate values. Virtual devices for an alias should take precedence over a physical device. Systems may attempt to boot from multiple devices that share an alias.

string	Description
BiosSetup	Boot to the BIOS setup utility.
Cd	Boot from the CD or DVD.
Diags	Boot to the manufacturer's diagnostics program.
Floppy	Boot from the floppy disk drive.
Hdd	Boot from a hard drive.
None	Boot from the normal boot device.
Pxe	Boot from the Pre-boot eXecution Environment (PXE).
Recovery	Boot to a system-designated recovery process or image.
RemoteDrive	Boot from a remote drive, such as an iSCSI target.
SDCard	Boot from an SD card.
UefiBootNext	Boot to the UEFI device that the <code>BootNext</code> property specifies.
UefiHttp	Boot from a UEFI HTTP network location.
UefiShell	Boot to the UEFI Shell.
UefiTarget	Boot to the UEFI device specified in the <code>UefiTargetBootSourceOverride</code> property.
Usb	Boot from a system BIOS-specified USB device.
Utilities	Boot to the manufacturer's utilities program or programs.

6.27.5.2 AutomaticRetryConfig

The configuration of how the system retries booting automatically.

- This property shall contain the configuration of how the system retries booting automatically.

string	Description
Disabled	Disable automatic retrying of booting. • This value shall indicate that automatic retrying of booting is disabled.
RetryAlways	Always automatically retry booting. • This value shall indicate that the system will always automatically retry booting.
RetryAttempts	Automatic retrying of booting is based on a specified retry count. • This value shall indicate that the number of retries of booting is based on the <code>AutomaticRetryAttempts</code> property, and the <code>RemainingAutomaticRetryAttempts</code> property indicates the number of remaining attempts.

6.27.5.3 BootOrderPropertySelection

The name of the boot order property that the system uses for the persistent boot order.

- This property shall indicate which boot order property the system uses for the persistent boot order.

string	Description
AliasBootOrder	The system uses the <code>AliasBootOrder</code> property to specify the persistent boot order.
BootOrder	The system uses the <code>BootOrder</code> property to specify the persistent boot order.

6.27.5.4 BootSourceOverrideEnabled

The state of the boot source override feature.

- This property shall contain `Once` for a one-time boot override, and `Continuous` for a remain-active-until-cancelled override. If set to `Once`, the value is reset to `Disabled` after the `BootSourceOverrideTarget` actions have completed successfully. Changes to this property do not alter the BIOS persistent boot order configuration.

string	Description
Continuous	The system boots to the target specified in the <code>BootSourceOverrideTarget</code> property until this property is <code>Disabled</code> .
Disabled	The system boots normally.

string	Description
Once	On its next boot cycle, the system boots one time to the boot source override target. Then, the <code>BootSourceOverrideEnabled</code> value is reset to <code>Disabled</code> .

6.27.5.5 BootSourceOverrideMode

The BIOS boot mode to use when the system boots from the `BootSourceOverrideTarget` boot source.

- This property shall contain the BIOS boot mode to use when the system boots from the `BootSourceOverrideTarget` boot source.

string	Description
Legacy	The system boots in non-UEFI boot mode to the boot source override target.
UEFI	The system boots in UEFI boot mode to the boot source override target.

6.27.5.6 BootSourceOverrideTarget

The current boot source to use at the next boot instead of the normal boot device, if `BootSourceOverrideEnabled` does not contain `Disabled`.

- This property shall contain the source to boot the system from, overriding the normal boot order. The `@Redfish.AllowableValues` annotation specifies the valid values for this property. `UefiTarget` indicates to boot from the UEFI device path found in `UefiTargetBootSourceOverride`. `UefiBootNext` indicates to boot from the UEFI `BootOptionReference` found in `BootNext`. Virtual devices for a target should take precedence over a physical device. Systems may attempt to boot from multiple devices that share a target identifier. Changes to this property do not alter the BIOS persistent boot order configuration.

string	Description
BiosSetup	Boot to the BIOS setup utility.
Cd	Boot from the CD or DVD.
Diags	Boot to the manufacturer's diagnostics program.
Floppy	Boot from the floppy disk drive.
Hdd	Boot from a hard drive.
None	Boot from the normal boot device.

string	Description
Pxe	Boot from the Pre-boot eXecution Environment (PXE).
Recovery (v1.19+)	Boot to a system-designated recovery process or image.
RemoteDrive (v1.2+)	Boot from a remote drive, such as an iSCSI target.
SDCard (v1.1+)	Boot from an SD card.
UefiBootNext (v1.5+)	Boot to the UEFI device that the <code>BootNext</code> property specifies.
UefiHttp (v1.1+)	Boot from a UEFI HTTP network location.
UefiShell	Boot to the UEFI Shell.
UefiTarget	Boot to the UEFI device specified in the <code>UefiTargetBootSourceOverride</code> property.
Usb	Boot from a system BIOS-specified USB device.
Utilities	Boot to the manufacturer's utilities program or programs.

6.27.5.7 CachePolicy

The cache policy to control how KMIP data is cached.

- This property shall contain the cache policy to control how KMIP data is cached.

string	Description
AfterFirstUse	The system caches KMIP data after first use for the duration specified by the <code>CacheDuration</code> property.
None	The system does not cache KMIP data.

6.27.5.8 ConnectTypesSupported

- This property enumerates the graphical console connection types that the implementation allows.
 - This property shall contain an array of the enumerations. `KVMIP` shall be included if a vendor-defined KVM-IP protocol is supported.

string	Description
KVMIP	The controller supports a graphical console connection through a KVM-IP (redirection of Keyboard, Video, Mouse over IP) protocol.
OEM	The controller supports a graphical console connection through an OEM-specific protocol.

6.27.5.9 DecommissionTypes

- The types of data to remove from the system.
 - This parameter shall contain a list of the types of data to remove from the system.

string	Description
All	Remove all possible data from the server. • This value shall indicate the service removes all the data that it can from the system. This shall include all possible OEM data as well.
BIOSConfig	Reset all BIOS settings to factory defaults. • This value shall indicate the service resets all BIOS settings to factory defaults. This shall be equivalent to performing the <code>ResetBios</code> action on each <code>Bios</code> resource.
Logs	Clear all logs. • This value shall indicate the service clears all logs. This shall be equivalent to performing the <code>ClearLog</code> action on each <code>LogService</code> resource.
ManagerConfig	Reset all manager settings to factory defaults. • This value shall indicate the service resets all associated managers to factory defaults. This shall be equivalent to performing the <code>ResetToDefaults</code> action on each <code>Manager</code> resource with the <code>ResetType</code> parameter of <code>ResetAll</code>.
NetworkConfig	Reset all network settings to factory defaults. • This value shall indicate the service resets all network settings on all network devices to factory defaults.
StorageConfig	Reset all storage controller settings to factory defaults. This will leave the user data intact unless that is also specified. • This value shall indicate the service resets all storage controller settings to factory defaults. This shall be equivalent to performing the <code>ResetToDefaults</code> action on each <code>Storage</code> resource with the <code>ResetType</code> parameter of <code>PreserveVolumes</code>.
TPM	Reset all user-accessible TPM settings to factory defaults. • This value shall indicate the service resets all user-accessible TPM device settings to factory defaults. All sensitive data stored within the applicable TPMs shall be erased.

string	Description
UserData	Remove all possible data from block devices and other user or operating system accessible storage attached to the system. This value shall indicate the service removes all the data from block devices or other operating system accessible storage. If the <code>RequireSecureErase</code> parameter contains <code>true</code>, this shall be equivalent to performing the <code>SecureErase</code> action on each drive.

6.27.5.10 HostingRoles

The enumerations of `HostingRole` specify different features that the hosting computer system supports.

- The hosting roles that this computer system supports.
 - This property shall contain the hosting roles that this computer system supports.

string	Description
Appliance	The system hosts functionality that supports the system acting as an appliance.
ApplicationServer	The system hosts functionality that supports general purpose applications.
BareMetalServer	The system hosts functionality that supports the system acting as a bare-metal server.
ContainerServer	The system hosts functionality that supports the system acting as a container server.
StorageServer	The system hosts functionality that supports the system acting as a storage server.
Switch	The system hosts functionality that supports the system acting as a switch.
VirtualMachineServer	The system hosts functionality that supports the system acting as a virtual machine server.

6.27.5.11 IndicatorLED

The state of the indicator LED, which identifies the system.

- This property shall contain the state of the indicator light, which identifies this system.

string	Description
Blinking	The indicator LED is blinking. This value shall represent that the indicator LED is in a blinking state where the LED is being turned on and off in repetition. If the service does not support this value, it shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code.

string	Description
Lit	The indicator LED is lit. This value shall represent that the indicator LED is in a solid on state. If the service does not support this value, it shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code.
Off	The indicator LED is off. This value shall represent that the indicator LED is in a solid off state. If the service does not support this value, it shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code.
Unknown (<i>deprecated v1.1</i>)	The state of the indicator LED cannot be determined. This value shall represent that the indicator LED is in an unknown state. The service shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code. <i>Deprecated in v1.1 and later. This value has been deprecated in favor of returning <code>null</code> if the state is unknown.</i>

6.27.5.12 InterfaceType

The interface type of the Trusted Module.

- This property shall contain the interface type of the installed Trusted Module.

string	Description
TCM1_0	Trusted Cryptography Module (TCM) 1.0.
TPM1_2	Trusted Platform Module (TPM) 1.2.
TPM2_0	Trusted Platform Module (TPM) 2.0.

6.27.5.13 InterfaceTypeSelection

The interface type selection supported by this Trusted Module.

- This property shall contain the interface type `Selection` method (for example to switch between `TPM1_2` and `TPM2_0`) that is supported by this Trusted Module.

string	Description
BiosSetting	The TrustedModule supports switching InterfaceType through platform software, such as a BIOS configuration attribute.
FirmwareUpdate	The TrustedModule supports switching InterfaceType through a firmware update.
None	The TrustedModule does not support switching the InterfaceType.
OemMethod	The TrustedModule supports switching InterfaceType through an OEM proprietary mechanism.

6.27.5.14 LastResetCause

The last reset cause of the system.

- This property shall contain the cause when the system last came out of a reset or was rebooted.

string	Description
ManagementCommand	System start or restart via an external command to the management controller or BMC. This value shall indicate the system start or restart was due to an external command to the management controller or BMC. Examples include the Redfish <code>Reset</code> action for the <code>ComputerSystem</code> resource or the IPMI 'Chassis Control' command.
OSSoftRestart	System start or restart via an OS soft restart. This value shall indicate the system start or restart was due to an OS soft restart. Examples include 'CTRL-ALT-DEL', 'init 6', or 'reboot'.
PowerButtonPress	System start or restart via a power button press. This value shall indicate the system start or restart was due to a power button press.
PowerEvent	System start or restart caused by a power event triggering a system shutdown. This value shall indicate the system start or restart was caused by a power event triggering a system shutdown.
PowerRestorePolicy	System start or restart due to the power restore policy. This value shall indicate the system automatically powered-up on AC being applied due the <code>PowerRestorePolicy</code> property containing <code>AlwaysOn</code> or <code>LastState</code>.
RTCWakeup	System power-up via an RTC (system real time clock) wakeup. This value shall indicate the system powered-up via an RTC (system real time clock) wakeup.

string	Description
SystemCrash	System start or restart caused by a system crash. This value shall indicate the system start or restart was caused by a system crash. Examples include an OS panic, hardware fault, or firmware fault.
ThermalEvent	System start or restart caused by a thermal event triggering a system shutdown. This value shall indicate the system start or restart was caused by a thermal event triggering a system shutdown.
Unknown	System start or restart detected, but the cause is unknown. This value shall indicate the system start or restart cause is unknown.
WatchdogExpiration	System start or restart caused by a watchdog expiration. This value shall indicate the system start or restart was caused by a watchdog expiration.

6.27.5.15 LastState

The last boot progress state.

- This property shall contain the last boot progress state.

string	Description
BusInitializationStarted	The system has started initializing the buses. This value shall indicate that the system has started to initialize the buses.
MemoryInitializationStarted	The system has started initializing the memory. This value shall indicate that the system has started to initialize the memory.
None	The system is not booting. This value shall indicate that the system is not booting or running, such as the system is powered off.
OEM	A boot progress state in an OEM-defined format. This value shall indicate an OEM-defined boot progress state.
OSBootStarted	The operating system has started booting. This value shall indicate that the operating system has started to boot.

string	Description
OSRunning	The operating system is running. This value shall indicate that the operating system is running and shall indicate the final boot progress state.
PCIResourceConfigStarted	The system has started initializing the PCI resources. This value shall indicate that the system has started to initialize the PCI resources.
PrimaryProcessorInitializationStarted	The system has started initializing the primary processor. This value shall indicate that the system has started to initialize the primary processor.
SecondaryProcessorInitializationStarted	The system has started initializing the remaining processors. This value shall indicate that the system has started to initialize the secondary processors.
SetupEntered (v1.15+)	The system has entered the setup utility. This value shall indicate that the system has entered the setup utility.
SystemHardwareInitializationComplete	The system has completed initializing all hardware. This value shall indicate that the system has completed initializing all hardware.

6.27.5.16 MemoryMirroring

The ability and type of memory mirroring that this computer system supports.

- This property shall contain the ability and type of memory mirroring that this computer system supports.

string	Description
DIMM	The system supports DIMM mirroring at the DIMM level. Individual DIMMs can be mirrored.
Hybrid	The system supports a hybrid mirroring at the system and DIMM levels. Individual DIMMs can be mirrored.
None	The system does not support DIMM mirroring.
System	The system supports DIMM mirroring at the system level. Individual DIMMs are not paired for mirroring in this mode.

6.27.5.17 PowerMode

The power mode setting of the computer system.

- This property shall contain the computer system power mode setting.

string	Description
BalancedPerformance	The system performs at the highest speeds while utilization is high and performs at reduced speeds when the utilization is low. • This value shall indicate the system performs at the highest speeds possible when the utilization is high and performs at reduced speeds when the utilization is low to save power. This mode is a compromise between <code>MaximumPerformance</code> and <code>PowerSaving</code>.
EfficiencyFavorPerformance (v1.22+)	The system performs at reduced speeds at all utilizations to save power while attempting to maintain performance. This mode differs from <code>EfficiencyFavorPower</code> in that more performance is retained but less power is saved. • This value shall indicate the system performs at reduced speeds at all utilizations to save power while attempting to maintain performance. This mode differs from <code>EfficiencyFavorPower</code> in that more performance is retained but less power is saved. This mode differs from 'MaximumPerformance' in that power is saved at the cost of some performance. This mode differs from 'BalancedPerformance' in that power saving occurs at all utilizations.
EfficiencyFavorPower (v1.22+)	The system performs at reduced speeds at all utilizations to save power at the cost of performance. This mode differs from <code>PowerSaving</code> in that more performance is retained and less power is saved. This mode differs from <code>EfficiencyFavorPerformance</code> in that less performance is retained but more power is saved. • This value shall indicate the system performs at reduced speeds at all utilizations to save power at the cost of performance. This mode differs from <code>PowerSaving</code> in that more performance is retained and less power is saved. This mode differs from <code>EfficiencyFavorPerformance</code> in that less performance is retained but more power is saved. This mode differs from 'BalancedPerformance' in that power saving occurs at all utilizations.
MaximumPerformance	The system performs at the highest speeds possible. • This value shall indicate the system performs at the highest speeds possible. This mode should be used when performance is the top priority.
OEM	The system power mode is OEM-defined. • This value shall indicate the system performs at an OEM-defined power mode.
OSControlled	The system power mode is controlled by the operating system. • This value shall indicate the system performs at an operating system-controlled power mode.
PowerSaving	The system performs at reduced speeds to save power. • This value shall indicate the system performs at reduced speeds to save power. This mode should be used when power saving is the top priority.

string	Description
Static	The system power mode is static. This value shall indicate the system performs at a static base speed.

6.27.5.18 PowerRestorePolicy

The desired power state of the system when power is restored after a power loss.

- This property shall indicate the desired power state of the system when power is applied to the system. The `LastState` value shall return the system to the `PowerState` property value it was in when power was lost.

string	Description
AlwaysOff	The system always remains powered off when power is applied.
AlwaysOn	The system always powers on when power is applied.
LastState	The system returns to its last on or off power state when power is applied.

6.27.5.19 PowerState

The current power state of the system.

- This property shall contain the power state of the system.

string	Description
Off	The resource is powered off. The components within the resource might continue to have AUX power.
On	The resource is powered on.
Paused	The resource is paused.
PoweringOff	A temporary state between on and off. The components within the resource can take time to process the power off action.
PoweringOn	A temporary state between off and on. The components within the resource can take time to process the power on action.

6.27.5.20 ResetType

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset. Services should include the `@Redfish.AllowableValues` annotation for this parameter to ensure compatibility with clients, even when `ActionInfo` has been implemented.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property shall contain the value <code>On</code>.
ForceRestart	Shut down immediately and non-gracefully and restart the unit. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
FullPowerCycle	Full power cycle the unit. Behaves like removing utility lines, followed by restoring utility lines to the resource. • This value shall indicate the resource will perform a full power cycle as if utility lines to the resource are removed and restored. This is different from <code>PowerCycle</code> in that it's as close to a true power cycle as possible. For example, removing AC power cables from an enclosure and then restoring the AC power cables. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>. If a service supports this value but there are no other distinct power cycle flows, the service shall support <code>PowerCycle</code> as an alias to <code>FullPowerCycle</code>. This type of reset may cause the manager providing the Redfish service to power cycle. If the manager providing the Redfish service is affected by this type of reset, the service shall send the action response before resetting to prevent client timeouts.
GracefulRestart	Shut down gracefully and restart the unit. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.

string	Description
GracefulShutdown	Shut down gracefully and power off. This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a paused state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Paused</code>.
PowerCycle	Power cycle the unit. Behaves like a power removal, followed by a power restore to the resource. This value shall indicate the resource will perform a power cycle. This is different from <code>FullPowerCycle</code> in that it typically performs localized power sequencing of the resource while external power is still present. For example, turning DC voltage regulators off and then turning DC voltage regulators back on. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
PushPowerButton	Simulate the pressing of the physical power button on this unit. This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.

string	Description
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.

6.27.5.21 SerialConsoleProtocol

The information about a serial console service that this system provides.

ConsoleEntryCommand (v1.13+)	string	read-only (null)	The command string passed to the service to select or enter the system's serial console. This property shall contain a command string that can be provided by a client to select or enter the system's serial console, when the console is shared among several systems or a manager CLI.
HotKeySequenceDisplay (v1.13+)	string	read-only (null)	The hotkey sequence available for the user to exit the serial console session. This property shall contain a string that can be provided to a user to describe the hotkey sequence used to exit the serial console session, or, if shared with a manager CLI, to return to the CLI.
Port (v1.13+)	integer	read-write (null)	The protocol port. This property shall contain the port assigned to the protocol.
ServiceEnabled (v1.13+)	boolean	read-write	An indication of whether the service is enabled for this system. This property shall indicate whether the protocol for the service is enabled.
SharedWithManagerCLI (v1.13+)	boolean	read-only	Indicates whether the serial console service is shared with access to the manager's command-line interface (CLI). This property shall indicate whether the serial console service is shared with access to the manager's command-line interface (CLI).

6.27.5.22 StopBootOnFault

If the boot should stop on a fault.

- This property shall contain the setting if the boot should stop on a fault.

string	Description
AnyFault	The system should stop the boot on any fault. This value shall indicate the system will stop the boot if a fault occurs. This includes, but is not limited to, faults that affect performance, fault tolerance, or capacity.
Never	The system performs any normal recovery actions during boot if a fault occurs. This value shall indicate the system will continue to attempt to boot if a fault occurs.

6.27.5.23 SystemType

The type of computer system that this resource represents.

- An enumeration that indicates the kind of system that this resource represents.

string	Description
Composed (v1.4+)	A computer system constructed by binding resource blocks together. A <code>SystemType</code> of <code>Composed</code> typically represents a single system constructed from disaggregated resources through the Redfish composition service.
DPU (v1.16+)	A computer system that performs the functions of a data processing unit, such as a SmartNIC. A <code>SystemType</code> of <code>DPU</code> typically represents a single system that performs offload computation as a data processing unit, such as a SmartNIC.
OS (deprecated v1.21)	An operating system instance. A <code>SystemType</code> of <code>OS</code> typically represents an OS or hypervisor view of the system. <i>Deprecated in v1.21 and later. This value has been deprecated in favor of representing operating systems with the <code>OperatingSystem</code> resource.</i>
Physical	A computer system. A <code>SystemType</code> of <code>Physical</code> typically represents the hardware aspects of a system, such as a management controller.
PhysicallyPartitioned	A hardware-based partition of a computer system. A <code>SystemType</code> of <code>PhysicallyPartitioned</code> typically represents a single system constructed from one or more physical systems through a firmware or hardware-based service.

string	Description
Virtual	A virtual machine instance running on this system. A <code>SystemType</code> of <code>Virtual</code> typically represents a system that is actually a virtual machine instance. Responses should contain the <code>ProcessorSummary</code> and <code>MemorySummary</code> properties to show the processor and memory resources allocated to the virtual machine.
VirtuallyPartitioned	A virtual or software-based partition of a computer system. A <code>SystemType</code> of <code>VirtuallyPartitioned</code> typically represents a single system constructed from one or more virtual systems through a software-based service.

6.27.5.24 TimeoutAction

The action to perform when the watchdog timer reaches its timeout value.

- This property shall contain the action to perform when the watchdog timer reaches its timeout value.

string	Description
None	No action taken.
OEM	Perform an OEM-defined action.
PowerCycle	Power cycle the system.
PowerDown	Power down the system.
ResetSystem	Reset the system.

6.27.5.25 TrustedModuleRequiredToBoot

The Trusted Module boot requirement.

- This property shall contain the Trusted Module boot requirement.

string	Description
Disabled	No Trusted Module requirement to boot. This value shall indicate a Trusted Module is not required to boot.

string	Description
Required	A functional Trusted Module is required to boot. This value shall indicate a functioning Trusted Module is required to boot.

6.27.5.26 UseCases

- The composition use cases in which this computer system can participate.
 - This property shall contain the composition use cases in which this computer system can participate.

string	Description
ExpandableSystem	This computer system supports expandable system composition and is associated with a resource block. This value shall indicate the computer system supports expandable system composition and is associated with a resource block.
ResourceBlockCapable	This computer system supports being registered as a resource block in order for it to participate in composition requests. This value shall indicate the computer system supports being registered as a resource block in order for it to participate in composition requests.

6.27.5.27 UUID

The UUID for this system.

- This property shall contain the universally unique identifier number for this system. RFC4122 describes methods to create this value. The value should be considered to be opaque. Client software should only treat the overall value as a UUID and should not interpret any subfields within the UUID. If the system supports SMBIOS, the property value should follow the SMBIOS 2.6 and later recommendation for converting the SMBIOS 16-byte UUID structure into the Redfish canonical `xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx` string format, so that the property value matches the byte order presented by current OS APIs, such as WMI and dmidecode. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification.

Pattern: `^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}$`

The UUID property contains the value of the Universally Unique Identifier (UUID) of a system, also known in some systems as GUIDs (Globally Unique Identifier). A UUID is 128 bits long (16 bytes).

Redfish clients should consider the value of the property to be opaque and should not interpret any sub-fields within the UUID.

The UUID property is a string data type. The RFC4122-specified 36-character string format is `xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx`, where each `x` represents a hexadecimal value from `0` to `f`.

If the computer system supports SMBIOS, the UUID string should be formed from the raw binary 16-byte SMBIOS UUID structure. This allows out-of-band clients to correlate the UUID that in-band agents are reading from SMBIOS. The UUID is represented out-of-band through the Redfish API.

6.27.5.27.1 Case sensitivity

Regarding the case of the hex values, RFC4122 specifies that the hex values should be lowercase characters. Most modern scripting languages typically also represent hex values in lowercase characters following the RFC. However, dmidecode, WMI and some Redfish implementations currently use uppercase characters for UUID on output.

Comparisons between UUID values should always be case-insensitive.

For new Redfish implementations, the recommendation is to follow RFC4122 guidelines: output using lower-case hex values when converting from the SMBIOS raw binary data.

Redfish implementations and operating system APIs are permitted to output in uppercase. For that reason, Redfish clients **MUST** compare UUIDs using a case-insensitive comparison (as recommended by RFC4122).

6.27.5.27.2 Conversion of UUID format

The SMBIOS 2.6 and later specification specifies the proper algorithm for converting the raw binary SMBIOS 16-byte structure into the canonical string format of `xxxxxx-xxxx-xxxx-xxxx-xxxxxxxx`. Redfish services should follow the SMBIOS 2.6 and later specification for implementing this conversion.

WMI and Linux dmidecode also follow the SMBIOS guidelines.

Specifically, RFC4122 defines that the canonical string value should follow network byte ordering. The SMBIOS represents the UUID as these fields:

```
{
  DWORD    time_low,
  WORD     time_mid,
  WORD     time_hi_and_version,
  BYTE     clock_seq_hi_and_reserved,
  BYTE     clock_seq_low,
  BYTE[6]  node
}
```

Little-endian systems (including x86 systems) require a little-endian to network-byte-order conversion for the first three fields in order to convert the SMBIOS binary UUID to network byte order.

As specified in the SMBIOS 2.6 and later specifications, if the canonical UUID string is:

```
00112233-4455-6677-8899-aabbccddeeff
```

The corresponding raw representation in the SMBIOS UUID structure is:

```
raw_smbios_uuid = {  
    0x33,  
    0x22,  
    0x11,  
    0x00,  
    0x55,  
    0x44,  
    0x77,  
    0x66,  
    0x88,  
    0x99,  
    0xAA,  
    0xBB,  
    0xCC,  
    0xDD,  
    0xEE,  
    0xFF  
}
```

Notice in the above SMBIOS representation that each of the first three words boundaries are in little-endian order. For example, the hex digits `00112233` are represented by the first raw SMBIOS 4-byte DWORD `0x33 0x22 0x11 0x00`.

The following sample code (written in C) could be used to convert the raw SMBIOS UUID struct in a little-endian system to the 35-character canonical string:

```
/* routine to convert raw little-endian smbios structure to canonical string */  
sprintf(  
    redfishUUID,  
    "%02x%02x%02x%02x-%02x%02x-%02x%02x-%02x%02x%02x%02x%02x%02x",  
    raw_smbios_uuid[3], raw_smbios_uuid[2],  
    raw_smbios_uuid[1], raw_smbios_uuid[0],  
    raw_smbios_uuid[5], raw_smbios_uuid[4],  
    raw_smbios_uuid[7], raw_smbios_uuid[6],  
    raw_smbios_uuid[8], raw_smbios_uuid[9],  
    raw_smbios_uuid[10], raw_smbios_uuid[11],  
    raw_smbios_uuid[12], raw_smbios_uuid[13],  
    raw_smbios_uuid[14], raw_smbios_uuid[15]  
);
```


The previous sample code creates the same canonically formatted string as WMI and dmidecode for little-endian x86 systems.

If the computer architecture is not little-endian, then the conversion and canonical representation should be the same as the operating system's APIs, such as WMI and dmidecode.

Note: As specified in RFC4122, the fields in the string should be zero-filled hexadecimal values, as shown in the previous conversion code, so that the overall string length and format is `xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxx`.

6.27.5.28 WarningAction

The action to perform when the watchdog timer is close to reaching its timeout value. This action typically occurs from three to ten seconds before to the timeout value, but the exact timing is dependent on the implementation.

- This property shall contain the action to perform before the watchdog timer expires. This action typically occurs from three to ten seconds before to the timeout value, but the exact timing is dependent on the implementation.

string	Description
DagnosticInterrupt	Raise a (typically non-maskable) Diagnostic Interrupt.
MessagingInterrupt	Raise a legacy IPMI messaging interrupt.
None	No action taken.
OEM	Perform an OEM-defined action.
SCI	Raise an interrupt using the ACPI System Control Interrupt (SCI).
SMI	Raise a Systems Management Interrupt (SMI).

6.27.6 Example response

```
{
  "@odata.type": "#ComputerSystem.v1_25_0.ComputerSystem",
  "Id": "437XR1138R2",
  "Name": "WebFrontEnd483",
  "SystemType": "Physical",
  "AssetTag": "Chicago-45Z-2381",
  "Manufacturer": "Contoso",
  "Model": "3500RX",
  "SKU": "8675309",
  "SerialNumber": "437XR1138R2",
  "PartNumber": "224071-J23",
}
```

```

"Description": "Web Front End node",
"UUID": "38947555-7742-3448-3784-823347823834",
"HostName": "web483",
"Status": {
  "State": "Enabled",
  "Health": "OK",
  "HealthRollup": "OK"
},
"HostingRoles": [
  "ApplicationServer"
],
"LocationIndicatorActive": false,
"PowerState": "On",
"Boot": {
  "BootSourceOverrideEnabled": "Once",
  "BootSourceOverrideTarget": "Pxe",
  "BootSourceOverrideTarget@Redfish.AllowableValues": [
    "None",
    "Pxe",
    "Cd",
    "Usb",
    "Hdd",
    "BiosSetup",
    "Utilities",
    "Diags",
    "SDCard",
    "UefiTarget"
  ],
  "BootSourceOverrideMode": "UEFI",
  "UefiTargetBootSourceOverride": "/0x31/0x33/0x01/0x01"
},
"TrustedModules": [
  {
    "FirmwareVersion": "1.13b",
    "InterfaceType": "TPM1_2",
    "Status": {
      "State": "Enabled",
      "Health": "OK"
    }
  }
],
"Oem": {
  "Contoso": {
    "@odata.type": "#Contoso.ComputerSystem",
    "ProductionLocation": {
      "FacilityName": "PacWest Production Facility",
      "Country": "USA"
    }
  },
  "Chipwise": {

```

```

        "@odata.type": "#Chipwise.ComputerSystem",
        "Style": "Executive"
    }
},
"BiosVersion": "P79 v1.33 (02/28/2015)",
"ProcessorSummary": {
    "Count": 2,
    "Model": "Multi-Core Intel(R) Xeon(R) processor 7xxx Series"
},
"MemorySummary": {
    "TotalSystemMemoryGiB": 96,
    "TotalSystemPersistentMemoryGiB": 0,
    "MemoryMirroring": "None"
},
"Bios": {
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/BIOS"
},
"Processors": {
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/Processors"
},
"Memory": {
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/Memory"
},
"EthernetInterfaces": {
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/EthernetInterfaces"
},
"SimpleStorage": {
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/SimpleStorage"
},
"LogServices": {
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/LogServices"
},
"Links": {
    "Chassis": [
        {
            "@odata.id": "/redfish/v1/Chassis/1U"
        }
    ],
    "ManagedBy": [
        {
            "@odata.id": "/redfish/v1/Managers/BMC"
        }
    ]
},
"Actions": {
    "#ComputerSystem.Reset": {
        "target": "/redfish/v1/Systems/437XR1138R2/Actions/ComputerSystem.Reset",
        "ResetType@Redfish.AllowableValues": [
            "On",
            "ForceOff",

```

```
        "GracefulShutdown",
        "GracefulRestart",
        "ForceRestart",
        "Nmi",
        "ForceOn",
        "PushPowerButton"
    ]
},
"Oem": {
    "#Contoso.Reset": {
        "target": "/redfish/v1/Systems/437XR1138R2/Oem/Contoso/Actions/Contoso.Reset"
    }
}
},
"@odata.id": "/redfish/v1/Systems/437XR1138R2"
}
```

6.28 Connection 1.4.0

Version	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2024.4	2023.2	2023.1	2021.1	2020.3

6.28.1 Description

The `Connection` schema describes the access permissions that endpoints, or groups of endpoints, have with other resources in the service.

- This resource shall represent information about a connection in the Redfish Specification.

6.28.2 URIs

`/redfish/v1/Fabrics/{FabricId}/Connections/{ConnectionId}`

6.28.3 Properties

Property	Type	Attributes	Notes
ConnectionKeys (v1.1+) {	object		The permission keys required to access the specified resources for this connection. This property shall contain the permission keys required to access the specified resources for this connection. Some fabrics require permission checks on transactions from authorized initiators.
CHAP (v1.2+) {	object	(null)	The CHAP-specific permission key information for this connection. This property shall contain the CHAP-specific permission key information for this connection. This property shall not be present if <code>DHCHAP</code> is present.
CHAPPassword (v1.2+)	string	read-write (null)	The password for CHAP authentication. The value is <code>null</code> in responses. This property shall contain the password for CHAP authentication. The value shall be <code>null</code> in responses.
CHAPUsername (v1.2+)	string	read-write (null)	The username for CHAP authentication. This property shall contain the username for CHAP authentication.
InitiatorCHAPPassword (v1.2+)	string	read-write (null)	The initiator shared secret for mutual (2-way) CHAP authentication. The value is <code>null</code> in responses. This property shall contain the initiator shared secret for mutual (2-way) CHAP authentication. The value shall be <code>null</code> in responses.
InitiatorCHAPUsername (v1.2+)	string	read-write (null)	The initiator username for mutual (2-way) CHAP authentication. This property shall contain the initiator username for mutual (2-way) CHAP authentication. For example, this would be the initiator IQN in iSCSI environments.
TargetCHAPPassword (v1.2+)	string	read-write (null)	The target shared secret for mutual (2-way) CHAP authentication. The value is <code>null</code> in responses. This property shall contain the target shared secret for mutual (2-way) CHAP authentication. The value shall be <code>null</code> in responses.
}			

Property	Type	Attributes	Notes
DHCHAP (v1.2+) {	object	(null)	The DHCHAP-specific permission key information for this connection. This property shall contain the DHCHAP-specific permission key information for this connection. This property shall not be present if CHAP is present.
LocalDHCHAPAuthSecret (v1.2+)	string	read-write (null)	The local DHCHAP authentication secret. The value is null in responses. This property shall contain the local DHCHAP authentication secret. The value shall be null in responses.
PeerDHCHAPAuthSecret (v1.2+)	string	read-write (null)	The peer DHCHAP authentication secret. The value is null in responses. This property shall contain the peer DHCHAP authentication secret. The value shall be null in responses.
}			
GenZ (v1.1+) {	object	(null)	The Gen-Z-specific permission key information for this connection. This property shall contain the Gen-Z-specific permission key information for this connection.
AccessKey (v1.1+)	string	read-write	The Access Key for this connection. This property shall contain the Gen-Z Core Specification-defined Access Key for this connection. Pattern: ^0[xX]([a-fA-F] [0-9]){2}\$
RKeyDomainCheckingEnabled (v1.1+)	boolean	read-write	Indicates whether Region Key domain checking is enabled for this connection. This property shall indicate whether Region Key domain checking is enabled for this connection.
RKeyReadOnlyKey (v1.1+)	string	read-write	The read-only Region Key for this connection. This property shall contain the Gen-Z Core Specification-defined read-only Region Key for this connection. Pattern: ^0[xX](((a-fA-F) [0-9]){2}){4}\$
RKeyReadWriteKey (v1.1+)	string	read-write	The read-write Region Key for this connection. This property shall contain the Gen-Z Core Specification-defined read-write Region Key for this connection. Pattern: ^0[xX](((a-fA-F) [0-9]){2}){4}\$

Property	Type	Attributes	Notes
}			
}			
ConnectionType	string (enum)	<i>read-only (null)</i>	The type of resources this connection specifies. This property shall contain the type of resources this connection specifies. <i>For the possible property values, see ConnectionType in Property details.</i>
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
InitiatorEndpointGroups [{	array		An array of links to the initiator endpoint groups that are associated with this connection. This property shall contain an array of links to resources of type <code>EndpointGroup</code> that are the initiator endpoint groups associated with this connection. If the referenced endpoint groups contain the <code>GroupType</code> property, the <code>GroupType</code> property shall contain the value <code>Initiator</code> or <code>Client</code>. This property shall not be present if <code>InitiatorEndpoints</code> is present.
@odata.id	string	<i>read-write</i>	Link to a <code>EndpointGroup</code> resource. See the Links section and the EndpointGroup schema for details.
}]			
InitiatorEndpoints [{	array		An array of links to the initiator endpoints that are associated with this connection. This property shall contain an array of links to resources of type <code>Endpoint</code> that are the initiator endpoints associated with this connection. If the referenced endpoints contain the <code>EntityRole</code> property, the <code>EntityRole</code> property shall contain the value <code>Initiator</code> or <code>Both</code>. This property shall not be present if <code>InitiatorEndpointGroups</code> is present.
@odata.id	string	<i>read-write</i>	Link to a <code>Endpoint</code> resource. See the Links section and the Endpoint schema for details.
}]			
Oem {	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
TargetEndpointGroups [{	array		An array of links to the target endpoint groups that are associated with this connection. This property shall contain an array of links to resources of type <code>EndpointGroup</code> that are the target endpoint groups associated with this connection. If the referenced endpoint groups contain the <code>GroupType</code> property, the <code>GroupType</code> property shall contain the value <code>Target</code> or <code>Server</code>. This property shall not be present if <code>TargetEndpoints</code> is present.
@odata.id	string	<i>read-write</i>	Link to a <code>EndpointGroup</code> resource. See the Links section and the <code>EndpointGroup</code> schema for details.
}]			
TargetEndpoints [{	array		An array of links to the target endpoints that are associated with this connection. This property shall contain an array of links to resources of type <code>Endpoint</code> that are the target endpoints associated with this connection. If the referenced endpoints contain the <code>EntityRole</code> property, the <code>EntityRole</code> property shall contain the value <code>Target</code> or <code>Both</code>. This property shall not be present if <code>TargetEndpointGroups</code> is present.
@odata.id	string	<i>read-write</i>	Link to a <code>Endpoint</code> resource. See the Links section and the <code>Endpoint</code> schema for details.
}]			
}			
MemoryChunkInfo (v1.1+) [{	array		The set of memory chunks and access capabilities specified for this connection. This property shall contain the set of memory chunks and access capabilities specified for this connection.
AccessCapabilities (v1.1+) []	array (string (enum))	<i>read-write</i> (null)	- Supported I/O access capabilities. - Each entry shall specify a current memory access capability. <i>For the possible property values, see AccessCapabilities in Property details.</i>
AccessState (v1.1+)	string (enum)	<i>read-write</i> (null)	The access state for this connection. The value of this property shall contain the access state for the associated resource in this connection. <i>For the possible property values, see AccessState in Property details.</i>

Property	Type	Attributes	Notes
MemoryChunk (v1.1+) {	object	(null)	The specified memory chunk. This property shall contain a link to a resource of type <code>MemoryChunk</code>. The endpoints referenced by the <code>InitiatorEndpoints</code> or <code>InitiatorEndpointGroups</code> properties shall be given access to this memory chunk as described by this object. If <code>TargetEndpoints</code> or <code>TargetEndpointGroups</code> is present, the referenced initiator endpoints shall be required to access the referenced memory chunk through one of the referenced target endpoints. See the <i>MemoryChunks</i> schema for details on this property.
@odata.id	string	read-write	Link to a <i>MemoryChunks</i> resource. See the Links section and the <i>MemoryChunks</i> schema for details.
}			
}]			
MemoryRegionInfo (v1.3+) [{	array		The set of memory regions and access capabilities specified for this connection. This property shall contain the set of memory regions and access capabilities specified for this connection.
AccessCapabilities (v1.3+) []	array (string (enum))	read-write (null)	- Supported I/O access capabilities. - Each entry shall specify a current memory access capability. For the possible property values, see <i>AccessCapabilities</i> in Property details.
AccessState (v1.3+)	string (enum)	read-write (null)	The access state for this connection. The value of this property shall contain the access state for the associated resource in this connection. For the possible property values, see <i>AccessState</i> in Property details.
MemoryRegion (v1.3+) {	object	(null)	The specified memory region. This property shall contain a link to a resource of type <code>MemoryRegion</code>. The endpoints referenced by the <code>InitiatorEndpoints</code> or <code>InitiatorEndpointGroups</code> properties shall be given access to this memory region as described by this object. If <code>TargetEndpoints</code> or <code>TargetEndpointGroups</code> is present, the referenced initiator endpoints shall be required to access the referenced memory region through one of the referenced target endpoints. For CXL fabrics, memory regions from <code>Connection</code> resources are not allowed. See the <i>MemoryRegion</i> schema for details on this property.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-write</i>	Link to a MemoryRegion resource. See the Links section and the <i>MemoryRegion</i> schema for details.
}			
}]			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
VolumeInfo [{	array		The set of volumes and access capabilities specified for this connection. This property shall contain the set of volumes and access capabilities specified for this connection.
AccessCapabilities []	array (string (enum))	<i>read-write (null)</i>	- Supported I/O access capabilities. - Each entry shall specify a current storage access capability. For the possible property values, see AccessCapabilities in Property details.
AccessState	string (enum)	<i>read-write (null)</i>	The access state for this connection. The value of this property shall contain the access state for the associated resource in this connection. For the possible property values, see AccessState in Property details.
LUN (v1.2+)	integer	<i>read-write (null)</i>	The initiator-visible logical unit number (LUN) assigned to this volume. This property shall contain the initiator-visible logical unit number (LUN) assigned to this volume for initiators referenced by the <i>InitiatorEndpoints</i> or <i>InitiatorEndpointGroups</i> properties.
Volume {	object		The specified volume. This property shall contain a link to a resource of type <i>Volume</i>. The endpoints referenced by the <i>InitiatorEndpoints</i> or <i>InitiatorEndpointGroups</i> properties shall be given access to this volume as described by this object. If <i>TargetEndpoints</i> or <i>TargetEndpointGroups</i> is present, the referenced initiator endpoints shall be required to access the referenced volume through one of the referenced target endpoints.

Property	Type	Attributes	Notes
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
}]			

6.28.4 Actions

6.28.4.1 AddVolumeInfo (v1.4+)

Description

This action adds a volume to the connection. Volumes are added to the `VolumeInfo` property.

- This action shall add a volume to the connection. Services shall add the volume to the `VolumeInfo` property.

Action URI

{Base URI of target resource}/Actions/Connection.AddVolumeInfo

Action parameters

Parameter Name	Type	Attributes	Notes
AccessCapabilities []	array (string (enum))	<i>read-write</i>	- The supported I/O access capabilities to assign to the volume. Clients are required to provide either <code>LUN</code>, <code>AccessCapabilities</code>, or both. - This parameter shall contain an array of the storage access capabilities to assign to the volume. Services shall reject requests that do not contain either <code>LUN</code> OR <code>AccessCapabilities</code>. <i>For the possible property values, see AccessCapabilities in Property details.</i>
LUN	integer	<i>optional</i>	The initiator-visible logical unit number (LUN) to assign to the volume. Clients are required to provide either <code>LUN</code>, <code>AccessCapabilities</code>, or both. This property shall contain the initiator-visible logical unit number (LUN) to assign to the volume. Services shall reject requests that do not contain either <code>LUN</code> OR <code>AccessCapabilities</code>.

Parameter Name	Type	Attributes	Notes
Volume {	object	<i>required</i>	The volume to add. This parameter shall contain a link to a resource of type <code>Volume</code> that represents the volume to add.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			

Request Example

```
{
  "Volume": {
    "@odata.id": "/redfish/v1/Storage/NVMeoF/Volumes/1"
  },
  "LUN": 1
}
```

6.28.4.2 RemoveVolumeInfo (v1.4+)

Description

This action removes a volume from the connection. Volumes are removed from the `VolumeInfo` property.

- This action shall remove a volume to the connection. Services shall remove the volume from the `VolumeInfo` property.

Action URI

{Base URI of target resource}/Actions/Connection.RemoveVolumeInfo

Action parameters

Parameter Name	Type	Attributes	Notes
LUN	integer	optional	The initiator-visible logical unit number (LUN) assigned to the volume to remove. This parameter shall contain the initiator-visible logical unit number (LUN) assigned to this volume to remove. If this parameter is not provided, the service shall remove all entries associated with volume referenced by the <code>Volume</code> parameter.
Volume {	object	required	The volume to remove. This parameter shall contain a link to a resource of type <code>Volume</code> that represents the volume to remove.
@odata.id	string (URI)	read-only	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			

Request Example

```
{
  "Volume": {
    "@odata.id": "/redfish/v1/Storage/NVMeoF/Volumes/1"
  }
}
```

6.28.5 Property details

6.28.5.1 AccessCapabilities

- The supported I/O access capabilities to assign to the volume. Clients are required to provide either `LUN`, `AccessCapabilities`, or both.
 - This parameter shall contain an array of the storage access capabilities to assign to the volume. Services shall reject requests that do not contain either `LUN` or `AccessCapabilities`.

string	Description
Read	Endpoints are allowed to perform reads from the specified resource.
Write	Endpoints are allowed to perform writes to the specified resource.

6.28.5.2 AccessState

The access state for this connection.

- The value of this property shall contain the access state for the associated resource in this connection.

string	Description
NonOptimized	The resource is in an active and non-optimized state. • This value shall indicate the resource is in an active and non-optimized state.
Optimized	The resource is in an active and optimized state. • This value shall indicate the resource is in an active and optimized state.
Standby	The resource is in a standby state. • This value shall indicate the resource is in a standby state.
Transitioning	The resource is transitioning to a new state. • This value shall indicate the resource is transitioning to a new state.
Unavailable	The resource is in an unavailable state. • This value shall indicate the resource is in an unavailable state.

6.28.5.3 ConnectionType

The type of resources this connection specifies.

- This property shall contain the type of resources this connection specifies.

string	Description
Memory	A connection to memory-related resources.
Storage	A connection to storage-related resources, such as volumes.

6.28.6 Example response

```
{
```

```

"@odata.type": "#Connection.v1_4_0.Connection",
"Id": "1",
"Name": "Connection info for host 1",
"ConnectionType": "Storage",
"VolumeInfo": [
  {
    "AccessCapabilities": [
      "Read",
      "Write"
    ],
    "Volume": {
      "@odata.id": "/redfish/v1/Storage/NVMeoF/Volumes/1"
    }
  },
  {
    "AccessCapabilities": [
      "Read",
      "Write"
    ],
    "Volume": {
      "@odata.id": "/redfish/v1/Storage/NVMeoF/Volumes/3"
    }
  }
],
"Links": {
  "InitiatorEndpoints": [
    {
      "@odata.id": "/redfish/v1/Fabrics/NVMeoF/Endpoints/Initiator1"
    }
  ]
},
"@odata.id": "/redfish/v1/Fabrics/NVMeoF/Connections/1"
}

```

6.29 ConnectionMethod 1.2.0

Version	v1.2	v1.1	v1.0
Release	2025.2	2022.3	2020.2

6.29.1 Description

The `ConnectionMethod` schema describes the protocol, provider, or other method used to communicate to a given access point for a Redfish aggregation service.

- This resource shall represent a connection method for a Redfish implementation.

6.29.2 URIs

/redfish/v1/AggregationService/ConnectionMethods/{*ConnectionMethodId*}

6.29.3 Properties

Property	Type	Attributes	Notes
ConnectionMethodType	string (enum)	<i>read-only</i> (null)	The type of connection method. • This property shall contain an identifier of the connection method. <i>For the possible property values, see ConnectionMethodType in Property details.</i>
ConnectionMethodVariant	string	<i>read-only</i> (null)	The variant of connection method. • This property shall contain an additional identifier of the connection method. This property shall be present if <code>ConnectionMethodType</code> is <code>OEM</code>.
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
AggregationSources [{	array		An array of links to the access points using this connection method. • This property shall contain an array of links to resources of type <code>AggregationSource</code> that are using this connection method.
@odata.id	string	<i>read-only</i>	Link to a <code>AggregationSource</code> resource. See the Links section and the <code>AggregationSource</code> schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
SerialInterface (v1.2+) {	object		The link to the serial interface for this connection method. • This property shall contain a link to a resource of type <code>SerialInterface</code> that represents the serial interface for this connection method. <i>See the SerialInterface schema for details on this property.</i>
@odata.id	string	<i>read-only</i>	Link to a <code>SerialInterface</code> resource. See the Links section and the <code>SerialInterface</code> schema for details.
}			
}			

Property	Type	Attributes	Notes
TunnelingProtocol (v1.1+)	string (enum)	<i>read-only</i> (null)	The tunneling protocol used for this connection method. This property shall contain the tunneling protocol used for this connection method. <i>For the possible property values, see TunnelingProtocol in Property details.</i>

6.29.4 Property details

6.29.4.1 ConnectionMethodType

The type of connection method.

- This property shall contain an identifier of the connection method.

string	Description
IPMI15	IPMI 1.5 connection method. This value shall indicate the connection method is IPMI 1.5.
IPMI20	IPMI 2.0 connection method. This value shall indicate the connection method is IPMI 2.0.
ModbusSerial (v1.2+)	Modbus serial connection method. This value shall indicate the connection method is Modbus serial (RTU).
ModbusTCP (v1.2+)	Modbus TCP connection method. This value shall indicate the connection method is Modbus TCP.
NETCONF	NETCONF connection method. This value shall indicate the connection method is NETCONF.
OEM	OEM connection method. This value shall indicate the connection method is OEM. The <code>ConnectionMethodVariant</code> property shall contain further identification information.
Redfish	Redfish connection method. This value shall indicate the connection method is Redfish.

string	Description
SNMP	SNMP connection method. This value shall indicate the connection method is SNMP.

6.29.4.2 TunnelingProtocol

The tunneling protocol used for this connection method.

- This property shall contain the tunneling protocol used for this connection method.

string	Description
OEM	OEM tunneling. This value shall indicate that the tunneling protocol is OEM-specific.
SSH	SSH tunneling. This value shall indicate that the tunneling protocol is SSH.

6.29.5 Example response

```

{
  "@odata.type": "#ConnectionMethod.v1_2_0.ConnectionMethod",
  "Id": "ConnectionMethod1",
  "Name": "ConnectionMethod One",
  "ConnectionMethodType": "Redfish",
  "ConnectionMethodVariant": "Contoso",
  "Links": {
    "AggregationSources": [
      {
        "@odata.id": "/redfish/v1/AggregationService/AggregationSources/AggregationSource1"
      }
    ]
  },
  "@odata.id": "/redfish/v1/AggregationService/ConnectionMethods/ConnectionMethod1"
}

```

6.30 Container 1.0.1

Version	v1.0
Release	2023.2

6.30.1 Description

The `Container` schema represents an instance of a container that is running on a computer system.

- This resource shall represent an instance of a container that is running on a computer system.

6.30.2 URIs

`/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/OperatingSystem/Containers/{ContainerId}`
`/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/OperatingSystem/Containers/{ContainerId}`
`/redfish/v1/Systems/{ComputerSystemId}/OperatingSystem/Containers/{ContainerId}`

6.30.3 Properties

Property	Type	Attributes	Notes
EthernetInterfaces {	object		The link to the collection of Ethernet interfaces associated with this container. • This property shall contain a link to a resource collection of type <code>EthernetInterfaceCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>EthernetInterface</i> . See the EthernetInterface schema for details.
}			
Limits {	object		The resource limits allocated to this container. • This property shall contain the resource limits allocated to this container.
CPUCount	number	<i>read-only (null)</i>	The number of processors available to this container. • This property shall contain the number of processors available to this container.

Property	Type	Attributes	Notes
MemoryBytes	integer (bytes)	<i>read-only</i> (null)	The amount of memory available to this container in bytes. This property shall contain the amount of memory available to this container in bytes.
}			
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
ContainerImage {	object		The link to the container image for this container. This property shall contain a link to a resource of type <code>ContainerImage</code> that represents the container image for this container. See the <i>ContainerImage</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a ContainerImage resource. See the Links section and the <i>ContainerImage</i> schema for details.
}			
Oem { }	object		See the OEM object definition in the Using this guide clause.
}			
MountPoints [{	array		The file system mount points configured for this container. This property shall contain the file system mount points configured for this container.
Destination	string	<i>read-only</i> (null)	The file system path in the container that is provided as the mount point to access the files and folders contained in the source path. This property shall contain the file system path in the container that is provided as the mount point to access the files and folders specified by the <code>Source</code> property.
Source	string	<i>read-only</i> (null)	The file system path from the hosting system that is provided to this container. This property shall contain the file system path from the hosting system that is provided to this container.
}]			
ProgrammaticId	string	<i>read-only</i> (null)	The programmatic identifier for this container. This property shall contain the programmatic identifier for this container. This is typically a hash string that represents the running instance of this container.

Property	Type	Attributes	Notes
StartTime	string (date-time)	<i>read-only</i> (<i>null</i>)	The date and time when the container started running. This property shall indicate the date and time when the container started running.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

6.30.4 Actions

6.30.4.1 Reset

Description

This action resets the container.

- This action shall reset the container.

Action URI

{Base URI of target resource}/Actions/Container.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	<i>optional</i>	The type of reset. This parameter shall contain the type of reset. <code>GracefulRestart</code> and <code>ForceRestart</code> shall indicate requests to restart the container. <code>GracefulShutdown</code> and <code>ForceOff</code> shall indicate requests to stop or disable the container. <code>On</code> and <code>ForceOn</code> shall indicate requests to start or enable the container. The service can accept a request without the parameter and shall perform a <code>GracefulRestart</code>. For the possible property values, see <i>ResetType</i> in Property details.

Request Example

```
{
  "ResetType": "GracefulRestart"
```

```
}

```

6.30.5 Property details

6.30.5.1 ResetType

The type of reset.

- This parameter shall contain the type of reset. `GracefulRestart` and `ForceRestart` shall indicate requests to restart the container. `GracefulShutdown` and `ForceOff` shall indicate requests to stop or disable the container. `On` and `ForceOn` shall indicate requests to start or enable the container. The service can accept a request without the parameter and shall perform a `GracefulRestart` .

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code> .
ForceOn	Turn on the unit immediately. This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property shall contain the value <code>On</code> .
ForceRestart	Shut down immediately and non-gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code> .

string	Description
FullPowerCycle	Full power cycle the unit. Behaves like removing utility lines, followed by restoring utility lines to the resource. This value shall indicate the resource will perform a full power cycle as if utility lines to the resource are removed and restored. This is different from <code>PowerCycle</code> in that it's as close to a true power cycle as possible. For example, removing AC power cables from an enclosure and then restoring the AC power cables. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>. If a service supports this value but there are no other distinct power cycle flows, the service shall support <code>PowerCycle</code> as an alias to <code>FullPowerCycle</code>. This type of reset may cause the manager providing the Redfish service to power cycle. If the manager providing the Redfish service is affected by this type of reset, the service shall send the action response before resetting to prevent client timeouts.
GracefulRestart	Shut down gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
GracefulShutdown	Shut down gracefully and power off. This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a paused state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Paused</code>.

string	Description
PowerCycle	Power cycle the unit. Behaves like a power removal, followed by a power restore to the resource. This value shall indicate the resource will perform a power cycle. This is different from <code>FullPowerCycle</code> in that it typically performs localized power sequencing of the resource while external power is still present. For example, turning DC voltage regulators off and then turning DC voltage regulators back on. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
PushPowerButton	Simulate the pressing of the physical power button on this unit. This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.

6.30.6 Example response

```
{
  "@odata.type": "#Container.v1_0_1.Container",
  "Id": "WebBusinessLogic",
  "Name": "Internal Web Business Logic",
  "StartTime": "2021-02-06T22:49:02Z",
  "Limits": {
    "MemoryBytes": 4294967296,
    "CPUCount": 1.5
  },
  "Status": {
    "State": "Enabled"
  },
  "MountPoints": [
    {
      "Source": "/opt/MyContainerStorage/WebConfig",
      "Destination": "/config"
    }
  ]
}
```



```

    }
  ],
  "ProgrammaticId": "5584c257aba833892e1841cb77d898edc1f942f3bf901e7e0c390a504b9897a0",
  "EthernetInterfaces": {
    "@odata.id": "/redfish/v1/Systems/VM1/OperatingSystem/Containers/WebBusinessLogic/
    EthernetInterfaces"
  },
  "Links": {
    "ContainerImage": {
      "@odata.id": "/redfish/v1/Systems/VM1/OperatingSystem/ContainerImages/WebLogic"
    }
  },
  "@odata.id": "/redfish/v1/Systems/VM1/OperatingSystem/Containers/WebBusinessLogic"
}

```

6.31 ContainerImage 1.0.1

Version	v1.0
Release	2023.2

6.31.1 Description

The `ContainerImage` schema represents a container image available to a computer system.

- This resource shall represent a container image available to a computer system.

6.31.2 URIs

```

/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/OperatingSystem/
ContainerImages/{ContainerImageId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/OperatingSystem/ContainerImages/
{ContainerImageId}
/redfish/v1/Systems/{ComputerSystemId}/OperatingSystem/ContainerImages/{ContainerImageId}

```

6.31.3 Properties

Property	Type	Attributes	Notes
CreateTime	string (date-time)	<i>read-only</i> (<i>null</i>)	The date and time when the container image was created. This property shall indicate the date and time when the container image was created.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Containers [{	array		The array of links to the containers running from this container image. This property shall contain an array of links to resources of type <code>Container</code> that represent the container instances running from this container image.
@odata.id	string	<i>read-only</i>	Link to a Container resource. See the Links section and the <i>Container</i> schema for details.
}]			
Oem { }	object		See the OEM object definition in the Using this guide clause.
SoftwareImage {	object		The link to the software image for this container image. This property shall contain a link to a resource of type <code>SoftwareInventory</code> that represents the software image for this container image. See the <i>SoftwareInventory</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a SoftwareInventory resource. See the Links section and the <i>SoftwareInventory</i> schema for details.
}			
}			
ProgrammaticId	string	<i>read-only</i> (<i>null</i>)	The programmatic identifier for this container image. This property shall contain the programmatic identifier for this container image. This is typically a hash string that represents the identifier of this container image.
SizeBytes	integer (bytes)	<i>read-only</i> (<i>null</i>)	The size of this container image in bytes. This property shall contain the size of this container image in bytes.

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
Type	string (enum)	read-only (null)	The image type of this container image. This property shall contain the supported image types for this container engine. For the possible property values, see Type in Property details.
Version	string	read-only (null)	The version of this application. This property shall contain the version of this application.

6.31.4 Property details

6.31.4.1 Type

The image type of this container image.

- This property shall contain the supported image types for this container engine.

string	Description
DockerV1	Docker V1. This value shall indicate a Docker Image Specification Version 1-defined Docker image.
DockerV2	Docker V2. This value shall indicate a Docker Image Manifest Version 2-defined Docker image.
OCI	OCI (Open Container Initiative). This value shall indicate an Open Container Specification-defined OCI (Open Container Initiative) image.

6.31.5 Example response

```
{
  "@odata.type": "#ContainerImage.v1_0_1.ContainerImage",
  "Id": "WebLogic",
```

```

    "Name": "Contoso Internal Web Business Logic 1.0",
    "CreateTime": "2021-02-06T22:49:02Z",
    "Type": "OCI",
    "Version": "1.0.0",
    "Status": {
      "State": "Enabled"
    },
    "ProgrammaticId": "2fbd319a987e5265aae45b7e786dead51d1aae48b7bea42bcfc91a62934ca37f",
    "SizeBytes": 373293056,
    "Links": {
      "Containers": [
        {
          "@odata.id": "/redfish/v1/Systems/VM1/OperatingSystem/Containers/WebBusinessLogic"
        }
      ]
    },
    "@odata.id": "/redfish/v1/Systems/VM1/OperatingSystem/ContainerImages/WebLogic"
  }
}
```

6.32 Control 1.7.0

Version	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2025.2	2024.4	2023.3	2023.2	2023.1	2022.2	2021.4	2021.2

6.32.1 Description

The `Control` schema describes a control point and its properties.

- This resource shall represent a control point for a Redfish implementation.

6.32.2 URIs

`/redfish/v1/Chassis/{ChassisId}/Controls/{ControlId}`

6.32.3 Properties

Property	Type	Attributes	Notes
Accuracy (<i>deprecated v1.4</i>)	number (%)	<i>read-only (null)</i>	The estimated percent error of measured versus actual values. This property shall contain the percent error of the measured versus actual values of the <code>SetPoint</code> property. <i>Deprecated in v1.4 and later. This property has been deprecated in favor of <code>SetPointAccuracy</code> to provide a range instead of a percentage.</i>
AllowableMax	number	<i>read-only (null)</i>	The maximum possible setting for this control. This property shall indicate the maximum possible value of the <code>SetPoint</code> or <code>SettingMax</code> properties for this control. Services shall not accept values for <code>SetPoint</code> or <code>SettingMax</code> above this value.
AllowableMin	number	<i>read-only (null)</i>	The minimum possible setting for this control. This property shall indicate the minimum possible value of the <code>SetPoint</code> or <code>SettingMin</code> properties for this control. Services shall not accept values for <code>SetPoint</code> or <code>SettingMin</code> below this value.
AllowableNumericValues []	array (number, null)	<i>read-only</i>	The supported values for the set point. This property shall contain the supported values for this control. The units shall follow the value of <code>SetPointUnits</code>. This property should only be present when the set point or range has a limited set of supported values that cannot be accurately described using the <code>Increment</code> property.
AssociatedSensors [{	array		An array of links to the sensors associated with this control. This property shall contain an array of links to resources of type <code>Sensor</code> that represent the sensors related to this control.
@odata.id	string	<i>read-only</i>	Link to a Sensor resource. See the Links section and the <code>Sensor</code> schema for details.
}]			
ControlDelaySeconds	number	<i>read-write (null)</i>	The time delay in seconds before the control will activate once the value has deviated from the set point. This property shall contain the time in seconds that will elapse after the control value deviates above or below the value of <code>SetPoint</code> before the control will activate.

Property	Type	Attributes	Notes
ControlLoop {	object		The control loop details. This property shall contain the details for the control loop described by this resource.
CoefficientUpdateTime	string (date-time)	<i>read-only</i> (null)	The date and time that the control loop coefficients were changed. This property shall contain the date and time that any of the coefficients for the control loop were last changed.
Differential	number	<i>read-write</i> (null)	The differential coefficient. This property shall contain the coefficient for the differential factor in a control loop.
Integral	number	<i>read-write</i> (null)	The integral coefficient. This property shall contain the coefficient for the integral factor in a control loop.
Proportional	number	<i>read-write</i> (null)	The proportional coefficient. This property shall contain the coefficient for the proportional factor in a control loop.
}			
ControlMode	string (enum)	<i>read-write</i> (null)	The current operating mode of the control. This property shall contain the operating mode of the control. <i>For the possible property values, see ControlMode in Property details.</i>
ControlType	string (enum)	<i>read-only</i> (null)	The type of control. This property shall contain the type of the control. <i>For the possible property values, see ControlType in Property details.</i>
DeadBand	number	<i>read-write</i> (null)	The maximum deviation from the set point allowed before the control will activate. This property shall contain the maximum deviation value allowed above or below the value of <code>SetPoint</code> before the control will activate.
DefaultSetPoint (v1.3+)	number	<i>read-only</i> (null)	The default set point of the control. This property shall contain the default set point control value. The units shall follow the value of <code>SetPointUnits</code>. Services apply this value to the <code>SetPoint</code> property under certain conditions, such as a reset of the manager or a <code>ResetToDefaults</code> action.

Property	Type	Attributes	Notes
Implementation	string (enum)	<i>read-only (null)</i>	The implementation of the control. This property shall contain the implementation of the control. <i>For the possible property values, see Implementation in Property details.</i>
Increment	number	<i>read-only (null)</i>	The smallest increment supported for the set point. This property shall contain the smallest change allowed to the value of the <code>SetPoint</code>, <code>SettingMin</code>, or <code>SettingMax</code> properties. The units shall follow the value of <code>SetPointUnits</code>.
Location {}	object		The location information for this control. This property shall indicate the location information for this control. For property details, see Location.
PhysicalContext	string (enum)	<i>read-only (null)</i>	The area or device to which this control applies. This property shall contain a description of the affected component or region within the equipment to which this control applies. <i>For the possible property values, see PhysicalContext in Property details.</i>
PhysicalSubContext	string (enum)	<i>read-only (null)</i>	The usage or location within a device to which this control applies. This property shall contain a description of the usage or sub-region within the equipment to which this control applies. This property generally differentiates multiple controls within the same <code>PhysicalContext</code> instance. <i>For the possible property values, see PhysicalSubContext in Property details.</i>
RelatedItem [{	array		An array of links to resources that this control services. This property shall contain an array of links to resources that this control services.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}}]			
Sensor {	object (excerpt)		The sensor reading associated with this control. This property shall contain the <code>Sensor</code> excerpt directly associated with this control. The value of the <code>DataSourceUri</code> property shall reference a resource of type <code>Sensor</code>. This property shall not be present if multiple sensors are associated with a single control. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.

Property	Type	Attributes	Notes
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			
SetPoint	number	<i>read-write</i> (null)	The desired set point of the control. This property shall contain the desired set point control value. The units shall follow the value of <code>SetPointUnits</code>. If the <code>DefaultSetPoint</code> property is not supported and if a user-defined set point is not configured, the property may contain <code>null</code> in responses.
SetPointAccuracy (v1.4+)	number	<i>read-only</i> (null)	Accuracy (+/-) of the set point. This property shall contain the accuracy of the value of the <code>SetPoint</code> for this control. The value shall be the absolute value of the maximum deviation of the <code>SetPoint</code> from its actual value. The value shall be in units that follow the <code>SetPointUnits</code> for this control.
SetPointError (v1.7+)	number	<i>read-only</i> (null)	The error (difference) from the desired set point of the control. This property shall contain the error, or difference, of the related Sensor <code>Reading</code> value from the value of the <code>SetPoint</code>. The units shall follow the value of <code>SetPointUnits</code>.
SetPointType	string (enum)	<i>read-only</i> (null)	The set point type used to operate the control. This property shall contain the type of set point definitions used to describe this control. <i>For the possible property values, see <code>SetPointType</code> in Property details.</i>
SetPointUnits	string	<i>read-only</i> (null)	The units of the set point and related properties in UCUM c/s format. This property shall contain the units of the control's set point and related properties. The value shall follow the case-sensitive symbol format defined by the Unified Code for Units of Measure (UCUM), as specified by the 'Units of measure annotation' clause of the Redfish Specification.
SetPointUpdateTime	string (date-time)	<i>read-only</i> (null)	The date and time that the set point was changed. This property shall contain the date and time that the value of <code>SetPoint</code> was last changed.

Property	Type	Attributes	Notes
SettingMax	number	<i>read-write (null)</i>	The maximum set point in the allowed range. This property shall contain the maximum desired set point within the acceptable range. The service shall reject values greater than the value of <code>AllowableMax</code>. The units shall follow the value of <code>SetPointUnits</code>.
SettingMin	number	<i>read-write (null)</i>	The minimum set point in the allowed range. This property shall contain the minimum desired set point within the acceptable range. The service shall reject values less than the value of <code>AllowableMin</code>. The units shall follow the value of <code>SetPointUnits</code>.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

6.32.4 Actions

6.32.4.1 ResetToDefaults (v1.2+)

Description

The action resets the values of writable properties to factory defaults.

- This action shall reset the values of writable properties in this resource to their default values as specified by the manufacturer.

Action URI

{Base URI of target resource}/Actions/Control.ResetToDefaults

Action parameters

This action takes no parameters.

6.32.5 Property details

6.32.5.1 ControlMode

The current operating mode of the control.

- This property shall contain the operating mode of the control.

string	Description
Automatic	Automatically adjust control to meet the set point.
Disabled	The control has been disabled.
Manual	No automatic adjustments are made to the control.
Override	User override of the automatic set point value.

6.32.5.2 ControlType

The type of control.

- This property shall contain the type of the control.

string	Description
DutyCycle (v1.5+)	Duty cycle (%) control. • This value shall indicate a control used to adjust the duty cycle, such as a PWM-based control, in percent units. The SetPointUnits property shall contain % .
Frequency	Frequency (Hz) control. • This value shall indicate a control used to limit the operating frequency, in hertz units, of a device, either to a single set point or within a range. The SetPointUnits property shall contain Hz .
FrequencyMHz (v1.1+)	Frequency (MHz) control. • This value shall indicate a control used to limit the operating frequency, in megahertz units, of a device, either to a single set point or within a range. The SetPointUnits property shall contain MHz .
LinearAcceleration (v1.6+)	Linear acceleration (m/s^2) control. • This value shall indicate a control used to adjust linear acceleration, in meters per square second units. The SetPointUnits property shall contain m/s2 .
LinearPosition (v1.6+)	Linear position or distance (m) control. • This value shall indicate a control used to adjust linear position or distance, in meter units. The SetPointUnits property shall contain m .

string	Description
LinearVelocity (v1.6+)	Linear velocity (m/s) control. This value shall indicate a control used to adjust linear velocity, in meters per second units. The <code>SetPointUnits</code> property shall contain <code>m/s</code>.
LiquidFlowLPM (v1.6+)	Liquid flow (L/min) control. This value shall indicate a control used to adjust the volume of liquid per unit of time, in liters per minute units, that flows through a particular junction. The <code>SetPointUnits</code> property shall contain <code>L/min</code>.
Percent (v1.5+)	Percent-based control. This value shall indicate a percent-based control, in percent units. The <code>SetPointUnits</code> property shall contain <code>%</code>.
Power	Power (W) control or power limit. This value shall indicate a control used to regulate or limit maximum power consumption, in watt units, either to a single set point or within a range. The <code>SetPointUnits</code> property shall contain <code>W</code>.
Pressure (v1.1+, deprecated v1.3)	Pressure (kPa) control. This value shall indicate a control used to adjust pressure in a system, in kilopascal units. The <code>SetPointUnits</code> property shall contain <code>kPa</code>. <i>Deprecated in v1.3 and later. This value has been deprecated in favor of <code>PressurekPa</code> for units consistency with the equivalent <code>Sensor</code> resource <code>ReadingType</code> value.</i>
PressurekPa (v1.3+)	Pressure (kPa) control. This value shall indicate a control used to adjust pressure in a system, in kilopascal units. The <code>SetPointUnits</code> property shall contain <code>kPa</code>.
RotationalAcceleration (v1.6+)	Rotational acceleration (rad/s²) control. This value shall indicate a control used to adjust rotational acceleration, in radians per square second units. The <code>SetPointUnits</code> property shall contain <code>rad/s²</code>.
RotationalPosition (v1.6+)	Rotational position (rad) control. This value shall indicate a control used to adjust rotational position, in radian units. The <code>SetPointUnits</code> property shall contain <code>rad</code>.
RotationalVelocity (v1.6+)	Rotational velocity (rad/s) control. This value shall indicate a control used to adjust rotational velocity, in radians per second units. The <code>SetPointUnits</code> property shall contain <code>rad/s</code>.

string	Description
Temperature	Temperature (C) control or thermostat. This value shall indicate a control used to regulate temperature, in degree Celsius units, either to a single set point or within a range. The <code>SetPointUnits</code> property shall contain <code>Cel</code>.
Valve (v1.3+)	Valve (% open) control. This value shall indicate a control used to adjust a valve in a system, in percent units. The <code>SetPointUnits</code> property shall contain <code>%</code>. A value of <code>100</code> shall indicate the valve is completely open, and a value of <code>0</code> shall indicate the valve is completely closed.

6.32.5.3 Implementation

The implementation of the control.

- This property shall contain the implementation of the control.

string	Description
Direct	The set point directly affects the control value.
Monitored	A physical control that cannot be adjusted through this interface.
Programmable	The set point can be adjusted through this interface.

6.32.5.4 PhysicalContext

The area or device to which this control applies.

- This property shall contain a description of the affected component or region within the equipment to which this control applies.

string	Description
Accelerator	An accelerator.
ACInput	An AC electrical input or input-related circuit.
ACMaintenanceBypassInput	An AC electrical maintenance bypass input.

string	Description
ACOutput	An AC electrical output or output-related circuit. This value shall indicate an electrical output or an output-related circuit, such as a branch output, which is not terminated as a power outlet.
ACStaticBypassInput	An AC electrical static bypass input.
ACUtilityInput	An AC electrical utility input. This value shall indicate an electrical input, where the source is an electrical utility as opposed to a backup or locally-generated power source. This value is intended to differentiate multiple electrical inputs between utility, maintenance bypass, or static bypass values. For general purpose usage, the value of <code>ACInput</code> is preferred.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	A compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC electrical bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	An expansion bay. This value shall indicate a location that provides for the expansion of functionality of a system, such as a PCIe slot that can accept an option card.
ExpansionSubsystem	A group of expansion bays. This value shall indicate a group of expansion bays and the devices installed in those bays.
Fan	A fan.

string	Description
Filter	A filter.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Manager	A management controller, such as a BMC (baseboard management controller).
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	A networking bay. This value shall indicate a location that provides for the expansion of networking functionality of a system, by the addition of networking devices.
NetworkingDevice	A networking device.
PowerOutlet	An electrical outlet. This value shall indicate an electrical outlet or receptacle.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	A power supply bay. This value shall indicate a location that provides for the installation of a power supply or similar devices.
Pump	A pump.
Rectifier	A rectifier device.
Reservoir	A reservoir.

string	Description
Room	The room.
StorageBay	A storage bay. This value shall indicate a location that provides for the expansion of storage functionality of a system, by the addition of storage devices.
StorageDevice	A storage device.
StorageSubsystem	A storage subsystem. This value shall indicate a storage subsystem, which may consist of one or more storage controllers, storage devices, or related components.
Switch	A switch device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.32.5.5 PhysicalSubContext

The usage or location within a device to which this control applies.

- This property shall contain a description of the usage or sub-region within the equipment to which this control applies. This property generally differentiates multiple controls within the same `PhysicalContext` instance.

string	Description
Input	The input.
Output	The output.

6.32.5.6 SetPointType

The set point type used to operate the control.

- This property shall contain the type of set point definitions used to describe this control.

string	Description
Monitor (v1.6+)	Control only monitors a reading. • This value shall indicate the control provides only monitoring of a sensor reading, and does not provide the ability to affect the reading. This value allows for multiple controls to be populated while only some of those controls provide a set point. The <code>SetPoint</code>, <code>SettingMin</code> and <code>SettingMax</code> properties shall not be present for this control type. For example, a motion controller may provide both position-based and velocity-based control modes, where the selected mode provides the <code>SetPoint</code>, and the control for the non-selected mode provides only a sensor reading. Range Control uses a range of values. This value shall indicate the control utilizes a set point range for its operation. The <code>SettingMin</code> and <code>SettingMax</code> properties shall be present for this control type. The <code>SetPoint</code> property shall not be present for this control type. Single Control uses a single set point. This value shall indicate the control utilizes a single set point for its operation. The <code>SetPoint</code> property shall be present for this control type. The <code>SettingMin</code> and <code>SettingMax</code> properties shall not be present for this control type.

6.32.6 Example response

```
{
  "@odata.type": "#Control.v1_7_0.Control",
  "Id": "PowerLimit",
  "Name": "System Power Limit",
  "PhysicalContext": "Chassis",
  "ControlType": "Power",
  "ControlMode": "Automatic",
  "SetPoint": 500,
  "SetPointUnits": "W",
  "AllowableMax": 1000,
  "AllowableMin": 150,
  "Sensor": {
    "Reading": 374,
    "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/TotalPower"
  },
  "Status": {
    "Health": "OK",
    "State": "Enabled"
  },
  "@odata.id": "/redfish/v1/Chassis/1U/Controls/PowerLimit"
}
```


6.33 CoolantConnector 1.2.0

Version	v1.2	v1.1	v1.0
Release	2025.2	2024.4	2023.1

6.33.1 Description

The `CoolantConnector` schema describes a liquid coolant connector, including any associated instrumentation.

- This resource shall represent a coolant connector for a Redfish implementation.

6.33.2 URIs

`/redfish/v1/Chassis/{ChassisId}/ThermalSubsystem/CoolantConnectors/{CoolantConnectorId}`
`/redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/PrimaryCoolantConnectors/{CoolantConnectorId}`
`/redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/SecondaryCoolantConnectors/{CoolantConnectorId}`
`/redfish/v1/ThermalEquipment/CoolingLoops/{CoolingUnitId}/PrimaryCoolantConnectors/{CoolantConnectorId}`
`/redfish/v1/ThermalEquipment/CoolingLoops/{CoolingUnitId}/SecondaryCoolantConnectors/{CoolantConnectorId}`
`/redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/PrimaryCoolantConnectors/{CoolantConnectorId}`
`/redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/SecondaryCoolantConnectors/{CoolantConnectorId}`
`/redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/PrimaryCoolantConnectors/{CoolantConnectorId}`
`/redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/SecondaryCoolantConnectors/{CoolantConnectorId}`
`/redfish/v1/ThermalEquipment/RPUs/{CoolingUnitId}/PrimaryCoolantConnectors/{CoolantConnectorId}`

6.33.3 Properties

Property	Type	Attributes	Notes
Coolant {	object		Details about the coolant used in this unit. This property shall contain details regarding the coolant contained or used by this unit. See the <i>CoolingLoop</i> schema for details on this property.
@odata.id	string	read-only	Link to a Coolant resource. See the Links section and the <i>CoolingLoop</i> schema for details.
}			

Property	Type	Attributes	Notes
CoolantConnectorType	string (enum)	<i>read-only</i> (null)	The type of coolant connector. This property shall contain the type of coolant connector. <i>For the possible property values, see <code>CoolantConnectorType</code> in Property details.</i>
CoolingLoopName	string	<i>read-write</i> (null)	The name of the cooling loop attached to this interface. This property shall contain the name of the cooling loop attached to this interface. If the <code>CoolingLoop</code> link property is present, this property shall contain the value of the <code>Id</code> property in the resource referenced by that link.
CoolingManagerURI	string (URI)	<i>read-write</i> (null)	The link to the application that manages the cooling loop. This property shall contain a URI to the application or device that provides administration or management of the cooling loop associated with this interface.
DeltaPressureControlkPa (v1.1+) {}	object		The desired differential pressure (kPa). This property shall contain the desired differential pressure, in kilopascal units, of this coolant connector. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Control</code> with the <code>ControlType</code> property containing the value <code>PressurekPa</code>. This property shall only be present for secondary coolant connectors. Services may automatically change other controls if a client attempts to enable this control to prevent conflicts. For more information about this property, see <code>ControlSingleLoopExcerpt</code> in Property Details.
DeltaPressurekPa {}	object		The differential pressure (kPa). This property shall contain the pressure, in kilopascal units, for the difference in pressure between the supply and outflow or return connection to the cooling loop. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>PressurekPa</code>. For more information about this property, see <code>SensorExcerpt</code> in Property Details.

Property	Type	Attributes	Notes
DeltaTemperatureCelsius {}	object		The differential temperature (C). This property shall contain the change in temperature, in degree Celsius units, between the supply connection and the outflow or return connection to the cooling loop. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Temperature</code>. For more information about this property, see <code>SensorExcerpt</code> in Property Details.
DeltaTemperatureControlCelsius (v1.1+) {}	object		The desired differential temperature (C). This property shall contain the desired differential temperature, in degree Celsius units, of this coolant connector. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Control</code> with the <code>ControlType</code> property containing the value <code>Temperature</code>. This property shall only be present for secondary coolant connectors. Services may automatically change other controls if a client attempts to enable this control to prevent conflicts. For more information about this property, see <code>ControlSingleLoopExcerpt</code> in Property Details.
FlowControlLitersPerMinute (v1.1+) {}	object		The desired liquid flow rate (L/min). This property shall contain the desired liquid flow rate, in liters per minute units, of this coolant connector. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Control</code> with the <code>ControlType</code> property containing the value <code>LiquidFlowLPM</code>. This property shall only be present for secondary coolant connectors. Services may automatically change other controls if a client attempts to enable this control to prevent conflicts. For more information about this property, see <code>ControlSingleLoopExcerpt</code> in Property Details.
FlowLitersPerMinute {}	object		The liquid flow (L/min). This property shall contain the liquid flow rate, in liters per minute units, for this coolant connector. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>LiquidFlowLPM</code>. For more information about this property, see <code>SensorExcerpt</code> in Property Details.

Property	Type	Attributes	Notes
HeatRemovedkW {}	object		The heat removed (kW) through this connector. This property shall contain the amount of heat removed, in kilowatt units, by the coolant flow through this connector. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Heat</code>. For more information about this property, see <code>SensorExcerpt</code> in Property Details.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
ConnectedChassis [{	array		Any array of links to chassis at the other end of the connection. This property shall contain an array of links to resources of type <code>Chassis</code> that represent the chassis at the other end of the connection.
@odata.id	string	<i>read-write</i>	Link to a Chassis resource. See the Links section and the <code>Chassis</code> schema for details.
}]			
ConnectedCoolingLoop {	object	(null)	A link to the cooling loop at the other end of the connection. This property shall contain a link to a resource of type <code>CoolingLoop</code> that represents the cooling loop at the other end of the connection. See the <code>CoolingLoop</code> schema for details on this property.
@odata.id	string	<i>read-write</i>	Link to a CoolingLoop resource. See the Links section and the <code>CoolingLoop</code> schema for details.
}			
ConnectedCoolingUnit {	object	(null)	A link to the cooling unit at the other end of the connection. This property shall contain a link to a resource of type <code>CoolingUnit</code> that represents the cooling unit at the other end of the connection. See the <code>CoolingUnit</code> schema for details on this property.
@odata.id	string	<i>read-write</i>	Link to a CoolingUnit resource. See the Links section and the <code>CoolingUnit</code> schema for details.
}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			

Property	Type	Attributes	Notes
LocationIndicatorActive	boolean	<i>read-write</i> (null)	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource.
RatedFlowLitersPerMinute	number (L/min)	<i>read-only</i> (null)	The rated liquid flow (L/min) for this loop interface. This property shall contain the rated liquid flow, in liters per minute units, for this loop interface.
RatedFlowPressurekPa	number (kPa)	<i>read-only</i> (null)	The pressure (kPa) at which the rated liquid flow is valid. This property shall contain the pressure, in kilopascal units, that the rated liquid flow is valid for this connector.
RatedPressurekPa	number (kPa)	<i>read-only</i> (null)	The rated pressure (kPa) for this connector. This property shall contain the rated maximum pressure, in kilopascal units, for this connector.
ReturnPressurekPa {}	object		The return pressure (kPa). This property shall contain the pressure, in kilopascal units, for the outflow or return connection to the cooling loop. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>PressurekPa</code>. For more information about this property, see <code>SensorExcerpt</code> in Property Details.
ReturnTemperatureCelsius {}	object		The return temperature (C). This property shall contain the temperature, in degree Celsius units, for the outflow or return connection to the cooling loop. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Temperature</code>. For more information about this property, see <code>SensorExcerpt</code> in Property Details.

Property	Type	Attributes	Notes
ReturnTemperatureControlCelsius (v1.1+) {}	object		The desired return temperature (C). This property shall contain the desired return temperature, in degree Celsius units, of this coolant connector. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Control</code> with the <code>ControlType</code> property containing the value <code>Temperature</code>. This property shall only be present for secondary coolant connectors. Services may automatically change other controls if a client attempts to enable this control to prevent conflicts. For more information about this property, see <code>ControlSingleLoopExcerpt</code> in Property Details.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <code>Status</code>.
SupplyPressurekPa {}	object		The supply pressure (kPa). This property shall contain the pressure, in kilopascal units, for the intake or supply connection to the cooling loop. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>PressurekPa</code>. For more information about this property, see <code>SensorExcerpt</code> in Property Details.
SupplyTemperatureCelsius {}	object		The supply temperature (C). This property shall contain the temperature, in degree Celsius units, for the intake or supply connection to the cooling loop. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Temperature</code>. For more information about this property, see <code>SensorExcerpt</code> in Property Details.

Property	Type	Attributes	Notes
SupplyTemperatureControlCelsius (v1.1+) {}	object		The desired supply temperature (C). This property shall contain the desired supply temperature, in degree Celsius units, of this coolant connector. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Control</code> with the <code>ControlType</code> property containing the value <code>Temperature</code>. This property shall only be present for secondary coolant connectors. Services may automatically change other controls if a client attempts to enable this control to prevent conflicts. For more information about this property, see <code>ControlSingleLoopExcerpt</code> in Property Details.
ValvePositionControlPercent (v1.2+) {}	object		The desired valve position (% open). This property shall contain the desired valve position, in percent units, of this coolant connector. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Control</code> with the <code>ControlType</code> property containing the value <code>Valve</code>. Services may automatically change other controls if a client attempts to enable this control to prevent conflicts. For more information about this property, see <code>ControlSingleLoopExcerpt</code> in Property Details.
ValvePositionPercent (v1.2+) {}	object		The valve position (% open) of this connector. This property shall contain the valve position, in percent units, of this connector. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Valve</code>. For more information about this property, see <code>SensorExcerpt</code> in Property Details.

6.33.4 Property details

6.33.4.1 ControlMode

The current operating mode of the control.

- This property shall contain the operating mode of the control.

string	Description
Automatic	Automatically adjust control to meet the set point.
Disabled	The control has been disabled.

string	Description
Manual	No automatic adjustments are made to the control.
Override	User override of the automatic set point value.

6.33.4.2 ControlSingleLoopExcerpt

The `Control` schema describes a control point and its properties. This object is an excerpt of the *Control* resource located at the URI shown in `DataSourceUri`.

AllowableMax	number	read-only (null)	The maximum possible setting for this control. This property shall indicate the maximum possible value of the <code>SetPoint</code> or <code>SettingMax</code> properties for this control. Services shall not accept values for <code>SetPoint</code> or <code>SettingMax</code> above this value.
AllowableMin	number	read-only (null)	The minimum possible setting for this control. This property shall indicate the minimum possible value of the <code>SetPoint</code> or <code>SettingMin</code> properties for this control. Services shall not accept values for <code>SetPoint</code> or <code>SettingMin</code> below this value.
ControlLoop {	object		The control loop details. This property shall contain the details for the control loop described by this resource.
CoefficientUpdateTime	string (date-time)	read-only (null)	The date and time that the control loop coefficients were changed. This property shall contain the date and time that any of the coefficients for the control loop were last changed.
Differential	number	read-write (null)	The differential coefficient. This property shall contain the coefficient for the differential factor in a control loop.
Integral	number	read-write (null)	The integral coefficient. This property shall contain the coefficient for the integral factor in a control loop.
Proportional	number	read-write (null)	The proportional coefficient. This property shall contain the coefficient for the proportional factor in a control loop.
}			

ControlMode	string (enum)	<i>read- write (null)</i>	The current operating mode of the control. This property shall contain the operating mode of the control. <i>For the possible property values, see ControlMode in Property details.</i>
DataSourceUri	string (URI)	<i>read- only (null)</i>	The link to the resource that provides the data for this control. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy. If no source resource is implemented, meaning the excerpt represents the only available data, this property shall not be present.
Reading	number	<i>read- only (null)</i>	The reading of the sensor associated with this control. This property shall contain the value of the <code>Reading</code> property of the <code>Sensor</code> resource directly associated with this control. This property shall not be present if multiple sensors are associated with a single control.
SetPoint	number	<i>read- write (null)</i>	The desired set point of the control. This property shall contain the desired set point control value. The units shall follow the value of <code>SetPointUnits</code>. If the <code>DefaultSetPoint</code> property is not supported and if a user-defined set point is not configured, the property may contain <code>null</code> in responses.

6.33.4.3 CoolantConnectorType

The type of coolant connector.

- This property shall contain the type of coolant connector.

string	Description
Closed	A closed or self-contained loop.
Inline	An inline connection or measurement point.
Pair	A connection pair.
Return	A return or outflow connection.
Supply	A supply or intake connection.

6.33.4.4 SensorExcerpt

The `Sensor` schema describes a sensor and its properties. This object is an excerpt of the `Sensor` resource located at the URI shown in `DataSourceUri`.

DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.

6.33.5 Example response

```
{
  "@odata.type": "#CoolantConnector.v1_2_0.CoolantConnector",
  "Id": "A",
  "Name": "Rack Cooling Loop A",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "CoolantConnectorType": "Pair",
  "RatedFlowLitersPerMinute": 30,
  "FlowLitersPerMinute": {
    "Reading": 24.3
  },
  "SupplyTemperatureCelsius": {
    "Reading": 14.8
  },
  "ReturnTemperatureCelsius": {
    "Reading": 38.2
  },
  "DeltaTemperatureCelsius": {
    "Reading": 23.4
  },
  "SupplyPressurekPa": {
    "Reading": 426.6
  },
  "ReturnPressurekPa": {
    "Reading": 409.9
  },
  "DeltaPressurekPa": {
    "Reading": 31.7
  },
  "Links": {
    "ConnectedCoolingLoop": {
      "@odata.id": "/redfish/v1/ThermalEquipment/CoolingLoops/Rack4"
    }
  }
},
```

```
    "@odata.id": "/redfish/v1/ThermalEquipment/CDUs/1/SecondaryCoolantConnectors/A"
  }
```

6.34 CoolingLoop 1.0.3

Version	v1.0
Release	2023.1

6.34.1 Description

The `CoolingLoop` schema describes a cooling loop. A cooling loop might be any coolant-carrying vessel, such as facility-level pipework, an immersion cooling tank, or a manifold. A loop might describe its connectors and instrumentation but does not generally include active cooling components or subsystems.

- This resource shall represent a cooling loop for a Redfish implementation.

6.34.2 URIs

/redfish/v1/ThermalEquipment/CoolingLoops/{CoolingLoopId}

6.34.3 Properties

Property	Type	Attributes	Notes
ConsumingEquipmentNames []	array (string, null)	read-write	An array of names of downstream devices that receive coolant from this cooling loop. • This property shall contain an array of user-assigned identifying strings that describe downstream devices that receive coolant from this cooling loop.
Coolant {	object		The coolant details for this cooling loop. • This property shall contain the details about the coolant contained in this cooling loop.
AdditiveName	string	read-write (null)	The name of the additive. • This property shall contain the name of the additive contained in the coolant.

Property	Type	Attributes	Notes
AdditivePercent	number (%)	<i>read-write</i> (null)	The percent additives contained in the coolant. This property shall contain the percent of additives, 0 to 100 , by volume, contained in the coolant mixture.
CoolantType	string (enum)	<i>read-write</i> (null)	The type of coolant. This property shall contain the type of coolant used by this resource. <i>For the possible property values, see CoolantType in Property details.</i>
DensityKgPerCubicMeter	number (kg/m3)	<i>read-write</i> (null)	The density (kg/m^3) of the coolant. This property shall contain the density of the coolant, in kilograms per cubic meter units, as measured at room temperature (20-25 degrees C) and atmospheric pressure.
RatedServiceHours	number	<i>read-write</i> (null)	The rated hours of service life for this coolant. This property shall contain the number of hours of service that the coolant is rated to provide before servicing or replacement is necessary.
ServicedDate	string (date-time)	<i>read-write</i> (null)	The date the coolant was last serviced. This property shall contain the date the coolant was last serviced or tested for quality.
ServiceHours	number	<i>read-write</i> (null)	The hours of service this coolant has provided. This property shall contain the number of hours of service that the coolant has provided.
SpecificHeatkJoulesPerKgK	number (kJ/kg/K)	<i>read-write</i> (null)	The specific heat capacity (kJ/(kg*K)) of the coolant. This property shall contain the specific heat capacity of the coolant, in kilojoules per kilogram per degree kelvin units, as measured at room temperature (20-25 degrees C) and atmospheric pressure.
}			
CoolantLevelPercent {	object (excerpt)		The coolant capacity filled (percent). This property shall contain the amount of coolant capacity, in percent units, filled in this cooling loop. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Percent</code> . Services that support this property shall also return the <code>CoolantLevelStatus</code> property. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.

Property	Type	Attributes	Notes
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			
CoolantLevelStatus	string (enum)	<i>read-only</i> (null)	The status of the coolant level in this cooling loop. This property shall indicate the status of the coolant level in this cooling loop. <i>For the possible property values, see CoolantLevelStatus in Property details.</i>
CoolantQuality	string (enum)	<i>read-only</i> (null)	The quality of the coolant. This property shall indicate the quality of the coolant contained in this cooling loop. <i>For the possible property values, see CoolantQuality in Property details.</i>
CoolingManagerURI	string (URI)	<i>read-write</i> (null)	The link to the application that manages the cooling loop. This property shall contain a URI to the application or device that provides administration or management of the cooling loop associated with this interface.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Chassis {	object	(null)	A link to the chassis that contains this equipment. This property shall contain a link to resources of type <code>Chassis</code> that represent the physical container that contains this resource. See the <i>Chassis</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.
}			

Property	Type	Attributes	Notes
Facility {	object		A link to the facility that contains this equipment. This property shall contain a link to a resource of type <code>Facility</code> that represents the facility that contains this equipment. See the <i>Facility</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Facility resource. See the Links section and the <i>Facility</i> schema for details.
}			
ManagedBy [{	array		An array of links to the managers responsible for managing this equipment. This property shall contain an array of links to resources of type <code>Manager</code> that represent the managers that manage this equipment.
@odata.id	string	<i>read-only</i>	Link to a Manager resource. See the Links section and the <i>Manager</i> schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
LocationIndicatorActive	boolean	<i>read-write (null)</i>	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource.
PrimaryCoolantConnectors {	object		A link to the primary coolant connectors for this equipment. This property shall contain a link to a resource collection of type <code>CoolantConnectorCollection</code> that contains the primary coolant connectors for this equipment. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>CoolantConnector</i> . See the <i>CoolantConnector</i> schema for details.
}			
RatedFlowLitersPerMinute	number (L/min)	<i>read-only (null)</i>	The rated liquid flow (L/min) for this cooling loop. This property shall contain the rated liquid flow, in liters per minute units, for this cooling loop.

Property	Type	Attributes	Notes
RatedPressurekPa	number (kPa)	<i>read-only</i> (<i>null</i>)	The rated pressure (kPa) for this cooling loop. This property shall contain the rated maximum pressure, in kilopascal units, for this cooling loop.
SecondaryCoolantConnectors {	object		A link to the secondary coolant connectors for this equipment. This property shall contain a link to a resource collection of type <code>CoolantConnectorCollection</code> that contains the secondary coolant connectors for this equipment. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>CoolantConnector</i> . See the <i>CoolantConnector</i> schema for details.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <i>Status</i>.
SupplyEquipmentNames []	array (string, null)	<i>read-write</i>	An array of names of upstream devices that supply coolant to this cooling loop. This property shall contain an array of user-assigned identifying strings that describe upstream devices that supply coolant to this cooling loop.
UserLabel	string	<i>read-write</i>	A user-assigned label. This property shall contain a user-assigned label used to identify this resource. If a value has not been assigned by a user, the value of this property shall be an empty string.

6.34.4 Property details

6.34.4.1 CoolantLevelStatus

The status of the coolant level in this cooling loop.

- This property shall indicate the status of the coolant level in this cooling loop.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

6.34.4.2 CoolantQuality

The quality of the coolant.

- This property shall indicate the quality of the coolant contained in this cooling loop.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

6.34.4.3 CoolantType

The type of coolant.

- This property shall contain the type of coolant used by this resource.

string	Description
Dielectric	Dielectric fluid.
Fluorocarbon	Fluorocarbon-based.
Hydrocarbon	Hydrocarbon-based.
Water	Water or glycol mixture, including additives.

6.34.5 Example response

```
{
  "@odata.type": "#CoolingLoop.v1_0_3.CoolingLoop",
  "Id": "BuildingChiller",
```



```

    "Name": "Feed from building chiller",
    "Status": {
      "State": "Enabled",
      "Health": "OK"
    },
    "UserLabel": "Building Chiller",
    "Coolant": {
      "CoolantType": "Water",
      "AdditiveName": "Generic cooling water biocide",
      "AdditivePercent": 0
    },
    "CoolantLevelStatus": "OK",
    "CoolantQuality": "OK",
    "CoolantLevelPercent": {
      "Reading": 95
    },
    "SupplyEquipmentNames": [
      "Chiller"
    ],
    "ConsumingEquipmentNames": [
      "Rack #1 CDU",
      "Rack #2 CDU",
      "Rack #3 CDU",
      "Rack #4 CDU"
    ],
    "@odata.id": "/redfish/v1/ThermalEquipment/CoolingLoops/BuildingChiller"
  }
}
```

6.35 CoolingUnit 1.3.0

Version	v1.3	v1.2	v1.1	v1.0
Release	2025.2	2024.4	2023.2	2023.1

6.35.1 Description

The `CoolingUnit` schema contains the definition for a cooling system component or unit, such as a coolant distribution unit (CDU) or a heat exchanger.

- This resource shall represent a cooling system component or unit for a Redfish implementation.

6.35.2 URIs

`/redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}`

/redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}
 /redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}
 /redfish/v1/ThermalEquipment/RPUs/{CoolingUnitId}

6.35.3 Properties

Property	Type	Attributes	Notes
Assembly {	object		The link to the assembly associated with this cooling unit. This property shall contain a link to a resource of type <code>Assembly</code>. See the <i>Assembly</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>Assembly</i> resource. See the Links section and the <i>Assembly</i> schema for details.
}			
AssetTag	string	<i>read-write (null)</i>	The user-assigned asset tag for this equipment. This property shall contain the user-assigned asset tag, which is an identifying string that tracks the equipment for inventory purposes.
Coolant {	object		Details about the coolant used in this unit. This property shall contain details regarding the coolant contained or used by this unit. See the <i>CoolingLoop</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>Coolant</i> resource. See the Links section and the <i>CoolingLoop</i> schema for details.
}			
CoolantConnectorRedundancy (v1.1+) [{}]	array (object)		The redundancy information for the devices in a redundancy group. - The redundancy information for the coolant connectors in this cooling unit. - This property shall contain redundancy information for the set of coolant connectors attached to this equipment. The values of the <code>RedundancyGroup</code> array shall reference resources of type <code>CoolantConnector</code>. For property details, see <i>RedundantGroup</i>.
CoolingCapacityWatts	integer	<i>read-only (null)</i>	The cooling capacity (W) of this equipment. This property shall contain the manufacturer-provided cooling capacity, in watt units, of this equipment.

Property	Type	Attributes	Notes
EnvironmentMetrics {	object		The link to the environment metrics for this equipment. This property shall contain a link to a resource of type <code>EnvironmentMetrics</code> that specifies the environment metrics for this equipment. See the <i>EnvironmentMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>EnvironmentMetrics</i> resource. See the Links section and the <i>EnvironmentMetrics</i> schema for details.
}			
EquipmentType	string (enum)	<i>read-only required</i>	The type of equipment this resource represents. This property shall contain the type of equipment this resource represents. For the possible property values, see <i>EquipmentType</i> in Property details.
FilterRedundancy [{}]	array (object)		The redundancy information for the devices in a redundancy group. - The redundancy information for the groups of filters in this unit. - This property shall contain redundancy information for the groups of filters in this unit. For property details, see <i>RedundantGroup</i>.
Filters {	object		A link to the filters for this equipment. This property shall contain a link to a resource collection of type <code>FilterCollection</code> that contains the filter information for this equipment. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Filter</i> . See the <i>Filter</i> schema for details.
}			
FirmwareVersion	string	<i>read-only</i>	The firmware version of this equipment. This property shall contain a string describing the firmware version of this equipment as provided by the manufacturer.

Property	Type	Attributes	Notes
LeakDetection {	object		A link to the leak detection components associated with this equipment. This property shall contain a link to a resource of type <code>LeakDetection</code> that contains the leak detection component information for this equipment. This link should be used when the leak detection capabilities are tied to a particular cooling unit or system which may span multiple <code>Chassis</code> resources. For equipment represented with a single <code>Chassis</code> resource or detection inside a particular <code>Chassis</code> resource, populating the <code>LeakDetection</code> resource under <code>ThermalSubsystem</code> for the relevant <code>Chassis</code> is the preferred approach. See the <i>LeakDetection</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>LeakDetection</code> resource. See the Links section and the <i>LeakDetection</i> schema for details.
}			
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Chassis [{	array		An array of links to the chassis that contain this equipment. This property shall contain an array of links to resources of type <code>Chassis</code> that represent the physical containers that contain this equipment.
@odata.id	string	<i>read-only</i>	Link to a <code>Chassis</code> resource. See the Links section and the <i>Chassis</i> schema for details.
}]			
Facility {	object		A link to the facility that contains this equipment. This property shall contain a link to a resource of type <code>Facility</code> that represents the facility that contains this equipment. See the <i>Facility</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>Facility</code> resource. See the Links section and the <i>Facility</i> schema for details.
}			
ManagedBy [{	array		An array of links to the managers responsible for managing this equipment. This property shall contain an array of links to resources of type <code>Manager</code> that represent the managers that manage this equipment.
@odata.id	string	<i>read-only</i>	Link to a <code>Manager</code> resource. See the Links section and the <i>Manager</i> schema for details.

Property	Type	Attributes	Notes
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
Location {}	object		The location of the equipment. This property shall contain the location information of the associated equipment. For property details, see Location.
Manufacturer	string	read-only (null)	The manufacturer of this equipment. This property shall contain the name of the organization responsible for producing the equipment. This organization may be the entity from which the equipment is purchased, but this is not necessarily true.
Model	string	read-only (null)	The product model number of this equipment. This property shall contain the manufacturer-provided model information of this equipment.
PartNumber	string	read-only (null)	The part number for this equipment. This property shall contain the manufacturer-provided part number for the equipment.
PrimaryCoolantConnectors {	object		A link to the primary coolant connectors for this equipment. This property shall contain a link to a resource collection of type <code>CoolantConnectorCollection</code> that contains the primary coolant connectors for this equipment. Contains a link to a resource.
@odata.id	string	read-only	Link to Collection of <i>CoolantConnector</i> . See the <i>CoolantConnector</i> schema for details.
}			
ProductionDate	string (date-time)	read-only (null)	The production or manufacturing date of this equipment. This property shall contain the date of production or manufacture for this equipment.

Property	Type	Attributes	Notes
PumpRedundancy [{}]	array (object)		The redundancy information for the devices in a redundancy group. - The redundancy information for the groups of pumps in this unit. - This property shall contain redundancy information for the groups of pumps in this unit. For property details, see RedundantGroup.
Pumps {	object		A link to the pumps for this equipment. This property shall contain a link to a resource collection of type <code>PumpCollection</code> that contains the pump information for this equipment. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Pump</i> . See the Pump schema for details.
}			
Reservoirs {	object		A link to the reservoirs for this equipment. This property shall contain a link to a resource collection of type <code>ReservoirCollection</code> that contains the reservoir information for this equipment. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Reservoir</i> . See the Reservoir schema for details.
}			
SecondaryCoolantConnectors {	object		A link to the secondary coolant connectors for this equipment. This property shall contain a link to a resource collection of type <code>CoolantConnectorCollection</code> that contains the secondary coolant connectors for this equipment. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>CoolantConnector</i> . See the CoolantConnector schema for details.
}			
SerialNumber	string	<i>read-only</i> (null)	The serial number for this equipment. This property shall contain a manufacturer-allocated number that identifies the equipment.

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
UserLabel	string	read-write	A user-assigned label. This property shall contain a user-assigned label used to identify this resource. If a value has not been assigned by a user, the value of this property shall be an empty string.
Version	string	read-only (null)	The hardware version of this equipment. This property shall contain the hardware version of this equipment as determined by the vendor or supplier.

6.35.4 Actions

6.35.4.1 SetMode (v1.2+)

Description

This action sets the operating mode of the cooling unit.

- This action shall set the operating mode of the cooling unit.

Action URI

{Base URI of target resource}/Actions/CoolingUnit.SetMode

Action parameters

Parameter Name	Type	Attributes	Notes
Mode	string (enum)	optional	The desired operating mode of the cooling unit. This parameter shall contain the desired operating mode of the cooling unit. <i>For the possible property values, see Mode in Property details.</i>

Request Example

```

{
  "Mode": "Disabled"
}
```

6.35.5 Property details

6.35.5.1 EquipmentType

The type of equipment this resource represents.

- This property shall contain the type of equipment this resource represents.

string	Description
CDU	A coolant distribution unit (CDU).
HeatExchanger	A heat exchanger.
ImmersionUnit	An immersion cooling unit.
RPU (v1.3+)	A reservoir and pumping unit (RPU).

6.35.5.2 Mode

The desired operating mode of the cooling unit.

- This parameter shall contain the desired operating mode of the cooling unit.

string	Description
Disabled	Disable the cooling unit. This value shall indicate a request to disable the cooling unit. When disabled, primary functions of the cooling unit, such as pump activity, are also disabled. When disabled, the cooling unit may perform administrative functions, such as monitoring sensors, controlling valves, and accepting new firmware. Upon successful completion, the <code>State</code> property within <code>Status</code>, shall contain the value <code>Disabled</code>.
Enabled	Enable the cooling unit. This value shall indicate a request to enable the cooling unit. Upon successful completion, the <code>State</code> property within <code>Status</code>, shall contain the value <code>Enabled</code>.

6.35.6 Example response

```
{
  "@odata.type": "#CoolingUnit.v1_3_0.CoolingUnit",
  "Id": "1",
  "EquipmentType": "CDU",
  "Name": "Rack #4 Cooling Distribution Unit",
  "FirmwareVersion": "3.2.0",
  "Version": "1.03b",
  "ProductionDate": "2020-12-24T08:00:00Z",
  "Manufacturer": "Contoso",
  "Model": "BRRR4000",
  "SerialNumber": "29347ZT536",
  "PartNumber": "ICE-9",
  "AssetTag": "PDX5-92381",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "Location": {
    "Placement": {
      "Row": "North 1"
    }
  },
  "PrimaryCoolantConnectors": {
    "@odata.id": "/redfish/v1/ThermalEquipment/CDUs/1/PrimaryCoolantConnectors"
  },
  "SecondaryCoolantConnectors": {
    "@odata.id": "/redfish/v1/ThermalEquipment/CDUs/1/SecondaryCoolantConnectors"
  },
  "Pumps": {
    "@odata.id": "/redfish/v1/ThermalEquipment/CDUs/1/Pumps"
  },
  "Filters": {
    "@odata.id": "/redfish/v1/ThermalEquipment/CDUs/1/Filters"
  },
  "EnvironmentMetrics": {
    "@odata.id": "/redfish/v1/ThermalEquipment/CDUs/1/EnvironmentMetrics"
  },
  "LeakDetection": {
    "@odata.id": "/redfish/v1/ThermalEquipment/CDUs/1/LeakDetection"
  },
  "Links": {
    "Facility": {
      "@odata.id": "/redfish/v1/Facilities/Room237"
    }
  },
  "@odata.id": "/redfish/v1/ThermalEquipment/CDUs/1"
}
```

6.36 CXLLogicalDevice 1.2.1

Version	v1.2	v1.1	v1.0
Release	2024.1	2023.2	2022.3

6.36.1 Description

The `CXLLogicalDevice` schema contains the properties of a CXL logical device within a PCIe device.

- This resource shall represent a CXL logical device that is a part of a PCIe device.

6.36.2 URIs

/redfish/v1/Chassis/{ChassisId}/PCleDevices/{PCleDeviceId}/CXLLogicalDevices/{CXLLogicalDeviceId}

6.36.3 Properties

Property	Type	Attributes	Notes
Identifiers [{}]	array (object)		Any additional identifiers for a resource. - The durable names for the CXL logical device. - This property shall contain a list of all known durable names for the associated CXL logical device. For property details, see Identifier.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Endpoints [{	array		An array of links to the endpoints associated with this CXL logical device. This property shall contain an array of links to resources of type <code>Endpoint</code> that represent the endpoints associated with this CXL logical device.
@odata.id	string	read-only	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.

Property	Type	Attributes	Notes
}}			
MemoryChunks [{	array		An array of links to the memory chunks owned by this CXL logical device. This property shall contain an array of links to resources of type <code>MemoryChunks</code> that represent the memory chunks owned by this CXL logical device.
@odata.id	string	<i>read-only</i>	Link to a <code>MemoryChunks</code> resource. See the Links section and the <i>MemoryChunks</i> schema for details.
}}			
MemoryDomains [{	array		An array of links to the memory domains associated with this CXL logical device. This property shall contain an array of links to resources of type <code>MemoryDomain</code> that represent the memory domains associated with this CXL logical device.
@odata.id	string	<i>read-only</i>	Link to a <code>MemoryDomain</code> resource. See the Links section and the <i>MemoryDomain</i> schema for details.
}}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCleFunctions [{	array		An array of links to the PCIe functions assigned to this CXL logical device. This property shall contain an array of links to resources of type <code>PCleFunction</code> that represent the PCIe functions assigned to this CXL logical device.
@odata.id	string	<i>read-only</i>	Link to a <code>PCleFunction</code> resource. See the Links section and the <i>PCleFunction</i> schema for details.
}}			
}			
Log {	object		The link to the log service associated with this CXL logical device. This property shall contain a link to a resource of type <code>LogService</code>. See the <i>LogService</i> schema for details on this property.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a LogService resource. See the Links section and the <i>LogService</i> schema for details.
}			
MemoryRegions (v1.1+) {	object		The link to the collection of memory regions associated with this CXL logical device. This property shall contain a link to a resource collection of type <i>MemoryRegionCollection</i> that represents the memory regions associated with this CXL logical device. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>MemoryRegion</i> . See the <i>MemoryRegion</i> schema for details.
}			
MemorySizeMiB	integer (mebibytes)	<i>read-only</i>	The total memory capacity currently available in this CXL logical device. This property shall contain the total memory capacity currently available in this CXL logical device in mebibytes (MiB). This value shall equate to the sum of the dynamic capacity extents and the static capacity assigned to this logical device.
QoS {	object		The quality of service configuration for this CXL logical device. This property shall contain the quality of service configuration for this CXL logical device.
AllocatedBandwidth	integer (%)	<i>read-write (null)</i>	The bandwidth allocated to this CXL logical device as a percentage. This property shall contain the bandwidth allocated, 0 to 100, for this CXL logical device as a percentage.
LimitPercent	integer (%)	<i>read-write (null)</i>	The bandwidth limit to this CXL logical device as a percentage. This property shall contain the bandwidth limit, 0 to 100, for this CXL logical device as a percentage.
}			
QoSTelemetryCapabilities {	object		The quality of service telemetry capabilities for this CXL logical device. This property shall contain the quality of service telemetry capabilities for this CXL logical device.

Property	Type	Attributes	Notes
EgressPortBackpressureSupported	boolean	<i>read-only</i> (null)	Indicates whether the device supports the CXL Specification-defined 'Egress Port Backpressure' mechanism. This property shall indicate whether the device supports the CXL Specification-defined 'Egress Port Backpressure' mechanism.
TemporaryThroughputReductionSupported (deprecated v1.2)	boolean	<i>read-only</i> (null)	Indicates whether the device supports the CXL Specification-defined 'Temporary Throughput Reduction' mechanism. This property shall indicate whether the device supports the CXL Specification-defined 'Temporary Throughput Reduction' mechanism. <i>Deprecated in v1.2 and later. This property has been deprecated in favor of <code>TemporaryThroughputReductionSupported</code> in <code>PCIeDevice</code>.</i>
}			
SemanticsSupported []	array (string (enum))	<i>read-only</i>	- The semantics supported by this CXL logical device. - This property shall contain the CXL Specification-defined semantics that are supported by this CXL logical device. <i>For the possible property values, see <code>SemanticsSupported</code> in <code>Property</code> details.</i>
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <code>Status</code>.

6.36.4 Property details

6.36.4.1 SemanticsSupported

- The semantics supported by this CXL logical device.
 - This property shall contain the CXL Specification-defined semantics that are supported by this CXL logical device.

string	Description
CXLcache	CXL caching protocol semantic. This value shall indicate the device conforms with the CXL Specification-defined 'CXL.cache' semantic.
CXLio	CXL I/O semantic. This value shall indicate the device conforms with the CXL Specification-defined 'CXL.io' semantic.
CXLmem	CXL memory access semantic. This value shall indicate the device conforms with the CXL Specification-defined 'CXL.mem' semantic.

6.36.5 Example response

```
{
  "@odata.type": "#CXLLogicalDevice.v1_2_1.CXLLogicalDevice",
  "Id": "1",
  "Name": "CXL Logical Device Type 1",
  "Description": "Locally attached CXL Logical Device Type 1",
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "HealthRollup": "OK"
  },
  "Identifiers": [
    {
      "DurableName": "4C-1D-96-FF-FE-DD-D8-35:0001",
      "DurableNameFormat": "GCXLID"
    }
  ],
  "SemanticsSupported": [
    "CXLio",
    "CXLcache"
  ],
  "Links": {
    "PCIEFunctions": [
      {
        "@odata.id": "/redfish/v1/Chassis/CXL1/PCIEDevices/1/PCIEFunctions/1"
      }
    ]
  },
  "@odata.id": "/redfish/v1/Chassis/CXL1/PCIEDevices/1/CXLLogicalDevices/1"
}
```

6.37 Drive 1.21.0

Version	v1.21	v1.20	v1.19	v1.18	v1.17	v1.16	v1.15	v1.14	v1.13	v1.12	v1.11	...
Release	2024.4	2024.2	2024.1	2023.3	2023.1	2022.3	2022.1	2021.4	2021.2	2020.4	2020.3	...

6.37.1 Description

The `Drive` schema represents a single physical drive for a system, including links to associated volumes. It also describes the location, such as a slot, socket, or bay, where a unit can be installed, by populating a resource instance with an absent state if a unit is not present.

- This resource shall represent a drive or other physical storage medium for a Redfish implementation. It may also represent a location, such as a slot, socket, or bay, where a unit may be installed, but the `State` property within the `Status` property contains `Absent`.

6.37.2 URIs

`/redfish/v1/Chassis/{ChassisId}/Drives/{DriveId}`

`/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Drives/{DriveId}`

`/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Drives/{DriveId}`
(deprecated)

`/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Drives/{DriveId}` (deprecated)

`/redfish/v1/ResourceBlocks/{ResourceBlockId}/Drives/{DriveId}`

`/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Drives/{DriveId}` (deprecated)

`/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Drives/{DriveId}`
(deprecated)

`/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Drives/{DriveId}` (deprecated)

6.37.3 Properties

Property	Type	Attributes	Notes
Assembly (v1.3+) {	object		The link to the assembly associated with this drive. This property shall contain a link to a resource of type <code>Assembly</code>. See the <code>Assembly</code> schema for details on this property.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a Assembly resource. See the Links section and the <i>Assembly</i> schema for details.
}			
AssetTag	string	<i>read-write</i> (null)	The user-assigned asset tag for this drive. This property shall track the drive for inventory purposes.
BlockSecurityIDEnabled (v1.20+)	boolean	<i>read-write</i> (null)	Indicates if establishment of a TCG-defined security ID (SID) on the drive is blocked. This property shall indicate if establishment of a TCG-defined security ID (SID) on the drive is blocked. The value <code>true</code> shall indicate the TCG-defined 'Block SID' command is sent to the drive during each drive boot sequence.
BlockSizeBytes	integer (bytes)	<i>read-only</i> (null)	The size, in bytes, of the smallest addressable unit, or block. This property shall contain the size of the smallest addressable unit of the associated drive.
CapableSpeedGbs	number (Gbit/s)	<i>read-only</i> (null)	The speed, in gigabits per second (Gbit/s) units, at which this drive can communicate to a storage controller in ideal conditions. This property shall contain fastest capable bus speed, in gigabits per second (Gbit/s) units, of the associated drive.
CapacityBytes	integer (bytes)	<i>read-only</i> (null)	The size, in bytes, of this drive. This property shall contain the raw size, in bytes, of the associated drive.
Certificates (v1.12+) {	object		The link to a collection of certificates for device identity and attestation. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that contains certificates for device identity and attestation. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			

Property	Type	Attributes	Notes
ConfigurationLock (v1.19+)	string (enum)	<i>read-write</i> (null)	Indicates whether in-band configuration requests to the drive are locked. Other properties, such as <code>ConfigurationLockState</code>, contain additional information regarding the status of the configuration lock. This property shall indicate whether configuration requests to the drive are locked. Services shall reject modification requests that contain the value <code>Partial</code>. <i>For the possible property values, see ConfigurationLock in Property details.</i>
DriveFormFactor (v1.16+)	string (enum)	<i>read-only</i> (null)	The form factor of the drive inserted in this slot. This property shall contain the form factor of the drive inserted in this slot. <i>For the possible property values, see DriveFormFactor in Property details.</i>
EncryptionAbility	string (enum)	<i>read-only</i> (null)	The encryption ability of this drive. This property shall contain the encryption ability for the associated drive. <i>For the possible property values, see EncryptionAbility in Property details.</i>
EncryptionStatus	string (enum)	<i>read-only</i> (null)	The status of the encryption of this drive. This property shall contain the encryption status for the associated drive. <i>For the possible property values, see EncryptionStatus in Property details.</i>
EnvironmentMetrics (v1.12+) {	object		The link to the environment metrics for this drive. This property shall contain a link to a resource of type <code>EnvironmentMetrics</code> that specifies the environment metrics for this drive. See the <i>EnvironmentMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>EnvironmentMetrics</i> resource. See the Links section and the <i>EnvironmentMetrics</i> schema for details.
}			
FailurePredicted	boolean	<i>read-only</i> (null)	An indication of whether this drive currently predicts a failure in the near future. This property shall indicate whether this drive currently predicts a manufacturer-defined failure.
FirmwareVersion (v1.17+)	string	<i>read-only</i> (null)	The firmware version for this drive. This property shall contain the firmware version as defined by the manufacturer for this drive.

Property	Type	Attributes	Notes
HardwareVersion (v1.21+)	string	<i>read-only</i> (null)	The hardware version of this drive. This property shall contain the hardware version of this drive as determined by the vendor or supplier.
HotspareReplacementMode (v1.5+)	string (enum)	<i>read-write</i> (null)	The replacement mode for the hot spare drive. This property shall indicate whether a commissioned hot spare continues to serve as a hot spare after the failed drive is replaced. <i>For the possible property values, see HotspareReplacementMode in Property details.</i>
HotspareType	string (enum)	<i>read-write</i> (null)	The type of hot spare that this drive serves as. This property shall contain the hot spare type for the associated drive. If the drive currently serves as a hot spare, the <code>State</code> property in <code>Status</code> shall contain <code>StandbySpare</code> and <code>Enabled</code> when it is part of a volume. <i>For the possible property values, see HotspareType in Property details.</i>
Identifiers [{}]	array (object)		Any additional identifiers for a resource. - The durable names for the drive. - This property shall contain a list of all known durable names for the associated drive. For property details, see Identifier.
IndicatorLED (deprecated v1.11)	string (enum)	<i>read-write</i> (null)	The state of the indicator LED, that identifies the drive. This property shall contain the state for the indicator light associated with this drive. <i>For the possible property values, see IndicatorLED in Property details. Deprecated in v1.11 and later. This property has been deprecated in favor of the LocationIndicatorActive property.</i>
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
ActiveSoftwareImage (v1.16+) {	object		The link to the software inventory that represents the active drive firmware image. This property shall contain a link a resource of type <code>SoftwareInventory</code> that represents the active drive firmware image. See the <i>SoftwareInventory</i> schema for details on this property.
@odata.id	string	<i>read-write</i>	Link to a <i>SoftwareInventory</i> resource. See the Links section and the <i>SoftwareInventory</i> schema for details.

Property	Type	Attributes	Notes
}			
Chassis (v1.2+) {	object		The link to the chassis that contains this drive. This property shall contain a link to a resource of type <code>Chassis</code> that represents the physical container associated with this drive. See the <i>Chassis</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.
}			
Endpoints (v1.1+) [{	array		An array of links to the endpoints that connect to this drive. This property shall contain an array of links to resources of type <code>Endpoint</code> with which this drive is associated.
@odata.id	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}]			
NetworkDeviceFunctions (v1.14+) [{	array		An array of links to the network device functions that provide network connectivity for this drive. This property shall contain the array of links to resources of type <code>NetworkDeviceFunction</code>. This property should only be present for drives with network connectivity, such as Ethernet attached drives.
@odata.id	string	<i>read-only</i>	Link to a NetworkDeviceFunction resource. See the Links section and the <i>NetworkDeviceFunction</i> schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCleFunctions (v1.6+) [{	array		An array of links to the PCIe functions that the drive produces. This property shall link to a resource of type <code>PCleFunction</code> that represents the PCIe functions associated with this resource.
@odata.id	string	<i>read-only</i>	Link to a PCleFunction resource. See the Links section and the <i>PCleFunction</i> schema for details.
}]			

Property	Type	Attributes	Notes
SoftwareImages (v1.16+) [{	array		The images that are associated with this drive. This property shall contain an array of links to resources of type <code>SoftwareInventory</code> that represent the firmware images that apply to this drive.
@odata.id	string	<i>read-only</i>	Link to a <code>SoftwareInventory</code> resource. See the Links section and the <code>SoftwareInventory</code> schema for details.
}]			
Storage (v1.13+) {	object		A link to the storage subsystem to which this drive belongs. This property shall contain a link to a resource of type <code>Storage</code> that represents the storage subsystem to which this drive belongs. See the <code>Storage</code> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>Storage</code> resource. See the Links section and the <code>Storage</code> schema for details.
}			
StoragePools (v1.8+) [{	array		An array of links to the storage pools to which this drive belongs. This property shall contain an array of links of type <code>StoragePool</code> to which this drive belongs.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
Volumes [{	array		An array of links to the volumes that this drive either wholly or only partially contains. This property shall contain an array of links to resources of type <code>Volume</code> with which this drive is associated. This property shall include all volume resources of which this drive is a member and all volumes for which this drive acts as a spare if the hot spare type is <code>Dedicated</code>.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
}			

Property	Type	Attributes	Notes
Location (<i>deprecated v1.4</i>) [{}]	array (object)		The location of a resource. - The location of the drive. - This property shall contain the location information of the associated drive. For property details, see Location. <i>Deprecated in v1.4 and later. This property has been deprecated in favor of the singular <code>PhysicalLocation</code> property.</i>
LocationIndicatorActive (<i>v1.11+</i>)	boolean	<i>read-write</i> (<i>null</i>)	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of <code>IndicatorLED</code> in this resource, if supported, to reflect the implementation of the locating function.
Manufacturer	string	<i>read-only</i> (<i>null</i>)	The manufacturer of this drive. This property shall contain the name of the organization responsible for producing the drive. This organization may be the entity from whom the drive is purchased, but this is not necessarily true.
Measurements (<i>v1.12+, deprecated v1.14</i>) [{}]	array		An array of DSP0274-defined measurement blocks. This property shall contain an array of DSP0274-defined measurement blocks. <i>Deprecated in v1.14 and later. This property has been deprecated in favor of the <code>ComponentIntegrity</code> resource.</i>
@odata.id	string	<i>read-only</i>	Link to a MeasurementBlock resource. See the Links section and the <i>SoftwareInventory</i> schema for details.
}]			
MediaType	string (enum)	<i>read-only</i> (<i>null</i>)	The type of media contained in this drive. This property shall contain the type of media contained in the associated drive. <i>For the possible property values, see MediaType in Property details.</i>
Metrics (<i>v1.17+</i>) {	object	(<i>null</i>)	The link to the metrics associated with this drive. This property shall contain a link to the metrics associated with this drive. See the <i>DriveMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a DriveMetrics resource. See the Links section and the <i>DriveMetrics</i> schema for details.
}			

Property	Type	Attributes	Notes
Model	string	<i>read-only</i> (null)	The model number for the drive. This property shall contain the name by which the manufacturer generally refers to the drive.
Multipath (v1.9+)	boolean	<i>read-only</i> (null)	An indication of whether the drive is accessible from multiple paths. This property shall indicate whether the drive is accessible by an initiator from multiple paths allowing for failover capabilities upon a path failure.
NegotiatedSpeedGbs	number (Gbit/s)	<i>read-only</i> (null)	The speed, in gigabits per second (Gbit/s) units, at which this drive currently communicates to the storage controller. This property shall contain current bus speed, in gigabits per second (Gbit/s) units, of the associated drive.
NVMe (v1.20+) {	object	(null)	NVMe properties for this drive. This property shall contain NVMe-specific properties of this drive.
ConfigurationLockState (v1.20+) {	object	(null)	The configurable features that are able to be locked from in-band usage on an NVMe subsystem and their current lock state. This property shall contain the configurable features that are able to be locked from in-band usage on an NVMe subsystem and their current lock state.
FirmwareCommit (v1.20+)	string (enum)	<i>read-only</i> (null)	The lock state of the NVMe-defined Firmware Commit command. This property shall contain the lock state of the NVMe-defined Firmware Commit command. <i>For the possible property values, see FirmwareCommit in Property details.</i>
FirmwareImageDownload (v1.20+)	string (enum)	<i>read-only</i> (null)	The lock state of the NVMe-defined Firmware Image Download command. This property shall contain the lock state of the NVMe-defined Firmware Image Download command. <i>For the possible property values, see FirmwareImageDownload in Property details.</i>
Lockdown (v1.20+)	string (enum)	<i>read-only</i> (null)	The lock state of the NVMe-defined Lockdown command. This property shall contain the lock state of the NVMe-defined Lockdown command. <i>For the possible property values, see Lockdown in Property details.</i>

Property	Type	Attributes	Notes
SecuritySend (v1.20+)	string (enum)	<i>read-only</i> (null)	The lock state of the NVMe-defined Security Send command. This property shall contain the lock state of the NVMe-defined Security Send command. <i>For the possible property values, see SecuritySend in Property details.</i>
VPDWrite (v1.20+)	string (enum)	<i>read-only</i> (null)	The lock state of the NVMe-MI-defined VPD Write command. This property shall contain the lock state of the NVMe-MI-defined VPD Write command. <i>For the possible property values, see VPDWrite in Property details.</i>
}			
}			
Operations (v1.1+) [{	array		The operations currently running on the drive. This property shall contain a list of all operations currently running on the drive.
AssociatedTask (v1.1+) {	object		The link to the task associated with the operation, if any. This property shall contain a link to a resource of type <code>Task</code> that represents the task associated with the operation. See the <code>Task</code> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Task resource. See the Links section and the <code>Task</code> schema for details.
}			
Operation (v1.17+)	string (enum)	<i>read-only</i> (null)	The type of the operation. This property shall contain the type of the operation. <i>For the possible property values, see Operation in Property details.</i>
OperationName (v1.1+, deprecated v1.17)	string	<i>read-only</i> (null)	The name of the operation. This property shall contain a string of the name of the operation. <i>Deprecated in v1.17 and later. This property is deprecated in favor of the operation property using the OperationType enumeration defined in the Volume schema.</i>
PercentageComplete (v1.1+)	integer (%)	<i>read-only</i> (null)	The percentage of the operation that has been completed. This property shall contain an integer of the percentage, 0 to 100, of the operation that has been completed.
}]			

Property	Type	Attributes	Notes
PartNumber	string	<i>read-only</i> (null)	The part number for this drive. This property shall contain the part number assigned by the organization that is responsible for producing or manufacturing the drive.
PhysicalLocation (v1.4+) {}	object		The location of the drive. This property is equivalent to the <code>Location</code> property common to other standard Redfish resources. This property shall contain the location information of the associated drive. For property details, see <code>Location</code>.
PredictedMediaLifeLeftPercent	number (%)	<i>read-only</i> (null)	The percentage of reads and writes that are predicted to be available for the media. This property shall contain an indicator of the percentage, typically 0 to 100, of life remaining in the drive's media.
Protocol	string (enum)	<i>read-only</i> (null)	The protocol that this drive currently uses to communicate to the storage controller. This property shall contain the protocol that the associated drive currently uses to communicate to the storage controller for this system. For the possible property values, see <code>Protocol</code> in <i>Property details</i>.
ReadyToRemove (v1.10+)	boolean	<i>read-write</i> (null)	An indication of whether the drive is prepared by the system for removal. This property shall indicate whether the system is prepared for the removal of this drive.
Revision	string	<i>read-only</i> (null)	The revision of a SCSI-based drive, as returned from the 'Inquiry' command, which can be the firmware or hardware version. For other types of drives, the <code>HardwareVersion</code> and <code>FirmwareVersion</code> properties are recommended in favor of this property. This property shall contain the manufacturer-defined revision for a SCSI-based drive, as returned in the 'Product Revision Level' field from the 'Inquiry' command, which can be the firmware or hardware version. For other types of drives, this property should not be present and services should support the <code>HardwareVersion</code> and <code>FirmwareVersion</code> properties in favor of this property. If this property is present for drives that are not SCSI-based, the value may contain a firmware version, hardware version, or a combination.
RotationSpeedRPM	number ({rev}/min)	<i>read-only</i> (null)	The rotation speed of this drive, in revolutions per minute (RPM) units. This property shall contain the rotation speed, in revolutions per minute (RPM) units, of the associated drive.

Property	Type	Attributes	Notes
SerialNumber	string	<i>read-only</i> (null)	The serial number for this drive. This property shall contain the manufacturer-allocated number that identifies the drive.
SKU	string	<i>read-only</i> (null)	The SKU for this drive. This property shall contain the stock-keeping unit (SKU) number for this drive.
SlotCapableProtocols (v1.16+) []	array (string (enum))	<i>read-only</i> (null)	- The drive protocols capable in this slot. - This property shall contain the drive protocols capable in this slot. The value of this property depends upon the connector in this slot, the storage controllers connected to this slot, the configuration of the system, and other constraints that determine if a particular protocol is capable at a given time. <i>For the possible property values, see SlotCapableProtocols in Property details.</i>
SlotFormFactor (v1.16+)	string (enum)	<i>read-only</i> (null)	The form factor of the slot. This property shall contain the form factor of the slot. <i>For the possible property values, see SlotFormFactor in Property details.</i>
SparePartNumber (v1.19+)	string	<i>read-only</i> (null)	The spare part number of the drive. This property shall contain the spare part number of the drive.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
StatusIndicator	string (enum)	<i>read-write</i> (null)	The state of the status indicator, which communicates status information about this drive. This property shall contain the status indicator state for the status indicator associated with this drive. The <code>@Redfish.AllowableValues</code> annotation specifies the valid values for this property. <i>For the possible property values, see StatusIndicator in Property details.</i>

Property	Type	Attributes	Notes
TargetConfigurationLockLevel (v1.20+)	string (enum)	read-write (null)	Indicates the target configuration lock level for the drive based upon the state of the <code>ConfigurationLock</code> property. Other properties, such as <code>ConfigurationLockState</code> , contain additional information regarding the status of the configuration lock. This property shall contain the target configuration lock level for the drive. For NVMe drives, services shall implement the locking requirements specified by SNIA's Swordfish NVMe Model Overview and Mapping Guide. <i>For the possible property values, see TargetConfigurationLockLevel in Property details.</i>
WriteCacheEnabled (v1.7+)	boolean	read-write (null)	An indication of whether the drive write cache is enabled. This property shall indicate whether the drive write cache is enabled.

6.37.4 Actions

6.37.4.1 Reset (v1.7+)

Description

This action resets this drive.

- This action shall reset this drive.

Action URI

{Base URI of target resource}/Actions/Drive.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	optional	The type of reset. This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset. <i>For the possible property values, see ResetType in Property details.</i>

Request Example

```
{
  "ResetType": "On"
}
```

6.37.4.2 RevertToOriginalFactoryState (v1.18+)

Description

This action reverts a self-encrypting drive (SED) to the original factory state.

- This action shall revert a self-encrypting drive (SED) to the original factory state. Upon successful completion of this action, the drive data shall be securely erased and the EncryptionStatus property shall contain Unencrypted .

Action URI

{Base URI of target resource}/Actions/Drive.RevertToOriginalFactoryState

Action parameters

Parameter Name	Type	Attributes	Notes
PhysicalSecureID	string	optional	The physical secure ID (PSID). The PSID is generally printed on the drive label and used to revert an encrypted SED. • This parameter shall contain the physical secure ID (PSID). The PSID is generally printed on the drive label and used to revert an encrypted SED.

Request Example

```
{
  "PhysicalSecureID": "89831871198324172084565217361041"
}
```

6.37.4.3 SecureErase

Description

This action securely erases the contents of the drive.

- This action shall securely erase the drive.

Action URI

{Base URI of target resource}/Actions/Drive.SecureErase

Action parameters

Parameter Name	Type	Attributes	Notes
OverwritePasses (v1.15+)	integer	<i>optional</i>	The number of times to overwrite the drive if performing an overwrite type of sanitization. This parameter shall contain the number of times to overwrite the drive if the <code>SanitizationType</code> parameter contains the value <code>Overwrite</code> . This parameter shall be ignored if the <code>SanitizationType</code> parameter does not contain the value <code>Overwrite</code> . If the client does not provide this parameter, the service shall perform an implementation-specific number of passes.
SanitizationType (v1.15+)	string (enum)	<i>optional</i>	The type of data sanitization to perform. This parameter shall contain the type of data sanitization to perform for the secure erase request. The service can accept a request without the parameter and perform an implementation-specific default secure erase. <i>For the possible property values, see <code>SanitizationType</code> in Property details.</i>

Request Example

```
{
  "SanitizationType": "CryptographicErase"
}
```

6.37.5 Property details

6.37.5.1 ConfigurationLock

Indicates whether in-band configuration requests to the drive are locked. Other properties, such as `ConfigurationLockState` , contain additional information regarding the status of the configuration lock.

- This property shall indicate whether configuration requests to the drive are locked. Services shall reject modification requests that contain the value `Partial` .

string	Description
Disabled	In-band configuration requests are not locked. This value shall indicate in-band configuration requests are not locked.
Enabled	In-band configuration requests are locked as specified by <code>TargetConfigurationLockLevel</code> . This value shall indicate in-band configuration requests are locked as specified by <code>TargetConfigurationLockLevel</code>.
Partial	Some in-band configuration requests are not locked while others are locked. This value is used for status reporting to indicate that the drive is partially locked and client action is recommended. This value shall indicate some in-band configuration requests are not locked while others are locked.

6.37.5.2 DriveFormFactor

The form factor of the drive inserted in this slot.

- This property shall contain the form factor of the drive inserted in this slot.

string	Description
Drive2_5	A 2.5 inch drive. This value shall indicate the drive is approximately 2.5 inches in width and no more than 0.8 inches in height and is not a U.2 drive.
Drive3_5	A 3.5 inch drive. This value shall indicate the drive is approximately 3.5 inches in width and no more than 1.1 inches in height.
EDSFF (v1.18+)	An EDSFF drive. This value shall indicate the drive corresponds to one of SNIA's SFF specifications with an unspecified form factor. The <code>SlotFormFactor</code> property should not contain this value.
EDSFF_1U_Long	An EDSFF 1U Long (E1.L) drive. This value shall indicate the drive corresponds to the SFF-TA-1007 Specification.
EDSFF_1U_Short	An EDSFF 1U Short (E1.S) drive. This value shall indicate the drive corresponds to the SFF-TA-1006 Specification.

string	Description
EDSFF_E3_Long	An EDSFF E3 Long (E3.L) drive. This value shall indicate the drive corresponds to the SFF-TA-1008 Specification and is approximately 142.2 mm in length.
EDSFF_E3_Short	An EDSFF E3 Short (E3.S) drive. This value shall indicate the drive corresponds to the SFF-TA-1008 Specification and is approximately 112.75 mm in length.
M2 (v1.18+)	An M.2 drive. This value shall indicate the drive corresponds to the PCI Express M.2 Specification with an unspecified form factor. The <code>SlotFormFactor</code> property should not contain this value.
M2_22110	An M.2 22110 drive. This value shall indicate the drive corresponds to the PCI Express M.2 Specification and is approximately 22 mm in width and 110 mm in length.
M2_2230	An M.2 2230 drive. This value shall indicate the drive corresponds to the PCI Express M.2 Specification and is approximately 22 mm in width and 30 mm in length.
M2_2242	An M.2 2242 drive. This value shall indicate the drive corresponds to the PCI Express M.2 Specification and is approximately 22 mm in width and 42 mm in length.
M2_2260	An M.2 2260 drive. This value shall indicate the drive corresponds to the PCI Express M.2 Specification and is approximately 22 mm in width and 60 mm in length.
M2_2280	An M.2 2280 drive. This value shall indicate the drive corresponds to the PCI Express M.2 Specification and is approximately 22 mm in width and 80 mm in length.
OEM	An OEM-defined form factor. This value shall indicate the drive is an OEM-defined form factor.
PCleHalfLength	A half-length PCIe add-in card. This value shall indicate the drive is an add-in card less than 7 inches in length.

string	Description
PCleSlotFullLength	A full-length PCIe add-in card. This value shall indicate the drive is an add-in card greater than 7 inches in length.
PCleSlotLowProfile	A low-profile PCIe add-in card. This value shall indicate the drive is an add-in card less than 2.5 inches in height.
U2	A U.2 drive. This value shall indicate the drive corresponds to the PCI Express SFF-8639 Module Specification.

6.37.5.3 EncryptionAbility

The encryption ability of this drive.

- This property shall contain the encryption ability for the associated drive.

string	Description
None	The drive is not capable of self-encryption.
Other	The drive is capable of self-encryption through some other means.
SelfEncryptingDrive	The drive is capable of self-encryption per the Trusted Computing Group's Self Encrypting Drive Standard.

6.37.5.4 EncryptionStatus

The status of the encryption of this drive.

- This property shall contain the encryption status for the associated drive.

string	Description
Foreign	The drive is currently encrypted, the data is not accessible to the user, and the system requires user intervention to expose the data.
Locked	The drive is currently encrypted and the data is not accessible to the user. However, the system can unlock the drive automatically.
Unencrypted (<i>deprecated v1.1</i>)	The drive is not currently encrypted. <i>Deprecated in v1.1 and later. This value has been deprecated in favor of Unencrypted.</i>

string	Description
Unencrypted (v1.1+)	The drive is not currently encrypted.
Unlocked	The drive is currently encrypted but the data is accessible to the user in unencrypted form.

6.37.5.5 FirmwareCommit

The lock state of the NVMe-defined Firmware Commit command.

- This property shall contain the lock state of the NVMe-defined Firmware Commit command.

string	Description
CommandUnsupported	The command is not supported, therefore lockdown does not apply.
LockdownUnsupported	The command is supported but is not able to be locked.
Locked	The command is supported and is currently locked.
Unlocked	The command is supported, able to be locked, and is currently unlocked.

6.37.5.6 FirmwareImageDownload

The lock state of the NVMe-defined Firmware Image Download command.

- This property shall contain the lock state of the NVMe-defined Firmware Image Download command.

string	Description
CommandUnsupported	The command is not supported, therefore lockdown does not apply.
LockdownUnsupported	The command is supported but is not able to be locked.
Locked	The command is supported and is currently locked.
Unlocked	The command is supported, able to be locked, and is currently unlocked.

6.37.5.7 HotspareReplacementMode

The replacement mode for the hot spare drive.

- This property shall indicate whether a commissioned hot spare continues to serve as a hot spare after the failed drive is replaced.

string	Description
NonRevertible	The hot spare drive that is commissioned due to a drive failure remains as a data drive and does not revert to a hot spare if the failed drive is replaced.
Revertible	The hot spare drive that is commissioned due to a drive failure reverts to a hot spare after the failed drive is replaced and rebuilt.

6.37.5.8 HotspareType

The type of hot spare that this drive serves as.

- This property shall contain the hot spare type for the associated drive. If the drive currently serves as a hot spare, the `State` property in `Status` shall contain `StandbySpare` and `Enabled` when it is part of a volume.

string	Description
Chassis	The drive is serving as a hot spare for all other drives in this storage domain that are contained in the same chassis.
Dedicated	The drive is serving as a hot spare for a user-defined set of drives or volumes. Clients cannot specify this value when modifying the <code>HotspareType</code> property. This value is reported as a result of configuring the spare drives within a volume.
Global	The drive is serving as a hot spare for all other drives in this storage domain.
None	The drive is not a hot spare.

6.37.5.9 IndicatorLED

The state of the indicator LED, that identifies the drive.

- This property shall contain the state for the indicator light associated with this drive.

string	Description
Blinking	The indicator LED is blinking. This value shall represent that the indicator LED is in a blinking state where the LED is being turned on and off in repetition. If the service does not support this value, it shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code.

string	Description
Lit	The indicator LED is lit. This value shall represent that the indicator LED is in a solid on state. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 Bad Request status code.
Off	The indicator LED is off. This value shall represent that the indicator LED is in a solid off state. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 Bad Request status code.

6.37.5.10 Lockdown

The lock state of the NVMe-defined Lockdown command.

- This property shall contain the lock state of the NVMe-defined Lockdown command.

string	Description
CommandUnsupported	The command is not supported, therefore lockdown does not apply.
LockdownUnsupported	The command is supported but is not able to be locked.
Locked	The command is supported and is currently locked.
Unlocked	The command is supported, able to be locked, and is currently unlocked.

6.37.5.11 MediaType

The type of media contained in this drive.

- This property shall contain the type of media contained in the associated drive.

string	Description
HDD	The drive media type is traditional magnetic platters.
SMR	The drive media type is shingled magnetic recording.
SSD	The drive media type is solid state or flash memory.

6.37.5.12 Operation

The type of the operation.

- This property shall contain the type of the operation.

string	Description
ChangeRAIDType	A ChangeRAIDType operation is being performed.
ChangeStripSize	A ChangeStripSize operation is being performed.
CheckConsistency	A CheckConsistency operation is being performed.
Compress	A Compress operation is being performed.
Decrypt	A Decrypt operation is being performed.
Deduplicate	A Deduplicate operation is being performed.
Delete	A Delete operation is being performed.
Encrypt	An Encrypt operation is being performed.
Format	A Format operation is being performed.
Initialize	An Initialize operation is being performed.
Rebuild	A Rebuild operation is being performed.
Replicate	A Replicate operation is being performed.
Resize	A Resize operation is being performed.
Sanitize	A Sanitize operation is being performed.

6.37.5.13 Protocol

The protocol that this drive currently uses to communicate to the storage controller.

- This property shall contain the protocol that the associated drive currently uses to communicate to the storage controller for this system.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
CXL	Compute Express Link. This value shall indicate conformance to the Compute Express Link Specification.
DisplayPort	DisplayPort. This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
eMMC	Embedded MultiMediaCard (e.MMC). This value shall indicate conformance to the JEDEC JESD84-B51A specification.
Ethernet	Ethernet. This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	Fibre CONnection (FICON). This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).

string	Description
GenZ	GenZ. This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.

string	Description
NVLink	NVLink. This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. This value shall indicate conformance to an OEM-specific architecture, and the OEM section may include additional information.
PCIe	PCI Express. This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
QPI	Intel QuickPath Interconnect (QPI). This value shall indicate conformance to the Intel QuickPath Interconnect (QPI) protocol.
RoCE	RDMA over Converged Ethernet Protocol. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.

string	Description
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UET	Ultra Ethernet Transport. This value shall indicate conformance to the Ultra Ethernet specifications.
UHCI	Universal Host Controller Interface (UHCI). This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
UPI	Intel UltraPath Interconnect (UPI). This value shall indicate conformance to the Intel UltraPath Interconnect (UPI) protocol.
USB	Universal Serial Bus (USB). This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. This value shall indicate conformance to the VESA SVGA Specification.

6.37.5.14 ResetType

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and

perform an implementation-specific default reset.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.
ForceOn	Turn on the unit immediately. This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property shall contain the value <code>on</code>.
ForceRestart	Shut down immediately and non-gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>on</code>.
FullPowerCycle	Full power cycle the unit. Behaves like removing utility lines, followed by restoring utility lines to the resource. This value shall indicate the resource will perform a full power cycle as if utility lines to the resource are removed and restored. This is different from <code>PowerCycle</code> in that it's as close to a true power cycle as possible. For example, removing AC power cables from an enclosure and then restoring the AC power cables. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>on</code>. If a service supports this value but there are no other distinct power cycle flows, the service shall support <code>PowerCycle</code> as an alias to <code>FullPowerCycle</code>. This type of reset may cause the manager providing the Redfish service to power cycle. If the manager providing the Redfish service is affected by this type of reset, the service shall send the action response before resetting to prevent client timeouts.
GracefulRestart	Shut down gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>on</code>.
GracefulShutdown	Shut down gracefully and power off. This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.

string	Description
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a paused state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Paused</code>.
PowerCycle	Power cycle the unit. Behaves like a power removal, followed by a power restore to the resource. This value shall indicate the resource will perform a power cycle. This is different from <code>FullPowerCycle</code> in that it typically performs localized power sequencing of the resource while external power is still present. For example, turning DC voltage regulators off and then turning DC voltage regulators back on. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
PushPowerButton	Simulate the pressing of the physical power button on this unit. This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.

6.37.5.15 SanitizationType

The type of data sanitization to perform.

- This parameter shall contain the type of data sanitization to perform for the secure erase request. The service can accept a request without the parameter and perform an implementation-specific default secure erase.

string	Description
BlockErase	Delete all logical block addresses, including those that are not currently mapping to active addresses, but leaving the data on the drive. • This value shall indicate sanitization is performed by deleting all logical block addresses, including those that are not currently mapping to active addresses, but leaving the data on the drive.
CryptographicErase	Erase the target data's encryption key leaving only the ciphertext on the drive. For more information, see NIST800-88 and ISO/IEC 27040. • This value shall indicate sanitization is performed by erasing the target data's encryption key leaving only the ciphertext on the drive. For more information, see NIST800-88 and ISO/IEC 27040.
Overwrite	Overwrite data by writing an implementation-specific pattern onto all sectors of the drive. • This value shall indicate sanitization is performed by overwriting data by writing an implementation-specific pattern onto all sectors of the drive.

6.37.5.16 SecuritySend

The lock state of the NVMe-defined Security Send command.

- This property shall contain the lock state of the NVMe-defined Security Send command.

string	Description
CommandUnsupported	The command is not supported, therefore lockdown does not apply.
LockdownUnsupported	The command is supported but is not able to be locked.
Locked	The command is supported and is currently locked.
Unlocked	The command is supported, able to be locked, and is currently unlocked.

6.37.5.17 SlotCapableProtocols

- The drive protocols capable in this slot.
 - This property shall contain the drive protocols capable in this slot. The value of this property depends upon the connector in this slot, the storage controllers connected to this slot, the configuration of the system, and other constraints that determine if a particular protocol is capable at a given time.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
CXL	Compute Express Link. This value shall indicate conformance to the Compute Express Link Specification.
DisplayPort	DisplayPort. This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
eMMC	Embedded MultiMediaCard (e.MMC). This value shall indicate conformance to the JEDEC JESD84-B51A specification.
Ethernet	Ethernet. This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	Fibre CONnection (FICON). This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).

string	Description
GenZ	GenZ. This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.

string	Description
NVLink	NVLink. This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. This value shall indicate conformance to an OEM-specific architecture, and the OEM section may include additional information.
PCIe	PCI Express. This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
QPI	Intel QuickPath Interconnect (QPI). This value shall indicate conformance to the Intel QuickPath Interconnect (QPI) protocol.
RoCE	RDMA over Converged Ethernet Protocol. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.

string	Description
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UET	Ultra Ethernet Transport. This value shall indicate conformance to the Ultra Ethernet specifications.
UHCI	Universal Host Controller Interface (UHCI). This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
UPI	Intel UltraPath Interconnect (UPI). This value shall indicate conformance to the Intel UltraPath Interconnect (UPI) protocol.
USB	Universal Serial Bus (USB). This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. This value shall indicate conformance to the VESA SVGA Specification.

6.37.5.18 SlotFormFactor

The form factor of the slot.

- This property shall contain the form factor of the slot.

string	Description
Drive2_5	A 2.5 inch drive. This value shall indicate the drive is approximately 2.5 inches in width and no more than 0.8 inches in height and is not a U.2 drive.
Drive3_5	A 3.5 inch drive. This value shall indicate the drive is approximately 3.5 inches in width and no more than 1.1 inches in height.
EDSFF (v1.18+)	An EDSFF drive. This value shall indicate the drive corresponds to one of SNIA's SFF specifications with an unspecified form factor. The <code>SlotFormFactor</code> property should not contain this value.
EDSFF_1U_Long	An EDSFF 1U Long (E1.L) drive. This value shall indicate the drive corresponds to the SFF-TA-1007 Specification.
EDSFF_1U_Short	An EDSFF 1U Short (E1.S) drive. This value shall indicate the drive corresponds to the SFF-TA-1006 Specification.
EDSFF_E3_Long	An EDSFF E3 Long (E3.L) drive. This value shall indicate the drive corresponds to the SFF-TA-1008 Specification and is approximately 142.2 mm in length.
EDSFF_E3_Short	An EDSFF E3 Short (E3.S) drive. This value shall indicate the drive corresponds to the SFF-TA-1008 Specification and is approximately 112.75 mm in length.
M2 (v1.18+)	An M.2 drive. This value shall indicate the drive corresponds to the PCI Express M.2 Specification with an unspecified form factor. The <code>SlotFormFactor</code> property should not contain this value.
M2_22110	An M.2 22110 drive. This value shall indicate the drive corresponds to the PCI Express M.2 Specification and is approximately 22 mm in width and 110 mm in length.
M2_2230	An M.2 2230 drive. This value shall indicate the drive corresponds to the PCI Express M.2 Specification and is approximately 22 mm in width and 30 mm in length.

string	Description
M2_2242	An M.2 2242 drive. This value shall indicate the drive corresponds to the PCI Express M.2 Specification and is approximately 22 mm in width and 42 mm in length.
M2_2260	An M.2 2260 drive. This value shall indicate the drive corresponds to the PCI Express M.2 Specification and is approximately 22 mm in width and 60 mm in length.
M2_2280	An M.2 2280 drive. This value shall indicate the drive corresponds to the PCI Express M.2 Specification and is approximately 22 mm in width and 80 mm in length.
OEM	An OEM-defined form factor. This value shall indicate the drive is an OEM-defined form factor.
PCleHalfLength	A half-length PCIe add-in card. This value shall indicate the drive is an add-in card less than 7 inches in length.
PCleSlotFullLength	A full-length PCIe add-in card. This value shall indicate the drive is an add-in card greater than 7 inches in length.
PCleSlotLowProfile	A low-profile PCIe add-in card. This value shall indicate the drive is an add-in card less than 2.5 inches in height.
U2	A U.2 drive. This value shall indicate the drive corresponds to the PCI Express SFF-8639 Module Specification.

6.37.5.19 StatusIndicator

The state of the status indicator, which communicates status information about this drive.

- This property shall contain the status indicator state for the status indicator associated with this drive. The `@Redfish.AllowableValues` annotation specifies the valid values for this property.

string	Description
Fail	The drive has failed.

string	Description
Hotspare	The drive has been marked to automatically rebuild and replace a failed drive.
InACriticalArray	The array to which this drive belongs has been degraded.
InAFailedArray	The array to which this drive belongs has failed.
OK	The drive is OK.
PredictiveFailureAnalysis	The drive still works but is predicted to fail soon.
Rebuild	The drive is being rebuilt.

6.37.5.20 TargetConfigurationLockLevel

Indicates the target configuration lock level for the drive based upon the state of the `ConfigurationLock` property. Other properties, such as `ConfigurationLockState`, contain additional information regarding the status of the configuration lock.

- This property shall contain the target configuration lock level for the drive. For NVMe drives, services shall implement the locking requirements specified by SNIA's Swordfish NVMe Model Overview and Mapping Guide.

string	Description
Baseline	The standard configuration lock level, corresponding to applying firmware, updating security keys, and modifying other hardware settings. It does not include managing the volumes or data on the drive.

6.37.5.21 VPDWrite

The lock state of the NVMe-MI-defined VPD Write command.

- This property shall contain the lock state of the NVMe-MI-defined VPD Write command.

string	Description
CommandUnsupported	The command is not supported, therefore lockdown does not apply.
LockdownUnsupported	The command is supported but is not able to be locked.
Locked	The command is supported and is currently locked.
Unlocked	The command is supported, able to be locked, and is currently unlocked.

6.37.6 Example response

```
{
  "@odata.type": "#Drive.v1_21_0.Drive",
  "Id": "3D58ECBC375FD9F2",
  "Name": "Drive Sample",
  "LocationIndicatorActive": true,
  "Model": "C123",
  "Revision": "100A",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "CapacityBytes": 89952700064,
  "FailurePredicted": false,
  "Protocol": "SAS",
  "MediaType": "HDD",
  "Manufacturer": "Contoso",
  "SerialNumber": "1234568",
  "PartNumber": "C123-1111",
  "Identifiers": [
    {
      "DurableNameFormat": "NAA",
      "DurableName": "32ADF365C6C1B7BD"
    }
  ],
  "HotspareType": "None",
  "EncryptionAbility": "SelfEncryptingDrive",
  "EncryptionStatus": "Unlocked",
  "RotationSpeedRPM": 15000,
  "BlockSizeBytes": 512,
  "CapableSpeedGbs": 12,
  "NegotiatedSpeedGbs": 12,
  "Links": {
    "Volumes": [
      {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/Storage/1/Volumes/2"
      },
      {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/Storage/1/Volumes/3"
      }
    ]
  },
  "Actions": {
    "#Drive.SecureErase": {
      "target": "/redfish/v1/Chassis/1U/Drives/3D58ECBC375FD9F2/Actions/Drive.SecureErase"
    }
  },
  "@odata.id": "/redfish/v1/Chassis/1U/Drives/3D58ECBC375FD9F2"
}
```

```
}

```

6.38 DriveMetrics 1.2.1

Version	v1.2	v1.1	v1.0
Release	2023.3	2023.2	2023.1

6.38.1 Description

The usage and health statistics for a drive.

- The `DriveMetrics` schema shall contain the usage and health statistics for a drive in a Redfish implementation.

6.38.2 URIs

`/redfish/v1/Chassis/{ChassisId}/Drives/{DriveId}/Metrics`
`/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Drives/{DriveId}/Metrics`
`/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Drives/{DriveId}/Metrics` (deprecated)
`/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Drives/{DriveId}/Metrics` (deprecated)
`/redfish/v1/ResourceBlocks/{ResourceBlockId}/Drives/{DriveId}/Metrics`
`/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Drives/{DriveId}/Metrics` (deprecated)
`/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Drives/{DriveId}/Metrics` (deprecated)
`/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Drives/{DriveId}/Metrics` (deprecated)

6.38.3 Properties

Property	Type	Attributes	Notes
BadBlockCount	integer	<i>read-only</i> (null)	The total number of bad blocks reported by the drive. • This property shall contain the total number of bad blocks reported by the drive.

Property	Type	Attributes	Notes
CorrectableIOReadErrorCount	integer	<i>read-only</i> (null)	The number of correctable read errors for the lifetime of the drive. This property shall contain the number of correctable read errors for the lifetime of the drive.
CorrectableIOWriteErrorCount	integer	<i>read-only</i> (null)	The number of correctable write errors for the lifetime of the drive. This property shall contain the number of correctable write errors for the lifetime of the drive.
NativeCommandQueueDepth (v1.1+)	integer	<i>read-only</i> (null)	The current depth of the Native Command Queue. This property shall contain the current depth of the Native Command Queue as defined by the SATA Specification.
NVMeSMART {	object		The NVMe SMART metrics for the drive. This property shall contain the NVMe SMART metrics for the drive as defined by the NVMe SMART/Health Information log page. This property shall not be present if the service represents NVMe controllers in the drive as StorageController resources. See the <i>StorageControllerMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a NVMeSMARTMetrics resource. See the Links section and the <i>StorageControllerMetrics</i> schema for details.
}			
PowerOnHours	number	<i>read-only</i> (null)	The number of power-on hours for the lifetime of the drive. This property shall contain the number of power-on hours for the lifetime of the drive.
ReadLOKiBytes (v1.2+)	integer (KiBy)	<i>read-only</i> (null)	The number of kibibytes read. This property shall contain the total number of kibibytes read from the time of last reset or wrap.
UncorrectableIOReadErrorCount	integer	<i>read-only</i> (null)	The number of uncorrectable read errors for the lifetime of the drive. This property shall contain the number of uncorrectable read errors for the lifetime of the drive.
UncorrectableIOWriteErrorCount	integer	<i>read-only</i> (null)	The number of uncorrectable write errors for the lifetime of the drive. This property shall contain the number of uncorrectable write errors for the lifetime of the drive.

Property	Type	Attributes	Notes
WriteOKiBytes (v1.2+)	integer (KiBy)	<i>read-only</i> (null)	The number of kibibytes written. This property shall contain the total number of kibibytes written from the time of last reset or wrap.

6.38.4 Example response

```
{
  "@odata.type": "#DriveMetrics.v1_2_1.DriveMetrics",
  "Id": "Metrics",
  "Name": "Drive Metrics",
  "CorrectableIOReadErrorCount": 184,
  "UncorrectableIOReadErrorCount": 0,
  "CorrectableIOWriteErrorCount": 18,
  "UncorrectableIOWriteErrorCount": 0,
  "BadBlockCount": 123098,
  "PowerOnHours": 3,
  "NVMeSMART": {
    "CriticalWarnings": {
      "PMRUnreliable": false,
      "PowerBackupFailed": false,
      "MediaInReadOnly": false,
      "OverallSubsystemDegraded": false,
      "SpareCapacityWornOut": false
    },
    "CompositeTemperatureCelsius": 34,
    "AvailableSparePercent": 50,
    "AvailableSpareThresholdPercent": 30,
    "PercentageUsed": 50,
    "EGCriticalWarningSummary": {
      "NamespacesInReadOnlyMode": false,
      "ReliabilityDegraded": false,
      "SpareCapacityUnderThreshold": false
    },
    "DataUnitsRead": 0,
    "DataUnitsWritten": 0,
    "HostReadCommands": 0,
    "HostWriteCommands": 0,
    "ControllerBusyTimeMinutes": 20,
    "PowerCycles": 49,
    "PowerOnHours": 3,
    "UnsafeShutdowns": 4,
    "MediaAndDataIntegrityErrors": 0,
    "NumberOfErrorInformationLogEntries": 100,
    "WarningCompositeTempTimeMinutes": 0,
    "CriticalCompositeTempTimeMinutes": 0,
  }
}
```

```

    "TemperatureSensorsCelsius": [
      34,
      34,
      34,
      34,
      34,
      35,
      33,
      32
    ],
    "ThermalMgmtTemp1TransitionCount": 10,
    "ThermalMgmtTemp2TransitionCount": 2,
    "ThermalMgmtTemp1TotalTimeSeconds": 20,
    "ThermalMgmtTemp2TotalTimeSeconds": 42
  },
  "@odata.id": "/redfish/v1/Chassis/StorageEnclosure1/Drives/0THGR0KP/Metrics"
}

```

6.39 Endpoint 1.8.2

Version	v1.8	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2022.3	2022.1	2021.1	2020.3	2019.4	2018.3	2018.2	2017.3	2016.2

6.39.1 Description

The `Endpoint` schema contains the properties of an endpoint resource that represents the properties of an entity that sends or receives protocol-defined messages over a transport.

- This resource contains a fabric endpoint for a Redfish implementation.

6.39.2 URIs

```

/redfish/v1/Fabrics/{FabricId}/Endpoints/{EndpointId}
/redfish/v1/Storage/{StorageId}/Endpoints/{EndpointId} (deprecated)
/redfish/v1/StorageServices/{StorageServiceId}/Endpoints/{EndpointId}

```

6.39.3 Properties

Property	Type	Attributes	Notes
ConnectedEntities [{	array		All the entities connected to this endpoint. This property shall contain all entities to which this endpoint allows access.
EntityLink {	object		The link to the associated entity. This property shall contain a link to an entity of the type specified by the description of the <code>EntityType</code> property value.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
EntityPcId {	object		The PCI ID of the connected entity. This property shall contain the PCI ID of the connected PCIe entity.
ClassCode (v1.2+)	string	<i>read-only</i> (null)	The Class Code, Subclass, and Programming Interface code of this PCIe function. This property shall contain the PCI Class Code, Subclass, and Programming Interface of the PCIe device function. Pattern: <code>^0[xX](([a-fA-F] [0-9]){2}){3}\$</code>
DeviceId	string	<i>read-only</i> (null)	The Device ID of this PCIe function. This property shall contain the PCI Device ID of the PCIe device function. Pattern: <code>^0[xX](([a-fA-F] [0-9]){2}){2}\$</code>
FunctionNumber (v1.2+)	integer	<i>read-only</i> (null)	The PCI ID of the connected entity. This property shall contain the PCI Function Number of the connected PCIe entity.
SubsystemId	string	<i>read-only</i> (null)	The Subsystem ID of this PCIe function. This property shall contain the PCI Subsystem ID of the PCIe device function. Pattern: <code>^0[xX](([a-fA-F] [0-9]){2}){2}\$</code>

Property	Type	Attributes	Notes
SubsystemVendorId	string	<i>read-only</i> (null)	The Subsystem Vendor ID of this PCIe function. This property shall contain the PCI Subsystem Vendor ID of the PCIe device function. Pattern: <code>^0[xX]([a-fA-F] [0-9]){2}){2}\$</code>
VendorId	string	<i>read-only</i> (null)	The Vendor ID of this PCIe function. This property shall contain the PCI Vendor ID of the PCIe device function. Pattern: <code>^0[xX]([a-fA-F] [0-9]){2}){2}\$</code>
}			
EntityRole	string (enum)	<i>read-only</i> (null)	The role of the connected entity. This property shall indicate if the specified entity is an initiator, target, or both. <i>For the possible property values, see EntityRole in Property details.</i>
EntityType	string (enum)	<i>read-only</i> (null)	The type of the connected entity. This property shall indicate if type of connected entity. <i>For the possible property values, see EntityType in Property details.</i>
GenZ (v1.4+) {	object		The Gen-Z related properties for the entity. This property shall contain the Gen-Z related properties for the entity.
AccessKey (v1.4+, deprecated v1.6)	string	<i>read-write</i> (null)	The Access Key for the entity. This property shall contain the Gen-Z Core Specification-defined 6 bit Access Key for the entity. Pattern: <code>^0[xX]([a-fA-F] [0-9]){2}\$</code> <i>Deprecated in v1.6 and later. This property has been deprecated in favor of the ConnectionKeys property in the Connection resource.</i>
GCID (v1.4+) {	object	(null)	The Global Component ID (GCID) for the entity. This property shall contain the Gen-Z Core Specification-defined Global Component ID for the entity.
CID (v1.4+)	string	<i>read-write</i> (null)	The component identifier portion of the GCID for the entity. This property shall contain the 12 bit component identifier portion of the GCID of the entity. Pattern: <code>^0[xX]([a-fA-F] [0-9]){3}\$</code>

Property	Type	Attributes	Notes
SID (v1.4+)	string	<i>read-write</i> (null)	The subnet identifier portion of the GCID for the entity. This property shall contain the 16 bit subnet identifier portion of the GCID of the entity. Pattern: <code>^0[xX](((a-fA-F) [0-9]){2}){2}\$</code>
}			
RegionKey (v1.4+, deprecated v1.6)	string	<i>read-write</i> (null)	The Region Key for the entity. This property shall contain the Gen-Z Core Specification-defined 32 bit Region Key for the entity. Pattern: <code>^0[xX](((a-fA-F) [0-9]){2}){4}\$</code> <i>Deprecated in v1.6 and later. This property has been deprecated in favor of the <code>ConnectionKeys</code> property in the <code>Connection</code> resource.</i>
}			
Identifiers [{ }]	array (object)		Any additional identifiers for a resource. - Identifiers for the remote entity. - Identifiers for the remote entity shall be unique in the context of other resources that can be reached over the connected network. For property details, see Identifier.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PciClassCode (deprecated v1.2)	string	<i>read-only</i> (null)	The Class Code, Subclass, and Programming Interface code of this PCIe function. This property shall contain the PCI Class Code, Subclass, and Programming Interface of the PCIe device function. Pattern: <code>^0[xX](((a-fA-F) [0-9]){2}){3}\$</code> <i>Deprecated in v1.2 and later. This property has been deprecated in favor of the <code>ClassCode</code> property inside the <code>EntityPciId</code> object.</i>
PciFunctionNumber (deprecated v1.2)	integer	<i>read-only</i> (null)	The PCI ID of the connected entity. This property shall contain the PCI Function Number of the connected PCIe entity. <i>Deprecated in v1.2 and later. This property has been deprecated in favor of the <code>FunctionNumber</code> property inside the <code>EntityPciId</code> object.</i>
}]			

Property	Type	Attributes	Notes
EndpointProtocol	string (enum)	<i>read-only</i> (null)	The protocol supported by this endpoint. This property shall contain the protocol this endpoint uses to communicate with other endpoints on this fabric. <i>For the possible property values, see EndpointProtocol in Property details.</i>
HostReservationMemoryBytes	integer (bytes)	<i>read-only</i> (null)	The amount of memory in bytes that the host should allocate to connect to this endpoint. This property shall contain the amount of memory in bytes that the host should allocate to connect to this endpoint.
Identifiers [{}]	array (object)		Any additional identifiers for a resource. - Identifiers for this endpoint. - Identifiers for this endpoint shall be unique in the context of other endpoints that can be reached over the connected network. For property details, see Identifier.
IPTransportDetails (v1.1+) [{	array		An array of details for each IP transport supported by this endpoint. The array structure can model multiple IP addresses for this endpoint. This array shall contain the details for each IP transport supported by this endpoint.
IPv4Address (v1.1+) { }	object		The IPv4 addresses assigned to the endpoint. This property shall contain the IPv4 address. For property details, see IPv4Address.
IPv6Address (v1.1+) { }	object		The IPv6 addresses assigned to the endpoint. This property shall contain the IPv6 address. For property details, see IPv6Address.
Port (v1.1+)	integer	<i>read-only</i>	The UDP or TCP port number used by the endpoint. This property shall contain a specified UDP or TCP port number used for communication with the endpoint.
TransportProtocol (v1.1+)	string (enum)	<i>read-only</i>	The protocol used by the connection entity. This property shall contain the protocol used by the connection entity. <i>For the possible property values, see TransportProtocol in Property details.</i>
}]			

Property	Type	Attributes	Notes
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
AddressPools (v1.4+) [{	array		An array of links to the address pools associated with this endpoint. This property shall contain an array of links to resources of type <code>AddressPool</code> with which this endpoint is associated.
@odata.id	string	<i>read-write</i>	Link to a <code>AddressPool</code> resource. See the Links section and the <code>AddressPool</code> schema for details.
}			
ConnectedPorts (v1.4+) [{	array		An array of links to the switch ports or remote device ports at the other end of the link. This property shall contain an array of links to resources of type <code>Port</code> that represent the switch ports or remote device ports to which this endpoint is connected.
@odata.id	string	<i>read-only</i>	Link to a <code>Port</code> resource. See the Links section and the <code>Port</code> schema for details.
}			
Connections (v1.5+) [{	array		The connections to which this endpoint belongs. This property shall contain an array of links to resources of type <code>Connection</code> that represent the connections to which this endpoint belongs.
@odata.id	string	<i>read-only</i>	Link to a <code>Connection</code> resource. See the Links section and the <code>Connection</code> schema for details.
}			
LocalPorts (v1.7+) [{	array		An array of links to the device ports that this endpoint represents. This property shall contain an array of links to resources of type <code>Port</code> that represent the device ports that this endpoint represents.
@odata.id	string	<i>read-only</i>	Link to a <code>Port</code> resource. See the Links section and the <code>Port</code> schema for details.
}			

Property	Type	Attributes	Notes
MutuallyExclusiveEndpoints [{	array		An array of links to the endpoints that cannot be used in zones if this endpoint is in a zone. This property shall contain an array of links to resources of type <code>Endpoint</code> that cannot be used in a zone if this endpoint is in a zone.
@odata.id	string	<i>read-only</i>	Link to another Endpoint resource.
}]			
NetworkDeviceFunction (v1.1+) [{	array		When <code>NetworkDeviceFunction</code> resources are present, this array contains links to the network device functions that connect to this endpoint. This property shall contain an array of links to resources of type <code>NetworkDeviceFunction</code> with which this endpoint is associated.
@odata.id	string	<i>read-only</i>	Link to a NetworkDeviceFunction resource. See the Links section and the <code>NetworkDeviceFunction</code> schema for details.
}]			
Oem { }	object		See the OEM object definition in the Using this guide clause.
Ports (deprecated v1.7) [{	array		An array of links to the physical ports associated with this endpoint. This property shall contain an array of links to resources of type <code>Port</code> that are utilized by this endpoint. <i>Deprecated in v1.7 and later. This property has been deprecated in favor of the <code>ConnectedPorts</code> and <code>LocalPorts</code> properties to clarify the semantics of each port referenced.</i>
@odata.id	string	<i>read-only</i>	Link to a Port resource. See the Links section and the <code>Port</code> schema for details.
}]			
Zones (v1.6+) [{	array		The zones to which this endpoint belongs. This property shall contain an array of links to resources of type <code>Zone</code> that represent the zones to which this endpoint belongs.
@odata.id	string	<i>read-only</i>	Link to a Zone resource. See the Links section and the <code>Zone</code> schema for details.
}]			
}			

Property	Type	Attributes	Notes
PcId {	object		The PCI ID of the endpoint. This property shall contain the PCI ID of the endpoint.
ClassCode (v1.2+)	string	<i>read-only</i> (null)	The Class Code, Subclass, and Programming Interface code of this PCIe function. This property shall contain the PCI Class Code, Subclass, and Programming Interface of the PCIe device function. Pattern: <code>^0[xX](([a-fA-F] [0-9]){2}){3}\$</code>
DevicId	string	<i>read-only</i> (null)	The Device ID of this PCIe function. This property shall contain the PCI Device ID of the PCIe device function. Pattern: <code>^0[xX](([a-fA-F] [0-9]){2}){2}\$</code>
FunctionNumber (v1.2+)	integer	<i>read-only</i> (null)	The PCI ID of the connected entity. This property shall contain the PCI Function Number of the connected PCIe entity.
SubsystemId	string	<i>read-only</i> (null)	The Subsystem ID of this PCIe function. This property shall contain the PCI Subsystem ID of the PCIe device function. Pattern: <code>^0[xX](([a-fA-F] [0-9]){2}){2}\$</code>
SubsystemVendorId	string	<i>read-only</i> (null)	The Subsystem Vendor ID of this PCIe function. This property shall contain the PCI Subsystem Vendor ID of the PCIe device function. Pattern: <code>^0[xX](([a-fA-F] [0-9]){2}){2}\$</code>
VendorId	string	<i>read-only</i> (null)	The Vendor ID of this PCIe function. This property shall contain the PCI Vendor ID of the PCIe device function. Pattern: <code>^0[xX](([a-fA-F] [0-9]){2}){2}\$</code>
}			

Property	Type	Attributes	Notes
Redundancy [{}]	array (object)		The common redundancy definition and structure used in other Redfish schemas. - Redundancy information for the lower-level endpoints supporting this endpoint. - The values of the properties in this array shall show how this endpoint is grouped with other endpoints for form redundancy sets. For property details, see Redundancy.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

6.39.4 Property details

6.39.4.1 EndpointProtocol

The protocol supported by this endpoint.

- This property shall contain the protocol this endpoint uses to communicate with other endpoints on this fabric.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
CXL	Compute Express Link. This value shall indicate conformance to the Compute Express Link Specification.
DisplayPort	DisplayPort. This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.

string	Description
eMMC	Embedded MultiMediaCard (e.MMC). This value shall indicate conformance to the JEDEC JESD84-B51A specification.
Ethernet	Ethernet. This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	Fibre CONnection (FICON). This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).
GenZ	GenZ. This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.

string	Description
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.
NVLink	NVLink. This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. This value shall indicate conformance to the NVM Express over Fabrics Specification.

string	Description
OEM	OEM-specific. This value shall indicate conformance to an OEM-specific architecture, and the OEM section may include additional information.
PCIe	PCI Express. This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
QPI	Intel QuickPath Interconnect (QPI). This value shall indicate conformance to the Intel QuickPath Interconnect (QPI) protocol.
RoCE	RDMA over Converged Ethernet Protocol. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.

string	Description
TFTP	Trivial File Transfer Protocol (TFTP). This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UET	Ultra Ethernet Transport. This value shall indicate conformance to the Ultra Ethernet specifications.
UHCI	Universal Host Controller Interface (UHCI). This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
UPI	Intel UltraPath Interconnect (UPI). This value shall indicate conformance to the Intel UltraPath Interconnect (UPI) protocol.
USB	Universal Serial Bus (USB). This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. This value shall indicate conformance to the VESA SVGA Specification.

6.39.4.2 EntityRole

The role of the connected entity.

- This property shall indicate if the specified entity is an initiator, target, or both.

string	Description
Both	The entity can both send and receive commands, messages, and other requests to or from other entities on the fabric.
Initiator	The entity sends commands, messages, or other types of requests to other entities on the fabric, but cannot receive commands from other entities.

string	Description
Target	The entity receives commands, messages, or other types of requests from other entities on the fabric, but cannot send commands to other entities.

6.39.4.3 EntityType

The type of the connected entity.

- This property shall indicate if type of connected entity.

string	Description
AccelerationFunction (v1.3+)	The entity is an acceleration function realized through a device, such as an FPGA. • This value shall indicate the entity this endpoint represents is an acceleration function. The <code>EntityLink</code> property, if present, should be of type <code>AccelerationFunction</code>.
Bridge	The entity is a PCIe bridge. • This value shall indicate the entity this endpoint represents is a PCIe bridge.
CXLDevice (v1.8+)	The entity is a CXL logical device. • This value shall indicate the entity this endpoint represents is a CXL logical device. The <code>EntityLink</code> property, if present, should be of type <code>CXLLogicalDevice</code>.
DisplayController	The entity is a display controller. • This value shall indicate the entity this endpoint represents is a display controller.
Drive	The entity is a drive. • This value shall indicate the entity this endpoint represents is a drive. The <code>EntityLink</code> property, if present, should be of type <code>Drive</code>.
FabricBridge (v1.4+)	The entity is a fabric bridge. • This value shall indicate the entity this endpoint represents is a fabric bridge. The <code>EntityLink</code> property, if present, should be of type <code>FabricAdapter</code>.
Manager (v1.5+)	The entity is a manager. • This value shall indicate the entity this endpoint represents is a manager. The <code>EntityLink</code> property, if present, should be of type <code>Manager</code>.

string	Description
MediaController (v1.4+)	The entity is a media controller. This value shall indicate the entity this endpoint represents is a media controller. The <code>EntityLink</code> property, if present, should be of type <code>MediaController</code>.
Memory (v1.8+)	The entity is a memory device. This value shall indicate the entity this endpoint represents is a memory device. The <code>EntityLink</code> property, if present, should be of type <code>Memory</code>.
MemoryChunk (v1.4+)	The entity is a memory chunk. This value shall indicate the entity this endpoint represents is a memory chunk. The <code>EntityLink</code> property, if present, should be of type <code>MemoryChunk</code>.
NetworkController	The entity is a network controller. This value shall indicate the entity this endpoint represents is a network controller. The <code>EntityLink</code> property, if present, should be of type <code>NetworkDeviceFunction</code> or <code>EthernetInterface</code>.
Processor	The entity is a processor. This value shall indicate the entity this endpoint represents is a processor. The <code>EntityLink</code> property, if present, should be of type <code>Processor</code>.
RootComplex	The entity is a PCIe root complex. This value shall indicate the entity this endpoint represents is a PCIe root complex. The <code>EntityLink</code> property, if present, should be of type <code>ComputerSystem</code>.
StorageExpander	The entity is a storage expander. This value shall indicate the entity this endpoint represents is a storage expander. The <code>EntityLink</code> property, if present, should be of type <code>Chassis</code>.
StorageInitiator	The entity is a storage initiator. This value shall indicate the entity this endpoint represents is a storage initiator. The <code>EntityLink</code> property, if present, should be of type <code>StorageController</code>.
StorageSubsystem (v1.6+)	The entity is a storage subsystem. This value shall indicate the entity this endpoint represents is a storage subsystem. The <code>EntityLink</code> property, if present, should be of type <code>Storage</code>.
Switch (v1.4+)	The entity is a switch, not an expander. Use <code>Expander</code> for expanders. This value shall indicate the entity this endpoint represents is a switch and not an expander. The <code>EntityLink</code> property, if present, should be of type <code>Switch</code>.

string	Description
Volume (v1.1+)	The entity is a volume. This value shall indicate the entity this endpoint represents is a volume. The <code>EntityLink</code> property, if present, should be of type <code>Volume</code>.

6.39.4.4 TransportProtocol

The protocol used by the connection entity.

- This property shall contain the protocol used by the connection entity.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
CXL	Compute Express Link. This value shall indicate conformance to the Compute Express Link Specification.
DisplayPort	DisplayPort. This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
eMMC	Embedded MultiMediaCard (e.MMC). This value shall indicate conformance to the JEDEC JESD84-B51A specification.
Ethernet	Ethernet. This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.

string	Description
FCoE	Fibre Channel over Ethernet (FCoE). This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	Fibre CONnection (FICON). This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).
GenZ	GenZ. This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.

string	Description
iSCSI	Internet SCSI. This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.
NVLink	NVLink. This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. This value shall indicate conformance to an OEM-specific architecture, and the OEM section may include additional information.
PCIe	PCI Express. This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
QPI	Intel QuickPath Interconnect (QPI). This value shall indicate conformance to the Intel QuickPath Interconnect (QPI) protocol.
RoCE	RDMA over Converged Ethernet Protocol. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.

string	Description
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UET	Ultra Ethernet Transport. This value shall indicate conformance to the Ultra Ethernet specifications.
UHCI	Universal Host Controller Interface (UHCI). This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.

string	Description
UPI	Intel UltraPath Interconnect (UPI). This value shall indicate conformance to the Intel UltraPath Interconnect (UPI) protocol.
USB	Universal Serial Bus (USB). This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. This value shall indicate conformance to the VESA SVGA Specification.

6.39.5 Example response

```
{
  "@odata.type": "#Endpoint.v1_8_2.Endpoint",
  "Id": "Drive1",
  "Name": "SAS Drive",
  "Description": "The SAS Drive in Enclosure 2 Bay 0",
  "EndpointProtocol": "SAS",
  "ConnectedEntities": [
    {
      "EntityType": "Drive",
      "EntityRole": "Target",
      "Identifiers": [
        {
          "DurableNameFormat": "NAA",
          "DurableName": "32ADF365C6C1B7C3"
        }
      ]
    }
  ],
  "Links": {
    "MutuallyExclusiveEndpoints": [
      {
        "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints/Enclosure2"
      }
    ],
    "ConnectedPorts": [
      {
        "@odata.id": "/redfish/v1/Fabrics/SAS/Switches/Switch1/Ports/8"
      },
      {
        "@odata.id": "/redfish/v1/Fabrics/SAS/Switches/Switch2/Ports/8"
      }
    ]
  }
}
```

```
    ],
    "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints/Drive1"
  }
}
```

6.40 EndpointGroup 1.3.4

Version	v1.3	v1.2	v1.1	v1.0
Release	2020.3	WIP v1.1.0	WIP v1.0.5	TP v1.0.3

6.40.1 Description

The `EndpointGroup` schema describes a group of endpoints that are managed as a unit.

- This resource shall represent a group of endpoints that are managed as a unit for a Redfish implementation.

6.40.2 URIs

`/redfish/v1/Fabrics/{FabricId}/EndpointGroups/{EndpointGroupId}`
`/redfish/v1/Storage/{StorageId}/EndpointGroups/{EndpointGroupId}`
`/redfish/v1/StorageServices/{StorageServiceId}/EndpointGroups/{EndpointGroupId}`
`/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/EndpointGroups/{EndpointGroupId}`

6.40.3 Properties

Property	Type	Attributes	Notes
AccessState <i>(deprecated v1.3)</i>	string (enum)	<i>read-write</i> (null)	The access state for this group. • The value of this property shall contain the access state for all associated resources in this endpoint group. <i>For the possible property values, see AccessState in Property details.</i> <i>Deprecated in v1.3 and later. This property has been deprecated in favor of the <code>AccessState</code> property in the connection resource.</i>

Property	Type	Attributes	Notes
Endpoints (<i>deprecated v1.3</i>) [{	array		The endpoints in this endpoint group. This property shall contain an array of links to resources of type <code>Endpoint</code> that represent the endpoints that are in this endpoint group. <i>Deprecated in v1.3 and later. This property has been deprecated in favor of the <code>Endpoints</code> property within <code>Links</code>.</i>
@odata.id	string	<i>read-write</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}]			
GroupType	string (enum)	<i>read-write</i> (null)	The endpoint group type. The value of this property shall contain the endpoint group type. If this endpoint group represents a SCSI target group, the value of this property shall contain <code>Server</code> or <code>Target</code>. <i>For the possible property values, see <code>GroupType</code> in Property details.</i>
Identifier {}	object		The durable name for the endpoint group. This property shall contain the durable name for the endpoint group. For property details, see Identifier.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Connections (<i>v1.3+</i>) [{	array		The connections to which this endpoint group belongs. This property shall contain an array of links to resources of type <code>Connection</code> that represent the connections to which this endpoint group belongs.
@odata.id	string	<i>read-only</i>	Link to a Connection resource. See the Links section and the <i>Connection</i> schema for details.
}]			
Endpoints (<i>v1.3+</i>) [{	array		The endpoints in this endpoint group. This property shall contain an array of links to resources of type <code>Endpoint</code> that represent the endpoints that are in this endpoint group.
@odata.id	string	<i>read-write</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}]			

Property	Type	Attributes	Notes
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
Preferred (<i>deprecated v1.2</i>)	boolean	<i>read-write (null)</i>	An indication if access to the resources through the endpoint group is preferred. The value of this property shall indicate if access to the resources through the endpoint group is preferred over access through other endpoints. The default value for this property is <code>false</code>. <i>Deprecated in v1.2 and later. This property has been deprecated in favor of the <code>AccessState</code> property in the connection resource.</i>
TargetEndpointGroupIdentifier	integer	<i>read-write (null)</i>	The SCSI-defined identifier for this group. The value of this property shall contain a SCSI-defined identifier for this group that corresponds to the TARGET PORT GROUP field in the REPORT TARGET PORT GROUPS response and the TARGET PORT GROUP field in an INQUIRY VPD page 85 response, type 5h identifier. See the INCITS SAM-5 specification. This property may not be present if the endpoint group does not represent a SCSI target group.

6.40.4 Property details

6.40.4.1 AccessState

The access state for this group.

- The value of this property shall contain the access state for all associated resources in this endpoint group.

string	Description
NonOptimized	The endpoints are in an active and non-optimized state. This value shall indicate each endpoint is in an active and non-optimized state.
Optimized	The endpoints are in an active and optimized state. This value shall indicate each endpoint is in an active and optimized state.
Standby	The endpoints are in a standby state. This value shall indicate each endpoint is in a standby state.

string	Description
Transitioning	The endpoints are transitioning to a new state. This value shall indicate each endpoint is transitioning to a new state.
Unavailable	The endpoints are in an unavailable state. This value shall indicate each endpoint is in an unavailable state.

6.40.4.2 GroupType

The endpoint group type.

- The value of this property shall contain the endpoint group type. If this endpoint group represents a SCSI target group, the value of this property shall contain `Server` or `Target`.

string	Description
Client (<i>deprecated v1.3</i>)	The group contains the client (initiator) endpoints. This value shall indicate that the endpoint group contains client (initiator) endpoints. If the associated endpoints contain the <code>EntityRole</code> property, the <code>EntityRole</code> property shall contain the value <code>Initiator</code> or <code>Both</code>. <i>Deprecated in v1.3 and later. This value has been deprecated in favor of <code>Initiator</code>.</i>
Initiator (v1.3+)	The group contains the initiator endpoints. This value shall indicate that the endpoint group contains initiator endpoints. If the associated endpoints contain the <code>EntityRole</code> property, the <code>EntityRole</code> property shall contain the value <code>Initiator</code> or <code>Both</code>.
Server (<i>deprecated v1.3</i>)	The group contains the server (target) endpoints. This value shall indicate that the endpoint group contains server (target) endpoints. If the associated endpoints contain the <code>EntityRole</code> property, the <code>EntityRole</code> property shall contain the value <code>Target</code> or <code>Both</code>. <i>Deprecated in v1.3 and later. This value has been deprecated in favor of <code>Target</code>.</i>
Target (v1.3+)	The group contains the target endpoints. This value shall indicate that the endpoint group contains target endpoints. If the associated endpoints contain the <code>EntityRole</code> property, the <code>EntityRole</code> property shall contain the value <code>Target</code> or <code>Both</code>.

6.40.5 Example response

```

{
  "@odata.type": "#EndpointGroup.v1_3_4.EndpointGroup",
  "Id": "1",
  "Name": "Endpoint group for all initiators",
  "GroupType": "Initiator",
  "Links": {
    "Endpoints": [
      {
        "@odata.id": "/redfish/v1/Fabrics/NVMeoF/Endpoints/Initiator1"
      },
      {
        "@odata.id": "/redfish/v1/Fabrics/NVMeoF/Endpoints/Initiator2"
      }
    ],
    "Connections": [
      {
        "@odata.id": "/redfish/v1/Fabrics/NVMeoF/Connections/3"
      }
    ]
  },
  "@odata.id": "/redfish/v1/Fabrics/NVMeoF/EndpointGroups/1"
}
```

6.41 EnvironmentMetrics 1.5.0

Version	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2025.2	2025.1	2022.2	2021.4	2021.2	2020.4

6.41.1 Description

The `EnvironmentMetrics` schema represents the environmental metrics of a device.

- This resource shall represent the environmental metrics for a Redfish implementation.

6.41.2 URIs

`/redfish/v1/Chassis/{ChassisId}/Drives/{DriveId}/EnvironmentMetrics`
`/redfish/v1/Chassis/{ChassisId}/EnvironmentMetrics`
`/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/EnvironmentMetrics`

/redfish/v1/Chassis/{ChassisId}/MediaControllers/{MediaControllerId}/EnvironmentMetrics
/redfish/v1/Chassis/{ChassisId}/MediaControllers/{MediaControllerId}/Ports/{PortId}/EnvironmentMetrics
/redfish/v1/Chassis/{ChassisId}/Memory/{MemoryId}/EnvironmentMetrics
/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/EnvironmentMetrics
/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Ports/{PortId}/EnvironmentMetrics
/redfish/v1/Chassis/{ChassisId}/PCleDevices/{PCleDeviceId}/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Drives/{DriveId}/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Memory/{MemoryId}/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/Ports/{PortId}/
EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/
{StorageControllerId}/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/
{StorageControllerId}/Ports/{PortId}/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Drives/{DriveId}/
EnvironmentMetrics (deprecated)
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/StorageControllers/
{StorageControllerId}/Ports/{PortId}/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/
{FabricAdapterId}/Ports/{PortId}/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/
GraphicsControllers/{GraphicsControllerId}/Ports/{PortId}/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Memory/
{MemoryId}/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/PCleDevices/
{PCleDeviceId}/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/
{ProcessorId}/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/
{ProcessorId}/Ports/{PortId}/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/
{StorageId}/Controllers/{StorageControllerId}/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/
{StorageId}/Controllers/{StorageControllerId}/Ports/{PortId}/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/
{StorageId}/Drives/{DriveId}/EnvironmentMetrics (deprecated)
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/
{StorageId}/StorageControllers/{StorageControllerId}/Ports/{PortId}/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/USBControllers/
{USBControllerId}/Ports/{PortId}/EnvironmentMetrics
/redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/EnvironmentMetrics
/redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Ports/{PortId}/EnvironmentMetrics
/redfish/v1/Facilities/{FacilityId}/AmbientMetrics

/redfish/v1/Facilities/{FacilityId}/EnvironmentMetrics
/redfish/v1/Managers/{ManagerId}/DedicatedNetworkPorts/{PortId}/EnvironmentMetrics
/redfish/v1/Managers/{ManagerId}/USBPorts/{PortId}/EnvironmentMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Drives/{DriveId}/EnvironmentMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Memory/{MemoryId}/EnvironmentMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/EnvironmentMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/Ports/{PortId}/EnvironmentMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/{StorageControllerId}/
EnvironmentMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Ports/{PortId}/
EnvironmentMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Drives/{DriveId}/EnvironmentMetrics
(deprecated)
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Ports/
{PortId}/EnvironmentMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/
Ports/{PortId}/EnvironmentMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/GraphicsControllers/
{GraphicsControllerId}/Ports/{PortId}/EnvironmentMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Memory/{MemoryId}/
EnvironmentMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/PCleDevices/{PCleDeviceId}/
EnvironmentMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/
EnvironmentMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/Ports/
{PortId}/EnvironmentMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/
{StorageControllerId}/EnvironmentMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/
{StorageControllerId}/Ports/{PortId}/EnvironmentMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Drives/{DriveId}/
EnvironmentMetrics (deprecated)
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/
StorageControllers/{StorageControllerId}/Ports/{PortId}/EnvironmentMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/USBControllers/{USBControllerId}/
Ports/{PortId}/EnvironmentMetrics
/redfish/v1/Storage/{StorageId}/Controllers/{StorageControllerId}/EnvironmentMetrics
/redfish/v1/Storage/{StorageId}/Controllers/{StorageControllerId}/Ports/{PortId}/EnvironmentMetrics
/redfish/v1/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Ports/{PortId}/EnvironmentMetrics
/redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/EnvironmentMetrics
/redfish/v1/Systems/{ComputerSystemId}/GraphicsControllers/{GraphicsControllerId}/Ports/{PortId}/
EnvironmentMetrics
/redfish/v1/Systems/{ComputerSystemId}/Memory/{MemoryId}/EnvironmentMetrics

/redfish/v1/Systems/{ComputerSystemId}/PCleDevices/{PCleDeviceId}/EnvironmentMetrics
 /redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/EnvironmentMetrics
 /redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/Ports/{PortId}/EnvironmentMetrics
 /redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/{StorageControllerId}/EnvironmentMetrics
 /redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Ports/{PortId}/
 EnvironmentMetrics
 /redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Drives/{DriveId}/EnvironmentMetrics (deprecated)
 /redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Ports/
 {PortId}/EnvironmentMetrics
 /redfish/v1/Systems/{ComputerSystemId}/USBControllers/{USBControllerId}/Ports/{PortId}/EnvironmentMetrics
 /redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/EnvironmentMetrics
 /redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/EnvironmentMetrics
 /redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/EnvironmentMetrics
 /redfish/v1/ThermalEquipment/RPUs/{CoolingUnitId}/EnvironmentMetrics

6.41.3 Properties

Property	Type	Attributes	Notes
AbsoluteHumidity (v1.2+) {}	object		Absolute humidity (g/m³). This property shall contain the absolute (volumetric) humidity sensor reading, in grams per cubic meter units, for this resource. The value should reflect the humidity measured at the exterior of the containing <code>Chassis</code> instance, or the interior of the containing <code>Facility</code> instance. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>AbsoluteHumidity</code>. For more information about this property, see SensorExcerpt in Property Details.
AmbientTemperatureCelsius (v1.4+) {}	object		Ambient temperature (Celsius). This property shall contain the ambient temperature, in degree Celsius units, for this resource. The ambient temperature shall be the temperature measured at a point exterior to the <code>Chassis</code> containing this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Temperature</code>. This property shall only be present, if supported, in resource instances subordinate to a <code>Chassis</code> or <code>CoolingUnit</code> resource. For more information about this property, see SensorExcerpt in Property Details.

Property	Type	Attributes	Notes
CurrentAmps (v1.5+) {	object (excerpt)		The current (A) for this device. This property shall contain the current, in ampere units, for this device. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Current</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
CrestFactor (v1.1+)	number	<i>read-only</i> (null)	The crest factor for this sensor. This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
THDPercent (v1.1+)	number (%)	<i>read-only</i> (null)	The total harmonic distortion percent (% THD). This property shall contain the total harmonic distortion of the <code>Reading</code> property in percent units, typically 0 to 100.
}			
DewPointCelsius (v1.1+) {}	object		The dew point temperature (C). This property shall contain the dew point, in degree Celsius units, based on the temperature and humidity values for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Temperature</code>. For more information about this property, see SensorExcerpt in Property Details.

Property	Type	Attributes	Notes
EnergyJoules (v1.2+) {}	object		Energy consumption (J). This property shall contain the total energy, in joule units, for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>EnergyJoules</code>. This property is used for reporting device-level energy consumption measurements, while <code>EnergykWh</code> is used for large-scale consumption measurements. For more information about this property, see <code>SensorExcerpt</code> in Property Details.
EnergykWh {	object (excerpt)		Energy consumption (kWh). This property shall contain the total energy, in kilowatt-hour units, for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>EnergykWh</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
ApparentkVAh (v1.5+)	number (kV.A.h)	<i>read-only (null)</i>	Apparent energy (kVAh). This property shall contain the apparent energy, in kilovolt-ampere-hour units, for an electrical energy measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>EnergykWh</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
DataSourceUri	string (URI)	<i>read-only (null)</i>	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
LifetimeReading (v1.1+)	number	<i>read-only (null)</i>	The total accumulation value for this sensor. This property shall contain the total accumulation of the <code>Reading</code> property over the sensor's lifetime. This value shall not be reset by the <code>ResetMetrics</code> action.
ReactivekVARh (v1.5+)	number (kV.A.h)	<i>read-only (null)</i>	Reactive energy (kVARh). This property shall contain the reactive energy, in kilovolt-ampere-hours (reactive) units, for an electrical energy measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>EnergykWh</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
Reading	number	<i>read-only (null)</i>	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.

Property	Type	Attributes	Notes
SensorResetTime	string (date-time)	<i>read-only</i> (null)	The date and time when the time-based properties were last reset. This property shall contain the date and time when the <code>ResetMetrics</code> action was last performed or when the service last reset the time-based property values.
}			
FanSpeedsPercent [{	array (excerpt)		Fan speeds (percent). This property shall contain the fan speeds, in percent units, for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Percent</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
DeviceName (v1.2+)	string	<i>read-only</i> (null)	The name of the device. This property shall contain the name of the device associated with this sensor. If the device is represented by a resource, the value shall contain the value of the <code>Name</code> property of the associated resource.
PhysicalContext	string (enum)	<i>read-write</i> (null)	The area or device to which this sensor measurement applies. This property shall contain a description of the affected component or region within the equipment to which this sensor measurement applies. <i>For the possible property values, see <code>PhysicalContext</code> in Property details.</i>
PhysicalSubContext	string (enum)	<i>read-write</i> (null)	The usage or location within a device to which this sensor measurement applies. This property shall contain a description of the usage or sub-region within the equipment to which this sensor measurement applies. This property generally differentiates multiple sensors within the same <code>PhysicalContext</code> instance. <i>For the possible property values, see <code>PhysicalSubContext</code> in Property details.</i>
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.

Property	Type	Attributes	Notes
SpeedRPM (v1.2+)	number ({rev}/min)	<i>read-only</i> (<i>null</i>)	The rotational speed. This property shall contain a reading of the rotational speed of the device in revolutions per minute (RPM) units.
}]			
HumidityPercent {}	object		Humidity (percent). This property shall contain the humidity, in percent units, for this resource. The value should reflect the humidity measured at the exterior of the containing <code>Chassis</code> instance, or the interior of the containing <code>Facility</code> instance. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Humidity</code>. For more information about this property, see <code>SensorExcerpt</code> in Property Details.
PowerLimitWatts (v1.1+) {}	object (excerpt)		Power limit (W). This property shall contain the power limit control, in watt units, for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Control</code> with the <code>ControlType</code> property containing the value of <code>Power</code>. This object is an excerpt of the <code>Control</code> resource located at the URI shown in <code>DataSourceUri</code>.
AllowableMax	number	<i>read-only</i> (<i>null</i>)	The maximum possible setting for this control. This property shall indicate the maximum possible value of the <code>SetPoint</code> or <code>SettingMax</code> properties for this control. Services shall not accept values for <code>SetPoint</code> or <code>SettingMax</code> above this value.
AllowableMin	number	<i>read-only</i> (<i>null</i>)	The minimum possible setting for this control. This property shall indicate the minimum possible value of the <code>SetPoint</code> or <code>SettingMin</code> properties for this control. Services shall not accept values for <code>SetPoint</code> or <code>SettingMin</code> below this value.
ControlMode	string (enum)	<i>read-write</i> (<i>null</i>)	The current operating mode of the control. This property shall contain the operating mode of the control. For the possible property values, see <code>ControlMode</code> in Property details.

Property	Type	Attributes	Notes
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this control. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy. If no source resource is implemented, meaning the excerpt represents the only available data, this property shall not be present.
DefaultSetPoint (v1.3+)	number	<i>read-only</i> (null)	The default set point of the control. This property shall contain the default set point control value. The units shall follow the value of <code>SetPointUnits</code>. Services apply this value to the <code>SetPoint</code> property under certain conditions, such as a reset of the manager or a <code>ResetToDefaults</code> action.
Reading	number	<i>read-only</i> (null)	The reading of the sensor associated with this control. This property shall contain the value of the <code>Reading</code> property of the <code>Sensor</code> resource directly associated with this control. This property shall not be present if multiple sensors are associated with a single control.
SetPoint	number	<i>read-write</i> (null)	The desired set point of the control. This property shall contain the desired set point control value. The units shall follow the value of <code>SetPointUnits</code>. If the <code>DefaultSetPoint</code> property is not supported and if a user-defined set point is not configured, the property may contain <code>null</code> in responses.
}			
PowerLoadPercent (v1.1+) {}	object		The power load (percent) for this device. This property shall contain the power load, in percent units, for this device that represents the <code>Total</code> <code>ElectricalContext</code> for this device. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Percent</code>. For more information about this property, see <code>SensorExcerpt</code> in Property Details.
PowerWatts {	object (excerpt)		Power consumption (W). This property shall contain the total power, in watt units, for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Power</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.

Property	Type	Attributes	Notes
ApparentVA	number (V.A)	<i>read-only</i> (<i>null</i>)	The product of voltage and current for an AC circuit, in volt-ampere units. This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
DataSourceUri	string (URI)	<i>read-only</i> (<i>null</i>)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
PhaseAngleDegrees (v1.5+)	number	<i>read-only</i> (<i>null</i>)	The phase angle (degrees) between the current and voltage waveforms. This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>Power</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
PowerFactor	number	<i>read-only</i> (<i>null</i>)	The power factor for this sensor. This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. <code>PowerFactor</code> is expressed in unit-less 1/100ths. This property can appear in sensors containing a <code>ReadingType</code> value of <code>Power</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
ReactiveVAR	number (V.A)	<i>read-only</i> (<i>null</i>)	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
Reading	number	<i>read-only</i> (<i>null</i>)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			

Property	Type	Attributes	Notes
TemperatureCelsius {}	object		Temperature (Celsius). This property shall contain the temperature, in degree Celsius units, for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Temperature</code>. For more information about this property, see <code>SensorExcerpt</code> in Property Details.
Voltage (v1.5+) {	object (excerpt)		The voltage (V) for this device. This property shall contain the voltage, in volt units, for this device. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Voltage</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
CrestFactor (v1.1+)	number	<i>read-only</i> (null)	The crest factor for this sensor. This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
THDPercent (v1.1+)	number (%)	<i>read-only</i> (null)	The total harmonic distortion percent (% THD). This property shall contain the total harmonic distortion of the <code>Reading</code> property in percent units, typically 0 to 100.
}			

6.41.4 Actions

6.41.4.1 ResetMetrics

Description

This action resets the summary metrics related to this equipment.

- This action shall reset any time intervals or counted values for this equipment.

Action URI

{Base URI of target resource}/Actions/EnvironmentMetrics.ResetMetrics

Action parameters

This action takes no parameters.

6.41.4.2 ResetToDefaults (v1.3+)

Description

The action resets the values of writable properties to factory defaults.

- This action shall reset the values of writable properties in this resource to their default values as specified by the manufacturer.

Action URI

{Base URI of target resource}/Actions/EnvironmentMetrics.ResetToDefaults

Action parameters

This action takes no parameters.

6.41.5 Property details

6.41.5.1 ControlMode

The current operating mode of the control.

- This property shall contain the operating mode of the control.

string	Description
Automatic	Automatically adjust control to meet the set point.
Disabled	The control has been disabled.
Manual	No automatic adjustments are made to the control.

string	Description
Override	User override of the automatic set point value.

6.41.5.2 PhysicalContext

The area or device to which this sensor measurement applies.

- This property shall contain a description of the affected component or region within the equipment to which this sensor measurement applies.

string	Description
Accelerator	An accelerator.
ACInput	An AC electrical input or input-related circuit.
ACMaintenanceBypassInput	An AC electrical maintenance bypass input.
ACOutput	An AC electrical output or output-related circuit. • This value shall indicate an electrical output or an output-related circuit, such as a branch output, which is not terminated as a power outlet.
ACStaticBypassInput	An AC electrical static bypass input.
ACUtilityInput	An AC electrical utility input. • This value shall indicate an electrical input, where the source is an electrical utility as opposed to a backup or locally-generated power source. This value is intended to differentiate multiple electrical inputs between utility, maintenance bypass, or static bypass values. For general purpose usage, the value of <code>ACInput</code> is preferred.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. • This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	A compute bay.

string	Description
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC electrical bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	An expansion bay. This value shall indicate a location that provides for the expansion of functionality of a system, such as a PCIe slot that can accept an option card.
ExpansionSubsystem	A group of expansion bays. This value shall indicate a group of expansion bays and the devices installed in those bays.
Fan	A fan.
Filter	A filter.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Manager	A management controller, such as a BMC (baseboard management controller).
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	A networking bay. This value shall indicate a location that provides for the expansion of networking functionality of a system, by the addition of networking devices.

string	Description
NetworkingDevice	A networking device.
PowerOutlet	An electrical outlet. This value shall indicate an electrical outlet or receptacle.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	A power supply bay. This value shall indicate a location that provides for the installation of a power supply or similar devices.
Pump	A pump.
Rectifier	A rectifier device.
Reservoir	A reservoir.
Room	The room.
StorageBay	A storage bay. This value shall indicate a location that provides for the expansion of storage functionality of a system, by the addition of storage devices.
StorageDevice	A storage device.
StorageSubsystem	A storage subsystem. This value shall indicate a storage subsystem, which may consist of one or more storage controllers, storage devices, or related components.
Switch	A switch device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.41.5.3 PhysicalSubContext

The usage or location within a device to which this sensor measurement applies.

- This property shall contain a description of the usage or sub-region within the equipment to which this sensor measurement applies. This property generally differentiates multiple sensors within the same `PhysicalContext` instance.

string	Description
Input	The input.
Output	The output.

6.41.5.4 SensorExcerpt

The `Sensor` schema describes a sensor and its properties. This object is an excerpt of the `Sensor` resource located at the URI shown in `DataSourceUri`.

DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	read-only (null)	The sensor value. • This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.

6.41.6 Example response

```
{
  "@odata.type": "#EnvironmentMetrics.v1_5_0.EnvironmentMetrics",
  "Name": "Processor Environment Metrics",
  "TemperatureCelsius": {
    "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/CPU1Temp",
    "Reading": 44
  },
  "PowerWatts": {
    "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/CPU1Power",
    "Reading": 12.87
  },
}
```

```

    "FanSpeedsPercent": [
      {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/CPUFan1",
        "DeviceName": "CPU #1 Fan Speed",
        "Reading": 80
      }
    ],
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/Processors/1/EnvironmentMetrics"
  }

```

6.42 EthernetInterface 1.12.4

Version	v1.12	v1.11	v1.10	v1.9	v1.8	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	...
Release	2023.3	2023.2	2023.1	2022.2	2021.2	2020.1	2019.1	2017.3	2017.1	2016.3	2016.2	...

6.42.1 Description

The `EthernetInterface` schema represents a single, logical Ethernet interface or network interface controller (NIC).

- This resource contains NIC resources as part of the Redfish Specification.

6.42.2 URIs

```

/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/NetworkDeviceFunctions/
{NetworkDeviceFunctionId}/EthernetInterfaces/{EthernetInterfaceId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/EthernetInterfaces/{EthernetInterfaceId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/
EthernetInterfaces/{EthernetInterfaceId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/OperatingSystem/
Containers/EthernetInterfaces/{EthernetInterfaceId}
/redfish/v1/Managers/{ManagerId}/EthernetInterfaces/{EthernetInterfaceId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/EthernetInterfaces/{EthernetInterfaceId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/EthernetInterfaces/
{EthernetInterfaceId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/OperatingSystem/Containers/
EthernetInterfaces/{EthernetInterfaceId}
/redfish/v1/Systems/{ComputerSystemId}/EthernetInterfaces/{EthernetInterfaceId}
/redfish/v1/Systems/{ComputerSystemId}/OperatingSystem/Containers/EthernetInterfaces/{EthernetInterfaceId}

```

6.42.3 Properties

Property	Type	Attributes	Notes
AutoNeg	boolean	<i>read-write (null)</i>	An indication of whether the speed and duplex are automatically negotiated and configured on this interface. This property shall indicate whether the speed and duplex are automatically negotiated and configured on this interface.
DHCPv4 (v1.4+) {	object		DHCPv4 configuration for this interface. This property shall contain the configuration of DHCP v4.
DHCPEnabled (v1.4+)	boolean	<i>read-write (null)</i>	An indication of whether DHCP v4 is enabled on this Ethernet interface. This property shall indicate whether DHCP v4 is enabled for this Ethernet interface.
FallbackAddress (v1.5+)	string (enum)	<i>read-write (null)</i>	DHCPv4 fallback address method for this interface. This property shall contain the fallback address method of DHCPv4. <i>For the possible property values, see FallbackAddress in Property details.</i>
UseDNSServers (v1.4+)	boolean	<i>read-write (null)</i>	An indication of whether this interface uses DHCP v4-supplied DNS servers. This property shall indicate whether the interface uses DHCP v4-supplied DNS servers.
UseDomainName (v1.4+)	boolean	<i>read-write (null)</i>	An indication of whether this interface uses a DHCP v4-supplied domain name. This property shall indicate whether the interface uses a DHCP v4-supplied domain name.
UseGateway (v1.4+)	boolean	<i>read-write (null)</i>	An indication of whether this interface uses a DHCP v4-supplied gateway. This property shall indicate whether the interface uses a DHCP v4-supplied gateway.
UseNTPServers (v1.4+)	boolean	<i>read-write (null)</i>	An indication of whether the interface uses DHCP v4-supplied NTP servers. This property shall indicate whether the interface uses DHCP v4-supplied NTP servers.
UseStaticRoutes (v1.4+)	boolean	<i>read-write (null)</i>	An indication of whether the interface uses DHCP v4-supplied static routes. This property shall indicate whether the interface uses a DHCP v4-supplied static routes.

Property	Type	Attributes	Notes
}			
DHCPv6 (v1.4+) {	object		DHCPv6 configuration for this interface. This property shall contain the configuration of DHCP v6.
OperatingMode (v1.4+)	string (enum)	<i>read-write</i> (null)	Determines the DHCPv6 operating mode for this interface. This property shall control the operating mode of DHCPv6 on this interface. <i>For the possible property values, see OperatingMode in Property details.</i>
UseDNSServers (v1.4+)	boolean	<i>read-write</i> (null)	An indication of whether the interface uses DHCP v6-supplied DNS servers. This property shall indicate whether the interface uses DHCP v6-supplied DNS servers.
UseDomainName (v1.4+)	boolean	<i>read-write</i> (null)	An indication of whether this interface uses a DHCP v6-supplied domain name. This property shall indicate whether the interface uses a DHCP v6-supplied domain name.
UseNTPServers (v1.4+)	boolean	<i>read-write</i> (null)	An indication of whether the interface uses DHCP v6-supplied NTP servers. This property shall indicate whether the interface uses DHCP v6-supplied NTP servers.
UseRapidCommit (v1.4+)	boolean	<i>read-write</i> (null)	An indication of whether the interface uses DHCP v6 rapid commit mode for stateful mode address assignments. Do not enable this option in networks where more than one DHCP v6 server is configured to provide address assignments. This property shall indicate whether the interface uses DHCP v6 rapid commit mode for stateful mode address assignments.
}			
EthernetInterfaceType (v1.6+)	string (enum)	<i>read-only</i> (null)	The type of interface. This property shall contain the type of interface. <i>For the possible property values, see EthernetInterfaceType in Property details.</i>
FQDN	string	<i>read-write</i> (null)	The complete, fully qualified domain name that DNS obtains for this interface. This property shall contain the fully qualified domain name that DNS obtains for this interface.

Property	Type	Attributes	Notes
FullDuplex	boolean	<i>read-write (null)</i>	An indication of whether full-duplex mode is enabled on the Ethernet connection for this interface. This property shall indicate whether full-duplex mode is enabled on the Ethernet connection for this interface.
HostName	string	<i>read-write (null)</i>	The DNS host name, without any domain information. This property shall contain the DNS host name for this interface. Modifying this property may modify the <code>HostName</code> in one or more <code>EthernetInterface</code> resources that belong to the same system, manager, or other device. If this interface is subordinate to a <code>ComputerSystem</code> resource, modifying this property may modify the <code>HostName</code> of the <code>ComputerSystem</code> resource that contains this interface. If this interface is subordinate to a <code>Manager</code> resource, modifying this property may modify the <code>HostName</code> of the <code>ManagerNetworkProtocol</code> resource of the <code>Manager</code> resource that contains this interface. Services should ignore this property in modification requests if <code>FQDN</code> is also provided in the same request.
InterfaceEnabled	boolean	<i>read-write (null)</i>	An indication of whether this interface is enabled. This property shall indicate whether this interface is enabled. If this interface is also a host interface, modifying this property may modify the <code>InterfaceEnabled</code> property in the <code>HostInterface</code> resource for this interface.
IPv4Addresses [{}]	array (object)		This type describes an IPv4 address. - The IPv4 addresses currently in use by this interface. - This property shall contain an array of objects that represent the IPv4 connection characteristics currently in use by this interface for any value of <code>AddressOrigin</code>. It is recommended that this property be regarded as read-only with configuration of static addresses performed by updating the values within <code>IPv4StaticAddresses</code>. Services may reject updates to this array for this reason. This property should contain an empty array if there are no active IPv4 addresses. For property details, see <code>IPv4Address</code>.

Property	Type	Attributes	Notes
IPv4StaticAddresses (v1.4+) [{}]	array (object)	(null)	This type describes an IPv4 address. - The IPv4 static addresses assigned to this interface. See IPv4Addresses for the addresses in use by this interface. - This property shall contain an array of objects that represent all IPv4 static addresses assigned to, but not necessarily in use by, this interface. The IPv4Addresses property shall also list the addresses that this interface uses. Services should represent static addresses that are not configured as <code>null</code> values, as described by the 'PATCH on array properties' clause of the Redfish Specification. Services should not represent static addresses that are not configured as invalid IP addresses, such as <code>0.0.0.0</code>. For property details, see IPv4Address.
IPv6Addresses [{}]	array (object)		This type describes an IPv6 address. - The IPv6 addresses currently in use by this interface. - This property shall contain an array of objects that represent the IPv6 connection characteristics for this interface for any value of AddressOrigin. This property should contain an empty array if there are no active IPv6 addresses. For property details, see IPv6Address.
IPv6AddressPolicyTable [{	array		An array that represents the RFC6724-defined address selection policy table. This property shall contain an array of objects that represent the RFC6724-defined address selection policy table.
Label	integer	<i>read-write</i> (null)	The IPv6 label, as defined in RFC6724, section 2.1. This property shall contain the IPv6 label value for this table entry, as defined in RFC6724, section 2.1.
Precedence	integer	<i>read-write</i> (null)	The IPv6 precedence, as defined in RFC6724, section 2.1. This property shall contain the IPv6 precedence value for this table entry, as defined in RFC6724, section 2.1.
Prefix	string	<i>read-write</i> (null)	The IPv6 address prefix, as defined in RFC6724, section 2.1. This property shall contain the IPv6 address prefix for this table entry, as defined in RFC6724, section 2.1.
}]			
IPv6DefaultGateway	string	<i>read-only</i> (null)	The IPv6 default gateway address in use on this interface. This property shall contain the current IPv6 default gateway address in use on this interface.

Property	Type	Attributes	Notes
IPv6Enabled (v1.12+)	boolean	<i>read-write</i> (null)	An indication of whether IPv6 is enabled on this interface. This property shall indicate whether IPv6 is enabled on this interface. If this property contains <code>false</code>, the interface shall not contain any assigned IPv6 addresses, shall not initiate DHCPv6 requests, and shall not send or process ICMPv6 packets. If this property is not present, but this interface contains other IPv6 properties, the value shall be assumed to be <code>true</code>.
IPv6StaticAddresses [{}]	array (object)	(null)	This type represents a single IPv6 static address to be assigned on a network interface. - The IPv6 static addresses assigned to this interface. See <code>IPv6Addresses</code> for the addresses in use by this interface. - This property shall contain an array of objects that represent the IPv6 static connection characteristics for this interface. Services should represent static addresses that are not configured as <code>null</code> values, as described by the 'PATCH on array properties' clause of the Redfish Specification. Services should not represent static addresses that are not configured as invalid IP addresses, such as <code>::</code>. For property details, see <code>IPv6StaticAddress</code>.
IPv6StaticDefaultGateways (v1.4+) [{}]	array (object)	(null)	This type represents a single IPv6 static address to be assigned on a network interface. - The IPv6 static default gateways for this interface. - The values in this array shall represent the IPv6 static default gateway addresses for this interface. For property details, see <code>IPv6GatewayStaticAddress v1.1.5</code>.
Links (v1.1+) {	object	<i>required on create</i>	The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
AffiliatedInterfaces (v1.10+) [{	array		The links to the Ethernet interfaces that are affiliated with this interface, such as a VLAN or a team that uses this interface. This property shall contain an array of links to resources of type <code>EthernetInterface</code> that represent the Ethernet interfaces that are affiliated with this interface. <code>EthernetInterface</code> resources referenced in this property shall reference this resource in their <code>RelatedInterfaces</code> property.
@odata.id	string	<i>read-only</i>	Link to another <code>EthernetInterface</code> resource.
}			

Property	Type	Attributes	Notes
Chassis (v1.3+) {	object		The link to the chassis that contains this Ethernet interface. This property shall contain a link to a resource of type <code>Chassis</code> that represent the physical container associated with this Ethernet interface. See the <i>Chassis</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.
}			
Endpoints (v1.1+) [{	array		An array of links to the endpoints that connect to this Ethernet interface. This property shall contain an array of links to resources of type <code>Endpoint</code> with which this Ethernet interface is associated.
@odata.id	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}]			
HostInterface (v1.2+) {	object		The link to a Host Interface that is associated with this Ethernet interface. This property shall contain a link to a resource of type <code>HostInterface</code> that represents the interface that a host uses to communicate with a manager. See the <i>HostInterface</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a HostInterface resource. See the Links section and the <i>HostInterface</i> schema for details.
}			
NetworkDeviceFunction (v1.6+, deprecated v1.7) {	object	(null)	The link to the parent network device function and is only used when representing one of the VLANs on that network device function, such as is done in Unix. This property shall contain a link to a resource of type <code>NetworkDeviceFunction</code> and only be populated with the <code>EthernetInterfaceType</code> property is <code>Virtual</code>. See the <i>NetworkDeviceFunction</i> schema for details on this property. <i>Deprecated in v1.7 and later. This property has been deprecated in favor of <code>NetworkDeviceFunctions</code> as each <code>EthernetInterface</code> could represent more than one <code>NetworkDeviceFunction</code>.</i>
@odata.id	string	<i>read-only</i>	Link to a NetworkDeviceFunction resource. See the Links section and the <i>NetworkDeviceFunction</i> schema for details.
}			

Property	Type	Attributes	Notes
NetworkDeviceFunctions (v1.7+) [{	array		The link to the network device functions that constitute this Ethernet interface. This property shall contain an array of links to resources of type <code>NetworkDeviceFunction</code>.
@odata.id	string	<i>read-only</i>	Link to a <code>NetworkDeviceFunction</code> resource. See the Links section and the <code>NetworkDeviceFunction</code> schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
Ports (v1.9+) [{	array		The links to the ports providing this Ethernet interface. This property shall contain an array of links to resources of type <code>Port</code> that represent the ports providing this Ethernet interface. This property shall not be present if the Ethernet interface is not directly associated to a physical port.
@odata.id	string	<i>read-only</i>	Link to a <code>Port</code> resource. See the Links section and the <code>Port</code> schema for details.
}]			
RelatedInterfaces (v1.9+) [{	array	<i>required on create</i>	The links to the Ethernet interfaces that constitute this Ethernet interface. This property shall contain an array of links to resources of type <code>EthernetInterface</code>. If <code>TeamMode</code> contains <code>None</code>, this property shall contain one member that represents the parent interface for the VLAN. For other values of <code>TeamMode</code>, this property shall contain the members of the team.
@odata.id	string	<i>read-write</i>	Link to another <code>EthernetInterface</code> resource.
}]			
}			
LinkStatus (v1.1+)	string (enum)	<i>read-only</i> (null)	The link status of this interface, or port. This property shall contain the link status of this interface, or port. <i>For the possible property values, see <code>LinkStatus</code> in Property details.</i>
MACAddress	string	<i>read-write</i> (null)	The currently configured MAC address of the interface, or logical port. This property shall contain the effective current MAC address of this interface. If an assignable MAC address is not supported, this value is a read-only alias of the <code>PermanentMACAddress</code>. Pattern: <code>^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})\$</code>

Property	Type	Attributes	Notes
MaxIPv6StaticAddresses	integer	<i>read-only</i> (null)	The maximum number of static IPv6 addresses that can be configured on this interface. This property shall indicate the number of array items supported by <code>IPv6StaticAddresses</code> , or the maximum number of static IPv6 addresses that can be configured on this interface.
MTUSize	integer	<i>read-write</i> (null)	The currently configured maximum transmission unit (MTU), in bytes, on this interface. This property shall contain the size, in bytes, of the largest protocol data unit (PDU) that can be passed in an Ethernet (MAC) frame on this interface, as currently configured by the operating system or driver.
NameServers []	array (string)	<i>read-only</i>	The DNS servers in use on this interface. This property shall contain the DNS servers in use on this interface.
PermanentMACAddress	string	<i>read-only</i> (null)	The permanent MAC address assigned to this interface, or port. This property shall contain the permanent MAC address of this interface, or port. Typically, this value is programmed during manufacturing. This address is not assignable. Pattern: <code>^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})\$</code>
RoutingScope (v1.11+)	string (enum)	<i>read-only</i> (null)	The routing scope for this interface. This property shall contain the routing scope for this interface. This property shall only be present if this interface belongs to a virtual machine or container. <i>For the possible property values, see <code>RoutingScope</code> in Property details.</i>
SpeedMbps	integer (Mbit/s)	<i>read-write</i> (null)	The current speed, in Mbit/s, of this interface. This property shall contain the link speed of the interface, in megabits per second (Mbit/s) units. This property shall be writable only when the <code>AutoNeg</code> property is <code>false</code> .
StatelessAddressAutoConfig (v1.4+) {	object		Stateless address autoconfiguration (SLAAC) parameters for this interface. This object shall contain the IPv4 and IPv6 stateless address automatic configuration (SLAAC) properties for this interface.
IPv4AutoConfigEnabled (v1.4+)	boolean	<i>read-write</i> (null)	An indication of whether IPv4 stateless address autoconfiguration (SLAAC) is enabled for this interface. This property shall indicate whether IPv4 stateless address autoconfiguration (SLAAC) is enabled for this interface.

Property	Type	Attributes	Notes
IPv6AutoConfigEnabled (v1.4+)	boolean	<i>read-write</i> (null)	An indication of whether IPv6 stateless address autoconfiguration (SLAAC) is enabled for this interface. This property shall indicate whether IPv6 stateless address autoconfiguration (SLAAC) is enabled for this interface.
}			
StaticNameServers (v1.4+) []	array (string, null)	<i>read-write</i>	The statically-defined set of DNS server IPv4 and IPv6 addresses. This property shall contain the statically-defined set of DNS server IP addresses to use when DHCP provisioning is not enabled for name server configuration. As an implementation option, they can be used in addition to DHCP-provided addresses, or in cases where the DHCP server provides no DNS assignments.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
TeamMode (v1.9+)	string (enum)	<i>read-write</i> (null)	The team mode for this interface. This property shall contain the team mode for this interface. If this property is not present, the value shall be assumed to be <code>None</code>. For the possible property values, see TeamMode in Property details.
UefiDevicePath	string	<i>read-only</i> (null)	The UEFI device path for this interface. This property shall contain the UEFI device path to the device that implements this interface, or port.
VLAN {	object		If this network interface supports more than one VLAN, this property is absent. VLAN collections appear in the <code>Links</code> property of this resource. This property shall contain the VLAN for this interface. If this interface supports more than one VLAN, the <code>VLAN</code> property shall be absent and, instead, the VLAN collection link shall be present.
Tagged (v1.3+)	boolean	<i>read-write</i> (null)	An indication of whether this VLAN is tagged or untagged for this interface. This property shall indicate whether this VLAN is tagged or untagged for this interface.
VLANEnable	boolean	<i>read-write required on create</i> (null)	An indication of whether this VLAN is enabled for this VLAN network interface. This property shall indicate whether this VLAN is enabled for this VLAN network interface.

Property	Type	Attributes	Notes
VLANId	integer	<i>read-write required on create (null)</i>	The ID for this VLAN. This property shall contain the ID for this VLAN.
VLANPriority (v1.2+)	integer	<i>read-write (null)</i>	The priority for this VLAN. This property shall contain the priority for this VLAN.
}			
VLANs (deprecated v1.7) {	object		The link to a collection of VLANs, which applies only if the interface supports more than one VLAN. If this property applies, the <code>VLANEnabled</code> and <code>VLANId</code> properties do not apply. This property shall contain a link to a resource collection of type <code>VlanNetworkInterfaceCollection</code>, which applies only if the interface supports more than one VLAN. If this property is present, the <code>VLANEnabled</code> and <code>VLANId</code> properties shall not be present. Contains a link to a resource. <i>Deprecated in v1.7 and later. This property has been deprecated in favor of newer methods indicating multiple VLANs.</i>
@odata.id	string	<i>read-only</i>	Link to Collection of <code>VlanNetworkInterface</code> . See the <code>VlanNetworkInterface</code> schema for details.
}			

6.42.4 Property details

6.42.4.1 EthernetInterfaceType

The type of interface.

- This property shall contain the type of interface.

string	Description
Physical	A physical Ethernet interface. This value shall indicate a physical traditional network interface.

string	Description
Virtual	A virtual Ethernet interface. This value shall indicate a network device function has multiple VLANs and is representing one of them as a virtual Ethernet interface. The <code>NetworkDeviceFunction</code> property within Links shall contain the locator for the parent network device function.

6.42.4.2 FallbackAddress

DHCPv4 fallback address method for this interface.

- This property shall contain the fallback address method of DHCPv4.

string	Description
AutoConfig	Fall back to an autoconfigured address. DHCP shall fall back to an address generated by the implementation.
None	Continue attempting DHCP without a fallback address. DHCP shall continue trying to obtain an address without falling back to a fixed address.
Static	Fall back to a static address specified by <code>IPv4StaticAddresses</code>. DHCP shall fall back to a static address specified by <code>IPv4StaticAddresses</code>.

6.42.4.3 LinkStatus

The link status of this interface, or port.

- This property shall contain the link status of this interface, or port.

string	Description
LinkDown	No link is detected on this interface, but the interface is connected.
LinkUp	The link is available for communication on this interface.
NoLink	No link or connection is detected on this interface.

6.42.4.4 OperatingMode

Determines the DHCPv6 operating mode for this interface.

- This property shall control the operating mode of DHCPv6 on this interface.

string	Description
Disabled	DHCPv6 is disabled. • DHCPv6 shall be disabled for this interface.
Enabled (v1.8+)	DHCPv6 is enabled. • DHCPv6 shall be enabled for this interface.
Stateful (deprecated v1.8)	DHCPv6 stateful mode. • DHCPv6 shall operate in stateful mode on this interface. DHCPv6 stateful mode configures addresses, and when it is enabled, stateless mode is also implicitly enabled. Services may replace this value with <code>Enabled</code>. <i>Deprecated in v1.8 and later. This property has been deprecated in favor of <code>Enabled</code>. The control between 'stateful' and 'stateless' is managed by the DHCP server and not the client.</i>
Stateless (deprecated v1.8)	DHCPv6 stateless mode. • DHCPv6 shall operate in stateless mode on this interface. DHCPv6 stateless mode allows configuring the interface using DHCP options but does not configure addresses. It is always enabled by default whenever DHCPv6 stateful mode is also enabled. Services may replace this value with <code>Enabled</code>. <i>Deprecated in v1.8 and later. This property has been deprecated in favor of <code>Enabled</code>. The control between 'stateful' and 'stateless' is managed by the DHCP server and not the client.</i>

6.42.4.5 RoutingScope

The routing scope for this interface.

- This property shall contain the routing scope for this interface. This property shall only be present if this interface belongs to a virtual machine or container.

string	Description
External	Externally accessible. • This value shall indicate this interface is externally accessible as if it were physically on the same network as the hosting system.

string	Description
HostOnly	Only accessible to a dedicated interface on the host. This value shall indicate this interface is only accessible to a dedicated interface on the hosting system.
Internal	Only accessible to internal networking on the host, such as when virtual machines or containers are allowed to communicate with each other on the same host system as well as a dedicated interface on the hosting system. This value shall indicate this interface is only accessible to internal networking on the host, such as when virtual machines or containers are allowed to communicate with each other on the same host system as well as a dedicated interface on the hosting system.
Limited	Accessible through IP translation provided by the hosting system. This value shall indicate this interface is accessible through IP translation provided by the hosting system, such as a NAT (network address translation).

6.42.4.6 TeamMode

The team mode for this interface.

- This property shall contain the team mode for this interface. If this property is not present, the value shall be assumed to be `None`.

string	Description
ActiveBackup	One interface in the team is active and the others are kept in standby until a failure occurs.
AdaptiveLoadBalancing	Packets are transmitted and received based upon the current load of each interface in the team.
AdaptiveTransmitLoadBalancing	Packets are transmitted based upon the current load of each interface in the team.
Broadcast	Packets are transmitted on all interfaces in the team.
IEEE802_3ad	The interfaces in the team create an IEEE802.3ad link aggregation group.
None	No teaming.
RoundRobin	Packets are transmitted in sequential order from the teamed interfaces.
XOR	Transmitting is determined based upon a hash policy.

6.42.5 Example response

```
{
  "@odata.type": "#EthernetInterface.v1_12_4.EthernetInterface",
  "Id": "1",
  "Name": "Ethernet Interface",
  "Description": "Manager NIC 1",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "LinkStatus": "LinkUp",
  "PermanentMACAddress": "12:44:6A:3B:04:11",
  "MACAddress": "12:44:6A:3B:04:11",
  "SpeedMbps": 1000,
  "AutoNeg": true,
  "FullDuplex": true,
  "MTUSize": 1500,
  "HostName": "web483",
  "FQDN": "web483.contoso.com",
  "NameServers": [
    "names.contoso.com"
  ],
  "IPv4Addresses": [
    {
      "Address": "192.168.0.10",
      "SubnetMask": "255.255.252.0",
      "AddressOrigin": "DHCP",
      "Gateway": "192.168.0.1"
    }
  ],
  "DHCPv4": {
    "DHCPEnabled": true,
    "UseDNSServers": true,
    "UseGateway": true,
    "UseNTPServers": false,
    "UseStaticRoutes": true,
    "UseDomainName": true
  },
  "DHCPv6": {
    "OperatingMode": "Enabled",
    "UseDNSServers": true,
    "UseDomainName": false,
    "UseNTPServers": false,
    "UseRapidCommit": false
  },
  "StatelessAddressAutoConfig": {
    "IPv4AutoConfigEnabled": false,
    "IPv6AutoConfigEnabled": true
  }
}
```

```

    },
    "IPv4StaticAddresses": [
      {
        "Address": "192.168.88.130",
        "SubnetMask": "255.255.0.0",
        "Gateway": "192.168.0.1"
      }
    ],
    "IPv6AddressPolicyTable": [
      {
        "Prefix": "::1/128",
        "Precedence": 50,
        "Label": 0
      }
    ],
    "MaxIPv6StaticAddresses": 1,
    "IPv6StaticAddresses": [
      {
        "Address": "fc00:1234::a:b:c:d",
        "PrefixLength": 64
      }
    ],
    "IPv6StaticDefaultGateways": [
      {
        "Address": "fe80::fe15:b4ff:fe97:90cd",
        "PrefixLength": 64
      }
    ],
    "IPv6DefaultGateway": "fe80::214:c1ff:fe4c:5c4d",
    "IPv6Addresses": [
      {
        "Address": "fe80::1ec1:deff:fe6f:1e24",
        "PrefixLength": 64,
        "AddressOrigin": "SLAAC",
        "AddressState": "Preferred"
      },
      {
        "Address": "fc00:1234::a:b:c:d",
        "PrefixLength": 64,
        "AddressOrigin": "Static",
        "AddressState": "Preferred"
      },
      {
        "Address": "2001:1:3:5::100",
        "PrefixLength": 64,
        "AddressOrigin": "DHCPv6",
        "AddressState": "Preferred"
      },
      {
        "Address": "2002:2:5::1ec1:deff:fe6f:1e24",

```

```
        "PrefixLength": 64,
        "AddressOrigin": "SLAAC",
        "AddressState": "Preferred"
    },
    ],
    "StaticNameServers": [
        "192.168.150.1",
        "fc00:1234:200:2500"
    ],
    "VLAN": {
        "VLANEnable": true,
        "VLANId": 101
    },
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/EthernetInterfaces/12446A3B0411"
}
```

6.43 Event 1.11.1

Version	v1.11	v1.10	v1.9	v1.8	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	...
Release	2024.3	2023.3	2023.2	2023.1	2021.2	2020.3	2020.2	2019.1	2018.2	2017.1	2016.1	...

6.43.1 Description

The `Event` schema describes the JSON payload received by an event destination, which has subscribed to event notification, when events occur. This resource contains data about events, including descriptions, severity, and a message identifier to a message registry that can be accessed for further information.

- This resource contains an event for a Redfish implementation.

6.43.2 Properties

Property	Type	Attributes	Notes
Context (v1.1+)	string	read-only	A context can be supplied at subscription time. This property is the context value supplied by the subscriber. • This property shall contain a client supplied context for the event destination to which this event is being sent.

Property	Type	Attributes	Notes
Events [{	array	<i>required</i>	Each event in this array has a set of properties that describe the event. Because this is an array, more than one event can be sent simultaneously. This property shall contain an array of objects that represent the occurrence of one or more events.
Actions (v1.2+) { }	object		The available actions for this resource. This property shall contain the available actions for this resource.
AdditionalDataSizeBytes (v1.8+)	integer (bytes)	<i>read-only</i> (null)	The size of the additional data for this event. This property shall contain the size of the additional data retrieved from the URI specified by the <code>AdditionalDataURI</code> property for this event.
AdditionalDataURI (v1.8+)	string (URI)	<i>read-only</i> (null)	The URI at which to access the additional data for the event, such as diagnostic data, image captures, or other files. This property shall contain the URI at which to access the additional data for the event, using the Redfish protocol and authentication methods. If both <code>DiagnosticData</code> and <code>AdditionalDataURI</code> are present, <code>DiagnosticData</code> shall contain a Base64-encoded string, with padding characters, of the data retrieved from the URI specified by the <code>AdditionalDataURI</code> property.
Context (deprecated v1.1)	string	<i>read-only</i>	A context can be supplied at subscription time. This property is the context value supplied by the subscriber. This property shall contain a client supplied context for the event destination to which this event is being sent. <i>Deprecated in v1.1 and later. Events are triggered independently from subscriptions to those events. This property has been deprecated in favor of the <code>Context</code> property found at the root level of the object.</i>
CPER (v1.8+) {	object		Details for a CPER section or record associated with this event. This property shall contain the details for a CPER section or record that is the source of this event.
NotificationType (v1.8+)	string (uuid)	<i>read-only</i> (null)	The CPER Notification Type for a CPER record. This property shall contain the CPER Notification Type for a CPER record that corresponds to the contents of the <code>DiagnosticData</code> property or data retrieved from the URI specified by the <code>AdditionalDataURI</code> property. This property shall only be present if <code>DiagnosticDataType</code> contains <code>CPER</code>. Pattern: <code>^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\$</code>

Property	Type	Attributes	Notes
Oem (v1.8+) {}	object		See the OEM object definition in the Using this guide clause.
SectionType (v1.8+)	string (uuid)	<i>read-only</i> (null)	The CPER Section Type. This property shall contain the CPER Section Type for a CPER section that corresponds to the contents of the <code>DiagnosticData</code> property or data retrieved from the URI specified by the <code>AdditionalDataURI</code> property. This property shall only be present if <code>DiagnosticDataType</code> contains <code>CPERSection</code>. Pattern: <code>^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\$</code>
}			
DiagnosticData (v1.8+)	string	<i>read-only</i> (null)	A Base64-encoded set of diagnostic data associated with this event. This property shall contain a Base64-encoded string, with padding characters, that represents the diagnostic data associated with this event. The contents shall depend on the value of the <code>DiagnosticDataType</code> property. The length of the value should not exceed 4 KB. Larger diagnostic data payloads should omit this property and use the <code>AdditionalDataURI</code> property to reference the data. If both <code>DiagnosticData</code> and <code>AdditionalDataURI</code> are present, <code>DiagnosticData</code> shall contain the Base64-encoding of the data retrieved from the URI specified by the <code>AdditionalDataURI</code> property.
DiagnosticDataType (v1.8+)	string (enum)	<i>read-only</i> (null)	The type of data available in the <code>DiagnosticData</code> property or retrieved from the URI specified by the <code>AdditionalDataURI</code> property. This property shall contain the type of data available in the <code>DiagnosticData</code> property or retrieved from the URI specified by the <code>AdditionalDataURI</code> property. <i>For the possible property values, see <code>DiagnosticDataType</code> in Property details.</i>
EventGroupId (v1.3+)	integer	<i>read-only</i>	The identifier that correlates events with the same root cause. If <code>0</code>, no other event is related to this event. This property shall indicate that events are related and shall have the same value when multiple event messages are produced by the same root cause. Implementations shall use separate values for events with a separate root cause. This property value shall not imply an ordering of events. The <code>0</code> value shall indicate that this event is not grouped with any other event.
EventId	string	<i>read-only</i>	The unique instance identifier of an event. This property shall contain a service-defined unique identifier for the event.

Property	Type	Attributes	Notes
EventTimestamp	string (date-time)	<i>read-only</i>	The time the event occurred. This property shall indicate the time the event occurred where the value shall be consistent with the Redfish service time that is also used for the values of the <code>Modified</code> property.
EventType <i>(deprecated v1.3)</i>	string (enum)	<i>read-only required</i>	The type of event. This property shall indicate the type of event. <i>For the possible property values, see EventType in Property details. Deprecated in v1.3 and later. This property has been deprecated. Starting with Redfish Specification v1.6 (Event v1.3), subscriptions are based on the RegistryPrefix and ResourceType properties and not on the EventType property.</i>
LogEntry <i>(v1.7+)</i> {	object		The link to a log entry if an entry was created for this event. This property shall contain a link to a resource of type <code>LogEntry</code> that represents the log entry created for this event. See the <code>LogEntry</code> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>LogEntry</code> resource. See the Links section and the <code>LogEntry</code> schema for details.
}			
MemberId	string	<i>read-only required</i>	The unique identifier for the member within an array. This property shall contain the unique identifier for this member within an array. For services supporting Redfish v1.6 or higher, this value shall contain the zero-based array index.
Message	string	<i>read-only</i>	The human-readable event message. This property shall contain a human-readable event message.
MessageArgs []	array (string)	<i>read-only</i>	An array of message arguments that are substituted for the arguments in the message when looked up in the message registry. This property shall contain an array of message arguments that are substituted for the arguments in the message when looked up in the message registry. It has the same semantics as the <code>MessageArgs</code> property in the Redfish <code>MessageRegistry</code> schema. If the corresponding <code>ParamType</code> value contains <code>number</code>, the service shall convert the number to a string representation of the number.

Property	Type	Attributes	Notes
MessageId	string	<i>read-only required</i>	The identifier for the message. This property shall contain a <code>MessageId</code> , as defined in the 'MessageId format' clause of the Redfish Specification. Pattern: <code>^[A-Za-z0-9]+\.\d+\.\d+\.[A-Za-z0-9.]+\$</code>
MessageSeverity (v1.5+)	string (enum)	<i>read-only</i>	The severity of the message in this event. This property shall contain the severity of the message in this event. Services can replace the value defined in the message registry with a value more applicable to the implementation. <i>For the possible property values, see MessageSeverity in Property details.</i>
Oem {}	object		See the OEM object definition in the Using this guide clause.
OEMDiagnosticDataType (v1.9+)	string	<i>read-only (null)</i>	The OEM-defined type of data available in the <code>DiagnosticData</code> property or retrieved from the URI specified by the <code>AdditionalDataURI</code> property. This property shall contain the OEM-defined type of data available in the <code>DiagnosticData</code> property or retrieved from the URI specified by the <code>AdditionalDataURI</code> property. This property shall be present if <code>DiagnosticDataType</code> is <code>OEM</code> .
OriginOfCondition {	object		A link to the resource or object that originated the condition that caused the event to be generated. This property shall contain a link to the resource or object that originated the condition that caused the event to be generated. If the event subscription has the <code>IncludeOriginOfCondition</code> property set to <code>true</code> , it shall include the entire resource or object referenced by the link. For events that represent the creation or deletion of a resource, this property should reference the created or deleted resource and not the collection that contains the resource.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
Resolution (v1.9+)	string	<i>read-only</i>	Used to provide suggestions on how to resolve the situation that caused the event. This property shall contain the resolution of the event. Services should replace the resolution defined in the message registry with a more specific resolution in the event.

Property	Type	Attributes	Notes
ResolutionSteps (v1.10+) [{ }]	array (object)		This type describes a recommended step of the service-defined resolution. - The list of recommended steps to resolve the cause of the event. - This property shall contain an array of recommended steps to resolve the cause of the event. This property shall not be present if the <code>MessageSeverity</code> or <code>Severity</code> properties contain <code>OK</code>. A client can stop executing the resolution steps once the <code>Resolved</code> property in the associated <code>LogEntry</code> resource contains <code>true</code> or the <code>Health</code> property in the associated resource referenced by the <code>OriginOfCondition</code> property contains <code>OK</code>. For property details, see <code>ResolutionStep</code>.
Severity (deprecated v1.5)	string	read-only	The severity of the event. This property shall contain the severity of the event, as defined in the 'Status' clause of the Redfish Specification. Services can replace the value defined in the message registry with a value more applicable to the implementation. <i>Deprecated in v1.5 and later. This property has been deprecated in favor of <code>MessageSeverity</code>, which ties the values to the enumerations defined for the <code>Health</code> property within <code>Status</code>.</i>
SpecificEventExistsInGroup (v1.6+)	boolean	read-only	Indicates this event is equivalent to a more specific event in this event group. This property shall indicate that the event is equivalent to another event, with a more specific definition, within the same <code>EventGroupId</code>. For example, the <code>DriveFailed</code> message from the Storage Device Message Registry is more specific than the <code>ResourceStatusChangedCritical</code> message from the Resource Event Message Registry, when both occur with the same <code>EventGroupId</code>. This property shall contain <code>true</code> if a more specific event is available, and shall contain <code>false</code> if no equivalent event exists in the same <code>EventGroupId</code>. If this property is absent, the value shall be assumed to be <code>false</code>.
UserAuthenticationSource (v1.11+)	string	read-only (null)	The source of authentication for the username property associated with the event record. This property shall contain the URL to the authentication service that is associated with the username property. This should be used for events that result from a user action. <i>For more information about this property, see Property details.</i>
Username (v1.11+)	string	read-only (null)	The username of the account associated with the event record. This property shall contain the username of the account associated with the event record. This should be used for events that result from a user action. <i>For more information about this property, see Property details.</i>

Property	Type	Attributes	Notes
}]			

6.43.3 Property details

6.43.3.1 DiagnosticDataType

The type of data available in the `DiagnosticData` property or retrieved from the URI specified by the `AdditionalDataURI` property.

- This property shall contain the type of data available in the `DiagnosticData` property or retrieved from the URI specified by the `AdditionalDataURI` property.

string	Description
CPER	UEFI Common Platform Error Record. • This value shall indicate the data provided at the URI specified by the <code>AdditionalDataURI</code> property is a complete UEFI Specification-defined Common Platform Error Record. The CPER data shall contain a Record Header and at least one Section as defined by the UEFI Specification.
CPERSection	A Section of a UEFI Common Platform Error Record. • This value shall indicate the data provided at the URI specified by the <code>AdditionalDataURI</code> property is a single Section of a UEFI Specification-defined Common Platform Error Record. The CPER data shall contain one Section as defined by the UEFI Specification, with no Record Header.
Manager	Manager diagnostic data.
OEM	OEM diagnostic data.
OS	Operating system (OS) diagnostic data.
PreOS	Pre-OS diagnostic data.

6.43.3.2 EventType

The type of event.

- This property shall indicate the type of event.

string	Description
Alert	A condition requires attention.
MetricReport (v1.3+)	The telemetry service is sending a metric report. Events of type <code>MetricReport</code> shall be sent to a client in accordance with the <code>MetricReport</code> schema definition.
Other (v1.4+)	Because <code>EventType</code> is deprecated as of Redfish Specification v1.6, the event is based on a registry or resource but not an <code>EventType</code> . Events of type <code>other</code> shall be sent to a client in accordance with subscriptions to <code>RegistryPrefixes</code> or <code>ResourceTypes</code>.
ResourceAdded	A resource has been added.
ResourceRemoved	A resource has been removed.
ResourceUpdated	A resource has been updated.
StatusChange	The status of a resource has changed.

6.43.3.3 MessageSeverity

The severity of the message in this event.

- This property shall contain the severity of the message in this event. Services can replace the value defined in the message registry with a value more applicable to the implementation.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

6.43.3.4 UserAuthenticationSource

The source of authentication for the username property associated with the event record.

- This property shall contain the URL to the authentication service that is associated with the username property. This should be used for events that result from a user action.

Services should return the `UserAuthenticationSource` property when multiple account providers are supported and the source of `Username` needs to be differentiated.

- If the user is a Redfish service-based account, the `UserAuthenticationSource` property shall contain the URL to the `AccountService` resource that manages the user account.
- For other account providers, such as LDAP or Active Directory, the `UserAuthenticationSource` property shall contain the URL to the domain's authentication server.

6.43.3.5 Username

The username of the account associated with the event record.

- This property shall contain the username of the account associated with the event record. This should be used for events that result from a user action.

The `Username` property is used for auditing to link a message to a specific user's action.

For certificate-based authentication, services shall populate the `Username` from the common name component of the subject of the certificate. For local user accounts and user accounts from external account providers, services shall populate `Username` from the following rules:

Account Provider	Encoding	Example
<code>RedfishService</code>	The value of the <code>UserName</code> property of the <code>ManagerAccount</code> resource. This applies to both local user accounts and external accounts from a remote Redfish service.	<code>joesmith</code>
<code>ActiveDirectoryService</code>	The User Principal Name (UPN).	<code>jsmith@ad-domain.company</code>
<code>LDAPService</code>	The User Principal Name (UPN).	<code>jsmith@ldap-domain.company</code>
<code>OAuth2</code>	The <code>sub</code> JWT claim.	<code>Joe Smith</code>
<code>TACACSPplus</code>	The client username.	<code>joesmith</code>
<code>OEM</code>	A human readable and unique identifier.	<code>joesmith</code>

6.43.4 Example response

```
{
  "@odata.type": "#Event.v1_7_0.Event",
  "Id": "1",
  "Name": "Event Array",
  "Context": "ContosoWebClient",
  "Events": [
    {
      "EventType": "Other",
```

```
    "EventId": "4593",
    "Severity": "Warning",
    "Message": "A cable has been removed from network adapter '1' port '1'.",
    "MessageId": "NetworkDevice.1.0.CableRemoved",
    "MessageArgs": [
      "1",
      "1"
    ],
    "OriginOfCondition": {
      "@odata.id": "/redfish/v1/Systems/1/EthernetInterfaces/1"
    },
    "LogEntry": {
      "@odata.id": "/redfish/v1/Managers/BMC/LogServices/EventLog/Entries/532"
    }
  }
]
```

6.44 EventDestination 1.15.1

Version	v1.15	v1.14	v1.13	v1.12	v1.11	v1.10	v1.9	v1.8	v1.7	v1.6	v1.5	...
Release	2024.3	2023.3	2022.3	2022.1	2021.2	2020.4	2020.3	2020.1	2019.3	2019.2	2019.1	...

6.44.1 Description

The `EventDestination` schema defines the target of an event subscription, including the event types and context to provide to the target in the event payload.

- This resource shall represent the target of an event subscription, including the event types and context to provide to the target in the event payload.

6.44.2 URIs

`/redfish/v1/EventService/Subscriptions/{EventDestinationId}`

6.44.3 Properties

Property	Type	Attributes	Notes
BackupDestinations (v1.15+) []	array (URI) (string, null)	<i>read-write</i>	The backup destination URIs for this event receiver. Events are sent to these URIs, in array order, when the destination URI is unreachable or returns an error. This property shall contain an array of URIs to destination where events are sent if the event receiver specified by <code>Destination</code> is unreachable or returns an error. Events are sent to each of the backup destinations, in array order, until a destination has been reached. An empty array shall indicate that the service supports backup event receivers, but none have been specified by the user.
Certificates (v1.9+) {	object		The link to a collection of server certificates for the server referenced by the <code>Destination</code> property. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that represent the server certificates for the server referenced by the <code>Destination</code> property. If <code>VerifyCertificate</code> is <code>true</code>, services shall compare the certificates in this collection with the certificate obtained during handshaking with the event destination in order to verify the identity of the event destination prior to sending an event. If the server cannot be verified, the service shall not send the event. If <code>VerifyCertificate</code> is <code>false</code>, the service shall not perform certificate verification with certificates in this collection. Regardless of the contents of this collection, services may perform additional verification based on other factors, such as the configuration of the <code>SecurityPolicy</code> resource. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
ClientCertificates (v1.11+) {	object		The link to a collection of client identity certificates provided to the server referenced by the <code>Destination</code> property. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that represents the client identity certificates that are provided to the server referenced by the <code>Destination</code> property as part of TLS handshaking. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			

Property	Type	Attributes	Notes
Context	string	<i>read-write required (null)</i>	A client-supplied string that is stored with the event destination subscription. This property shall contain a client-supplied context that remains with the connection through the connection's lifetime.
DeliveryRetryPolicy (v1.6+)	string (enum)	<i>read-write (null)</i>	The subscription delivery retry policy for events, where the subscription type is <code>RedfishEvent</code>. This property shall indicate the subscription delivery retry policy for events where the subscription type is <code>RedfishEvent</code>. <i>For the possible property values, see <code>DeliveryRetryPolicy</code> in Property details.</i>
Destination	string (URI)	<i>read-only required on create</i>	The URI of the destination event receiver. This property shall contain a URI to the destination where the events are sent. If <code>Protocol</code> is <code>SMTP</code>, the URI shall follow the RFC6068-described format. SNMP URIs shall be consistent with RFC4088. Specifically, for SNMPv3, if a username is specified in the SNMP URI, the SNMPv3 authentication and encryption configuration associated with that user shall be utilized in the SNMPv3 traps. Syslog URIs shall be consistent with RFC3986 and contain the scheme <code>syslog://</code>. Server-sent event destinations shall be in the form <code>redfish-sse://ip:port</code> where <code>ip</code> and <code>port</code> are the IP address and the port of the client with the open SSE connection. For other URIs, such as HTTP or HTTPS, they shall be consistent with RFC3986.
EventFormatType (v1.4+)	string (enum)	<i>read-only (null)</i>	The content types of the message that are sent to the <code>EventDestination</code>. This property shall indicate the content types of the message that this service sends to the <code>EventDestination</code>. If this property is not present, the <code>EventFormatType</code> shall be assumed to be <code>Event</code>. <i>For the possible property values, see <code>EventFormatType</code> in Property details.</i>
EventTypes (deprecated v1.5) []	array (string (enum))	<i>read-only</i>	- The types of events that are sent to the destination. - This property shall contain an array that contains the types of events that shall be sent to the destination. To specify that a client is subscribing for metric reports, the <code>EventTypes</code> property should include 'MetricReport'. If the subscription does not include this property, the service shall use a single element with a default of <code>Other</code>. <i>For the possible property values, see <code>EventTypes</code> in Property details. Deprecated in v1.5 and later. This property has been deprecated. Starting with Redfish Specification v1.6 (Event v1.3), subscriptions are based on the <code>RegistryPrefix</code> and <code>ResourceType</code> properties and not on the <code>EventType</code> property. Use <code>EventFormatType</code> to create subscriptions for metric reports. If the subscription does not include this property, the service shall use a single element with a default of <code>Other</code>.</i>

Property	Type	Attributes	Notes
ExcludeMessageIds (v1.12+) []	array (string, null)	<i>read-only</i>	The list of <code>MessageId</code> values that are not sent to this event destination. This property shall contain an array of excluded <code>MessageId</code> values that are not allowed values for the <code>MessageId</code> property within an event sent to the subscriber. The <code>MessageId</code> shall be in the <code>MessageRegistryPrefix.MessageKey</code> format. If included, the <code>MessageId</code> major and minor version details should be ignored. Events with a <code>MessageId</code> that is contained in this array shall not be sent to the subscriber. If this property is an empty array or is absent, no exclusive filtering based upon the <code>MessageId</code> of an event is performed.
ExcludeRegistryPrefixes (v1.12+) []	array (string, null)	<i>read-only</i>	The list of prefixes for the message registries that contain the <code>MessageId</code> values that are not sent to this event destination. This property shall contain an array of prefixes of excluded message registries that contain the <code>MessageId</code> values that are not allowed values for the <code>MessageId</code> property within an event sent to the subscriber. Events with a <code>MessageId</code> that is from a message registry contained in this array shall not be sent to the subscriber. If this property is an empty array or is absent, no exclusive filtering based upon message registry of the <code>MessageId</code> of an event is performed.
HeartbeatIntervalMinutes (v1.11+)	integer	<i>read-only</i> (null)	Interval for sending heartbeat events to the destination in minutes. This property shall indicate the interval for sending periodic heartbeat events to the subscriber. The value shall be the interval, in minutes, between each periodic event. This property shall not be present if the <code>SendHeartbeat</code> property is not present.
HttpHeaders [{	array		An array of settings for HTTP headers, such as authorization information. This array is <code>null</code> or an empty array in responses. An empty array is the preferred return value on read operations. This property shall contain an array of objects consisting of the names and values of the HTTP headers to include with every event <code>POST</code> to the event destination. This object shall be <code>null</code> or an empty array in responses. An empty array is the preferred return value in responses.
(pattern)	string	<i>read-write</i>	Property names follow regular expression pattern " <code>^[^:\s]+\$</code> "
}]			

Property	Type	Attributes	Notes
IncludeOriginOfCondition (v1.8+)	boolean	<i>read-only</i> (null)	An indication of whether the events subscribed to will also include the entire resource or object referenced by the <code>OriginOfCondition</code> property in the event payload. This property shall indicate whether the event payload sent to the subscription destination will expand the <code>OriginOfCondition</code> property to include the resource or object referenced by the <code>OriginOfCondition</code> property.
MessageIds (v1.1+) []	array (string, null)	<i>read-only</i>	The list of <code>MessageId</code> values that are sent to this event destination. This property shall contain an array of <code>MessageId</code> values that are the allowable values for the <code>MessageId</code> property within an event sent to the subscriber. The <code>MessageId</code> should be in the <code>MessageRegistryPrefix.MessageKey</code> format. If included, the <code>MessageId</code> major and minor version details should be ignored. Events with a <code>MessageId</code> that is not contained in this array and is not from a message registry contained in <code>RegistryPrefixes</code> shall not be sent to the subscriber. If this property is an empty array or is absent, no inclusive filtering based upon the <code>MessageId</code> of an event is performed.
MetricReportDefinitions (v1.6+) [{	array		A list of metric report definitions for which the service only sends related metric reports. If this property is absent or the array is empty, metric reports that originate from any metric report definition are sent to the subscriber. This property shall specify an array of metric report definitions that are the only allowable generators of metric reports for this subscription. Metric reports originating from metric report definitions not contained in this array shall not be sent to the subscriber. If this property is absent or the array is empty, the service shall send metric reports originating from any metric report definition to the subscriber.
@odata.id	string	<i>read-only</i>	Link to a <code>MetricReportDefinition</code> resource. See the Links section and the <code>MetricReportDefinition</code> schema for details.
}]			
OEMProtocol (v1.9+)	string	<i>read-only</i>	The OEM-defined protocol type of the event connection. This property shall contain the protocol type that the event uses to send the event to the destination. This property shall be present if <code>Protocol</code> is <code>OEM</code>.
OEMSubscriptionType (v1.9+)	string	<i>read-only</i>	The OEM-defined subscription type for events. This property shall indicate the OEM-defined type of subscription for events. This property shall be present if <code>SubscriptionType</code> is <code>OEM</code>.

Property	Type	Attributes	Notes
OriginResources (v1.1+) [{	array		The array of resources for which the service sends only related events. This property shall specify an array of resources, resource collections, or referenceable members that are the only allowable values for the <code>OriginOfCondition</code> property within an event that the service sends to the subscriber. Events with an <code>OriginOfCondition</code> that is not contained in this array, and is not subordinate to members of this array if <code>SubordinateResources</code> contains the value <code>true</code>, shall not be sent to the subscriber. If this property is an empty array or is absent, no filtering based upon the URI of the <code>OriginOfCondition</code> of an event is performed.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
Protocol	string (enum)	<i>read-only required on create</i>	The protocol type of the event connection. This property shall contain the protocol type that the event uses to send the event to the destination. A <code>Redfish</code> value shall indicate that the event type shall adhere to the type defined in the Redfish Specification. <i>For the possible property values, see Protocol in Property details.</i>
RegistryPrefixes (v1.4+) []	array (string, null)	<i>read-only</i>	The list of prefixes for the message registries that contain the <code>MessageId</code> values that are sent to this event destination. This property shall contain an array the prefixes of message registries that contain the <code>MessageId</code> values that are the allowable values for the <code>MessageId</code> property within an event sent to the subscriber. Events with a <code>MessageId</code> that is not from a message registry contained in this array and is not contained by <code>MessageIds</code> shall not be sent to the subscriber. If this property is an empty array or is absent, no inclusive filtering based upon message registry of the <code>MessageId</code> of an event is performed.

Property	Type	Attributes	Notes
ResourceTypes (v1.4+) []	array (string, null)	read-only	The list of resource type values (schema names) that correspond to the <code>OriginOfCondition</code> . The version and full namespace should not be specified. This property shall specify an array of resource type values that contain the allowable resource types for the resource referenced by the <code>OriginOfCondition</code> property. Events with the resource type of the resource referenced by the <code>OriginOfCondition</code> property that is not contained in this array shall not be sent to the subscriber. If this property is an empty array or is absent, no filtering based upon the resource type of the <code>OriginOfCondition</code> of an event is performed. This property shall contain only the general namespace for the type and not the versioned value. For example, it shall not contain <code>Task.v1_2_0.Task</code> and instead shall contain <code>Task</code> . To specify that a client is subscribing to metric reports, the <code>EventTypes</code> property should include <code>MetricReport</code> .
SendHeartbeat (v1.11+)	boolean	read-only (null)	Send a heartbeat event periodically to the destination. This property shall indicate that the service shall periodically send the <code>RedfishServiceFunctional</code> message defined in the Heartbeat Event Message Registry to the subscriber. If this property is not present, no periodic event shall be sent. This property shall not apply to event destinations if the <code>SubscriptionType</code> property contains the value <code>SSE</code> .
Severities (v1.13+) []	array (string (enum))	read-only (null)	- The list of severities that are sent to this event destination. - This property shall contain an array of severities that are the allowable values for the <code>MessageSeverity</code> property within an event sent to the subscriber. If this property is an empty array or is absent, no filtering based upon the <code>MessageSeverity</code> of an event is performed. <i>For the possible property values, see Severities in Property details.</i>
SNMP (v1.7+) {	object		Settings for an SNMP event destination. This property shall contain the settings for an SNMP event destination.
AuthenticationKey (v1.7+)	string	read-write (null)	The secret authentication key for SNMPv3. This property shall contain the key for SNMPv3 authentication. The value shall be <code>null</code> in responses. This property accepts a passphrase or a hex-encoded key. If the string starts with <code>Passphrase:</code> , the remainder of the string shall be the passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. If the string starts with <code>Hex:</code> , then the remainder of the string shall be the key encoded in hexadecimal notation. If the string starts with neither, the full string shall be a passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. Pattern: <code>(^[-~]+\$) (^Passphrase:[-~]+\$) (^Hex:[0-9A-Fa-f]{24,96}\$) (^*+\$)</code>

Property	Type	Attributes	Notes
AuthenticationKeySet (v1.10+)	boolean	<i>read-only</i>	Indicates if the <code>AuthenticationKey</code> property is set. This property shall contain <code>true</code> if a valid value was provided for the <code>AuthenticationKey</code> property. Otherwise, the property shall contain <code>false</code>.
AuthenticationProtocol (v1.7+)	string (enum)	<i>read-write</i> (null)	The authentication protocol for SNMPv3. This property shall contain the SNMPv3 authentication protocol. <i>For the possible property values, see <code>AuthenticationProtocol</code> in Property details.</i>
EncryptionKey (v1.7+)	string	<i>read-write</i> (null)	The secret authentication key for SNMPv3. This property shall contain the key for SNMPv3 encryption. The value shall be <code>null</code> in responses. This property accepts a passphrase or a hex-encoded key. If the string starts with <code>Passphrase:</code>, the remainder of the string shall be the passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. If the string starts with <code>Hex:</code>, then the remainder of the string shall be the key encoded in hexadecimal notation. If the string starts with neither, the full string shall be a passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. Pattern: <code>(^[-~]+\$) (^Passphrase:[-~]+\$) (^Hex:[0-9A-Fa-f]{16,64}\$) (^*+\$)</code>
EncryptionKeySet (v1.10+)	boolean	<i>read-only</i>	Indicates if the <code>EncryptionKey</code> property is set. This property shall contain <code>true</code> if a valid value was provided for the <code>EncryptionKey</code> property. Otherwise, the property shall contain <code>false</code>.
EncryptionProtocol (v1.7+)	string (enum)	<i>read-write</i> (null)	The encryption protocol for SNMPv3. This property shall contain the SNMPv3 encryption protocol. <i>For the possible property values, see <code>EncryptionProtocol</code> in Property details.</i>
TrapCommunity (v1.7+)	string	<i>read-write</i> (null)	The SNMP trap community string. This property shall contain the SNMP trap community string. The value shall be <code>null</code> in responses.
}			
Status (v1.6+) {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <code>Status</code>.

Property	Type	Attributes	Notes
SubordinateResources (v1.4+)	boolean	<i>read-only (null)</i>	An indication of whether the subscription is for events in the <code>OriginResources</code> array and its subordinate resources. If <code>true</code> and the <code>OriginResources</code> array is specified, the subscription is for events in the <code>OriginResources</code> array and its subordinate resources. Note that resources associated through the Links section are not considered subordinate. If <code>false</code> and the <code>OriginResources</code> array is specified, the subscription is for events in the <code>OriginResources</code> array only. If the <code>OriginResources</code> array is not present, this property has no relevance. This property shall indicate whether the subscription is for events in the <code>OriginResources</code> array and its subordinate resources. If <code>true</code> and the <code>OriginResources</code> array is specified, the subscription is for events in the <code>OriginResources</code> array and its subordinate resources. Note that resources associated through the Links section are not considered subordinate. If <code>false</code> and the <code>OriginResources</code> array is specified, the subscription shall be for events in the <code>OriginResources</code> array only. If the <code>OriginResources</code> array is not present, this property shall have no relevance.
SubscriptionType (v1.3+)	string (enum)	<i>read-only required (null)</i>	The subscription type for events. This property shall indicate the type of subscription for events. If this property is not present, the <code>SubscriptionType</code> shall be assumed to be <code>RedfishEvent</code>. <i>For the possible property values, see SubscriptionType in Property details.</i>
SyslogFilters (v1.9+) [{	array		A list of filters applied to syslog messages before sending to a remote syslog server. An empty list indicates all syslog messages are sent. This property shall describe all desired syslog messages to send to a remote syslog server. If this property contains an empty array or is absent, all messages shall be sent.
LogFacilities (v1.9+) []	array (string (enum))	<i>read-write (null)</i>	The syslog facility code is an enumeration of program types. - The types of programs that can log messages. - This property shall contain the types of programs that can log messages. If this property contains an empty array or is absent, all facilities shall be indicated. <i>For the possible property values, see LogFacilities in Property details.</i>
LowestSeverity (v1.9+)	string (enum)	<i>read-write (null)</i>	The lowest severity level message that will be forwarded. This property shall contain the lowest syslog severity level that will be forwarded. The service shall forward all messages equal to or greater than the value in this property. The value <code>All</code> shall indicate all severities. <i>For the possible property values, see LowestSeverity in Property details.</i>
}]			

Property	Type	Attributes	Notes
VerifyCertificate (v1.9+)	boolean	<i>read-write (null)</i>	An indication of whether the service will verify the certificate of the server referenced by the <code>Destination</code> property prior to sending the event. This property shall indicate whether the service will verify the certificate of the server referenced by the <code>Destination</code> property prior to sending the event with the certificates found in the collection referenced by the <code>Certificates</code> property. If this property is not supported by the service or specified by the client in the create request, it shall be assumed to be <code>false</code>. Regardless of the value of this property, services may perform additional verification based on other factors, such as the configuration of the <code>SecurityPolicy</code> resource.

6.44.4 Actions

6.44.4.1 ResumeSubscription

Description

This action resumes a suspended event subscription.

- This action shall resume a suspended event subscription, which affects the subscription status. The service may deliver buffered events when the subscription is resumed.

Action URI

{Base URI of target resource}/Actions/EventDestination.ResumeSubscription

Action parameters

Parameter Name	Type	Attributes	Notes
DeliverBufferedEventDuration (v1.12+)	string (duration)	<i>optional</i>	The maximum age of buffered events that should be delivered when resuming the subscription. This parameter shall indicate the event age of any buffered or otherwise undelivered events that shall be delivered to this event destination when the subscription is resumed. The service shall deliver any available, previously undelivered event that was created within the duration specified. A value that equates to zero time, such as <code>PT0S</code>, shall indicate that no previously undelivered events shall be sent. If undelivered events within the duration may have been discarded due to a lack of buffer space, the service should send the <code>EventBufferExceeded</code> message from the Base Message Registry. If the client does not provide this parameter, the service shall apply an implementation-specific duration. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?)?\$</code>

Request Example

```
{
  "DeliverBufferedEventDuration": "PT8H"
}
```

6.44.4.2 SuspendSubscription (v1.12+)

Description

This action suspends an event subscription.

- This action shall suspend an event subscription. No events shall be sent to the event destination until invocation of the `ResumeSubscription` action. The value of the `State` property within `Status` shall contain `Disabled` for a suspended subscription. The service may buffer events while the subscription is suspended.

Action URI

{Base URI of target resource}/Actions/EventDestination.SuspendSubscription

Action parameters

This action takes no parameters.

6.44.5 Property details

6.44.5.1 AuthenticationProtocol

The authentication protocol for SNMPv3.

- This property shall contain the SNMPv3 authentication protocol.

string	Description
CommunityString	Trap community string authentication. • This value shall indicate authentication using SNMP community strings and the value of TrapCommunity.
HMAC128_SHA224 (v1.10+)	HMAC-128-SHA-224 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC128SHA224AuthProtocol.
HMAC192_SHA256 (v1.10+)	HMAC-192-SHA-256 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC192SHA256AuthProtocol.
HMAC256_SHA384 (v1.10+)	HMAC-256-SHA-384 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC256SHA384AuthProtocol.
HMAC384_SHA512 (v1.10+)	HMAC-384-SHA-512 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC384SHA512AuthProtocol.
HMAC_MD5	HMAC-MD5-96 authentication. • This value shall indicate authentication conforms to the RFC3414-defined HMAC-MD5-96 authentication protocol.
HMAC_SHA96	HMAC-SHA-96 authentication. • This value shall indicate authentication conforms to the RFC3414-defined HMAC-SHA-96 authentication protocol.
None	No authentication. • This value shall indicate authentication is not required.

6.44.5.2 DeliveryRetryPolicy

The subscription delivery retry policy for events, where the subscription type is `RedfishEvent`.

- This property shall indicate the subscription delivery retry policy for events where the subscription type is `RedfishEvent`.

string	Description
RetryForever	The subscription is not suspended or terminated, and attempts at delivery of future events continues regardless of the number of retries. This value shall indicate the subscription is not suspended or terminated, and attempts at delivery of future events shall continue regardless of the number of retries. The interval between retries remains constant and is specified by the <code>DeliveryRetryIntervalSeconds</code> property in the event service.
RetryForeverWithBackoff (v1.10+)	The subscription is not suspended or terminated, and attempts at delivery of future events continues regardless of the number of retries, but issued over time according to a service-defined backoff algorithm. This value shall indicate the subscription is not suspended or terminated, and attempts at delivery of future events shall continue regardless of the number of retries. Retry attempts are issued over time according to a service-defined backoff algorithm. The backoff algorithm may insert an increasing amount of delay between retry attempts and may reach a maximum.
SuspendRetries	The subscription is suspended after the maximum number of retries is reached. This value shall indicate the subscription is suspended after the maximum number of retries is reached, specified by the <code>DeliveryRetryAttempts</code> property in the event service. The value of the <code>State</code> property within <code>Status</code> shall contain <code>Disabled</code> for a suspended subscription.
TerminateAfterRetries	The subscription is terminated after the maximum number of retries is reached. This value shall indicate the subscription is terminated after the maximum number of retries is reached, specified by the <code>DeliveryRetryAttempts</code> property in the event service. The service shall delete this resource to terminate the subscription.

6.44.5.3 EncryptionProtocol

The encryption protocol for SNMPv3.

- This property shall contain the SNMPv3 encryption protocol.

string	Description
CBC_DES	CBC-DES encryption. This value shall indicate encryption conforms to the RFC3414-defined CBC-DES encryption protocol.
CFB128_AES128	CFB128-AES-128 encryption. This value shall indicate encryption conforms to the RFC3826-defined CFB128-AES-128 encryption protocol.
CFB128_AES192 (v1.14+)	CFB128-AES-192 encryption. This value shall indicate encryption conforms to the CFB128-AES-192 encryption protocol, extended from RFC3826.
CFB128_AES256 (v1.14+)	CFB128-AES-256 encryption. This value shall indicate encryption conforms to the CFB128-AES-256 encryption protocol, extended from RFC3826.
None	No encryption. This value shall indicate there is no encryption.

6.44.5.4 EventFormatType

The content types of the message that are sent to the `EventDestination`.

- This property shall indicate the content types of the message that this service sends to the `EventDestination`. If this property is not present, the `EventFormatType` shall be assumed to be Event.

string	Description
Event	The subscription destination receives an event payload. The subscription destination shall receive an event payload as defined by the value of the <code>Protocol</code> property.
MetricReport	The subscription destination receives a metric report. The subscription destination shall receive a metric report payload as defined by the value of the <code>Protocol</code> property.

6.44.5.5 EventTypes

- The types of events that are sent to the destination.

- This property shall contain an array that contains the types of events that shall be sent to the destination. To specify that a client is subscribing for metric reports, the `EventTypes` property should include 'MetricReport'. If the subscription does not include this property, the service shall use a single element with a default of `Other`.

string	Description
Alert	A condition requires attention.
MetricReport	The telemetry service is sending a metric report. • Events of type <code>MetricReport</code> shall be sent to a client in accordance with the <code>MetricReport</code> schema definition.
Other	Because <code>EventType</code> is deprecated as of Redfish Specification v1.6, the event is based on a registry or resource but not an <code>EventType</code> . • Events of type <code>other</code> shall be sent to a client in accordance with subscriptions to <code>RegistryPrefixes</code> or <code>ResourceTypes</code>.
ResourceAdded	A resource has been added.
ResourceRemoved	A resource has been removed.
ResourceUpdated	A resource has been updated.
StatusChange	The status of a resource has changed.

6.44.5.6 LogFacilities

The syslog facility code is an enumeration of program types.

- The types of programs that can log messages.
 - This property shall contain the types of programs that can log messages. If this property contains an empty array or is absent, all facilities shall be indicated.

string	Description
Auth	Security/authentication messages.
Authpriv	Security/authentication messages.
Console	Log alert.
Cron	Clock daemon.
Daemon	System daemons.

string	Description
FTP	FTP daemon.
Kern	Kernel messages.
Local0	Locally used facility 0.
Local1	Locally used facility 1.
Local2	Locally used facility 2.
Local3	Locally used facility 3.
Local4	Locally used facility 4.
Local5	Locally used facility 5.
Local6	Locally used facility 6.
Local7	Locally used facility 7.
LPR	Line printer subsystem.
Mail	Mail system.
News	Network news subsystem.
NTP	NTP subsystem.
Security	Log audit.
SolarisCron	Scheduling daemon.
Syslog	Messages generated internally by syslogd.
User	User-level messages.
UUCP	UUCP subsystem.

6.44.5.7 LowestSeverity

The lowest severity level message that will be forwarded.

- This property shall contain the lowest syslog severity level that will be forwarded. The service shall forward all messages equal to or greater than the value in this property. The value `All` shall indicate all severities.

string	Description
Alert	A condition that should be corrected immediately, such as a corrupted system database.

string	Description
All	A message of any severity.
Critical	Hard device errors.
Debug	Messages that contain information normally of use only when debugging a program.
Emergency	A panic condition.
Error	An Error.
Informational	Informational only.
Notice	Conditions that are not error conditions, but that might require special handling.
Warning	A Warning.

6.44.5.8 Protocol

The protocol type of the event connection.

- This property shall contain the protocol type that the event uses to send the event to the destination. A `Redfish` value shall indicate that the event type shall adhere to the type defined in the Redfish Specification.

string	Description
Kafka (v1.13+)	The destination follows the Kafka protocol for event notifications. This value shall indicate the destination follows the Apache-defined Kafka protocol as defined by the Kafka Protocol Guide. The <code>Context</code> property shall contain the Kafka topic of the destination broker.
OEM (v1.9+)	The destination follows an OEM protocol for event notifications. This value shall indicate an OEM-specific protocol. The <code>OEMProtocol</code> property shall contain the specific OEM event destination protocol.
Redfish	The destination follows the Redfish Specification for event notifications. This value shall indicate the destination follows the Redfish Specification for event notifications. Destinations requesting <code>EventFormatType</code> of <code>Event</code> shall receive a Redfish resource of type <code>Event</code>. Destinations requesting <code>EventFormatType</code> of <code>MetricReport</code> shall receive a Redfish resource of type <code>MetricReport</code>.
SMTP (v1.7+)	The destination follows the SMTP specification for event notifications. This value shall indicate the destination follows the RFC5321-defined SMTP specification.

string	Description
SNMPv1 (v1.7+)	The destination follows the SNMPv1 protocol for event notifications. This value shall indicate the destination follows the RFC1157-defined SNMPv1 protocol.
SNMPv2c (v1.7+)	The destination follows the SNMPv2c protocol for event notifications. This value shall indicate the destination follows the SNMPv2c protocol as defined by RFC1441 and RFC1452.
SNMPv3 (v1.7+)	The destination follows the SNMPv3 protocol for event notifications. This value shall indicate the destination follows the SNMPv3 protocol as defined by RFC3411 and RFC3418.
SyslogRELP (v1.9+)	The destination follows syslog RELP for event notifications. This value shall indicate the destination follows the Reliable Event Logging Protocol (RELP) transport for syslog as defined by www.rsyslog.com.
SyslogTCP (v1.9+)	The destination follows syslog TCP-based transport for event notifications. This value shall indicate the destination follows the TCP-based transport for syslog as defined in RFC6587.
SyslogTLS (v1.9+)	The destination follows syslog TLS-based transport for event notifications. This value shall indicate the destination follows the TLS-based transport for syslog as defined in RFC5424.
SyslogUDP (v1.9+)	The destination follows syslog UDP-based transport for event notifications. This value shall indicate the destination follows the UDP-based transport for syslog as defined in RFC5424.

6.44.5.9 Severities

- The list of severities that are sent to this event destination.
 - This property shall contain an array of severities that are the allowable values for the `MessageSeverity` property within an event sent to the subscriber. If this property is an empty array or is absent, no filtering based upon the `MessageSeverity` of an event is performed.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.

string	Description
Warning	A condition requires attention.

6.44.5.10 SubscriptionType

The subscription type for events.

- This property shall indicate the type of subscription for events. If this property is not present, the `SubscriptionType` shall be assumed to be `RedfishEvent`.

string	Description
OEM (v1.9+)	The subscription is an OEM subscription. • This value shall indicate an OEM subscription type. The <code>OEMSubscriptionType</code> property shall contain the specific OEM subscription type.
RedfishEvent	The subscription follows the Redfish Specification for event notifications. To send an event notification, a service sends an HTTP <code>POST</code> to the subscriber's destination URI.
SNMPInform (v1.7+)	The subscription follows versions 2 and 3 of SNMP Inform for event notifications. • This value shall indicate the subscription follows versions 2 and 3 of SNMP Inform for event notifications. <code>Protocol</code> shall specify the appropriate version of SNMP.
SNMPTrap (v1.7+)	The subscription follows the various versions of SNMP Traps for event notifications. • This value shall indicate the subscription follows the various versions of SNMP Traps for event notifications. <code>Protocol</code> shall specify the appropriate version of SNMP.
SSE	The subscription follows the HTML5 server-sent event definition for event notifications.
Syslog (v1.9+)	The subscription sends syslog messages for event notifications. • This value shall indicate the subscription forwards syslog messages to the event destination. <code>Protocol</code> shall specify the appropriate syslog protocol.

6.44.6 Example response

```
{
  "@odata.type": "#EventDestination.v1_15_1.EventDestination",
  "Id": "1",
  "Name": "WebUser3 subscribes to all Redfish events",
  "Destination": "http://www.dnsname.com/Destination1",
```

```

    "SubscriptionType": "RedfishEvent",
    "DeliveryRetryPolicy": "TerminateAfterRetries",
    "RegistryPrefixes": [],
    "MessageIds": [],
    "OriginResources": [],
    "ResourceTypes": [],
    "Status": {
      "State": "Enabled"
    },
    "Actions": {
      "#EventDestination.ResumeSubscription": {
        "target": "/redfish/v1/EventService/Subscriptions/1/Actions/EventDestination.ResumeSubscription"
      }
    },
    "Context": "WebUser3",
    "Protocol": "Redfish",
    "@odata.id": "/redfish/v1/EventService/Subscriptions/1"
  }

```

6.45 EventService 1.11.0

Version	v1.11	v1.10	v1.9	v1.8	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	...
Release	2025.1	2023.1	2022.3	2022.1	2020.2	2020.1	2019.3	2019.2	2019.1	2018.2	2018.1	...

6.45.1 Description

The `EventService` schema contains properties for managing event subscriptions and generates the events sent to subscribers. The resource has links to the actual collection of subscriptions, which are called event destinations.

- This resource shall represent an event service for a Redfish implementation.

6.45.2 URIs

/redfish/v1/EventService

6.45.3 Properties

Property	Type	Attributes	Notes
DeliveryRetryAttempts	integer	<i>read-write</i>	The number of times that the <code>POST</code> of an event is retried before the subscription terminates or is suspended. This retry occurs at the service level, which means that the HTTP <code>POST</code> to the event destination fails with an HTTP <code>4xx</code> or <code>5xx</code> status code or an HTTP timeout occurs this many times before the event destination subscription terminates or is suspended. This property shall contain the number of times that the <code>POST</code> of an event is retried before the subscription terminates or is suspended. This retry occurs at the service level, which means that the HTTP <code>POST</code> to the event destination fails with an HTTP <code>4xx</code> or <code>5xx</code> status code or an HTTP timeout occurs this many times before the event destination subscription terminates or is suspended. The service shall delete the <code>EventDestination</code> resource to terminate the subscription. The service shall set the value of the <code>State</code> property within <code>Status</code> of the <code>EventDestination</code> resource to <code>Disabled</code> for a suspended subscription.
DeliveryRetryIntervalSeconds	integer (seconds)	<i>read-write</i>	The interval, in seconds, between retry attempts for sending any event. This property shall contain the interval, in seconds, between the retry attempts for any event sent to the subscription destination.
EventFormatTypes (v1.2+) []	array (string (enum))	<i>read-only</i> (null)	- The content types of the message that this service can send to the event destination. - This property shall contain the content types of the message that this service can send to the event destination. If this property is not present, the <code>EventFormatType</code> shall be assumed to be <code>Event</code>. <i>For the possible property values, see EventFormatTypes in Property details.</i>
EventTypesForSubscription (deprecated v1.3) []	array (string (enum))	<i>read-only</i>	- The types of events to which a client can subscribe. - This property shall contain the types of events to which a client can subscribe. The semantics associated with the enumeration values are defined in the Redfish Specification. <i>For the possible property values, see EventTypesForSubscription in Property details. Deprecated in v1.3 and later. This property has been deprecated. Starting with Redfish Specification v1.6 (Event v1.3), subscriptions are based on the <code>RegistryPrefix</code> and <code>ResourceType</code> properties and not on the <code>EventType</code> property.</i>

Property	Type	Attributes	Notes
ExcludeMessageId (v1.8+)	boolean	<i>read-only</i>	An indication of whether the service supports filtering by the <code>ExcludeMessageIds</code> property. This property shall indicate whether this service supports filtering by the <code>ExcludeMessageIds</code> property.
ExcludeRegistryPrefix (v1.8+)	boolean	<i>read-only</i>	An indication of whether the service supports filtering by the <code>ExcludeRegistryPrefixes</code> property. This property shall indicate whether this service supports filtering by the <code>ExcludeRegistryPrefixes</code> property.
IncludeOriginOfConditionSupported (v1.6+)	boolean	<i>read-only</i> (null)	An indication of whether the service supports including the resource payload of the origin of condition in the event payload. This property shall indicate whether the service supports including the resource payload of the origin of condition in the event payload. If <code>true</code>, event subscriptions are allowed to specify the <code>IncludeOriginOfCondition</code> property.
RegistryPrefixes (v1.2+) []	array (string, null)	<i>read-only</i>	The list of the prefixes of the message registries that can be used for the <code>RegistryPrefixes</code> or <code>ExcludeRegistryPrefixes</code> properties on a subscription. If this property is absent or contains an empty array, the service does not support registry prefix-based subscriptions. This property shall contain the array of the prefixes of the message registries that shall be allowed or excluded for an event subscription.
ResourceTypes (v1.2+) []	array (string, null)	<i>read-only</i>	The list of <code>@odata.type</code> values, or schema names, that can be specified in the <code>ResourceTypes</code> array in a subscription. If this property is absent or contains an empty array, the service does not support resource type-based subscriptions. This property shall specify an array of the valid <code>@odata.type</code> values that can be used for an event subscription.
ServerSentEventUri (v1.1+)	string (URI)	<i>read-only</i>	The link to a URI for receiving Server-Sent Event representations for the events that this service generates. This property shall contain a URI that specifies an HTML5 Server-Sent Event-conformant endpoint.

Property	Type	Attributes	Notes
ServiceEnabled	boolean	<i>read-write (null)</i>	An indication of whether this service is enabled. If <code>false</code>, events are no longer published, new SSE connections cannot be established, and existing SSE connections are terminated. This property shall indicate whether this service is enabled. If <code>false</code>, events are no longer published, new SSE connections cannot be established, and existing SSE connections are terminated.
Severities (v1.9+) []	array (string (enum))	<i>read-only (null)</i>	- The list of severities that can be specified in the <code>Severities</code> array in a subscription. - This property shall specify an array of the allowable severities that can be used for an event subscription. If this property is absent or contains an empty array, the service does not support severity-based subscriptions. <i>For the possible property values, see Severities in Property details.</i>
SMTP (v1.5+) {	object		Settings for SMTP event delivery. This property shall contain settings for SMTP event delivery.
Authentication (v1.5+)	string (enum)	<i>read-write (null)</i>	The authentication method for the SMTP server. This property shall contain the authentication method for the SMTP server. <i>For the possible property values, see Authentication in Property details.</i>
ConnectionProtocol (v1.5+)	string (enum)	<i>read-write (null)</i>	The connection type to the outgoing SMTP server. This property shall contain the connection type to the outgoing SMTP server. <i>For the possible property values, see ConnectionProtocol in Property details.</i>
FromAddress (v1.5+)	string	<i>read-write (null)</i>	The 'from' email address of the outgoing email. This property shall contain the email address to use for the 'from' field in an outgoing email.
Password (v1.5+)	string	<i>read-write (null)</i>	The password for authentication with the SMTP server. The value is <code>null</code> in responses. This property shall contain the password for authentication with the SMTP server. The value shall be <code>null</code> in responses.

Property	Type	Attributes	Notes
PasswordSet (v1.9+)	boolean	<i>read-only</i>	Indicates if the <code>Password</code> property is set. This property shall contain <code>true</code> if a valid value was provided for the <code>Password</code> property. Otherwise, the property shall contain <code>false</code>.
Port (v1.5+)	integer	<i>read-write (null)</i>	The destination SMTP port. This property shall contain the destination port for the SMTP server.
ServerAddress (v1.5+)	string	<i>read-write (null)</i>	The address of the SMTP server. This property shall contain the address of the SMTP server for outgoing email.
ServiceEnabled (v1.5+)	boolean	<i>read-write (null)</i>	An indication if SMTP for event delivery is enabled. This property shall indicate if SMTP for event delivery is enabled.
Username (v1.5+)	string	<i>read-write (null)</i>	The username for authentication with the SMTP server. This property shall contain the username for authentication with the SMTP server.
}			
SSEFilterPropertiesSupported (v1.2+) {	object		The set of properties that are supported in the <code>\$filter</code> query parameter for the <code>ServerSentEventUri</code> . This property shall contain the properties that are supported in the <code>\$filter</code> query parameter for the URI indicated by the <code>ServerSentEventUri</code> property, as described by the Redfish Specification.
EventFormatType (v1.2+)	boolean	<i>read-only</i>	An indication of whether the service supports filtering by the <code>EventFormatType</code> property. This property shall indicate whether this service supports filtering by the <code>EventFormatType</code> property.

Property	Type	Attributes	Notes
EventType (v1.2+, deprecated v1.3)	boolean	read-only	An indication of whether the service supports filtering by the <code>EventTypes</code> property. This property shall indicate whether this service supports filtering by the <code>EventTypes</code> property. <i>Deprecated in v1.3 and later. This property has been deprecated. Starting with Redfish Specification v1.6 (Event v1.3), subscriptions are based on the <code>RegistryPrefix</code> and <code>ResourceType</code> properties and not on the <code>EventType</code> property.</i>
MessageId (v1.2+)	boolean	read-only	An indication of whether the service supports filtering by the <code>MessageIds</code> property. This property shall indicate whether this service supports filtering by the <code>MessageIds</code> property.
MetricReportDefinition (v1.2+)	boolean	read-only	An indication of whether the service supports filtering by the <code>MetricReportDefinitions</code> property. This property shall indicate whether this service supports filtering by the <code>MetricReportDefinitions</code> property.
OriginResource (v1.2+)	boolean	read-only	An indication of whether the service supports filtering by the <code>OriginResources</code> property. This property shall indicate whether this service supports filtering by the <code>OriginResources</code> property.
RegistryPrefix (v1.2+)	boolean	read-only	An indication of whether the service supports filtering by the <code>RegistryPrefixes</code> property. This property shall indicate whether this service supports filtering by the <code>RegistryPrefixes</code> property.
ResourceType (v1.2+)	boolean	read-only	An indication of whether the service supports filtering by the <code>ResourceTypes</code> property. This property shall indicate whether this service supports filtering by the <code>ResourceTypes</code> property.
SubordinateResources (v1.4+)	boolean	read-only	An indication of whether the service supports filtering by the <code>SubordinateResources</code> property. This property shall indicate whether this service supports filtering by the <code>SubordinateResources</code> property.
}			

Property	Type	Attributes	Notes
SSEIncludeOriginOfConditionSupported (v1.11+)	boolean	<i>read-only</i> (null)	An indication of whether the service supports the <code>includeoriginofcondition</code> query parameter for the <code>ServerSentEventUri</code> . This property shall indicate whether the service supports the <code>includeoriginofcondition</code> query parameter for the <code>ServerSentEventUri</code> , as described by the Redfish Specification.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <code>Status</code>.
SubordinateResourcesSupported (v1.2+)	boolean	<i>read-only</i> (null)	An indication of whether the service supports the <code>SubordinateResources</code> property on both event subscriptions and generated events. This property shall indicate whether the service supports the <code>SubordinateResources</code> property on both event subscriptions and generated events.
Subscriptions {	object		The link to a collection of event destinations. This property shall contain the link to a resource collection of type <code>EventDestinationCollection</code> . Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <code>EventDestination</code> . See the <code>EventDestination</code> schema for details.
}			

6.45.4 Actions

6.45.4.1 SubmitTestEvent

Description

This action generates a test event.

- This action shall add a test event to the event service with the event data specified in the action parameters. Then, this message should be sent to any appropriate event destinations.

Action URI

{Base URI of target resource}/Actions/EventService.SubmitTestEvent

Action parameters

Parameter Name	Type	Attributes	Notes
EventGroupId (v1.3+)	integer	<i>optional</i>	The group identifier for the event. The parameter shall contain the group identifier for the event. It has the same semantics as the <code>EventGroupId</code> property in the <code>Event</code> schema for Redfish. If not provided by the client, the resulting event should not contain the <code>EventGroupId</code> property.
EventId	string	<i>optional</i>	The ID for the event to add. This parameter shall have the same semantics as the <code>EventId</code> property in the <code>Event</code> schema for Redfish. A service can ignore this value and replace it with its own. If not provided by the client, the resulting event may contain a service-defined <code>EventId</code> property.
EventTimestamp	string (date-time)	<i>optional</i>	The date and time for the event to add. This parameter shall contain the date and time for the event to add and have the same semantics as the <code>EventTimestamp</code> property in the <code>Event</code> schema for Redfish. If not provided by the client, the resulting event should not contain the <code>EventTimestamp</code> property.
EventType (deprecated v1.3)	string (enum)	<i>optional</i>	The type for the event to add. This parameter shall contain the property name for which the following allowable values apply. If not provided by the client, the resulting event should not contain the <code>EventType</code> property. <i>For the possible property values, see EventType in Property details. Deprecated in v1.3 and later. This parameter has been deprecated. Starting with Redfish Specification v1.6 (Event v1.3), subscriptions are based on the RegistryPrefix and ResourceType properties and not on the EventType property.</i>
Message	string	<i>optional</i>	The human-readable message for the event to add. This parameter shall have the same semantics as the <code>Message</code> property in the <code>Event</code> schema for Redfish. If not provided by the client, the resulting event should not contain the <code>Message</code> property.
MessageArgs []	array (string)	<i>optional</i>	An array of message arguments for the event to add. This parameter shall have the same semantics as the <code>MessageArgs</code> property in the <code>Event</code> schema for Redfish. If not provided by the client, the resulting event should not contain the <code>MessageArgs</code> property.

Parameter Name	Type	Attributes	Notes
MessageId	string	<i>required</i>	The <code>MessageId</code> for the event to add. This parameter shall contain the <code>MessageId</code> for the event to add and have the same semantics as the <code>MessageId</code> property in the <code>Event</code> schema for Redfish. Services should accept arbitrary values for this parameter that match that match the defined pattern. Pattern: <code>^\w+\.\d+\.\d+\.\w+\$</code>
MessageSeverity (v1.10+)	string (enum)	<i>optional</i>	The severity for the event to add. This property shall contain the severity for the event to add and have the same semantics as the <code>MessageSeverity</code> property in the <code>Event</code> schema for Redfish. If not provided by the client, the resulting event should not contain the <code>MessageSeverity</code> property. <i>For the possible property values, see <code>MessageSeverity</code> in Property details.</i>
OriginOfCondition	string (URI)	<i>optional</i>	The URL in the <code>OriginOfCondition</code> property of the event to add. It is not a reference object. This parameter shall be a string that represents the URL contained by the <code>OriginOfCondition</code> property in the <code>Event</code> schema for Redfish. If not provided by the client, the resulting event should not contain the <code>OriginOfCondition</code> property.
Severity	string	<i>optional</i>	The severity for the event to add. This parameter shall contain the severity for the event to add and have the same semantics as the <code>Severity</code> property in the <code>Event</code> schema for Redfish. If not provided by the client, the resulting event should not contain the <code>Severity</code> property.

Request Example

```
{
  "EventId": "5",
  "EventTimestamp": "2016-01-10T18:02:00Z",
  "Severity": "Critical",
  "Message": "Fan 2 crossed Lower Fatal Threshold; fans are no longer redundant",
  "MessageId": "Event.1.0.FanWayTooSlow",
  "MessageArgs": [
    "2"
  ],
  "OriginOfCondition": "/redfish/v1/Chassis/MultiBladeEncl/Thermal"
}
```

6.45.4.2 TestEventSubscription (v1.10+)

Description

This action generates a test event using the pre-defined test message.

- This action shall send an event containing the `TestMessage` message from the Resource Event Message Registry to all appropriate event destinations.

Action URI

{Base URI of target resource}/Actions/EventService.TestEventSubscription

Action parameters

This action takes no parameters.

6.45.5 Property details

6.45.5.1 Authentication

The authentication method for the SMTP server.

- This property shall contain the authentication method for the SMTP server.

string	Description
AutoDetect	Auto-detect. • This value shall indicate authentication is auto-detected.
CRAM_MD5	CRAM-MD5 authentication. • This value shall indicate authentication conforms to the RFC4954-defined AUTH CRAM-MD5 mechanism.
Login (deprecated v1.7)	LOGIN authentication. • This value shall indicate authentication conforms to the RFC4954-defined AUTH LOGIN mechanism. <i>Deprecated in v1.7 and later. This value has been deprecated in favor of <code>Plain</code>, which supersedes the LOGIN authentication method for SASL.</i>
None	No authentication. • This value shall indicate authentication is not required.

string	Description
Plain	PLAIN authentication. This value shall indicate authentication conforms to the RFC4954-defined AUTH PLAIN mechanism.

6.45.5.2 ConnectionProtocol

The connection type to the outgoing SMTP server.

- This property shall contain the connection type to the outgoing SMTP server.

string	Description
AutoDetect	Auto-detect. This value shall indicate the connection is auto-detected.
None	Clear text. This value shall indicate the connection is in clear text.
StartTLS	StartTLS. This value shall indicate the connection conforms to the RFC3207-defined StartTLS extension.
TLS_SSL	TLS/SSL. This value shall indicate the connection is TLS/SSL.

6.45.5.3 EventFormatTypes

- The content types of the message that this service can send to the event destination.
 - This property shall contain the content types of the message that this service can send to the event destination. If this property is not present, the `EventFormatType` shall be assumed to be `Event`.

string	Description
Event	The subscription destination receives an event payload. The subscription destination shall receive an event payload as defined by the value of the <code>Protocol</code> property.

string	Description
MetricReport	The subscription destination receives a metric report. The subscription destination shall receive a metric report payload as defined by the value of the <code>Protocol</code> property.

6.45.5.4 EventType

The type for the event to add.

- This parameter shall contain the property name for which the following allowable values apply. If not provided by the client, the resulting event should not contain the `EventType` property.

string	Description
Alert	A condition requires attention.
MetricReport	The telemetry service is sending a metric report. Events of type <code>MetricReport</code> shall be sent to a client in accordance with the <code>MetricReport</code> schema definition.
Other	Because <code>EventType</code> is deprecated as of Redfish Specification v1.6, the event is based on a registry or resource but not an <code>EventType</code>. Events of type <code>other</code> shall be sent to a client in accordance with subscriptions to <code>RegistryPrefixes</code> or <code>ResourceTypes</code>.
ResourceAdded	A resource has been added.
ResourceRemoved	A resource has been removed.
ResourceUpdated	A resource has been updated.
StatusChange	The status of a resource has changed.

6.45.5.5 EventTypesForSubscription

- The types of events to which a client can subscribe.
 - This property shall contain the types of events to which a client can subscribe. The semantics associated with the enumeration values are defined in the Redfish Specification.

string	Description
Alert	A condition requires attention.
MetricReport	The telemetry service is sending a metric report. Events of type <code>MetricReport</code> shall be sent to a client in accordance with the <code>MetricReport</code> schema definition.
Other	Because <code>EventType</code> is deprecated as of Redfish Specification v1.6, the event is based on a registry or resource but not an <code>EventType</code>. Events of type <code>other</code> shall be sent to a client in accordance with subscriptions to <code>RegistryPrefixes</code> or <code>ResourceTypes</code>.
ResourceAdded	A resource has been added.
ResourceRemoved	A resource has been removed.
ResourceUpdated	A resource has been updated.
StatusChange	The status of a resource has changed.

6.45.5.6 MessageSeverity

The severity for the event to add.

- This property shall contain the severity for the event to add and have the same semantics as the `MessageSeverity` property in the `Event` schema for Redfish. If not provided by the client, the resulting event should not contain the `MessageSeverity` property.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

6.45.5.7 Severities

- The list of severities that can be specified in the `'Severities'` array in a subscription.
 - This property shall specify an array of the allowable severities that can be used for an event subscription. If this property is absent or contains an empty array, the service does not support severity-based subscriptions.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

6.45.6 Example response

```
{
  "@odata.type": "#EventService.v1_11_0.EventService",
  "Id": "EventService",
  "Name": "Event Service",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "ServiceEnabled": true,
  "DeliveryRetryAttempts": 3,
  "DeliveryRetryIntervalSeconds": 60,
  "EventTypesForSubscription": [
    "StatusChange",
    "ResourceUpdated",
    "ResourceAdded",
    "ResourceRemoved",
    "Alert",
    "Other"
  ],
  "ServerSentEventUri": "/redfish/v1/EventService/SSE",
  "SSEFilterPropertiesSupported": {
    "EventType": true,
    "MetricReportDefinition": false,
    "RegistryPrefix": true,
    "ResourceType": true,
    "EventFormatType": false,
    "MessageId": true,
    "OriginResource": true,
    "SubordinateResources": true
  },
  "Subscriptions": {
    "@odata.id": "/redfish/v1/EventService/Subscriptions"
  },
  "Actions": {
    "#EventService.SubmitTestEvent": {
      "target": "/redfish/v1/EventService/Actions/EventService.SubmitTestEvent",
      "@Redfish.ActionInfo": "/redfish/v1/EventService/SubmitTestEventActionInfo"
    }
  }
},
```

```

    "@odata.id": "/redfish/v1/EventService"
  }

```

6.46 ExternalAccountProvider 1.8.1

Version	v1.8	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2024.3	2023.2	2023.1	2022.3	2022.1	2021.2	2020.4	2018.3	2018.1

6.46.1 Description

The `ExternalAccountProvider` schema represents a remote service that provides accounts for this manager to use for authentication.

- This resource shall represent a remote authentication service in the Redfish Specification.

6.46.2 URIs

`/redfish/v1/AccountService/ExternalAccountProviders/{ExternalAccountProviderId}`
`/redfish/v1/Managers/{ManagerId}/RemoteAccountService/ExternalAccountProviders/{ExternalAccountProviderId}`

6.46.3 Properties

Property	Type	Attributes	Notes
AccountProviderType	string (enum)	<i>read-only required on create (null)</i>	The type of external account provider to which this service connects. This property shall contain the type of external account provider to which this service connects. <i>For the possible property values, see AccountProviderType in Property details.</i>
Authentication {	object		The authentication information for the external account provider. This property shall contain the authentication information for the external account provider.

Property	Type	Attributes	Notes
AuthenticationType	string (enum)	<i>read-write</i> (null)	The type of authentication used to connect to the external account provider. This property shall contain the type of authentication used to connect to the external account provider. <i>For the possible property values, see AuthenticationType in Property details.</i>
EncryptionKey (v1.2+)	string	<i>read-write</i> (null)	Specifies the encryption key. This property shall contain the value of a symmetric encryption key for account services that support some form of encryption, obfuscation, or authentication such as TACACS+. The value shall be <code>null</code> in responses. The property shall accept a hexadecimal string whose length depends on the external account service, such as TACACS+. A TACACS+ service shall use this property to specify the secret key as defined in RFC8907. Pattern: <code>^[0-9a-fA-F]+\$</code>
EncryptionKeySet (v1.2+)	boolean	<i>read-only</i> (null)	Indicates if the <code>EncryptionKey</code> property is set. This property shall contain <code>true</code> if a valid value was provided for the <code>EncryptionKey</code> property. Otherwise, the property shall contain <code>false</code>. For a TACACS+ service, the value <code>false</code> shall indicate data obfuscation, as defined in section 4.5 of RFC8907, is disabled.
KerberosKeytab	string	<i>read-write</i> (null)	The Base64-encoded Kerberos keytab for this service. A <code>PATCH</code> or <code>PUT</code> operation writes the keytab. This property is <code>null</code> in responses. This property shall contain a Base64-encoded string, with padding characters, of the Kerberos keytab for this service. A <code>PATCH</code> or <code>PUT</code> operation writes the keytab. The value shall be <code>null</code> in responses.
Oem {}	object		See the OEM object definition in the Using this guide clause.
Password	string	<i>read-write</i> (null)	The password for this service. A <code>PATCH</code> or <code>PUT</code> request writes the password. This property is <code>null</code> in responses. This property shall contain the password for this service. A <code>PATCH</code> or <code>PUT</code> operation writes the password. The value shall be <code>null</code> in responses.
Token	string	<i>read-write</i> (null)	The token for this service. A <code>PATCH</code> or <code>PUT</code> operation writes the token. This property is <code>null</code> in responses. This property shall contain the token for this service. A <code>PATCH</code> or <code>PUT</code> operation writes the token. The value shall be <code>null</code> in responses.

Property	Type	Attributes	Notes
Username	string	<i>read-write</i>	The username for the service. This property shall contain the username for this service.
}			
Certificates (v1.1+) {	object		The link to a collection of certificates that the external account provider uses. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that contains certificates the external account provider uses. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
LDAPService {	object		The additional mapping information needed to parse a generic LDAP service. This property shall contain any additional mapping information needed to parse a generic LDAP service. This property should only be present if <code>AccountProviderType</code> is <code>LDAPService</code>.
Oem {}	object		See the OEM object definition in the Using this guide clause.
SearchSettings {	object		The required settings to search an external LDAP service. This property shall contain the required settings to search an external LDAP service.
BaseDistinguishedNames []	array (string, null)	<i>read-write</i>	The base distinguished names to use to search an external LDAP service. This property shall contain an array of base distinguished names to use to search an external LDAP service.
EmailAttribute (v1.7+)	string	<i>read-write</i> (null)	The attribute name that contains the LDAP user's email address. This property shall contain the attribute name that contains the LDAP user's email address. If this value is not set by the user, or the property is not present, the value shall be <code>mail</code>.
GroupNameAttribute	string	<i>read-write</i> (null)	The attribute name that contains the LDAP group name entry. This property shall contain the attribute name that contains the LDAP group name.

Property	Type	Attributes	Notes
GroupsAttribute	string	<i>read-write</i> (null)	The attribute name that contains the groups for a user on the LDAP user entry. This property shall contain the attribute name that contains the groups for an LDAP user entry.
SSHKeyAttribute (v1.4+)	string	<i>read-write</i> (null)	The attribute name that contains the LDAP user's SSH public key entry. This property shall contain the attribute name that contains the LDAP user's SSH public key.
UsernameAttribute	string	<i>read-write</i> (null)	The attribute name that contains the LDAP username entry. This property shall contain the attribute name that contains the LDAP username.
}			
}			
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
OAuth2Service (v1.3+) {	object	(null)	The additional information needed to parse an OAuth 2.0 service. This property shall contain additional information needed to parse an OAuth 2.0 service. This property should only be present inside an <code>OAuth2</code> property.
Audience (v1.3+) []	array (string)	<i>read-only</i>	The allowable audience strings of the Redfish service. This property shall contain an array of allowable RFC7519-defined audience strings of the Redfish service. The values shall uniquely identify the Redfish service. For example, a MAC address or UUID for the manager can uniquely identify the service.
Issuer (v1.3+)	string	<i>read-write</i> (null)	The issuer string of the OAuth 2.0 service. Clients should configure this property if <code>Mode</code> contains <code>Offline</code> . This property shall contain the RFC8414-defined issuer string of the OAuth 2.0 service. If the <code>Mode</code> property contains the value <code>Discovery</code>, this property shall contain the value of the <code>issuer</code> string from the OAuth 2.0 service's metadata and this property shall be read-only. Clients should configure this property if <code>Mode</code> contains <code>Offline</code>.

Property	Type	Attributes	Notes
Mode (v1.3+)	string (enum)	<i>read-write</i>	The mode of operation for token validation. This property shall contain the mode of operation for token validation. <i>For the possible property values, see Mode in Property details.</i>
OAuthServiceSigningKeys (v1.3+)	string	<i>read-write (null)</i>	The Base64-encoded signing keys of the issuer of the OAuth 2.0 service. Clients should configure this property if <code>Mode</code> contains <code>Offline</code>. This property shall contain a Base64-encoded string, with padding characters, of the RFC7517-defined signing keys of the issuer of the OAuth 2.0 service. Services shall verify the token provided in the <code>Authorization</code> header of the request with the value of this property. If the <code>Mode</code> property contains the value <code>Discovery</code>, this property shall contain the keys found at the URI specified by the <code>jwks_uri</code> string from the OAuth 2.0 service's metadata and this property shall be read-only. Clients should configure this property if <code>Mode</code> contains <code>Offline</code>.
Oem (v1.6+) {}	object		See the OEM object definition in the Using this guide clause.
}			
Priority (v1.2+)	integer	<i>read-write (null)</i>	The authentication priority for the external account provider. This property shall contain the assigned priority for the specified external account provider. The value <code>0</code> shall indicate the highest priority. Increasing values shall represent decreasing priority. If an external provider does not have a priority assignment or two or more external providers have the same priority, the behavior shall be determined by the Redfish service. The priority is used to determine the order of authentication and authorization for each external account provider.
RemoteRoleMapping [{	array		The mapping rules to convert the external account providers account information to the local Redfish role. This property shall contain a set of the mapping rules that are used to convert the external account providers account information to the local Redfish role.
LocalAccountTypes (v1.8+) []	array (string (enum))	<i>read-write (null)</i>	- The list of local services in the manager that the remote user or group is allowed to access. - This property shall contain an array of the various local manager services that the remote user or group is allowed to access. This shall not include functionality for receiving events or other notifications. If this property is not supported, the value shall be assumed to be an array that contains the value <code>Redfish</code>. <i>For the possible property values, see LocalAccountTypes in Property details.</i>

Property	Type	Attributes	Notes
LocalOEMAccountTypes (v1.8+) []	array (string, null)	<i>read-write</i>	The OEM account types for the remote user or group. This property shall contain an array of the OEM account types for the remote user or group when <code>LocalAccountTypes</code> contains <code>OEM</code>.
LocalRole	string	<i>read-write (null)</i>	The name of the local Redfish role to which to map the remote user or group. This property shall contain the <code>RoleId</code> property value within a role resource on this Redfish service to which to map the remote user or group.
MFABypass (v1.5+) {	object	(null)	The multi-factor authentication bypass settings. This property shall contain the multi-factor authentication bypass settings.
BypassTypes (v1.12+) []	array (string (enum))	<i>read-write (null)</i>	- The types of multi-factor authentication this account or role mapping is allowed to bypass. - This property shall contain the types of multi-factor authentication this account or role mapping is allowed to bypass. An empty array shall indicate this account or role mapping cannot bypass any multi-factor authentication types that are currently enabled. <i>For the possible property values, see <code>BypassTypes</code> in Property details.</i>
}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
RemoteGroup	string	<i>read-write (null)</i>	The name of the remote group, or the remote role in the case of a Redfish service, that maps to the local Redfish role to which this entity links. This property shall contain the name of the remote group, or the remote role in the case of a Redfish service, that maps to the local Redfish role to which this entity links.
RemoteUser	string	<i>read-write (null)</i>	The name of the remote user that maps to the local Redfish role to which this entity links. This property shall contain the name of the remote user that maps to the local Redfish role to which this entity links.
}]			

Property	Type	Attributes	Notes
Retries (v1.6+)	integer	<i>read-write</i> (null)	The number of times to retry connecting to an address in the <code>ServiceAddresses</code> property before attempting the next address in the array. This property shall contain the number of retries to attempt a connection to an address in the <code>ServiceAddresses</code> property before attempting a connection to the next address in the array or giving up. If this property is not present, the service has internal policies for handling retries.
ServiceAddresses []	array (string, null)	<i>read-write</i>	The addresses of the user account providers to which this external account provider links. The format of this field depends on the type of external account provider. This property shall contain the addresses of the account providers to which this external account provider links. The format of this field depends on the type of external account provider. Each item in the array shall contain a single address. Services can define their own behavior for managing multiple addresses.
ServiceEnabled	boolean	<i>read-write</i> (null)	An indication of whether this service is enabled. This property shall indicate whether this service is enabled.
TACACSplusService (v1.2+) {	object	(null)	The additional information needed to parse a TACACS+ services. This property shall contain additional information needed to parse a TACACS+ services. This property should only be present inside a <code>TACACSplus</code> property.
AuthorizationService (v1.6+)	string	<i>read-write</i>	The TACACS+ service authorization argument. This property shall contain the TACACS+ service authorization argument as defined by section 8.2 of RFC8907. If this property is not present, the service defines the value to provide to the TACACS+ server.
Oem (v1.6+) {}	object		See the OEM object definition in the Using this guide clause.
PasswordExchangeProtocols (v1.2+) []	array (string (enum))	<i>read-write</i> (null)	- Indicates the allowed TACACS+ password exchange protocols. - This property shall indicate all the allowed TACACS+ password exchange protocol described under section 5.4.2 of RFC8907. <i>For the possible property values, see PasswordExchangeProtocols in Property details.</i>

Property	Type	Attributes	Notes
PrivilegeLevelArgument (v1.2+)	string	<i>read-write</i> (null)	Indicates the name of the TACACS+ argument name in an authorization request. This property shall specify the name of the argument in a TACACS+ Authorization REPLY packet body, as defined in RFC8907, that contains the user's privilege level.
}			
TimeoutSeconds (v1.6+)	integer	<i>read-write</i> (null)	The period of time, in seconds, this account service will wait for a response from an address of a user account provider before timing out. This property shall contain the period of time, in seconds, this account service will wait for a response from an address of a user account provider before timing out. If this property is not present, the service has internal policies for handling timeouts.

6.46.4 Property details

6.46.4.1 AccountProviderType

The type of external account provider to which this service connects.

- This property shall contain the type of external account provider to which this service connects.

string	Description
ActiveDirectoryService	An external Active Directory service. The external account provider shall be a Microsoft Active Directory Technical Specification-conformant service. The <code>ServiceAddresses</code> property shall contain fully qualified domain names (FQDN) or NetBIOS names that link to the domain servers for the Active Directory service.
LDAPService	A generic external LDAP service. The external account provider shall be an RFC4511-conformant service. The <code>ServiceAddresses</code> property shall contain RFC3986-defined URIs in the format <code>scheme://host:port</code>, where <code>scheme://</code> and <code>:port</code> are optional, that link to the LDAP servers for the service. If the scheme is not specified, services shall assume it is <code>ldaps://</code>. If the port is not specified, services shall assume it is <code>636</code>. For example, <code>ldaps://contoso.com:636</code> or <code>contoso.com</code>.

string	Description
OAuth2 (v1.3+)	An external OAuth 2.0 service. The external account provider shall be an RFC6749-conformant service. The <code>ServiceAddresses</code> property shall contain RFC3986-defined URIs that correspond to the RFC8414-defined metadata for the OAuth 2.0 service. For example, <code>https://contoso.org/.well-known/oauth-authorization-server</code>.
OEM	An OEM-specific external authentication or directory service.
RedfishService	An external Redfish service. The external account provider shall be a DMTF Redfish Specification-conformant service. The <code>ServiceAddresses</code> property shall contain URIs to <code>AccountService</code> resources that correspond to Redfish services. For example, <code>https://192.168.1.50/redfish/v1/AccountService</code>.
TACACSPplus (v1.3+)	An external TACACS+ service. The external account provider shall be an RFC8907-conformant service. The <code>ServiceAddresses</code> property shall contain RFC3986-defined URIs in the format <code>host:port</code> that correspond to the TACACS+ services.

6.46.4.2 AuthenticationType

The type of authentication used to connect to the external account provider.

- This property shall contain the type of authentication used to connect to the external account provider.

string	Description
KerberosKeytab	A Kerberos keytab.
OEM	An OEM-specific authentication mechanism.
Token	An opaque authentication token.
UsernameAndPassword	A username and password combination.

6.46.4.3 BypassTypes

- The types of multi-factor authentication this account or role mapping is allowed to bypass.
 - This property shall contain the types of multi-factor authentication this account or role mapping is allowed to bypass. An empty array shall indicate this account or role mapping cannot bypass any multi-factor authentication types that are currently enabled.

string	Description
All	Bypass all multi-factor authentication types. This value shall indicate an account or role mapping can bypass all multi-factor authentication types including OEM-defined types.
ClientCertificate	Bypass client certificate authentication. This value shall indicate an account or role mapping can bypass client certificate authentication. Authentication with client certificates is configured with the <code>ClientCertificate</code> property.
GoogleAuthenticator	Bypass Google Authenticator. This value shall indicate an account or role mapping can bypass Google Authenticator. Authentication with Google Authenticator is configured with the <code>GoogleAuthenticator</code> property.
MicrosoftAuthenticator	Bypass Microsoft Authenticator. This value shall indicate an account or role mapping can bypass Microsoft Authenticator. Authentication with Microsoft Authenticator is configured with the <code>MicrosoftAuthenticator</code> property.
OEM	Bypass OEM-defined multi-factor authentication. This value shall indicate an account or role mapping can bypass OEM-defined multi-factor authentication.
OneTimePasscode	Bypass one-time passcode authentication. This value shall indicate an account or role mapping can bypass one-time passcode authentication. Authentication with a one-time passcode is configured with the <code>OneTimePasscode</code> property.
SecurID	Bypass RSA SecurID. This value shall indicate an account or role mapping can bypass RSA SecurID. Authentication with RSA SecurID is configured with the <code>SecurID</code> property.
TimeBasedOneTimePassword	Bypass Time-based One-Time Password (TOTP) authentication. This value shall indicate an account or role mapping can bypass RFC6238-defined Time-based One-Time Password (TOTP) authentication. Authentication with a Time-based One-Time Password is configured with the <code>TimeBasedOneTimePassword</code> property.

6.46.4.4 LocalAccountTypes

- The list of local services in the manager that the remote user or group is allowed to access.
 - This property shall contain an array of the various local manager services that the remote user or group is allowed to access. This shall not include functionality for receiving events or other notifications. If this property is not supported, the value shall be assumed to be an array that contains the value `'Redfish'`.

string	Description
ControlPanel	Allow PIN-based access via an external control panel, such as a keypad, touchscreen, or other human interface. This value shall indicate the account is used to allow PIN-based access via an external control panel. If this value is specified, the <code>AccountTypes</code> property should not contain other values for the same <code>ManagerAccount</code> resource. If this value is specified, <code>Password</code> shall contain the PIN to enable access, and may not follow other password-related rules. The <code>ChangePassword</code> action, if supported, may be used to update the PIN.
HostConsole	Allow access to the host's console, which could be connected through Telnet, SSH, or another protocol. This value shall indicate the account is allowed to access the host console.
IPMI	Allow access to the Intelligent Platform Management Interface service. This value shall indicate the account is allowed to access the Intelligent Platform Management Interface service.
KVMIP	Allow access to a Keyboard-Video-Mouse over IP session. This value shall indicate the account is allowed to access the Keyboard-Video-Mouse over IP session service.
ManagerConsole	Allow access to the manager's console, which could be connected through Telnet, SSH, SM CLP, or another protocol. This value shall indicate the account is allowed to access the manager console.
OEM	OEM account type. See the <code>OEMAccountTypes</code> property. This value shall indicate the account is allowed to access the services listed in the <code>OEMAccountTypes</code> property.
Redfish	Allow access to the Redfish service. This value shall indicate the account is allowed to access Redfish services. If the version of the <code>ManagerAccount</code> resource is lower than the schema version when another enumeration value in this list was added, the implementation may include that functionality as part of the <code>Redfish</code> value.
SNMP	Allow access to SNMP services. This value shall indicate the account is allowed to access SNMP services.
VirtualMedia	Allow access to control virtual media. This value shall indicate the account is allowed to control virtual media.

string	Description
WebUI	Allow access to a web user interface session, such as a graphical interface or another web-based protocol. This value shall indicate the account is allowed to access the web interface.

6.46.4.5 Mode

The mode of operation for token validation.

- This property shall contain the mode of operation for token validation.

string	Description
Discovery	OAuth 2.0 service information for token validation is downloaded by the service. This value shall indicate the service performs token validation from information found at the URIs specified by the <code>ServiceAddresses</code> property. Services shall implement a caching method of this information so it's not necessary to retrieve metadata and key information for every request containing a token.
Offline	OAuth 2.0 service information for token validation is configured by a client. Clients should configure the <code>Issuer</code> and <code>OAuthServiceSigningKeys</code> properties for this mode. This value shall indicate the service performs token validation from properties configured by a client. Clients should configure the <code>Issuer</code> and <code>OAuthServiceSigningKeys</code> properties for this mode.

6.46.4.6 PasswordExchangeProtocols

- Indicates the allowed TACACS+ password exchange protocols.
 - This property shall indicate all the allowed TACACS+ password exchange protocol described under section 5.4.2 of RFC8907.

string	Description
ASCII	The ASCII Login method. This value shall indicate the ASCII Login flow as described under section 5.4.2 of RFC8907.
CHAP	The CHAP Login method. This value shall indicate the CHAP Login flow as described under section 5.4.2 of RFC8907.

string	Description
MSCHAPv1	The MS-CHAP v1 Login method. This value shall indicate the MS-CHAP v1 Login flow as described under section 5.4.2 of RFC8907.
MSCHAPv2	The MS-CHAP v2 Login method. This value shall indicate the MS-CHAP v2 Login flow as described under section 5.4.2 of RFC8907.
PAP	The PAP Login method. This value shall indicate the PAP Login flow as described under section 5.4.2 of RFC8907.

6.46.5 Example response

```
{
  "@odata.type": "#ExternalAccountProvider.v1_8_1.ExternalAccountProvider",
  "Id": "ExternalRedfishService",
  "Name": "Remote Redfish Service",
  "Description": "Remote Redfish Service providing additional Accounts to this Redfish Service",
  "AccountProviderType": "RedfishService",
  "ServiceAddresses": [
    "https://redfish.contoso.org/redfish/v1/AccountService"
  ],
  "Authentication": {
    "AuthenticationType": "Token",
    "Token": null
  },
  "RemoteRoleMapping": [
    {
      "RemoteGroup": "Admin",
      "LocalRole": "Administrator"
    },
    {
      "RemoteGroup": "Operator",
      "LocalRole": "Operator"
    },
    {
      "RemoteGroup": "ReadOnly",
      "LocalRole": "ReadOnly"
    }
  ],
  "@odata.id": "/redfish/v1/AccountService/ExternalAccountProviders/ExternalRedfishService"
}
```

6.47 Fabric 1.4.0

Version	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2025.2	2022.1	2020.3	2019.4	2016.2

6.47.1 Description

The `Fabric` schema represents a simple fabric consisting of one or more switches, zero or more endpoints, and zero or more zones.

- This resource shall represent a simple switchable fabric for a Redfish implementation.

6.47.2 URIs

/redfish/v1/Fabrics/{FabricId}

6.47.3 Properties

Property	Type	Attributes	Notes
AddressPools (v1.1+) {	object		The collection of links to the address pools that this fabric contains. This property shall contain a link to a resource collection of type <code>AddressPoolCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>AddressPool</i> . See the AddressPool schema for details.
}			
Connections (v1.2+) {	object		The collection of links to the connections that this fabric contains. This property shall contain a link to a resource collection of type <code>ConnectionCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Connection</i> . See the Connection schema for details.
}			

Property	Type	Attributes	Notes
EndpointGroups (v1.2+) {	object		The collection of links to the endpoint groups that this fabric contains. This property shall contain a link to a resource collection of type <code>EndpointGroupCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>EndpointGroup</i> . See the EndpointGroup schema for details.
}			
Endpoints {	object		The collection of links to the endpoints that this fabric contains. This property shall contain a link to a resource collection of type <code>EndpointCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Endpoint</i> . See the Endpoint schema for details.
}			
FabricType	string (enum)	<i>read-only</i> (null)	The protocol being sent over this fabric. This property shall contain the type of fabric being represented by this simple fabric. <i>For the possible property values, see FabricType in Property details.</i>
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
ManagedBy (v1.4+) [{	array		An array of links to the managers responsible for managing this fabric. This property shall contain an array of links to resources of type <code>Manager</code> that represent the managers responsible for managing this fabric.
@odata.id	string	<i>read-only</i>	Link to a Manager resource. See the Links section and the <i>Manager</i> schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
MaxZones	integer	<i>read-only</i> (null)	The maximum number of zones the switch can currently configure. This property shall contain the maximum number of zones the switch can currently configure. Changes in the logical or physical configuration of the system can change this value.

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
Switches {	object		The collection of links to the switches that this fabric contains. This property shall contain a link to a resource collection of type <code>SwitchCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Switch</i> . See the Switch schema for details.
}			
UUID (v1.3+)	string (uuid)	<i>read-write</i> (null)	The UUID for this fabric. This property shall contain a universally unique identifier number for the fabric. Pattern: <code>^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\$</code>
Zones {	object		The collection of links to the zones that this fabric contains. This property shall contain a link to a resource collection of type <code>ZoneCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Zone</i> . See the Zone schema for details.
}			

6.47.4 Property details

6.47.4.1 FabricType

The protocol being sent over this fabric.

- This property shall contain the type of fabric being represented by this simple fabric.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.

string	Description
CXL	Compute Express Link. This value shall indicate conformance to the Compute Express Link Specification.
DisplayPort	DisplayPort. This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
eMMC	Embedded MultiMediaCard (e.MMC). This value shall indicate conformance to the JEDEC JESD84-B51A specification.
Ethernet	Ethernet. This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	Fibre CONnection (FICON). This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).
GenZ	GenZ. This value shall indicate conformance to the Gen-Z Core Specification.

string	Description
HDMI	HDMI. This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.
NVLink	NVLink. This value shall indicate conformance to the NVIDIA NVLink protocol.

string	Description
NVMe	Non-Volatile Memory Express (NVMe). This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. This value shall indicate conformance to an OEM-specific architecture, and the OEM section may include additional information.
PCIe	PCI Express. This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
QPI	Intel QuickPath Interconnect (QPI). This value shall indicate conformance to the Intel QuickPath Interconnect (QPI) protocol.
RoCE	RDMA over Converged Ethernet Protocol. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial ATA Attachment. This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.

string	Description
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UET	Ultra Ethernet Transport. This value shall indicate conformance to the Ultra Ethernet specifications.
UHCI	Universal Host Controller Interface (UHCI). This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
UPI	Intel UltraPath Interconnect (UPI). This value shall indicate conformance to the Intel UltraPath Interconnect (UPI) protocol.
USB	Universal Serial Bus (USB). This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. This value shall indicate conformance to the VESA SVGA Specification.

6.47.5 Example response

```
{
```

```
"@odata.type": "#Fabric.v1_4_0.Fabric",
"Id": "SAS",
"Name": "SAS Fabric",
"FabricType": "SAS",
"Description": "A SAS Fabric with redundant switches connected to two initiators",
"Status": {
  "State": "Enabled",
  "Health": "OK"
},
"Zones": {
  "@odata.id": "/redfish/v1/Fabrics/SAS/Zones"
},
"Endpoints": {
  "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints"
},
"Switches": {
  "@odata.id": "/redfish/v1/Fabrics/SAS/Switches"
},
"@odata.id": "/redfish/v1/Fabrics/SAS"
}
```

6.48 FabricAdapter 1.5.3

Version	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2022.3	2022.2	2022.1	2021.3	2021.2	2019.4

6.48.1 Description

A fabric adapter represents the physical fabric adapter capable of connecting to an interconnect fabric. Examples include, but are not limited to, Ethernet, NVMe over Fabrics, Gen-Z, and SAS fabric adapters.

- This resource shall represent a physical fabric adapter capable of connecting to an interconnect fabric.

6.48.2 URIs

/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}
/redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}

6.48.3 Properties

Property	Type	Attributes	Notes
ASICManufacturer	string	<i>read-only</i> (null)	The manufacturer name for the ASIC of this fabric adapter. This property shall contain the manufacturer name of the ASIC for the fabric adapter as defined by the manufacturer.
ASICPartNumber	string	<i>read-only</i> (null)	The part number for the ASIC on this fabric adapter. This property shall contain the part number of the ASIC for the fabric adapter as defined by the manufacturer.
ASICRevisionIdentifier	string	<i>read-only</i> (null)	The revision identifier for the ASIC on this fabric adapter. This property shall contain the revision identifier of the ASIC for the fabric adapter as defined by the manufacturer.
FabricType (v1.3+)	string (enum)	<i>read-write</i>	The configured fabric type of this fabric adapter. This property shall contain the configured fabric type of this fabric adapter. <i>For the possible property values, see FabricType in Property details.</i>
FabricTypeCapabilities (v1.3+) []	array (string (enum))	<i>read-only</i>	- An array of fabric types supported by this fabric adapter. - This property shall contain an array of fabric types supported by this fabric adapter. <i>For the possible property values, see FabricTypeCapabilities in Property details.</i>
FirmwareVersion	string	<i>read-only</i> (null)	The firmware version of this fabric adapter. This property shall contain the firmware version for the fabric adapter as defined by the manufacturer.
GenZ {	object		The Gen-Z specific properties for this fabric adapter. This property shall contain the Gen-Z specific properties for this fabric adapter.
MSDT {	object		The Multi Subnet Destination Table for the component. This property shall contain a link to a resource collection of type <code>RouteEntryCollection</code> that represents the Gen-Z Core Specification-defined MSDT structure. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>RouteEntry</i> . See the <i>RouteEntry</i> schema for details.
}			

Property	Type	Attributes	Notes
PIDT []	array (string, null)	<i>read-write</i>	An array of table entry values for the Packet Injection Delay Table. This property shall contain an array of table entry values for the Gen-Z Core Specification-defined Packet Injection Delay Table for the component.
RequestorVCAT {	object		The Requestor Virtual Channel Action Table for the component. This property shall contain a link to a resource collection of type <code>VCATEntryCollection</code> that represents the Gen-Z Core Specification-defined REQ-VCAT structure. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <code>VCATEntry</code> . See the <code>VCATEntry</code> schema for details.
}			
ResponderVCAT {	object		The Responder Virtual Channel Action Table for the component. This property shall contain a link to a resource collection of type <code>VCATEntryCollection</code> that represents the Gen-Z Core Specification-defined RSP-VCAT structure. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <code>VCATEntry</code> . See the <code>VCATEntry</code> schema for details.
}			
RITable []	array (string, null)	<i>read-write</i>	An array of table entry values for the Responder Interface Table. This property shall contain an array of table entry values for the Gen-Z Core Specification-defined Responder Interface Table for the component.
SSDT {	object		The Single Subnet Destination Table for the component. This property shall contain a link to a resource collection of type <code>RouteEntryCollection</code> that represents the Gen-Z Core Specification-defined SSDT structure. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <code>RouteEntry</code> . See the <code>RouteEntry</code> schema for details.
}			
}			
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.

Property	Type	Attributes	Notes
Endpoints [{	array		An array of links to the endpoints that represent the logical fabric connection to this fabric adapter. This property shall contain an array of links to resources of type <code>Endpoint</code> that represent the logical fabric connections associated with this fabric adapter.
@odata.id	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}]			
MemoryDomains (v1.3+) [{	array		An array of links to the memory domains associated with this fabric adapter. This property shall contain an array of links to resources of type <code>MemoryDomain</code> that represent the memory domains associated with this fabric adapter.
@odata.id	string	<i>read-write</i>	Link to a MemoryDomain resource. See the Links section and the <i>MemoryDomain</i> schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCleDevices (v1.2+) [{	array		An array of links to the PCIe devices associated with this fabric adapter. This property shall contain an array of links to resources of type <code>PCleDevice</code> that represent the PCIe devices associated with this fabric adapter.
@odata.id	string	<i>read-only</i>	Link to a PCleDevice resource. See the Links section and the <i>PCleDevice</i> schema for details.
}]			
Processors (v1.5+) [{	array		An array of links to the processors that this fabric adapter provides to a fabric. This property shall contain an array of links to resources of type <code>Processor</code> that represent the processors that this fabric adapter provides to a fabric.
@odata.id	string	<i>read-only</i>	Link to a Processor resource. See the Links section and the <i>Processor</i> schema for details.
}]			
}			
Location (v1.1+) {}	object		The location of the fabric adapter. This property shall contain the location information of the fabric adapter. For property details, see Location.

Property	Type	Attributes	Notes
LocationIndicatorActive (v1.4+)	boolean	<i>read-write</i> (null)	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource.
Manufacturer	string	<i>read-only</i> (null)	The manufacturer or OEM of this fabric adapter. This property shall contain a value that represents the manufacturer of the fabric adapter.
Model	string	<i>read-only</i> (null)	The model string for this fabric adapter. This property shall contain the information about how the manufacturer refers to this fabric adapter.
PartNumber	string	<i>read-only</i> (null)	The part number for this fabric adapter. This property shall contain the part number for the fabric adapter as defined by the manufacturer.
PCleInterface {	object		The PCIe interface details for this fabric adapter. This property shall contain details on the PCIe interface that connects this PCIe-based fabric adapter to its host.
LanesInUse (v1.3+)	integer	<i>read-only</i> (null)	The number of PCIe lanes in use by this device. This property shall contain the number of PCIe lanes in use by this device, which shall be equal to or less than the <code>MaxLanes</code> property value.
MaxLanes (v1.3+)	integer	<i>read-only</i> (null)	The number of PCIe lanes supported by this device. This property shall contain the maximum number of PCIe lanes supported by this device.
MaxPCleType (v1.3+)	string (enum)	<i>read-only</i> (null)	The highest version of the PCIe specification supported by this device. This property shall contain the maximum PCIe specification that this device supports. <i>For the possible property values, see <code>MaxPCleType</code> in Property details.</i>
Oem (v1.3+) {}	object		See the OEM object definition in the Using this guide clause.
PCleType (v1.3+)	string (enum)	<i>read-only</i> (null)	The version of the PCIe specification in use by this device. This property shall contain the negotiated PCIe interface version in use by this device. <i>For the possible property values, see <code>PCleType</code> in Property details.</i>

Property	Type	Attributes	Notes
}			
Ports {	object		The link to the collection of ports that exist on the fabric adapter. This property shall contain a link to a resource collection of type <code>PortCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Port</i> . See the Port schema for details.
}			
SerialNumber	string	<i>read-only</i> (null)	The serial number for this fabric adapter. This property shall contain the serial number for the fabric adapter.
SKU	string	<i>read-only</i> (null)	The manufacturer SKU for this fabric adapter. This property shall contain the SKU for the fabric adapter.
SparePartNumber	string	<i>read-only</i> (null)	The spare part number for this fabric adapter. This property shall contain the spare part number for the fabric adapter as defined by the manufacturer.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
UUID	string (uuid)	<i>read-only</i> (null)	The UUID for this fabric adapter. This property shall contain a universally unique identifier number for the fabric adapter. Pattern: <code>^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\$</code>

6.48.4 Property details

6.48.4.1 FabricType

The configured fabric type of this fabric adapter.

- This property shall contain the configured fabric type of this fabric adapter.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
CXL	Compute Express Link. This value shall indicate conformance to the Compute Express Link Specification.
DisplayPort	DisplayPort. This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
eMMC	Embedded MultiMediaCard (e.MMC). This value shall indicate conformance to the JEDEC JESD84-B51A specification.
Ethernet	Ethernet. This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	Fibre CONnection (FICON). This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).

string	Description
GenZ	GenZ. This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.

string	Description
NVLink	NVLink. This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. This value shall indicate conformance to an OEM-specific architecture, and the OEM section may include additional information.
PCIe	PCI Express. This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
QPI	Intel QuickPath Interconnect (QPI). This value shall indicate conformance to the Intel QuickPath Interconnect (QPI) protocol.
RoCE	RDMA over Converged Ethernet Protocol. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.

string	Description
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UET	Ultra Ethernet Transport. This value shall indicate conformance to the Ultra Ethernet specifications.
UHCI	Universal Host Controller Interface (UHCI). This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
UPI	Intel UltraPath Interconnect (UPI). This value shall indicate conformance to the Intel UltraPath Interconnect (UPI) protocol.
USB	Universal Serial Bus (USB). This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. This value shall indicate conformance to the VESA SVGA Specification.

6.48.4.2 FabricTypeCapabilities

- An array of fabric types supported by this fabric adapter.
 - This property shall contain an array of fabric types supported by this fabric adapter.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
CXL	Compute Express Link. This value shall indicate conformance to the Compute Express Link Specification.
DisplayPort	DisplayPort. This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
eMMC	Embedded MultiMediaCard (e.MMC). This value shall indicate conformance to the JEDEC JESD84-B51A specification.
Ethernet	Ethernet. This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	Fibre CONnection (FICON). This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).

string	Description
GenZ	GenZ. This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.

string	Description
NVLink	NVLink. This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. This value shall indicate conformance to an OEM-specific architecture, and the OEM section may include additional information.
PCIe	PCI Express. This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
QPI	Intel QuickPath Interconnect (QPI). This value shall indicate conformance to the Intel QuickPath Interconnect (QPI) protocol.
RoCE	RDMA over Converged Ethernet Protocol. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.

string	Description
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UET	Ultra Ethernet Transport. This value shall indicate conformance to the Ultra Ethernet specifications.
UHCI	Universal Host Controller Interface (UHCI). This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
UPI	Intel UltraPath Interconnect (UPI). This value shall indicate conformance to the Intel UltraPath Interconnect (UPI) protocol.
USB	Universal Serial Bus (USB). This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. This value shall indicate conformance to the VESA SVGA Specification.

6.48.4.3 MaxPCleType

The highest version of the PCIe specification supported by this device.

- This property shall contain the maximum PCIe specification that this device supports.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.
Gen6 (v1.16+)	A PCIe v6.0 slot.

6.48.4.4 PCIeType

The version of the PCIe specification in use by this device.

- This property shall contain the negotiated PCIe interface version in use by this device.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.
Gen6 (v1.16+)	A PCIe v6.0 slot.

6.48.5 Example response

```

{
  "@odata.type": "#FabricAdapter.v1_5_3.FabricAdapter",
  "Id": "Bridge",
  "Name": "Gen-Z Bridge",
  "Manufacturer": "Contoso",
  "Model": "Gen-Z Bridge Model X",
  "PartNumber": "975999-001",
  "SparePartNumber": "152111-A01",
  "SKU": "Contoso 2-port Gen-Z Bridge",
  "SerialNumber": "2M220100SL",

```

```

    "ASICRevisionIdentifier": "A0",
    "ASICPartNumber": "53312",
    "ASICManufacturer": "Contoso",
    "FirmwareVersion": "7.4.10",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Ports": {
        "@odata.id": "/redfish/v1/Systems/GenZ-example/FabricAdapters/1/Ports"
    },
    "PCIeInterface": {
        "MaxPCIeType": "Gen4",
        "MaxLanes": 64,
        "PCIeType": "Gen4",
        "LanesInUse": 64
    },
    "UUID": "45724775-ed3b-2214-1313-9865200c1cc1",
    "Links": {
        "Endpoints": [
            {
                "@odata.id": "/redfish/v1/Fabrics/GenZ/Endpoints/3"
            }
        ]
    },
    "GenZ": {
        "SSDT": {
            "@odata.id": "/redfish/v1/Systems/GenZ-example/FabricAdapters/1/SSDT"
        },
        "MSDT": {
            "@odata.id": "/redfish/v1/Systems/GenZ-example/FabricAdapters/1/MSDT"
        },
        "RequestorVCAT": {
            "@odata.id": "/redfish/v1/Systems/GenZ-example/FabricAdapters/1/REQ-VCAT"
        },
        "ResponderVCAT": {
            "@odata.id": "/redfish/v1/Systems/GenZ-example/FabricAdapters/1/RSP-VCAT"
        },
        "RITable": [
            "0x12",
            "0x3E",
            "0x12",
            "0x3E",
            "0x12",
            "0x3E",
            "0x12",
            "0x3E",
            "0x12",
            "0x3E",
            "0x12",
            "0x3E",
            "0x12",
            "0x3E",
            "0x12"
        ]
    }
}

```

6.49 Facility 1.4.2

Version 2025.2

Release	2023.1	2021.3	2021.2	2020.4	2019.4

6.49.1 Description

The `Facility` schema represents the physical location containing equipment, such as a room, building, or campus.

- This resource shall be used to represent a location containing equipment, such as a room, building, or campus, for a Redfish implementation.

6.49.2 URIs

/redfish/v1/Facilities/{FacilityId}

6.49.3 Properties

Property	Type	Attributes	Notes
AmbientMetrics (v1.1+) {	object		The link to the ambient environment metrics for this facility. This property shall contain a link to a resource of type <code>EnvironmentMetrics</code> that specifies the outdoor environment metrics for this facility. See the <i>EnvironmentMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>EnvironmentMetrics</i> resource. See the Links section and the <i>EnvironmentMetrics</i> schema for details.
}			
EnvironmentMetrics (v1.1+) {	object		The link to the environment metrics for this facility. This property shall contain a link to a resource of type <code>EnvironmentMetrics</code> that specifies the environment metrics for this facility. See the <i>EnvironmentMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>EnvironmentMetrics</i> resource. See the Links section and the <i>EnvironmentMetrics</i> schema for details.
}			
FacilityType	string (enum)	<i>read-only required</i>	The type of location this resource represents. This property shall contain the type of location this resource represents. For the possible property values, see <i>FacilityType</i> in Property details.

Property	Type	Attributes	Notes
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
CDUs (v1.4+) [{	array		An array of links to the coolant distribution units in this facility. The value of this property shall contain an array of links to resources of type <code>CoolingUnit</code> that represent the coolant distribution units in this facility.
@odata.id	string	<i>read-write</i>	Link to a CoolingUnit resource. See the Links section and the <i>CoolingUnit</i> schema for details.
}]			
ContainedByFacility {	object		The link to the facility that contains this facility. This property shall contain a link to a resource of type <code>Facility</code> that represents the facility that contains this facility.
@odata.id	string	<i>read-write</i>	Link to another Facility resource.
}			
ContainsChassis [{	array		An array of links to the outermost chassis contained within this facility. The value of this property shall be an array of links to resources of type <code>Chassis</code> that represent the outermost chassis that this facility contains. This array shall only contain chassis instances that do not include a <code>ContainedBy</code> property within the <code>Links</code> property. That is, only chassis instances that are not contained by another chassis.
@odata.id	string	<i>read-write</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.
}]			
ContainsFacilities [{	array		An array of links to other facilities contained within this facility. The value of this property shall be an array of links to resources of type <code>Facility</code> that represent the facilities that this facility contains.
@odata.id	string	<i>read-write</i>	Link to another Facility resource.
}]			
CoolingLoops (v1.4+) [{	array		An array of links to the cooling loops in this facility. The value of this property shall contain an array of links to resources of type <code>CoolingLoop</code> that represent the cooling loops in this facility.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-write</i>	Link to a CoolingLoop resource. See the Links section and the <i>CoolingLoop</i> schema for details.
}}			
ElectricalBuses (v1.3+) [{	array		An array of links to the electrical buses in this facility. The value of this property shall contain an array of links to resources of type <i>PowerDistribution</i> that represent the electrical buses in this facility.
@odata.id	string	<i>read-write</i>	Link to a PowerDistribution resource. See the Links section and the <i>PowerDistribution</i> schema for details.
}}			
FloorPDUs [{	array		An array of links to the floor power distribution units in this facility. The value of this property shall be an array of links to resources of type <i>PowerDistribution</i> that represent the floor power distribution units in this facility.
@odata.id	string	<i>read-write</i>	Link to a PowerDistribution resource. See the Links section and the <i>PowerDistribution</i> schema for details.
}}			
ImmersionUnits (v1.4+) [{	array		An array of links to the immersion cooling units in this facility. The value of this property shall contain an array of links to resources of type <i>CoolingUnit</i> that represent the immersion cooling units in this facility.
@odata.id	string	<i>read-write</i>	Link to a CoolingUnit resource. See the Links section and the <i>CoolingUnit</i> schema for details.
}}			
ManagedBy [{	array		An array of links to the managers responsible for managing this facility. The value of this property shall be an array of links to resources of type <i>Manager</i> that represent the managers that manager this facility.
@odata.id	string	<i>read-only</i>	Link to a Manager resource. See the Links section and the <i>Manager</i> schema for details.
}}			
Oem {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
PowerShelves (v1.2+) [{	array		An array of links to the power shelves in this facility. The value of this property shall be an array of links to resources of type <code>PowerDistribution</code> that represent the power shelves in this facility.
@odata.id	string	<i>read-write</i>	Link to a <code>PowerDistribution</code> resource. See the Links section and the <code>PowerDistribution</code> schema for details.
}]			
RackPDUs [{	array		An array of links to the rack-level power distribution units in this facility. The value of this property shall be an array of links to resources of type <code>PowerDistribution</code> that represent the rack-level power distribution units in this facility.
@odata.id	string	<i>read-write</i>	Link to a <code>PowerDistribution</code> resource. See the Links section and the <code>PowerDistribution</code> schema for details.
}]			
Switchgear [{	array		An array of links to the switchgear in this facility. The value of this property shall be an array of links to resources of type <code>PowerDistribution</code> that represent the switchgear in this facility.
@odata.id	string	<i>read-write</i>	Link to a <code>PowerDistribution</code> resource. See the Links section and the <code>PowerDistribution</code> schema for details.
}]			
TransferSwitches [{	array		An array of links to the transfer switches in this facility. The value of this property shall be an array of links to resources of type <code>PowerDistribution</code> that represent the transfer switches in this facility.
@odata.id	string	<i>read-write</i>	Link to a <code>PowerDistribution</code> resource. See the Links section and the <code>PowerDistribution</code> schema for details.
}]			
}			
Location {}	object		The location of the facility. This property shall contain the location information of the associated facility. For property details, see <code>Location</code> .

Property	Type	Attributes	Notes
PowerDomains {	object		Link to the power domains in this facility. This property shall contain a link to a resource collection of type <code>PowerDomainCollection</code> that contains the power domains associated with this facility. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>PowerDomain</i> . See the <i>PowerDomain</i> schema for details.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <i>Status</i> .

6.49.4 Property details

6.49.4.1 FacilityType

The type of location this resource represents.

- This property shall contain the type of location this resource represents.

string	Description
Building	A structure with a roof and walls.
Floor	A floor inside of a building.
Room	A room inside of a building or floor.
Site	A small area consisting of several buildings.

6.49.5 Example response

```
{
  "@odata.type": "#Facility.v1_4_2.Facility",
  "Id": "Room237",
  "Name": "Room #237, 2nd Floor",
  "FacilityType": "Room",
  "Status": {
    "State": "Enabled",
```

```

        "Health": "OK"
    },
    "Location": {
        "PhysicalAddress": {
            "Country": "US",
            "StateOrProvince": "Oregon",
            "City": "Portland",
            "StreetAddress": "1001 SW 5th Avenue",
            "PostalCode": "97204",
            "ISOCountryCode": "USA",
            "ISOSubdivisionCode": "OR"
        }
    },
    "PowerDomains": {
        "@odata.id": "/redfish/v1/Facilities/Room237/PowerDomains"
    },
    "Links": {
        "ContainedByFacility": {
            "@odata.id": "/redfish/v1/Facilities/Building"
        },
        "RackPDUs": [
            {
                "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1"
            }
        ]
    },
    "@odata.id": "/redfish/v1/Facilities/Room237"
}

```

6.50 Fan 1.5.2

Version	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2023.2	2023.1	2022.2	2022.1	2021.1	2020.4

6.50.1 Description

The `Fan` schema describes a cooling fan unit for a computer system or similar devices contained within a chassis. It also describes the location, such as a slot, socket, or bay, where a unit can be installed, by populating a resource instance with an absent state if a unit is not present.

- This resource shall represent a cooling fan for a Redfish implementation. It may also represent a location, such as a slot, socket, or bay, where a unit may be installed, but the `State` property within the `Status` property contains `Absent`.

6.50.2 URIs

/redfish/v1/Chassis/{ChassisId}/ThermalSubsystem/Fans/{FanId}

6.50.3 Properties

Property	Type	Attributes	Notes
Assembly {	object		The link to the assembly associated with this fan. This property shall contain a link to a resource of type <code>Assembly</code>. See the <i>Assembly</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>Assembly</i> resource. See the Links section and the <i>Assembly</i> schema for details.
}			
FanDiameterMm (v1.4+)	integer (mm)	<i>read-only</i> (null)	The diameter of the fan assembly in millimeter units. This property shall contain the diameter of the fan assembly in millimeter units.
HotPluggable	boolean	<i>read-only</i> (null)	An indication of whether this device can be inserted or removed while the equipment is in operation. This property shall indicate whether the device can be inserted or removed while the underlying equipment otherwise remains in its current operational state. Hot-pluggable devices can become operable without altering the operational state of the underlying equipment. Devices that cannot be inserted or removed from equipment in operation, or devices that cannot become operable without affecting the operational state of that equipment, shall not be hot-pluggable.
Links (v1.2+) {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
CoolingChassis (v1.2+) [{	array		An array of links to the chassis that are directly cooled by this fan. This property shall contain an array of links to resources of type <code>Chassis</code> that represent the chassis directly cooled by this fan. This property shall not be present if the fan is only providing cooling to its containing chassis.
@odata.id	string	<i>read-only</i>	Link to a <i>Chassis</i> resource. See the Links section and the <i>Chassis</i> schema for details.

Property	Type	Attributes	Notes
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
Location {}	object		The location of the fan. This property shall contain the location information of this fan. For property details, see Location.
LocationIndicatorActive	boolean	<i>read-write</i> (null)	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource.
Manufacturer	string	<i>read-only</i> (null)	The manufacturer of this fan. This property shall contain the name of the organization responsible for producing the fan. This organization may be the entity from whom the fan is purchased, but this is not necessarily true.
Model	string	<i>read-only</i> (null)	The model number for this fan. This property shall contain the model information as defined by the manufacturer for this fan.
PartNumber	string	<i>read-only</i> (null)	The part number for this fan. This property shall contain the part number as defined by the manufacturer for this fan.
PhysicalContext	string (enum)	<i>read-only</i>	The area or device associated with this fan. This property shall contain a description of the affected device or region within the chassis with which this fan is associated. For the possible property values, see <i>PhysicalContext</i> in <i>Property details</i>.
PowerWatts (v1.1+) {	object (excerpt)		Power consumption (W). This property shall contain the total power, in watt units, for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Power</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.

Property	Type	Attributes	Notes
ApparentVA	number (V.A)	<i>read-only (null)</i>	The product of voltage and current for an AC circuit, in volt-ampere units. This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
DataSourceUri	string (URI)	<i>read-only (null)</i>	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
PhaseAngleDegrees (v1.5+)	number	<i>read-only (null)</i>	The phase angle (degrees) between the current and voltage waveforms. This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>Power</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
PowerFactor	number	<i>read-only (null)</i>	The power factor for this sensor. This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. <code>PowerFactor</code> is expressed in unit-less 1/100ths. This property can appear in sensors containing a <code>ReadingType</code> value of <code>Power</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
ReactiveVAR	number (V.A)	<i>read-only (null)</i>	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
Reading	number	<i>read-only (null)</i>	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			
Replaceable (v1.3+)	boolean	<i>read-only (null)</i>	An indication of whether this component can be independently replaced as allowed by the vendor's replacement policy. This property shall indicate whether this component can be independently replaced as allowed by the vendor's replacement policy. A value of <code>false</code> indicates the component needs to be replaced by policy as part of another component. If the <code>LocationType</code> property of this component contains <code>Embedded</code>, this property shall contain <code>false</code>.

Property	Type	Attributes	Notes
SecondarySpeedPercent (v1.5+) {	object (excerpt)		The fan speed (percent) of the second rotor in a multi-rotor fan. This property shall contain the fan speed, in percent units, for the secondary rotor of this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Percent</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
SpeedRPM (v1.2+)	number ({rev}/min)	<i>read-only</i> (null)	The rotational speed. This property shall contain a reading of the rotational speed of the device in revolutions per minute (RPM) units.
}			
SerialNumber	string	<i>read-only</i> (null)	The serial number for this fan. This property shall contain the serial number as defined by the manufacturer for this fan.
SparePartNumber	string	<i>read-only</i> (null)	The spare part number for this fan. This property shall contain the spare or replacement part number as defined by the manufacturer for this fan.
SpeedPercent {	object (excerpt)		The fan speed (percent). This property shall contain the fan speed, in percent units, for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Percent</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.

Property	Type	Attributes	Notes
Reading	number	<i>read-only</i> (<i>null</i>)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
SpeedRPM (v1.2+)	number ({rev}/min)	<i>read-only</i> (<i>null</i>)	The rotational speed. This property shall contain a reading of the rotational speed of the device in revolutions per minute (RPM) units.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

6.50.4 Property details

6.50.4.1 PhysicalContext

The area or device associated with this fan.

- This property shall contain a description of the affected device or region within the chassis with which this fan is associated.

string	Description
Accelerator	An accelerator.
ACInput	An AC electrical input or input-related circuit.
ACMaintenanceBypassInput	An AC electrical maintenance bypass input.
ACOutput	An AC electrical output or output-related circuit. This value shall indicate an electrical output or an output-related circuit, such as a branch output, which is not terminated as a power outlet.
ACStaticBypassInput	An AC electrical static bypass input.

string	Description
ACUtilityInput	An AC electrical utility input. This value shall indicate an electrical input, where the source is an electrical utility as opposed to a backup or locally-generated power source. This value is intended to differentiate multiple electrical inputs between utility, maintenance bypass, or static bypass values. For general purpose usage, the value of <code>ACInput</code> is preferred.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	A compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC electrical bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	An expansion bay. This value shall indicate a location that provides for the expansion of functionality of a system, such as a PCIe slot that can accept an option card.
ExpansionSubsystem	A group of expansion bays. This value shall indicate a group of expansion bays and the devices installed in those bays.
Fan	A fan.
Filter	A filter.
FPGA	An FPGA.
Front	The front of the chassis.

string	Description
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Manager	A management controller, such as a BMC (baseboard management controller).
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	A networking bay. This value shall indicate a location that provides for the expansion of networking functionality of a system, by the addition of networking devices.
NetworkingDevice	A networking device.
PowerOutlet	An electrical outlet. This value shall indicate an electrical outlet or receptacle.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	A power supply bay. This value shall indicate a location that provides for the installation of a power supply or similar devices.
Pump	A pump.
Rectifier	A rectifier device.
Reservoir	A reservoir.
Room	The room.

string	Description
StorageBay	A storage bay. This value shall indicate a location that provides for the expansion of storage functionality of a system, by the addition of storage devices.
StorageDevice	A storage device.
StorageSubsystem	A storage subsystem. This value shall indicate a storage subsystem, which may consist of one or more storage controllers, storage devices, or related components.
Switch	A switch device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.50.5 Example response

```
{
  "@odata.type": "#Fan.v1_5_2.Fan",
  "Id": "Bay1",
  "Name": "Fan Bay 1",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "PhysicalContext": "Chassis",
  "Model": "RKS-440DC",
  "Manufacturer": "Contoso Fans",
  "PartNumber": "23456-133",
  "SparePartNumber": "93284-133",
  "LocationIndicatorActive": true,
  "HotPluggable": true,
  "SpeedPercent": {
    "Reading": 45,
```

```
      "SpeedRPM": 2200,
      "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/FanBay1"
    },
    "Location": {
      "PartLocation": {
        "ServiceLabel": "Chassis Fan Bay 1",
        "LocationType": "Bay",
        "LocationOrdinalValue": 0
      }
    },
    "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/Fans/Bay1"
  }
}
```

6.51 Filter 1.1.0

Version	v1.1	v1.0
Release	2025.2	2023.1

6.51.1 Description

The `Filter` schema describes a filter unit for a cooling system or similar device.

- This resource shall represent the management properties for monitoring and management of filters for a Redfish implementation.

6.51.2 URIs

`/redfish/v1/Chassis/{ChassisId}/ThermalSubsystem/Filters/{FilterId}`
`/redfish/v1/Chassis/{ChassisId}/ThermalSubsystem/Pumps/{PumpId}/Filters/{FilterId}`
`/redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/Filters/{FilterId}`
`/redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/Pumps/{PumpId}/Filters/{FilterId}`
`/redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/Reservoirs/{ReservoirId}/Filters/{FilterId}`
`/redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/Filters/{FilterId}`
`/redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/Pumps/{PumpId}/Filters/{FilterId}`
`/redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/Reservoirs/{ReservoirId}/Filters/{FilterId}`
`/redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/Filters/{FilterId}`
`/redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/Pumps/{PumpId}/Filters/{FilterId}`
`/redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/Reservoirs/{ReservoirId}/Filters/{FilterId}`
`/redfish/v1/ThermalEquipment/RPUs/{CoolingUnitId}/Filters/{FilterId}`

/redfish/v1/ThermalEquipment/RPUs/{CoolingUnitId}/Pumps/{PumpId}/Filters/{FilterId}
 /redfish/v1/ThermalEquipment/RPUs/{CoolingUnitId}/Reservoirs/{ReservoirId}/Filters/{FilterId}

6.51.3 Properties

Property	Type	Attributes	Notes
Assembly {	object		The link to the assembly associated with this filter. This property shall contain a link to a resource of type <code>Assembly</code>. See the <i>Assembly</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>Assembly</i> resource. See the Links section and the <i>Assembly</i> schema for details.
}			
DeltaLiquidPressurekPa (v1.1+) {	object (excerpt)		The differential pressure (kPa) across the liquid filter. This property shall contain the pressure, in kilopascal units, for the difference in pressure between the intake and outflow connections on the filter. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>PressurekPa</code>. This object is an excerpt of the <i>Sensor</i> resource located at the URI shown in <code>DataSourceUri</code>.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			
HotPluggable	boolean	<i>read-only</i> (null)	An indication of whether this device can be inserted or removed while the equipment is in operation. This property shall indicate whether the device can be inserted or removed while the underlying equipment otherwise remains in its current operational state. Devices indicated as hot-pluggable shall allow the device to become operable without altering the operational state of the underlying equipment. Devices that cannot be inserted or removed from equipment in operation, or devices that cannot become operable without affecting the operational state of that equipment, shall be indicated as not hot-pluggable.

Property	Type	Attributes	Notes
Location {}	object		The location of the filter. This property shall contain the location information of this filter. For property details, see Location.
LocationIndicatorActive	boolean	<i>read-write</i> (null)	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource.
Manufacturer	string	<i>read-only</i> (null)	The manufacturer of this filter. This property shall contain the name of the organization responsible for producing the filter. This organization may be the entity from whom the filter is purchased, but this is not necessarily true.
Model	string	<i>read-only</i> (null)	The model number for this filter. This property shall contain the model information as defined by the manufacturer for this filter.
PartNumber	string	<i>read-only</i> (null)	The part number for this filter. This property shall contain the part number as defined by the manufacturer for this filter.
PhysicalContext	string (enum)	<i>read-only</i>	The area or device associated with this filter. This property shall contain a description of the affected device or region within the chassis with which this filter is associated. <i>For the possible property values, see PhysicalContext in Property details.</i>
RatedServiceHours	number	<i>read-only</i> (null)	The rated hours of service life for this filter. This property shall contain the number of hours of service that the filter or filter media is rated to provide before servicing or replacement is necessary.
Replaceable	boolean	<i>read-only</i> (null)	An indication of whether this component can be independently replaced as allowed by the vendor's replacement policy. This property shall indicate whether this component can be independently replaced as allowed by the vendor's replacement policy. A value of <code>false</code> indicates the component needs to be replaced by policy as part of another component. If the <code>LocationType</code> property of this component contains <code>Embedded</code>, this property shall contain <code>false</code>.

Property	Type	Attributes	Notes
SerialNumber	string	read-only (null)	The serial number for this filter. This property shall contain the serial number as defined by the manufacturer for this filter.
ServicedDate	string (date-time)	read-write (null)	The date this filter was put into service. This property shall contain the date the filter or filter media was put into active service. The service may update the value in response to an update of <code>ServiceHours</code>.
ServiceHours	number	read-write (null)	The hours of service this filter has provided. This property shall contain the number of hours of service that the filter or filter media has provided. The service may reset or update the value in response to an update of <code>ServicedDate</code>.
SparePartNumber	string	read-only (null)	The spare part number for this filter. This property shall contain the spare or replacement part number as defined by the manufacturer for this filter.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
UserLabel	string	read-write	A user-assigned label. This property shall contain a user-assigned label used to identify this resource. If a value has not been assigned by a user, the value of this property shall be an empty string.

6.51.4 Property details

6.51.4.1 PhysicalContext

The area or device associated with this filter.

- This property shall contain a description of the affected device or region within the chassis with which this filter is associated.

string	Description
Accelerator	An accelerator.

string	Description
ACInput	An AC electrical input or input-related circuit.
ACMaintenanceBypassInput	An AC electrical maintenance bypass input.
ACOutput	An AC electrical output or output-related circuit. This value shall indicate an electrical output or an output-related circuit, such as a branch output, which is not terminated as a power outlet.
ACStaticBypassInput	An AC electrical static bypass input.
ACUtilityInput	An AC electrical utility input. This value shall indicate an electrical input, where the source is an electrical utility as opposed to a backup or locally-generated power source. This value is intended to differentiate multiple electrical inputs between utility, maintenance bypass, or static bypass values. For general purpose usage, the value of <code>ACInput</code> is preferred.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	A compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC electrical bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	An expansion bay. This value shall indicate a location that provides for the expansion of functionality of a system, such as a PCIe slot that can accept an option card.

string	Description
ExpansionSubsystem	A group of expansion bays. This value shall indicate a group of expansion bays and the devices installed in those bays.
Fan	A fan.
Filter	A filter.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Manager	A management controller, such as a BMC (baseboard management controller).
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	A networking bay. This value shall indicate a location that provides for the expansion of networking functionality of a system, by the addition of networking devices.
NetworkingDevice	A networking device.
PowerOutlet	An electrical outlet. This value shall indicate an electrical outlet or receptacle.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	A power supply bay. This value shall indicate a location that provides for the installation of a power supply or similar devices.

string	Description
Pump	A pump.
Rectifier	A rectifier device.
Reservoir	A reservoir.
Room	The room.
StorageBay	A storage bay. This value shall indicate a location that provides for the expansion of storage functionality of a system, by the addition of storage devices.
StorageDevice	A storage device.
StorageSubsystem	A storage subsystem. This value shall indicate a storage subsystem, which may consist of one or more storage controllers, storage devices, or related components.
Switch	A switch device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.51.5 Example response

```
{
  "@odata.type": "#Filter.v1_1_0.Filter",
  "Id": "1",
  "Name": "Cooling Loop Filter",
  "ServicedDate": "2020-12-24T08:00:00Z",
  "ServiceHours": 5791,
  "RatedServiceHours": 10000,
  "Manufacturer": "Contoso",
  "Model": "MyCoffee",
}
```

```
    "PartNumber": "Cone4",
    "Status": {
      "State": "Enabled",
      "Health": "OK"
    },
    "Location": {
      "Placement": {
        "Row": "North 1"
      }
    },
    "@odata.id": "/redfish/v1/ThermalEquipment/CDUs/1/Filters/1"
  }
```

6.52 GraphicsController 1.0.2

Version	v1.0
Release	2021.1

6.52.1 Description

The `GraphicsController` schema defines a graphics controller that can be used to drive one or more display devices.

- This resource shall represent a graphics output device in a Redfish implementation.

6.52.2 URIs

`/redfish/v1/Systems/{ComputerSystemId}/GraphicsControllers/{GraphicsControllerId}`

6.52.3 Properties

Property	Type	Attributes	Notes
AssetTag	string	read-write (null)	The user-assigned asset tag for this graphics controller. • This property shall contain the user-assigned asset tag, which is an identifying string that tracks the drive for inventory purposes.

Property	Type	Attributes	Notes
BiosVersion	string	<i>read-only</i> (null)	The version of the graphics controller BIOS or primary graphics controller firmware. This property shall contain the version string of the currently installed and running BIOS or firmware for the graphics controller.
DriverVersion	string	<i>read-only</i> (null)	The version of the graphics controller driver loaded in the operating system. This property shall contain the version string of the currently loaded driver for this graphics controller.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCleDevice {	object		A link to the PCIe device that represents this graphics controller. This property shall contain a link to a resource of type <code>PCleDevice</code> that represents this graphics controller. See the <i>PCleDevice</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a PCIeDevice resource. See the Links section and the <i>PCleDevice</i> schema for details.
}			
Processors [{	array		An array of links to the processors that are a part of this graphics controller. This property shall contain an array of links to resources of type <code>Processor</code> that represent the processors that this graphics controller contains.
@odata.id	string	<i>read-only</i>	Link to a Processor resource. See the Links section and the <i>Processor</i> schema for details.
}]			
}			
Location {}	object		The location of the graphics controller. This property shall contain the location information of the associated graphics controller. For property details, see Location.

Property	Type	Attributes	Notes
Manufacturer	string	<i>read-only</i> (null)	The manufacturer of this graphics controller. This property shall contain the name of the organization responsible for producing the graphics controller. This organization may be the entity from which the graphics controller is purchased, but this is not necessarily true.
Model	string	<i>read-only</i> (null)	The product model number of this graphics controller. This property shall contain the manufacturer-provided model information of this graphics controller.
PartNumber	string	<i>read-only</i> (null)	The part number for this graphics controller. This property shall contain the manufacturer-provided part number for the graphics controller.
Ports {	object		The ports of the graphics controller. This property shall contain a link to a resource collection of type <code>PortCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Port</i> . See the Port schema for details.
}			
SerialNumber	string	<i>read-only</i> (null)	The serial number for this graphics controller. This property shall contain a manufacturer-allocated number that identifies the graphics controller.
SKU	string	<i>read-only</i> (null)	The SKU for this graphics controller. This property shall contain the SKU number for this graphics controller.
SparePartNumber	string	<i>read-only</i> (null)	The spare part number of the graphics controller. This property shall contain the spare part number of the graphics controller.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

6.52.4 Example response

```
{
```

```
"@odata.type": "#GraphicsController.v1_0_2.GraphicsController",
"Id": "GPU1",
"Name": "Contoso Graphics Controller 1",
"AssetTag": "",
"Manufacturer": "Contoso",
"Model": "GPU1",
"SKU": "80937",
"SerialNumber": "2M220100SL",
"PartNumber": "G37891",
"SparePartNumber": "G37890",
"BiosVersion": "90.02.17.00.7D",
"DriverVersion": "27.21.14.6079 (Contoso 460.79) DCH / Win 10 64",
"Status": {
  "State": "Enabled",
  "Health": "OK"
},
"Location": {
  "PartLocation": {
    "ServiceLabel": "Slot 1",
    "LocationOrdinalValue": 1,
    "LocationType": "Slot",
    "Orientation": "LeftToRight",
    "Reference": "Rear"
  }
},
"Ports": {
  "@odata.id": "/redfish/v1/Systems/1/GraphicsControllers/GPU1/Ports"
},
"Links": {
  "Processors": [
    {
      "@odata.id": "/redfish/v1/Systems/1/Processors/GPU"
    }
  ]
},
"@odata.id": "/redfish/v1/Systems/1/GraphicsControllers/GPU1"
}
```

6.53 Heater 1.0.2

Version	v1.0
Release	2022.3

6.53.1 Description

The `Heater` schema describes a heating unit for devices contained within a chassis.

- This resource shall represent the management properties for monitoring and management of heaters for a Redfish implementation.

6.53.2 URIs

/redfish/v1/Chassis/{ChassisId}/ThermalSubsystem/Heaters/{HeaterId}

6.53.3 Properties

Property	Type	Attributes	Notes
Assembly {	object		The link to the assembly associated with this heater. This property shall contain a link to a resource of type <code>Assembly</code>. See the <i>Assembly</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>Assembly</i> resource. See the Links section and the <i>Assembly</i> schema for details.
}			
HotPluggable	boolean	<i>read-only</i> (null)	An indication of whether this device can be inserted or removed while the equipment is in operation. This property shall indicate whether the device can be inserted or removed while the underlying equipment otherwise remains in its current operational state. Hot-pluggable devices can become operable without altering the operational state of the underlying equipment. Devices that cannot be inserted or removed from equipment in operation, or devices that cannot become operable without affecting the operational state of that equipment, shall not be hot-pluggable.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Managers [{	array		An array of links to the managers heated by this heater. This property shall contain an array of links to the managers which this heater heats.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a Manager resource. See the Links section and the <i>Manager</i> schema for details.
}}			
Memory [{	array		An array of links to the memory devices heated by this heater. This property shall contain an array of links to the memory devices which this heater heats.
@odata.id	string	<i>read-only</i>	Link to a Memory resource. See the Links section and the <i>Memory</i> schema for details.
}}			
NetworkAdapters [{	array		An array of links to the network adapters heated by this heater. This property shall contain an array of links to the network adapters which this heater heats.
@odata.id	string	<i>read-only</i>	Link to a NetworkAdapter resource. See the Links section and the <i>NetworkAdapter</i> schema for details.
}}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
Processors [{	array		An array of links to the processors heated by this heater. This property shall contain an array of links to the processors which this heater heats.
@odata.id	string	<i>read-only</i>	Link to a Processor resource. See the Links section and the <i>Processor</i> schema for details.
}}			
StorageControllers [{	array		An array of links to the storage controllers heated by this heater. This property shall contain an array of links to the storage controllers which this heater heats.
@odata.id	string	<i>read-only</i>	Link to a StorageController resource. See the Links section and the <i>StorageController</i> schema for details.
}}			
}			

Property	Type	Attributes	Notes
Location {}	object		The location of the heater. This property shall contain the location information of this heater. For property details, see Location.
LocationIndicatorActive	boolean	<i>read-write</i> (null)	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource.
Manufacturer	string	<i>read-only</i> (null)	The manufacturer of this heater. This property shall contain the name of the organization responsible for producing the heater. This organization may be the entity from whom the heater is purchased, but this is not necessarily true.
Metrics {	object		The link to the heater metrics resource associated with this heater. This property shall contain a link to a resource of type <code>HeaterMetrics</code>. See the <i>HeaterMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a HeaterMetrics resource. See the Links section and the <i>HeaterMetrics</i> schema for details.
}			
Model	string	<i>read-only</i> (null)	The model number for this heater. This property shall contain the model information as defined by the manufacturer for this heater.
PartNumber	string	<i>read-only</i> (null)	The part number for this heater. This property shall contain the part number as defined by the manufacturer for this heater.
PhysicalContext	string (enum)	<i>read-only</i>	The area or device associated with this heater. This property shall contain a description of the affected device or region within the chassis with which this heater is associated. <i>For the possible property values, see PhysicalContext in Property details.</i>
SerialNumber	string	<i>read-only</i> (null)	The serial number for this heater. This property shall contain the serial number as defined by the manufacturer for this heater.

Property	Type	Attributes	Notes
SparePartNumber	string	<i>read-only</i> (null)	The spare part number for this heater. This property shall contain the spare or replacement part number as defined by the manufacturer for this heater.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

6.53.4 Property details

6.53.4.1 PhysicalContext

The area or device associated with this heater.

- This property shall contain a description of the affected device or region within the chassis with which this heater is associated.

string	Description
Accelerator	An accelerator.
ACInput	An AC electrical input or input-related circuit.
ACMaintenanceBypassInput	An AC electrical maintenance bypass input.
ACOutput	An AC electrical output or output-related circuit. This value shall indicate an electrical output or an output-related circuit, such as a branch output, which is not terminated as a power outlet.
ACStaticBypassInput	An AC electrical static bypass input.
ACUtilityInput	An AC electrical utility input. This value shall indicate an electrical input, where the source is an electrical utility as opposed to a backup or locally-generated power source. This value is intended to differentiate multiple electrical inputs between utility, maintenance bypass, or static bypass values. For general purpose usage, the value of <code>ACInput</code> is preferred.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.

string	Description
Battery	A battery.
Board	A circuit board. This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	A compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC electrical bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	An expansion bay. This value shall indicate a location that provides for the expansion of functionality of a system, such as a PCIe slot that can accept an option card.
ExpansionSubsystem	A group of expansion bays. This value shall indicate a group of expansion bays and the devices installed in those bays.
Fan	A fan.
Filter	A filter.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Manager	A management controller, such as a BMC (baseboard management controller).

string	Description
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	A networking bay. This value shall indicate a location that provides for the expansion of networking functionality of a system, by the addition of networking devices.
NetworkingDevice	A networking device.
PowerOutlet	An electrical outlet. This value shall indicate an electrical outlet or receptacle.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	A power supply bay. This value shall indicate a location that provides for the installation of a power supply or similar devices.
Pump	A pump.
Rectifier	A rectifier device.
Reservoir	A reservoir.
Room	The room.
StorageBay	A storage bay. This value shall indicate a location that provides for the expansion of storage functionality of a system, by the addition of storage devices.
StorageDevice	A storage device.
StorageSubsystem	A storage subsystem. This value shall indicate a storage subsystem, which may consist of one or more storage controllers, storage devices, or related components.
Switch	A switch device.
SystemBoard	The system board (PCB).

string	Description
Transceiver	A transceiver. This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.53.5 Example response

```
{
  "@odata.type": "#Heater.v1_0_2.Heater",
  "Id": "CPU1Heater",
  "Description": "Heater for CPU1",
  "Name": "Heater 1",
  "PhysicalContext": "CPU",
  "Manufacturer": "Contoso Heaters",
  "Model": "CPUHeater",
  "SerialNumber": "SNDHM0123456789",
  "PartNumber": "12345-123",
  "SparePartNumber": "54321-321",
  "LocationIndicatorActive": false,
  "HotPluggable": true,
  "Status": {
    "Health": "OK",
    "State": "Enabled"
  },
  "Links": {
    "Processors": [
      {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/Processors/CPU1"
      }
    ]
  },
  "Metrics": {
    "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/Heaters/CPU1Heater/Metrics"
  },
  "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/Heaters/CPU1Heater"
}
```

6.54 HeaterMetrics 1.0.2

Version	v1.0
Release	2022.3

6.54.1 Description

The `HeaterMetrics` schema contains definitions for the metrics of a heater.

- This resource shall be used to represent the metrics of a heater unit for a Redfish implementation.

6.54.2 URIs

/redfish/v1/Chassis/{ChassisId}/ThermalSubsystem/Heaters/{HeaderId}/Metrics

6.54.3 Properties

Property	Type	Attributes	Notes
PowerWatts {	object (excerpt)		Power consumption (W). • This property shall contain the total power consumption, in watt units, for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Power</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
ApparentVA	number (V.A)	<i>read-only</i> (null)	The product of voltage and current for an AC circuit, in volt-ampere units. • This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.

Property	Type	Attributes	Notes
PhaseAngleDegrees (v1.5+)	number	<i>read-only (null)</i>	The phase angle (degrees) between the current and voltage waveforms. This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>Power</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
PowerFactor	number	<i>read-only (null)</i>	The power factor for this sensor. This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. <code>PowerFactor</code> is expressed in unit-less 1/100ths. This property can appear in sensors containing a <code>ReadingType</code> value of <code>Power</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
ReactiveVAR	number (V.A)	<i>read-only (null)</i>	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
Reading	number	<i>read-only (null)</i>	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			
PrePowerOnHeatingTimeSeconds	integer	<i>read-only (null)</i>	The total number of seconds the heater was active while the device it heats was powered off. This property shall contain the total number of seconds the heater was active while the device it heats was powered off.
RuntimeHeatingTimeSeconds	integer	<i>read-only (null)</i>	The total number of seconds the heater was active while the device it heats was powered on. This property shall contain the total number of seconds the heater was active while the device it heats was powered on.

Property	Type	Attributes	Notes
TemperatureReadingsCelsius [{	array (excerpt)		The temperatures (in degree Celsius units) from all related sensors for this device. This property shall contain the temperatures, in degree Celsius units, for this subsystem. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Temperature</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
DeviceName (v1.2+)	string	<i>read-only</i> (null)	The name of the device. This property shall contain the name of the device associated with this sensor. If the device is represented by a resource, the value shall contain the value of the <code>Name</code> property of the associated resource.
PhysicalContext	string (enum)	<i>read-write</i> (null)	The area or device to which this sensor measurement applies. This property shall contain a description of the affected component or region within the equipment to which this sensor measurement applies. <i>For the possible property values, see PhysicalContext in Property details.</i>
PhysicalSubContext	string (enum)	<i>read-write</i> (null)	The usage or location within a device to which this sensor measurement applies. This property shall contain a description of the usage or sub-region within the equipment to which this sensor measurement applies. This property generally differentiates multiple sensors within the same <code>PhysicalContext</code> instance. <i>For the possible property values, see PhysicalSubContext in Property details.</i>
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}]			

6.54.4 Actions

6.54.4.1 ResetMetrics

Description

This action resets the summary metrics related to this equipment.

- This action shall reset any time intervals or counted values for this equipment.

Action URI

{Base URI of target resource}/Actions/HeaterMetrics.ResetMetrics

Action parameters

This action takes no parameters.

6.54.5 Property details

6.54.5.1 PhysicalContext

The area or device to which this sensor measurement applies.

- This property shall contain a description of the affected component or region within the equipment to which this sensor measurement applies.

string	Description
Accelerator	An accelerator.
ACInput	An AC electrical input or input-related circuit.
ACMaintenanceBypassInput	An AC electrical maintenance bypass input.
ACOutput	An AC electrical output or output-related circuit. • This value shall indicate an electrical output or an output-related circuit, such as a branch output, which is not terminated as a power outlet.
ACStaticBypassInput	An AC electrical static bypass input.

string	Description
ACUtilityInput	An AC electrical utility input. This value shall indicate an electrical input, where the source is an electrical utility as opposed to a backup or locally-generated power source. This value is intended to differentiate multiple electrical inputs between utility, maintenance bypass, or static bypass values. For general purpose usage, the value of <code>ACInput</code> is preferred.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	A compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC electrical bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	An expansion bay. This value shall indicate a location that provides for the expansion of functionality of a system, such as a PCIe slot that can accept an option card.
ExpansionSubsystem	A group of expansion bays. This value shall indicate a group of expansion bays and the devices installed in those bays.
Fan	A fan.
Filter	A filter.
FPGA	An FPGA.
Front	The front of the chassis.

string	Description
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Manager	A management controller, such as a BMC (baseboard management controller).
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	A networking bay. This value shall indicate a location that provides for the expansion of networking functionality of a system, by the addition of networking devices.
NetworkingDevice	A networking device.
PowerOutlet	An electrical outlet. This value shall indicate an electrical outlet or receptacle.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	A power supply bay. This value shall indicate a location that provides for the installation of a power supply or similar devices.
Pump	A pump.
Rectifier	A rectifier device.
Reservoir	A reservoir.
Room	The room.

string	Description
StorageBay	A storage bay. This value shall indicate a location that provides for the expansion of storage functionality of a system, by the addition of storage devices.
StorageDevice	A storage device.
StorageSubsystem	A storage subsystem. This value shall indicate a storage subsystem, which may consist of one or more storage controllers, storage devices, or related components.
Switch	A switch device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.54.5.2 PhysicalSubContext

The usage or location within a device to which this sensor measurement applies.

- This property shall contain a description of the usage or sub-region within the equipment to which this sensor measurement applies. This property generally differentiates multiple sensors within the same `PhysicalContext` instance.

string	Description
Input	The input.
Output	The output.

6.54.6 Example response

```
{
  "@odata.type": "#HeaterMetrics.v1_0_2.HeaterMetrics",
  "Id": "HeaterMetrics",
  "Description": "Heater Metrics for CPU1 Heater",
  "Name": "CPU1 Heater Metrics",
  "PrePowerOnHeatingTimeSeconds": 600,
  "RuntimeHeatingTimeSeconds": 3600,
  "PowerWatts": {
    "Reading": 200.3
  },
  "TemperatureReadingsCelsius": [
    {
      "DeviceName": "Heater Average Temperature",
      "Reading": 2.5
    }
  ],
  "Actions": {
    "#HeaterMetrics.ResetMetrics": {
      "target": "/redfish/v1/Chassis/1U/ThermalSubsystem/Heaters/CPU1Heater/Metrics/HeaterMetrics.ResetMetrics"
    }
  },
  "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/Heaters/CPU1Heater/Metrics"
}
```

6.55 HostInterface 1.3.3

Version	v1.3	v1.2	v1.1	v1.0
Release	2020.3	2018.2	2017.1	2016.3

6.55.1 Description

The `HostInterface` schema contains properties associated with a Redfish host interface. A Redfish host interface is a connection between host software and a Redfish service.

- This resource shall represent a Redfish host interface as part of the Redfish Specification.

6.55.2 URIs

`/redfish/v1/Managers/{ManagerId}/HostInterfaces/{HostInterfaceId}`

6.55.3 Properties

Property	Type	Attributes	Notes
AuthenticationModes []	array (string (enum))	<i>read-write</i>	- The authentication modes available on this interface. - This property shall contain an array consisting of the authentication modes allowed on this interface. <i>For the possible property values, see AuthenticationModes in Property details.</i>
AuthNoneRoleId (v1.2+)	string	<i>read-write</i>	The role when no authentication on this interface is used. This property shall contain the <code>Id</code> property of the <code>Role</code> resource that is used when no authentication on this interface is performed. This property shall be absent if <code>AuthNone</code> is not supported by the service for the <code>AuthenticationModes</code> property.
CredentialBootstrapping (v1.3+) {	object		The credential bootstrapping settings for this interface. This property shall contain settings for the Redfish Host Interface Specification-defined 'credential bootstrapping via IPMI commands' feature for this interface. This property shall be absent if credential bootstrapping is not supported by the service.
EnableAfterReset (v1.3+)	boolean	<i>read-write (null)</i>	An indication of whether credential bootstrapping is enabled after a reset for this interface. This property shall indicate whether credential bootstrapping is enabled after a reset for this interface. If <code>true</code>, services shall set the <code>Enabled</code> property to <code>true</code> after a reset of the host or the service.
Enabled (v1.3+)	boolean	<i>read-write (null)</i>	An indication of whether credential bootstrapping is enabled for this interface. This property shall indicate whether credential bootstrapping is enabled for this interface.
RoleId (v1.3+)	string	<i>read-write</i>	The role used for the bootstrap account created for this interface. This property shall contain the <code>Id</code> property of the <code>Role</code> resource that is used for the bootstrap account created for this interface.
}			

Property	Type	Attributes	Notes
ExternallyAccessible	boolean	<i>read-only (null)</i>	An indication of whether external entities can access this interface. External entities are non-host entities. For example, if the host and manager are connected through a switch and the switch also exposes an external port on the system, external clients can also use the interface, and this property value is <code>true</code>. This property shall indicate whether external entities can access this interface. External entities are non-host entities. For example, if the host and manager are connected through a switch and the switch also exposes an external port on the system, external clients can also use the interface, and this property value is <code>true</code>.
FirmwareAuthEnabled <i>(deprecated v1.3)</i>	boolean	<i>read-write (null)</i>	An indication of whether this firmware authentication is enabled for this interface. This property shall indicate whether firmware authentication is enabled for this interface. <i>Deprecated in v1.3 and later. This property has been deprecated in favor of newer methods of negotiating credentials.</i>
FirmwareAuthRoleId <i>(deprecated v1.3)</i>	string	<i>read-write</i>	The Redfish role used for firmware authentication on this interface. This property shall contain the <code>Id</code> property of the <code>Role</code> resource that is configured for firmware authentication on this interface. <i>Deprecated in v1.3 and later. This property has been deprecated in favor of newer methods of negotiating credentials.</i>
HostEthernetInterfaces {	object		A link to the collection of network interface controllers or cards (NICs) that a computer system uses to communicate with this host interface. This property shall contain a link to a resource collection of type <code>EthernetInterfaceCollection</code> that computer systems use as the host interface to this manager. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>EthernetInterface</i> . See the <i>EthernetInterface</i> schema for details.
}			
HostInterfaceType	string (enum)	<i>read-only (null)</i>	The host interface type for this interface. This property shall contain the host interface type for this interface. <i>For the possible property values, see HostInterfaceType in Property details.</i>

Property	Type	Attributes	Notes
InterfaceEnabled	boolean	<i>read-write (null)</i>	An indication of whether this interface is enabled. This property shall indicate whether this interface is enabled. Modifying this property may modify the <code>InterfaceEnabled</code> property in the <code>EthernetInterface</code> resource for this host interface.
KernelAuthEnabled <i>(deprecated v1.3)</i>	boolean	<i>read-write (null)</i>	An indication of whether this kernel authentication is enabled for this interface. This property shall indicate whether kernel authentication is enabled for this interface. <i>Deprecated in v1.3 and later. This property has been deprecated in favor of newer methods of negotiating credentials.</i>
KernelAuthRoleId <i>(deprecated v1.3)</i>	string	<i>read-write</i>	The Redfish role used for kernel authentication on this interface. This property shall contain the <code>Id</code> property of the <code>Role</code> resource that is configured for kernel authentication on this interface. <i>Deprecated in v1.3 and later. This property has been deprecated in favor of newer methods of negotiating credentials.</i>
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
AuthNoneRole <i>(v1.2+)</i> {	object		The link to the Redfish role that contains the privileges on this host interface when no authentication is performed. This property shall contain a link to a resource of type <code>Role</code>, and should link to the resource identified by property <code>AuthNoneRoleId</code>. This property shall be absent if <code>AuthNone</code> is not supported by the service for the <code>AuthenticationModes</code> property. See the <i>Role</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Role resource. See the Links section and the <i>Role</i> schema for details.
}			
ComputerSystems [{	array		An array of links to the computer systems connected to this host interface. This property shall contain an array of links to resources of type <code>ComputerSystem</code> that are connected to this host interface.
@odata.id	string	<i>read-only</i>	Link to a ComputerSystem resource. See the Links section and the <i>ComputerSystem</i> schema for details.
}]			

Property	Type	Attributes	Notes
CredentialBootstrappingRole (v1.3+) {	object		The link to the role that contains the privileges for the bootstrap account created for this interface. This property shall contain a link to a resource of type <code>Role</code>, and should link to the resource identified by the <code>RoleId</code> property within <code>CredentialBootstrapping</code>. This property shall be absent if the Redfish Host Interface Specification-defined 'credential bootstrapping via IPMI commands' feature is not supported by the service. See the <i>Role</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Role resource. See the Links section and the <i>Role</i> schema for details.
}			
FirmwareAuthRole (deprecated v1.3) {	object		The link to the Redfish role that has firmware authentication privileges on this host interface. This property shall contain a link to a resource of type <code>Role</code>, and should link to the resource identified by property <code>FirmwareAuthRoleId</code>. See the <i>Role</i> schema for details on this property. <i>Deprecated in v1.3 and later. This property has been deprecated in favor of newer methods of negotiating credentials.</i>
@odata.id	string	<i>read-only</i>	Link to a Role resource. See the Links section and the <i>Role</i> schema for details.
}			
KernelAuthRole (deprecated v1.3) {	object		The link to the Redfish role defining privileges for this host interface when using kernel authentication. This property shall contain a link to a resource of type <code>Role</code>, and should link to the resource identified by property <code>KernelAuthRoleId</code>. See the <i>Role</i> schema for details on this property. <i>Deprecated in v1.3 and later. This property has been deprecated in favor of newer methods of negotiating credentials.</i>
@odata.id	string	<i>read-only</i>	Link to a Role resource. See the Links section and the <i>Role</i> schema for details.
}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			

Property	Type	Attributes	Notes
ManagerEthernetInterface {	object		A link to a single network interface controllers or cards (NIC) that this manager uses for network communication with this host interface. This property shall contain a link to a resource of type <code>EthernetInterface</code> that represents the network interface that this manager uses as the host interface. See the <i>EthernetInterface</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>EthernetInterface</i> resource. See the Links section and the <i>EthernetInterface</i> schema for details.
}			
NetworkProtocol {	object		A link to the network services and their settings that the manager controls. In this property, clients find configuration options for the network and network services. This property shall contain a link to a resource of type <code>ManagerNetworkProtocol</code> that represents the network services for this manager. See the <i>ManagerNetworkProtocol</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>ManagerNetworkProtocol</i> resource. See the Links section and the <i>ManagerNetworkProtocol</i> schema for details.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

6.55.4 Property details

6.55.4.1 AuthenticationModes

- The authentication modes available on this interface.
 - This property shall contain an array consisting of the authentication modes allowed on this interface.

string	Description
AuthNone	Requests without any sort of authentication are allowed.
BasicAuth	Requests using HTTP Basic authentication are allowed.

string	Description
OemAuth	Requests using OEM authentication mechanisms are allowed.
RedfishSessionAuth	Requests using Redfish session authentication are allowed.

6.55.4.2 HostInterfaceType

The host interface type for this interface.

- This property shall contain the host interface type for this interface.

string	Description
NetworkHostInterface	This interface is a network host interface.

6.55.5 Example response

```
{
  "@odata.type": "#HostInterface.v1_3_3.HostInterface",
  "Id": "1",
  "Name": "Host Interface",
  "Description": "Management Host Interface",
  "HostInterfaceType": "NetworkHostInterface",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "InterfaceEnabled": true,
  "ExternallyAccessible": false,
  "AuthenticationModes": [
    "AuthNone",
    "BasicAuth",
    "RedfishSessionAuth",
    "OemAuth"
  ],
  "CredentialBootstrapping": {
    "EnableAfterReset": true,
    "Enabled": true,
    "RoleId": "User"
  },
  "HostEthernetInterfaces": {
    "@odata.id": "/redfish/v1/Managers/BMC/HostInterfaces/1/HostEthernetInterfaces"
  },
  "ManagerEthernetInterface": {
```

```
      "@odata.id": "/redfish/v1/Managers/BMC/EthernetInterfaces/ToHost"
    },
    "NetworkProtocol": {
      "@odata.id": "/redfish/v1/Managers/BMC/NetworkProtocol"
    },
    "Links": {
      "ComputerSystems": [
        {
          "@odata.id": "/redfish/v1/Systems/ORD144"
        }
      ],
      "CredentialBootstrappingRole": {
        "@odata.id": "/redfish/v1/AccountService/Roles/User"
      }
    },
    "@odata.id": "/redfish/v1/Managers/BMC/HostInterfaces/1"
  }
}
```

6.56 Job 1.3.0

Version	v1.3	v1.2	v1.1	v1.0
Release	2025.2	2022.3	2022.1	2018.2

6.56.1 Description

The `Job` schema contains information about a job that a Redfish job service schedules or executes. Clients create jobs to describe a series of operations that occur at periodic intervals.

- This resource shall contain a job in a Redfish implementation.

6.56.2 URIs

/redfish/v1/JobService/Jobs/{JobId}
/redfish/v1/JobService/Jobs/{JobId}/Steps/{JobId2}

6.56.3 Properties

Property	Type	Attributes	Notes
CreatedBy	string	<i>read-only</i>	The person or program that created this job entry. This property shall contain the username, software program name, or other identifier indicating the creator of this job.
CreationTime (v1.3+)	string (date-time)	<i>read-only</i>	The date and time when the job was created. This property shall contain the date and time when the job was created.
EndTime	string (date-time)	<i>read-only</i>	The date and time when the job was completed. This property shall contain the date and time when the job was completed. This property shall not appear if the job is running or was not completed. This property shall appear only if the <code>JobState</code> is <code>Completed</code>, <code>Cancelled</code>, or <code>Exception</code>.
EstimatedCompletionTime (v1.3+)	string (date-time)	<i>read-only</i>	The date and time when the job is expected to complete. This property shall contain the date and time when the job is expected to complete. If the <code>EstimatedDuration</code> property is supported, the value of this property shall contain the summation of the <code>StartTime</code> property and the <code>EstimatedDuration</code> property.
EstimatedDuration (v1.1+)	string (duration)	<i>read-only</i> (null)	The estimated total time required to complete the job. This property shall contain the estimated total time needed to complete the job. The value is not expected to change while the job is in progress, but the service may update the value if it obtains new information that significantly changes the expected duration. Services should be conservative in the reported estimate and clients should treat this value as an estimate. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)??\$</code>
HidePayload	boolean	<i>read-only</i>	An indication of whether the contents of the payload or parameters should be hidden from view after the job has been created. If <code>true</code>, responses do not return the payload or parameters. If <code>false</code>, responses return the payload or parameters. If this property is not present when the job is created, the default is <code>false</code>. This property shall indicate whether the contents of the payload should be hidden from view after the job has been created. If <code>true</code>, responses shall not return the <code>Payload</code> Or <code>Parameters</code> properties. If <code>false</code>, responses shall return the <code>Payload</code> Or <code>Parameters</code> properties. If this property is not present when the job is created, the default is <code>false</code>.

Property	Type	Attributes	Notes
JobPriority (v1.3+)	integer	<i>read-only</i> (null)	The requested priority for this job. This property shall contain the requested priority of this job. The value 0 shall indicate the highest priority. Increasing values shall represent decreasing priority.
JobState	string (enum)	<i>read-write</i>	The state of the job. This property shall contain the state of the job. <i>For the possible property values, see JobState in Property details.</i>
JobStatus	string (enum)	<i>read-only</i>	The status of the job. This property shall contain the health status of the job. This property should contain <code>Critical</code> if one or more messages in the <code>Messages</code> array contains the severity <code>Critical</code>. This property should contain <code>Warning</code> if one or more messages in the <code>Messages</code> array contains the severity <code>Warning</code> and if no messages contain the severity <code>Critical</code>. This property should contain <code>Ok</code> if all messages in the <code>Messages</code> array contain the severity <code>Ok</code> or if the array is empty. <i>For the possible property values, see JobStatus in Property details.</i>
JobType (v1.3+)	string (enum)	<i>read-only</i>	The type of this job. This property shall contain the type of this job. <i>For the possible property values, see JobType in Property details.</i>
Links (v1.2+) {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
CreatedResources (v1.2+) [{	array		An array of URIs referencing the resources created as the result of this job. This property shall contain an array of links to resources indicating the resources created as the result of this job. Services shall set this property prior to the job entering its final state.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			

Property	Type	Attributes	Notes
Executor (v1.3+) {	object	(null)	A link to the executor that is running this job. This property shall contain a link to a resource of type <code>JobExecutor</code> that represents the executor that is running this job. See the <i>JobExecutor</i> schema for details on this property.
@odata.id	string	read-only	Link to a JobExecutor resource. See the Links section and the <i>JobExecutor</i> schema for details.
}			
JobDocument (v1.3+) {	object	(null)	A link to the job document that was used to create this job. This property shall contain a link to a resource of type <code>JobDocument</code> that represents the job document that was used to create this job. See the <i>JobDocument</i> schema for details on this property.
@odata.id	string	read-only	Link to a JobDocument resource. See the Links section and the <i>JobDocument</i> schema for details.
}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
ParentJob (v1.3+) {	object	(null)	The link to the job that created this job. This property shall contain a link to a resource of type <code>Job</code> that represents the job that created this job.
@odata.id	string	read-only	Link to another Job resource.
}			
PreferredExecutors (v1.3+) [{	array		An array of links to the preferred executors to run this job. This property shall contain an array of links to resources of type <code>JobExecutor</code> that represent the preferred executors to run this job.
@odata.id	string	read-only	Link to a JobExecutor resource. See the Links section and the <i>JobExecutor</i> schema for details.
}]			
SubsidiaryJobs (v1.3+) [{	array		An array of links to the jobs created by this job. This property shall contain an array of links to resources of type <code>Job</code> that represent the jobs created by this job.
@odata.id	string	read-only	Link to another Job resource.

Property	Type	Attributes	Notes
}]			
ValidatedExecutors (v1.3+) [{	array		An array of links to the executors that have been validated to run this job. This property shall contain an array of links to resources of type <code>JobExecutor</code> that represent the executors that have been validated to run this job.
@odata.id	string	<i>read-only</i>	Link to a JobExecutor resource. See the Links section and the <i>JobExecutor</i> schema for details.
}]			
}			
MaxExecutionTime	string (duration)	<i>read-write</i> (null)	The maximum amount of time the job is allowed to execute. This property shall contain the maximum duration the job is allowed to execute before being stopped by the service. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?</code>
Messages [{]}	array (object)		The message that the Redfish service returns. - An array of messages associated with the job. - This property shall contain an array of messages associated with the job. For property details, see Message.
Parameters (v1.3+) {	object		The parameters specified for running this document-based job. This property shall contain the parameters specified for running this document-based job. This property shall only be present for document-based jobs and if the <code>HidePayload</code> property is <code>false</code>.
(pattern)	string, boolean, number	<i>read-write</i> (null)	Property names follow regular expression pattern <code>^[A-Za-z][A-Za-z0-9_]+\$</code>
}			
Payload {	object		The HTTP and JSON request payload details for this user-specified job. This property shall contain the HTTP and JSON request payload information for executing this user-specified job. This property shall only be present for user-specified jobs and if the <code>HidePayload</code> property is <code>false</code>.
HttpHeaders []	array (string)	<i>read-only</i>	An array of HTTP headers in this job. This property shall contain an array of HTTP headers in this job.

Property	Type	Attributes	Notes
HttpOperation	string	<i>read-only</i>	The HTTP operation that executes this job. This property shall contain the HTTP operation that executes this job.
JsonBody	string	<i>read-only</i>	The JSON payload to use in the execution of this job. This property shall contain JSON-formatted payload for this job.
TargetUri	string (URI)	<i>read-only</i>	The link to the target for this job. This property shall contain link to a target location for an HTTP operation.
}			
PercentComplete	integer (%)	<i>read-only</i> (null)	The completion percentage of this job. This property shall contain the completion progress of the job, reported in percent of completion, 0 to 100. If the job has not been started, the value shall be zero.
Schedule {	object		The schedule settings for this job. This property shall contain the scheduling details for this job and the recurrence frequency for future instances of this job. This property shall not be present for document-based jobs. For property details, see Schedule.
StartTime	string (date-time)	<i>read-only</i>	The date and time when the job was started or is scheduled to start. This property shall contain the date and time when the job was last started or is scheduled to start.
StepOrder []	array (string)	<i>read-only</i>	The serialized execution order of the job steps. This property shall contain an array of <code>Id</code> property values for the job steps in the order that they shall be executed. Each step shall be completed prior to the execution of the next step in array order. An incomplete list of steps shall be considered an invalid configuration. If this property is not present or contains an empty array it shall indicate that the step execution order is omitted and may occur in parallel or in series as determined by the service. This property shall not be present for document-based jobs.
Steps {	object		The link to a collection of steps for this job. This property shall contain the link to a resource collection of type <code>JobCollection</code>. This property shall not be present if this resource represents a step for a job. This property shall not be present for document-based jobs. Contains a link to a resource.

Property	Type	Attributes	Notes
@odata.id	string	read-only	Link to Collection of <i>Job</i> . See the Job schema for details.
}			

6.56.4 Actions

6.56.4.1 Cancel (v1.3+)

Description

Cancels the job.

- This action shall cancel the job if it is currently in the `Running`, `Invalid`, or `Suspended` states. The job shall transition to `Cancelled` if the action is successful.

Action URI

{Base URI of target resource}/Actions/Job.Cancel

Action parameters

This action takes no parameters.

6.56.4.2 ForceStart (v1.3+)

Description

Forces the job to start.

- This action shall force the job to start running if it is in the `Pending` state. The job shall transition to `Running` if the action is successful.

Action URI

{Base URI of target resource}/Actions/Job.ForceStart

Action parameters

This action takes no parameters.

6.56.4.3 Invalidate (v1.3+)

Description

Invalidates the job.

- This action shall invalidate the job if it is in the `Pending` state. The job shall transition to `Invalid` if the action is successful.

Action URI

{Base URI of target resource}/Actions/Job.Invalidate

Action parameters

This action takes no parameters.

6.56.4.4 Resubmit (v1.3+)

Description

Resubmits the job.

- This action shall resubmit a job to the job service. The new job shall be based on the job document, and properties of the resource associated with this action. Services shall take appropriate measures to make sure that appropriate security is maintained - for instance, only allowing the same user that created the job to resubmit it.

Action URI

{Base URI of target resource}/Actions/Job.Resubmit

Action parameters

Parameter Name	Type	Attributes	Notes
StartTime	string (date-time)	<i>optional</i>	The time to start the job. • This parameter shall contain the time to start the job.

Request Example

```
{  
  "StartTime": "2022-01-16T04:14:33+06:00"  
}
```

6.56.4.5 Resume (v1.3+)

Description

Resumes the job.

- This action shall resume the job if it is in the `Suspended` state. The job shall transition to `Running` if the action is successful.

Action URI

{Base URI of target resource}/Actions/Job.Resume

Action parameters

This action takes no parameters.

6.56.4.6 Suspend (v1.3+)

Description

Suspends the job.

- This action shall suspend the job if it is in the `Running` state. The job shall transition to `Suspended` if the action is successful.

Action URI

{Base URI of target resource}/Actions/Job.Suspend

Action parameters

This action takes no parameters.

6.56.4.7 Validate (v1.3+)

Description

Validates the job.

- This action shall request the validation the job if it is in the `New` state. The job shall transition to `Pending` if the action is successful. If the job is not valid, it shall transition to `Invalid`.

Action URI

{Base URI of target resource}/Actions/Job.Validate

Action parameters

This action takes no parameters.

6.56.5 Property details

6.56.5.1 JobState

The state of the job.

- This property shall contain the state of the job.

string	Description
Cancelled	Job was cancelled. • This value shall indicate that the operation completed because the job was cancelled by an operator. The job may restart in the future based on the scheduling configuration of the job or operations performed by a user.
Completed	Job was completed. • This value shall indicate that the operation completed successfully or with warnings. The job may restart in the future based on the scheduling configuration of the job or operations performed by a user.
Continue	Job is to resume operation. • This value shall indicate that the operation has been resumed from a paused condition and should return to a Running state.
Exception	Job has stopped due to an exception condition. • This value shall indicate that the operation completed with errors. The job may restart in the future based on the scheduling configuration of the job or operations performed by a user.
Interrupted	Job has been interrupted. • This value shall indicate that the operation has been interrupted but is expected to restart and is therefore not complete.

string	Description
Invalid (v1.3+)	Job is invalid. This value shall indicate that validation has determined that the system is not properly configured to run the document-based job. To perform validation checks again, perform the <code>Validate</code> action.
New	A new job. This value shall indicate that this job is newly created but the operation has not yet started. This shall be the initial state for document-based jobs. Upon receiving the <code>Validate</code> action, or if the value of <code>ValidationPolicy</code> in the <code>JobService</code> resource contains <code>Automatic</code>, the document-based job's <code>JobState</code> shall transition to <code>Validating</code>. If the <code>ValidationPolicy</code> property in the <code>JobService</code> resource contains <code>Bypass</code>, the <code>JobState</code> for a document-based job shall transition to <code>Pending</code>.
Pending	Job is pending and has not started. This value shall indicate that the operation is pending some condition and has not yet begun to execute.
Running	Job is running normally. This value shall indicate that the operation is executing. Jobs that complete successfully shall transition from this state to the <code>Completed</code> state. Jobs that do not complete successfully shall transition from this state to the <code>Exception</code> state.
Service	Job is running as a service. This value shall indicate that the operation is now running as a service and expected to continue operation until stopped or killed.
Starting	Job is starting. This value shall indicate that the operation is starting.
Stopping	Job is in the process of stopping. This value shall indicate that the operation is stopping but is not yet complete.
Suspended	Job has been suspended. This value shall indicate that the operation has been suspended but is expected to restart and is therefore not complete. To resume a job, perform the <code>Resume</code> action.
UserIntervention	Job is waiting for user intervention. This value shall indicate that the operation is waiting for a user to intervene and needs to be manually continued, stopped, or cancelled.

string	Description
Validating (v1.3+)	Job is validating. This value shall indicate that the document-based job is validating the state of the system to determine if it can run. For example, a job that runs on factory equipment might check to ensure that the equipment is properly configured and has sufficient ingredients to run the job. If the validation checks fail, the job shall transition to the <code>Invalid</code> state. If the validation checks are successful, the job shall transition to the <code>Pending</code> state.

6.56.5.2 JobStatus

The status of the job.

- This property shall contain the health status of the job. This property should contain `Critical` if one or more messages in the `Messages` array contains the severity `Critical`. This property should contain `Warning` if one or more messages in the `Messages` array contains the severity `Warning` and if no messages contain the severity `Critical`. This property should contain `OK` if all messages in the `Messages` array contain the severity `OK` or if the array is empty.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

6.56.5.3 JobType

The type of this job.

- This property shall contain the type of this job.

string	Description
DocumentBased	A document-based job. This value shall indicate a job that was created by performing the <code>SubmitJob</code> action on a <code>JobDocument</code> resource.

string	Description
ServiceGenerated	A service-generated job. This value shall indicate a job that was created automatically by the service as part of its internal policies.
UserSpecified	A user-specified job. This value shall indicate a job that was created by performing an HTTP <code>POST</code> operation on a <code>JobCollection</code> resource.

6.56.6 Example response

```
{
  "@odata.type": "#Job.v1_3_0.Job",
  "Id": "RebootRack",
  "Name": "Scheduled Nightly Reboot of the rack",
  "JobStatus": "OK",
  "JobState": "Running",
  "StartTime": "2018-04-01T00:01+6:00",
  "PercentComplete": 24,
  "Schedule": {
    "Lifetime": "P4Y",
    "InitialStartTime": "2018-01-01T01:00:00+06:00",
    "RecurrenceInterval": "P1D",
    "EnabledDaysOfWeek": [
      "Monday",
      "Tuesday",
      "Wednesday",
      "Thursday",
      "Friday"
    ]
  },
  "Steps": {
    "@odata.id": "/redfish/v1/JobService/Jobs/RebootRack/Steps"
  },
  "StepOrder": [
    "Red",
    "Orange",
    "Yellow",
    "Green",
    "Blue",
    "Indigo",
    "Violet"
  ],
  "@odata.id": "/redfish/v1/JobService/Jobs/RebootRack"
}
```

6.57 JobDocument 1.0.0

Version	v1.0
Release	2025.2

6.57.1 Description

The `JobDocument` schema describes the template for a job with a set of parameters.

- This resource shall represent a job document for a Redfish implementation.

6.57.2 URIs

/redfish/v1/JobService/Documents/{*JobDocumentId*}

6.57.3 Properties

Property	Type	Attributes	Notes
CreationTime	string (date-time)	<i>read-only</i>	The date and time when this job document resource was created. • This property shall contain the date and time when this job document resource was created.
DocumentData	string	<i>read-only</i>	The job document data as a Base64-encoded string. • This property shall contain a Base64-encoded string of the job document data. This property shall not be present if <code>DocumentDataURI</code> is present.
DocumentDataHash	string	<i>read-only</i>	The hash of the job document data. • This property shall contain the hash of the job document data as a hex-encoded string. Pattern: <code>^[0-9a-fA-F]+\$</code>
DocumentDataURI	string (URI)	<i>read-only</i>	The URI at which to access the job document data. • This property shall contain the URI at which to access the job document data. This property shall not be present if <code>DocumentData</code> is present.

Property	Type	Attributes	Notes
DocumentType	string	<i>read-only</i>	The type of job document data associated with this job document. This property shall contain the type of job document data associated with this job document.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
SupportedExecutors [{	array		An array of links to the executors that are capable of running jobs instantiated from this job document. This property shall contain an array of links to resources of type <code>JobExecutor</code> that represent the executors that are capable of running jobs instantiated from this job document.
@odata.id	string	<i>read-only</i>	Link to a JobExecutor resource. See the Links section and the <i>JobExecutor</i> schema for details.
}]			
}			
ParameterMetadata [{	array		The metadata for each of the parameters supported by this job document for the <code>SubmitJob</code> action. This property shall contain the metadata for each of the parameters supported by this job document for the <code>SubmitJob</code> action.
AllowableNumbers []	array (string)	<i>read-only</i>	The allowable numeric values or duration values, inclusive ranges of values, and incremental step values for this parameter. This property shall indicate the allowable numeric values, inclusive ranges of values, and incremental step values for this parameter, as defined in the 'Allowable values for numbers and durations' clause of the Redfish Specification. This property shall only be present for numeric parameters or string parameters that specify a duration.
AllowablePattern	string	<i>read-only</i>	The allowable pattern for this parameter. This property shall contain a regular expression that describes the allowable values for this parameter. This property shall only be present for string parameters.

Property	Type	Attributes	Notes
AllowableValueDescriptions []	array (string)	<i>read-only</i>	Descriptions of allowable values for this parameter. This property shall contain the descriptions of allowable values for this parameter. The descriptions shall appear in the same array order as the <code>AllowableValues</code> property.
AllowableValues []	array (string)	<i>read-only</i>	The allowable values for this parameter. This property shall indicate the allowable values for this parameter.
DataType	string (enum)	<i>read-only required</i>	The JSON property type for this parameter. This property shall contain the JSON property type for this parameter. <i>For the possible property values, see <code>DataType</code> in Property details.</i>
Description	string	<i>read-only</i>	A description of the parameter. This property shall contain a description of the parameter.
MaximumValue	number	<i>read-only</i>	The maximum supported value for this parameter. This integer or number property shall contain the maximum value that this service supports. This property shall not be present for non-integer or number parameters.
MinimumValue	number	<i>read-only</i>	The minimum supported value for this parameter. This integer or number property shall contain the minimum value that this service supports. This property shall not be present for non-integer or number parameters.
Name	string	<i>read-only required</i>	The name of the parameter. This property shall contain the name of the parameter.
Required	boolean	<i>read-only</i>	An indication of whether the parameter is required. This property shall indicate whether the parameter is required.
ValueHint	string	<i>read-only</i>	A hint value for the parameter. This property shall contain a hint value for the parameter.
}]			

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
Version	string	<i>read-only</i>	The version of this job document. This property shall contain the version of this job document.

6.57.4 Actions

6.57.4.1 SubmitJob

Description

Creates a new job based on the contents of this job document and additional parameters.

- This action shall create a new `Job` resource based on the contents of this job document and additional parameters.

Action URI

{Base URI of target resource}/Actions/JobDocument.SubmitJob

Action parameters

Parameter Name	Type	Attributes	Notes
HidePayload	boolean	<i>optional</i>	An indication of whether the contents of the parameters should be hidden from view after the job has been created. If <code>true</code>, responses do not return the parameters. If <code>false</code>, responses return the parameters. If this parameter is not present when the job is created, the default is <code>false</code>. This parameter shall indicate whether the contents of the parameters should be hidden from view after the job has been created. If <code>true</code>, responses shall not return the <code>Parameters</code> property. If <code>false</code>, responses shall return the <code>Parameters</code> property. If this parameter is not present when the job is created, the default is <code>false</code>.

Parameter Name	Type	Attributes	Notes
JobCreator {	object	<i>optional</i>	The link to the job that is submitting this job. This parameter shall contain a link to a resource of type <code>Job</code> that represents the job that is submitting this job. See the <i>Job</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Job resource. See the Links section and the <i>Job</i> schema for details.
}			
Parameters {	object	<i>required</i>	The list of parameters for the new job that are specific to this job document. This parameter shall contain the list of parameters for the new job that are specific to this job document. Services shall reject requests containing parameters that do not meet the requirements specified by the <code>ParameterMetadata</code> property.
PreferredExecutors [{	array	<i>required</i>	An array of links to the preferred executors to run this job. This parameter shall contain an array of links to resources of type <code>JobExecutor</code> that represent the preferred executors to run this job.
@odata.id	string	<i>read-only</i>	Link to a JobExecutor resource. See the Links section and the <i>JobExecutor</i> schema for details.
}]			
StartTime	string (date-time)	<i>optional</i>	The date and time when the job is scheduled to start. This parameter shall contain the date and time when the job is scheduled to start.

Request Example

```
{
  "JobCreator": {
    "@odata.id": "https://192.168.0.1/redfish/v1/JobService/Jobs/1"
  },
  "Parameters": {
    "AmountPieces": 10000,
    "Flavor": "Orange",
    "Shape": "Cylinder"
  },
  "StartTime": "2022-01-16T04:14:33+06:00",
  "PreferredExecutors": [
    {
      "@odata.id": "/redfish/v1/JobService/Executors/1"
    }
  ]
}
```

```
}  
]  
}
```

6.57.5 Property details

6.57.5.1 DataType

The JSON property type for this parameter.

- This property shall contain the JSON property type for this parameter.

string	Description
Boolean	A boolean.
Number	A number.
String	A string.

6.57.6 Example response

```
{  
  "@odata.type": "#JobDocument.v1_0_0.JobDocument",  
  "Id": "Recipe1",  
  "Name": "Sweet candy",  
  "Description": "Produce specified amount of the sweet candies",  
  "Actions": {  
    "#JobDocument.SubmitJob": {  
      "target": "/redfish/v1/JobService/Documents/Recipe1/Actions/JobDocument.SubmitJob"  
    }  
  },  
  "DocumentType": "Script",  
  "Version": "1.0.0-20210215",  
  "CreationTime": "2022-01-16T04:14:33+06:00",  
  "DocumentDataURI": "https://recipestore.vendor.com/recipes?Action=Download&RecipeId=SweetCandy",  
  "Status": {  
    "State": "Enabled",  
    "Health": "OK"  
  },  
  "ParameterMetadata": [  
    {  
      "Name": "AmountPieces",  

```

```
        "DataType": "Number",
        "MinimumValue": 0,
        "Required": true,
        "Description": "The number of pieces to produce",
        "ValueHint": "10000"
    },
    {
        "Name": "Flavors",
        "AllowableValues": [
            "Orange",
            "Strawberry",
            "Lemon",
            "Lime",
            "Raspberry",
            "Vanilla"
        ],
        "DataType": "String",
        "Required": true,
        "Description": "The flavors of the candy. One or two choices may be given",
        "ValueHint": "Orange"
    },
    {
        "Name": "Shape",
        "AllowableValues": [
            "Cylinder",
            "Sphere",
            "Dome",
            "Cone"
        ],
        "DataType": "String",
        "Required": true,
        "Description": "The shape of the candy.",
        "ValueHint": "Dome"
    }
],
"Links": {
    "SupportedExecutors": [
        {
            "@odata.id": "/redfish/v1/JobService/Executors/1"
        }
    ]
},
"@odata.id": "/redfish/v1/JobService/Documents/Recipe1"
}
```

6.58 JobExecutor 1.0.0

Version	v1.0
Release	2025.2

6.58.1 Description

The `JobExecutor` schema describes an entity that carries out a job.

- This resource shall represent a job executor for a Redfish implementation.

6.58.2 URIs

/redfish/v1/JobService/Executors/{*JobExecutorId*}

6.58.3 Properties

Property	Type	Attributes	Notes
ExecutorType	string	<i>read-only</i>	The primary type of job this executor processes. • This property shall contain the primary type of job executed by this resource.
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Chassis [{	array		An array of links to the chassis that contain this equipment. • This property shall contain an array of links to resources of type <code>Chassis</code> that represent the physical containers that contain this equipment.
@odata.id	string	<i>read-only</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.
}]			

Property	Type	Attributes	Notes
ComputerSystem {	object		The system that is performing the work of this job executor. This property shall contain a link to a resource of type <code>ComputerSystem</code> that represents the system that is performing the work of this job executor. See the <i>ComputerSystem</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a ComputerSystem resource. See the Links section and the <i>ComputerSystem</i> schema for details.
}			
ExecutingJobs [{	array		Links to jobs this executor is running. This property shall contain an array of links to resources of type <code>Job</code> that represent the jobs this executor is running.
@odata.id	string	<i>read-only</i>	Link to a Job resource. See the Links section and the <i>Job</i> schema for details.
}]			
}			
MaximumConcurrentJobs	integer	<i>read-only</i>	The maximum concurrent jobs this executor can process. This property shall contain the maximum concurrent jobs this executor can process.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

6.58.4 Example response

```
{
  "@odata.type": "#JobExecutor.v1_0_0.JobExecutor",
  "Id": "1",
  "Name": "Main Job Executor",
  "Description": "Executor for Document-based Jobs",
  "ExecutorType": "Script",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "MaximumConcurrentJobs": 1,
  "Links": {
```



```
    "ExecutingJobs": [
      {
        "@odata.id": "/redfish/v1/JobService/Jobs/1"
      }
    ],
    "Chassis": [
      {
        "@odata.id": "/redfish/v1/Chassis/Aggregator"
      }
    ],
    "ComputerSystem": {
      "@odata.id": "/redfish/v1/Systems/1"
    }
  },
  "@odata.id": "/redfish/v1/JobService/Executors/1"
}
```

6.59 JobService 1.1.0

Version	v1.1	v1.0
Release	2025.2	2018.2

6.59.1 Description

The `JobService` schema contains properties for scheduling and execution of operations, represents the properties for the job service itself, and has links to jobs managed by the job service.

- This resource shall represent a job service for a Redfish implementation.

6.59.2 URIs

/redfish/v1/JobService

6.59.3 Properties

Property	Type	Attributes	Notes
DateTime	string (date-time)	<i>read-only</i> (<i>null</i>)	The current date and time setting for the job service. This property shall contain the current date and time setting for the job service.
JobDocuments (v1.1+) {	object		The links to the job document collection. This property shall contain a link to a resource collection of type <code>JobDocumentCollection</code>. This property shall only be present if the service supports document-based jobs. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>JobDocument</i> . See the JobDocument schema for details.
}			
JobExecutors (v1.1+) {	object		The links to the job executor collection. This property shall contain a link to a resource collection of type <code>JobExecutorCollection</code>. This property shall only be present if the service supports document-based jobs. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>JobExecutor</i> . See the JobExecutor schema for details.
}			
Jobs {	object		The links to the jobs collection. This property shall contain a link to a resource collection of type <code>JobCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Job</i> . See the Job schema for details.
}			
Log {	object		The link to a log service that the job service uses. This service can be a dedicated log service or a pointer to a log service under another resource, such as a manager. This property shall contain a link to a resource of type <code>LogService</code> that this job service uses. See the <i>LogService</i> schema for details on this property.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a LogService resource. See the Links section and the <i>LogService</i> schema for details.
}			
ServiceCapabilities {	object		The supported capabilities of this job service implementation. This property shall contain properties that describe the capabilities or supported features of this implementation of a job service.
DocumentBasedJobs (v1.1+)	boolean	<i>read-only</i> (null)	An indication of whether document-based jobs are supported. This property shall indicate whether document-based jobs are supported. Document-based jobs are jobs that are created by performing the <code>SubmitJob</code> action on a <code>JobDocument</code> resource in the <code>JobDocumentCollection</code> resource referenced by the <code>JobDocuments</code> property.
MaxJobs	integer	<i>read-only</i> (null)	The maximum number of jobs supported. This property shall contain the maximum number of jobs supported by the implementation.
MaxSteps	integer	<i>read-only</i> (null)	The maximum number of job steps supported. This property shall contain the maximum number of steps supported by a single job instance.
Scheduling	boolean	<i>read-only</i> (null)	An indication of whether scheduling of jobs is supported. This property shall indicate whether the <code>Schedule</code> property within the job supports scheduling of jobs.
UserSpecifiedJobs (v1.1+)	boolean	<i>read-only</i> (null)	An indication of whether user-specified jobs are supported. This property shall indicate whether user-specified jobs are supported. User-specified jobs are jobs that are created by performing an HTTP <code>POST</code> operation on the <code>JobCollection</code> resource referenced by the <code>Jobs</code> property.
}			
ServiceEnabled	boolean	<i>read-write</i> (null)	An indication of whether this service is enabled. This property shall indicate whether this service is enabled.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

Property	Type	Attributes	Notes
ValidationPolicy (v1.1+)	string (enum)	<i>read-only</i> (<i>null</i>)	The policy for how document-based jobs are validated. This property shall contain policy for how document-based jobs are validated. <i>For the possible property values, see ValidationPolicy in Property details.</i>

6.59.4 Actions

6.59.4.1 CancelAllJobs (v1.1+)

Description

Cancels all jobs.

- This action shall cancel all jobs. The service shall transition all jobs to the `Cancelled` state.

Action URI

{Base URI of target resource}/Actions/JobService.CancelAllJobs

Action parameters

This action takes no parameters.

6.59.5 Property details

6.59.5.1 ValidationPolicy

The policy for how document-based jobs are validated.

- This property shall contain policy for how document-based jobs are validated.

string	Description
Automatic	Jobs are validated automatically. This value shall indicate that jobs are validated automatically. The <code>JobState</code> property of a new job shall contain <code>Validating</code> when created with the <code>SubmitJob</code> action from the <code>JobDocument</code> resource.

string	Description
Bypass	Jobs are not validated. This value shall indicate jobs are not validated. The <code>JobState</code> property of a new job shall contain <code>Pending</code> when created with the <code>SubmitJob</code> action from the <code>JobDocument</code> resource.
Manual	Jobs are validated manually. This value shall indicate jobs are validated manually. The <code>JobState</code> property of a new job shall contain <code>New</code> when created with the <code>SubmitJob</code> action from the <code>JobDocument</code> resource and wait for a user to perform the <code>Validate</code> action in the <code>Job</code> resource.

6.59.6 Example response

```
{
  "@odata.type": "#JobService.v1_1_0.JobService",
  "Id": "JobService",
  "Name": "Job Service",
  "DateTime": "2018-06-13T04:14+06:00",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "ServiceEnabled": true,
  "ServiceCapabilities": {
    "MaxJobs": 100,
    "MaxSteps": 50,
    "Scheduling": true
  },
  "Jobs": {
    "@odata.id": "/redfish/v1/JobService/Jobs"
  },
  "Log": {
    "@odata.id": "/redfish/v1/JobService/Log"
  },
  "Actions": {
    "Oem": {
      "#Contoso.EasyButton": {
        "target": "/redfish/v1/JobService/Contoso.EasyButton",
        "@Redfish.ActionInfo": "/redfish/v1/JobService/EasyButtonActionInfo"
      }
    }
  },
  "@odata.id": "/redfish/v1/JobService"
}
```

6.60 JsonSchemaFile 1.1.5

Version	v1.1	v1.0
Release	2017.1	1.0

6.60.1 Description

The `JsonSchemaFile` schema contains the properties that describe the locations, as URIs, of a Redfish schema definition that a Redfish service implements or references.

- This resource shall represent the schema file locator resource for a Redfish implementation.

6.60.2 URIs

/redfish/v1/JsonSchemas/{*JsonSchemaFileId*}

6.60.3 Properties

Property	Type	Attributes	Notes
Languages []	array (string)	<i>read-only required</i>	The RFC5646-conformant language codes for the available schemas. • This property contains a set of RFC5646-conformant language codes.
Location [{	array	<i>required</i>	Location information for this schema file. • This property shall contain the location information for this schema file.
ArchiveFile	string	<i>read-only</i>	The name of the file in the archive, if the schema is hosted on the service in an archive file. • This property shall contain the file name of the individual schema file within the archive file that the <code>ArchiveUri</code> property specifies. The file name shall conform to the Redfish Specification-described format.
ArchiveUri	string (URI)	<i>read-only</i>	The link to an archive file, if the schema is hosted on the service in an archive file. • This property shall contain a URI colocated with the Redfish service that specifies the location of the schema file, which can be retrieved using the Redfish protocol and authentication methods. This property shall be used for only archive files, in zip or other formats. The <code>ArchiveFile</code> value shall be the individual schema file name within the archive file.

Property	Type	Attributes	Notes
Language	string	<i>read-only</i>	The language code for the schema file. This property shall contain an RFC5646-conformant language code or the <code>default</code> string.
PublicationUri	string (URI)	<i>read-only</i>	The link to publicly available (canonical) URI for schema. This property shall contain a URI not colocated with the Redfish service that specifies the canonical location of the schema file. This property shall be used for only individual schema files.
Uri	string (URI)	<i>read-only</i>	The link to locally available URI for schema. This property shall contain a URI colocated with the Redfish service that specifies the location of the schema file, which can be retrieved using the Redfish protocol and authentication methods. This property shall be used for only individual schema files. The file name portion of the URI shall conform to the format specified in the Redfish Specification.
}}]			
Schema	string	<i>read-only required</i>	The <code>@odata.type</code> name this schema describes. This property shall contain the <code>@odata.type</code> property value for that schema and shall conform to the Redfish Specification-specified syntax for the 'Type' property.

6.60.4 Example response

```
{
  "@odata.type": "#JsonSchemaFile.v1_1_5.JsonSchemaFile",
  "Id": "Chassis.v1_11_0",
  "Name": "Chassis Schema File",
  "Description": "Chassis Schema File Location",
  "Languages": [
    "en"
  ],
  "Schema": "#Chassis.v1_11_0.Chassis",
  "Location": [
    {
      "Language": "en",
      "ArchiveUri": "/Schemas.gz",
      "PublicationUri": "http://redfish.dmtf.org/schemas/v1/Chassis.v1_11_0.json",
      "ArchiveFile": "Chassis.v1_11_0.json"
    },
    {
      "Language": "zh",
```

```

        "ArchiveUri": "/Schemas.zh.gz",
        "PublicationUri": "http://schemas.contoso.com/Chassis.v1_11_0.zh.json",
        "ArchiveFile": "Chassis.v1_11_0.zh.json"
    },
    {
        "Language": "xy",
        "Uri": "/redfish/v1/JsonSchemas/Chassis.v1_11_0.xy.json",
        "PublicationUri": "http://schemas.contoso.com/Chassis.v1_11_0.xy.json"
    }
],
"@odata.id": "/redfish/v1/JsonSchemas/Chassis.v1_11_0"
}

```

6.61 Key 1.4.1

Version	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2023.3	2023.2	2022.3	2022.1	2021.2

6.61.1 Description

The `Key` schema describes sensitive data for accessing devices or services.

- This resource shall represent a key for a Redfish implementation.

6.61.2 URIs

/redfish/v1/AccountService/Accounts/{*ManagerAccountId*}/Keys/{*KeyId*}
 /redfish/v1/AggregationService/AggregationSources/{*AggregationSourceId*}/PresentedPublicHostKey
 /redfish/v1/AggregationService/AggregationSources/{*AggregationSourceId*}/PublicIdentityKey
 /redfish/v1/AggregationService/AggregationSources/{*AggregationSourceId*}/TrustedPublicHostKeys/{*KeyId*}
 /redfish/v1/KeyService/NVMeoFSecrets/{*KeyId*}
 /redfish/v1/Managers/{*ManagerId*}/RemoteAccountService/Accounts/{*ManagerAccountId*}/Keys/{*KeyId*}
 /redfish/v1/UpdateService/PublicIdentitySSHKey/{*KeyId*}
 /redfish/v1/UpdateService/RemoteServerSSHKeys/{*KeyId*}

6.61.3 Properties

Property	Type	Attributes	Notes
KeyString	string	<i>read-only required on create (null)</i>	The string for the key. This property shall contain the key, and the format shall follow the requirements specified by the <code>KeyType</code> property value.
KeyType	string (enum)	<i>read-only required on create (null)</i>	The format of the key. This property shall contain the format type for the key. <i>For the possible property values, see KeyType in Property details.</i>
NVMeoF {	object		NVMe-oF specific properties. This property shall contain NVMe-oF specific properties for this key. This property shall be present if <code>KeyType</code> contains the value <code>NVMeoF</code>.
HostKeyId	string	<i>read-write (null)</i>	The identifier of the host key paired with this target key. This property shall contain the value of the <code>Id</code> property of the <code>Key</code> resource representing the host key paired with this target key. An empty string shall indicate the key is not paired. This property shall be absent for host keys.
NQN	string	<i>read-only required on create (null)</i>	The NVMe Qualified Name (NQN) of the host or target subsystem associated with this key. This property shall contain the NVMe Qualified Name (NQN) of the host or target subsystem associated with this key. The value of this property shall follow the NQN format defined by the NVMe Base Specification.
OEMSecurityProtocolType	string	<i>read-only (null)</i>	The OEM security protocol that this key uses. This property shall contain the OEM-defined security protocol that this key uses. The value shall be derived from the contents of the <code>KeyString</code> property. This property shall be present if <code>SecurityProtocolType</code> contains the value <code>OEM</code>.
SecureHashAllowList []	array (string (enum))	<i>read-only (null)</i>	The NVMe secure hash algorithms that a key is allowed to use. - The secure hash algorithms allowed with the usage of this key. - This property shall contain the secure hash algorithms allowed with the usage of this key. An empty list or the absence of this property shall indicate any secure hash algorithms are allowed with this key. <i>For the possible property values, see SecureHashAllowList in Property details.</i>

Property	Type	Attributes	Notes
SecurityProtocolType	string (enum)	<i>read-only</i> (null)	The security protocol that this key uses. This property shall contain the security protocol that this key uses. The value shall be derived from the contents of the <code>KeyString</code> property. <i>For the possible property values, see <code>SecurityProtocolType</code> in Property details.</i>
}			
SSH (v1.2+) {	object		SSH specific properties. This property shall contain SSH specific properties for this key. This property shall be present if <code>KeyType</code> contains the value <code>SSH</code>.
Comment (v1.4+)	string	<i>read-only</i> (null)	The user-specified comment associated with this key, which typically contains the client's username and host name. This property shall contain the user-specified comment associated with this key, which typically contains the client's username and host name.
Fingerprint (v1.2+)	string	<i>read-only</i> (null)	A fingerprint of the key. This property shall contain the fingerprint of the key. Pattern: <code>(^MD5(:[0-9a-f]{2})+)\$ ^SHA256:[A-Za-z0-9+/=]+\$</code>
RemoteServerHostName (v1.3+)	string	<i>read-only</i> (null)	The host name of the remote server associated with this key. This property shall contain the host name of the remote server associated with this key.
}			
UserDescription (v1.1+)	string	<i>read-write</i> (null)	A user-defined string to describe this key. This property shall contain a user-provided string that describes the key.

6.61.4 Property details

6.61.4.1 KeyType

The format of the key.

- This property shall contain the format type for the key.

string	Description
NVMeoF	An NVMe-oF key. This value shall indicate the format of the key is defined by one of the NVMe specifications.
SSH (v1.1+)	An SSH public key. This value shall indicate the format of the key is defined by one of the SSH public key formats as defined in, but not limited to, RFC4253, RFC4716, or RFC8709.

6.61.4.2 SecureHashAllowList

The NVMe secure hash algorithms that a key is allowed to use.

- The secure hash algorithms allowed with the usage of this key.
 - This property shall contain the secure hash algorithms allowed with the usage of this key. An empty list or the absence of this property shall indicate any secure hash algorithms are allowed with this key.

string	Description
SHA256	SHA-256. This value shall indicate the SHA-256 hash function as defined by the 'DH-HMAC-CHAP hash function identifiers' figure in the NVMe Base Specification.
SHA384	SHA-384. This value shall indicate the SHA-384 hash function as defined by the 'DH-HMAC-CHAP hash function identifiers' figure in the NVMe Base Specification.
SHA512	SHA-512. This value shall indicate the SHA-512 hash function as defined by the 'DH-HMAC-CHAP hash function identifiers' figure in the NVMe Base Specification.

6.61.4.3 SecurityProtocolType

The security protocol that this key uses.

- This property shall contain the security protocol that this key uses. The value shall be derived from the contents of the `KeyString` property.

string	Description
DHHC	Diffie-Hellman Hashed Message Authentication Code Challenge Handshake Authentication Protocol (DH-HMAC-CHAP). This value shall indicate the Diffie-Hellman Hashed Message Authentication Code Challenge Handshake Authentication Protocol (DH-HMAC-CHAP) as defined by the NVMe Base Specification.
OEM	OEM. This value shall indicate an OEM-defined security protocol. The <code>OEMSecurityProtocolType</code> property shall contain the specific OEM protocol.
TLS_PSK	Transport Layer Security Pre-Shared Key (TLS PSK). This value shall indicate Transport Layer Security Pre-Shared Key (TLS PSK) as defined by the NVMe TCP Transport Specification.

6.61.5 Example response

```
{
  "@odata.type": "#Key.v1_4_1.Key",
  "Id": "0",
  "Name": "NVMeoF key 0, target subsystem",
  "KeyType": "NVMeoF",
  "KeyString": "DHHC-1:00:1a6zGodOr4SEG0Zzaw398rpY0wqipUWj4jWjUh4HWUz6aQ2n:",
  "NVMeoF": {
    "NQN": "nqn.corp.com:nvme:target-subsystem-0001",
    "SecurityProtocolType": "DHHC",
    "HostKeyId": "1",
    "SecureHashAllowList": [
      "SHA384",
      "SHA512"
    ]
  },
  "@odata.id": "/redfish/v1/KeyService/NVMeoFSecrets/0"
}
```

6.62 KeyPolicy 1.0.1

Version	v1.0
Release	2021.2

6.62.1 Description

The `KeyPolicy` schema describes settings for how keys are allowed to be used for accessing devices or services.

- This resource shall represent a key policy for a Redfish implementation.

6.62.2 URIs

/redfish/v1/KeyService/NVMeoFKeyPolicies/{KeyPolicyId}

6.62.3 Properties

Property	Type	Attributes	Notes
IsDefault	boolean	<i>read-write</i> (null)	Indicates if this is the default key policy. • This property shall indicate if this key policy is the policy applied when no other policies are specified.
KeyPolicyType	string (enum)	<i>read-only</i> <i>required on create</i> (null)	The type of key policy. • This property shall contain the type of key policy. <i>For the possible property values, see KeyPolicyType in Property details.</i>
NVMeoF {	object		NVMe-oF specific properties. • This property shall contain NVMe-oF specific properties for this key policy. This property shall be present if <code>KeyPolicyType</code> contains the value <code>NVMeoF</code>.
CipherSuiteAllowList []	array (string (enum))	<i>read-write</i> (null)	The NVMe cipher suites that a key is allowed to use. • The cipher suites that this key policy allows. ◦ This property shall contain the cipher suites that this key policy allows. The absence of the property shall indicate any cipher suite is allowed. An empty list shall indicate no cipher suites are allowed. <i>For the possible property values, see CipherSuiteAllowList in Property details.</i>

Property	Type	Attributes	Notes
DHGroupAllowList []	array (string (enum))	<i>read-write (null)</i>	The NVMe Diffie-Hellman (DH) groups that a key is allowed to use. - The Diffie-Hellman (DH) groups that this key policy allows. - This property shall contain the Diffie-Hellman (DH) groups that this key policy allows. The absence of the property shall indicate any DH group is allowed. An empty list shall indicate no DH groups are allowed. <i>For the possible property values, see DHGroupAllowList in Property details.</i>
OEMSecurityProtocolAllowList []	array (string, null)	<i>read-write</i>	The OEM security protocols that this key policy allows. This property shall contain the OEM-defined security protocols that this key policy allows. NVMe-oF channels are restricted to OEM-defined security protocols in this list. An empty list shall indicate no security protocols are allowed. This property shall be present if <code>SecurityProtocolAllowList</code> contains <code>OEM</code>.
SecureHashAllowList []	array (string (enum))	<i>read-write (null)</i>	The NVMe secure hash algorithms that a key is allowed to use. - The secure hash algorithms that this key policy allows. - This property shall contain the secure hash algorithms that this key policy allows. The absence of the property shall indicate any secure hash algorithm is allowed. An empty list shall indicate no secure hash algorithms are allowed. <i>For the possible property values, see SecureHashAllowList in Property details.</i>
SecurityProtocolAllowList []	array (string (enum))	<i>read-write (null)</i>	The NVMe security protocols that a key is allowed to use. - The security protocols that this key policy allows. - This property shall contain the security protocols that this key policy allows. NVMe-oF channels are restricted to security protocols in this list. The absence of the property shall indicate any security protocol is allowed. An empty list shall indicate no security protocols are allowed. <i>For the possible property values, see SecurityProtocolAllowList in Property details.</i>
SecurityTransportAllowList []	array (string (enum))	<i>read-write (null)</i>	The NVMe security transports that a key is allowed to use. - The security transports that this key policy allows. - This property shall contain the security transports that this key policy allows. The absence of the property shall indicate any security transport is allowed. An empty list shall indicate no security transports are allowed. <i>For the possible property values, see SecurityTransportAllowList in Property details.</i>

Property	Type	Attributes	Notes
}			

6.62.4 Property details

6.62.4.1 CipherSuiteAllowList

The NVMe cipher suites that a key is allowed to use.

- The cipher suites that this key policy allows.
 - This property shall contain the cipher suites that this key policy allows. The absence of the property shall indicate any cipher suite is allowed. An empty list shall indicate no cipher suites are allowed.

string	Description
TLS_AES_128_GCM_SHA256	TLS_AES_128_GCM_SHA256. • This value shall indicate TLS_AES_128_GCM_SHA256 as defined by the 'Mandatory and Recommended Cipher Suites' clause in the NVMe TCP Transport Specification.
TLS_AES_256_GCM_SHA384	TLS_AES_256_GCM_SHA384. • This value shall indicate TLS_AES_256_GCM_SHA384 as defined by the 'Mandatory and Recommended Cipher Suites' clause in the NVMe TCP Transport Specification.

6.62.4.2 DHGroupAllowList

The NVMe Diffie-Hellman (DH) groups that a key is allowed to use.

- The Diffie-Hellman (DH) groups that this key policy allows.
 - This property shall contain the Diffie-Hellman (DH) groups that this key policy allows. The absence of the property shall indicate any DH group is allowed. An empty list shall indicate no DH groups are allowed.

string	Description
FFDHE2048	2048-bit Diffie-Hellman (DH) group. • This value shall indicate the 2048-bit Diffie-Hellman (DH) group as defined by the 'DH-HMAC-CHAP Diffie-Hellman group identifiers' figure in the NVMe Base Specification.

string	Description
FFDHE3072	3072-bit Diffie-Hellman (DH) group. This value shall indicate the 3072-bit Diffie-Hellman (DH) group as defined by the 'DH-HMAC-CHAP Diffie-Hellman group identifiers' figure in the NVMe Base Specification.
FFDHE4096	4096-bit Diffie-Hellman (DH) group. This value shall indicate the 4096-bit Diffie-Hellman (DH) group as defined by the 'DH-HMAC-CHAP Diffie-Hellman group identifiers' figure in the NVMe Base Specification.
FFDHE6144	6144-bit Diffie-Hellman (DH) group. This value shall indicate the 2048-bit Diffie-Hellman (DH) group as defined by the 'DH-HMAC-CHAP Diffie-Hellman group identifiers' figure in the NVMe Base Specification.
FFDHE8192	8192-bit Diffie-Hellman (DH) group. This value shall indicate the 8192-bit Diffie-Hellman (DH) group as defined by the 'DH-HMAC-CHAP Diffie-Hellman group identifiers' figure in the NVMe Base Specification.

6.62.4.3 KeyPolicyType

The type of key policy.

- This property shall contain the type of key policy.

string	Description
NVMeoF	An NVMe-oF key policy. This value shall indicate the key policy is for an NVMe-oF key.

6.62.4.4 SecureHashAllowList

The NVMe secure hash algorithms that a key is allowed to use.

- The secure hash algorithms that this key policy allows.
 - This property shall contain the secure hash algorithms that this key policy allows. The absence of the property shall indicate any secure hash algorithm is allowed. An empty list shall indicate no secure hash algorithms are allowed.

string	Description
SHA256	SHA-256. This value shall indicate the SHA-256 hash function as defined by the 'DH-HMAC-CHAP hash function identifiers' figure in the NVMe Base Specification.
SHA384	SHA-384. This value shall indicate the SHA-384 hash function as defined by the 'DH-HMAC-CHAP hash function identifiers' figure in the NVMe Base Specification.
SHA512	SHA-512. This value shall indicate the SHA-512 hash function as defined by the 'DH-HMAC-CHAP hash function identifiers' figure in the NVMe Base Specification.

6.62.4.5 SecurityProtocolAllowList

The NVMe security protocols that a key is allowed to use.

- The security protocols that this key policy allows.
 - This property shall contain the security protocols that this key policy allows. NVMe-oF channels are restricted to security protocols in this list. The absence of the property shall indicate any security protocol is allowed. An empty list shall indicate no security protocols are allowed.

string	Description
DHHC	Diffie-Hellman Hashed Message Authentication Code Challenge Handshake Authentication Protocol (DH-HMAC-CHAP). This value shall indicate the Diffie-Hellman Hashed Message Authentication Code Challenge Handshake Authentication Protocol (DH-HMAC-CHAP) as defined by the NVMe Base Specification.
OEM	OEM. This value shall indicate an OEM-defined security protocol. The <code>OEMSecurityProtocolAllowList</code> property shall contain the specific OEM protocol.
TLS_PSK	Transport Layer Security Pre-Shared Key (TLS PSK). This value shall indicate Transport Layer Security Pre-Shared Key (TLS PSK) as defined by the NVMe TCP Transport Specification.

6.62.4.6 SecurityTransportAllowList

The NVMe security transports that a key is allowed to use.

- The security transports that this key policy allows.
 - This property shall contain the security transports that this key policy allows. The absence of the property shall indicate any security transport is allowed. An empty list shall indicate no security transports are allowed.

string	Description
TLSv2	Transport Layer Security (TLS) v2. • This value shall indicate Transport Layer Security (TLS) v2 as defined by the 'Transport Specific Address Subtype Definition for NVMe/TCP Transport' figure in the NVMe TCP Transport Specification.
TLSv3	Transport Layer Security (TLS) v3. • This value shall indicate Transport Layer Security (TLS) v3 as defined by the 'Transport Specific Address Subtype Definition for NVMe/TCP Transport' figure in the NVMe TCP Transport Specification.

6.62.5 Example response

```
{
  "@odata.type": "#KeyPolicy.v1_0_1.KeyPolicy",
  "Id": "0",
  "Name": "Default NVMeoF Key Policy",
  "IsDefault": true,
  "KeyPolicyType": "NVMeoF",
  "NVMeoF": {
    "SecurityTransportAllowList": [
      "TLSv2",
      "TLSv3"
    ],
    "CipherSuiteAllowList": [
      "TLS_AES_128_GCM_SHA256",
      "TLS_AES_256_GCM_SHA384"
    ],
    "SecurityProtocolAllowList": [
      "DHHC",
      "TLS_PSK"
    ],
    "DHGroupAllowList": [
```

```
        "FFDHE2048",
        "FFDHE3072",
        "FFDHE4096",
        "FFDHE6144",
        "FFDHE8192"
    ],
    "SecureHashAllowList": [
        "SHA384",
        "SHA512"
    ]
},
"@odata.id": "/redfish/v1/KeyService/NVMeoFKeyPolicies/0"
}
```

6.63 KeyService 1.0.1

Version	v1.0
Release	2021.2

6.63.1 Description

The `KeyService` schema describes a key service that represents the actions available to manage keys.

- This resource shall represent the key service properties for a Redfish implementation.

6.63.2 URIs

/redfish/v1/KeyService

6.63.3 Properties

Property	Type	Attributes	Notes
NVMeoFKeyPolicies {	object		The NVMe-oF key policies maintained by this service. • This property shall contain a link to a resource collection of type <code>KeyPolicyCollection</code> that contains the NVMe-oF key policies maintained by this service. The <code>KeyPolicyType</code> property for all members of this collection shall contain the value <code>NVMeoF</code>. Contains a link to a resource.

Property	Type	Attributes	Notes
@odata.id	string	read-only	Link to Collection of <i>KeyPolicy</i> . See the KeyPolicy schema for details.
}			
NVMeoFSecrets {	object		The NVMe-oF keys maintained by this service. This property shall contain a link to a resource collection of type <code>KeyCollection</code> that contains the NVMe-oF keys maintained by this service. The <code>KeyType</code> property for all members of this collection shall contain the value <code>NVMeoF</code>. Contains a link to a resource.
@odata.id	string	read-only	Link to Collection of <i>Key</i> . See the Key schema for details.
}			

6.63.4 Example response

```

{
  "@odata.type": "#KeyService.v1_0_1.KeyService",
  "Id": "KeyService",
  "Name": "Key Service",
  "NVMeoFSecrets": {
    "@odata.id": "/redfish/v1/KeyService/NVMeoFSecrets"
  },
  "NVMeoFKeyPolicies": {
    "@odata.id": "/redfish/v1/KeyService/NVMeoFKeyPolicies"
  },
  "@odata.id": "/redfish/v1/KeyService"
}

```

6.64 LeakDetection 1.1.0

Version	v1.1	v1.0
Release	2024.3	2023.1

6.64.1 Description

The `LeakDetection` schema contains definitions for reporting leaks in liquid cooling systems or other equipment.

- This resource shall represent the leak detection functionality present in a service for a Redfish implementation.

6.64.2 URIs

/redfish/v1/Chassis/{ChassisId}/ThermalSubsystem/LeakDetection
 /redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/LeakDetection
 /redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/LeakDetection
 /redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/LeakDetection
 /redfish/v1/ThermalEquipment/RPUs/{CoolingUnitId}/LeakDetection

6.64.3 Properties

Property	Type	Attributes	Notes
LeakDetectorGroups [{	array		The groups of leak detection equipment. This property shall contain an array of leak detection groups.
Detectors [{	array (excerpt)		The leak detection states from all related leak detection devices in this group. This property shall contain the states of all leak detection devices in this detector group. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>LeakDetector</code>. This object is an excerpt of the <i>LeakDetector</i> resource located at the URI shown in <code>DataSourceUri</code>.
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this leak detector. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
DetectorState	string (enum)	read-only (null)	The state of the leak detector. This property shall contain the state of the leak detector. The value of this property should equate the value of <code>Health</code> in <code>Status</code>, and was created primarily for use in excerpts of this resource. <i>For the possible property values, see <code>DetectorState</code> in Property details.</i>
DeviceName (v1.2+)	string	read-only (null)	The name of the device. This property shall contain the name of the device associated with this leak detector. If the device is represented by a resource, the value shall contain the value of the <code>Name</code> property of the associated resource.
PhysicalContext	string (enum)	read-only (null)	The area or device to which this leak detector applies. This property shall contain a description of the affected component or region within the equipment to which this leak detector applies. <i>For the possible property values, see <code>PhysicalContext</code> in Property details.</i>

Property	Type	Attributes	Notes
PhysicalSubContext	string (enum)	<i>read-only</i> (null)	The usage or location within a device to which this leak detector applies. This property shall contain a description of the usage or sub-region within the equipment to which this leak detector applies. This property generally differentiates multiple leak detectors within the same <code>PhysicalContext</code> instance. <i>For the possible property values, see <code>PhysicalSubContext</code> in Property details.</i>
}]			
GroupName	string	<i>read-only</i>	The name of this leak detector group. This property shall contain the name used to describe this group of leak detectors and related equipment.
HumidityPercent {	object (excerpt)		Humidity (percent). This property shall contain the humidity, in percent units, for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Humidity</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			
Status (v1.1+) {}	object	<i>required</i>	The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <code>Status</code>.
}]			
LeakDetectors {	object		The link to the collection of leak detectors within this subsystem. This property shall contain a link to a resource collection of type <code>LeakDetectorCollection</code>. Contains a link to a resource.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to Collection of <i>LeakDetector</i> . See the LeakDetector schema for details.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

6.64.4 Property details

6.64.4.1 DetectorState

The state of the leak detector.

- This property shall contain the state of the leak detector. The value of this property should equate the value of `Health` in `Status`, and was created primarily for use in excerpts of this resource.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

6.64.4.2 PhysicalContext

The area or device to which this leak detector applies.

- This property shall contain a description of the affected component or region within the equipment to which this leak detector applies.

string	Description
Accelerator	An accelerator.
ACInput	An AC electrical input or input-related circuit.
ACMaintenanceBypassInput	An AC electrical maintenance bypass input.

string	Description
ACOutput	An AC electrical output or output-related circuit. This value shall indicate an electrical output or an output-related circuit, such as a branch output, which is not terminated as a power outlet.
ACStaticBypassInput	An AC electrical static bypass input.
ACUtilityInput	An AC electrical utility input. This value shall indicate an electrical input, where the source is an electrical utility as opposed to a backup or locally-generated power source. This value is intended to differentiate multiple electrical inputs between utility, maintenance bypass, or static bypass values. For general purpose usage, the value of <code>ACInput</code> is preferred.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	A compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC electrical bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	An expansion bay. This value shall indicate a location that provides for the expansion of functionality of a system, such as a PCIe slot that can accept an option card.
ExpansionSubsystem	A group of expansion bays. This value shall indicate a group of expansion bays and the devices installed in those bays.
Fan	A fan.

string	Description
Filter	A filter.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Manager	A management controller, such as a BMC (baseboard management controller).
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	A networking bay. This value shall indicate a location that provides for the expansion of networking functionality of a system, by the addition of networking devices.
NetworkingDevice	A networking device.
PowerOutlet	An electrical outlet. This value shall indicate an electrical outlet or receptacle.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	A power supply bay. This value shall indicate a location that provides for the installation of a power supply or similar devices.
Pump	A pump.
Rectifier	A rectifier device.
Reservoir	A reservoir.

string	Description
Room	The room.
StorageBay	A storage bay. This value shall indicate a location that provides for the expansion of storage functionality of a system, by the addition of storage devices.
StorageDevice	A storage device.
StorageSubsystem	A storage subsystem. This value shall indicate a storage subsystem, which may consist of one or more storage controllers, storage devices, or related components.
Switch	A switch device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.64.4.3 PhysicalSubContext

The usage or location within a device to which this leak detector applies.

- This property shall contain a description of the usage or sub-region within the equipment to which this leak detector applies. This property generally differentiates multiple leak detectors within the same `PhysicalContext` instance.

string	Description
Input	The input.
Output	The output.

6.64.5 Example response

```
{
  "@odata.type": "#LeakDetection.v1_1_0.LeakDetection",
  "Id": "LeakDetection",
  "Name": "Leak Detection Systems",
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "Conditions": []
  },
  "LeakDetectorGroups": [
    {
      "GroupName": "Detectors under and around the CDU",
      "Status": {
        "Health": "OK"
      },
      "HumidityPercent": {
        "Reading": 45
      },
      "Detectors": [
        {
          "DataSourceUri": "/redfish/v1/ThermalEquipment/CDUs/1/LeakDetection/LeakDetectors/Moisture",
          "DeviceName": "Moisture-type Leak Detector",
          "DetectorState": "OK"
        },
        {
          "DeviceName": "Leak Detection Rope 1",
          "DetectorState": "OK"
        }
      ],
      {
        "DataSourceUri": "/redfish/v1/ThermalEquipment/CDUs/1/LeakDetection/LeakDetectors/Overflow",
        "DeviceName": "Overflow Float Switch",
        "DetectorState": "OK"
      }
    ]
  ],
  "LeakDetectors": {
    "@odata.id": "/redfish/v1/ThermalEquipment/CDUs/1/LeakDetection/LeakDetectors"
  },
  "@odata.id": "/redfish/v1/ThermalEquipment/CDUs/1/LeakDetection"
}
```

6.65 LeakDetector 1.4.0

Version	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2025.2	2024.4	2024.3	2024.1	2023.1

6.65.1 Description

The `LeakDetector` schema describes a state-based or digital-value leak detector and its properties.

- This resource shall represent a state-based or digital-value leak detector for a Redfish implementation.

6.65.2 URIs

`/redfish/v1/Chassis/{ChassisId}/LeakDetectors/{LeakDetectorId}`
`/redfish/v1/Chassis/{ChassisId}/ThermalSubsystem/LeakDetection/LeakDetectors/{LeakDetectorId}` (deprecated)
`/redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/LeakDetection/LeakDetectors/{LeakDetectorId}` (deprecated)
`/redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/LeakDetection/LeakDetectors/{LeakDetectorId}` (deprecated)
`/redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/LeakDetection/LeakDetectors/{LeakDetectorId}` (deprecated)

6.65.3 Properties

Property	Type	Attributes	Notes
CriticalReactionType (v1.4+)	string (enum)	read-write	The reaction to perform when a critical leak is detected. The reaction that shall be performed when the <code>DetectorState</code> property changes to <code>Critical</code>. <i>For the possible property values, see CriticalReactionType in Property details.</i>
DetectorState	string (enum)	read-only (null)	The state of the leak detector. This property shall contain the state of the leak detector. The value of this property should equate the value of <code>Health</code> in <code>Status</code>, and was created primarily for use in excerpts of this resource. <i>For the possible property values, see DetectorState in Property details.</i>

Property	Type	Attributes	Notes
Enabled (v1.3+)	boolean	<i>read-write</i> (null)	Indicates whether the leak detector is enabled and provides a status. This property shall indicate whether the leak detector is enabled and provides a <code>DetectorState</code>. The value <code>true</code> shall indicate the leak detector is enabled and returns the <code>DetectorState</code> property with a valid value. The value <code>false</code> shall indicate the leak detector is disabled, shall not return the <code>DetectorState</code> property, and shall not trigger events, logging, or other functionality. This property allows a user to disable a faulty leak detector or to otherwise remove it from use.
LeakDetectorType	string (enum)	<i>read-only</i> (null)	The type of leak detection sensor. This property shall contain the reading type of the leak detection sensor. <i>For the possible property values, see <code>LeakDetectorType</code> in Property details.</i>
Location {}	object		The location information for this leak detector. This property shall indicate the location information for this leak detector. For property details, see <code>Location</code>.
Manufacturer	string	<i>read-only</i> (null)	The manufacturer of this leak detector. This property shall contain the name of the organization responsible for producing the leak detector. This organization may be the entity from whom the leak detector is purchased, but this is not necessarily true.
Model	string	<i>read-only</i> (null)	The model number of the leak detector. This property shall contain the name by which the manufacturer generally refers to the leak detector.
PartNumber	string	<i>read-only</i> (null)	The part number of the leak detector. This property shall contain a part number assigned by the organization that is responsible for producing or manufacturing the leak detector.
PhysicalContext	string (enum)	<i>read-only</i> (null)	The area or device to which this leak detector applies. This property shall contain a description of the affected component or region within the equipment to which this leak detector applies. <i>For the possible property values, see <code>PhysicalContext</code> in Property details.</i>
PhysicalSubContext	string (enum)	<i>read-only</i> (null)	The usage or location within a device to which this leak detector applies. This property shall contain a description of the usage or sub-region within the equipment to which this leak detector applies. This property generally differentiates multiple leak detectors within the same <code>PhysicalContext</code> instance. <i>For the possible property values, see <code>PhysicalSubContext</code> in Property details.</i>

Property	Type	Attributes	Notes
ReactionDelaySeconds (v1.4+)	integer (seconds)	<i>read-write</i>	The delay in seconds after a leak is detected before the selected reaction is executed. The value shall indicate the number of seconds to delay after the <code>DetectorState</code> changes before the selected reaction is executed. If the <code>DetectorState</code> returns to <code>OK</code> prior to the delay value, the service shall not perform the reaction.
SensingFrequency	number	<i>read-only</i> (null)	The time interval between readings of the physical leak detector. This property shall contain the time interval between readings of the physical leak detector.
SerialNumber	string	<i>read-only</i> (null)	The serial number of the leak detector. This property shall contain a manufacturer-allocated number that identifies the leak detector.
SKU	string	<i>read-only</i> (null)	The SKU of the leak detector. This property shall contain the stock-keeping unit number for this leak detector.
SparePartNumber	string	<i>read-only</i> (null)	The spare part number of the leak detector. This property shall contain the spare part number of the leak detector.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <code>Status</code>.
UserLabel (v1.1+)	string	<i>read-write</i>	A user-assigned label. This property shall contain a user-assigned label used to identify this resource. If a value has not been assigned by a user, the value of this property shall be an empty string.
WarningReactionType (v1.4+)	string (enum)	<i>read-write</i>	The reaction to perform when a warning-level leak is detected. The reaction that shall be performed when the <code>DetectorState</code> property changes to <code>Warning</code>. For the possible property values, see <code>WarningReactionType</code> in Property details.

6.65.4 Property details

6.65.4.1 CriticalReactionType

The reaction to perform when a critical leak is detected.

- The reaction that shall be performed when the `DetectorState` property changes to `Critical`.

string	Description
ForceOff	Forcefully shut down the device, equipment, or system. This value shall indicate that the associated device, equipment, or system monitored by this leak detector is forcefully shut down when a leak is detected.
GracefulShutdown	Gracefully shut down the device, equipment, or system. This value shall indicate that the associated device, equipment, or system monitored by this leak detector is gracefully shut down when a leak is detected.
None	No reaction. This value shall indicate no reaction occurs when a leak is detected.

6.65.4.2 DetectorState

The state of the leak detector.

- This property shall contain the state of the leak detector. The value of this property should equate the value of `Health` in `Status`, and was created primarily for use in excerpts of this resource.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

6.65.4.3 LeakDetectorType

The type of leak detection sensor.

- This property shall contain the reading type of the leak detection sensor.

string	Description
FloatSwitch	A float switch.
Moisture	A moisture sensor.

6.65.4.4 PhysicalContext

The area or device to which this leak detector applies.

- This property shall contain a description of the affected component or region within the equipment to which this leak detector applies.

string	Description
Accelerator	An accelerator.
ACInput	An AC electrical input or input-related circuit.
ACMaintenanceBypassInput	An AC electrical maintenance bypass input.
ACOutput	An AC electrical output or output-related circuit. This value shall indicate an electrical output or an output-related circuit, such as a branch output, which is not terminated as a power outlet.
ACStaticBypassInput	An AC electrical static bypass input.
ACUtilityInput	An AC electrical utility input. This value shall indicate an electrical input, where the source is an electrical utility as opposed to a backup or locally-generated power source. This value is intended to differentiate multiple electrical inputs between utility, maintenance bypass, or static bypass values. For general purpose usage, the value of <code>ACInput</code> is preferred.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.

string	Description
ComputeBay	A compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC electrical bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	An expansion bay. This value shall indicate a location that provides for the expansion of functionality of a system, such as a PCIe slot that can accept an option card.
ExpansionSubsystem	A group of expansion bays. This value shall indicate a group of expansion bays and the devices installed in those bays.
Fan	A fan.
Filter	A filter.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Manager	A management controller, such as a BMC (baseboard management controller).
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.

string	Description
NetworkBay	A networking bay. This value shall indicate a location that provides for the expansion of networking functionality of a system, by the addition of networking devices.
NetworkingDevice	A networking device.
PowerOutlet	An electrical outlet. This value shall indicate an electrical outlet or receptacle.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	A power supply bay. This value shall indicate a location that provides for the installation of a power supply or similar devices.
Pump	A pump.
Rectifier	A rectifier device.
Reservoir	A reservoir.
Room	The room.
StorageBay	A storage bay. This value shall indicate a location that provides for the expansion of storage functionality of a system, by the addition of storage devices.
StorageDevice	A storage device.
StorageSubsystem	A storage subsystem. This value shall indicate a storage subsystem, which may consist of one or more storage controllers, storage devices, or related components.
Switch	A switch device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.

string	Description
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.65.4.5 PhysicalSubContext

The usage or location within a device to which this leak detector applies.

- This property shall contain a description of the usage or sub-region within the equipment to which this leak detector applies. This property generally differentiates multiple leak detectors within the same `PhysicalContext` instance.

string	Description
Input	The input.
Output	The output.

6.65.4.6 WarningReactionType

The reaction to perform when a warning-level leak is detected.

- The reaction that shall be performed when the `DetectorState` property changes to `Warning`.

string	Description
ForceOff	Forcefully shut down the device, equipment, or system. • This value shall indicate that the associated device, equipment, or system monitored by this leak detector is forcefully shut down when a leak is detected.
GracefulShutdown	Gracefully shut down the device, equipment, or system. • This value shall indicate that the associated device, equipment, or system monitored by this leak detector is gracefully shut down when a leak is detected.
None	No reaction. • This value shall indicate no reaction occurs when a leak is detected.

6.65.5 Example response

```

{
  "@odata.type": "#LeakDetector.v1_4_0.LeakDetector",
  "Id": "Moisture",
  "Name": "Moisture-type Leak Detector",
  "LeakDetectorType": "Moisture",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "DetectorState": "OK",
  "CriticalReactionType": "ForceOff",
  "WarningReactionType": "None",
  "ReactionDelaySeconds": 15,
  "PartNumber": "3493-A44",
  "SerialNumber": "916239",
  "Manufacturer": "Contoso Water Detection Systems",
  "Model": "Depends 3000",
  "Location": {
    "PartLocation": {
      "Reference": "Bottom",
      "ServiceLabel": "Leak Detector"
    }
  },
  "PhysicalContext": "Chassis",
  "@odata.id": "/redfish/v1/ThermalEquipment/CDUs/1/LeakDetection/LeakDetectors/Moisture"
}
```

6.66 License 1.1.4

Version	v1.1	v1.0
Release	2022.3	2021.3

6.66.1 Description

The `License` schema describes a license for a feature.

- This resource shall represent a license for a Redfish implementation.

6.66.2 URIs

/redfish/v1/LicenseService/Licenses/{LicenseId}

6.66.3 Properties

Property	Type	Attributes	Notes
AuthorizationScope	string (enum)	<i>read-only</i> (null)	The authorization scope of the license. This property shall contain the authorization scope of the license. <i>For the possible property values, see AuthorizationScope in Property details.</i>
Contact {	object		The contact of the license. This property shall contain an object containing information about the contact of the license.
ContactName	string	<i>read-only</i> (null)	Name of this contact. This property shall contain the name of a person or organization to contact for information about this license.
EmailAddress	string	<i>read-only</i> (null)	Email address for this contact. This property shall contain the email address for a person or organization to contact for information about this license.
PhoneNumber	string	<i>read-only</i> (null)	Phone number for this contact. This property shall contain the phone number for a person or organization to contact for information about this license.
}			
DownloadURI	string (URI)	<i>read-only</i>	The URI from which to download the license file. This property shall contain the URI from which to download the license file, using the Redfish protocol and authentication methods. The service provides this URI for the download of the OEM-specific binary file of license data. An HTTP GET from this URI shall return a response payload of MIME type <code>application/octet-stream</code>.
EntitlementId	string	<i>read-only</i> (null)	The entitlement identifier for this license. This property shall contain the entitlement identifier for this license, used to display a license key, partial license key, or other value used to identify or differentiate license instances.

Property	Type	Attributes	Notes
ExpirationDate	string (date-time)	<i>read-only</i> (null)	The date and time when the license expires. This property shall contain the date and time when the license expires.
GracePeriodDays	integer	<i>read-only</i> (null)	The grace days of this license. The value of this property shall contain the number of days that the license is still usable after the date and time specified by the <code>ExpirationDate</code> property.
InstallDate	string (date-time)	<i>read-only</i> (null)	The date and time when the license was installed. This property shall contain the date and time when the license was installed.
LicenseInfoURI	string (URI)	<i>read-only</i> (null)	The URI at which more information about this license can be obtained. This property shall contain the URI at which to provide more information about the license. The information provided at the URI is intended to be general product-related and not tied to a specific user, customer, or license instance.
LicenseOrigin	string (enum)	<i>read-only</i> (null)	This indicates the origin of the license. This property shall contain the origin for the license. <i>For the possible property values, see LicenseOrigin in Property details.</i>
LicenseString	string	<i>read-only</i> <i>required on create</i> (null)	The Base64-encoded string of the license. This property shall contain the Base64-encoded string, with padding characters, of the license. This property shall not appear in response payloads.
LicenseType	string (enum)	<i>read-only</i> (null)	The type of the license. This property shall contain the type for the license. <i>For the possible property values, see LicenseType in Property details.</i>
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
AuthorizedDevices [{	array		An array of links to the devices authorized by the license. This property shall contain an array of links to the devices that are authorized by the license. Clients can provide this property when installing a license to apply the license to specific devices. If not provided when installing a license, the service may determine the devices to which the license applies. This property shall not be present if the <code>AuthorizationScope</code> property contains the value <code>Service</code>.

Property	Type	Attributes	Notes
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
TargetServices (v1.1+) [{	array		An array of links to the managers where the license is installed. This property shall contain an array of links to resources of type <code>Manager</code> that represent the services where the license is installed, such as remote Redfish services. This property shall only be present in aggregators when the <code>AuthorizationScope</code> property contains <code>Service</code> or <code>Capacity</code>.
@odata.id	string	<i>read-only</i>	Link to a Manager resource. See the Links section and the <i>Manager</i> schema for details.
}}]			
}			
Manufacturer	string	<i>read-only</i> (null)	The manufacturer or producer of this license. This property shall represent the name of the manufacturer or producer of this license.
MaxAuthorizedDevices	integer	<i>read-only</i> (null)	The maximum number of devices authorized by the license. This property shall contain the maximum number of devices that are authorized by the license. This property shall only be present if the <code>AuthorizationScope</code> property contains the value <code>Capacity</code>.
PartNumber	string	<i>read-only</i> (null)	The part number for this license. This property shall contain the manufacturer-provided part number for the license.
RemainingDuration	string (duration)	<i>read-only</i> (null)	The remaining usage duration before the license expires. This property shall contain the remaining usage duration before the license expires. This property shall only be present for licenses that are based on usage time. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?</code>

Property	Type	Attributes	Notes
RemainingUseCount	integer	read-only (null)	The remaining usage count before the license expires. This property shall contain the remaining usage count before the license expires. This property shall only be present for licenses that are based on usage count.
Removable	boolean	read-only (null)	An indication of whether the license is removable. This property shall indicate whether a user can remove the license with an HTTP <code>DELETE</code> operation.
SerialNumber	string	read-only (null)	The serial number for this license. This property shall contain a manufacturer-allocated number that identifies the license.
SKU	string	read-only (null)	The SKU for this license. This property shall contain the SKU number for this license.
Status {}	object		The status of the license. This property shall contain the status of license. For property details, see Status.

6.66.4 Property details

6.66.4.1 AuthorizationScope

The authorization scope of the license.

- This property shall contain the authorization scope of the license.

string	Description
Capacity	The license authorizes functionality to a number of devices, but not restricted to specific device instances. This value shall indicate the license authorizes functionality for one or more device instances limited to a maximum number of devices specified by the value of the <code>MaxAuthorizedDevices</code> property. In an aggregator, the aggregating service shall represent the applicable services in the <code>TargetServices</code> property in the <code>Links</code> property.

string	Description
Device	The license authorizes functionality for specific device instances. This value shall indicate the license authorizes functionality for one or more specific device instances, listed as values of the <code>AuthorizedDevices</code> property.
Service	The license authorizes functionality to a service. This value shall indicate the license authorizes product-level or service-level functionality for a service. This may include hardware or software features not tied to a specific device or subsystem. <code>License</code> resources using this value shall not include the <code>AuthorizedDevices</code> nor the <code>MaxAuthorizedDevices</code> properties. In an aggregator, the aggregating service shall represent the applicable services in the <code>TargetServices</code> property in the <code>Links</code> property.

6.66.4.2 LicenseOrigin

This indicates the origin of the license.

- This property shall contain the origin for the license.

string	Description
BuiltIn	A license was provided with the product.
Installed	A license installed by user.

6.66.4.3 LicenseType

The type of the license.

- This property shall contain the type for the license.

string	Description
Production	A license for use in production environments. This value shall indicate a license purchased or obtained for use in production environments.
Prototype	A prototype version of license. This value shall indicate a license that is designed for development or internal use.

string	Description
Trial	A trial license. This value shall indicate a trial version of a license.

6.66.5 Example response

```
{
  "@odata.type": "#License.v1_1_4.License",
  "Id": "KVM",
  "Name": "Blade KVM-IP License 3-Pack",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "EntitlementId": "LIC20180820LDLM5C",
  "LicenseType": "Production",
  "Removable": false,
  "LicenseOrigin": "BuiltIn",
  "AuthorizationScope": "Device",
  "GracePeriodDays": 60,
  "Manufacturer": "Contoso",
  "InstallDate": "2020-08-20T20:13:44Z",
  "ExpirationDate": "2022-08-20T20:13:43Z",
  "Links": {
    "AuthorizedDevices": [
      {
        "@odata.id": "/redfish/v1/Managers/Blade1"
      },
      {
        "@odata.id": "/redfish/v1/Managers/Blade4"
      },
      {
        "@odata.id": "/redfish/v1/Managers/Blade5"
      }
    ]
  },
  "Contact": {
    "ContactName": "Bob Johnson",
    "EmailAddress": "bjohnson@contoso.com"
  },
  "DownloadURI": "/dumpster/license111",
  "LicenseInfoURI": "http://shop.contoso.com/licenses/blade-kvm",
  "@odata.id": "/redfish/v1/LicenseService/Licenses/KVM"
}
```

6.67 LicenseService 1.1.2

Version	v1.1	v1.0
Release	2022.3	2021.3

6.67.1 Description

The `LicenseService` schema describes the license service and the properties for the service itself with a link to the collection of licenses. The license service also provides methods for installing licenses in a Redfish service.

- This resource shall represent a license service and the properties that affect the service itself for a Redfish implementation.

6.67.2 URIs

/redfish/v1/LicenseService

6.67.3 Properties

Property	Type	Attributes	Notes
LicenseExpirationWarningDays	integer	<i>read-write</i> (null)	The number of days prior to a license expiration that a warning message is sent. A value of zero indicates no warning message is sent. This property shall contain the number of days prior to a license expiration that the service shall send the <code>DaysBeforeExpiration</code> message from the License Message Registry at least once. A value of zero shall indicate that no warning messages are sent prior to license expiration.
Licenses {	object		The link to the collection of licenses. This property shall contain a link to a resource collection of type <code>LicenseCollection</code>. When installing a license with a <code>POST</code> operation to this collection, the service may update an existing License resource instead of creating a new resource. In these cases, the service shall respond with the HTTP <code>200 OK</code> status code or HTTP <code>204 No Content</code> status code and the <code>Location</code> header in the response shall contain the URI of the updated License resource. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>License</i> . See the License schema for details.

Property	Type	Attributes	Notes
}			
ServiceEnabled	boolean	<i>read-write (null)</i>	An indication of whether this service is enabled. This property shall indicate whether this service is enabled.

6.67.4 Actions

6.67.4.1 Install

Description

This action installs one or more licenses from a remote file.

- This action shall install one or more licenses from a remote file. The service may update an existing `License` resource. The `Location` header in the response shall contain the URI of the new or updated `License` resource.

Action URI

{Base URI of target resource}/Actions/LicenseService.Install

Action parameters

Parameter Name	Type	Attributes	Notes
AuthorizedDevices (v1.1+) [{	array	<i>optional</i>	An array of links to the devices to be authorized by the license. This parameter shall contain an array of links to the devices to be authorized by the license. Clients can provide this parameter when installing a license to apply the license to specific devices. If not provided when installing a license, the service may determine the devices to which the license applies. This parameter shall not be present if the <code>AuthorizationScope</code> property contains the value <code>Service</code>.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			

Parameter Name	Type	Attributes	Notes
LicenseFileURI	string (URI)	<i>required</i>	The URI of the license file to install. This parameter shall contain an RFC3986-defined URI that links to a file that the license service retrieves to install the license in that file. This URI should contain a scheme that describes the transfer protocol. If the <code>TransferProtocol</code> parameter is absent or not supported, and a transfer protocol is not specified by a scheme contained within this URI, the service shall use HTTP to get the file.
Password	string	<i>optional</i>	The password to access the URI specified by the <code>LicenseFileURI</code> parameter. This parameter shall contain the password to access the URI specified by the <code>LicenseFileURI</code> parameter.
TargetServices (v1.1+) [{	array	<i>optional</i>	An array of links to the managers where the license will be installed. This property shall contain an array of links to resources of type <code>Manager</code> that represent the services where the license will be installed, such as remote Redfish services. This parameter shall only be present in aggregators when the <code>AuthorizationScope</code> property contains <code>Service</code> or <code>Capacity</code>.
@odata.id	string	<i>read-only</i>	Link to a Manager resource. See the Links section and the <i>Manager</i> schema for details.
}]			
TransferProtocol	string (enum)	<i>optional</i>	The network protocol that the license service uses to retrieve the license file located at the URI provided in <code>LicenseFileURI</code>. This parameter is ignored if the URI provided in <code>LicenseFileURI</code> contains a scheme. This parameter shall contain the network protocol that the license service shall use to retrieve the license file located at the <code>LicenseFileURI</code>. Services should ignore this parameter if the URI provided in <code>LicenseFileURI</code> contains a scheme. If this parameter is not provided or supported, and if a transfer protocol is not specified by a scheme contained within this URI, the service shall use HTTP to retrieve the file. <i>For the possible property values, see TransferProtocol in Property details.</i>
Username	string	<i>optional</i>	The username to access the URI specified by the <code>LicenseFileURI</code> parameter. This parameter shall contain the username to access the URI specified by the <code>LicenseFileURI</code> parameter.

Request Example

```
{
  "LicenseFileURI": "ftp://licensing.contoso.org/bmc_kvmpip_8RS247MKRQ8027.bin",
  "Username": "operations",
```

```
    "Password": "Pa55w0rd"
  }
```

6.67.5 Property details

6.67.5.1 TransferProtocol

The network protocol that the license service uses to retrieve the license file located at the URI provided in `LicenseFileURI`. This parameter is ignored if the URI provided in `LicenseFileURI` contains a scheme.

- This parameter shall contain the network protocol that the license service shall use to retrieve the license file located at the `LicenseFileURI`. Services should ignore this parameter if the URI provided in `LicenseFileURI` contains a scheme. If this parameter is not provided or supported, and if a transfer protocol is not specified by a scheme contained within this URI, the service shall use HTTP to retrieve the file.

string	Description
CIFS	Common Internet File System (CIFS).
FTP	File Transfer Protocol (FTP).
HTTP	Hypertext Transfer Protocol (HTTP).
HTTPS	Hypertext Transfer Protocol Secure (HTTPS).
NFS	Network File System (NFS).
OEM	A manufacturer-defined protocol.
SCP	Secure Copy Protocol (SCP).
SFTP	SSH File Transfer Protocol (SFTP).
TFTP	Trivial File Transfer Protocol (TFTP).

6.67.6 Example response

```
{
  "@odata.type": "#LicenseService.v1_1_2.LicenseService",
  "Name": "License Service",
  "ServiceEnabled": true,
  "LicenseExpirationWarningDays": 14,
  "Actions": {
```

```

    "#LicenseService.Install": {
      "target": "/redfish/v1/LicenseService/Actions/LicenseService.Install",
      "@Redfish.ActionInfo": "/redfish/v1/LicenseService/InstallActionInfo"
    },
    "Licenses": {
      "@odata.id": "/redfish/v1/LicenseService/Licenses"
    },
    "@odata.id": "/redfish/v1/LicenseService"
  }

```

6.68 LogEntry 1.19.0

Version	v1.19	v1.18	v1.17	v1.16	v1.15	v1.14	v1.13	v1.12	v1.11	v1.10	v1.9	...
Release	2025.2	2025.1	2024.3	2023.3	2023.1	2022.3	2022.2	2022.1	2021.4	2021.3	2021.1	...

6.68.1 Description

The `LogEntry` schema defines the record format for a log. It is designed for Redfish event logs, OEM-specific log formats, and the IPMI System Event Log (SEL). The `EntryType` field indicates the type of log and the resource includes several additional properties dependent on the `EntryType`.

- This resource shall represent the log format for log services in a Redfish implementation.

6.68.2 URIs

```

/redfish/v1/Chassis/{ChassisId}/LogServices/{LogServiceId}/Entries/{LogEntryId}
/redfish/v1/Chassis/{ChassisId}/PCleDevices/{PCleDeviceId}/CXLLogicalDevices/{CXLLogicalDeviceId}/DeviceLog/
Entries/{LogEntryId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/LogServices/
{LogServiceId}/Entries/{LogEntryId}
/redfish/v1/JobService/Log/Entries/{LogEntryId}
/redfish/v1/Managers/{ManagerId}/LogServices/{LogServiceId}/Entries/{LogEntryId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/LogServices/{LogServiceId}/Entries/
{LogEntryId}
/redfish/v1/Systems/{ComputerSystemId}/LogServices/{LogServiceId}/Entries/{LogEntryId}
/redfish/v1/Systems/{ComputerSystemId}/Memory/{MemoryId}/DeviceLog/Entries/{LogEntryId}
/redfish/v1/TelemetryService/LogService/Entries/{LogEntryId}

```

6.68.3 Properties

Property	Type	Attributes	Notes
AdditionalDataSizeBytes (v1.7+)	integer (bytes)	<i>read-only</i> (null)	The size of the additional data for this log entry. This property shall contain the size of the additional data retrieved from the URI specified by the <code>AdditionalDataURI</code> property for this log entry.
AdditionalDataURI (v1.7+)	string (URI)	<i>read-only</i> (null)	The URI at which to access the additional data for this log entry, such as diagnostic data, image captures, or other files. This property shall contain the URI at which to access the additional data for this log entry, using the Redfish protocol and authentication methods. If both <code>DiagnosticData</code> and <code>AdditionalDataURI</code> are present, <code>DiagnosticData</code> shall contain a Base64-encoded string, with padding characters, of the data retrieved from the URI specified by the <code>AdditionalDataURI</code> property.
CPER (v1.15+) {	object		Details for a CPER section or record associated with this log entry. This property shall contain the details for a CPER section or record that is the source of this log entry.
NotificationType (v1.15+)	string (uuid)	<i>read-only</i> (null)	The CPER Notification Type for a CPER record. This property shall contain the CPER Notification Type for a CPER record that corresponds to the contents of the <code>DiagnosticData</code> property or data retrieved from the URI specified by the <code>AdditionalDataURI</code> property. This property shall only be present if <code>DiagnosticDataType</code> contains <code>CPER</code>. Pattern: <code>^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\$</code>
Oem (v1.15+) {}	object		See the OEM object definition in the Using this guide clause.
SectionType (v1.15+)	string (uuid)	<i>read-only</i> (null)	The CPER Section Type. This property shall contain the CPER Section Type for a CPER section that corresponds to the contents of the <code>DiagnosticData</code> property or data retrieved from the URI specified by the <code>AdditionalDataURI</code> property. This property shall only be present if <code>DiagnosticDataType</code> contains <code>CPERSection</code>. Pattern: <code>^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\$</code>
}			

Property	Type	Attributes	Notes
Created	string (date-time)	<i>read-only</i>	The date and time when the log entry was created. This property shall contain the date and time when the log entry was created.
CXLEntryType (v1.14+)	string (enum)	<i>read-only</i>	The specific CXL entry type. This property shall contain the specific CXL entry type. This property shall only be present if <code>EntryType</code> contains <code>CXL</code>. <i>For the possible property values, see CXLEntryType in Property details.</i>
DiagnosticData (v1.15+)	string	<i>read-only</i> (null)	A Base64-encoded set of diagnostic data associated with this log entry. This property shall contain a Base64-encoded string, with padding characters, that represents diagnostic data associated with this log entry. The contents shall depend on the value of the <code>DiagnosticDataType</code> property. The length of the value should not exceed 4 KB. Larger diagnostic data payloads should omit this property and use the <code>AdditionalDataURI</code> property to reference the data. If both <code>DiagnosticData</code> and <code>AdditionalDataURI</code> are present, <code>DiagnosticData</code> shall contain the Base64-encoding of the data retrieved from the URI specified by the <code>AdditionalDataURI</code> property.
DiagnosticDataType (v1.7+)	string (enum)	<i>read-only</i> (null)	The type of data available in the <code>DiagnosticData</code> property or retrieved from the URI specified by the <code>AdditionalDataURI</code> property. This property shall contain the type of data available in the <code>DiagnosticData</code> property or retrieved from the URI specified by the <code>AdditionalDataURI</code> property. The <code>OriginOfCondition</code> property, if present, shall contain a link to the resource that represents the device from which the diagnostic data was collected. <i>For the possible property values, see DiagnosticDataType in Property details.</i>
EntryCode	string (enum)	<i>read-only</i> (null)	The entry code for the log entry if the entry type is <code>SEL</code>. This property shall contain the entry code for the log entry if the <code>EntryType</code> is <code>SEL</code>. Tables 42-1 and 42-2 of the IPMI Specification v2.0 revision 1.1 describe these enumerations. <i>For the possible property values, see EntryCode in Property details.</i>
EntryType	string (enum)	<i>read-only</i> <i>required</i>	The type of log entry. This property shall represent the type of log entry. If the resource represents an IPMI SEL entry, the value shall contain <code>SEL</code>. If the resource represents a Redfish event log entry, the value shall contain <code>Event</code>. If the resource represents a CXL event record, the value shall contain <code>CXL</code>. If the resource represents an OEM log entry format, the value shall contain <code>Oem</code>. <i>For the possible property values, see EntryType in Property details.</i>

Property	Type	Attributes	Notes
EventGroupId (v1.4+)	integer	<i>read-only</i> (null)	An identifier that correlates events with the same cause. This property shall indicate that events are related and shall have the same value in the case where multiple event messages are produced by the same root cause. Implementations shall use separate values for events with separate root cause. There shall not be ordering of events implied by this property's value.
EventId (v1.1+)	string	<i>read-only</i>	The unique instance identifier for an event. If present, this <code>LogEntry</code> records an <code>Event</code> and the value shall indicate a unique identifier for the event, the format of which is implementation dependent.
EventTimestamp (v1.1+)	string (date-time)	<i>read-only</i>	The date and time when the event occurred. If present, this <code>LogEntry</code> records an event and the value shall contain the date and time when the event occurred.
EventType (v1.1+, deprecated v1.4)	string (enum)	<i>read-only</i>	The type of event recorded in this log. If present, this <code>LogEntry</code> records an event and the value shall indicate the type of event. <i>For the possible property values, see EventType in Property details.</i> <i>Deprecated in v1.4 and later. This property has been deprecated. Starting with Redfish Specification v1.6 (Event v1.3), subscriptions are based on the RegistryPrefix and ResourceType properties and not on the EventType property.</i>
FirstOverflowTimestamp (v1.14+)	string (date-time)	<i>read-only</i>	The timestamp of the first overflow captured after this log entry. This property shall contain the timestamp of the first overflow captured after this log entry. If this log entry is the most recent log entry in the log service, this property shall not be present if no overflow errors occurred after the time of this log entry. If this log entry is not the most recent log entry in the log service, this property shall not be present if no overflow errors occurred between the time of this log entry and the time of the next log entry.
GeneratorId (v1.5+)	string	<i>read-only</i> (null)	An identifier of the device that has generated the IPMI SEL Event Record. If <code>EntryType</code> is <code>SEL</code>, this property shall contain the 'Generator ID' field of the IPMI SEL Event Record. If <code>EntryType</code> is not <code>SEL</code>, this property should not be present. Pattern: <code>^0[xx]((([a-fA-F] [0-9]){2})){2}\$</code>

Property	Type	Attributes	Notes
LastOverflowTimestamp (v1.14+)	string (date-time)	<i>read-only</i>	The timestamp of the last overflow captured after this log entry. This property shall contain the timestamp of the last overflow captured after this log entry. If this log entry is the most recent log entry in the log service, this property shall not be present if no overflow errors occurred after the time of this log entry. If this log entry is not the most recent log entry in the log service, this property shall not be present if no overflow errors occurred between the time of this log entry and the time of the next log entry.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
OriginOfCondition {	object		The link to the resource that caused the log entry. This property shall contain a link to the resource that caused the log entry. For log entries that represent the creation or deletion of a resource, this property should reference the created or deleted resource and not the collection that contains the resource.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
RelatedItem (v1.12+) [{	array		An array of links to resources associated with this log entry. This property shall contain an array of links to resources that are related to this log entry. It shall not contain links to <code>LogEntry</code> resources. <code>RelatedLogEntries</code> is used to reference related log entries. This property shall not contain the value of the <code>OriginOfCondition</code> property.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			

Property	Type	Attributes	Notes
RelatedLogEntries (v1.12+) [{	array		An array of links to other log entries that are related to this log entry. This property shall contain an array of links to resources of type <code>LogEntry</code> in this or other log services that are related to this log entry. This property should be used to link a log entry indicating the resolution of a condition with a log entry for the initial condition.
@odata.id	string	<i>read-only</i>	Link to another LogEntry resource.
}]			
}			
Message	string	<i>read-only</i> (null)	The message of the log entry. This property decodes from the entry type. If the entry type is <code>Event</code> , this property contains a message. If the entry type is <code>SEL</code> , this property contains an SEL-specific message. If the entry type is <code>CXL</code> , this property contains a CXL event record. Otherwise, this property contains an OEM-specific log entry. In most cases, this property contains the actual log entry. This property shall contain the message of the log entry. This property decodes from the entry type. If the entry type is <code>Event</code>, this property contains a message. If the entry type is <code>SEL</code>, this property contains an SEL-specific message, following the format specified in Table 32-1, SEL Event Records, in the IPMI Specification v2.0 revision 1.1. If the entry type is <code>CXL</code>, this property contains the CXL event record as a string of hex bytes in the pattern <code>^([a-fA-F0-9]{2})+\$</code>. Otherwise, this property contains an OEM-specific log entry. In most cases, this property contains the actual log entry.
MessageArgs []	array (string)	<i>read-only</i>	An array of message arguments that are substituted for the arguments in the message when looked up in the message registry. This property shall contain an array of message arguments that are substituted for the arguments in the message when looked up in the message registry. It has the same semantics as the <code>MessageArgs</code> property in the Redfish <code>MessageRegistry</code> schema. If the corresponding <code>ParamType</code> value contains <code>number</code>, the service shall convert the number to a string representation of the number.

Property	Type	Attributes	Notes
MessageId	string	<i>read-only</i>	The <code>MessageId</code>, event data, or OEM-specific information. This property decodes from the entry type. If the entry type is <code>Event</code>, this property contains a Redfish Specification-defined <code>MessageId</code>. If the entry type is <code>SEL</code>, this property contains the Event Data. Otherwise, this property contains OEM-specific information. This property shall contain the <code>MessageId</code>, event data, or OEM-specific information. This property decodes from the entry type. If the entry type is <code>Event</code>, this property contains a Redfish Specification-defined <code>MessageId</code> property of the event. If the entry type is <code>SEL</code>, the format should follow the pattern <code>^0[xX]([a-fA-F][0-9]){2}{4}\$</code>, which results in a string in the form '0xNNaabbcc', where 'NN' is the EventDir/EventType byte, 'aa' is the Event Data 1 byte, 'bb' is Event Data 2 byte, 'cc' is Event Data 3 byte, corresponding with bytes 13-16 in the IPMI SEL Event Record. If the entry type is <code>CXL</code>, this property shall not be present. Otherwise, this property contains OEM-specific information.
Modified (v1.6+)	string (date-time)	<i>read-only</i>	The date and time when the log entry was last modified. This property shall contain the date and time when the log entry was last modified. This property shall not appear if the log entry has not been modified since it was created.
OEMDiagnosticDataType (v1.7+)	string	<i>read-only</i> (null)	The OEM-defined type of data available in the <code>DiagnosticData</code> property or retrieved from the URI specified by the <code>AdditionalDataURI</code> property. This property shall contain the OEM-defined type of data available in the <code>DiagnosticData</code> property or retrieved from the URI specified by the <code>AdditionalDataURI</code> property. This property shall be present if <code>DiagnosticDataType</code> is <code>OEM</code>.
OemLogEntryCode (v1.3+)	string	<i>read-only</i> (null)	The OEM-specific entry code, if the <code>LogEntryCode</code> type is <code>OEM</code>. This property shall represent the OEM-specific Log Entry Code type of the Entry. This property shall only be present if <code>EntryType</code> is <code>SEL</code> and <code>LogEntryCode</code> is <code>OEM</code>.
OemRecordFormat	string	<i>read-only</i> (null)	The OEM-specific format of the entry. If the entry type is <code>Oem</code>, this property contains more information about the record format from the OEM. This property shall represent the OEM-specific format of the entry. This property shall be required if the <code>EntryType</code> value is <code>Oem</code>.
OemSensorType (v1.3+)	string	<i>read-only</i> (null)	The OEM-specific sensor type if the sensor type is <code>OEM</code>. This property shall represent the OEM-specific sensor type of the entry. This property shall only be used if <code>EntryType</code> is <code>SEL</code> and <code>SensorType</code> is <code>OEM</code>.

Property	Type	Attributes	Notes
Originator (v1.11+)	string	<i>read-only</i>	The source of the log entry. This property shall contain the source of the log entry.
OriginatorType (v1.11+)	string (enum)	<i>read-only</i>	The type of originator data. This property shall contain the type of originator data. <i>For the possible property values, see OriginatorType in Property details.</i>
OverflowErrorCount (v1.14+)	integer	<i>read-only</i>	The count of overflow errors that occurred after this log entry. This property shall contain the count of overflow errors that occurred after this log entry. If this log entry is the most recent log entry in the log service, this property shall not be present if no overflow errors occurred after the time of this log entry. If this log entry is not the most recent log entry in the log service, this property shall not be present if no overflow errors occurred between the time of this log entry and the time of the next log entry.
PartNumber (v1.19+)	string	<i>read-only</i> (null)	The part number associated with the source of this log entry. This property shall contain the manufacturer-provided part number for the source of this log entry.
Persistency (v1.14+)	boolean	<i>read-only</i>	Indicates whether the log entry is persistent across a cold reset of the device. This property shall indicate whether the log entry is persistent across a cold reset of the device.
Resolution (v1.9+)	string	<i>read-only</i>	Used to provide suggestions on how to resolve the situation that caused the log entry. This property shall contain the resolution of the log entry. Services should replace the resolution defined in the message registry with a more specific resolution in a log entry.
ResolutionSteps (v1.16+) [{ }]	array (object)		This type describes a recommended step of the service-defined resolution. - The list of recommended steps to resolve the cause of the log entry. - This property shall contain an array of recommended steps to resolve the cause of the log entry. This property shall not be present if the <code>Severity</code> property contains <code>OK</code>. A client can stop executing the resolution steps once the <code>Resolved</code> property resource contains <code>true</code> or the <code>Health</code> property in the associated resource referenced by the <code>OriginOfCondition</code> property contains <code>OK</code>. For property details, see ResolutionStep.

Property	Type	Attributes	Notes
Resolved (v1.8+)	boolean	<i>read-write</i> (null)	Indicates if the cause of the log entry has been resolved or repaired. This property shall contain an indication if the cause of the log entry has been resolved or repaired. The value <code>true</code> shall indicate if the cause of the log entry has been resolved or repaired. This property shall contain the value <code>false</code> if the log entry is still active. The value <code>false</code> shall be the initial state. Clients should ignore this property if <code>Severity</code> contains <code>OK</code>.
SensorNumber	integer	<i>read-only</i> (null)	The IPMI-defined sensor number. This property shall contain the IPMI sensor number if the value of the <code>EntryType</code> property is <code>SEL</code>. This property should not appear in the resource for other values of <code>EntryType</code>.
SensorType	string (enum)	<i>read-only</i> (null)	The sensor type to which the log entry pertains if the entry type is <code>SEL</code> . This property shall contain the sensor type to which the log entry pertains if the entry type is <code>SEL</code>. Table 42-3, Sensor Type Codes, in the IPMI Specification v2.0 revision 1.1 describes these enumerations. <i>For the possible property values, see <code>SensorType</code> in Property details.</i>
SerialNumber (v1.19+)	string	<i>read-only</i> (null)	The serial number associated with the source of this log entry. This property shall contain a manufacturer-allocated number that identifies the source of this log entry.
ServiceProviderNotified (v1.9+)	boolean	<i>read-only</i> (null)	Indicates if the log entry has been sent to the service provider. This property shall contain an indication if the log entry has been sent to the service provider.
Severity	string (enum)	<i>read-only</i> (null)	The severity of the log entry. This property shall contain the severity of the condition that created the log entry. If <code>EntryType</code> contains <code>Event</code>, services can replace the value defined in the message registry with a value more applicable to the implementation. <i>For the possible property values, see <code>Severity</code> in Property details.</i>

Property	Type	Attributes	Notes
SpecificEventExistsInGroup (v1.13+)	boolean	read-only	Indicates this log entry is equivalent to a more specific log entry within the same <code>EventGroupId</code> . This property shall indicate that this log entry is equivalent to another log entry, with a more specific definition, within the same <code>EventGroupId</code> . For example, the <code>DriveFailed</code> message from the Storage Device Message Registry is more specific than the <code>ResourceStatusChangedCritical</code> message from the Resource Event Message Registry, when both occur with the same <code>EventGroupId</code> . This property shall contain <code>true</code> if a more specific event is available, and shall contain <code>false</code> if no equivalent event exists in the same <code>EventGroupId</code> . If this property is absent, the value shall be assumed to be <code>false</code> .
UserAuthenticationSource (v1.17+)	string	read-only (null)	The source of authentication for the username property associated with the log entry. This property shall contain the URL to the authentication service that is associated with the username property. This should be used for audit logs that result from a user action. <i>For more information about this property, see Property details.</i>
Username (v1.17+)	string	read-only (null)	The username of the account associated with the log entry. This property shall contain the username of the account associated with the log entry. This should be used for audit logs that result from a user action. <i>For more information about this property, see Property details.</i>

6.68.4 Property details

6.68.4.1 CXLEntryType

The specific CXL entry type.

- This property shall contain the specific CXL entry type. This property shall only be present if `EntryType` contains `CXL` .

string	Description
DynamicCapacity	A CXL Dynamic Capacity log entry.
Failure	A CXL failure log entry.
Fatal	A CXL fatal log entry.

string	Description
Informational	A CXL informational log entry.
Warning	A CXL warning log entry.

6.68.4.2 DiagnosticDataType

The type of data available in the `DiagnosticData` property or retrieved from the URI specified by the `AdditionalDataURI` property.

- This property shall contain the type of data available in the `DiagnosticData` property or retrieved from the URI specified by the `AdditionalDataURI` property. The `OriginOfCondition` property, if present, shall contain a link to the resource that represents the device from which the diagnostic data was collected.

string	Description
CPER (<i>v1.10+</i>)	UEFI Common Platform Error Record. This value shall indicate the data provided at the URI specified by the <code>AdditionalDataURI</code> property is a complete UEFI Specification-defined Common Platform Error Record. The CPER data shall contain a Record Header and at least one Section as defined by the UEFI Specification.
CPERSection (<i>v1.10+</i>)	A Section of a UEFI Common Platform Error Record. This value shall indicate the data provided at the URI specified by the <code>AdditionalDataURI</code> property is a single Section of a UEFI Specification-defined Common Platform Error Record. The CPER data shall contain one Section as defined by the UEFI Specification, with no Record Header.
Device (<i>v1.18+</i>)	Device diagnostic data. This value shall indicate the data provided at the URI specified by the <code>AdditionalDataURI</code> property contains vendor-defined diagnostic data for a device.
Manager	Manager diagnostic data.
OEM	OEM diagnostic data.
OS	Operating system (OS) diagnostic data.
PreOS	Pre-OS diagnostic data.

6.68.4.3 EntryCode

The entry code for the log entry if the entry type is `SEL`.

- This property shall contain the entry code for the log entry if the `EntryType` is `SEL`. Tables 42-1 and 42-2 of the

IPMI Specification v2.0 revision 1.1 describe these enumerations.

string	Description
Assert	The condition has been asserted.
D0 Power State	The ACPI-defined D0 power state.
D1 Power State	The ACPI-defined D1 power state.
D2 Power State	The ACPI-defined D2 power state.
D3 Power State	The ACPI-defined D3 power state.
Deassert	The condition has been deasserted.
Device Disabled	A device has been disabled.
Device Enabled	A device has been enabled.
Device Inserted / Device Present	A device has been inserted or is present.
Device Removed / Device Absent	A device has been removed or is absent.
Fully Redundant	Indicates that full redundancy has been regained.
Informational	An informational event.
Install Error	An install error has been detected.
Limit Exceeded	A limit has been exceeded.
Limit Not Exceeded	A limit has not been exceeded.
Lower Critical - going high	The reading crossed the Lower Critical threshold while going high.
Lower Critical - going low	The reading crossed the Lower Critical threshold while going low.
Lower Non-critical - going high	The reading crossed the Lower Non-critical threshold while going high.
Lower Non-critical - going low	The reading crossed the Lower Non-critical threshold while going low.
Lower Non-recoverable - going high	The reading crossed the Lower Non-recoverable threshold while going high.
Lower Non-recoverable - going low	The reading crossed the Lower Non-recoverable threshold while going low.
Monitor	A monitor event.

string	Description
Non-redundant:Insufficient Resources	Unit is non-redundant and has insufficient resources to maintain normal operation.
Non-redundant:Sufficient Resources from Insufficient Resources	Unit has regained minimum resources needed for normal operation.
Non-redundant:Sufficient Resources from Redundant	Redundancy has been lost but unit is functioning with minimum resources needed for normal operation.
OEM (v1.3+)	An OEM-defined event.
Performance Lags	Performance does not meet expectations.
Performance Met	Performance meets expectations.
Predictive Failure asserted	A Predictive Failure has been detected.
Predictive Failure deasserted	A Predictive Failure is no longer present.
Redundancy Degraded	Redundancy still exists, but at less than full level.
Redundancy Degraded from Fully Redundant	Unit has lost some redundant resource(s) but is still in a redundant state.
Redundancy Degraded from Non-redundant	Unit has regained some resource(s) and is redundant but not fully redundant.
Redundancy Lost	Entered any non-redundant state, including Non-redundant: Insufficient Resources.
State Asserted	The state has been asserted.
State Deasserted	The state has been deasserted.
Transition to Active	The state transitioned to active.
Transition to Busy	The state transitioned to busy.
Transition to Critical from less severe	A state has changed to Critical from less severe.
Transition to Critical from Non-recoverable	A state has changed to Critical from Non-recoverable.
Transition to Degraded	A state has transitioned to Degraded.
Transition to Idle	The state transitioned to idle.
Transition to In Test	A state has transitioned to In Test.
Transition to Non-Critical from more severe	A state has changed to Non-Critical from more severe.

string	Description
Transition to Non-Critical from OK	A state has changed to Non-Critical from OK.
Transition to Non-recoverable	A state has changed to Non-recoverable.
Transition to Non-recoverable from less severe	A state has changed to Non-recoverable from less severe.
Transition to Off Duty	A state has transitioned to Off Duty.
Transition to Off Line	A state has transitioned to Off Line.
Transition to OK	A state has changed to OK.
Transition to On Line	A state has transitioned to On Line.
Transition to Power Off	A state has transitioned to Power Off.
Transition to Power Save	A state has transitioned to Power Save.
Transition to Running	A state has transitioned to Running.
Upper Critical - going high	The reading crossed the Upper Critical threshold while going high.
Upper Critical - going low	The reading crossed the Upper Critical threshold while going low.
Upper Non-critical - going high	The reading crossed the Upper Non-critical threshold while going high.
Upper Non-critical - going low	The reading crossed the Upper Non-critical threshold while going low.
Upper Non-recoverable - going high	The reading crossed the Upper Non-recoverable threshold while going high.
Upper Non-recoverable - going low	The reading crossed the Upper Non-recoverable threshold while going low.

6.68.4.4 EntryType

The type of log entry.

- This property shall represent the type of log entry. If the resource represents an IPMI SEL entry, the value shall contain `SEL`. If the resource represents a Redfish event log entry, the value shall contain `Event`. If the resource represents a CXL event record, the value shall contain `CXL`. If the resource represents an OEM log entry format, the value shall contain `Oem`.

string	Description
CXL (v1.14+)	A CXL log entry.
Event	A Redfish-defined message.
Oem	An entry in an OEM-defined format.
SEL	A legacy IPMI System Event Log (SEL) entry.

6.68.4.5 EventType

The type of event recorded in this log.

- If present, this `LogEntry` records an event and the value shall indicate the type of event.

string	Description
Alert	A condition requires attention.
MetricReport	The telemetry service is sending a metric report. • Events of type <code>MetricReport</code> shall be sent to a client in accordance with the <code>MetricReport</code> schema definition.
Other	Because <code>EventType</code> is deprecated as of Redfish Specification v1.6, the event is based on a registry or resource but not an <code>EventType</code>. • Events of type <code>other</code> shall be sent to a client in accordance with subscriptions to <code>RegistryPrefixes</code> or <code>ResourceTypes</code>.
ResourceAdded	A resource has been added.
ResourceRemoved	A resource has been removed.
ResourceUpdated	A resource has been updated.
StatusChange	The status of a resource has changed.

6.68.4.6 OriginatorType

The type of originator data.

- This property shall contain the type of originator data.

string	Description
Client	A client of the service created this log entry.
Internal	A process running on the service created this log entry.
SupportingService	A process not running on the service but running on a supporting service, such as RDE implementations, UEFI, or host processes, created this log entry.

6.68.4.7 SensorType

The sensor type to which the log entry pertains if the entry type is `SEL`.

- This property shall contain the sensor type to which the log entry pertains if the entry type is `SEL`. Table 42-3, Sensor Type Codes, in the IPMI Specification v2.0 revision 1.1 describes these enumerations.

string	Description
Add-in Card	A sensor for an add-in card.
BaseOSBoot/InstallationStatus	A sensor for a base OS boot or installation status event.
Battery	A sensor for a battery.
Boot Error	A sensor for a boot error event.
Button/Switch	A sensor for a button or switch.
Cable/Interconnect	A sensor for a cable or interconnect device type.
Chassis	A sensor for a chassis.
ChipSet	A sensor for a chipset.
CoolingDevice	A sensor for a cooling device.
Critical Interrupt	A sensor for a critical interrupt event.
Current	A current sensor.
Drive Slot/Bay	A sensor for a drive slot or bay.
Entity Presence	A sensor for an entity presence event.
Event Logging Disabled	A sensor for the event log.
Fan	A fan sensor.
FRUState	A sensor for a FRU state event.

string	Description
LAN	A sensor for a LAN device.
Management Subsystem Health	A sensor for a management subsystem health event.
Memory	A sensor for a memory device.
Microcontroller/Coprocessor	A sensor for a microcontroller or coprocessor.
Module/Board	A sensor for a module or board.
Monitor ASIC/IC	A sensor for a monitor ASIC or IC.
OEM (v1.3+)	An OEM-defined sensor.
OS Stop/Shutdown	A sensor for an OS stop or shutdown event.
Other FRU	A sensor for another type of FRU.
Other Units-based Sensor	A sensor for a miscellaneous analog sensor.
Physical Chassis Security	A physical security sensor.
Platform Alert	A sensor for a platform alert event.
Platform Security Violation Attempt	A platform security sensor.
POST Memory Resize	A sensor for a POST memory resize event.
Power Supply / Converter	A sensor for a power supply or DC-to-DC converter.
PowerUnit	A sensor for a power unit.
Processor	A sensor for a processor.
Session Audit	A sensor for a session audit event.
Slot/Connector	A sensor for a slot or connector.
System ACPI PowerState	A sensor for an ACPI power state event.
System Event	A sensor for a system event.
System Firmware Progress	A sensor for a system firmware progress event.
SystemBoot/Restart	A sensor for a system boot or restart event.
Temperature	A temperature sensor.
Terminator	A sensor for a terminator.

string	Description
Version Change	A sensor for a version change event.
Voltage	A voltage sensor.
Watchdog	A sensor for a watchdog event.

6.68.4.8 Severity

The severity of the log entry.

- This property shall contain the severity of the condition that created the log entry. If `EntryType` contains `Event`, services can replace the value defined in the message registry with a value more applicable to the implementation.

string	Description
Critical	A critical condition that requires immediate attention.
OK	Informational or operating normally.
Warning	A condition that requires attention.

6.68.4.9 UserAuthenticationSource

The source of authentication for the username property associated with the log entry.

- This property shall contain the URL to the authentication service that is associated with the username property. This should be used for audit logs that result from a user action.

Services should return the `UserAuthenticationSource` property when multiple account providers are supported and the source of `Username` needs to be differentiated.

- If the user is a Redfish service-based account, the `UserAuthenticationSource` property shall contain the URL to the `AccountService` resource that manages the user account.
- For other account providers, such as LDAP or Active Directory, the `UserAuthenticationSource` property shall contain the URL to the domain's authentication server.

6.68.4.10 Username

The username of the account associated with the log entry.

- This property shall contain the username of the account associated with the log entry. This should be used for

audit logs that result from a user action.

The `Username` property is used for auditing to link a message to a specific user's action.

For certificate-based authentication, services shall populate the `Username` from the common name component of the subject of the certificate. For local user accounts and user accounts from external account providers, services shall populate `Username` from the following rules:

Account Provider	Encoding	Example
<code>RedfishService</code>	The value of the <code>UserName</code> property of the <code>ManagerAccount</code> resource. This applies to both local user accounts and external accounts from a remote Redfish service.	<code>joesmith</code>
<code>ActiveDirectoryService</code>	The User Principal Name (UPN).	<code>jsmith@ad-domain.company</code>
<code>LDAPService</code>	The User Principal Name (UPN).	<code>jsmith@ldap-domain.company</code>
<code>OAuth2</code>	The <code>sub</code> JWT claim.	<code>Joe Smith</code>
<code>TACACsplus</code>	The client username.	<code>joesmith</code>
<code>OEM</code>	A human readable and unique identifier.	<code>joesmith</code>

6.68.5 Example response

```
{
  "@odata.type": "#LogEntry.v1_19_0.LogEntry",
  "Id": "1",
  "Name": "Log Entry 1",
  "EntryType": "Event",
  "Severity": "Critical",
  "Created": "2012-03-07T14:44:00Z",
  "Resolved": false,
  "Message": "Temperature threshold exceeded",
  "MessageId": "Contoso.1.0.TempAssert",
  "MessageArgs": [
    "42"
  ],
  "Links": {
    "OriginOfCondition": {
      "@odata.id": "/redfish/v1/Chassis/1U/Thermal"
    }
  },
  "@odata.id": "/redfish/v1/Systems/437XR1138R2/LogServices/Log1/Entries/1"
}
```

6.69 LogService 1.8.0

Version	v1.8	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2025.1	2024.1	2023.3	2023.2	2022.3	2021.2	2020.3	2017.3	1.0

6.69.1 Description

The `LogService` schema contains properties for monitoring and configuring a log service. When the `Id` property contains `DeviceLog`, the log contains device-resident log entries that follow the physical device when moved from system-to-system, and not a replication or subset of a system event log.

- This resource shall represent a log service for a Redfish implementation. When the `Id` property contains `DeviceLog`, the log shall contain log entries that migrate with the device.

6.69.2 URIs

```
/redfish/v1/Chassis/{ChassisId}/LogServices/{LogServiceId}
/redfish/v1/Chassis/{ChassisId}/PCleDevices/{PCleDeviceId}/CXLLogicalDevices/{CXLLogicalDeviceId}/DeviceLog
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/LogServices/
{LogServiceId}
/redfish/v1/JobService/Log
/redfish/v1/Managers/{ManagerId}/LogServices/{LogServiceId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/LogServices/{LogServiceId}
/redfish/v1/Systems/{ComputerSystemId}/LogServices/{LogServiceId}
/redfish/v1/Systems/{ComputerSystemId}/Memory/{MemoryId}/DeviceLog
/redfish/v1/TelemetryService/LogService
```

6.69.3 Properties

Property	Type	Attributes	Notes
AutoClearResolvedEntries (v1.7+)	string (enum)	read-write (null)	Indicates if this log service automatically clears the resolved log entries. This property shall indicate if this log service automatically clears the resolved log entries found in the <code>LogEntryCollection</code> resource. If this property is not present, the value shall be assumed to be <code>None</code>. <i>For the possible property values, see <code>AutoClearResolvedEntries</code> in Property details.</i>

Property	Type	Attributes	Notes
AutoDSTEnabled (v1.3+)	boolean	<i>read-write</i>	An indication of whether the log service is configured for automatic Daylight Saving Time (DST) adjustment. This property shall indicate whether the log service is configured for automatic Daylight Saving Time (DST) adjustment. DST adjustment shall not modify the timestamp of existing log entries.
DateTime	string (date-time)	<i>read-write</i> (null)	The current date and time with UTC offset of the log service. This property shall contain the current date and time with UTC offset of the log service.
DateTimeLocalOffset	string	<i>read-write</i> (null)	The time offset from UTC that the <code>DateTime</code> property is in <code>+HH:MM</code> format. This property shall contain the offset from UTC time that the <code>DateTime</code> property contains. If both <code>DateTime</code> and <code>DateTimeLocalOffset</code> are provided in modification requests, services shall apply <code>DateTimeLocalOffset</code> after <code>DateTime</code> is applied. Pattern: <code>^([+-][0-1][0-9]:[0-5][0-9])\$</code>
DiagnosticDataDetails (v1.7+) [{	array		The detailed information for the data collected with the <code>CollectDiagnosticData</code> action. This property shall contain the detailed information for the data collected with the <code>CollectDiagnosticData</code> action.
DiagnosticDataType (v1.7+)	string (enum)	<i>read-only</i> (null)	The type of diagnostic data to collect with the <code>CollectDiagnosticData</code> action. This property shall contain the type of diagnostic data to collect with the <code>CollectDiagnosticData</code> action. For the possible property values, see <i>DiagnosticDataType</i> in <i>Property details</i>.
EstimatedDuration (v1.7+)	string (duration)	<i>read-only</i> (null)	The estimated total time required to generate the data with the <code>CollectDiagnosticData</code> action. This property shall contain the estimated total time required to generate the data with the <code>CollectDiagnosticData</code> action. This value shall not include the duration that it takes the data to transfer to a remote server. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\. \d+)?)S)?)?\$</code>
EstimatedSizeBytes (v1.7+)	integer	<i>read-only</i> (null)	The estimated size of the data collected by <code>CollectDiagnosticData</code> action. This property shall contain the estimated size of the data collected by <code>CollectDiagnosticData</code> action.

Property	Type	Attributes	Notes
OEMDiagnosticDataType (v1.7+)	string	<i>read-only</i> (null)	The OEM-defined type of diagnostic data to collect with the <code>CollectDiagnosticData</code> action. This property shall contain the OEM-defined type of diagnostic data to collect with the <code>CollectDiagnosticData</code> action. This property is required if <code>DiagnosticDataType</code> is <code>OEM</code>.
}]			
Entries {	object		The link to the log entry collection. This property shall contain a link to a resource collection of type <code>LogEntryCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <code>LogEntry</code> . See the <code>LogEntry</code> schema for details.
}			
LogEntryType (v1.1+)	string (enum)	<i>read-only</i> (null)	The format of the log entries. This property shall contain the value for the <code>EntryType</code> property of all <code>LogEntry</code> resources contained in the <code>LogEntryCollection</code> resource for this log service. If the service cannot determine or guarantee a single <code>EntryType</code> value for all <code>LogEntry</code> resources, this property shall contain the value <code>Multiple</code>. <i>For the possible property values, see LogEntryType in Property details.</i>
LogPurposes (v1.4+) []	array (string enum))	<i>read-only</i> (null)	- The purposes of the log. - This property shall contain the purposes of the log. <i>For the possible property values, see LogPurposes in Property details.</i>
MaxNumberOfRecords	integer	<i>read-only</i>	The maximum number of log entries that this service can have. This property shall contain the maximum number of <code>LogEntry</code> resources in the <code>LogEntryCollection</code> resource for this service.
OEMLogPurpose (v1.4+)	string	<i>read-only</i> (null)	The OEM-specified purpose of the log if <code>LogPurposes</code> contains <code>OEM</code>. This property shall contain the OEM-specified purpose of the log if <code>LogPurposes</code> contains <code>OEM</code>.
Overflow (v1.4+)	boolean	<i>read-only</i>	Indicates whether the log service has overflowed. This property shall indicate whether the log service has overflowed and is no longer able to store new logs.

Property	Type	Attributes	Notes
OverWritePolicy	string (enum)	<i>read-only</i>	The overwrite policy for this service that takes place when the log is full. This property shall indicate the policy of the log service when the <code>MaxNumberOfRecords</code> has been reached. <i>For the possible property values, see OverWritePolicy in Property details.</i>
Persistency (v1.4+)	boolean	<i>read-only</i>	Indicates whether the log service is persistent across a cold reset. This property shall indicate whether the log service is persistent across a cold reset of the device.
ServiceEnabled	boolean	<i>read-write (null)</i>	An indication of whether this service is enabled. This property shall indicate whether this service is enabled.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
SyslogFilters (v1.2+) [{	array		A list of syslog message filters to be logged locally. This property shall describe all desired syslog messages to be logged locally. If this property contains an empty array, all messages shall be logged.
LogFacilities (v1.2+) []	array (string (enum))	<i>read-write (null)</i>	The syslog facility code is an enumeration of program types. - The types of programs that can log messages. - This property shall contain the types of programs that can log messages. If this property contains an empty array or is absent, all facilities shall be indicated. <i>For the possible property values, see LogFacilities in Property details.</i>
LowestSeverity (v1.2+)	string (enum)	<i>read-write (null)</i>	The lowest severity level message that will be logged. This property shall contain the lowest syslog severity level that will be logged. The service shall log all messages equal to or greater than the value in this property. The value <code>All</code> shall indicate all severities. <i>For the possible property values, see LowestSeverity in Property details.</i>
}]			

6.69.4 Actions

6.69.4.1 ClearLog

Description

The action to clear the log for this log service.

- This action shall delete all entries found in the `LogEntryCollection` resource for this log service.

Action URI

{Base URI of target resource}/Actions/LogService.ClearLog

Action parameters

Parameter Name	Type	Attributes	Notes
LogEntriesETag (v1.3+)	string	<i>optional</i>	The ETag of the log entry collection within this log service. If the provided ETag does not match the current ETag of the log entry collection, the request is rejected. This parameter shall contain the ETag of the <code>LogEntryCollection</code> resource for this log service. If the client-provided ETag does not match the current ETag of the <code>LogEntryCollection</code> resource for this log service, the service shall return the HTTP <code>428 Precondition Required</code> status code to reject the request.

Request Example

```
{
  "LogEntriesETag": "W/\"2A90423A\""
}
```

6.69.4.2 CollectDiagnosticData (v1.2+)

Description

The action to collect the diagnostic data for the given type. When the diagnostic data is collected, a new log entry will be created and the additional data referenced by the new log entry will contain the diagnostic data.

- This action shall collect the diagnostic data for the given type. The `Location` header in the response shall contain a URI to a resource of type `LogEntry` that contains the diagnostic data. The `AdditionalDataURI` property in the referenced `LogEntry` resource shall contain the URI to download the diagnostic data.

Action URI

{Base URI of target resource}/Actions/LogService.CollectDiagnosticData

Action parameters

Parameter Name	Type	Attributes	Notes
DiagnosticDataType	string (enum)	<i>required</i>	The type of diagnostic data to collect. This parameter shall contain the type of diagnostic data to collect. <i>For the possible property values, see DiagnosticDataType in Property details.</i>
OEMDiagnosticDataType	string	<i>optional</i>	The OEM-defined type of diagnostic data to collect. This parameter shall contain the OEM-defined type of diagnostic data to collect. This parameter shall be required if <code>DiagnosticDataType</code> is <code>OEM</code>.
Password (v1.6+)	string	<i>optional</i>	The password to access the URI specified by the <code>TargetURI</code> parameter. This parameter shall contain the password to access the URI specified by the <code>TargetURI</code> parameter.
TargetDevice (v1.8+) {	object	<i>optional</i>	The link to the device to collect diagnostic data. This parameter shall contain a link to the resource that represents the device to collect diagnostic data. This parameter shall be required if <code>DiagnosticDataType</code> contains <code>Device</code>.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
TargetURI (v1.6+)	string (URI)	<i>optional</i>	The URI to access when sending the diagnostic data. This parameter shall contain the URI to access when sending the diagnostic data. If this parameter is not provided by the client, the service shall not send the diagnostic data.
TransferProtocol (v1.6+)	string (enum)	<i>optional</i>	The network protocol that the service uses to send the diagnostic data. This parameter shall contain the network protocol that the service uses to send the diagnostic data. <i>For the possible property values, see TransferProtocol in Property details.</i>

Parameter Name	Type	Attributes	Notes
UserName (v1.6+)	string	<i>optional</i>	The username to access the URI specified by the <code>TargetURI</code> parameter. This parameter shall contain the username to access the URI specified by the <code>TargetURI</code> parameter.

Request Example

```
{
  "DiagnosticDataType": "Manager"
}
```

6.69.4.3 PushDiagnosticData (v1.6+)

Description

The action to push an existing diagnostic data to a target URI.

- This action shall send an existing diagnostic data to a target URI.

Action URI

{Base URI of target resource}/Actions/LogService.PushDiagnosticData

Action parameters

Parameter Name	Type	Attributes	Notes
AdditionalDataURI	string (URI)	<i>required</i>	The URI of the diagnostic data to transfer to the URI specified by the <code>TargetURI</code> parameter. This parameter shall contain the URI of the diagnostic data to transfer to the URI specified by the <code>TargetURI</code> parameter.
Password	string	<i>optional</i>	The password to access the URI specified by the <code>TargetURI</code> parameter. This parameter shall contain the password to access the URI specified by the <code>TargetURI</code> parameter.
TargetURI	string (URI)	<i>required</i>	The URI to access when sending the diagnostic data. This parameter shall contain the URI to access when sending the diagnostic data.

Parameter Name	Type	Attributes	Notes
TransferProtocol	string (enum)	<i>optional</i>	The network protocol that the service uses to send the diagnostic data. This parameter shall contain the network protocol that the service uses to send the diagnostic data. <i>For the possible property values, see TransferProtocol in Property details.</i>
UserName	string	<i>optional</i>	The username to access the URI specified by the TargetURI parameter. This parameter shall contain the username to access the URI specified by the TargetURI parameter.

Request Example

```
{
  "AdditionalDataUri": "/redfish/v1/LogService/Diags/10242023T132938.bin",
  "TargetURI": "https://192.168.24.34/receivedfiles/192-168-89-33_10242023T132938.bin",
  "UserName": "Admin",
  "Password": "FluffyBunny23",
  "TransferProtocol": "HTTPS"
}
```

6.69.5 Property details

6.69.5.1 AutoClearResolvedEntries

Indicates if this log service automatically clears the resolved log entries.

- This property shall indicate if this log service automatically clears the resolved log entries found in the [LogEntryCollection](#) resource. If this property is not present, the value shall be assumed to be [None](#).

string	Description
ClearEventGroup	Automatically clears all resolved log entries and other entries within the same EventGroupId. This value shall indicate this log service automatically clears all log entries that contain the value true for the Resolved property and other entries within the same EventGroupId.
None	Do not automatically clear the resolved log entries. This value shall indicate this log service does not automatically clear the resolved log entries.

string	Description
RetainCauseResolutionEntries	Retains log entries of the original cause and the final resolution, but automatically clears other entries containing the intermediate results within the same <code>EventGroupId</code> . This value shall indicate this log service retains the entries containing the original cause and the final resolution, but automatically clears other entries containing the intermediate results within the same <code>EventGroupId</code> . For example, the original cause of a fan failure is indicated by an entry containing the <code>FanFailed</code> message key in the <code>MessageId</code> property, followed by the entries containing <code>FanRemoved</code> and <code>FanInserted</code> message keys corresponding to user actions. Finally, an entry showing the fan failure is repaired with <code>FanRestored</code> message key in the <code>MessageId</code> property. In this case, the entries with <code>FanFailed</code> and <code>FanRestored</code> message keys are retained, but other entries within the same <code>EventGroupId</code> are automatically cleared.
UpdateCauseEntry	Updates log entries of the original cause, but automatically clears other entries within the same <code>EventGroupId</code> . This value shall indicate this log service updates the entry containing the original cause for the repaired status, but automatically clears other entries within the same <code>EventGroupId</code> . For example, the original cause of a fan failure is indicated by an entry containing <code>FanFailed</code> message key in the <code>MessageId</code> property, followed by the entries containing <code>FanRemoved</code> and <code>FanInserted</code> message keys corresponding to user actions. Finally, an entry showing the fan failure is repaired with <code>FanRestored</code> message key in the <code>MessageId</code> property. In this case, the entry with <code>FanFailed</code> message key is updated to show the repaired status, such as updating the value of <code>Resolved</code> property to <code>true</code> and the timestamp contained by the <code>Modified</code> property, but other entries within the same <code>EventGroupId</code> are automatically cleared.

6.69.5.2 DiagnosticDataType

The type of diagnostic data to collect.

- This parameter shall contain the type of diagnostic data to collect.

string	Description
Device (v1.8+)	Device diagnostic data.
Manager	Manager diagnostic data.
OEM	OEM diagnostic data.
OS	Operating system (OS) diagnostic data.
PreOS	Pre-OS diagnostic data.

6.69.5.3 LogEntryType

The format of the log entries.

- This property shall contain the value for the `EntryType` property of all `LogEntry` resources contained in the `LogEntryCollection` resource for this log service. If the service cannot determine or guarantee a single `EntryType` value for all `LogEntry` resources, this property shall contain the value `Multiple`.

string	Description
CXL (v1.5+)	The log contains CXL log entries.
Event	The log contains Redfish-defined messages.
Multiple	The log contains multiple log entry types and, therefore, the log service cannot guarantee a single entry type.
OEM	The log contains entries in an OEM-defined format.
SEL	The log contains legacy IPMI System Event Log (SEL) entries.

6.69.5.4 LogFacilities

The syslog facility code is an enumeration of program types.

- The types of programs that can log messages.
 - This property shall contain the types of programs that can log messages. If this property contains an empty array or is absent, all facilities shall be indicated.

string	Description
Auth	Security/authentication messages.
Authpriv	Security/authentication messages.
Console	Log alert.
Cron	Clock daemon.
Daemon	System daemons.
FTP	FTP daemon.
Kern	Kernel messages.
Local0	Locally used facility 0.

string	Description
Local1	Locally used facility 1.
Local2	Locally used facility 2.
Local3	Locally used facility 3.
Local4	Locally used facility 4.
Local5	Locally used facility 5.
Local6	Locally used facility 6.
Local7	Locally used facility 7.
LPR	Line printer subsystem.
Mail	Mail system.
News	Network news subsystem.
NTP	NTP subsystem.
Security	Log audit.
SolarisCron	Scheduling daemon.
Syslog	Messages generated internally by syslogd.
User	User-level messages.
UUCP	UUCP subsystem.

6.69.5.5 LogPurposes

- The purposes of the log.
 - This property shall contain the purposes of the log.

string	Description
Diagnostic	The log provides information for diagnosing hardware or software issues, such as error conditions, sensor threshold trips, or exception cases.
ExternalEntity	The log exposes log entries provided by external entities, such as external users, system firmware, operating systems, or management applications.
OEM	The log is used for an OEM-defined purpose.

string	Description
Operations	The log provides information about management operations that have a significant impact on the system, such as firmware updates, system resets, and storage volume creation.
Security	The log provides security-related information such as authentication, authorization, and data access logging required for security audits.
Telemetry	The log provides telemetry history, typically collected on a regular basis.

6.69.5.6 LowestSeverity

The lowest severity level message that will be logged.

- This property shall contain the lowest syslog severity level that will be logged. The service shall log all messages equal to or greater than the value in this property. The value `All` shall indicate all severities.

string	Description
Alert	A condition that should be corrected immediately, such as a corrupted system database.
All	A message of any severity.
Critical	Hard device errors.
Debug	Messages that contain information normally of use only when debugging a program.
Emergency	A panic condition.
Error	An Error.
Informational	Informational only.
Notice	Conditions that are not error conditions, but that might require special handling.
Warning	A Warning.

6.69.5.7 OverWritePolicy

The overwrite policy for this service that takes place when the log is full.

- This property shall indicate the policy of the log service when the `MaxNumberOfRecords` has been reached.

string	Description
NeverOverWrites	When full, new entries to the log are discarded.

string	Description
Unknown	The overwrite policy is not known or is undefined.
WrapsWhenFull	When full, new entries to the log overwrite earlier entries.

6.69.5.8 TransferProtocol

The network protocol that the service uses to send the diagnostic data.

- This parameter shall contain the network protocol that the service uses to send the diagnostic data.

string	Description
CIFS	Common Internet File System (CIFS).
FTP	File Transfer Protocol (FTP).
HTTP	Hypertext Transfer Protocol (HTTP).
HTTPS	Hypertext Transfer Protocol Secure (HTTPS).
NFS	Network File System (NFS).
OEM	A manufacturer-defined protocol.
SCP	Secure Copy Protocol (SCP).
SFTP	SSH File Transfer Protocol (SFTP).
TFTP	Trivial File Transfer Protocol (TFTP).

6.69.6 Example response

```
{
  "@odata.type": "#LogService.v1_8_0.LogService",
  "Id": "Log1",
  "Name": "System Log Service",
  "Description": "This log contains entries related to the operation of the host Computer System.",
  "MaxNumberOfRecords": 1000,
  "OverWritePolicy": "WrapsWhenFull",
  "DateTime": "2015-03-13T04:14:33+06:00",
  "DateTimeLocalOffset": "+06:00",
  "ServiceEnabled": true,
  "LogEntryType": "Event",
  "Status": {
```

```
    "State": "Enabled",
    "Health": "OK"
  },
  "Actions": {
    "#LogService.ClearLog": {
      "target": "/redfish/v1/Managers/1/LogServices/Log1/Actions/LogService.ClearLog"
    }
  },
  "Entries": {
    "@odata.id": "/redfish/v1/Managers/1/LogServices/Log1/Entries"
  },
  "@odata.id": "/redfish/v1/Managers/1/LogServices/Log1"
}
```

6.70 Manager 1.22.0

Version	v1.22	v1.21	v1.20	v1.19	v1.18	v1.17	v1.16	v1.15	v1.14	v1.13	v1.12	...
Release	2025.2	2025.1	2024.4	2023.3	2023.1	2022.3	2022.2	2022.1	2021.4	2021.2	2021.1	...

6.70.1 Description

In Redfish, a manager is a systems management entity that can implement or provide access to a Redfish service. Examples of managers are BMCs (baseboard management controllers), enclosure managers, management controllers, and other subsystems that are assigned manageability functions. An implementation can have multiple managers, which might be directly accessible through a Redfish-defined interface.

- This resource shall represent a management subsystem for a Redfish implementation.

6.70.2 URIs

/redfish/v1/Managers/{ManagerId}

6.70.3 Properties

Property	Type	Attributes	Notes
AdditionalFirmwareVersions (v1.15+) {	object		The additional firmware versions of the manager. This property shall contain the additional firmware versions of the manager.
Bootloader (v1.7+)	string	<i>read-only</i> (null)	The bootloader version contained in this software, such as U-Boot or UEFI. This property shall contain the bootloader version contained in this software.
BootParameters (v1.11+)	string	<i>read-only</i> (null)	The version of the configuration file that contains the initial boot parameters of this software, such as parameters for U-Boot. This property shall contain the version of the configuration file that contains the initial boot parameters of this software.
FactoryConfiguration (v1.11+)	string	<i>read-only</i> (null)	The version of the configuration that contains the factory default runtime configuration parameters of this software. This property shall contain the version of the configuration that contains the factory default runtime configuration parameters of this software.
Kernel (v1.7+)	string	<i>read-only</i> (null)	The kernel version contained in this software. This property shall contain the kernel version contained in this software. For strict POSIX software, the value shall contain the output of <code>uname -srm</code>. For Microsoft Windows, the value shall contain the output of <code>ver</code>, from Command Prompt.
Microcode (v1.7+)	string	<i>read-only</i> (null)	The microcode version contained in this software, such as processor microcode. This property shall contain the microcode version contained in this software.
Oem (v1.7+) {}	object		See the OEM object definition in the Using this guide clause.
OSDistribution (v1.8+)	string	<i>read-only</i> (null)	The operating system name of this software. This property shall contain the operating system name of this software.
}			

Property	Type	Attributes	Notes
AutoDSTEnabled (v1.4+)	boolean	<i>read-write</i>	An indication of whether the manager is configured for automatic Daylight Saving Time (DST) adjustment. This property shall indicate whether the manager is configured for automatic Daylight Saving Time (DST) adjustment.
Certificates (v1.13+) {	object		The link to a collection of certificates for device identity and attestation. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that contains certificates for device identity and attestation. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
CommandShell {	object		The manager's command line user interface or command shell service. This property shall describe a command line user interface or command shell service provided by this manager. The command shell refers to an interface used to interact with the manager itself, not a dedicated console session redirected from a host operating system. For redirected serial or host operating system consoles, see the <code>SerialConsole</code> property in the <code>ComputerSystem</code> resource.
ConnectTypesSupported []	array (string (enum))	<i>read-only</i>	- This property enumerates the command shell connection types that the implementation allows. - This property shall contain an array of the enumerations. SSH shall be included if the Secure Shell (SSH) protocol is supported. Telnet shall be included if the Telnet protocol is supported. IPMI shall be included if the IPMI Serial Over LAN (SOL) protocol is supported. <i>For the possible property values, see ConnectTypesSupported in Property details.</i>
MaxConcurrentSessions	integer	<i>read-only</i>	The maximum number of service sessions, regardless of protocol, that this manager can support. This property shall contain the maximum number of concurrent service sessions that this implementation supports.
ServiceEnabled	boolean	<i>read-write</i>	An indication of whether the service is enabled for this manager. This property shall indicate whether the protocol for the service is enabled.
}			

Property	Type	Attributes	Notes
DateTime	string (date-time)	<i>read-write</i> (<i>null</i>)	The current date and time with UTC offset of the manager. This property shall contain the current date and time with UTC offset of the manager.
DateTimeLocalOffset	string	<i>read-write</i> (<i>null</i>)	The time offset from UTC that the <code>DateTime</code> property is in <code>+HH:MM</code> format. This property shall contain the offset from UTC time that the <code>DateTime</code> property contains. If both <code>DateTime</code> and <code>DateTimeLocalOffset</code> are provided in modification requests, services shall apply <code>DateTimeLocalOffset</code> after <code>DateTime</code> is applied. Pattern: <code>^([+-][0-1][0-9]:[0-5][0-9])\$</code>
DateTimeSource (v1.20+)	string (enum)	<i>read-write</i> (<i>null</i>)	The source of the date and time of this manager, such as NTP, RTC, or firmware. This property shall contain the source of the <code>DateTime</code> property of this manager. The service shall update this property if the source changes internally, for example if an NTP server is unavailable and the source falls back to the time stored by the RTC. <i>For the possible property values, see <code>DateTimeSource</code> in Property details.</i>
DaylightSavingTime (v1.19+) {	object		The daylight saving time settings for this manager. This property shall contain the daylight saving time settings for this manager.
EndDateTime (v1.19+)	string (date-time)	<i>read-write</i>	The end date and time with UTC offset of daylight saving time. This property shall contain the end date and time with UTC offset of daylight saving time for this manager. If daylight saving time is permanent, specify a sufficiently distant end date and time. Services shall update the UTC offset based on changes made to <code>DateTimeLocalOffset</code>. This property shall be read-only if the service contains time zone databases.
OffsetMinutes (v1.19+)	integer	<i>read-write</i>	The daylight saving time offset in minutes. This property shall contain the number of minutes added to the <code>DateTime</code> value when the <code>DateTime</code> value is between the values of <code>StartDateTime</code> and <code>EndDateTime</code>. This offset shall be applied only if <code>AutoDSTEnabled</code> is <code>true</code>. This property shall be read-only if the service contains time zone databases.
StartDateTime (v1.19+)	string (date-time)	<i>read-write</i>	The start date and time with UTC offset of daylight saving time. This property shall contain the start date and time with UTC offset of daylight saving time for this manager. Services shall update the UTC offset based on changes made to <code>DateTimeLocalOffset</code>. This property shall be read-only if the service contains time zone databases.

Property	Type	Attributes	Notes
TimeZoneName (v1.19+)	string	<i>read-write</i>	The time zone of the manager when daylight saving time is in effect. This property shall contain the time zone of the manager when daylight saving time is in effect. When daylight saving time is in effect, the service shall update the <code>TimeZoneName</code> property in the root of the resource. When daylight saving time is no longer in effect, the service shall restore the original value of the <code>TimeZoneName</code> property in the root of the resource. The time zone shall be either the 'Name' or the 'Format' for the zone as defined in the IANA Time Zone Database. The value of this property is used for display purposes, especially to enhance the display of time. This property shall be read-only if the service contains time zone databases.
}			
DedicatedNetworkPorts (v1.16+) {	object		The dedicated network ports of the manager. This property shall contain a link to a resource collection of type <code>PortCollection</code> that represent the dedicated network ports of the manager. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Port</i> . See the Port schema for details.
}			
EthernetInterfaces {	object		The link to a collection of NICs that this manager uses for network communication. This property shall contain a link to a resource collection of type <code>EthernetInterfaceCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>EthernetInterface</i> . See the EthernetInterface schema for details.
}			
FirmwareVersion	string	<i>read-only</i> (null)	The firmware version of this manager. This property shall contain the firmware version as defined by the manufacturer for the associated manager.

Property	Type	Attributes	Notes
GraphicalConsole {	object		The manager's graphical console service. This property shall contain the information about the graphical console (KVM-IP) service of this manager. This property should be used to describe a service for the manager's console or operating system, not a service provided on behalf of a host operating system. Implementations representing host OS consoles, known generally as a KVM-IP feature, should use the <code>GraphicalConsole</code> property in the <code>ComputerSystem</code> resource.
ConnectTypesSupported []	array (string (enum))	<i>read-only</i>	- This property enumerates the graphical console connection types that the implementation allows. - This property shall contain an array of the enumerations. RDP shall be included if the Remote Desktop (RDP) protocol is supported. KVMIP shall be included if a vendor-defined KVM-IP protocol is supported. <i>For the possible property values, see <code>ConnectTypesSupported</code> in Property details.</i>
MaxConcurrentSessions	integer	<i>read-only</i>	The maximum number of service sessions, regardless of protocol, that this manager can support. This property shall contain the maximum number of concurrent service sessions that this implementation supports.
ServiceEnabled	boolean	<i>read-write</i>	An indication of whether the service is enabled for this manager. This property shall indicate whether the protocol for the service is enabled.
}			
HostInterfaces (v1.3+) {	object		The link to a collection of host interfaces that this manager uses for local host communication. Clients can find host interface configuration options and settings in this navigation property. This property shall contain a link to a resource collection of type <code>HostInterfaceCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>HostInterface</i> . See the <i>HostInterface</i> schema for details.
}			
LastResetTime (v1.9+)	string (date-time)	<i>read-only</i>	The date and time when the manager was last reset or rebooted. This property shall contain the date and time when the manager last came out of a reset or was rebooted.

Property	Type	Attributes	Notes
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
ActiveSoftwareImage (v1.6+) {	object		The link to the software inventory resource that represents the active firmware image for this manager. This property shall contain a link to a resource of type <code>SoftwareInventory</code> that represents the active firmware image for this manager. See the <i>SoftwareInventory</i> schema for details on this property.
@odata.id	string	<i>read-write</i>	Link to a SoftwareInventory resource. See the Links section and the <i>SoftwareInventory</i> schema for details.
}			
ManagedBy (v1.9+) [{	array		The array of links to the managers responsible for managing this manager. This property shall contain an array of links to resources of type <code>Manager</code> that represent the managers for this manager.
@odata.id	string	<i>read-only</i>	Link to another Manager resource.
}]			
ManagerForChassis [{	array		An array of links to the chassis this manager controls. This property shall contain an array of links to chassis over which this manager instance has control.
@odata.id	string	<i>read-only</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.
}]			
ManagerForFabrics (v1.22+) [{	array		An array of links to the fabrics that this manager controls. This property shall contain an array of links to resources of type <code>Fabric</code> that represent the fabrics that this manager controls.
@odata.id	string	<i>read-only</i>	Link to a Fabric resource. See the Links section and the <i>Fabric</i> schema for details.
}]			
ManagerForManagers (v1.9+) [{	array		An array of links to the managers that are managed by this manager. This property shall contain an array of links to resources of type <code>Manager</code> that represent the managers being managed by this manager.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to another Manager resource.
}}			
ManagerForServers [{	array		An array of links to the systems that this manager controls. This property shall contain an array of links to computer systems over which this manager instance has control.
@odata.id	string	<i>read-only</i>	Link to a ComputerSystem resource. See the Links section and the <i>ComputerSystem</i> schema for details.
}}			
ManagerForSwitches (v1.4+) [{	array		An array of links to the switches that this manager controls. This property shall contain an array of links to switches that this manager instance controls.
@odata.id	string	<i>read-only</i>	Link to a Switch resource. See the Links section and the <i>Switch</i> schema for details.
}}			
ManagerInChassis (v1.1+) {	object		The link to the chassis where this manager is located. This property shall contain a link to the chassis where this manager is located. See the <i>Chassis</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.
}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
SelectedNetworkPort (v1.18+) {	object	(null)	The network port currently used by this manager. This allows selection of shared or dedicated ports for managers that support one or the other. For managers that always have their dedicated port enabled, this allows the selection of which shared port to use. This property shall contain a link to a resource of type <i>Port</i> that represents the current network port used by this manager. See the <i>Port</i> schema for details on this property.
@odata.id	string	<i>read-write</i>	Link to a Port resource. See the Links section and the <i>Port</i> schema for details.
}			

Property	Type	Attributes	Notes
SoftwareImages (v1.6+) [{	array		The images that are associated with this manager. This property shall contain an array of links to resources of type <code>SoftwareInventory</code> that represent the firmware images that apply to this manager.
@odata.id	string	<i>read-only</i>	Link to a <code>SoftwareInventory</code> resource. See the Links section and the <code>SoftwareInventory</code> schema for details.
}]			
}			
Location (v1.11+) {}	object		The location of the manager. This property shall contain the location information of the associated manager. For property details, see <code>Location</code>.
LocationIndicatorActive (v1.11+)	boolean	<i>read-write</i> (null)	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of <code>IndicatorLED</code> in this resource, if supported, to reflect the implementation of the locating function.
LogServices {	object		The link to a collection of logs that the manager uses. This property shall contain a link to a resource collection of type <code>LogServiceCollection</code> that this manager uses. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <code>LogService</code> . See the <code>LogService</code> schema for details.
}			
ManagerDiagnosticData (v1.14+) {	object	(null)	The diagnostic data for this manager. This property shall contain a link to a resource of type <code>ManagerDiagnosticData</code> that represents the diagnostic data for this manager. See the <code>ManagerDiagnosticData</code> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>ManagerDiagnosticData</code> resource. See the Links section and the <code>ManagerDiagnosticData</code> schema for details.
}			

Property	Type	Attributes	Notes
ManagerType	string (enum)	<i>read-only</i>	The type of manager that this resource represents. This property shall describe the function of this manager. The <code>ManagementController</code> value shall be used if none of the other enumerations apply. <i>For the possible property values, see <code>ManagerType</code> in Property details.</i>
Manufacturer (v1.7+)	string	<i>read-only</i> (null)	The manufacturer of this manager. This property shall contain the name of the organization responsible for producing the manager. This organization may be the entity from whom the manager is purchased, but this is not necessarily true.
Measurements (v1.13+, deprecated v1.14) [{	array		An array of DSP0274-defined measurement blocks. This property shall contain an array of DSP0274-defined measurement blocks. <i>Deprecated in v1.14 and later. This property has been deprecated in favor of the <code>ComponentIntegrity</code> resource.</i>
@odata.id	string	<i>read-only</i>	Link to a MeasurementBlock resource. See the Links section and the <code>SoftwareInventory</code> schema for details.
}]			
Model	string	<i>read-only</i> (null)	The model information of this manager, as defined by the manufacturer. This property shall contain the information about how the manufacturer refers to this manager.
NetworkProtocol {	object		The link to the network services and their settings that the manager controls. This property shall contain a link to a resource of type <code>ManagerNetworkProtocol</code>, which represents the network services for this manager. See the <code>ManagerNetworkProtocol</code> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a ManagerNetworkProtocol resource. See the Links section and the <code>ManagerNetworkProtocol</code> schema for details.
}			
OEMSecurityMode (v1.21+)	string	<i>read-only</i> (null)	The OEM-specific security compliance mode(s) that the manager is currently configured to enforce. This property shall the OEM-specific security compliance mode(s) that the manager is currently configured to enforce. This property shall only be present if <code>SecurityMode</code> contains <code>OEM</code>.

Property	Type	Attributes	Notes
PartNumber (v1.7+)	string	<i>read-only</i> (null)	The part number of the manager. This property shall contain a part number assigned by the organization that is responsible for producing or manufacturing the manager.
PowerState (v1.2+)	string (enum)	<i>read-only</i> (null)	The current power state of the manager. This property shall contain the power state of the manager. <i>For the possible property values, see PowerState in Property details.</i>
Redundancy [{}]	array (object)		The common redundancy definition and structure used in other Redfish schemas. - The redundancy information for the managers of this system. - The properties in this array shall show how this manager is grouped with other managers for form redundancy sets. For property details, see Redundancy.
RemoteAccountService (v1.5+) {	object		The link to the account service resource for the remote manager that this resource represents. This property shall contain a link to the account service resource for the remote manager that this resource represents. This property shall only be present when providing aggregation of a remote manager. See the <i>AccountService</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>AccountService</i> resource. See the Links section and the <i>AccountService</i> schema for details.
}			
RemoteRedfishServiceUri (v1.5+)	string (URI)	<i>read-only</i> (null)	The URI of the Redfish service root for the remote manager that this resource represents. This property shall contain the URI of the Redfish service root for the remote manager that this resource represents. This property shall only be present when providing aggregation of Redfish services.
SecurityMode (v1.21+)	string (enum)	<i>read-only</i>	The security compliance mode that the manager is currently configured to enforce. This property shall contain the security compliance mode that the manager is currently configured to enforce. <i>For the possible property values, see SecurityMode in Property details.</i>

Property	Type	Attributes	Notes
SecurityPolicy (v1.16+) {	object	(null)	The security policy settings for this manager. This property shall contain a link to a resource of type <code>SecurityPolicy</code> that contains the security policy settings for this manager. See the <i>SecurityPolicy</i> schema for details on this property.
@odata.id	string	read-only	Link to a <i>SecurityPolicy</i> resource. See the Links section and the <i>SecurityPolicy</i> schema for details.
}			
SerialConsole (deprecated v1.10) {	object		The serial console service that this manager provides. This property shall contain information about the serial console service of this manager. <i>Deprecated in v1.10 and later. This property has been deprecated in favor of the <code>SerialConsole</code> property in the <code>ComputerSystem</code> resource.</i>
ConnectTypesSupported []	array (string (enum))	read-only	- This property enumerates the serial console connection types that the implementation allows. - This property shall contain an array of the enumerations. SSH shall be included if the Secure Shell (SSH) protocol is supported. Telnet shall be included if the Telnet protocol is supported. IPMI shall be included if the IPMI Serial Over LAN (SOL) protocol is supported. <i>For the possible property values, see <code>ConnectTypesSupported</code> in Property details.</i>
MaxConcurrentSessions	integer	read-only	The maximum number of service sessions, regardless of protocol, that this manager can support. This property shall contain the maximum number of concurrent service sessions that this implementation supports.
ServiceEnabled	boolean	read-write	An indication of whether the service is enabled for this manager. This property shall indicate whether the protocol for the service is enabled.
}			
SerialInterfaces {	object		The link to a collection of serial interfaces that this manager uses for serial and console communication. This property shall contain a link to a resource collection of type <code>SerialInterfaceCollection</code>, which this manager uses. Contains a link to a resource.
@odata.id	string	read-only	Link to Collection of <i>SerialInterface</i> . See the <i>SerialInterface</i> schema for details.
}			

Property	Type	Attributes	Notes
SerialNumber (v1.7+)	string	<i>read-only</i> (null)	The serial number of the manager. This property shall contain a manufacturer-allocated number that identifies the manager.
ServiceEntryPointUUID	string (uuid)	<i>read-only</i> (null)	The UUID of the Redfish service that is hosted by this manager. This property shall contain the UUID of the Redfish service that is hosted by this manager. Each manager providing an entry point to the same Redfish service shall report the same UUID value, even though the name of the property may imply otherwise. This property shall not be present if this manager does not provide a Redfish service entry point. Pattern: <code>^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\$</code>
ServiceIdentification (v1.15+)	string	<i>read-write</i> (null)	A product instance identifier displayed in the Redfish service root. This property shall contain a vendor-provided or user-provided value that identifies and associates a discovered Redfish service with a particular product instance. If this manager provides the Redfish service, the <code>ServiceIdentification</code> property in the <code>ServiceRoot</code> resource shall contain the value of this property. This property shall only be present if the manager provides the Redfish service. The value of this property is used in conjunction with the <code>Product</code> and <code>Vendor</code> properties in <code>ServiceRoot</code> to match user credentials or other a priori product instance information necessary for initial deployment to the correct, matching Redfish service.
SharedNetworkPorts (v1.16+) {	object		The shared network ports of the manager. This property shall contain a link to a resource collection of type <code>PortCollection</code> that represent the shared network ports of the manager. The members of this collection shall reference Port resources subordinate to NetworkAdapter resources. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Port</i> . See the Port schema for details.
}			
SparePartNumber (v1.11+)	string	<i>read-only</i> (null)	The spare part number of the manager. This property shall contain the spare part number of the manager.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

Property	Type	Attributes	Notes
TimeZoneName (v1.10+)	string	<i>read-write</i>	The time zone of the manager. This property shall contain the time zone of the manager. The time zone shall be either the 'Name' or the 'Format' for the zone as defined in the IANA Time Zone Database. The value of this property is used for display purposes, especially to enhance the display of time. A Redfish service may not be able to ensure accuracy and consistency between the <code>DateTimeOffset</code> property and this property. Therefore, to specify the correct time zone offset, see the <code>DateTimeOffset</code> property.
USBPorts (v1.12+) {	object		The USB ports of the manager. This property shall contain a link to a resource collection of type <code>PortCollection</code> that represent the USB ports of the manager. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Port</i> . See the Port schema for details.
}			
UUID	string (uuid)	<i>read-only</i> (null)	The UUID for this manager. This property shall contain the UUID for the manager. Pattern: <code>^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\$</code>
Version (v1.17+)	string	<i>read-only</i> (null)	The hardware version of this manager. This property shall contain the hardware version of this manager as determined by the vendor or supplier.
VirtualMedia (deprecated v1.10) {	object		The link to the virtual media services for this particular manager. This property shall contain a link to a resource collection of type <code>VirtualMediaCollection</code>, which this manager uses. Contains a link to a resource. <i>Deprecated in v1.10 and later. This property has been deprecated in favor of the <code>VirtualMedia</code> property in the <code>ComputerSystem</code> resource.</i>
@odata.id	string	<i>read-only</i>	Link to Collection of <i>VirtualMedia</i> . See the VirtualMedia schema for details.
}			

6.70.4 Actions

6.70.4.1 ForceFailover

Description

The `ForceFailover` action forces a failover of this manager to the manager used in the parameter.

- This action shall perform a forced failover of the manager's redundancy to the manager supplied as a parameter.

Action URI

{Base URI of target resource}/Actions/Manager.ForceFailover

Action parameters

Parameter Name	Type	Attributes	Notes
NewManager {	object	<i>required</i>	The manager to which to fail over. • This parameter shall contain the manager to which to fail over.
@odata.id	string	<i>read-only</i>	Link to another Manager resource.
}			

Request Example

```
{
  "NewManager": [
    {
      "@odata.id": "/redfish/v1/Managers/3"
    }
  ]
}
```

6.70.4.2 ModifyRedundancySet

Description

The `ModifyRedundancySet` operation adds members to or removes members from a redundant group of managers.

- The `ModifyRedundancySet` operation shall add members to or remove members from a redundant group of managers.

Action URI

{Base URI of target resource}/Actions/Manager.ModifyRedundancySet

Action parameters

Parameter Name	Type	Attributes	Notes
Add [{	array	<i>optional</i>	An array of managers to add to the redundancy set. This parameter shall contain an array of managers to add to the redundancy set.
@odata.id	string	<i>read-only</i>	Link to another Manager resource.
}]			
Remove [{	array	<i>optional</i>	An array of managers to remove from the redundancy set. This parameter shall contain an array of managers to remove from the redundancy set.
@odata.id	string	<i>read-only</i>	Link to another Manager resource.
}]			

Request Example

```
{
  "Add": [
    {
      "@odata.id": "/redfish/v1/Managers/4"
    }
  ]
}
```

6.70.4.3 Reset

Description

The reset action resets/reboots the manager.

- This action shall reset the manager. If this manager provides the Redfish service, the service shall send the action response before resetting to prevent client timeouts.

Action URI

{Base URI of target resource}/Actions/Manager.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	<i>optional</i>	The type of reset. This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset. Services should include the <code>@Redfish.AllowableValues</code> annotation for this parameter to ensure compatibility with clients, even when <code>ActionInfo</code> has been implemented. <i>For the possible property values, see <code>ResetType</code> in Property details.</i>

Request Example

```
{  
  "ResetType": "ForceRestart"  
}
```

6.70.4.4 ResetToDefaults (v1.8+)

Description

The reset action resets the manager settings to factory defaults. This can cause the manager to reset.

- This action shall reset the manager settings. This action may impact other resources.

Action URI

{Base URI of target resource}/Actions/Manager.ResetToDefaults

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	<i>required</i>	The type of reset to defaults. This parameter shall contain the type of reset to defaults. <i>For the possible property values, see <code>ResetType</code> in Property details.</i>

Request Example

```
{
```

```
    "ResetType": "PreserveNetworkAndUsers"
  }
```

6.70.4.5 UpdateSecurityMode (v1.21+)

Description

The update security mode action updates the security mode for the manager. This can cause the manager to reset and reset other settings to factory defaults. Services might require the `ResetToDefaults` action to clear the security mode.

- This action shall update the security mode for the manager. Services may reset other settings to factory defaults. Services may require the `ResetToDefaults` action to clear security settings. This action may impact other resources.

Action URI

{Base URI of target resource}/Actions/Manager.UpdateSecurityMode

Action parameters

Parameter Name	Type	Attributes	Notes
OEMSecurityMode	string	optional	The OEM-specific security mode to apply to the manager. • This parameter shall contain the OEM-specific security mode to apply to the manager. This parameter shall be required if <code>SecurityMode</code> is <code>OEM</code>.
SecurityMode	string (enum)	required	The security mode to apply to the manager. • This parameter shall contain the security mode to apply to the manager. <i>For the possible property values, see SecurityMode in Property details.</i>

Request Example

```
{
  "SecurityMode": "CNSA_1_0"
}
```


6.70.5 Property details

6.70.5.1 ConnectTypesSupported

6.70.5.1.1 In CommandShell:

- This property enumerates the command shell connection types that the implementation allows.
 - This property shall contain an array of the enumerations. SSH shall be included if the Secure Shell (SSH) protocol is supported. Telnet shall be included if the Telnet protocol is supported. IPMI shall be included if the IPMI Serial Over LAN (SOL) protocol is supported.

string	Description
IPMI	The controller supports a command shell connection through the IPMI Serial Over LAN (SOL) protocol.
Oem	The controller supports a command shell connection through an OEM-specific protocol.
SSH	The controller supports a command shell connection through the SSH protocol.
Telnet	The controller supports a command shell connection through the Telnet protocol.

6.70.5.1.2 In GraphicalConsole:

- This property enumerates the graphical console connection types that the implementation allows.
 - This property shall contain an array of the enumerations. RDP shall be included if the Remote Desktop (RDP) protocol is supported. KVMIP shall be included if a vendor-defined KVM-IP protocol is supported.

string	Description
KVMIP	The controller supports a graphical console connection through a KVM-IP (redirection of Keyboard, Video, Mouse over IP) protocol.
Oem	The controller supports a graphical console connection through an OEM-specific protocol.

6.70.5.1.3 In SerialConsole:

- This property enumerates the serial console connection types that the implementation allows.
 - This property shall contain an array of the enumerations. SSH shall be included if the Secure Shell (SSH) protocol is supported. Telnet shall be included if the Telnet protocol is supported. IPMI shall be included if the IPMI Serial Over LAN (SOL) protocol is supported.

string	Description
IPMI	The controller supports a serial console connection through the IPMI Serial Over LAN (SOL) protocol.
Oem	The controller supports a serial console connection through an OEM-specific protocol.
SSH	The controller supports a serial console connection through the SSH protocol.
Telnet	The controller supports a serial console connection through the Telnet protocol.

6.70.5.2 DateTimeSource

The source of the date and time of this manager, such as NTP, RTC, or firmware.

- This property shall contain the source of the `DateTime` property of this manager. The service shall update this property if the source changes internally, for example if an NTP server is unavailable and the source falls back to the time stored by the RTC.

string	Description
Firmware	The date and time is set and held by firmware.
Host	The date and time is retrieved from the host.
NTP	The date and time source is a Network Time Protocol (NTP) server.
PTP	The date and time source is a Precision Time Protocol (PTP) server.
RTC	The date and time is retrieved from the manager's real time clock (RTC).

6.70.5.3 ManagerType

The type of manager that this resource represents.

- This property shall describe the function of this manager. The `ManagementController` value shall be used if none of the other enumerations apply.

string	Description
AuxiliaryController	A controller that provides management functions for a particular subsystem or group of devices as part of a larger system.
BMC	A controller that provides management functions for one or more computer systems. Commonly known as a BMC (baseboard management controller). Examples of this include a BMC dedicated to one system or a multi-host manager providing BMC capabilities to multiple systems.

string	Description
EnclosureManager	A controller that provides management functions for a chassis, group of devices, or group of systems with their own BMCs (baseboard management controllers). An example of this is a manager that aggregates and orchestrates management functions across multiple BMCs in an enclosure.
FabricManager (v1.22+)	A controller that primarily monitors or manages the operation of a group of fabric attached nodes and switches.
ManagementController	A controller that primarily monitors or manages the operation of a device or system.
RackManager	A controller that provides management functions for a whole or part of a rack. An example of this is a manager that aggregates and orchestrates management functions across multiple managers, such as enclosure managers and BMCs (baseboard management controllers), in a rack.
Service (v1.4+)	A software-based service that provides management functions.

6.70.5.4 PowerState

The current power state of the manager.

- This property shall contain the power state of the manager.

string	Description
Off	The resource is powered off. The components within the resource might continue to have AUX power.
On	The resource is powered on.
Paused	The resource is paused.
PoweringOff	A temporary state between on and off. The components within the resource can take time to process the power off action.
PoweringOn	A temporary state between off and on. The components within the resource can take time to process the power on action.

6.70.5.5 ResetType

6.70.5.5.1 In Actions: Reset:

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset. Services should include the `@Redfish.AllowableValues` annotation for this parameter to ensure compatibility with clients, even when `ActionInfo` has been implemented.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.
ForceOn	Turn on the unit immediately. This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property shall contain the value <code>on</code>.
ForceRestart	Shut down immediately and non-gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>on</code>.
FullPowerCycle	Full power cycle the unit. Behaves like removing utility lines, followed by restoring utility lines to the resource. This value shall indicate the resource will perform a full power cycle as if utility lines to the resource are removed and restored. This is different from <code>PowerCycle</code> in that it's as close to a true power cycle as possible. For example, removing AC power cables from an enclosure and then restoring the AC power cables. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>on</code>. If a service supports this value but there are no other distinct power cycle flows, the service shall support <code>PowerCycle</code> as an alias to <code>FullPowerCycle</code>. This type of reset may cause the manager providing the Redfish service to power cycle. If the manager providing the Redfish service is affected by this type of reset, the service shall send the action response before resetting to prevent client timeouts.
GracefulRestart	Shut down gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>on</code>.
GracefulShutdown	Shut down gracefully and power off. This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.

string	Description
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a paused state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Paused</code>.
PowerCycle	Power cycle the unit. Behaves like a power removal, followed by a power restore to the resource. This value shall indicate the resource will perform a power cycle. This is different from <code>FullPowerCycle</code> in that it typically performs localized power sequencing of the resource while external power is still present. For example, turning DC voltage regulators off and then turning DC voltage regulators back on. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
PushPowerButton	Simulate the pressing of the physical power button on this unit. This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.

6.70.5.5.2 In Actions: `ResetToDefaults`:

The type of reset to defaults.

- This parameter shall contain the type of reset to defaults.

string	Description
PreserveNetwork	Reset all settings except network settings to factory defaults.
PreserveNetworkAndUsers	Reset all settings except network and local usernames/passwords to factory defaults.
ResetAll	Reset all settings to factory defaults.

6.70.5.6 SecurityMode

The security mode to apply to the manager.

- This parameter shall contain the security mode to apply to the manager.

string	Description
CNSA_1_0	This security mode indicates the implementation meets NSA Commercial National Security Algorithm Suite 1.0 requirements. This mode requires FIPS 140-2 compliance. • This value shall indicate that the implementation meets NSA Commercial National Security Algorithm Suite 1.0 requirements and FIPS 140-2 compliance.
CNSA_2_0	This security mode indicates the implementation meets NSA Commercial National Security Algorithm Suite 2.0 requirements. This mode requires FIPS 140-3 compliance. • This value shall indicate that the implementation meets NSA Commercial National Security Algorithm Suite 2.0 requirements and FIPS 140-3 compliance.
Default	This security mode indicates the implementation is in a vendor-specific default security state that does not match any other value. • This value shall indicate that the implementation is in a vendor-specific default security state that does not match any other value.
FIPS_140_2	This security mode indicates the implementation complies with FIPS 140-2. • This value shall indicate that the implementation complies with FIPS 140-2.
FIPS_140_3	This security mode indicates the implementation complies with FIPS 140-3. • This value shall indicate that the implementation complies with FIPS 140-3.
OEM	This security mode indicates the implementation is in an OEM-specific security state. • This value shall indicate that the implementation is in an OEM-specific security state.

string	Description
SuiteB	This security mode indicates the implementation meets NSA Suite B cryptographic standards for Top Secret installations. This mode requires FIPS 140-2 compliance. This value shall indicate that the implementation meets NSA Suite B cryptographic standards for Top Secret installations and FIPS 140-2 compliance.

6.70.6 Example response

```
{
  "@odata.type": "#Manager.v1_22_0.Manager",
  "Id": "BMC",
  "Name": "Manager",
  "ManagerType": "BMC",
  "Description": "Contoso BMC",
  "ServiceEntryPointUUID": "92384634-2938-2342-8820-489239905423",
  "UUID": "58893887-8974-2487-2389-841168418919",
  "Model": "Joo Janta 200",
  "FirmwareVersion": "4.4.6521",
  "DateTime": "2015-03-13T04:14:33+06:00",
  "DateTimeLocalOffset": "+06:00",
  "DateTimeSource": "NTP",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "PowerState": "On",
  "GraphicalConsole": {
    "ServiceEnabled": true,
    "MaxConcurrentSessions": 2,
    "ConnectTypesSupported": [
      "KVMIP"
    ]
  },
  "CommandShell": {
    "ServiceEnabled": true,
    "MaxConcurrentSessions": 4,
    "ConnectTypesSupported": [
      "Telnet",
      "SSH"
    ]
  },
  "HostInterfaces": {
    "@odata.id": "/redfish/v1/Managers/9/HostInterfaces"
  },
  "NetworkProtocol": {
    "@odata.id": "/redfish/v1/Managers/BMC/NetworkProtocol"
  }
}
```

```

    },
    "EthernetInterfaces": {
      "@odata.id": "/redfish/v1/Managers/BMC/NICs"
    },
    "SerialInterfaces": {
      "@odata.id": "/redfish/v1/Managers/BMC/SerialInterfaces"
    },
    "LogServices": {
      "@odata.id": "/redfish/v1/Managers/BMC/LogServices"
    },
    "VirtualMedia": {
      "@odata.id": "/redfish/v1/Systems/437XR1138R2/VirtualMedia"
    },
    "Links": {
      "ManagerForServers": [
        {
          "@odata.id": "/redfish/v1/Systems/437XR1138R2"
        }
      ],
      "ManagerForChassis": [
        {
          "@odata.id": "/redfish/v1/Chassis/1U"
        }
      ],
      "ManagerInChassis": {
        "@odata.id": "/redfish/v1/Chassis/1U"
      }
    },
    "Actions": {
      "#Manager.Reset": {
        "target": "/redfish/v1/Managers/BMC/Actions/Manager.Reset",
        "ResetType@Redfish.AllowableValues": [
          "ForceRestart",
          "GracefulRestart"
        ]
      }
    },
    "@odata.id": "/redfish/v1/Managers/BMC"
  }
}

```

6.71 ManagerAccount 1.14.0

Version	v1.14	v1.13	v1.12	v1.11	v1.10	v1.9	v1.8	v1.7	v1.6	v1.5	v1.4	...
Release	2025.2	2024.3	2023.3	2023.2	2022.3	2022.1	2021.1	2020.4	2020.1	2019.4	2019.3	...

6.71.1 Description

The `ManagerAccount` schema defines the user accounts that are owned by a manager. Changes to a manager account might affect the current Redfish service connection if this manager is responsible for the Redfish service.

- This resource shall represent a user account for the manager in a Redfish implementation. The account shall indicate the allowed access to one of more services in the manager.

6.71.2 URIs

/redfish/v1/AccountService/Accounts/{*ManagerAccountId*}

/redfish/v1/Managers/{*ManagerId*}/RemoteAccountService/Accounts/{*ManagerAccountId*}

6.71.3 Properties

Property	Type	Attributes	Notes
AccountExpiration (v1.8+)	string (date-time)	<i>read-write</i> (<i>null</i>)	Indicates the date and time when this account expires. If <code>null</code> , the account never expires. This property shall contain the date and time when this account expires. The service shall disable or delete an account that has expired. This property shall not apply to accounts created by the Redfish Host Interface Specification-defined credential bootstrapping. If the value is <code>null</code>, or the property is not present, the account never expires.
AccountTypes (v1.4+) []	array (string (enum))	<i>read-write</i> <i>required</i> (<i>null</i>)	- The list of services in the manager that the account is allowed to access. - This property shall contain an array of the various manager services that the account is allowed to access. This shall not include functionality for receiving events or other notifications. If this property is not provided by the client, the default value shall be an array that contains the value <code>Redfish</code>. The service may add additional values when this property is set or updated if allowed by the value of the <code>StrictAccountTypes</code> property. <i>For the possible property values, see AccountTypes in Property details.</i>
Certificates (v1.2+) {	object		The link to a collection of user identity certificates for this account. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that represents the user identity certificates for this account. Contains a link to a resource.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
EmailAddress (v1.11+)	string	<i>read-write</i> (null)	The email address associated with this account. This property shall contain the email address associated with this account.
Enabled	boolean	<i>read-write</i>	An indication of whether an account is enabled. An administrator can disable it without deleting the user information. If <i>true</i> , the account is enabled and the user can log in. If <i>false</i> , the account is disabled and, in the future, the user cannot log in. This property shall indicate whether an account is enabled. If <i>true</i>, the account is enabled and the user can log in. If <i>false</i>, the account is disabled and, in the future, the user cannot log in.
HostBootstrapAccount (v1.8+)	boolean	<i>read-only</i>	An indication of whether this account is a bootstrap account for the host interface. This property shall indicate whether this account is a bootstrap account created by the Redfish Host Interface Specification-defined credential bootstrapping.
Keys (v1.9+) {	object		The link to the collection of keys that can be used to authenticate this account. For example, an SSH public key could be added to this collection to allow for SSH public key authentication. This property shall contain a link to a resource collection of type <i>KeyCollection</i> that contains the keys that can be used to authenticate this account. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Key</i> . See the Key schema for details.
}			
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
Role {	object		The link to the Redfish role that defines the privileges for this account. This property shall contain a link to a resource of type <i>Role</i>, and should link to the resource identified by the <i>RoleId</i> property. See the <i>Role</i> schema for details on this property.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a Role resource. See the Links section and the <i>Role</i> schema for details.
}			
}			
Locked	boolean	<i>read-write</i>	An indication of whether the account service automatically locked the account because the lockout threshold was exceeded. To manually unlock the account before the lockout duration period, an administrator can change the property to <code>false</code> to clear the lockout condition. This property shall indicate whether the account service automatically locked the account because the <code>AccountLockoutThreshold</code> was exceeded. To manually unlock the account before the lockout duration period, an administrator shall be able to change the property to <code>false</code> to clear the lockout condition.
MFABypass (v1.10+) {	object	(null)	The multi-factor authentication bypass settings for this account. This property shall contain the multi-factor authentication bypass settings for this account.
BypassTypes (v1.12+) []	array (string (enum))	<i>read-write</i> (null)	- The types of multi-factor authentication this account or role mapping is allowed to bypass. - This property shall contain the types of multi-factor authentication this account or role mapping is allowed to bypass. An empty array shall indicate this account or role mapping cannot bypass any multi-factor authentication types that are currently enabled. <i>For the possible property values, see BypassTypes in Property details.</i>
}			
OEMAccountTypes (v1.4+) []	array (string, null)	<i>read-write</i>	The OEM account types. This property shall contain an array of the OEM account types for this account. This property shall be valid when <code>AccountTypes</code> contains <code>OEM</code>.

Property	Type	Attributes	Notes
OneTimePasscodeDeliveryAddress (v1.11+)	string	<i>read-write</i> (null)	The address used to receive one-time passcode messages for multi-factor authentication. This property shall contain the contact address for receiving one-time passcode messages for multi-factor authentication for this account when the <code>Enabled</code> property in the <code>OneTimePasscode</code> property in <code>AccountService</code> resource contains <code>true</code>. This is typically the contact email address associated with the account, but may be a separate, relay email address for delivery via SMS or other contact method.
Password	string	<i>read-write</i> <i>required on create</i> (null)	The password. Use this property with a <code>PATCH</code> or <code>PUT</code> to write the password for the account. This property is <code>null</code> in responses. This property shall contain the password for this account. The value shall be <code>null</code> in responses.
PasswordChangeRequired (v1.3+)	boolean	<i>read-write</i> (null)	An indication of whether the service requires that the password for this account be changed before further access to the account is allowed. This property shall indicate whether the service requires that the password for this account be changed before further access to the account is allowed. The implementation may deny access to the service if the password has not been changed. A manager account created with an initial <code>PasswordChangeRequired</code> value of <code>true</code> may force a password change before first access of the account. When the <code>Password</code> property for this account is updated, the service shall set this property to <code>false</code>.
PasswordExpiration (v1.6+)	string (date-time)	<i>read-write</i> (null)	Indicates the date and time when this account password expires. If <code>null</code>, the account password never expires. This property shall contain the date and time when this account password expires. If the value is <code>null</code>, the account password never expires. If provided during account creation or password modification, this value shall override the value of the <code>PasswordExpirationDays</code> property in the <code>AccountService</code> resource.
PhoneNumber (v1.11+)	string	<i>read-write</i> (null)	The contact phone number associated with this account. This property shall contain the contact phone number associated with this account.
RoleId	string	<i>read-write</i> <i>required on create</i>	The role for this account. This property shall contain the <code>RoleId</code> of the role resource configured for this account. The service shall reject <code>POST</code>, <code>PATCH</code>, or <code>PUT</code> operations that provide a <code>RoleId</code> that does not exist by returning the HTTP <code>400 Bad Request</code> status code.

Property	Type	Attributes	Notes
SecretKeySet (v1.13+)	boolean	<i>read-only</i>	Indicates if the secret key for Time-based One-Time Password (TOTP) multi-factor authentication is set. This property shall indicate if the secret key for RFC6238-defined Time-based One-Time Password (TOTP) multi-factor authentication is set.
SNMP (v1.4+) {	object	(null)	The SNMP settings for this account. This property shall contain the SNMP settings for this account when <code>AccountTypes</code> contains <code>SNMP</code>.
AuthenticationKey (v1.4+)	string	<i>read-write</i> (null)	The secret authentication key for SNMPv3. This property shall contain the key for SNMPv3 authentication. The value shall be <code>null</code> in responses. This property accepts a passphrase or a hex-encoded key. If the string starts with <code>Passphrase:</code>, the remainder of the string shall be the passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. If the string starts with <code>Hex:</code>, then the remainder of the string shall be the key encoded in hexadecimal notation. If the string starts with neither, the full string shall be a passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. Pattern: <code>(^[-~]+\$) (^Passphrase:[-~]+\$) (^Hex:[0-9A-Fa-f]{24,96}) (^*+\$)</code>
AuthenticationKeySet (v1.5+)	boolean	<i>read-only</i>	Indicates if the <code>AuthenticationKey</code> property is set. This property shall contain <code>true</code> if a valid value was provided for the <code>AuthenticationKey</code> property. Otherwise, the property shall contain <code>false</code>.
AuthenticationProtocol (v1.4+)	string (enum)	<i>read-write</i> (null)	The authentication protocol for SNMPv3. This property shall contain the SNMPv3 authentication protocol. <i>For the possible property values, see <code>AuthenticationProtocol</code> in Property details.</i>

Property	Type	Attributes	Notes
EncryptionKey (v1.4+)	string	<i>read-write</i> (null)	The secret encryption key used in SNMPv3. This property shall contain the key for SNMPv3 encryption. The value shall be <code>null</code> in responses. This property accepts a passphrase or a hex-encoded key. If the string starts with <code>Passphrase:</code>, the remainder of the string shall be the passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. If the string starts with <code>Hex:</code>, then the remainder of the string shall be the key encoded in hexadecimal notation. If the string starts with neither, the full string shall be a passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. Pattern: <code>(^[-~]+\$) (^Passphrase:[-~]+\$) (^Hex:[0-9A-Fa-f]{16,64}\$) (^*+\$)</code>
EncryptionKeySet (v1.5+)	boolean	<i>read-only</i>	Indicates if the <code>EncryptionKey</code> property is set. This property shall contain <code>true</code> if a valid value was provided for the <code>EncryptionKey</code> property. Otherwise, the property shall contain <code>false</code>.
EncryptionProtocol (v1.4+)	string (enum)	<i>read-write</i> (null)	The encryption protocol for SNMPv3. This property shall contain the SNMPv3 encryption protocol. <i>For the possible property values, see <code>EncryptionProtocol</code> in Property details.</i>
}			
StrictAccountTypes (v1.7+)	boolean	<i>read-write</i> (null)	Indicates if the service needs to use the account types exactly as specified when the account is created or updated. This property shall indicate if the service needs to use the value of <code>AccountTypes</code> and <code>OEMAccountTypes</code> values exactly as specified. A <code>true</code> value shall indicate the service needs to either accept the value without changes or reject the request. A <code>false</code> value shall indicate the service may add additional <code>AccountTypes</code> and <code>OEMAccountTypes</code> values as needed to support limitations it has in separately controlling access to individual services. If this property is not present, the value shall be assumed to be <code>false</code>. An update of the service can cause account types to be added to or removed from the <code>AccountTypes</code> and <code>OEMAccountTypes</code> properties, regardless of the value of this property. After a service update, clients should inspect all accounts where the value of this property is <code>true</code> and perform maintenance as needed.
UserName	string	<i>read-write</i> <i>required on create</i>	The username for the account. This property shall contain the username for this account.

6.71.4 Actions

6.71.4.1 ChangePassword (v1.11+)

Description

This action changes the account password.

- This action shall change the account password while requiring password for the current session. This action prevents session hijacking.

Action URI

{Base URI of target resource}/Actions/ManagerAccount.ChangePassword

Action parameters

Parameter Name	Type	Attributes	Notes
NewPassword	string	required	The new account password. • This parameter shall contain the new password.
SessionAccountPassword	string	required	The password of the account tied to the current session. • This parameter shall contain the password of the current session's account. A user changing their own password shall provide their current password for this parameter. An administrator changing the password for a different user shall provide their own password for this parameter. If the request is performed with HTTP Basic authentication, this parameter shall contain the same password encoded in the <code>Authorization</code> header.

Request Example

```
{
  "SessionAccountPassword": "secret123",
  "NewPassword": "B3tt3rS3cur1tY!"
}
```

6.71.4.2 ClearSecretKey (v1.13+)

Description

This action clears the secret key for Time-based One-Time Password (TOTP) multi-factor authentication for this account.

- This action shall clear the secret key for RFC6238-defined Time-based One-Time Password (TOTP) multi-factor authentication for this account.

Action URI

{Base URI of target resource}/Actions/ManagerAccount.ClearSecretKey

Action parameters

This action takes no parameters.

6.71.4.3 GenerateSecretKey (v1.13+)**Description**

This action randomly generates a new secret key for Time-based One-Time Password (TOTP) multi-factor authentication for this account.

- This action shall randomly generate a new secret key for RFC6238-defined Time-based One-Time Password (TOTP) multi-factor authentication for this account.

Action URI

{Base URI of target resource}/Actions/ManagerAccount.GenerateSecretKey

Action parameters

This action takes no parameters.

Response Payload

{			
SecretKey (v1.13+)	string	read-only	The secret key generated for Time-based One-Time Password (TOTP) multi-factor authentication. • This property shall contain secret key generated for RFC6238-defined Time-based One-Time Password (TOTP) multi-factor authentication. Clients shall retain the value of this property to generate tokens for future session creation requests.
}			

Response Example


```
{
  "SecretKey": "JEFDWSHUJOL342324DSFHJ324"
}
```

6.71.4.4 VerifyTimeBasedOneTimePassword (v1.13+)

Description

This action verifies a user-provided Time-based One-Time Password (TOTP). This is to ensure the client's copy of the secret key is aligned with the secret key stored by the service.

- This action shall verify a user-provided RFC6238-defined Time-based One-Time Password (TOTP).

Action URI

{Base URI of target resource}/Actions/ManagerAccount.VerifyTimeBasedOneTimePassword

Action parameters

Parameter Name	Type	Attributes	Notes
TimeBasedOneTimePassword	string	required	The Time-based One-Time Password (TOTP) to verify. • This parameter shall contain the Time-based One-Time Password (TOTP) to verify. If the Time-based One-Time Password (TOTP) is not valid, the service shall return the HTTP 400 Bad Request status code.

Request Example

```
{
  "TimeBasedOneTimePassword": "123456789abcdef"
}
```

6.71.5 Property details

6.71.5.1 AccountTypes

- The list of services in the manager that the account is allowed to access.
 - This property shall contain an array of the various manager services that the account is allowed to access. This shall not include functionality for receiving events or other notifications. If this property is not provided by the client, the default value shall be an array that contains the value `Redfish`. The service may add

additional values when this property is set or updated if allowed by the value of the `StrictAccountTypes` property.

string	Description
ControlPanel	Allow PIN-based access via an external control panel, such as a keypad, touchscreen, or other human interface. This value shall indicate the account is used to allow PIN-based access via an external control panel. If this value is specified, the <code>AccountTypes</code> property should not contain other values for the same <code>ManagerAccount</code> resource. If this value is specified, <code>Password</code> shall contain the PIN to enable access, and may not follow other password-related rules. The <code>ChangePassword</code> action, if supported, may be used to update the PIN.
HostConsole	Allow access to the host's console, which could be connected through Telnet, SSH, or another protocol. This value shall indicate the account is allowed to access the host console.
IPMI	Allow access to the Intelligent Platform Management Interface service. This value shall indicate the account is allowed to access the Intelligent Platform Management Interface service.
KVMIP	Allow access to a Keyboard-Video-Mouse over IP session. This value shall indicate the account is allowed to access the Keyboard-Video-Mouse over IP session service.
ManagerConsole	Allow access to the manager's console, which could be connected through Telnet, SSH, SM CLP, or another protocol. This value shall indicate the account is allowed to access the manager console.
OEM	OEM account type. See the <code>OEMAccountTypes</code> property. This value shall indicate the account is allowed to access the services listed in the <code>OEMAccountTypes</code> property.
Redfish	Allow access to the Redfish service. This value shall indicate the account is allowed to access Redfish services. If the version of the <code>ManagerAccount</code> resource is lower than the schema version when another enumeration value in this list was added, the implementation may include that functionality as part of the <code>Redfish</code> value.
SNMP	Allow access to SNMP services. This value shall indicate the account is allowed to access SNMP services.
VirtualMedia	Allow access to control virtual media. This value shall indicate the account is allowed to control virtual media.

string	Description
WebUI	Allow access to a web user interface session, such as a graphical interface or another web-based protocol. This value shall indicate the account is allowed to access the web interface.

6.71.5.2 AuthenticationProtocol

The authentication protocol for SNMPv3.

- This property shall contain the SNMPv3 authentication protocol.

string	Description
HMAC128_SHA224 (v1.7+)	HMAC-128-SHA-224 authentication. This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC128SHA224AuthProtocol.
HMAC192_SHA256 (v1.7+)	HMAC-192-SHA-256 authentication. This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC192SHA256AuthProtocol.
HMAC256_SHA384 (v1.7+)	HMAC-256-SHA-384 authentication. This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC256SHA384AuthProtocol.
HMAC384_SHA512 (v1.7+)	HMAC-384-SHA-512 authentication. This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC384SHA512AuthProtocol.
HMAC_MD5	HMAC-MD5-96 authentication. This value shall indicate authentication conforms to the RFC3414-defined HMAC-MD5-96 authentication protocol.
HMAC_SHA96	HMAC-SHA-96 authentication. This value shall indicate authentication conforms to the RFC3414-defined HMAC-SHA-96 authentication protocol.
None	No authentication. This value shall indicate authentication is not required.

6.71.5.3 BypassTypes

- The types of multi-factor authentication this account or role mapping is allowed to bypass.
 - This property shall contain the types of multi-factor authentication this account or role mapping is allowed to bypass. An empty array shall indicate this account or role mapping cannot bypass any multi-factor authentication types that are currently enabled.

string	Description
All	Bypass all multi-factor authentication types. This value shall indicate an account or role mapping can bypass all multi-factor authentication types including OEM-defined types.
ClientCertificate	Bypass client certificate authentication. This value shall indicate an account or role mapping can bypass client certificate authentication. Authentication with client certificates is configured with the <code>ClientCertificate</code> property.
GoogleAuthenticator	Bypass Google Authenticator. This value shall indicate an account or role mapping can bypass Google Authenticator. Authentication with Google Authenticator is configured with the <code>GoogleAuthenticator</code> property.
MicrosoftAuthenticator	Bypass Microsoft Authenticator. This value shall indicate an account or role mapping can bypass Microsoft Authenticator. Authentication with Microsoft Authenticator is configured with the <code>MicrosoftAuthenticator</code> property.
OEM	Bypass OEM-defined multi-factor authentication. This value shall indicate an account or role mapping can bypass OEM-defined multi-factor authentication.
OneTimePasscode	Bypass one-time passcode authentication. This value shall indicate an account or role mapping can bypass one-time passcode authentication. Authentication with a one-time passcode is configured with the <code>OneTimePasscode</code> property.
SecurID	Bypass RSA SecurID. This value shall indicate an account or role mapping can bypass RSA SecurID. Authentication with RSA SecurID is configured with the <code>SecurID</code> property.
TimeBasedOneTimePassword	Bypass Time-based One-Time Password (TOTP) authentication. This value shall indicate an account or role mapping can bypass RFC6238-defined Time-based One-Time Password (TOTP) authentication. Authentication with a Time-based One-Time Password is configured with the <code>TimeBasedOneTimePassword</code> property.

6.71.5.4 EncryptionProtocol

The encryption protocol for SNMPv3.

- This property shall contain the SNMPv3 encryption protocol.

string	Description
CBC_DES	CBC-DES encryption. • This value shall indicate encryption conforms to the RFC3414-defined CBC-DES encryption protocol.
CFB128_AES128	CFB128-AES-128 encryption. • This value shall indicate encryption conforms to the RFC3826-defined CFB128-AES-128 encryption protocol.
CFB128_AES192 (v1.12+)	CFB128-AES-192 encryption. • This value shall indicate encryption conforms to the CFB128-AES-192 encryption protocol, extended from RFC3826.
CFB128_AES256 (v1.12+)	CFB128-AES-256 encryption. • This value shall indicate encryption conforms to the CFB128-AES-256 encryption protocol, extended from RFC3826.
None	No encryption. • This value shall indicate there is no encryption.

6.71.6 Example response

```
{
  "@odata.type": "#ManagerAccount.v1_14_0.ManagerAccount",
  "Id": "1",
  "Name": "User Account",
  "Description": "User Account",
  "Enabled": true,
  "Password": null,
  "PasswordChangeRequired": false,
  "AccountTypes": [
    "Redfish"
  ],
  "UserName": "Administrator",
  "RoleId": "Administrator",
}
```

```
"Locked": false,
"Links": {
  "Role": {
    "@odata.id": "/redfish/v1/AccountService/Roles/Administrator"
  }
},
"Actions": {
  "#ManagerAccount.ChangePassword": {
    "target": "/redfish/v1/AccountService/Accounts/1/Actions/ManagerAccount.ChangePassword"
  }
},
"@odata.id": "/redfish/v1/AccountService/Accounts/1"
}
```

6.72 ManagerDiagnosticData 1.2.3

Version	v1.2	v1.1
Release	2022.3	2021.4

6.72.1 Description

The `ManagerDiagnosticData` schema defines internal diagnostic data for a manager. It contains information that might be used by vendors to collect debug information about the manager. Clients should not make decisions for raising alerts, creating service events, or other actions based on information in this resource.

- This resource shall represent internal diagnostic data for a manager for a Redfish implementation. Clients should not make decisions for raising alerts, creating service events, or other actions based on information in this resource.

6.72.2 URIs

`/redfish/v1/Managers/{ManagerId}/ManagerDiagnosticData`

6.72.3 Properties

Property	Type	Attributes	Notes
BootTimeStatistics {	object		The boot-time statistics of the manager. This property shall contain the boot-time statistics of the manager.
FirmwareTimeSeconds	number	<i>read-only</i> (null)	The number of seconds the manager spent in the firmware stage. This property shall contain the number of seconds the manager spent in the firmware stage.
InitrdTimeSeconds	number	<i>read-only</i> (null)	The number of seconds the manager spent in the initrd boot stage. This property shall contain the number of seconds the manager spent in the initrd boot stage.
KernelTimeSeconds	number	<i>read-only</i> (null)	The number of seconds the manager spent in the kernel stage. This property shall contain the number of seconds the manager spent in the kernel stage.
LoaderTimeSeconds	number	<i>read-only</i> (null)	The number of seconds the manager spent in the loader stage. This property shall contain the number of seconds the manager spent in the loader stage.
UserSpaceTimeSeconds	number	<i>read-only</i> (null)	The number of seconds the manager spent in the user space boot stage. This property shall contain the number of seconds the manager spent in the user space boot stage.
}			
FreeStorageSpaceKiB	integer (KiBy)	<i>read-only</i> (null)	The available storage space on this manager in kibibytes (KiB). This property shall contain the available storage space on this manager in kibibytes (KiB).
I2CBuses [{	array		The statistics of the I2C buses. This property shall contain the statistics of the I2C buses. Services may subdivide a physical bus into multiple entries in this property based on how the manager tracks bus segments, virtual buses from a controller, and other segmentation capabilities.

Property	Type	Attributes	Notes
BusErrorCount	integer	<i>read-only (null)</i>	The number of bus errors on this I2C bus. This property shall contain the number of bus errors on this I2C bus. Bus errors include, but are not limited to, an SDA rising or falling edge while SCL is high or a stuck bus signal.
I2CBusName	string	<i>read-only</i>	The name of the I2C bus. This property shall contain the name of the I2C bus.
NACKCount	integer	<i>read-only (null)</i>	The number of NACKs on this I2C bus. This property shall contain the number of NACKs on this I2C bus.
TotalTransactionCount	integer	<i>read-only (null)</i>	The total number of transactions on this I2C bus. This property shall contain the total number of transactions on this I2C bus. The count shall include the number of I2C transactions initiated by the manager and the number of I2C transactions where the manager is the target device.
}]			
MemoryECCStatistics {	object		The memory ECC statistics of the manager. This property shall contain the memory ECC statistics of the manager.
CorrectableECCErrorCount	integer	<i>read-only (null)</i>	The number of correctable errors since reset. This property shall contain the number of correctable errors since reset.
UncorrectableECCErrorCount	integer	<i>read-only (null)</i>	The number of uncorrectable errors since reset. This property shall contain the number of uncorrectable errors since reset.
}			
MemoryStatistics {	object		The memory statistics of the manager. This property shall contain the memory statistics of the manager.
AvailableBytes	integer (bytes)	<i>read-only (null)</i>	The amount of memory available in bytes for starting new processes without swapping. This property shall contain the amount of memory available in bytes for starting new processes without swapping. This includes free memory and reclaimable cache and buffers.

Property	Type	Attributes	Notes
BuffersAndCacheBytes	integer (bytes)	<i>read-only</i> (null)	The amount of memory used in bytes by kernel buffers, page caches, and slabs. This property shall contain the amount of memory used in bytes by kernel buffers, page caches, and slabs.
FreeBytes	integer (bytes)	<i>read-only</i> (null)	The amount of free memory in bytes. This property shall contain the amount of free memory in bytes.
SharedBytes	integer (bytes)	<i>read-only</i> (null)	The amount of shared memory in bytes. This property shall contain the amount of shared memory in bytes. This includes things such as memory consumed by temporary file systems.
TotalBytes	integer (bytes)	<i>read-only</i> (null)	The total amount of memory in bytes. This property shall contain the total amount of memory in bytes.
UsedBytes	integer (bytes)	<i>read-only</i> (null)	The amount of used memory in bytes. This property shall contain the amount of used memory in bytes. This value is calculated as <code>TotalBytes</code> minus <code>FreeBytes</code> minus <code>BuffersAndCacheBytes</code>.
}			
ProcessorStatistics {	object		The processor statistics of the manager. This property shall contain the processor statistics of the manager.
KernelPercent	number (%)	<i>read-only</i> (null)	The percentage of CPU time spent in kernel mode. This property shall contain the percentage of CPU time, <code>0</code> to <code>100</code>, spent in kernel mode.
UserPercent	number (%)	<i>read-only</i> (null)	The percentage of CPU time spent in user mode. This property shall contain the percentage of CPU time, <code>0</code> to <code>100</code>, spent in user mode.
}			
ServiceRootUptimeSeconds (v1.2+)	number	<i>read-only</i> (null)	The wall-clock time the service root hosted by this manager has been running in seconds. This property shall contain the wall-clock time the service root hosted by this manager has been running in seconds.

Property	Type	Attributes	Notes
TopProcesses [{	array		The statistics of the top processes of this manager. This property shall contain the statistics of the top processes of this manager.
CommandLine	string	<i>read-only</i>	The command line of this process. This property shall contain the command line with parameters of this process.
KernelTimeSeconds	number	<i>read-only</i> (null)	The number of seconds this process executed in kernel space. This property shall contain the number of seconds this process executed in kernel space.
ResidentSetSizeBytes	integer (bytes)	<i>read-only</i> (null)	The resident set size of this process in bytes. This property shall contain the resident set size of this process in bytes, which is the amount of memory allocated to the process and is in RAM.
RestartAfterFailureCount (v1.1+)	integer	<i>read-only</i> (null)	The number of times this process has restarted unexpectedly. This property shall contain the number of times this process has restarted unexpectedly, such as due to unintentional failures, restarts, or shutdowns, with the same command line including arguments.
RestartCount (v1.1+)	integer	<i>read-only</i> (null)	The number of times this process has restarted. This property shall contain the number of times this process has restarted with the same command line including arguments.
UptimeSeconds (v1.1+)	number	<i>read-only</i> (null)	The wall-clock time this process has been running in seconds. This property shall contain the wall-clock time this process has been running in seconds.
UserTimeSeconds	number	<i>read-only</i> (null)	The number of seconds this process executed in user space. This property shall contain the number of seconds this process executed in user space.
}]			

6.72.4 Actions

6.72.4.1 ResetMetrics

Description

Resets time intervals or counted values of the diagnostic data for this manager.

- This action shall reset any time intervals or counted values of the diagnostic data for this manager.

Action URI

{Base URI of target resource}/Actions/ManagerDiagnosticData.ResetMetrics

Action parameters

This action takes no parameters.

6.72.5 Example response

```
{
  "@odata.type": "#ManagerDiagnosticData.v1_2_3.ManagerDiagnosticData",
  "Id": "ManagerDiagnosticData",
  "Name": "Manager Diagnostic Data",
  "I2CBuses": [
    {
      "I2CBusName": "i2c-0",
      "TotalTransactionCount": 10000,
      "BusErrorCount": 12,
      "NACKCount": 34
    },
    {
      "I2CBusName": "i2c-1",
      "TotalTransactionCount": 20000,
      "BusErrorCount": 56,
      "NACKCount": 78
    }
  ],
  "MemoryStatistics": {
    "TotalBytes": 1013052000,
    "UsedBytes": 45084000,
    "FreeBytes": 894820000,
    "SharedBytes": 19864000,
    "BuffersAndCacheBytes": 73148000,
    "AvailableBytes": 928248000
  }
},
```

```

    "ProcessorStatistics": {
      "KernelPercent": 12.34,
      "UserPercent": 23.45
    },
    "TopProcesses": [
      {
        "CommandLine": "dbus-broker",
        "UserTimeSeconds": 14400,
        "KernelTimeSeconds": 10800,
        "ResidentSetSizeBytes": 2300000
      },
      {
        "CommandLine": "swampd",
        "UserTimeSeconds": 13200,
        "KernelTimeSeconds": 8441,
        "ResidentSetSizeBytes": 8883000
      },
      {
        "CommandLine": "ipmid",
        "UserTimeSeconds": 13100,
        "KernelTimeSeconds": 6650,
        "ResidentSetSizeBytes": 23400000
      },
      {
        "CommandLine": "phosphor-hwmon-readd -i iface1",
        "UserTimeSeconds": 5100,
        "KernelTimeSeconds": 3200,
        "ResidentSetSizeBytes": 564000
      }
    ],
    "BootTimeStatistics": {
      "FirmwareTimeSeconds": 42.3,
      "LoaderTimeSeconds": 12.3,
      "KernelTimeSeconds": 33.1,
      "InitrdTimeSeconds": 3.2,
      "UserSpaceTimeSeconds": 81.1
    },
    "MemoryECCStatistics": {
      "CorrectableECCErrorCount": 1,
      "UncorrectableECCErrorCount": 2
    },
    "@odata.id": "/redfish/v1/Managers/BMC/ManagerDiagnosticData"
  }

```

6.73 ManagerNetworkProtocol 1.12.0

Version	v1.12	v1.11	v1.10	v1.9	v1.8	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	...

Release	2025.2	2025.1	2023.3	2022.2	2021.2	2020.4	2020.1	2019.3	2018.3	2018.2	2017.1	...

6.73.1 Description

The network service settings for the manager.

- This resource shall represent the network service settings for the manager.

6.73.2 URIs

/redfish/v1/Managers/{ManagerId}/NetworkProtocol

6.73.3 Properties

Property	Type	Attributes	Notes
DHCP (v1.1+) {}	object		The settings for this manager's DHCPv4 protocol support. • This object shall contain the DHCPv4 protocol settings for the manager. For more information about this property, see Protocol in Property Details.
DHCPv6 (v1.3+) {}	object		The settings for this manager's DHCPv6 protocol support. • This object shall contain the DHCPv6 protocol settings for the manager. For more information about this property, see Protocol in Property Details.
FQDN	string	read-only (null)	The fully qualified domain name for the manager obtained by DNS including the host name and top-level domain name. • This property shall contain the fully qualified domain name for the manager.
FTP (v1.10+) {}	object		The settings for this manager's FTP protocol support. • This object shall contain the File Transfer Protocol (FTP) settings for the manager. The default Port property value should be 21 for compatibility with established client implementations. For more information about this property, see Protocol in Property Details.

Property	Type	Attributes	Notes
FTPS (v1.10+) {}	object		The settings for this manager's FTP over SSL (FTPS) protocol support that apply to all system instances controlled by this manager. This object shall contain the File Transfer Protocol over SSL (FTPS) settings for the manager. The default value should be <code>21</code> for compatibility with established client implementations. For more information about this property, see Protocol in Property Details.
HostName	string	<i>read-only (null)</i>	The DNS host name of this manager, without any domain information. This property shall contain the host name without any domain information.
HTTP {}	object		The settings for this manager's HTTP protocol support. This object shall contain the HTTP protocol settings for the manager. The default <code>Port</code> property value should be <code>80</code> for compatibility with established client implementations. For more information about this property, see Protocol in Property Details.
HTTPS {	object		The settings for this manager's HTTPS protocol support. This object shall contain the HTTPS/SSL protocol settings for this manager. The default <code>Port</code> property value should be <code>443</code> for compatibility with established client implementations.
Certificates (v1.4+) {	object		The link to a collection of certificates used for HTTPS by this manager. This property shall contain a link to a resource collection of type <code>CertificateCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
Port	integer	<i>read-write (null)</i>	The protocol port. This property shall contain the port assigned to the protocol.

Property	Type	Attributes	Notes
ProtocolEnabled	boolean	<i>read-write (null)</i>	An indication of whether the protocol is enabled. This property shall indicate whether the protocol is enabled.
}			
IPMI {}	object		The settings for this manager's IPMI-over-LAN protocol support. This object shall contain the IPMI over LAN protocol settings for the manager. The default <code>Port</code> property value should be <code>623</code> for compatibility with established client implementations. For more information about this property, see Protocol in Property Details.
KVMIP {}	object		The settings for this manager's KVM-IP protocol support that apply to all system instances controlled by this manager. This object shall contain the KVM-IP (Keyboard, Video, Mouse over IP) protocol settings for the manager. If multiple systems are supported by this manager, these properties, if present, apply to all instances of KVM-IP controlled by this manager. For more information about this property, see Protocol in Property Details.
mDNS (v1.11+) {}	object		The settings for this manager's Multicast Domain Name Service (mDNS) protocol support. This object shall contain the Multicast Domain Name Service (mDNS) settings for the manager. The default <code>Port</code> property value should be <code>5353</code> for compatibility with established client implementations. For more information about this property, see Protocol in Property Details.
Modbus (v1.12+) {}	object		The settings for this manager's Modbus TCP protocol support. This object shall contain the Modbus TCP protocol settings for the manager.

Property	Type	Attributes	Notes
AllowedClients (v1.12+) []	array (string, null)	<i>read-write</i>	Indicates the list of allowed clients for this Modbus TCP server interface. This property shall contain all the clients allowed to access this Modbus TCP server interface. If <code>RestrictAccessToAllowedClients</code> contains <code>true</code>, the service shall enforce this restriction. If <code>RestrictAccessToAllowedClients</code> contains <code>false</code>, the service shall not enforce this restriction. This property may contain FQDN, IPv4 addresses, IPv6 addresses, or any combination of those formats. Services may reject unsupported formats.
MaximumConnectedClients (v1.12+)	integer	<i>read-write</i> (null)	The maximum number of simultaneously connected clients. This property shall contain the maximum number of simultaneously connected clients to this Modbus TCP server.
NumberOfConnectedClients (v1.12+)	integer	<i>read-only</i> (null)	The current number of connected clients. This property shall contain the current number of connected clients to this Modbus TCP server.
Port	integer	<i>read-write</i> (null)	The protocol port. This property shall contain the port assigned to the protocol.
ProtocolEnabled	boolean	<i>read-write</i> (null)	An indication of whether the protocol is enabled. This property shall indicate whether the protocol is enabled.
ReadOnly (v1.12+)	boolean	<i>read-write</i> (null)	Indicates if the interface is read only. This property shall indicate if the Modbus TCP server protocol interface is read only. If <code>true</code>, the Modbus TCP server service on this manager shall reject or ignore Modbus requests that modify data.
RestrictAccessToAllowedClients (v1.12+)	boolean	<i>read-write</i> (null)	Indicates if access to this Modbus TCP server protocol interface is restricted to allowed clients. This property shall indicate if access to the Modbus TCP server protocol interface is restricted to allowed clients. If <code>true</code>, the Modbus TCP server service on this manager shall restrict access to the list of clients defined by the <code>AllowedClients</code> property.

Property	Type	Attributes	Notes
ServerId (v1.12+)	integer	<i>read-write</i> (null)	The server identifier for this Modbus TCP protocol interface. This property shall contain the Modbus Messaging On TCP/IP Implementation Guide-defined 'Unit Identifier' that identifies this Modbus TCP protocol server.
}			
NTP (v1.2+) {	object		The settings for this manager's NTP protocol support. This object shall contain the NTP protocol settings for the manager.
NetworkSuppliedServers (v1.9+) []	array (string, null)	<i>read-only</i>	The NTP servers supplied by other network protocols to this manager. This property shall contain the NTP servers supplied by other network protocols to this manager. DHCP is an example of a protocol that can supply NTP servers to this manager.
NTPServers (v1.2+) []	array (string, null)	<i>read-write</i>	Indicates to which user-supplied NTP servers this manager is subscribed. This property shall contain all the user-supplied NTP servers for which this manager is using to obtain time. <code>NetworkSuppliedServers</code> is used for NTP servers supplied by other network protocols such as DHCP.
Port	integer	<i>read-write</i> (null)	The protocol port. This property shall contain the port assigned to the protocol.
ProtocolEnabled	boolean	<i>read-write</i> (null)	An indication of whether the protocol is enabled. This property shall indicate whether the protocol is enabled.
}			
Proxy (v1.8+) {	object		The HTTP/HTTPS proxy information for this manager. This property shall contain the HTTP/HTTPS proxy configuration for this manager.

Property	Type	Attributes	Notes
Enabled (v1.8+)	boolean	<i>read-write</i>	Indicates if the manager uses the proxy server. This property shall indicate if the proxy server is used for communications.
ExcludeAddresses (v1.8+) []	array (string, null)	<i>read-write</i>	Addresses that do not require the proxy server to access. This property shall contain a list of hostnames or IP addresses that do not require a connection through the proxy server to access.
Password (v1.8+)	string	<i>read-write</i> (null)	The password for the proxy. The value is <code>null</code> in responses. This property shall contain the password for this proxy. The value shall be <code>null</code> in responses.
PasswordSet (v1.8+)	boolean	<i>read-only</i>	Indicates if the <code>Password</code> property is set. This property shall contain <code>true</code> if a valid value was provided for the <code>Password</code> property. Otherwise, the property shall contain <code>false</code>.
ProxyAutoConfigURI (v1.8+)	string (URI)	<i>read-write</i> (null)	The URI used to access a proxy auto-configuration (PAC) file. This property shall contain the URI at which to access a proxy auto-configuration (PAC) file containing one or more JavaScript functions for configuring proxy usage for this manager.
ProxyServerURI (v1.8+)	string (URI)	<i>read-write</i>	The URI of the proxy server, including the scheme and any non-default port value. This property shall contain the URI of the proxy server. The value shall contain the scheme for accessing the server, and shall include the port if the value is not the default port for the specified scheme.
Username (v1.8+)	string	<i>read-write</i>	The username for the proxy. This property shall contain the username for this proxy.
}			

Property	Type	Attributes	Notes
RDP (v1.3+) {}	object		The settings for this manager's Remote Desktop Protocol support. This object shall contain the Remote Desktop Protocol settings for the manager. For more information about this property, see Protocol in Property Details.
RFB (v1.3+) {}	object		The settings for this manager's Remote Frame Buffer protocol support, which can support VNC. This object shall contain the Remote Frame Buffer protocol settings for the manager. For more information about this property, see Protocol in Property Details.
SFTP (v1.10+) {}	object		The settings for this manager's Secure Shell File Transfer Protocol (SFTP) support. This object shall contain the Secure Shell File Transfer Protocol (SFTP) protocol settings for the manager. The default value should be 22 for compatibility with established client implementations. For more information about this property, see Protocol in Property Details.
SNMP {	object		The settings for this manager's SNMP support. This object shall contain the SNMP protocol settings for this manager. The default <code>Port</code> property value should be 161 for compatibility with established client implementations.
AuthenticationProtocol (v1.5+)	string (enum)	<i>read-write</i> (null)	The authentication protocol used for SNMP access to this manager. This property shall contain the SNMP authentication protocol used to access this manager. When the property contains the value <code>Account</code>, the SNMP settings in each manager account are used for authentication. <i>For the possible property values, see AuthenticationProtocol in Property details.</i>

Property	Type	Attributes	Notes
CommunityAccessMode (v1.5+, deprecated v1.10)	string (enum)	read-write (null)	The access level of the SNMP community. This property shall contain the access/privilege level of the SNMP community used to access an SNMP manager. For the possible property values, see <i>CommunityAccessMode</i> in Property details. Deprecated in v1.10 and later. This property has been deprecated in favor of <i>AccessMode</i> inside <i>CommunityStrings</i>.
CommunityStrings (v1.5+) [{	array		The SNMP community strings. This property shall contain an array of the SNMP community strings used to access an SNMP manager.
AccessMode (v1.5+)	string (enum)	read-write (null)	The access level of the SNMP community. This property shall contain the access/privilege level of the SNMP community used to access an SNMP manager. For the possible property values, see <i>AccessMode</i> in Property details.
CommunityString (v1.5+)	string	read-write (null)	The SNMP community string. This property shall contain the SNMP community string used for accessing an SNMP service on this manager. If <code>HideCommunityStrings</code> is <code>true</code>, this value shall be <code>null</code> in responses.
IPv4AddressRangeLower (v1.10+)	string	read-write (null)	The lowest IPv4 address in the range allowed to access the service. This property shall contain the lowest IPv4 address in the range allowed to access the SNMP service using this community string. If <code>RestrictCommunityToIPv4AddressRange</code> contains <code>true</code>, the service shall enforce this range. If <code>RestrictCommunityToIPv4AddressRange</code> contains <code>false</code>, the service shall not enforce this range. Pattern: <code>^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$</code>

Property	Type	Attributes	Notes
IPv4AddressRangeUpper (v1.10+)	string	<i>read-write</i> (null)	The highest IPv4 address in the range allowed to access the service. This property shall contain the upper or highest IPv4 address in the range allowed to access the SNMP service using this community string. If <code>RestrictCommunityToIPv4AddressRange</code> contains <code>true</code>, the service shall enforce this range. If <code>RestrictCommunityToIPv4AddressRange</code> contains <code>false</code>, the service shall not enforce this range. Pattern: <code>^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$</code>
Name (v1.5+)	string	<i>read-write</i> (null)	The name of the SNMP community. This property shall contain a display name describing the SNMP community.
RestrictCommunityToIPv4AddressRange (v1.10+)	boolean	<i>read-only</i>	Indicates if this community is restricted to accessing the service from a range of IPv4 addresses. This property shall indicate if this community is restricted to accessing the service from a range of IPv4 addresses. If <code>true</code>, SNMP access using this community string is restricted to the range of IPv4 addresses defined by the <code>IPv4AddressRangeLower</code> and <code>IPv4AddressRangeUpper</code> properties.
}}			
EnableSNMPv1 (v1.5+)	boolean	<i>read-write</i> (null)	Indicates if access via SNMPv1 is enabled. This property shall indicate if access to the SNMP service on this manager using the SNMPv1 protocol is enabled.
EnableSNMPv2c (v1.5+)	boolean	<i>read-write</i> (null)	Indicates if access via SNMPv2c is enabled. This property shall indicate if access to the SNMP service on this manager using the SNMPv2c protocol is enabled.
EnableSNMPv3 (v1.5+)	boolean	<i>read-write</i> (null)	Indicates if access via SNMPv3 is enabled. This property shall indicate if access to the SNMP service on this manager using the SNMPv3 protocol is enabled.

Property	Type	Attributes	Notes
EncryptionProtocol (v1.5+)	string (enum)	<i>read-write</i> (null)	The encryption protocol used for SNMPv3 access to this manager. This property shall contain the SNMPv3 encryption protocol used to access this manager, unless <code>AuthenticationProtocol</code> contains the value <code>Account</code>. <i>For the possible property values, see EncryptionProtocol in Property details.</i>
EngineId (v1.5+) {	object	(null)	The engine ID. This property shall contain the RFC3411-defined engine ID.
ArchitectureId (v1.6+)	string	<i>read-write</i> (null)	The architecture identifier. This property shall contain the architecture identifier as described in item 3 of the <code>snmpEngineId</code> syntax of RFC3411. The full RFC3411-defined <code>snmpEngineId</code> is formed from the concatenation of the value in the <code>PrivateEnterpriseId</code> property and the value in this property. If the most significant bit in <code>PrivateEnterpriseId</code> is set to zero, this property shall not be present. Pattern: <code>^([A-Za-f0-9]{2}){0,27}[A-Za-f0-9]{2}\$</code>
EnterpriseSpecificMethod (v1.5+)	string	<i>read-write</i> (null)	The enterprise-specific method. This property shall contain the enterprise-specific method as described in item 2 of the <code>snmpEngineId</code> syntax of RFC3411. The full RFC3411-defined <code>snmpEngineId</code> is formed from the concatenation of the value in the <code>PrivateEnterpriseId</code> property and the value in this property. If the most significant bit in <code>PrivateEnterpriseId</code> is set to one, this property shall not be present. Pattern: <code>^([A-Za-f0-9]{2}){7}[A-Za-f0-9]{2}\$</code>
PrivateEnterpriseId (v1.5+)	string	<i>read-only</i> (null)	The private enterprise ID. This property shall contain an RFC3411-defined private enterprise ID. Pattern: <code>^([A-Za-f0-9]{2}){3}[A-Za-f0-9]{2}\$</code>
}			
HideCommunityStrings (v1.5+)	boolean	<i>read-write</i> (null)	Indicates if the community strings should be hidden. This property shall indicate if the community strings should be hidden in responses.

Property	Type	Attributes	Notes
Port	integer	<i>read-write (null)</i>	The protocol port. This property shall contain the port assigned to the protocol.
ProtocolEnabled	boolean	<i>read-write (null)</i>	An indication of whether the protocol is enabled. This property shall indicate whether the protocol is enabled.
TrapPort (v1.10+)	integer	<i>read-write (null)</i>	The SNMP trap port. This property shall contain the port assigned to SNMP traps.
}			
SSDP {	object		The settings for this manager's SSDP support. This object shall contain the SSDP protocol settings for this manager. Simple Service Discovery Protocol (SSDP) is for network discovery of devices supporting the Redfish Service. The default <code>Port</code> property value should be <code>1900</code> for compatibility with established client implementations.
NotifyIPv6Scope	string (enum)	<i>read-write (null)</i>	The IPv6 scope for multicast NOTIFY messages for SSDP. This property shall contain the IPv6 scope for multicast NOTIFY messages. The valid enumerations are a subset of the available IPv6 scope types. <i>For the possible property values, see <code>NotifyIPv6Scope</code> in Property details.</i>
NotifyMulticastIntervalSeconds	integer (seconds)	<i>read-write (null)</i>	The time interval, in seconds, between transmissions of the multicast NOTIFY ALIVE message from this service for SSDP. This property shall contain the time interval, in seconds, between transmissions of the multicast NOTIFY ALIVE message. A setting of 0 seconds shall disable this functionality. The recommended value is 600 seconds. When disabled, other NOTIFY messages are also disabled due to their dependency on previously sent NOTIFY ALIVE messages.

Property	Type	Attributes	Notes
NotifyTTL	integer	<i>read-write</i> (null)	The time-to-live hop count for SSDP multicast NOTIFY messages. This property shall contain the time-to-live hop count used for multicast NOTIFY messages. The recommended value is 2.
Port	integer	<i>read-write</i> (null)	The protocol port. This property shall contain the port assigned to the protocol.
ProtocolEnabled	boolean	<i>read-write</i> (null)	An indication of whether the protocol is enabled. This property shall indicate whether the protocol is enabled.
}			
SSH {}	object		The settings for this manager's Secure Shell (SSH) protocol support. This object shall contain the Secure Shell (SSH) protocol settings for the manager. The default value should be 22 for compatibility with established client implementations. For more information about this property, see Protocol in Property Details.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
Telnet {}	object		The settings for this manager's Telnet protocol support. This object shall contain the Telnet protocol settings for this manager. The default <code>Port</code> property value should be 23 for compatibility with established client implementations. For more information about this property, see Protocol in Property Details.

Property	Type	Attributes	Notes
VirtualMedia {}	object		The settings for this manager's virtual media support that apply to all system instances controlled by this manager. This object shall contain the virtual media protocol settings for this manager. The <code>Port</code> property shall contain the TCP port assigned for virtual media usage. If multiple systems are supported by this manager, these properties, if present, apply to all instances of virtual media controlled by this manager. For more information about this property, see Protocol in Property Details.

6.73.4 Property details

6.73.4.1 AccessMode

The access level of the SNMP community.

- This property shall contain the access/privilege level of the SNMP community used to access an SNMP manager.

string	Description
Full	READ-WRITE access mode. This value shall indicate the RFC1157-defined READ-WRITE access mode.
Limited	READ-ONLY access mode. This value shall indicate the RFC1157-defined READ-ONLY access mode.

6.73.4.2 AuthenticationProtocol

The authentication protocol used for SNMP access to this manager.

- This property shall contain the SNMP authentication protocol used to access this manager. When the property contains the value `Account`, the SNMP settings in each manager account are used for authentication.

string	Description
Account	Authentication is determined by account settings. This value shall indicate authentication for SNMPv3 access is determined based on the corresponding account settings.
CommunityString	SNMP community string authentication. This value shall indicate authentication uses SNMP community strings.
HMAC128_SHA224 (v1.7+)	HMAC-128-SHA-224 authentication. This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC128SHA224AuthProtocol.
HMAC192_SHA256 (v1.7+)	HMAC-192-SHA-256 authentication. This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC192SHA256AuthProtocol.
HMAC256_SHA384 (v1.7+)	HMAC-256-SHA-384 authentication. This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC256SHA384AuthProtocol.
HMAC384_SHA512 (v1.7+)	HMAC-384-SHA-512 authentication. This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC384SHA512AuthProtocol.
HMAC_MD5	HMAC-MD5-96 authentication. This value shall indicate authentication for SNMPv3 access conforms to the RFC3414-defined HMAC-MD5-96 authentication protocol.
HMAC_SHA96	HMAC-SHA-96 authentication. This value shall indicate authentication for SNMPv3 access conforms to the RFC3414-defined HMAC-SHA-96 authentication protocol.

6.73.4.3 CommunityAccessMode

The access level of the SNMP community.

- This property shall contain the access/privilege level of the SNMP community used to access an SNMP manager.

string	Description
Full	READ-WRITE access mode. This value shall indicate the RFC1157-defined READ-WRITE access mode.
Limited	READ-ONLY access mode. This value shall indicate the RFC1157-defined READ-ONLY access mode.

6.73.4.4 EncryptionProtocol

The encryption protocol used for SNMPv3 access to this manager.

- This property shall contain the SNMPv3 encryption protocol used to access this manager, unless `AuthenticationProtocol` contains the value `Account`.

string	Description
Account	Encryption is determined by account settings. This value shall indicate encryption is determined based on the corresponding account settings.
CBC_DES	CBC-DES encryption. This value shall indicate encryption conforms to the RFC3414-defined CBC-DES encryption protocol.
CFB128_AES128	CFB128-AES-128 encryption. This value shall indicate encryption conforms to the RFC3826-defined CFB128-AES-128 encryption protocol.
CFB128_AES192 (v1.10+)	CFB128-AES-192 encryption. This value shall indicate encryption conforms to the CFB128-AES-192 encryption protocol, extended from RFC3826.
CFB128_AES256 (v1.10+)	CFB128-AES-256 encryption. This value shall indicate encryption conforms to the CFB128-AES-256 encryption protocol, extended from RFC3826.
None	No encryption. This value shall indicate there is no encryption.

6.73.4.5 NotifyIPv6Scope

The IPv6 scope for multicast NOTIFY messages for SSDP.

- This property shall contain the IPv6 scope for multicast NOTIFY messages. The valid enumerations are a subset of the available IPv6 scope types.

string	Description
Link	SSDP NOTIFY messages are sent to addresses in the IPv6 local link scope.
Organization	SSDP NOTIFY messages are sent to addresses in the IPv6 local organization scope.
Site	SSDP NOTIFY messages are sent to addresses in the IPv6 local site scope.

6.73.4.6 Protocol

The settings for a network protocol associated with a manager.

Port	integer	read-write (null)	The protocol port. This property shall contain the port assigned to the protocol.
ProtocolEnabled	boolean	read-write (null)	An indication of whether the protocol is enabled. This property shall indicate whether the protocol is enabled.

6.73.5 Example response

```

{
  "@odata.type": "#ManagerNetworkProtocol.v1_12_0.ManagerNetworkProtocol",
  "Id": "NetworkProtocol",
  "Name": "Manager Network Protocol",
  "Description": "Manager Network Service",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "HostName": "web483-bmc",
  "FQDN": "web483-bmc.dmtf.org",
  "HTTP": {
    "ProtocolEnabled": true,
    "Port": 80
  }
}

```

```
    },
    "HTTPS": {
      "ProtocolEnabled": true,
      "Port": 443
    },
    "IPMI": {
      "ProtocolEnabled": true,
      "Port": 623
    },
    "SSH": {
      "ProtocolEnabled": true,
      "Port": 22
    },
    "SNMP": {
      "ProtocolEnabled": true,
      "Port": 161
    },
    "VirtualMedia": {
      "ProtocolEnabled": true,
      "Port": 17988
    },
    "SSDP": {
      "ProtocolEnabled": true,
      "Port": 1900,
      "NotifyMulticastIntervalSeconds": 600,
      "NotifyTTL": 5,
      "NotifyIPv6Scope": "Site"
    },
    "Telnet": {
      "ProtocolEnabled": true,
      "Port": 23
    },
    "KVMIP": {
      "ProtocolEnabled": true,
      "Port": 5288
    },
    "@odata.id": "/redfish/v1/Managers/BMC/NetworkProtocol"
  }
```

6.74 MediaController 1.3.2 (deprecated)

Version	v1.3 <i>Deprecated</i>	v1.2 <i>Deprecated</i>	v1.1	v1.0
Release	2022.1	2021.1	2020.2	2019.4

This schema has been deprecated and use in new implementations is discouraged except to retain compatibility with existing products. This schema has been deprecated in favor of the `FabricAdapter` schema.

6.74.1 Description

The `MediaController` schema contains the definition of a media controller and its configuration.

- This resource shall represent a media controller in a Redfish implementation.

6.74.2 URIs

/redfish/v1/Chassis/{ChassisId}/MediaControllers/{MediaControllerId} (deprecated)

6.74.3 Properties

Property	Type	Attributes	Notes
EnvironmentMetrics (v1.2+) {	object		The link to the environment metrics for this media controller. • This property shall contain a link to a resource of type <code>EnvironmentMetrics</code> that specifies the environment metrics for this media controller. See the <code>EnvironmentMetrics</code> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>EnvironmentMetrics</code> resource. See the Links section and the <code>EnvironmentMetrics</code> schema for details.
}			
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Endpoints [{	array		An array of links to the endpoints that connect to this media controller. • This property shall contain an array of links to resources of type <code>Endpoint</code> with which this media controller is associated.
@odata.id	string	<i>read-only</i>	Link to a <code>Endpoint</code> resource. See the Links section and the <code>Endpoint</code> schema for details.
}]			
MemoryDomains [{	array		An array of links to the memory domains associated with this media controller. • This property shall contain an array of links to resources of type <code>MemoryDomain</code> that represent the memory domains associated with this memory controller.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a MemoryDomain resource. See the Links section and the <i>MemoryDomain</i> schema for details.
}}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
Manufacturer	string	<i>read-only</i> (null)	The manufacturer of this media controller. This property shall contain the manufacturer of the media controller.
MediaControllerType	string (enum)	<i>read-only</i> (null)	The type of media controller. This property shall contain the type of media controller. <i>For the possible property values, see MediaControllerType in Property details.</i>
Model	string	<i>read-only</i> (null)	The model of this media controller. This property shall contain the model of the media controller.
PartNumber	string	<i>read-only</i> (null)	The part number of this media controller. This property shall indicate the part number as provided by the manufacturer of this media controller.
Ports {	object		The link to the collection of ports associated with this media controller. This property shall contain a link to a resource collection of type <code>PortCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Port</i> . See the Port schema for details.
}			
SerialNumber	string	<i>read-only</i> (null)	The serial number of this media controller. This property shall indicate the serial number as provided by the manufacturer of this media controller.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

Property	Type	Attributes	Notes
UUID (v1.1+)	string (uuid)	<i>read-only</i> (<i>null</i>)	The UUID for this media controller. This property shall contain a universally unique identifier number for the media controller. Pattern: <code>^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\$</code>

6.74.4 Actions

6.74.4.1 Reset

Description

This action resets this media controller.

- This action shall reset this media controller.

Action URI

{Base URI of target resource}/Actions/MediaController.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	<i>optional</i>	The type of reset. This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset. <i>For the possible property values, see ResetType in Property details.</i>

Request Example

```
{  
  "ResetType": "ForceRestart"  
}
```


6.74.5 Property details

6.74.5.1 MediaControllerType

The type of media controller.

- This property shall contain the type of media controller.

string	Description
Memory	The media controller is for memory. • This value shall indicate the media controller is for memory.

6.74.5.2 ResetType

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property shall contain the value <code>On</code>.
ForceRestart	Shut down immediately and non-gracefully and restart the unit. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.

string	Description
FullPowerCycle	Full power cycle the unit. Behaves like removing utility lines, followed by restoring utility lines to the resource. This value shall indicate the resource will perform a full power cycle as if utility lines to the resource are removed and restored. This is different from <code>PowerCycle</code> in that it's as close to a true power cycle as possible. For example, removing AC power cables from an enclosure and then restoring the AC power cables. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>. If a service supports this value but there are no other distinct power cycle flows, the service shall support <code>PowerCycle</code> as an alias to <code>FullPowerCycle</code>. This type of reset may cause the manager providing the Redfish service to power cycle. If the manager providing the Redfish service is affected by this type of reset, the service shall send the action response before resetting to prevent client timeouts.
GracefulRestart	Shut down gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
GracefulShutdown	Shut down gracefully and power off. This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a paused state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Paused</code>.

string	Description
PowerCycle	Power cycle the unit. Behaves like a power removal, followed by a power restore to the resource. This value shall indicate the resource will perform a power cycle. This is different from <code>FullPowerCycle</code> in that it typically performs localized power sequencing of the resource while external power is still present. For example, turning DC voltage regulators off and then turning DC voltage regulators back on. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
PushPowerButton	Simulate the pressing of the physical power button on this unit. This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.

6.74.6 Example response

```
{
  "@odata.type": "#MediaController.v1_3_2.MediaController",
  "Id": "MediaController1",
  "Name": "Media Controller 1",
  "MediaControllerType": "Memory",
  "Manufacturer": "Contoso",
  "Model": "Contoso MediaController",
  "SerialNumber": "2M220100SL",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "UUID": "41784113-ed6b-2284-1414-916520dc1dd1",
  "Ports": {
    "@odata.id": "/redfish/v1/Chassis/GenZ/MediaControllers/1/Ports"
  },
}
```

```

    "Actions": {
      "#MediaController.Reset": {
        "target": "/redfish/v1/Chassis/GenZ/MediaControllers/1/Actions/MediaController.Reset",
        "ResetType@Redfish.AllowableValues": [
          "ForceRestart"
        ]
      }
    },
    "Links": {
      "Endpoints": [
        {
          "@odata.id": "/redfish/v1/Fabrics/GenZ/Endpoints/1"
        }
      ],
      "MemoryDomains": [
        {
          "@odata.id": "/redfish/v1/Chassis/GenZ/MemoryDomains/1"
        }
      ]
    },
    "@odata.id": "/redfish/v1/Chassis/GenZ/MediaControllers/1"
  }

```

6.75 Memory 1.21.0

Version	v1.21	v1.20	v1.19	v1.18	v1.17	v1.16	v1.15	v1.14	v1.13	v1.12	v1.11	...
Release	2025.2	2024.1	2023.3	2023.2	2022.3	2022.2	2022.1	2021.4	2021.2	2021.1	2020.4	...

6.75.1 Description

The `Memory` schema represents a memory device, such as a DIMM, and its configuration. It also describes the location, such as a slot, socket, or bay, where a unit can be installed, by populating a resource instance with an absent state if a unit is not present.

- This resource shall represent a memory device in a Redfish implementation. It may also represent a location, such as a slot, socket, or bay, where a unit may be installed, but the `State` property within the `Status` property contains `Absent`.

6.75.2 URIs

`/redfish/v1/Chassis/{ChassisId}/Memory/{MemoryId}`

`/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Memory/{MemoryId}`

```

/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Memory/
{MemoryId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Memory/{MemoryId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Memory/{MemoryId}
/redfish/v1/Systems/{ComputerSystemId}/Memory/{MemoryId}
/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/CacheMemory/{MemoryId}

```

6.75.3 Properties

Property	Type	Attributes	Notes
AllocationAlignmentMiB (v1.2+)	integer (mebibytes)	<i>read-only</i> (null)	The boundary that memory regions are allocated on, measured in mebibytes (MiB). This property shall contain the alignment boundary on which memory regions are allocated, measured in MiB.
AllocationIncrementMiB (v1.2+)	integer (mebibytes)	<i>read-only</i> (null)	The size of the smallest unit of allocation for a memory region in mebibytes (MiB). This property shall contain the allocation increment for regions, measured in MiB.
AllowedSpeedsMHz []	array (MHz) (integer)	<i>read-only</i>	Speeds supported by this memory device. This property shall contain the speeds supported by this memory device.
Assembly (v1.4+) {	object		The link to the assembly resource associated with this memory device. This property shall contain a link to a resource of type <code>Assembly</code>. See the <i>Assembly</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>Assembly</i> resource. See the Links section and the <i>Assembly</i> schema for details.
}			
BaseModuleType	string (enum)	<i>read-only</i> (null)	The base module type of the memory device. This property shall contain the base module type of the memory device. For the possible property values, see <i>BaseModuleType</i> in <i>Property details</i>.

Property	Type	Attributes	Notes
BusWidthBits	integer	<i>read-only</i> (null)	The bus width, in bits. This property shall contain the bus width, in bits.
CacheLevel (v1.20+)	integer	<i>read-only</i>	The level of the cache memory. This value shall contain the level of the cache memory. This property shall only be present if the <code>MemoryType</code> contains the value <code>Cache</code>.
CacheSizeMiB (v1.4+)	integer (mebibytes)	<i>read-only</i> (null)	Total size of the cache portion memory in MiB. This property shall contain the total size of the cache portion memory in MiB. If the <code>MemoryType</code> property contains the value <code>Cache</code>, the <code>CacheSizeMiB</code> property shall be absent and the <code>CapacityMiB</code> property shall be present.
CapacityMiB	integer (mebibytes)	<i>read-only</i> (null)	Memory capacity in mebibytes (MiB). This property shall contain the memory capacity in MiB.
Certificates (v1.11+) {	object		The link to a collection of certificates for device identity and attestation. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that contains certificates for device identity and attestation. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
ConfigurationLocked (v1.7+)	boolean	<i>read-only</i> (null)	An indication of whether the configuration of this memory device is locked and cannot be altered. This property shall indicate whether the configuration of this memory device is locked and cannot be altered.
CXL (v1.17+) {	object		CXL properties for this memory device. This property shall contain CXL-specific properties for this memory device.

Property	Type	Attributes	Notes
LabelStorageSizeBytes (v1.17+)	integer (bytes)	<i>read-only</i>	The size of the label storage area in bytes of this memory device. This property shall contain the size of the label storage area in bytes of this memory device.
StagedNonVolatileSizeMiB (v1.17+)	integer (mebibytes)	<i>read-write</i>	Total device non-volatile memory capacity in MiB staged for next activation. The value is in multiples of 256 MiB. The value of this property shall indicate the total device non-volatile memory capacity in mebibytes. The value shall be in multiples of 256 mebibytes.
StagedVolatileSizeMiB (v1.17+)	integer (mebibytes)	<i>read-write</i>	Total device volatile memory capacity in MiB staged for next activation. This value is in multiples of 256 MiB. The value of this property shall indicate the total device volatile memory capacity in mebibytes staged for next activation. This value shall be in multiples of 256 mebibytes.
}			
DataWidthBits	integer	<i>read-only</i> (null)	Data width in bits. This property shall contain the data width in bits.
DeviceID (deprecated v1.3)	string	<i>read-only</i> (null)	Device ID. This property shall contain the device ID of the memory device. <i>Deprecated in v1.3 and later. This property has been deprecated in favor of <code>ModuleProductID</code>.</i>
DeviceLocator (deprecated v1.9)	string	<i>read-only</i> (null)	Location of the memory device in the platform. This property shall contain the location of the memory device in the platform, typically marked in the silk screen. <i>Deprecated in v1.9 and later. This property has been deprecated in favor of the <code>ServiceLabel</code> property within <code>Location</code>.</i>
Enabled (v1.12+)	boolean	<i>read-write</i>	An indication of whether this memory is enabled. The value of this property shall indicate if this memory is enabled.

Property	Type	Attributes	Notes
EnvironmentMetrics (v1.11+) {	object		The link to the environment metrics for this memory. This property shall contain a link to a resource of type <code>EnvironmentMetrics</code> that specifies the environment metrics for this memory. See the <i>EnvironmentMetrics</i> schema for details on this property.
@odata.id	string	read-only	Link to a <i>EnvironmentMetrics</i> resource. See the Links section and the <i>EnvironmentMetrics</i> schema for details.
}			
ErrorCorrection	string (enum)	read-only (null)	Error correction scheme supported for this memory device. This property shall contain the error correction scheme supported for this memory device. For the possible property values, see <i>ErrorCorrection</i> in Property details.
FirmwareApiVersion	string	read-only (null)	Version of API supported by the firmware. This property shall contain the version of API supported by the firmware.
FirmwareRevision	string	read-only (null)	Revision of firmware on the memory controller. This property shall contain the revision of firmware on the memory controller.
FunctionClasses (deprecated v1.3) []	array (string)	read-only	Function classes by the memory device. This property shall contain the function classes by the memory device. Deprecated in v1.3 and later. This property has been deprecated in favor of <i>OperatingMemoryModes</i> at the root of the resource, or <i>MemoryClassification</i> found within <i>RegionSet</i>.
HealthData (v1.17+) {	object		The health data of this memory device. This property shall contain the health data of this memory device.
PredictedMediaLifeLeftPercent (v1.17+, deprecated v1.19)	number (%)	read-only (null)	The current health of the memory device as a percentage. This property shall contain the current health of the memory device as a percentage, 0 to 100. Deprecated in v1.19 and later. This property has been deprecated in favor of <i>PredictedMediaLifeLeftPercent</i> in the <i>MemoryMetrics</i> resource.

Property	Type	Attributes	Notes
}			
IsRankSpareEnabled	boolean	<i>read-only</i> (null)	An indication of whether rank spare is enabled for this memory device. This property shall indicate whether rank spare is enabled for this memory device.
IsSpareDeviceEnabled	boolean	<i>read-only</i> (null)	An indication of whether a spare device is enabled for this memory device. This property shall indicate whether the spare device is enabled.
Links (v1.2+) {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Batteries (v1.15+) [{	array		The batteries that provide power to this memory device during a power-loss event. This property shall contain an array of links to resources of type <code>Battery</code> that represent the batteries that provide power to this memory device during a power-loss event, such as with battery-backed NVDIMMs. This property shall not be present if the batteries power the containing chassis as a whole rather than the individual memory device.
@odata.id	string	<i>read-only</i>	Link to a Battery resource. See the Links section and the <i>Battery</i> schema for details.
}]			
Chassis (v1.2+) {	object		The link to the chassis that contains this memory device. This property shall contain a link to a resource of type <code>Chassis</code> that represents the physical container associated with this memory device. See the <i>Chassis</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.
}			

Property	Type	Attributes	Notes
Endpoints (v1.17+) [{	array		An array of links to the endpoints associated with this memory. This property shall contain an array of links to resources of type <code>Endpoint</code> that represent the endpoints associated with this memory.
@odata.id	string	<i>read-only</i>	Link to a <code>Endpoint</code> resource. See the Links section and the <code>Endpoint</code> schema for details.
}]			
MemoryMediaSources (v1.17+) [{	array		An array of memory chunks providing media for this memory. This property shall contain an array of links to resources of type <code>MemoryChunks</code> that represent the memory chunk instances providing media for this memory.
@odata.id	string	<i>read-only</i>	Link to a <code>MemoryChunks</code> resource. See the Links section and the <code>MemoryChunks</code> schema for details.
}]			
MemoryRegionMediaSources (v1.18+) [{	array		An array of memory regions providing media for this memory. This property shall contain an array of links to resources of type <code>MemoryRegion</code> that represent the memory region instances providing media for this memory.
@odata.id	string	<i>read-only</i>	Link to a <code>MemoryRegion</code> resource. See the Links section and the <code>MemoryRegion</code> schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
Processors (v1.11+) [{	array		An array of links to the processors associated with this memory device. This property shall contain an array of links to resources of type <code>Processor</code> that are associated with this memory device.
@odata.id	string	<i>read-only</i>	Link to a <code>Processor</code> resource. See the Links section and the <code>Processor</code> schema for details.
}]			
}			

Property	Type	Attributes	Notes
Location (v1.4+) {}	object		The location of the memory device. This property shall contain the location information of the associated memory device. For property details, see Location.
LocationIndicatorActive (v1.10+)	boolean	<i>read-write</i> (null)	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of <code>IndicatorLED</code> in this resource, if supported, to reflect the implementation of the locating function.
Log (v1.13+) {	object		The link to the log service associated with this memory. This property shall contain a link to a resource of type <code>LogService</code>. See the <code>LogService</code> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>LogService</code> resource. See the Links section and the <code>LogService</code> schema for details.
}			
LogicalSizeMiB (v1.4+)	integer (mebibytes)	<i>read-only</i> (null)	Total size of the logical memory in MiB. This property shall contain the total size of the logical memory in MiB.
Manufacturer	string	<i>read-only</i> (null)	The memory device manufacturer. This property shall contain the manufacturer of the memory device.
MaxTDPMilliWatts []	array (milliWatts) (integer)	<i>read-only</i>	Set of maximum power budgets supported by the memory device in milliwatt units. This property shall contain an array of maximum power budgets supported by the memory device in milliwatt units.
Measurements (v1.11+, deprecated v1.14) [{	array		An array of DSP0274-defined measurement blocks. This property shall contain an array of DSP0274-defined measurement blocks. <i>Deprecated in v1.14 and later. This property has been deprecated in favor of the <code>ComponentIntegrity</code> resource.</i>

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a MeasurementBlock resource. See the Links section and the <i>SoftwareInventory</i> schema for details.
}}			
MemoryDeviceType	string (enum)	<i>read-only</i> (null)	Type details of the memory device. This property shall contain the Memory Device Type as defined by SMBIOS. <i>For the possible property values, see MemoryDeviceType in Property details.</i>
MemoryLocation {	object		Memory connection information to sockets and memory controllers. This object shall contain properties that describe the memory connection information to sockets and memory controllers.
Channel	integer	<i>read-only</i> (null)	The channel number to which the memory device is connected. This property shall contain the channel number to which the memory device is connected.
MemoryController	integer	<i>read-only</i> (null)	The memory controller number to which the memory device is connected. This property shall contain the memory controller number to which the memory device is connected.
Slot	integer	<i>read-only</i> (null)	The slot number to which the memory device is connected. This property shall contain the slot number to which the memory device is connected.
Socket	integer	<i>read-only</i> (null)	The socket number to which the memory device is connected. This property shall contain the socket number to which the memory device is connected.
}			
MemoryMedia []	array (string (enum))	<i>read-only</i>	- Media of this memory device. - This property shall contain the media types of this memory device. <i>For the possible property values, see MemoryMedia in Property details.</i>

Property	Type	Attributes	Notes
MemorySubsystemControllerManufacturerID (v1.3+)	string	<i>read-only</i> (null)	The manufacturer ID of the memory subsystem controller of this memory device. This property shall contain the two byte manufacturer ID of the memory subsystem controller of this memory device as defined by JEDEC in JEP-106. Pattern: <code>^0[xX](([a-fA-F] [0-9]){2}){2}\$</code>
MemorySubsystemControllerProductID (v1.3+)	string	<i>read-only</i> (null)	The product ID of the memory subsystem controller of this memory device. This property shall contain the two byte product ID of the memory subsystem controller of this memory device as defined by the manufacturer. Pattern: <code>^0[xX](([a-fA-F] [0-9]){2}){2}\$</code>
MemoryType	string (enum)	<i>read-only</i> (null)	The type of memory device. This property shall contain the type of memory device that this resource represents. <i>For the possible property values, see MemoryType in Property details.</i>
Metrics {	object		The link to the metrics associated with this memory device. See the <i>MemoryMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a MemoryMetrics resource. See the Links section and the <i>MemoryMetrics</i> schema for details.
}			
Model (v1.11+)	string	<i>read-only</i> (null)	The product model number of this device. This property shall indicate the model information as provided by the manufacturer of this memory.
ModuleManufacturerID (v1.3+)	string	<i>read-only</i> (null)	The manufacturer ID of this memory device. This property shall contain the two byte manufacturer ID of this memory device as defined by JEDEC in JEP-106. Pattern: <code>^0[xX](([a-fA-F] [0-9]){2}){2}\$</code>
ModuleProductID (v1.3+)	string	<i>read-only</i> (null)	The product ID of this memory device. This property shall contain the two byte product ID of this memory device as defined by the manufacturer. Pattern: <code>^0[xX](([a-fA-F] [0-9]){2}){2}\$</code>

Property	Type	Attributes	Notes
NonVolatileSizeLimitMiB (v1.17+)	integer (mebibytes)	<i>read-write</i>	The total non-volatile memory capacity in mebibytes (MiB). This property shall contain the total non-volatile memory capacity in mebibytes (MiB).
NonVolatileSizeMiB (v1.4+)	integer (mebibytes)	<i>read-only</i> (null)	Total size of the non-volatile portion memory in MiB. This property shall contain the total size of the non-volatile portion memory in MiB.
OperatingMemoryModes []	array (string (enum))	<i>read-only</i>	- Memory modes supported by the memory device. - This property shall contain the memory modes supported by the memory device. <i>For the possible property values, see OperatingMemoryModes in Property details.</i>
OperatingSpeedMhz	integer (MHz)	<i>read-only</i> (null)	Operating speed of the memory device in MHz or MT/s as appropriate. This property shall contain the operating speed of the memory device in MHz or MT/s (mega-transfers per second) as reported by the memory device. Memory devices that operate at their bus speed shall report the operating speed in MHz (bus speed), while memory devices that transfer data faster than their bus speed, such as DDR memory, shall report the operating speed in MT/s (mega-transfers/second). The reported value shall match the conventionally reported values for the technology used by the memory device.
OperatingSpeedRangeMHz (v1.13+) {	object (excerpt)		Range of allowed operating speeds (MHz). This property shall contain the operating speed control, in megahertz units, for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Control</code> with the <code>ControlType</code> property containing the value of <code>FrequencyMHz</code>. This object is an excerpt of the <i>Control</i> resource located at the URI shown in <code>DataSourceUri</code>.
AllowableMax	number	<i>read-only</i> (null)	The maximum possible setting for this control. This property shall indicate the maximum possible value of the <code>SetPoint</code> or <code>SettingMax</code> properties for this control. Services shall not accept values for <code>SetPoint</code> or <code>SettingMax</code> above this value.

Property	Type	Attributes	Notes
AllowableMin	number	<i>read-only (null)</i>	The minimum possible setting for this control. This property shall indicate the minimum possible value of the <code>SetPoint</code> or <code>SettingMin</code> properties for this control. Services shall not accept values for <code>SetPoint</code> or <code>SettingMin</code> below this value.
AllowableNumericValues []	array (number, null)	<i>read-only</i>	The supported values for the set point. This property shall contain the supported values for this control. The units shall follow the value of <code>SetPointUnits</code>. This property should only be present when the set point or range has a limited set of supported values that cannot be accurately described using the <code>Increment</code> property.
ControlMode	string (enum)	<i>read-write (null)</i>	The current operating mode of the control. This property shall contain the operating mode of the control. <i>For the possible property values, see ControlMode in Property details.</i>
DataSourceUri	string (URI)	<i>read-only (null)</i>	The link to the resource that provides the data for this control. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy. If no source resource is implemented, meaning the excerpt represents the only available data, this property shall not be present.
Reading	number	<i>read-only (null)</i>	The reading of the sensor associated with this control. This property shall contain the value of the <code>Reading</code> property of the <code>Sensor</code> resource directly associated with this control. This property shall not be present if multiple sensors are associated with a single control.
SettingMax	number	<i>read-write (null)</i>	The maximum set point in the allowed range. This property shall contain the maximum desired set point within the acceptable range. The service shall reject values greater than the value of <code>AllowableMax</code>. The units shall follow the value of <code>SetPointUnits</code>.

Property	Type	Attributes	Notes
SettingMin	number	<i>read-write</i> (null)	The minimum set point in the allowed range. This property shall contain the minimum desired set point within the acceptable range. The service shall reject values less than the value of <code>AllowableMin</code>. The units shall follow the value of <code>SetPointUnits</code>.
}			
PartNumber	string	<i>read-only</i> (null)	The product part number of this device. This property shall indicate the part number as provided by the manufacturer of this memory device.
PersistentRegionNumberLimit (v1.2+)	integer	<i>read-only</i> (null)	Total number of persistent regions this memory device can support. This property shall contain the total number of persistent regions this memory device can support.
PersistentRegionSizeLimitMiB	integer (mebibytes)	<i>read-only</i> (null)	Total size of persistent regions in mebibytes (MiB). This property shall contain the total size of persistent regions in MiB.
PersistentRegionSizeMaxMiB (v1.2+)	integer (mebibytes)	<i>read-only</i> (null)	Maximum size of a single persistent region in mebibytes (MiB). This property shall contain the maximum size of a single persistent regions in MiB.
PoisonListMaxMediaErrorRecords (v1.17+)	integer	<i>read-write</i>	The maximum number of media error records this device can track in its poison list. This property shall contain the maximum number of media error records this device can track in its poison list.
PowerManagementICManufacturerID (v1.20+)	string	<i>read-only</i> (null)	The manufacturer ID of the Power Management Integrated Controller on this memory device. This property shall contain the two byte manufacturer ID of the Power Management Integrated Controller on this memory device as defined by JEDEC in JESD301. Pattern: <code>^0[xX](((a-fA-F) [0-9]){2}){2}\$</code>

Property	Type	Attributes	Notes
PowerManagementICRevisionID (v1.20+)	string	<i>read-only</i> (null)	The revision ID of the Power Management Integrated Controller on this memory device. This property shall contain the two byte revision ID of the Power Management Integrated Controller on this memory device as defined by JEDEC in JESD301. Pattern: <code>^0[xX]((([a-fA-F] [0-9]){2}){2})\$</code>
PowerManagementPolicy {	object		Power management policy information. This object shall contain properties that describe the power management policy for this resource.
AveragePowerBudgetMilliWatts	integer (milliWatts)	<i>read-only</i> (null)	Average power budget, in milliwatt units. This property shall contain the average power budget, in milliwatt units.
MaxTDPMilliWatts	integer (milliWatts)	<i>read-only</i> (null)	Maximum TDP in milliwatt units. This property shall contain the maximum TDP in milliwatt units.
PeakPowerBudgetMilliWatts	integer (milliWatts)	<i>read-only</i> (null)	Peak power budget, in milliwatt units. This property shall contain the peak power budget, in milliwatt units.
PolicyEnabled	boolean	<i>read-only</i> (null)	An indication of whether the power management policy is enabled. This property shall indicate whether the power management policy is enabled.
}			
RankCount	integer	<i>read-only</i> (null)	Number of ranks available in the memory device. This property shall contain the number of ranks available in the memory device. The ranks could be used for spare or interleave.
Regions [{	array		Memory regions information within the memory device. This property shall contain the memory region information within the memory device.

Property	Type	Attributes	Notes
MasterPassphraseEnabled (v1.17+)	boolean	<i>read-only</i> (null)	An indication of whether the master passphrase is enabled for this region. This property shall indicate whether the master passphrase is enabled for this region.
MemoryClassification	string (enum)	<i>read-only</i> (null)	The classification of memory that the memory region occupies. This property shall contain the classification of memory that the memory region occupies. <i>For the possible property values, see MemoryClassification in Property details.</i>
OffsetMiB	integer (mebibytes)	<i>read-only</i> (null)	Offset within the memory that corresponds to the start of this memory region in mebibytes (MiB). This property shall contain the offset within the memory that corresponds to the start of this memory region in MiB.
PassphraseEnabled (v1.5+)	boolean	<i>read-only</i> (null)	An indication of whether the passphrase is enabled for this region. This property shall indicate whether the passphrase is enabled for this region.
PassphraseState (deprecated v1.5)	boolean	<i>read-only</i> (null)	An indication of whether the state of the passphrase for this region is enabled. This property shall indicate whether the state of the passphrase for this region is enabled. <i>Deprecated in v1.5 and later. This property has been deprecated in favor of <code>PassphraseEnabled</code> found within <code>RegionSet</code>.</i>
RegionId	string	<i>read-only</i> (null)	Unique region ID representing a specific region within the memory device. This property shall contain the unique region ID representing a specific region within the memory device.
SizeMiB	integer (mebibytes)	<i>read-only</i> (null)	Size of this memory region in mebibytes (MiB). This property shall contain the size of this memory region in MiB.
}}]			

Property	Type	Attributes	Notes
SecurityCapabilities {	object		Security capabilities of the memory device. This property shall contain properties that describe the security capabilities of the memory device.
ConfigurationLockCapable (v1.7+)	boolean	read-only (null)	An indication of whether this memory device supports the locking, or freezing, of the configuration. This property shall indicate whether this memory device supports the locking, or freezing, of the configuration.
DataLockCapable (v1.7+)	boolean	read-only (null)	An indication of whether this memory device supports data locking. This property shall indicate whether this memory device supports the locking of data access.
MaxPassphraseCount	integer	read-only (null)	Maximum number of passphrases supported for this memory device. This property shall contain the maximum number of passphrases supported for this memory device.
PassphraseCapable	boolean	read-only (null)	An indication of whether the memory device is passphrase capable. This property shall indicate whether the memory device is passphrase capable.
PassphraseLockLimit (v1.7+)	integer	read-only (null)	The maximum number of incorrect passphrase attempts allowed before memory device is locked. This property shall contain the maximum number of incorrect passphrase access attempts allowed before access to data is locked. If 0, the number of attempts is infinite.
SecurityStates (deprecated v1.7) []	array (string (enum))	read-only	- Security states supported by the memory device. - This property shall contain the security states supported by the memory device. <i>For the possible property values, see SecurityStates in Property details. Deprecated in v1.7 and later. This property has been deprecated in favor of using the individual <code>PassphraseCapable</code>, <code>DataLockCapable</code>, and <code>ConfigurationLockCapable</code> properties.</i>
}			

Property	Type	Attributes	Notes
SecurityState (v1.7+)	string (enum)	<i>read-write</i> (null)	The current security state of this memory device. This property shall contain the current security state of this memory device. <i>For the possible property values, see SecurityState in Property details.</i>
SecurityStates (v1.17+) {	object		The security states of this memory device. This property shall contain the security states of this memory device.
MasterPassphraseAttemptCountReached (v1.17+)	boolean	<i>read-only</i> (null)	An indication of whether an incorrect master passphrase attempt count has been reached. This property shall indicate whether an incorrect master passphrase attempt count has been reached.
UserPassphraseAttemptCountReached (v1.17+)	boolean	<i>read-only</i> (null)	An indication of whether an incorrect user passphrase attempt count has been reached. This property shall indicate whether an incorrect user passphrase attempt count has been reached.
}			
SerialNumber	string	<i>read-only</i> (null)	The product serial number of this device. This property shall indicate the serial number as provided by the manufacturer of this memory device.
SpareDeviceCount	integer	<i>read-only</i> (null)	Number of unused spare devices available in the memory device. This property shall contain the number of unused spare devices available in the memory device. If the memory device fails, the spare devices could be used.
SparePartNumber (v1.11+)	string	<i>read-only</i> (null)	The spare part number of the memory. This property shall contain the spare part number of the memory.
Status (v1.1+) {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

Property	Type	Attributes	Notes
SubsystemDeviceID <i>(deprecated v1.3)</i>	string	<i>read-only (null)</i>	Subsystem device ID. This property shall contain the subsystem device ID of the memory device. <i>Deprecated in v1.3 and later. This property has been deprecated in favor of <code>MemorySubsystemControllerProductID</code>.</i>
SubsystemVendorID <i>(deprecated v1.3)</i>	string	<i>read-only (null)</i>	SubSystem vendor ID. This property shall contain the subsystem vendor ID of the memory device. <i>Deprecated in v1.3 and later. This property has been deprecated in favor of <code>MemorySubsystemControllerManufacturerID</code>.</i>
VendorID <i>(deprecated v1.3)</i>	string	<i>read-only (null)</i>	Vendor ID. This property shall contain the vendor ID of the memory device. <i>Deprecated in v1.3 and later. This property has been deprecated in favor of <code>ModuleManufacturerID</code>.</i>
VolatileRegionNumberLimit <i>(v1.2+)</i>	integer	<i>read-only (null)</i>	Total number of volatile regions this memory device can support. This property shall contain the total number of volatile regions this memory device can support.
VolatileRegionSizeLimitMiB	integer (mebibytes)	<i>read-only (null)</i>	Total size of volatile regions in mebibytes (MiB). This property shall contain the total size of volatile regions in MiB.
VolatileRegionSizeMaxMiB <i>(v1.2+)</i>	integer (mebibytes)	<i>read-only (null)</i>	Maximum size of a single volatile region in mebibytes (MiB). This property shall contain the maximum size of a single volatile regions in MiB.
VolatileSizeLimitMiB <i>(v1.17+)</i>	integer (mebibytes)	<i>read-write</i>	The total volatile memory capacity in mebibytes (MiB). This property shall contain the total volatile memory capacity in mebibytes (MiB).
VolatileSizeMiB <i>(v1.4+)</i>	integer (mebibytes)	<i>read-only (null)</i>	Total size of the volatile portion memory in MiB. This property shall contain the total size of the volatile portion memory in MiB.

6.75.4 Actions

6.75.4.1 DisableMasterPassphrase (v1.17+)

Description

Disables the master passphrase for the given region.

- This action shall disable the master passphrase on the supplied region provided the supplied master passphrase matches that of the region.

Action URI

{Base URI of target resource}/Actions/Memory.DisableMasterPassphrase

Action parameters

Parameter Name	Type	Attributes	Notes
Passphrase	string	<i>required</i>	The master passphrase for the specified region. • This parameter shall contain the master passphrase for the specified region.
RegionId	string	<i>required</i>	The memory region ID to which to disable the master passphrase. • This parameter shall contain the memory region ID to which to disable the master passphrase.

Request Example

```
{
  "Passphrase": "FluffyBunny",
  "RegionId": 2
}
```

6.75.4.2 DisablePassphrase

Description

Disable passphrase for the given region.

- This action shall disable the need for passphrases on the supplied region provided the supplied passphrase

matches that of the region.

Action URI

{Base URI of target resource}/Actions/Memory.DisablePassphrase

Action parameters

Parameter Name	Type	Attributes	Notes
Passphrase	string	required	Passphrase for doing the operation. This property shall contain the passphrase used in this action.
RegionId	string	required	The memory region ID to which to apply this action. This property shall contain the memory region ID to which to apply this action.

Request Example

```
{
  "Passphrase": "FluffyBunny",
  "RegionId": 2
}
```

6.75.4.3 FreezeSecurityState (v1.17+)

Description

Freezes the security state of the memory device.

- This action shall freeze the security state of the memory device.

Action URI

{Base URI of target resource}/Actions/Memory.FreezeSecurityState

Action parameters

This action takes no parameters.

6.75.4.4 InjectPersistentPoison (v1.17+)

Description

Injects poison to a specific persistent memory address in the memory device.

- This action shall inject poison to a specific persistent memory address in the memory device.

Action URI

{Base URI of target resource}/Actions/Memory.InjectPersistentPoison

Action parameters

Parameter Name	Type	Attributes	Notes
PhysicalAddress	string	<i>required</i>	The device persistent physical address in which to perform a poison injection as a hex-encoded string. • This parameter shall contain the device persistent physical address in which to perform a poison injection as a hex-encoded string. Pattern: <code>^0x[0-9a-fA-F]+\$</code>

Request Example

```
{
  "PhysicalAddress": "0x8000000"
}
```

6.75.4.5 OverwriteUnit (v1.6+)

Description

This contains the action for securely erasing given regions using the NIST SP800-88 Purge: Overwrite.

- This action shall securely erase the supplied region provided the supplied passphrase matches that of the given region using the NIST SP800-88 Purge: Overwrite. Use the `SecureEraseUnit` method to perform NIST SP800-88 Purge: Cryptographic Erase.

Action URI

{Base URI of target resource}/Actions/Memory.OverwriteUnit

Action parameters

Parameter Name	Type	Attributes	Notes
Passphrase	string	<i>required</i>	Passphrase for doing the operation. This property shall contain the passphrase used in this action.
RegionId	string	<i>required</i>	The memory region ID to which to apply this action. This property shall contain the memory region ID to which to apply this action.

Request Example

```
{
  "Passphrase": "FluffyBunny",
  "RegionId": 2
}
```

6.75.4.6 Reset (v1.8+)**Description**

This action resets this memory device.

- This action shall reset this memory device.

Action URI

{Base URI of target resource}/Actions/Memory.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	<i>optional</i>	The type of reset. This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset. <i>For the possible property values, see ResetType in Property details.</i>

Request Example

```
{
  "ResetType": "ForceRestart"
}
```

6.75.4.7 ResetToDefaults (v1.16+)

Description

The action resets the values of writable properties to factory defaults.

- This action shall reset the values of writable properties in this resource to their default values as specified by the manufacturer.

Action URI

{Base URI of target resource}/Actions/Memory.ResetToDefaults

Action parameters

This action takes no parameters.

6.75.4.8 ScanMedia (v1.17+)

Description

Scans the media of the memory device.

- This action shall scan the media of the memory device.

Action URI

{Base URI of target resource}/Actions/Memory.ScanMedia

Action parameters

Parameter Name	Type	Attributes	Notes
Length	integer	required	The length of the target region to scan in bytes from the physical address. • This parameter shall contain the length of the target region to scan in bytes from the PhysicalAddress parameter.

Parameter Name	Type	Attributes	Notes
NoEventLog	boolean	<i>optional</i>	Indicates whether events related to the media scan are not logged. This parameter shall indicate whether events related to the media scan are not logged. If not provided by the client, the value shall be assumed to be <code>false</code>.
PhysicalAddress	string	<i>required</i>	The starting device physical address to scan as a hex-encoded string. This parameter shall contain the starting device physical address to scan as a hex-encoded string. Pattern: <code>^0x[0-9a-fA-F]+\$</code>

Request Example

```
{
  "PhysicalAddress": "0x8000000",
  "Length": 2097152
}
```

6.75.4.9 SecureEraseUnit

Description

This contains the action for securely erasing given regions using the NIST SP800-88 Purge: Cryptographic Erase.

- This action shall securely erase the supplied region provided the supplied passphrase matches that of the given region using the NIST SP800-88 Purge: Cryptographic Erase. Use the `overwriteUnit` method to perform NIST SP800-88 Purge: Overwrite.

Action URI

{Base URI of target resource}/Actions/Memory.SecureEraseUnit

Action parameters

Parameter Name	Type	Attributes	Notes
Passphrase	string	<i>required</i>	Passphrase for doing the operation. This property shall contain the passphrase used in this action.

Parameter Name	Type	Attributes	Notes
RegionId	string	required	The memory region ID to which to apply this action. This property shall contain the memory region ID to which to apply this action.

Request Example

```
{
  "Passphrase": "FluffyBunny",
  "RegionId": 2
}
```

6.75.4.10 SetMasterPassphrase (v1.17+)

Description

Sets the master passphrase for the given region.

- This action shall set the supplied master passphrase to the supplied region.

Action URI

{Base URI of target resource}/Actions/Memory.SetMasterPassphrase

Action parameters

Parameter Name	Type	Attributes	Notes
Passphrase	string	required	The master passphrase to set for the specified region. This parameter shall contain the master passphrase to set for the specified region.
RegionId	string	required	The memory region ID to which to apply the master passphrase. This parameter shall contain the memory region ID to which to apply the master passphrase.

Request Example

```
{
  "Passphrase": "FluffyBunny",
  "RegionId": 2
}
```

6.75.4.11 SetPassphrase

Description

Set passphrase for the given regions.

- This action shall apply the supplied passphrase to the supplied region.

Action URI

{Base URI of target resource}/Actions/Memory.SetPassphrase

Action parameters

Parameter Name	Type	Attributes	Notes
Passphrase	string	required	Passphrase for doing the operation. • This property shall contain the passphrase used in this action.
RegionId	string	required	The memory region ID to which to apply this action. • This property shall contain the memory region ID to which to apply this action.

Request Example

```
{
  "Passphrase": "FluffyBunny",
  "RegionId": 2
}
```

6.75.4.12 UnlockUnit

Description

This contains the action for unlocking given regions.

- This action shall apply the supplied passphrase to the supplied region for the purpose of unlocking the given regions.

Action URI

{Base URI of target resource}/Actions/Memory.UnlockUnit

Action parameters

Parameter Name	Type	Attributes	Notes
Passphrase	string	required	The passphrase required to complete the operation. • This property shall contain the passphrase required to complete this action.
RegionId	string	required	The memory region ID to which to apply this action. • This property shall contain the memory region ID to which to apply this action.

Request Example

```
{
  "Passphrase": "FluffyBunny",
  "RegionId": 2
}
```

6.75.5 Property details

6.75.5.1 BaseModuleType

The base module type of the memory device.

- This property shall contain the base module type of the memory device.

string	Description
CAMM (v1.21+)	Compression Attached Memory Module.
Die (v1.7+)	A die within a package.
LRDIMM	Load Reduced.
Mini_RDIMM	Mini_RDIMM.

string	Description
Mini_UDIMM	Mini_UDIMM.
RDIMM	Registered DIMM.
SO_DIMM	SO_DIMM.
SO_DIMM_16b	SO_DIMM_16b.
SO_DIMM_32b	SO_DIMM_32b.
SO_RDIMM_72b	SO_RDIMM_72b.
SO_UDIMM_72b	SO_UDIMM_72b.
UDIMM	UDIMM.

6.75.5.2 ControlMode

The current operating mode of the control.

- This property shall contain the operating mode of the control.

string	Description
Automatic	Automatically adjust control to meet the set point.
Disabled	The control has been disabled.
Manual	No automatic adjustments are made to the control.
Override	User override of the automatic set point value.

6.75.5.3 ErrorCorrection

Error correction scheme supported for this memory device.

- This property shall contain the error correction scheme supported for this memory device.

string	Description
AddressParity	Address parity errors can be corrected.
MultiBitECC	Multibit data errors can be corrected by ECC.

string	Description
NoECC	No ECC available.
SingleBitECC	Single bit data errors can be corrected by ECC.

6.75.5.4 MemoryClassification

The classification of memory that the memory region occupies.

- This property shall contain the classification of memory that the memory region occupies.

string	Description
Block	Block-accessible memory.
ByteAccessiblePersistent	Byte-accessible persistent memory.
Volatile	Volatile memory.

6.75.5.5 MemoryDeviceType

Type details of the memory device.

- This property shall contain the Memory Device Type as defined by SMBIOS.

string	Description
DDR	DDR.
DDR2	DDR2.
DDR2_SDRAM	DDR2 SDRAM.
DDR2_SDRAM_FB_DIMM	DDR2 SDRAM FB_DIMM.
DDR2_SDRAM_FB_DIMM_PROBE	DDR2 SDRAM FB_DIMM PROBE.
DDR3	DDR3.
DDR3_SDRAM	DDR3 SDRAM.
DDR4	DDR4.
DDR4_SDRAM	DDR4 SDRAM.

string	Description
DDR4E_SDRAM	DDR4E SDRAM.
DDR5 (v1.11+)	Double data rate type five synchronous dynamic random-access memory.
DDR5_MRDIMM (v1.21+)	DDR5 MRDIMM.
DDR_SDRAM	DDR SDRAM.
DDR_SGRAM	DDR SGRAM.
EDO	EDO.
FastPageMode	Fast Page Mode.
GDDR (v1.11+)	Synchronous graphics random-access memory.
GDDR2 (v1.11+)	Double data rate type two synchronous graphics random-access memory.
GDDR3 (v1.11+)	Double data rate type three synchronous graphics random-access memory.
GDDR4 (v1.11+)	Double data rate type four synchronous graphics random-access memory.
GDDR5 (v1.11+)	Double data rate type five synchronous graphics random-access memory.
GDDR5X (v1.11+)	Double data rate type five X synchronous graphics random-access memory.
GDDR6 (v1.11+)	Double data rate type six synchronous graphics random-access memory.
HBM (v1.7+)	High Bandwidth Memory.
HBM2 (v1.7+)	The second generation of High Bandwidth Memory.
HBM2E (v1.17+)	An updated version of the second generation of High Bandwidth Memory.
HBM3 (v1.11+)	The third generation of High Bandwidth Memory.
Logical (v1.4+)	Logical device, such as when the memory is fabric-attached.
LPDDR3_SDRAM	LPDDR3 SDRAM.
LPDDR4_SDRAM	LPDDR4 SDRAM.
LPDDR5_SDRAM (v1.19+)	LPDDR5 SDRAM.
OEM (v1.11+)	OEM-defined.
PipelinedNibble	Pipelined Nibble.
ROM	ROM.
SDRAM	SDRAM.

6.75.5.6 MemoryMedia

- Media of this memory device.
 - This property shall contain the media types of this memory device.

string	Description
DRAM	DRAM media.
Intel3DXPoint	Intel 3D XPoint media.
NAND	NAND media.
Proprietary	Proprietary media.

6.75.5.7 MemoryType

The type of memory device.

- This property shall contain the type of memory device that this resource represents.

string	Description
Cache (v1.20+)	Cache. • This value shall represent cache memory.
DRAM	The memory device is composed of volatile memory. • This value shall represent a volatile DRAM memory device.
IntelOptane (v1.6+)	The memory device is an Intel Optane Persistent Memory Module. • This value shall represent an Intel Optane Persistent Memory Module.
NVDIMM_F	The memory device is composed of non-volatile memory. • This value shall represent an NVDIMM_F memory device as defined by JEDEC.
NVDIMM_N	The memory device is composed of volatile memory backed by non-volatile memory. • This value shall represent an NVDIMM_N memory device as defined by JEDEC.
NVDIMM_P	The memory device is composed of a combination of non-volatile and volatile memory. • This value shall represent an NVDIMM_P memory device as defined by JEDEC.

6.75.5.8 OperatingMemoryModes

- Memory modes supported by the memory device.
 - This property shall contain the memory modes supported by the memory device.

string	Description
Block	Block-accessible system memory.
PMEM	Persistent memory, byte-accessible through system address space.
Volatile	Volatile memory.

6.75.5.9 ResetType

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property shall contain the value <code>On</code>.
ForceRestart	Shut down immediately and non-gracefully and restart the unit. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.

string	Description
FullPowerCycle	Full power cycle the unit. Behaves like removing utility lines, followed by restoring utility lines to the resource. This value shall indicate the resource will perform a full power cycle as if utility lines to the resource are removed and restored. This is different from <code>PowerCycle</code> in that it's as close to a true power cycle as possible. For example, removing AC power cables from an enclosure and then restoring the AC power cables. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>. If a service supports this value but there are no other distinct power cycle flows, the service shall support <code>PowerCycle</code> as an alias to <code>FullPowerCycle</code>. This type of reset may cause the manager providing the Redfish service to power cycle. If the manager providing the Redfish service is affected by this type of reset, the service shall send the action response before resetting to prevent client timeouts.
GracefulRestart	Shut down gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
GracefulShutdown	Shut down gracefully and power off. This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a paused state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Paused</code>.

string	Description
PowerCycle	Power cycle the unit. Behaves like a power removal, followed by a power restore to the resource. This value shall indicate the resource will perform a power cycle. This is different from <code>FullPowerCycle</code> in that it typically performs localized power sequencing of the resource while external power is still present. For example, turning DC voltage regulators off and then turning DC voltage regulators back on. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
PushPowerButton	Simulate the pressing of the physical power button on this unit. This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.

6.75.5.10 SecurityState

The current security state of this memory device.

- This property shall contain the current security state of this memory device.

string	Description
Disabled	Secure mode is disabled.
Enabled	Secure mode is enabled and access to the data is allowed.
Frozen (deprecated v1.7)	Secure state is frozen and cannot be modified until reset. <i>Deprecated in v1.7 and later. This value has been deprecated in favor of using the <code>ConfigurationLocked</code> value to indicate that the configuration has been frozen.</i>
Locked	Secure mode is enabled and access to the data is locked.

string	Description
Passphraselimit	Number of attempts to unlock the memory exceeded limit.
Unlocked (<i>deprecated v1.7</i>)	Secure mode is enabled and access to the data is unlocked. <i>Deprecated in v1.7 and later. This value has been deprecated in favor of <code>Enabled</code> to indicate normal security operation.</i>

6.75.5.11 SecurityStates

- Security states supported by the memory device.
 - This property shall contain the security states supported by the memory device.

string	Description
Disabled	Secure mode is disabled.
Enabled	Secure mode is enabled and access to the data is allowed.
Frozen	Secure state is frozen and cannot be modified until reset.
Locked	Secure mode is enabled and access to the data is locked.
Passphraselimit	Number of attempts to unlock the memory exceeded limit.
Unlocked	Secure mode is enabled and access to the data is unlocked.

6.75.6 Example response

```
{
  "@odata.type": "#Memory.v1_21_0.Memory",
  "Name": "Regular Memory",
  "Id": "1",
  "RankCount": 1,
  "MaxTDPMilliWatts": [
    12000
  ],
  "CapacityMiB": 8192,
  "DataWidthBits": 64,
  "BusWidthBits": 72,
  "ErrorCorrection": "MultiBitECC",
  "MemoryLocation": {
    "Socket": 1,
    "MemoryController": 1,
    "Channel": 1,
    "Slot": 1
  },
}
```

```

    "MemoryType": "DRAM",
    "MemoryDeviceType": "DDR4",
    "BaseModuleType": "RDIMM",
    "MemoryMedia": [
        "DRAM"
    ],
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Metrics": {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/Memory/1/MemoryMetrics"
    },
    "EnvironmentMetrics": {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/Memory/1/EnvironmentMetrics"
    },
    "Location": {
        "PartLocation": {
            "ServiceLabel": "Socket 1_A",
            "LocationType": "Socket",
            "LocationOrdinalValue": 0
        }
    },
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/Memory/1"
}

```

6.76 MemoryChunks 1.6.2

Version	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2023.2	2022.3	2020.3	2019.4	2017.3	2017.1	2016.2

6.76.1 Description

The `MemoryChunks` schema contains the definition of a memory chunk and its configuration.

- This resource shall represent memory chunks and interleave sets in a Redfish implementation.

6.76.2 URIs

/redfish/v1/Chassis/{ChassisId}/MemoryDomains/{MemoryDomainId}/MemoryChunks/{MemoryChunksId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/MemoryDomains/{MemoryDomainId}/MemoryChunks/{MemoryChunksId}

/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/MemoryDomains/{MemoryDomainId}/MemoryChunks/{MemoryChunksId}
 /redfish/v1/Systems/{ComputerSystemId}/MemoryDomains/{MemoryDomainId}/MemoryChunks/{MemoryChunksId}

6.76.3 Properties

Property	Type	Attributes	Notes
AddressRangeOffsetMiB (v1.3+)	integer (mebibytes)	<i>read-only</i> (null)	Offset of the memory chunk in the address range in MiB. The value of this property shall be the offset of the memory chunk in the address range in MiB.
AddressRangeType	string (enum)	<i>read-only</i> <i>required</i> (null)	Memory type of this memory chunk. This property shall contain the type of memory chunk. <i>For the possible property values, see AddressRangeType in Property details.</i>
DisplayName (v1.4+)	string	<i>read-write</i> (null)	A user-configurable string to name the memory chunk. This property shall contain a user-configurable string to name the memory chunk.
InterleaveSets [{	array		The interleave sets for the memory chunk. These properties shall represent the interleave sets for the memory chunk. If not specified by the client during a create operation, the memory chunk shall be created across all available memory within the memory domain.
Memory {	object		Describes a memory device of the interleave set. This property shall contain the memory device to which these settings apply.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
MemoryLevel	integer	<i>read-only</i> (null)	Level of the interleave set for multi-level tiered memory. This property shall contain the level of this interleave set for multi-level tiered memory.

Property	Type	Attributes	Notes
OffsetMiB	integer (mebibytes)	<i>read-only</i> (null)	Offset within the DIMM that corresponds to the start of this memory region, measured in mebibytes (MiB). This property shall contain the offset within the DIMM that corresponds to the start of this memory region, with units in MiB.
RegionId	string	<i>read-only</i> (null)	DIMM region identifier. This property shall contain the DIMM region identifier.
SizeMiB	integer (mebibytes)	<i>read-only</i> (null)	Size of this memory region measured in mebibytes (MiB). This property shall contain the size of this memory region, with units in MiB.
}]			
IsMirrorEnabled	boolean	<i>read-only</i> (null)	An indication of whether memory mirroring is enabled for this memory chunk. This property shall indicate whether memory mirroring is enabled for this memory chunk.
IsSpare	boolean	<i>read-only</i> (null)	An indication of whether sparing is enabled for this memory chunk. This property shall indicate whether sparing is enabled for this memory chunk.
Links (v1.3+) {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
CXLLogicalDevices (v1.5+) [{	array		An array of links to the CXL logical devices associated with this memory chunk. This property shall contain an array of links to resources of type <code>CXLLogicalDevice</code> that represent the CXL logical devices associated with this memory chunk.
@odata.id	string	<i>read-only</i>	Link to a CXLLogicalDevice resource. See the Links section and the <i>CXLLogicalDevice</i> schema for details.
}]			
Endpoints (v1.3+) [{	array		An array of links to the endpoints that connect to this memory chunk. This property shall contain a link to the resources of type <code>Endpoint</code> with which this memory chunk is associated.
@odata.id	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.

Property	Type	Attributes	Notes
}]			
MemoryRegions (v1.6+) [{	array		An array of links to the memory regions for which this memory chunk provides capacity. This property shall contain an array of links to resources of type <code>MemoryRegion</code> that represent the memory regions for which this memory chunk provides capacity.
@odata.id	string	<i>read-only</i>	Link to a <code>MemoryRegion</code> resource. See the Links section and the <code>MemoryRegion</code> schema for details.
}]			
Oem {	object		See the OEM object definition in the Using this guide clause.
}			
MediaLocation (v1.5+)	string (enum)	<i>read-write</i> (null)	The location of the memory media for this memory chunk. This property shall contain the location of the memory media for this memory chunk. <i>For the possible property values, see <code>MediaLocation</code> in Property details.</i>
MemoryChunkSizeMiB	integer (mebibytes)	<i>read-only</i> (null)	Size of the memory chunk measured in mebibytes (MiB). This property shall contain the size of the memory chunk in MiB.
RequestedOperationalState (v1.5+)	string (enum)	<i>read-write</i> (null)	The requested operational state of this memory chunk. This property shall contain the requested operational state of this memory chunk. <i>For the possible property values, see <code>RequestedOperationalState</code> in Property details.</i>
Status (v1.2+) {	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <code>Status</code>.

6.76.4 Property details

6.76.4.1 AddressRangeType

Memory type of this memory chunk.

- This property shall contain the type of memory chunk.

string	Description
Block	Block accessible memory.
PMEM	Byte accessible persistent memory.
Volatile	Volatile memory.

6.76.4.2 MediaLocation

The location of the memory media for this memory chunk.

- This property shall contain the location of the memory media for this memory chunk.

string	Description
Local	The memory chunk was created using local media.
Mixed	The memory chunk was created using both local media and remote media accessible through a fabric.
Remote	The memory chunk was created using remote media accessible through a fabric.

6.76.4.3 RequestedOperationalState

The requested operational state of this memory chunk.

- This property shall contain the requested operational state of this memory chunk.

string	Description
Offline	Memory chunk cannot be used. Consumers of this memory chunk should perform cleanup operations as needed to prepare for the removal of this memory chunk.
Online	Memory chunk can be used.

6.76.5 Example response

```
{
  "@odata.type": "#MemoryChunks.v1_6_2.MemoryChunks",
  "Name": "Memory Chunk - Whole System",
  "Id": "1",
  "MemoryChunkSizeMiB": 32768,
```

```

    "AddressRangeType": "Volatile",
    "IsMirrorEnabled": false,
    "IsSpare": false,
    "InterleaveSets": [
      {
        "Memory": {
          "@odata.id": "/redfish/v1/Systems/2/Memory/1"
        }
      },
      {
        "Memory": {
          "@odata.id": "/redfish/v1/Systems/2/Memory/2"
        }
      },
      {
        "Memory": {
          "@odata.id": "/redfish/v1/Systems/2/Memory/3"
        }
      },
      {
        "Memory": {
          "@odata.id": "/redfish/v1/Systems/2/Memory/4"
        }
      }
    ],
    "@Redfish.Settings": {
      "@odata.type": "#Settings.v1_4_0.Settings",
      "SettingsObject": {
        "@odata.id": "/redfish/v1/Systems/2/MemoryDomains/1/MemoryChunks/1/SD"
      },
      "Time": "2012-03-07T14:44.30-05:00",
      "ETag": "someetag",
      "Messages": [
        {
          "MessageId": "Base.1.0.Success"
        }
      ]
    },
    "@odata.id": "/redfish/v1/Systems/2/MemoryDomains/1/MemoryChunks/1"
  }

```

6.77 MemoryDomain 1.5.1

Version	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2022.3	2022.1	2019.4	2017.1	2016.3	2016.2

6.77.1 Description

The `MemoryDomain` schema describes a memory domain and its configuration. Memory domains indicate to the client which memory, or DIMMs, can be grouped together in memory chunks to represent addressable memory.

- This resource shall represent memory domains in a Redfish implementation.

6.77.2 URIs

`/redfish/v1/Chassis/{ChassisId}/MemoryDomains/{MemoryDomainId}`

`/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/MemoryDomains/{MemoryDomainId}`

`/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/MemoryDomains/{MemoryDomainId}`

`/redfish/v1/Systems/{ComputerSystemId}/MemoryDomains/{MemoryDomainId}`

6.77.3 Properties

Property	Type	Attributes	Notes
AllowsBlockProvisioning	boolean	<i>read-only</i> (null)	An indication of whether this memory domain supports the provisioning of blocks of memory. • This property shall indicate whether this memory domain supports the creation of blocks of memory.
AllowsMemoryChunkCreation	boolean	<i>read-only</i> (null)	An indication of whether this memory domain supports the creation of memory chunks. • This property shall indicate whether this memory domain supports the creation of memory chunks.
AllowsMirroring (v1.1+)	boolean	<i>read-only</i> (null)	An indication of whether this memory domain supports the creation of memory chunks with mirroring enabled. • This property shall indicate whether this memory domain supports the creation of memory chunks with mirroring enabled.
AllowsSparing (v1.1+)	boolean	<i>read-only</i> (null)	An indication of whether this memory domain supports the creation of memory chunks with sparing enabled. • This property shall indicate whether this memory domain supports the creation of memory chunks with sparing enabled.
InterleavableMemorySets [{	array		The interleave sets for the memory chunk. • This property shall represent the interleave sets for the memory chunk.

Property	Type	Attributes	Notes
MemorySet [{	array		The set of memory for a particular interleave set. This property shall contain an array of links to resources of type <code>Memory</code>.
@odata.id	string	<i>read-only</i>	Link to a Memory resource. See the Links section and the <i>Memory</i> schema for details.
}]			
}]			
Links (v1.3+) {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
CXLLogicalDevices (v1.5+) [{	array		An array of links to the CXL logical devices associated with this memory domain. This property shall contain an array of links to resources of type <code>CXLLogicalDevice</code> that represent the CXL logical devices that are associated with this memory domain.
@odata.id	string	<i>read-only</i>	Link to a CXLLogicalDevice resource. See the Links section and the <i>CXLLogicalDevice</i> schema for details.
}]			
FabricAdapters (v1.5+) [{	array		An array of links to the fabric adapters that present this memory domain to a fabric. This property shall contain an array of links to resources of type <code>FabricAdapter</code> that represent the fabric adapters that present this memory domain to a fabric.
@odata.id	string	<i>read-only</i>	Link to a FabricAdapter resource. See the Links section and the <i>FabricAdapter</i> schema for details.
}]			
MediaControllers (v1.3+, deprecated v1.4) [{	array		An array of links to the media controllers for this memory domain. This property shall contain an array of links to resources of type <code>MediaController</code> that are associated with this memory domain. <i>Deprecated in v1.4 and later. This property has been deprecated in favor of the <i>FabricAdapters</i> property.</i>
@odata.id	string	<i>read-only</i>	Link to a MediaController resource. See the Links section and the <i>MediaController</i> schema for details.

Property	Type	Attributes	Notes
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCleFunctions (v1.5+) [{}	array		An array of links to the PCIe functions representing this memory domain. This property shall contain an array of links to resources of type <code>PCleFunction</code> that represent the PCIe functions representing this memory domain.
@odata.id	string	<i>read-only</i>	Link to a PCleFunction resource. See the Links section and the <i>PCleFunction</i> schema for details.
}]			
}			
MemoryChunkIncrementMiB (v1.5+)	integer (mebibytes)	<i>read-only (null)</i>	The incremental size, from the minimum size, allowed for a memory chunk within this domain in mebibytes (MiB). This property shall contain the incremental size, from <code>MemoryChunkIncrementMiB</code>, allowed for a memory chunk within this domain in mebibytes (MiB).
MemoryChunks {	object		The link to the collection of memory chunks associated with this memory domain. This property shall contain a link to a resource collection of type <code>MemoryChunksCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>MemoryChunks</i> . See the MemoryChunks schema for details.
}			
MemorySizeMiB (v1.5+)	integer (mebibytes)	<i>read-only (null)</i>	The total size of the memory domain in mebibytes (MiB). This property shall contain the total size of the memory domain in mebibytes (MiB).
MinMemoryChunkSizeMiB (v1.5+)	integer (mebibytes)	<i>read-only (null)</i>	The minimum size allowed for a memory chunk within this domain in mebibytes (MiB). This property shall contain the minimum size allowed for a memory chunk within this domain in mebibytes (MiB).

Property	Type	Attributes	Notes
Status (v1.5+) {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

6.77.4 Example response

```
{
  "@odata.type": "#MemoryDomain.v1_5_1.MemoryDomain",
  "Name": "Memory Domain - Whole System Mirroring Only",
  "Id": "1",
  "MemoryChunks": {
    "@odata.id": "/redfish/v1/Systems/4/MemoryDomains/1/MemoryChunks"
  },
  "AllowsMemoryChunkCreation": false,
  "AllowsBlockProvisioning": false,
  "InterleavableMemorySets": [
    {
      "MemorySet": [
        {
          "@odata.id": "/redfish/v1/Systems/2/Memory/1"
        },
        {
          "@odata.id": "/redfish/v1/Systems/2/Memory/2"
        },
        {
          "@odata.id": "/redfish/v1/Systems/2/Memory/3"
        },
        {
          "@odata.id": "/redfish/v1/Systems/2/Memory/4"
        }
      ]
    }
  ],
  "@odata.id": "/redfish/v1/Systems/2/MemoryDomains/1"
}
```

6.78 MemoryMetrics 1.7.3

Version	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2023.1	2022.3	2022.1	2020.3	2020.1	2019.2	2016.2	2016.1

6.78.1 Description

The `MemoryMetrics` schema contains usage and health statistics for a memory device or system memory summary.

- This resource shall represent the memory metrics for a memory device or system memory summary in a Redfish implementation.

6.78.2 URIs

```
/redfish/v1/Chassis/{ChassisId}/Memory/{MemoryId}/MemoryMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Memory/{MemoryId}/MemoryMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/MemorySummary/
MemoryMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Memory/
{MemoryId}/MemoryMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/
MemorySummary/MemoryMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/
{ProcessorId}/MemorySummary/MemoryMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Memory/{MemoryId}/MemoryMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/MemorySummary/MemoryMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Memory/{MemoryId}/MemoryMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/MemorySummary/MemoryMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/
MemorySummary/MemoryMetrics
/redfish/v1/Systems/{ComputerSystemId}/Memory/{MemoryId}/MemoryMetrics
/redfish/v1/Systems/{ComputerSystemId}/MemorySummary/MemoryMetrics
/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/CacheMemory/{MemoryId}/MemoryMetrics
/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/MemorySummary/MemoryMetrics
```

6.78.3 Properties

Property	Type	Attributes	Notes
BandwidthPercent (v1.2+)	number (%)	<i>read-only</i> (null)	The memory bandwidth utilization as a percentage. This property shall contain memory bandwidth utilization as a percentage. When this resource is subordinate to the <code>MemorySummary</code> object, this property shall be the memory bandwidth utilization over all memory as a percentage, typically 0 to 100.

Property	Type	Attributes	Notes
BlockSizeBytes	integer (bytes)	<i>read-only</i> (null)	The block size, in bytes. This property shall contain the block size, in bytes, of all structure elements. When this resource is subordinate to the <code>MemorySummary</code> object, this property is not applicable.
CapacityUtilizationPercent (v1.7+)	number (%)	<i>read-only</i> (null)	The memory capacity utilization as a percentage. This property shall contain the memory capacity utilization as a percentage, typically 0 to 100. When this resource is subordinate to the <code>MemorySummary</code> object, this property shall be the memory capacity utilization over all memory as a percentage.
CorrectedPersistentErrorCount (v1.6+)	integer	<i>read-only</i> (null)	The number of corrected errors in persistent memory. This property shall contain the number of corrected errors in persistent memory.
CorrectedVolatileErrorCount (v1.6+)	integer	<i>read-only</i> (null)	The number of corrected errors in volatile memory. This property shall contain the number of corrected errors in volatile memory.
CurrentPeriod {	object		The memory metrics since the last reset or <code>ClearCurrentPeriod</code> action. This property shall contain properties that describe the memory metrics for the current period.
BlocksRead	integer	<i>read-only</i> (null)	The number of blocks read since reset. This property shall contain the number of blocks read since reset. When this resource is subordinate to the <code>MemorySummary</code> object, this property shall be the sum of BlocksRead over all memory.
BlocksWritten	integer	<i>read-only</i> (null)	The number of blocks written since reset. This property shall contain the number of blocks written since reset. When this resource is subordinate to the <code>MemorySummary</code> object, this property shall be the sum of BlocksWritten over all memory.

Property	Type	Attributes	Notes
CorrectableECCErrorCount (v1.4+)	integer	<i>read-only</i> (null)	The number of correctable errors since reset. This property shall contain the number of correctable errors since reset. When this resource is subordinate to the <code>MemorySummary</code> object, this property shall be the sum of <code>CorrectableECCErrorCount</code> over all memory.
IndeterminateCorrectableErrorCount (v1.5+)	integer	<i>read-only</i> (null)	The number of indeterminate correctable errors since reset. This property shall contain the number of indeterminate correctable errors since reset. Since the error origin is indeterminate, the same error can be duplicated across multiple <code>MemoryMetrics</code> resources. When this resource is subordinate to the <code>MemorySummary</code> object, this property shall be the sum of indeterminate correctable errors across all memory without duplication, which may not be the sum of all <code>IndeterminateCorrectableErrorCount</code> properties over all memory.
IndeterminateUncorrectableErrorCount (v1.5+)	integer	<i>read-only</i> (null)	The number of indeterminate uncorrectable errors since reset. This property shall contain the number of indeterminate uncorrectable errors since reset. Since the error origin is indeterminate, the same error can be duplicated across multiple <code>MemoryMetrics</code> resources. When this resource is subordinate to the <code>MemorySummary</code> object, this property shall be the sum of indeterminate uncorrectable errors across all memory without duplication, which may not be the sum of all <code>IndeterminateUncorrectableErrorCount</code> properties over all memory.
UncorrectableECCErrorCount (v1.4+)	integer	<i>read-only</i> (null)	The number of uncorrectable errors since reset. This property shall contain the number of uncorrectable errors since reset. When this resource is subordinate to the <code>MemorySummary</code> object, this property shall be the sum of <code>UncorrectableECCErrorCount</code> over all memory.
}			
CXL (v1.6+) {	object		The memory metrics specific to CXL devices. This property shall contain the memory metrics specific to CXL devices.

Property	Type	Attributes	Notes
AlertCapabilities (v1.6+) {	object	(null)	The conditions that would generate an alert to the CXL Fabric Manager or host. This property shall contain the conditions that would generate an alert to the CXL Fabric Manager or host.
CorrectableECCErrors (v1.6+)	boolean	read-only (null)	Indicates whether correctable ECC errors generate an alert to the CXL Fabric Manager or host. This property shall indicate whether correctable ECC errors generate an alert to the CXL Fabric Manager or host.
SpareBlock (v1.6+)	boolean	read-only (null)	Indicates whether spare block conditions generate an alert to the CXL Fabric Manager or host. This property shall indicate whether spare block conditions generate an alert to the CXL Fabric Manager or host.
Temperature (v1.6+)	boolean	read-only (null)	Indicates whether temperature conditions generate an alert to the CXL Fabric Manager or host. This property shall indicate whether temperature conditions generate an alert to the CXL Fabric Manager or host.
UncorrectableECCErrors (v1.6+)	boolean	read-only (null)	Indicates whether uncorrectable ECC errors generate an alert to the CXL Fabric Manager or host. This property shall indicate whether uncorrectable ECC errors generate an alert to the CXL Fabric Manager or host.
}			
}			
DirtyShutdownCount (v1.6+)	integer	read-only (null)	The number of shutdowns while outstanding writes have not completed to persistent memory. This property shall contain the number of shutdowns while outstanding writes have not completed to persistent memory.
HealthData {	object		The health information of the memory. This property shall contain properties that describe the health data memory metrics for the memory.

Property	Type	Attributes	Notes
AlarmTrips {	object		Alarm trip information about the memory. This object shall contain properties describe the types of alarms that have been raised by the memory. When this resource is subordinate to the <code>MemorySummary</code> object, this property shall indicate whether an alarm of a given type have been raised by any area of memory.
AddressParityError	boolean	<i>read-only</i> (null)	An indication of whether an address parity error was detected that a retry could not correct. This property shall indicate whether an address parity error was detected that a retry could not correct.
CorrectableECCError	boolean	<i>read-only</i> (null)	An indication of whether the correctable error threshold crossing alarm trip was detected. This property shall indicate whether the correctable error threshold crossing alarm trip was detected.
SpareBlock	boolean	<i>read-only</i> (null)	An indication of whether the spare block capacity crossing alarm trip was detected. This property shall indicate whether the spare block capacity crossing alarm trip was detected.
Temperature	boolean	<i>read-only</i> (null)	An indication of whether a temperature threshold alarm trip was detected. This property shall indicate whether a temperature threshold alarm trip was detected.
UncorrectableECCError	boolean	<i>read-only</i> (null)	An indication of whether the uncorrectable error threshold alarm trip was detected. This property shall indicate whether the uncorrectable error threshold alarm trip was detected.
}			
DataLossDetected	boolean	<i>read-only</i> (null)	An indication of whether data loss was detected. This property shall indicate whether data loss was detected. When this resource is subordinate to the <code>MemorySummary</code> object, this property shall indicate whether any data loss was detected in any area of memory.

Property	Type	Attributes	Notes
LastShutdownSuccess	boolean	<i>read-only</i> (null)	An indication of whether the last shutdown succeeded. This property shall indicate whether the last shutdown succeeded.
PerformanceDegraded	boolean	<i>read-only</i> (null)	An indication of whether performance has degraded. This property shall indicate whether performance has degraded. When this resource is subordinate to the <code>MemorySummary</code> object, this property shall indicate whether degraded performance mode status is detected in any area of memory.
PredictedMediaLifeLeftPercent (v1.1+)	number (%)	<i>read-only</i> (null)	The percentage of reads and writes that are predicted to still be available for the media. This property shall contain an indicator of the percentage, 0 to 100, of life remaining in the media.
RemainingSpareBlockPercentage	number (%)	<i>read-only</i> (null)	The remaining spare blocks, as a percentage. This property shall contain the remaining spare blocks as a percentage, 0 to 100. When this resource is subordinate to the <code>MemorySummary</code> object, this property shall be the <code>RemainingSpareBlockPercentage</code> over all memory.
}			
LifeTime {	object		The memory metrics for the lifetime of the memory. This property shall contain properties that describe the memory metrics for the lifetime of the memory.
BlocksRead	integer	<i>read-only</i> (null)	The number of blocks read for the lifetime of the memory. This property shall contain the number of blocks read for the lifetime of the memory. When this resource is subordinate to the <code>MemorySummary</code> object, this property shall be the sum of <code>BlocksRead</code> over all memory.
BlocksWritten	integer	<i>read-only</i> (null)	The number of blocks written for the lifetime of the memory. This property shall contain the number of blocks written for the lifetime of the memory. When this resource is subordinate to the <code>MemorySummary</code> object, this property shall be the sum of <code>BlocksWritten</code> over all memory.

Property	Type	Attributes	Notes
CorrectableECCErrorCount (v1.4+)	integer	<i>read-only</i> (null)	The number of correctable errors for the lifetime of the memory. This property shall contain the number of correctable errors for the lifetime of the memory. When this resource is subordinate to the <code>MemorySummary</code> object, this property shall be the sum of <code>CorrectableECCErrorCount</code> over all memory.
IndeterminateCorrectableErrorCount (v1.5+)	integer	<i>read-only</i> (null)	The number of indeterminate correctable errors for the lifetime of the memory. This property shall contain the number of indeterminate correctable errors for the lifetime of the memory. Since the error origin is indeterminate, the same error can be duplicated across multiple <code>MemoryMetrics</code> resources. When this resource is subordinate to the <code>MemorySummary</code> object, this property shall be the sum of indeterminate correctable errors across all memory without duplication, which may not be the sum of all <code>IndeterminateCorrectableErrorCount</code> properties over all memory.
IndeterminateUncorrectableErrorCount (v1.5+)	integer	<i>read-only</i> (null)	The number of indeterminate uncorrectable errors for the lifetime of the memory. This property shall contain the number of indeterminate uncorrectable errors for the lifetime of the memory. Since the error origin is indeterminate, the same error can be duplicated across multiple <code>MemoryMetrics</code> resources. When this resource is subordinate to the <code>MemorySummary</code> object, this property shall be the sum of indeterminate uncorrectable errors across all memory without duplication, which may not be the sum of all <code>IndeterminateUncorrectableErrorCount</code> properties over all memory.
UncorrectableECCErrorCount (v1.4+)	integer	<i>read-only</i> (null)	The number of uncorrectable errors for the lifetime of the memory. This property shall contain the number of uncorrectable errors for the lifetime of the memory. When this resource is subordinate to the <code>MemorySummary</code> object, this property shall be the sum of <code>UncorrectableECCErrorCount</code> over all memory.
}			

Property	Type	Attributes	Notes
OperatingSpeedMHz (v1.3+)	integer (MHz)	read-only (null)	Operating speed of memory in MHz or MT/s as appropriate. This property shall contain the operating speed of memory in MHz or MT/s (mega-transfers per second) as reported by the memory device. Memory devices that operate at their bus speed shall report the operating speed in MHz (bus speed), while memory devices that transfer data faster than their bus speed, such as DDR memory, shall report the operating speed in MT/s (mega-transfers/second). The reported value shall match the conventionally reported values for the technology used by the memory device.

6.78.4 Actions

6.78.4.1 ClearCurrentPeriod

Description

This action sets the `CurrentPeriod` property's values to 0.

- This action shall set the `CurrentPeriod` property's values to 0.

Action URI

`{Base URI of target resource}/Actions/MemoryMetrics.ClearCurrentPeriod`

Action parameters

This action takes no parameters.

6.78.5 Example response

```
{
  "@odata.type": "#MemoryMetrics.v1_7_3.MemoryMetrics",
  "Name": "Memory Metrics",
  "Id": "Metrics",
  "BlockSizeBytes": 4096,
  "CurrentPeriod": {
    "BlocksRead": 0,
    "BlocksWritten": 0
  },
  "LifeTime": {
```



```
      "BlocksRead": 0,
      "BlocksWritten": 0
    },
    "HealthData": {
      "RemainingSpareBlockPercentage": 50,
      "LastShutdownSuccess": true,
      "DataLossDetected": false,
      "PerformanceDegraded": false,
      "AlarmTrips": {
        "Temperature": true,
        "SpareBlock": false,
        "UncorrectableECCError": false,
        "CorrectableECCError": false
      }
    },
    "Actions": {
      "#MemoryMetrics.ClearCurrentPeriod": {
        "target": "/redfish/v1/Systems/1/Memory/1/Actions/MemoryMetrics.ClearCurrentPeriod"
      }
    },
    "@odata.id": "/redfish/v1/Systems/1/Memory/1/MemoryMetrics"
  }
}
```

6.79 MemoryRegion 1.0.3

Version	v1.0
Release	2023.2

6.79.1 Description

The `MemoryRegion` schema contains the definition of a memory region and its configuration.

- This resource shall represent a memory region in a Redfish implementation.

6.79.2 URIs

`/redfish/v1/Chassis/{ChassisId}/PCleDevices/{PCleDeviceId}/CXLLogicalDevices/{CXLLogicalDeviceId}/MemoryRegions/{MemoryRegionId}`

6.79.3 Properties

Property	Type	Attributes	Notes
BlockSizeMiB	integer (mebibytes)	<i>read-write</i>	The memory region block size in mebibytes (MiB). This property shall contain the memory region block size in mebibytes (MiB). The region size, base offset, all extent sizes, and all extent base offsets shall be aligned to this block size.
ExtentsCount	integer	<i>read-only</i> (null)	The number of extents defined for this memory region. This property shall contain the number of extents defined for this memory region.
HardwareManagedCoherencyRegion	boolean	<i>read-only</i> (null)	An indication of whether the device manages the cache coherency across hosts for this memory region. This property shall indicate whether the device manages the cache coherency across hosts and thereby ensures that each host has a consistent view of this memory region content as defined in the 'Flags' field of 'Device Scoped Memory Affinity Structure' defined in the Coherent Device Attribute Table (CDAT) Specification.
MemoryChunks [{	array		The set of memory chunks providing capacity for this memory region. This property shall contain the set of memory chunks providing capacity for this memory region.
ChunkLink {	object		The link to the memory chunk providing capacity to the memory region. This property shall contain a link to a resource of type <code>MemoryChunks</code> that provides capacity to the memory region. See the <i>MemoryChunks</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>MemoryChunks</i> resource. See the Links section and the <i>MemoryChunks</i> schema for details.
}			
ChunkOffsetMiB	integer (mebibytes)	<i>read-only</i>	Offset of the memory chunk within the memory region in mebibytes (MiB). The value of this property shall be the offset of the memory chunk within the memory region in mebibytes (MiB).
}]			

Property	Type	Attributes	Notes
MemoryExtents [{	array		The set of memory extents defined for this memory region. This property shall contain the set of memory extents defining address ranges available for an access in dynamic capacity memory regions.
ExtentOffsetMiB	integer (mebibytes)	<i>read-only</i>	Offset of the memory extent within the memory region in mebibytes (MiB). The value of this property shall be the offset of the memory extent within the memory region in mebibytes (MiB).
ExtentSizeMiB	integer (mebibytes)	<i>read-only</i>	Size of the memory extent in mebibytes (MiB). This property shall contain the size of the memory extent in MiB.
SequenceNumber	integer	<i>read-only</i> (null)	The memory extent sequence number. This property shall contain the sequence number instructing host on the relative order the extents have to be placed in the host adjacent virtual address space.
Tag	string	<i>read-only</i>	The tag of this memory extent. This property shall contain an opaque context attached to each extent to track usage of each extent or map extent to specific processes, transactions, or workloads on the host.
}]			
NonVolatileRegion	boolean	<i>read-only</i> (null)	An indication of whether this memory region represents non-volatile memory. This property shall indicate whether this memory region represents non-volatile memory as defined in the 'Flags' field of 'Device Scoped Memory Affinity Structure' defined in the Coherent Device Attribute Table (CDAT) Specification.
RegionBaseOffsetMiB	integer (mebibytes)	<i>read-only</i>	The offset of the memory region in the device address range in mebibytes (MiB). The value of this property shall contain the offset of the memory region in the device address range in mebibytes (MiB).
RegionNumber	integer	<i>read-only</i>	The memory region number. This property shall contain the memory region number.

Property	Type	Attributes	Notes
RegionSizeMiB	integer (mebibytes)	<i>read-only</i>	The size of the memory region in mebibytes (MiB). This property shall contain the size of the memory region in mebibytes (MiB).
RegionType	string (enum)	<i>read-only required</i>	The type of memory region. This property shall contain the type of memory region. <i>For the possible property values, see RegionType in Property details.</i>
SanitizeOnRelease	boolean	<i>read-write (null)</i>	An indication of whether the capacity released from this memory region will be sanitized before it is made available to any host. This property shall indicate whether the device has been configured such that capacity released from this memory region will be sanitized before it is made available to any host.
ShareableRegion	boolean	<i>read-only (null)</i>	An indication of whether this memory region can be shared across multiple hosts. This property shall indicate whether this memory region can be shared across multiple hosts as defined in the 'Flags' field of 'Device Scoped Memory Affinity Structure' defined in the Coherent Device Attribute Table (CDAT) Specification.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

6.79.4 Property details

6.79.4.1 RegionType

The type of memory region.

- This property shall contain the type of memory region.

string	Description
Dynamic	Dynamic memory region. The address range coverage may be changed in the runtime.
Static	Static memory region. The whole address range is always covered by memory.

6.79.5 Example response

```
{
  "@odata.type": "#MemoryRegion.v1_0_3.MemoryRegion",
  "Id": "1",
  "Name": "Dynamic Memory Region 1",
  "Description": "CXL Dynamic Memory Region 1 of LD 1 in Device 1",
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "HealthRollup": "OK"
  },
  "RegionType": "Dynamic",
  "RegionNumber": 0,
  "RegionBaseOffsetMiB": 0,
  "RegionSizeMiB": 65536,
  "ShareableRegion": false,
  "SanitizeOnRelease": true,
  "BlockSizeMiB": 128,
  "ExtentsCount": 1,
  "MemoryExtents": [
    {
      "ExtentOffsetMiB": 0,
      "ExtentSizeMiB": 4096,
      "Tag": "User Defined Tag",
      "SequenceNumber": 0
    }
  ],
  "MemoryChunks": [
    {
      "ChunkOffsetMiB": 0,
      "ChunkLink": {
        "@odata.id": "/redfish/v1/Chassis/1/MemoryDomains/1/MemoryChunks/1"
      }
    }
  ],
  "@odata.id": "/redfish/v1/Chassis/1/PCIeDevices/1/CXLLogicalDevices/1/MemoryRegions/1"
}
```

6.80 MessageRegistry 1.6.3

Version	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2022.3	2021.3	2020.1	2019.1	2018.2	2017.1	1.0

6.80.1 Description

The `MessageRegistry` schema describes all message registries. It represents the properties for the message registries themselves.

- This resource shall represent a message registry for a Redfish implementation.

6.80.2 Properties

Property	Type	Attributes	Notes
Language	string	<i>read-only required</i>	The RFC5646-conformant language code for the message registry. This property shall contain an RFC5646-conformant language code.
Messages {	object	<i>required</i>	The message keys contained in the message registry. This property shall contain the message keys contained in the message registry. The message keys are the suffix of the <code>MessageId</code> and shall be unique within this message registry.
(pattern) {	object		Property names follow regular expression pattern "[A-Za-z0-9]+"
ArgDescriptions (v1.3+) []	array (string, null)	<i>read-only</i>	The <code>MessageArgs</code> descriptions, in order, used for this message. This property shall contain an ordered array of text describing each argument used as substitution in the message.
ArgLongDescriptions (v1.3+) []	array (string, null)	<i>read-only</i>	The <code>MessageArgs</code> normative descriptions, in order, used for this message. This property shall contain an ordered array of normative language for each argument used as substitution in the message.
ClearingLogic (v1.2+) {	object		The clearing logic associated with this message. The properties within indicate the events, specified by message keys for other messages in this registry, that are cleared by this message with optional conditions. This property shall contain the clearing logic associated with this message. Clearing in this context deasserts the event rather than removes the event from a log.

Property	Type	Attributes	Notes
ClearsAll (v1.2+)	boolean	<i>read-only</i> (null)	Indicates whether all logged events containing messages from this message registry are cleared when this message is received. If conditional properties are present, such as the <code>ClearsIf</code> property, the specified conditions shall be required to clear the logged events. This property shall indicate whether all logged events containing messages from this message registry are cleared when this message is received. If conditional properties are present, such as the <code>ClearsIf</code> property, the specified conditions are required to clear the logged events.
ClearsIf (v1.2+)	string (enum)	<i>read-only</i> (null)	The condition required to clear the logged events specified by other properties in this object when this message is received. This property shall contain the condition required to clear the logged events specified by other properties in this object when this message is received. If not present, no condition is checked prior to clearing logged events when this message is received. <i>For the possible property values, see <code>ClearsIf</code> in Property details.</i>
ClearsMessage (v1.2+) []	array (string, null)	<i>read-only</i>	An array of message keys for logged events that are cleared when this message is received. If conditional properties are present, such as the <code>ClearsIf</code> property, the specified conditions are required to clear the logged events with these message keys. This property shall contain an array of message keys for logged events that are cleared when this message is received. If conditional properties are present, such as the <code>ClearsIf</code> property, the specified conditions shall be required to clear the logged events with these message keys. This property shall contain message keys, without message registry names and versions, as defined in the 'MessageId format' clause of the Redfish Specification. This property shall not reference message keys in other message registries.
}			
Deprecated (v1.5+)	string	<i>read-only</i> (null)	The reason the message has been deprecated. This property shall indicate that a message is deprecated. The value of the string should explain the deprecation, including reference to a new message or messages to be used. The message can be supported in new and existing implementations, but usage in new implementations is discouraged. Deprecated messages are likely to be removed in a future major version of the message registry. The <code>ReplacedBy</code> property may be used to provide a reference to a replacement message definition.

Property	Type	Attributes	Notes
Description	string	<i>read-only required</i>	A short description of how and when to use this message. This property shall indicate how and when this message is returned by the Redfish service.
LongDescription (v1.3+)	string	<i>read-only (null)</i>	The normative language that describes this message's usage. This property shall contain the normative language that describes this message's usage in a Redfish implementation.
MapsToGeneralMessages (v1.6+) []	array (string, null)	<i>read-only</i>	The general or less-specific messages related to this message. This property shall indicate that this message maps to general or less-specific messages that duplicates information about the condition that generated this message. Services may issue the referenced messages along with this message to provide consistency for clients. The array shall contain <code>MessageRegistryPrefix.MessageKey</code> formatted values that describe the message registry and message key used to identify the messages. Pattern: <code>^[A-Z]\w+\.[A-Z]\w+\$</code>
Message	string	<i>read-only required</i>	The actual message. This property shall contain the message to display. If a %integer is included in part of the string, it shall represent a string substitution for any <code>MessageArgs</code> that accompany the message, in order.
MessageSeverity (v1.4+)	string (enum)	<i>read-only required (null)</i>	The severity of the message. This property shall contain the severity of the message. Services can replace the severity defined in the message registry with a value more applicable to the implementation in message payloads and event payloads. <i>For the possible property values, see MessageSeverity in Property details.</i>
NumberOfArgs	integer	<i>read-only required</i>	The number of arguments in the message. This property shall contain the number of arguments that are substituted for the locations marked with % in the message.
Oem {}	object		See the OEM object definition in the Using this guide clause.
ParamTypes []	array (string (enum))	<i>read-only</i>	- The data types of the message arguments, prior to conversion to strings for inclusion in a message. - This property shall contain an ordered array of the data types of the values in <code>MessageArgs</code>, prior to their conversion to strings for inclusion in a message. <i>For the possible property values, see ParamTypes in Property details.</i>

Property	Type	Attributes	Notes
ReplacedBy (v1.6+)	string	<i>read-only (null)</i>	The message identifier that replaces this message. This property shall contain the message registry and message key, in the <code>MessageRegistryPrefix.MessageKey</code> format, that identifies the message that replaces this message. This property may be used to indicate replacement for a deprecated message, including cases where a standardized version replaces an OEM-created message. Pattern: <code>^[A-Z]\w+\.[A-Z]\w+\$</code>
Resolution	string	<i>read-only required</i>	Used to provide suggestions on how to resolve the situation that caused the error. This property shall contain the resolution of the message. Services can replace the resolution defined in the message registry with a more specific resolution in message payloads.
Severity (deprecated v1.4)	string	<i>read-only required</i>	The severity of the message. This property shall contain the severity of the condition resulting in the message, as defined in the 'Status' clause of the Redfish Specification. Services can replace the severity defined in the message registry with a value more applicable to the implementation in message payloads and event payloads. <i>Deprecated in v1.4 and later. This property has been deprecated in favor of <code>MessageSeverity</code>, which ties the values to the enumerations defined for the <code>Health</code> property within <code>Status</code>.</i>
VersionAdded (v1.5+)	string	<i>read-only (null)</i>	The registry version which added this message. This property shall contain the version of the message registry when the message was added. This property shall not appear for messages created at version <code>1.0.0</code> of a message registry. Pattern: <code>^\d+\.\d+\.\d+\$</code>
VersionDeprecated (v1.5+)	string	<i>read-only (null)</i>	The registry version when the message was deprecated. This property shall contain the version of the registry when the message was deprecated. This property shall not appear if the message has not been deprecated. Pattern: <code>^\d+\.\d+\.\d+\$</code>
}			
}			
OwningEntity	string	<i>read-only required</i>	The organization or company that publishes this message registry. This property shall represent the publisher of this message registry.

Property	Type	Attributes	Notes
RegistryPrefix	string	<i>read-only required</i>	The single-word prefix that is used in forming and decoding <code>MessageId</code> values. This property shall contain the Redfish Specification-defined prefix used in forming and decoding <code>MessageId</code> values that uniquely identifies all messages that belong to this message registry.
RegistryVersion	string	<i>read-only required</i>	The message registry version in the middle portion of a <code>MessageId</code>. This property shall contain the version of this message registry. Pattern: <code>^\d+\.\d+\.\d+\$</code>

6.80.3 Property details

6.80.3.1 ClearsIf

The condition required to clear the logged events specified by other properties in this object when this message is received.

- This property shall contain the condition required to clear the logged events specified by other properties in this object when this message is received. If not present, no condition is checked prior to clearing logged events when this message is received.

string	Description
SameOriginOfCondition	Indicates that a logged event is cleared by a message if the <code>OriginOfCondition</code> for both events are the same. This value shall indicate that a logged event is cleared by a message if the <code>OriginOfCondition</code> for both events are the same.

6.80.3.2 MessageSeverity

The severity of the message.

- This property shall contain the severity of the message. Services can replace the severity defined in the message registry with a value more applicable to the implementation in message payloads and event payloads.

string	Description
Critical	A critical condition requires immediate attention.

string	Description
OK	Normal.
Warning	A condition requires attention.

6.80.3.3 ParamTypes

- The data types of the message arguments, prior to conversion to strings for inclusion in a message.
 - This property shall contain an ordered array of the data types of the values in `MessageArgs`, prior to their conversion to strings for inclusion in a message.

string	Description
number	The argument is a number converted to a string.
string	The argument is a string.

6.80.4 Example response

```
{
  "@odata.type": "#MessageRegistry.v1_3_1.MessageRegistry",
  "Id": "Basic.1.2.0",
  "Name": "Simple Message Registry",
  "Language": "en",
  "Description": "Collection of Basic messages for numerous use cases",
  "RegistryPrefix": "Basic",
  "RegistryVersion": "1.2.0",
  "OwningEntity": "Contoso",
  "Messages": {
    "Success": {
      "Description": "Indicates that all conditions of a successful operation have been met.",
      "Message": "Successfully Completed Request",
      "Severity": "OK",
      "NumberOfArgs": 0,
      "Resolution": "None"
    },
    "GeneralError": {
      "Description": "Indicates that a general error has occurred.",
      "Message": "A general error has occurred. See ExtendedInfo for more information.",
      "Severity": "Critical",
      "NumberOfArgs": 0,
      "Resolution": "See ExtendedInfo for more information."
    },
    "ResourceAtUriUnauthorized": {
```

```

        "Description": "Indicates that the attempt to access the resource/file/image at the URI was
unauthorized.",
        "Message": "While accessing the resource at %1, the service received an authorization error
%2.",
        "Severity": "Critical",
        "NumberOfArgs": 2,
        "ParamTypes": [
            "string",
            "string"
        ],
        "Resolution": "Ensure that the appropriate access is provided for the service in order for it
to access the URI."
    }
}
}

```

6.81 MessageRegistryFile 1.1.5

Version	v1.1	v1.0
Release	2017.1	2016.1

6.81.1 Description

The `MessageRegistryFile` schema describes the registry file locator resource. This referenced registry file can be any type of registry, such as a message registry, privilege registry, or attribute registry.

- This resource shall represent the registry file locator for a Redfish implementation.

6.81.2 URIs

/redfish/v1/Registries/{MessageRegistryFileId}

6.81.3 Properties

Property	Type	Attributes	Notes
Languages []	array (string)	<i>read-only required</i>	The RFC5646-conformant language codes for the available registries. This property contains a set of RFC5646-conformant language codes.

Property	Type	Attributes	Notes
Location [{	array	<i>required</i>	The location information for this registry file. This property shall contain the location information for this registry file.
ArchiveFile	string	<i>read-only</i>	If the service hosts the registry in an archive file, the name of the file within the archive. This property shall contain the file name of the individual registry file within the archive file specified by the <code>ArchiveUri</code> property. The file name shall conform to the Redfish Specification-specified syntax.
ArchiveUri	string (URI)	<i>read-only</i>	If the registry is hosted on the service in an archive file, the link to the archive file. This property shall contain a URI that is colocated with the Redfish service that specifies the location of the registry file, which can be retrieved using the Redfish protocol and authentication methods. This property shall be used for only ZIP or other archive files. The <code>ArchiveFile</code> property shall contain the file name of the individual registry file within the archive file.
Language	string	<i>read-only</i>	The language code for the registry file. This property shall contain an RFC5646-conformant language code or <code>default</code>.
PublicationUri	string (URI)	<i>read-only</i>	The link to publicly available (canonical) URI for the registry. This property shall contain a URI not colocated with the Redfish service that specifies the canonical location of the registry file. This property shall be used for only individual registry files.
Uri	string (URI)	<i>read-only</i>	The link to locally available URI for the registry. This property shall contain a URI colocated with the Redfish service that specifies the location of the registry file, which can be retrieved using the Redfish protocol and authentication methods. This property shall be used for only individual registry files. The file name portion of the URI shall conform to Redfish Specification-specified syntax.
}]			
Registry	string	<i>read-only required</i>	The registry name and its major and minor versions. This registry can be any type of registry, such as a message registry, privilege registry, or attribute registry. This property shall contain the registry name and its major and minor versions, as defined by the Redfish Specification. This registry can be any type of registry, such as message registry, privilege registry, or attribute registry.

6.81.4 Example response

```
{
  "@odata.type": "#MessageRegistryFile.v1_1_5.MessageRegistryFile",
  "Id": "Base.1.0.0",
  "Name": "Base Message Registry File",
  "Description": "Base Message Registry File locations",
  "Languages": [
    "en"
  ],
  "Registry": "Base.1.0",
  "Location": [
    {
      "Language": "en",
      "ArchiveUri": "/FileRepo/Registries.gz",
      "PublicationUri": "https://redfish.contoso.org/registries/v1/Base.1.0.0.json",
      "ArchiveFile": "Base.1.0.0.json"
    },
    {
      "Language": "zh",
      "ArchiveUri": "/FileRepo/Registries.zh.gz",
      "PublicationUri": "https://redfish.contoso.org/registries/v1/zh/Base.1.0.0.zh.json",
      "ArchiveFile": "Base.1.0.0.zh.json"
    }
  ],
  "@odata.id": "/redfish/v1/Registries/Base.1.0.0"
}
```

6.82 MetricDefinition 1.3.5

Version	v1.3	v1.2	v1.1	v1.0
Release	2022.1	2021.1	2020.3	2018.2

6.82.1 Description

The `MetricDefinition` schema describes the metadata information for a metric.

- This resource shall contain the metadata information for a metric in a Redfish implementation.

6.82.2 URIs

`/redfish/v1/TelemetryService/MetricDefinitions/{MetricDefinitionId}`

6.82.3 Properties

Property	Type	Attributes	Notes
Accuracy	number	<i>read-only</i> (null)	The estimated percent error of measured versus actual values. This property shall contain the percent error +/- of the measured versus actual values. The property is not meaningful when the <code>MetricType</code> property is <code>Discrete</code>.
Calculable	string (enum)	<i>read-write</i> (null)	An indication of whether the metric can be used in a calculation. This property shall specify whether the metric can be used in a calculation. <i>For the possible property values, see <code>Calculable</code> in Property details.</i>
CalculationAlgorithm	string (enum)	<i>read-only</i> (null)	The calculation that is performed on a source metric to obtain the metric being defined. This property shall contain the calculation performed to obtain the metric. <i>For the possible property values, see <code>CalculationAlgorithm</code> in Property details.</i>
CalculationParameters [{	array		The metric properties that are part of a calculation that this metric definition defines. This property shall list the metric properties that are part of a calculation that this metric definition defines. This property should be present if <code>ImplementationType</code> contains <code>Synthesized</code> OR <code>Calculated</code>.
ResultMetric	string	<i>read-only</i> (null)	The URI with wildcards and property identifiers of the metric property that stores the result of the calculation. If the URI has wildcards, the wildcards are substituted as specified in the <code>Wildcards</code> property. This property shall contain a URI with wildcards and property identifiers of the metric property that stores the result of the calculation. A set of curly braces shall delimit each wildcard in the URI. The corresponding entry in the <code>Wildcard</code> property shall replace each wildcard. After each wildcard is replaced, it shall identify a resource property to which the metric definition applies. The property identifiers portion of the URI shall follow RFC6901-defined JSON pointer notation rules.

Property	Type	Attributes	Notes
SourceMetric	string	<i>read-only (null)</i>	The URI with wildcards and property identifiers of the metric property used as the input into the calculation. If the URI has wildcards, the wildcards are substituted as specified in the <code>Wildcards</code> property. This property shall contain a URI with wildcards and property identifiers of the metric property used as the input into the calculation. A set of curly braces shall delimit each wildcard in the URI. The corresponding entry in the <code>Wildcard</code> property shall replace each wildcard. After each wildcard is replaced, it shall identify a resource property to which the metric definition applies. The property identifiers portion of the URI shall follow RFC6901-defined JSON pointer notation rules.
}]			
CalculationTimeInterval	string (duration)	<i>read-write (null)</i>	The time interval over which the metric calculation is performed. This property shall specify the time interval over the metric calculation is performed. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?</code>
Calibration	number	<i>read-only (null)</i>	The calibration offset added to the metric reading. This property shall contain the calibration offset added to the metric reading. The value shall have the units specified in the <code>Units</code> property. The property is not meaningful when the <code>MetricType</code> property is <code>Discrete</code>.
DiscreteValues []	array (string, null)	<i>read-write</i>	This array property specifies possible values of a discrete metric. The values of the property shall specify the possible values of the discrete metric. This property shall have values when the <code>MetricType</code> property is <code>Discrete</code>.
Implementation	string (enum)	<i>read-only (null)</i>	The implementation of the metric. This property shall specify the implementation of the metric. <i>For the possible property values, see Implementation in Property details.</i>
IsLinear	boolean	<i>read-write (null)</i>	An indication of whether the metric values are linear versus non-linear. This property shall indicate whether the metric values are linear versus non-linear. Linear metrics can use a greater than relation to compared them. An example of linear metrics include performance metrics. Examples of non-linear metrics include error codes.

Property	Type	Attributes	Notes
LogicalContexts (v1.3+) []	array (string (enum))	read-only	- The logical contexts related to the metric. - This property shall contain the logical contexts related to the metric. This property should be present when the <code>PhysicalContext</code> property does not provide complete information and additional context information is needed. For example, if the metric refers to capacity or performance. <i>For the possible property values, see LogicalContexts in Property details.</i>
MaxReadingRange	number	read-only (null)	Maximum value for metric reading. The value shall indicate the highest possible value for a related <code>MetricValue</code>. The value shall have the units specified in the property <code>Units</code>. The property is not meaningful when the <code>MetricType</code> property is <code>Discrete</code>.
MetricDataType	string (enum)	read-write (null)	The data type of the metric. This property shall specify the data-type of the metric. <i>For the possible property values, see MetricDataType in Property details.</i>
MetricProperties []	array (URI) (string, null)	read-write	The list of URIs with wildcards and property identifiers that this metric definition defines. If a URI has wildcards, the wildcards are substituted as specified in the <code>Wildcards</code> property. This array property shall list the URIs with wildcards and property identifiers that this metric defines. A set of curly braces shall delimit each wildcard in the URI. The corresponding entry in the <code>Wildcard</code> property shall replace each wildcard. After each wildcard is replaced, it shall identify a resource property to which the metric definition applies. The property identifiers portion of the URI shall follow RFC6901-defined JSON pointer notation rules. This property should not be present if <code>ImplementationType</code> contains <code>Synthesized</code> OR <code>Calculated</code>.
MetricType	string (enum)	read-write (null)	The type of metric. This property shall specify the type of metric. <i>For the possible property values, see MetricType in Property details.</i>
MinReadingRange	number	read-only (null)	Minimum value for metric reading. This property shall contain the lowest possible value for the metric reading. The value shall have the units specified in the property <code>Units</code>. The property is not meaningful when the <code>MetricType</code> property is <code>Discrete</code>.
OEMCalculationAlgorithm (v1.1+)	string	read-only (null)	The OEM-defined calculation that is performed on a source metric to obtain the metric being defined. This property shall contain the OEM-defined calculation performed to obtain the metric. This property shall be present if <code>CalculationAlgorithm</code> is <code>OEM</code>.

Property	Type	Attributes	Notes
PhysicalContext	string (enum)	<i>read-only</i> (null)	The physical context of the metric. This property shall contain the physical context of the metric. <i>For the possible property values, see PhysicalContext in Property details.</i>
Precision	integer	<i>read-only</i> (null)	Number of significant digits in the metric reading. This property shall specify the number of significant digits in the metric reading. The property is not meaningful when the <code>MetricType</code> property is <code>Discrete</code>.
SensingInterval	string (duration)	<i>read-write</i> (null)	The time interval between when a metric is updated. This property shall specify the time interval between when a metric is updated. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?</code>
TimestampAccuracy	string (duration)	<i>read-only</i> (null)	The accuracy of the timestamp. This property shall specify the expected + or - variability of the timestamp. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?</code>
Units	string	<i>read-write</i> (null)	The units of measure for this metric. This property shall specify the units of the metric. This property shall be consistent with the case-sensitive ('C/s' column) Unified Code for Units of Measure. Note: Not all units of measure are covered by UCUM.
Wildcards [{	array		The wildcards and their substitution values for the entries in the <code>MetricProperties</code> array property. The property shall contain a list of wildcards and their replacement strings, which are applied to the <code>MetricProperties</code> array property. Each wildcard shall have a corresponding entry in this array property.
Name	string	<i>read-only</i> (null)	The string used as a wildcard. This property shall contain the string used as a wildcard.
Values []	array (string, null)	<i>read-only</i>	An array of values to substitute for the wildcard. <code>*</code> indicates all possible values for the wildcard. This property shall contain the list of values to substitute for the wildcard. The value <code>*</code> shall indicate all possible values for the wildcard.
}]			

6.82.4 Property details

6.82.4.1 Calculable

An indication of whether the metric can be used in a calculation.

- This property shall specify whether the metric can be used in a calculation.

string	Description
NonCalculatable	No calculations should be performed on the metric reading.
NonSummable	The sum of the metric reading across multiple instances is not meaningful.
Summable	The sum of the metric reading across multiple instances is meaningful.

6.82.4.2 CalculationAlgorithm

The calculation that is performed on a source metric to obtain the metric being defined.

- This property shall contain the calculation performed to obtain the metric.

string	Description
Average	The metric is calculated as the average metric reading over a sliding time interval. The metric shall be calculated as the average metric reading over a sliding time interval. The time interval shall contain the <code>CalculationTimeInterval</code> property value.
Maximum	The metric is calculated as the maximum metric reading over during a time interval. The metric shall be calculated as the maximum metric reading over a sliding time interval. The time interval shall contain the <code>CalculationTimeInterval</code> property value.
Minimum	The metric is calculated as the minimum metric reading over a sliding time interval. The metric shall be calculated as the minimum metric reading over a sliding time interval. The time interval shall contain the <code>CalculationTimeInterval</code> property value.
OEM (v1.1+)	The metric is calculated as specified by an OEM. The metric shall be calculated as specified by an OEM. The <code>OEMCalculationAlgorithm</code> property shall contain the specific OEM calculation algorithm.

6.82.4.3 Implementation

The implementation of the metric.

- This property shall specify the implementation of the metric.

string	Description
Calculated	The metric is implemented by applying a calculation on another metric property. The calculation is specified in the <code>CalculationAlgorithm</code> property.
DigitalMeter	The metric is implemented as digital meter.
PhysicalSensor	The metric is implemented as a physical sensor.
Synthesized	The metric is implemented by applying a calculation on one or more metric properties. The calculation is not provided.

6.82.4.4 LogicalContexts

- The logical contexts related to the metric.
 - This property shall contain the logical contexts related to the metric. This property should be present when the `PhysicalContext` property does not provide complete information and additional context information is needed. For example, if the metric refers to capacity or performance.

string	Description
Capacity	Capacity-related logical context.
Environment	Environment-related logical context.
Network	Network-related logical context.
Performance	Performance-related logical context.
Security	Security-related logical context.
Storage	Storage-related logical context.

6.82.4.5 MetricDataType

The data type of the metric.

- This property shall specify the data-type of the metric.

string	Description
Boolean	The JSON boolean definition.
DateTime	The JSON string definition with the date-time format.
Decimal	The JSON decimal definition.
Enumeration	The JSON string definition with a set of defined enumerations.
Integer	The JSON integer definition.
String	The JSON string definition.

6.82.4.6 MetricType

The type of metric.

- This property shall specify the type of metric.

string	Description
Countdown	The metric is a countdown metric. The metric reading is a non-negative integer that decreases monotonically. When a counter reaches its minimum, the value resets to preset value and resumes counting down.
Counter	The metric is a counter metric. The metric reading is a non-negative integer that increases monotonically. When a counter reaches its maximum, the value resets to 0 and resumes counting.
Discrete	The metric is a discrete metric. The metric value is discrete. The possible values are listed in the <code>DiscreteValues</code> property. • The metric values shall indicate discrete states.
Gauge	The metric is a gauge metric. The metric value is a real number. When the metric value reaches the gauge's extrema, it stays at that value, until the reading falls within the extrema.
Numeric	The metric is a numeric metric. The metric value is any real number.
String (v1.2+)	The metric is a non-discrete string metric. The metric reading is a non-discrete string that displays some non-discrete, non-numeric data.

6.82.4.7 PhysicalContext

The physical context of the metric.

- This property shall contain the physical context of the metric.

string	Description
Accelerator	An accelerator.
ACInput	An AC electrical input or input-related circuit.
ACMaintenanceBypassInput	An AC electrical maintenance bypass input.
ACOutput	An AC electrical output or output-related circuit. This value shall indicate an electrical output or an output-related circuit, such as a branch output, which is not terminated as a power outlet.
ACStaticBypassInput	An AC electrical static bypass input.
ACUtilityInput	An AC electrical utility input. This value shall indicate an electrical input, where the source is an electrical utility as opposed to a backup or locally-generated power source. This value is intended to differentiate multiple electrical inputs between utility, maintenance bypass, or static bypass values. For general purpose usage, the value of <code>ACInput</code> is preferred.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	A compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC electrical bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	An expansion bay. This value shall indicate a location that provides for the expansion of functionality of a system, such as a PCIe slot that can accept an option card.

string	Description
ExpansionSubsystem	A group of expansion bays. This value shall indicate a group of expansion bays and the devices installed in those bays.
Fan	A fan.
Filter	A filter.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Manager	A management controller, such as a BMC (baseboard management controller).
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	A networking bay. This value shall indicate a location that provides for the expansion of networking functionality of a system, by the addition of networking devices.
NetworkingDevice	A networking device.
PowerOutlet	An electrical outlet. This value shall indicate an electrical outlet or receptacle.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	A power supply bay. This value shall indicate a location that provides for the installation of a power supply or similar devices.

string	Description
Pump	A pump.
Rectifier	A rectifier device.
Reservoir	A reservoir.
Room	The room.
StorageBay	A storage bay. This value shall indicate a location that provides for the expansion of storage functionality of a system, by the addition of storage devices.
StorageDevice	A storage device.
StorageSubsystem	A storage subsystem. This value shall indicate a storage subsystem, which may consist of one or more storage controllers, storage devices, or related components.
Switch	A switch device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.82.5 Example response

```
{
  "@odata.type": "#MetricDefinition.v1_3_5.MetricDefinition",
  "Id": "PowerConsumedWatts",
  "Name": "Power Consumed Watts Metric Definition",
  "MetricType": "Numeric",
  "Implementation": "PhysicalSensor",
  "PhysicalContext": "PowerSupply",
  "MetricDataType": "Decimal",
  "Units": "W",
```



```

    "Precision": 4,
    "Accuracy": 1,
    "Calibration": 2,
    "MinReadingRange": 0,
    "MaxReadingRange": 50,
    "SensingInterval": "PT1S",
    "TimestampAccuracy": "PT1S",
    "Wildcards": [
      {
        "Name": "ChassisID",
        "Values": [
          "1"
        ]
      }
    ],
    "MetricProperties": [
      "/redfish/v1/Chassis/{ChassisID}/Power#/PowerControl/0/PowerConsumedWatts"
    ],
    "@odata.id": "/redfish/v1/TelemetryService/MetricDefinitions/PowerConsumedWatts"
  }

```

6.83 MetricReport 1.5.2

Version	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2022.2	2020.2	2019.4	2019.2	2018.3	2018.2

6.83.1 Description

The `MetricReport` schema represents a set of collected metrics.

- This resource shall represent a metric report in a Redfish implementation. When a metric report is deleted, the historic metric data used to generate the report shall be deleted as well unless other metric reports are consuming the data.

6.83.2 URIs

`/redfish/v1/TelemetryService/MetricReports/{MetricReportId}`

6.83.3 Properties

Property	Type	Attributes	Notes
Context (v1.4+)	string	<i>read-only</i>	A context can be supplied at subscription time. This property is the context value supplied by the subscriber. This property shall contain a client supplied context for the event destination to which this event is being sent. This property shall only be present when sent as a payload in an event.
MetricReportDefinition {	object		The link to the definition of this metric report. This property shall contain a link to a resource of type <code>MetricReportDefinition</code>. See the <i>MetricReportDefinition</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>MetricReportDefinition</i> resource. See the Links section and the <i>MetricReportDefinition</i> schema for details.
}			
MetricValues [{	array		An array of metric values for the metered items of this metric report. The values shall be metric values for this metric report.
MetricDefinition (deprecated v1.5) {	object		The link to the metric definition for this metric. This property shall contain a link to a resource of type <code>MetricDefinition</code> that describes what this metric value captures. See the <i>MetricDefinition</i> schema for details on this property. <i>Deprecated in v1.5 and later. This property has been deprecated in favor of the <code>MetricId</code> property.</i>
@odata.id	string	<i>read-only</i>	Link to a <i>MetricDefinition</i> resource. See the Links section and the <i>MetricDefinition</i> schema for details.
}			
MetricId	string	<i>read-only</i> (null)	The metric definitions identifier that contains additional information for the source metric. This property shall contain the value of the <code>Id</code> property of the <code>MetricDefinition</code> resource that contains additional information for the source metric.
MetricProperty	string (URI)	<i>read-only</i> (null)	The URI for the property from which this metric is derived. This property shall contain a URI following RFC6901-specified JSON pointer notation to the property from which this metric is derived. The value of <code>MetricValue</code> may contain additional calculations performed on the property based upon the configuration of the <code>MetricReportDefinition</code>.

Property	Type	Attributes	Notes
MetricValue	string	<i>read-only</i> (null)	The metric value, as a string. This property shall contain the metric value, as a string. For numeric metrics, the service shall convert the number to a string representation of the number. For array metrics, the service shall convert the array to an RFC8259-defined JSON string. For boolean metrics, this property shall contain the strings <code>true</code> or <code>false</code>. If the metric value is <code>null</code>, this property shall contain <code>null</code>.
Oem (v1.2+) {}	object		See the OEM object definition in the Using this guide clause.
Timestamp	string (date-time)	<i>read-only</i> (null)	The date and time when the metric is obtained. A management application can establish a time series of metric data by retrieving the instances of metric value and sorting them according to their timestamp. The value shall time when the metric value was obtained. Note that this value may be different from the time when this instance is created.
}]			
ReportSequence (deprecated v1.3)	string	<i>read-only</i>	The current sequence identifier for this metric report. This property shall contain the current sequence identifier for this metric report. The sequence identifier is a unique identifier assigned by the service for serializing metric reports as they are produced. <i>Deprecated in v1.3 and later. This property has been deprecated due to specification changes with regards to Server-Sent Events.</i>
Timestamp (v1.1+)	string (date-time)	<i>read-only</i> (null)	The time associated with the metric report in its entirety. The time of the metric report can be relevant when the time of individual metrics are minimally different. This property shall contain the time when the metric report was generated.

6.83.4 Example response

```
{
  "@odata.type": "#MetricReport.v1_5_2.MetricReport",
  "Id": "AvgPlatformPowerUsage",
  "Name": "Average Platform Power Usage metric report",
  "MetricReportDefinition": {
    "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions/AvgPlatformPowerUsage"
  },
  "MetricValues": [
    {
      "MetricId": "AverageConsumedWatts",
      "MetricValue": "100",
      "Timestamp": "2016-11-08T12:25:00-05:00",
    }
  ]
}
```

```

        "MetricProperty": "/redfish/v1/Chassis/Tray_1/Power#/0/PowerConsumedWatts"
    },
    {
        "MetricId": "AverageConsumedWatts",
        "MetricValue": "94",
        "Timestamp": "2016-11-08T13:25:00-05:00",
        "MetricProperty": "/redfish/v1/Chassis/Tray_1/Power#/0/PowerConsumedWatts"
    },
    {
        "MetricId": "AverageConsumedWatts",
        "MetricValue": "100",
        "Timestamp": "2016-11-08T14:25:00-05:00",
        "MetricProperty": "/redfish/v1/Chassis/Tray_1/Power#/0/PowerConsumedWatts"
    }
],
"@odata.id": "/redfish/v1/TelemetryService/MetricReports/AvgPlatformPowerUsage"
}

```

6.84 MetricReportDefinition 1.4.7

Version	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2020.4	2019.2	2019.1	2018.3	2018.2

6.84.1 Description

The `MetricReportDefinition` schema describes set of metrics that are collected into a metric report.

- This resource shall specify a set of metrics that shall be collected into a metric report in a Redfish implementation.

6.84.2 URIs

/redfish/v1/TelemetryService/MetricReportDefinitions/{MetricReportDefinitionId}

6.84.3 Properties

Property	Type	Attributes	Notes
AppendLimit	integer	<i>read-only</i>	The maximum number of entries that can be appended to a metric report. When the metric report reaches its limit, its behavior is dictated by the <code>ReportUpdates</code> property. This property shall contain a number that indicates the maximum number of entries that can be appended to a metric report. When the metric report reaches its limit, its behavior shall be dictated by the <code>ReportUpdates</code> property. This property shall be required if <code>ReportUpdates</code> contains <code>AppendWrapsWhenFull</code> Or <code>AppendStopsWhenFull</code>.
Links (v1.2+) {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
Triggers (v1.2+) [{	array		The triggers that cause this metric report definition to generate a new metric report upon a trigger occurrence when the <code>TriggerActions</code> property contains <code>RedfishMetricReport</code>. This property shall contain a set of triggers that cause this metric report to generate a new metric report upon a trigger occurrence when the <code>TriggerActions</code> property contains <code>RedfishMetricReport</code>.
@odata.id	string	<i>read-only</i>	Link to a Triggers resource. See the Links section and the <i>Triggers</i> schema for details.
}]			
}			
MetricProperties []	array (URI) (string, null)	<i>read-write</i>	The list of URIs with wildcards and property identifiers to include in the metric report. If a URI has wildcards, the wildcards are substituted as specified in the <code>wildcards</code> property. This property shall contain a list of URIs with wildcards and property identifiers to include in the metric report. A set of curly braces shall delimit each wildcard in the URI. The corresponding entry in the <code>wildcard</code> property shall replace each wildcard. After each wildcard is replaced, it shall describe a resource property to include in the metric report. The property identifiers portion of the URI shall follow RFC6901-specified JSON pointer notation rules.

Property	Type	Attributes	Notes
MetricReport {	object		The most recent metric report produced by this metric report definition. This property shall contain a link to a resource of type <code>MetricReport</code> that represents the most recent metric report produced by this metric report definition. See the <i>MetricReport</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>MetricReport</i> resource. See the Links section and the <i>MetricReport</i> schema for details.
}			
MetricReportDefinitionEnabled (v1.2+)	boolean	<i>read-write</i> (null)	An indication of whether the generation of new metric reports is enabled. This property shall indicate whether the generation of new metric reports is enabled.
MetricReportDefinitionType	string (enum)	<i>read-write</i> (null)	Specifies when the metric report is generated. This property shall specify when the metric report is generated. If the value is <code>Periodic</code>, the <code>Schedule</code> property shall be present. For the possible property values, see <i>MetricReportDefinitionType</i> in Property details.
MetricReportHeartbeatInterval (v1.2+)	string (duration)	<i>read-write</i> (null)	The interval at which to send the complete metric report because the Redfish client wants refreshed metric data even when the data has not changed. This property value is always greater than the recurrence interval of a metric report, and it only applies when the <code>SuppressRepeatedMetricValue</code> property is <code>true</code>. The property value shall contain a Redfish duration that describes the time interval between generations of the unsuppressed metric report. It shall always be a value greater than the <code>RecurrenceInterval</code> property within <code>Schedule</code> and should only apply when the <code>SuppressRepeatedMetricValue</code> property is <code>true</code>. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?</code>
Metrics [{	array		The list of metrics to include in the metric report. The metrics might include calculations to apply to metric properties. The property shall contain a list of metrics to include in the metric report. The metrics may include calculations to apply to metric properties.
CollectionDuration	string (duration)	<i>read-write</i> (null)	The duration over which the function is computed. This property shall specify the duration over which the function is computed. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?</code>

Property	Type	Attributes	Notes
CollectionFunction	string (enum)	<i>read-write (null)</i>	Specifies the function to perform on each of the metric properties listed in the <code>MetricProperties</code> property or the metric properties specified in the <code>MetricDefinition</code> referenced by the <code>MetricId</code> property. If not specified, calculations are not performed on the metric properties. The property shall specify the function to perform on each of the metric properties listed in the <code>MetricProperties</code> property or the metric properties specified in the <code>MetricDefinition</code> referenced by the <code>MetricId</code> property. If not specified, calculations shall not be performed on the metric properties. <i>For the possible property values, see <code>CollectionFunction</code> in Property details.</i>
CollectionTimeScope	string (enum)	<i>read-write (null)</i>	The scope of time over which the function is applied. This property shall specify the scope of time over which the function is applied. <i>For the possible property values, see <code>CollectionTimeScope</code> in Property details.</i>
MetricId	string	<i>read-write (null)</i>	The metric definition identifier that contains the metric properties to include in the metric report. This property shall contain the value of the <code>Id</code> property of the <code>MetricDefinition</code> resource that contains the metric properties to include in the metric report. This property should not be present if <code>MetricProperties</code> is present.
MetricProperties []	array (URI) (string, null)	<i>read-write</i>	The list of URIs with wildcards and property identifiers to include in the metric report. If a URI has wildcards, the wildcards are substituted as specified in the <code>wildcards</code> property. This property shall contain a list of URIs with wildcards and property identifiers to include in the metric report. A set of curly braces shall delimit each wildcard in the URI. The corresponding entry in the <code>wildcard</code> property shall replace each wildcard. After each wildcard is replaced, it shall describe a resource property to include in the metric report. The property identifiers portion of the URI shall follow RFC6901-specified JSON pointer notation rules. This property should not be present if <code>MetricId</code> is present.
Oem (v1.4+) {}	object		See the OEM object definition in the Using this guide clause.
}]			

Property	Type	Attributes	Notes
ReportActions []	array (string (enum))	<i>read-write</i>	Actions to perform when a metric report is generated. - The set of actions to perform when a metric report is generated. - This property shall contain the set of actions to perform when the metric report is generated. This property should be ignored if <code>MetricReportDefinitionType</code> contains the value <code>OnRequest</code>. <i>For the possible property values, see ReportActions in Property details.</i>
ReportTimespan (v1.3+)	string (duration)	<i>read-write (null)</i>	The maximum timespan that a metric report can cover. This property shall contain the maximum timespan that a metric report can cover. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?</code>
ReportUpdates	string (enum)	<i>read-write</i>	The behavior for how subsequent metric reports are handled in relationship to an existing metric report created from the metric report definition. Namely, whether to overwrite, append, or create a metric report. This property shall contain the behavior for how subsequent metric reports are handled in relationship to an existing metric report created from the metric report definition. This property should be ignored if <code>MetricReportDefinitionType</code> contains the value <code>OnRequest</code>. <i>For the possible property values, see ReportUpdates in Property details.</i>
Schedule {}	object		The schedule for generating the metric report. This property shall contain the schedule of the metric report. The metric report shall be generated at an interval specified by the <code>RecurrenceInterval</code> property within <code>Schedule</code>. If the <code>MaxOccurrences</code> property within <code>Schedule</code> is specified, the metric report shall no longer be generated after the specified number of occurrences. The <code>State</code> property within <code>Status</code> should be set to <code>Disabled</code> and the <code>MetricReportDefinitionEnabled</code> property should be set to <code>false</code> when the specified number of occurrences is reached. For property details, see Schedule.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

Property	Type	Attributes	Notes
SuppressRepeatedMetricValue (v1.2+)	boolean	read-write (null)	An indication of whether any metrics are suppressed from the generated metric report. If <code>true</code>, any metric that equals the same value in the previously generated metric report is suppressed from the current report. Also, duplicate metrics are suppressed. If <code>false</code>, no metrics are suppressed from the current report. The current report might contain no metrics if all metrics equal the values in the previously generated metric report. This property shall indicate whether any metrics are suppressed from the generated metric report. If <code>true</code>, any metric that equals the same value in the previously generated metric report is suppressed from the current report. Also, duplicate metrics are suppressed. If <code>false</code>, no metrics are suppressed from the current report. The current report may contain no metrics if all metrics equal the values in the previously generated metric report.
Wildcards [{	array		The set of wildcards and their substitution values for the entries in the <code>MetricProperties</code> property. The property shall contain a set of wildcards and their replacement strings, which are applied to the <code>MetricProperties</code> property. Each wildcard expressed in the <code>MetricProperties</code> property shall have a corresponding entry in this property.
Keys (deprecated v1.1) []	array (string, null)	read-write	An array of values to substitute for the wildcard. This property shall contain the list of values to substitute for the wildcard. <i>Deprecated in v1.1 and later. This property has been deprecated in favor of using the property Values.</i>
Name	string	read-write (null)	The string used as a wildcard. This property shall contain the string used as a wildcard.
Values (v1.1+) []	array (string, null)	read-write	An array of values to substitute for the wildcard. <code>*</code> indicates all possible values for the wildcard. This property shall contain the list of values to substitute for the wildcard. The value <code>*</code> shall indicate all possible values for the wildcard.
}]			

6.84.4 Property details

6.84.4.1 CollectionFunction

Specifies the function to perform on each of the metric properties listed in the `MetricProperties` property or the

metric properties specified in the `MetricDefinition` referenced by the `MetricId` property. If not specified, calculations are not performed on the metric properties.

- The property shall specify the function to perform on each of the metric properties listed in the `MetricProperties` property or the metric properties specified in the `MetricDefinition` referenced by the `MetricId` property. If not specified, calculations shall not be performed on the metric properties.

string	Description
Average	The metric is calculated as the average metric reading over a duration. • This value shall indicate the metric is calculated as the average metric reading over a duration. The duration shall be the <code>CollectionDuration</code> property value.
Maximum	The metric is calculated as the maximum metric reading over a duration. • This value shall indicate the metric is calculated as the maximum metric reading over a duration. The duration shall be the <code>CollectionDuration</code> property value.
Minimum	The metric is calculated as the minimum metric reading over a duration. • This value shall indicate the metric is calculated as the minimum metric reading over a duration. The duration shall be the <code>CollectionDuration</code> property value.
Summation	The metric is calculated as the sum of the values over a duration. • This value shall indicate the metric is calculated as the sum of the specified metric reading over a duration. The duration shall be the <code>CollectionDuration</code> property value.

6.84.4.2 CollectionTimeScope

The scope of time over which the function is applied.

- This property shall specify the scope of time over which the function is applied.

string	Description
Interval	The corresponding metric values apply to a time interval. On the corresponding metric value instances, the <code>Timestamp</code> property value in the metric report specifies the end of the time interval and the <code>CollectionDuration</code> property specifies its duration. • This value shall indicate the corresponding metric values apply to a time interval. On the corresponding metric value instances, the <code>Timestamp</code> property value in the metric report shall specify the end of the time interval and the <code>CollectionDuration</code> property shall specify its duration.

string	Description
Point	The corresponding metric values apply to a point in time. On the corresponding metric value instances, the <code>Timestamp</code> property value in the metric report specifies the point in time. This value shall indicate the corresponding metric values apply to a point in time. On the corresponding metric value instances, the <code>Timestamp</code> property value in the metric report shall specify the point in time.
StartupInterval	The corresponding metric values apply to a time interval that began at the startup of the measured resource. On the corresponding metric value instances, the <code>Timestamp</code> property value in the metric report specifies the end of the time interval. The <code>CollectionDuration</code> property value specifies the duration between the startup of the resource and timestamp. This value shall indicate the corresponding metric values apply to a time interval that began at the startup of the measured resource. On the corresponding metric value instances, the <code>Timestamp</code> property value in the metric report shall specify the end of the time interval. The <code>CollectionDuration</code> property value shall specify the duration between the startup of the resource and timestamp.

6.84.4.3 MetricReportDefinitionType

Specifies when the metric report is generated.

- This property shall specify when the metric report is generated. If the value is `Periodic`, the `Schedule` property shall be present.

string	Description
OnChange	The metric report is generated when any of the metric values change.
OnRequest	The metric report is generated when an HTTP <code>GET</code> is performed on the specified metric report.
Periodic	The metric report is generated at a periodic time interval, specified in the <code>Schedule</code> property.

6.84.4.4 ReportActions

Actions to perform when a metric report is generated.

- The set of actions to perform when a metric report is generated.
 - This property shall contain the set of actions to perform when the metric report is generated. This property should be ignored if `MetricReportDefinitionType` contains the value `OnRequest`.

string	Description
LogToMetricReportsCollection	Record the occurrence to the metric report collection. This value shall indicate the service records the occurrence to the metric report collection found under the telemetry service. The service shall update the metric report based on the setting of the <code>ReportUpdates</code> property.
RedfishEvent	Send a Redfish event message containing the metric report. This value shall indicate the service sends a Redfish event of type <code>MetricReport</code> to subscribers in the event subscription collection of the event service.

6.84.4.5 ReportUpdates

The behavior for how subsequent metric reports are handled in relationship to an existing metric report created from the metric report definition. Namely, whether to overwrite, append, or create a metric report.

- This property shall contain the behavior for how subsequent metric reports are handled in relationship to an existing metric report created from the metric report definition. This property should be ignored if `MetricReportDefinitionType` contains the value `OnRequest`.

string	Description
AppendStopsWhenFull	New information is appended to the metric report. The service stops adding entries when the metric report has reached its maximum capacity. This value shall indicate the service appends new information to the metric report referenced by the <code>MetricReport</code> property. The service shall stop adding entries when the metric report has reached its maximum capacity. The <code>State</code> property within <code>Status</code> should be set to <code>Disabled</code> and the <code>MetricReportDefinitionEnabled</code> property should be set to <code>false</code> when the append limit is reached.
AppendWrapsWhenFull	New information is appended to the metric report. The metric report entries are overwritten with new entries when the metric report has reached its maximum capacity. This value shall indicate the service appends new information to the metric report referenced by the <code>MetricReport</code> property. The service shall overwrite entries in the metric report with new entries when the metric report has reached its maximum capacity.
NewReport	A new metric report is created, whose identifier is a service-defined identifier concatenated with the timestamp. This value shall indicate the service creates a new metric report resource, whose <code>Id</code> property is a service-defined identifier concatenated with the timestamp. The metric report referenced by the <code>MetricReport</code> property shall reference the metric report most recently created by this metric report definition.

string	Description
Overwrite	Overwrite the metric report. This value shall indicate the service overwrites the metric report referenced by the <code>MetricReport</code> property.

6.84.5 Example response

```
{
  "@odata.type": "#MetricReportDefinition.v1_4_7.MetricReportDefinition",
  "Id": "PlatformPowerUsage",
  "Name": "Transmit and Log Platform Power Usage",
  "MetricReportDefinitionType": "Periodic",
  "Schedule": {
    "RecurrenceInterval": "PT1H"
  },
  "ReportActions": [
    "RedfishEvent",
    "LogToMetricReportsCollection"
  ],
  "ReportUpdates": "AppendWrapsWhenFull",
  "AppendLimit": 256,
  "MetricReport": {
    "@odata.id": "/redfish/v1/TelemetryService/MetricReports/PlatformPowerUsage"
  },
  "Status": {
    "State": "Enabled"
  },
  "Wildcards": [
    {
      "Name": "PWild",
      "Values": [
        "0"
      ]
    },
    {
      "Name": "TWild",
      "Values": [
        "Tray_1",
        "Tray_2"
      ]
    }
  ],
  "MetricProperties": [
    "/redfish/v1/Chassis/{TWild}/Power#/PowerControl/{PWild}/PowerConsumedWatts"
  ],
  "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions/PlatformPowerUsage"
}
```

```
}

```

6.85 NetworkAdapter 1.12.1

Version	v1.12	v1.11	v1.10	v1.9	v1.8	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	...
Release	2025.2	2024.1	2023.3	2021.4	2021.2	2021.1	2020.4	2020.3	2020.2	2019.2	2018.2	...

6.85.1 Description

The `NetworkAdapter` schema represents a physical network adapter capable of connecting to a computer network. Examples include but are not limited to Ethernet, Fibre Channel, and converged network adapters.

- This resource shall represent a physical network adapter capable of connecting to a computer network in a Redfish implementation. Services should represent adapters that contain multiple controllers with independent management interfaces as multiple `NetworkAdapter` resources.

6.85.2 URIs

`/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}`

6.85.3 Properties

Property	Type	Attributes	Notes
Assembly (v1.1+) {	object		The link to the assembly resource associated with this adapter. This property shall contain a link to a resource of type <code>Assembly</code>. See the <i>Assembly</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>Assembly</i> resource. See the Links section and the <i>Assembly</i> schema for details.
}			

Property	Type	Attributes	Notes
Certificates (v1.6+) {	object		The link to a collection of certificates for device identity and attestation. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that contains certificates for device identity and attestation. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
Controllers [{	array		The set of network controllers ASICs that make up this NetworkAdapter. This property shall contain the set of network controllers ASICs that make up this network adapter.
ControllerCapabilities {	object		The capabilities of this controller. This property shall contain the capabilities of this controller.
DataCenterBridging {	object		Data center bridging (DCB) for this controller. This property shall contain capability, status, and configuration values related to data center bridging (DCB) for this controller.
Capable	boolean	<i>read-only</i> (null)	An indication of whether this controller is capable of data center bridging (DCB). This property shall indicate whether this controller is capable of data center bridging (DCB).
}			
NetworkDeviceFunctionCount	integer	<i>read-only</i> (null)	The maximum number of physical functions available on this controller. This property shall contain the number of physical functions available on this controller.
NetworkPortCount	integer	<i>read-only</i> (null)	The number of physical ports on this controller. This property shall contain the number of physical ports on this controller.
NPAR (v1.2+) {	object		NIC Partitioning (NPAR) capabilities for this controller. This property shall contain capability, status, and configuration values related to NIC partitioning for this controller.

Property	Type	Attributes	Notes
NparCapable (v1.2+)	boolean	<i>read-only</i> (null)	An indication of whether the controller supports NIC function partitioning. This property shall indicate whether the controller supports NIC function partitioning.
NparEnabled (v1.2+)	boolean	<i>read-write</i> (null)	An indication of whether NIC function partitioning is active on this controller. This property shall indicate whether NIC function partitioning is active on this controller.
}			
NPIV {	object		N_Port ID Virtualization (NPIV) capabilities for this controller. This property shall contain N_Port ID Virtualization (NPIV) capabilities for this controller.
MaxDeviceLogins	integer	<i>read-only</i> (null)	The maximum number of N_Port ID Virtualization (NPIV) logins allowed simultaneously from all ports on this controller. This property shall contain the maximum number of N_Port ID Virtualization (NPIV) logins allowed simultaneously from all ports on this controller.
MaxPortLogins	integer	<i>read-only</i> (null)	The maximum number of N_Port ID Virtualization (NPIV) logins allowed per physical port on this controller. This property shall contain the maximum number of N_Port ID Virtualization (NPIV) logins allowed per physical port on this controller.
}			
VirtualizationOffload {	object		Virtualization offload for this controller. This property shall contain capability, status, and configuration values related to virtualization offload for this controller.
SRIOV {	object		Single-root input/output virtualization (SR-IOV) capabilities. This property shall contain single-root input/output virtualization (SR-IOV) capabilities.

Property	Type	Attributes	Notes
SRIOVEnabled (v1.12+)	boolean	<i>read-write</i>	An indication of whether single root input/output virtualization (SR-IOV) is enabled for this controller. This property shall indicate whether single root input/output virtualization (SR-IOV) is enabled for this controller.
SRIOVVEPACapable	boolean	<i>read-only</i> (null)	An indication of whether this controller supports single root input/output virtualization (SR-IOV) in Virtual Ethernet Port Aggregator (VEPA) mode. This property shall indicate whether this controller supports single root input/output virtualization (SR-IOV) in Virtual Ethernet Port Aggregator (VEPA) mode.
}			
VirtualFunction {	object		The virtual function of the controller. This property shall describe the capability, status, and configuration values related to the virtual function for this controller.
DeviceMaxCount	integer	<i>read-only</i> (null)	The maximum number of virtual functions supported by this controller. This property shall contain the maximum number of virtual functions supported by this controller.
MinAssignmentGroupSize	integer	<i>read-only</i> (null)	The minimum number of virtual functions that can be allocated or moved between physical functions for this controller. This property shall contain the minimum number of virtual functions that can be allocated or moved between physical functions for this controller.
NetworkPortMaxCount	integer	<i>read-only</i> (null)	The maximum number of virtual functions supported per network port for this controller. This property shall contain the maximum number of virtual functions supported per network port for this controller.
}			
}			
}			
FirmwarePackageVersion	string	<i>read-only</i> (null)	The version of the user-facing firmware package. This property shall contain the version number of the user-facing firmware package.

Property	Type	Attributes	Notes
Identifiers (v1.3+) [{}]	array (object)		Any additional identifiers for a resource. - The durable names for the network adapter controller. - This property shall contain a list of all known durable names for the controller associated with the network adapter. For property details, see Identifier.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
ActiveSoftwareImage (v1.10+) {	object		The link to the software inventory resource that represents the active firmware image for this controller. This property shall contain a link to a resource of type <code>SoftwareInventory</code> that represents the active firmware image for this controller. See the <i>SoftwareInventory</i> schema for details on this property.
@odata.id	string	<i>read-write</i>	Link to a <i>SoftwareInventory</i> resource. See the Links section and the <i>SoftwareInventory</i> schema for details.
}			
NetworkDeviceFunctions [{	array		An array of links to the network device functions associated with this network controller. This property shall contain an array of links to resources of type <code>NetworkDeviceFunction</code> that represent the network device functions associated with this network controller.
@odata.id	string	<i>read-only</i>	Link to a <i>NetworkDeviceFunction</i> resource. See the Links section and the <i>NetworkDeviceFunction</i> schema for details.
}]			
NetworkPorts (deprecated v1.5) [{	array		An array of links to the network ports associated with this network controller. This property shall contain an array of links to resources of type <code>NetworkPort</code> that represent the network ports associated with this network controller. <i>Deprecated in v1.5 and later. This property has been deprecated in favor of the <code>Ports</code> property.</i>
@odata.id	string	<i>read-only</i>	Link to a <i>NetworkPort</i> resource. See the Links section and the <i>NetworkPort</i> schema for details.
}]			

Property	Type	Attributes	Notes
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCleDevices [{	array		An array of links to the PCIe devices associated with this network controller. This property shall contain an array of links to resources of type <code>PCleDevice</code> that represent the PCIe devices associated with this network controller.
@odata.id	string	<i>read-only</i>	Link to a PCleDevice resource. See the Links section and the <i>PCleDevice</i> schema for details.
}]			
Ports (v1.5+) [{	array		An array of links to the ports associated with this network controller. This property shall contain an array of links to resources of type <code>Port</code> that represent the ports associated with this network controller.
@odata.id	string	<i>read-only</i>	Link to a Port resource. See the Links section and the <i>Port</i> schema for details.
}]			
SoftwareImages (v1.10+) [{	array		The images that are associated with this controller. This property shall contain an array of links to resource of type <code>SoftwareInventory</code> that represent the firmware images that apply to this controller.
@odata.id	string	<i>read-only</i>	Link to a SoftwareInventory resource. See the Links section and the <i>SoftwareInventory</i> schema for details.
}]			
}			
Location (v1.1+) {}	object		The location of the network adapter controller. This property shall contain the location information of the controller associated with the network adapter. For property details, see Location.
PCleInterface (v1.2+) {	object		The PCIe interface details for this controller. This property shall contain details for the PCIe interface that connects this PCIe-based controller to its host.

Property	Type	Attributes	Notes
LanesInUse (v1.3+)	integer	<i>read-only</i> (null)	The number of PCIe lanes in use by this device. This property shall contain the number of PCIe lanes in use by this device, which shall be equal to or less than the <code>MaxLanes</code> property value.
MaxLanes (v1.3+)	integer	<i>read-only</i> (null)	The number of PCIe lanes supported by this device. This property shall contain the maximum number of PCIe lanes supported by this device.
MaxPCleType (v1.3+)	string (enum)	<i>read-only</i> (null)	The highest version of the PCIe specification supported by this device. This property shall contain the maximum PCIe specification that this device supports. <i>For the possible property values, see <code>MaxPCleType</code> in Property details.</i>
Oem (v1.3+) {}	object		See the OEM object definition in the Using this guide clause.
PCleType (v1.3+)	string (enum)	<i>read-only</i> (null)	The version of the PCIe specification in use by this device. This property shall contain the negotiated PCIe interface version in use by this device. <i>For the possible property values, see <code>PCleType</code> in Property details.</i>
}			
}}			
EnvironmentMetrics (v1.7+) {	object		The link to the environment metrics for this network adapter. This property shall contain a link to a resource of type <code>EnvironmentMetrics</code> that specifies the environment metrics for this network adapter. See the <i>EnvironmentMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>EnvironmentMetrics</i> resource. See the Links section and the <i>EnvironmentMetrics</i> schema for details.
}			
Identifiers (v1.4+) [{}]	array (object)		Any additional identifiers for a resource. - The durable names for the network adapter. - This property shall contain a list of all known durable names for the network adapter. For property details, see Identifier.

Property	Type	Attributes	Notes
LLDPEnabled (v1.7+)	boolean	<i>read-write</i>	Enable or disable LLDP globally for an adapter. This property shall contain the state indicating whether LLDP is globally enabled on a network adapter. If set to <code>false</code>, the <code>LLDPEnabled</code> value for the ports associated with this adapter shall be disregarded.
Location (v1.4+) {}	object		The location of the network adapter. This property shall contain the location information of the network adapter. For property details, see Location.
Manufacturer	string	<i>read-only</i> (null)	The manufacturer or OEM of this network adapter. This property shall contain a value that represents the manufacturer of the network adapter.
Measurements (v1.6+, deprecated v1.9) [{	array		An array of DSP0274-defined measurement blocks. This property shall contain an array of DSP0274-defined measurement blocks. <i>Deprecated in v1.9 and later. This property has been deprecated in favor of the <code>ComponentIntegrity</code> resource.</i>
@odata.id	string	<i>read-only</i>	Link to a MeasurementBlock resource. See the Links section and the <i>SoftwareInventory</i> schema for details.
}]			
Metrics (v1.7+) {	object	(null)	The link to the metrics associated with this adapter. This property shall contain a link to a resource of type <code>NetworkAdapterMetrics</code> that contains the metrics associated with this adapter. See the <i>NetworkAdapterMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a NetworkAdapterMetrics resource. See the Links section and the <i>NetworkAdapterMetrics</i> schema for details.
}			
Model	string	<i>read-only</i> (null)	The model string for this network adapter. This property shall contain the information about how the manufacturer refers to this network adapter.

Property	Type	Attributes	Notes
NetworkDeviceFunctions {	object		The link to the collection of network device functions associated with this network adapter. This property shall contain a link to a resource collection of type <code>NetworkDeviceFunctionCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>NetworkDeviceFunction</i> . See the <i>NetworkDeviceFunction</i> schema for details.
}			
NetworkPorts (<i>deprecated v1.5</i>) {	object		The link to the collection of network ports associated with this network adapter. This property shall contain a link to a resource collection of type <code>NetworkPortCollection</code>. Contains a link to a resource. <i>Deprecated in v1.5 and later. This property has been deprecated in favor of the <code>Ports</code> property.</i>
@odata.id	string	<i>read-only</i>	Link to Collection of <i>NetworkPort</i> . See the <i>NetworkPort</i> schema for details.
}			
PartNumber	string	<i>read-only</i> (<i>null</i>)	Part number for this network adapter. This property shall contain the part number for the network adapter as defined by the manufacturer.
Ports (<i>v1.5+</i>) {	object		The link to the collection of ports associated with this network adapter. This property shall contain a link to a resource collection of type <code>PortCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Port</i> . See the <i>Port</i> schema for details.
}			
Processors (<i>v1.8+</i>) {	object		The link to the collection of offload processors contained in this network adapter. This property shall contain a link to a resource collection of type <code>ProcessorCollection</code> that represent the offload processors contained in this network adapter. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Processor</i> . See the <i>Processor</i> schema for details.

Property	Type	Attributes	Notes
}			
SerialNumber	string	<i>read-only (null)</i>	The serial number for this network adapter. This property shall contain the serial number for the network adapter.
SKU	string	<i>read-only (null)</i>	The manufacturer SKU for this network adapter. This property shall contain the SKU for the network adapter.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

6.85.4 Actions

6.85.4.1 Reset (v1.11+)

Description

This action resets the network adapter.

- This action shall reset a network adapter.

Action URI

{Base URI of target resource}/Actions/NetworkAdapter.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	<i>optional</i>	The type of reset. This parameter shall contain the type of reset. The service can accept a request without the parameter and shall perform a <code>GracefulRestart</code>. For the possible property values, see <i>ResetType</i> in Property details.

Request Example

```
{
  "ResetType": "ForceRestart"
}
```

6.85.4.2 ResetSettingsToDefault

Description

This action is to clear the settings back to factory defaults.

- This action shall reset of all active and pending settings back to factory default settings upon reset of the network adapter.

Action URI

{Base URI of target resource}/Actions/NetworkAdapter.ResetSettingsToDefault

Action parameters

This action takes no parameters.

6.85.5 Property details

6.85.5.1 MaxPCleType

The highest version of the PCle specification supported by this device.

- This property shall contain the maximum PCle specification that this device supports.

string	Description
Gen1	A PCle v1.0 slot.
Gen2	A PCle v2.0 slot.
Gen3	A PCle v3.0 slot.
Gen4	A PCle v4.0 slot.
Gen5	A PCle v5.0 slot.
Gen6 (v1.16+)	A PCle v6.0 slot.

6.85.5.2 PCIeType

The version of the PCIe specification in use by this device.

- This property shall contain the negotiated PCIe interface version in use by this device.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.
Gen6 (v1.16+)	A PCIe v6.0 slot.

6.85.5.3 ResetType

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and shall perform a `GracefulRestart`.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property shall contain the value <code>On</code>.
ForceRestart	Shut down immediately and non-gracefully and restart the unit. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.

string	Description
FullPowerCycle	Full power cycle the unit. Behaves like removing utility lines, followed by restoring utility lines to the resource. This value shall indicate the resource will perform a full power cycle as if utility lines to the resource are removed and restored. This is different from <code>PowerCycle</code> in that it's as close to a true power cycle as possible. For example, removing AC power cables from an enclosure and then restoring the AC power cables. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>. If a service supports this value but there are no other distinct power cycle flows, the service shall support <code>PowerCycle</code> as an alias to <code>FullPowerCycle</code>. This type of reset may cause the manager providing the Redfish service to power cycle. If the manager providing the Redfish service is affected by this type of reset, the service shall send the action response before resetting to prevent client timeouts.
GracefulRestart	Shut down gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
GracefulShutdown	Shut down gracefully and power off. This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a paused state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Paused</code>.

string	Description
PowerCycle	Power cycle the unit. Behaves like a power removal, followed by a power restore to the resource. This value shall indicate the resource will perform a power cycle. This is different from <code>FullPowerCycle</code> in that it typically performs localized power sequencing of the resource while external power is still present. For example, turning DC voltage regulators off and then turning DC voltage regulators back on. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
PushPowerButton	Simulate the pressing of the physical power button on this unit. This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.

6.85.6 Example response

```
{
  "@odata.type": "#NetworkAdapter.v1_12_1.NetworkAdapter",
  "Id": "9fa725a1",
  "Name": "Network Adapter View",
  "Manufacturer": "Contoso",
  "Model": "599TPS-T",
  "SKU": "Contoso TPS-Net 2-Port Base-T",
  "SerialNumber": "003BFLRT00023234",
  "PartNumber": "975421-B20",
  "Ports": {
    "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/Ports"
  },
  "NetworkDeviceFunctions": {
    "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/NetworkDeviceFunctions"
  },
  "Controllers": [
```

```
{
  "FirmwarePackageVersion": "7.4.10",
  "Links": {
    "PCIeDevices": [
      {
        "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/NIC"
      }
    ],
    "Ports": [
      {
        "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/Ports/1"
      }
    ],
    "NetworkDeviceFunctions": [
      {
        "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/NetworkDeviceFunctions/11111111100"
      }
    ]
  },
  "ControllerCapabilities": {
    "NetworkPortCount": 2,
    "NetworkDeviceFunctionCount": 8,
    "DataCenterBridging": {
      "Capable": true
    },
    "VirtualizationOffload": {
      "VirtualFunction": {
        "DeviceMaxCount": 256,
        "NetworkPortMaxCount": 128,
        "MinAssignmentGroupSize": 4
      },
      "SRIOV": {
        "SRIOVEnabled": true,
        "SRIOVVEPACapable": true
      }
    },
    "NPIV": {
      "MaxDeviceLogins": 4,
      "MaxPortLogins": 2
    },
    "NPAR": {
      "NparCapable": true,
      "NparEnabled": false
    }
  },
  "PCIeInterface": {
    "PCIeType": "Gen2",
    "MaxPCIeType": "Gen3",
    "LanesInUse": 1,
    "MaxLanes": 4
  }
}
```

```
    },
    "Location": {
      "PartLocation": {
        "ServiceLabel": "Slot 1",
        "LocationType": "Slot",
        "LocationOrdinalValue": 0,
        "Reference": "Rear",
        "Orientation": "LeftToRight"
      }
    }
  },
  "Actions": {
    "#NetworkAdapter.ResetSettingsToDefault": {
      "target": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/Actions/NetworkAdapter.ResetSettingsToDefault"
    }
  },
  "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1"
}
```

6.86 NetworkAdapterMetrics 1.1.0

Version	v1.1	v1.0
Release	2024.1	2021.1

6.86.1 Description

The NetworkAdapterMetrics schema contains usage and health statistics for a network adapter.

- This resource shall represent the network metrics for a single network adapter in a Redfish implementation.

6.86.2 URIs

/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Metrics

6.86.3 Properties

Property	Type	Attributes	Notes
CPUCorePercent	number (%)	<i>read-only</i> (null)	The device CPU core utilization as a percentage. This property shall contain the device CPU core utilization as a percentage, typically 0 to 100 .
HostBusRXPercent	number (%)	<i>read-only</i> (null)	The host bus, such as PCIe, RX utilization as a percentage. This property shall contain the host bus, such as PCIe, RX utilization as a percentage, typically 0 to 100 , which is calculated by dividing the total bytes received by the theoretical max.
HostBusTXPercent	number (%)	<i>read-only</i> (null)	The host bus, such as PCIe, TX utilization as a percentage. This property shall contain the host bus, such as PCIe, TX utilization as a percentage, typically 0 to 100 , which is calculated by dividing the total bytes transmitted by the theoretical max.
NCSIRXBytes	integer (bytes)	<i>read-only</i> (null)	The total number of NC-SI bytes received since reset. This property shall contain the total number of NC-SI bytes received since reset, including both passthrough and non-passthrough traffic.
NCSIRXFrames	integer	<i>read-only</i> (null)	The total number of NC-SI frames received since reset. This property shall contain the total number of NC-SI frames received since reset, including both passthrough and non-passthrough traffic.
NCSITXBytes	integer (bytes)	<i>read-only</i> (null)	The total number of NC-SI bytes sent since reset. This property shall contain the total number of NC-SI bytes sent since reset, including both passthrough and non-passthrough traffic.
NCSITXFrames	integer	<i>read-only</i> (null)	The total number of NC-SI frames sent since reset. This property shall contain the total number of NC-SI frames sent since reset, including both passthrough and non-passthrough traffic.
RXBytes	integer (bytes)	<i>read-only</i> (null)	The total number of bytes received since reset. This property shall contain the total number of bytes received since reset, including host and remote management passthrough traffic, and inclusive of all protocol overhead.

Property	Type	Attributes	Notes
RXMulticastFrames	integer	<i>read-only</i> (null)	The total number of good multicast frames received since reset. This property shall contain the total number of good multicast frames received since reset.
RXUnicastFrames	integer	<i>read-only</i> (null)	The total number of good unicast frames received since reset. This property shall contain the total number of good unicast frames received since reset.
TXBytes	integer (bytes)	<i>read-only</i> (null)	The total number of bytes transmitted since reset. This property shall contain the total number of bytes transmitted since reset, including host and remote management passthrough traffic, and inclusive of all protocol overhead.
TXMulticastFrames	integer	<i>read-only</i> (null)	The total number of good multicast frames transmitted since reset. This property shall contain the total number of good multicast frames transmitted since reset.
TXUnicastFrames	integer	<i>read-only</i> (null)	The total number of good unicast frames transmitted since reset. This property shall contain the total number of good unicast frames transmitted since reset.

6.86.4 Actions

6.86.4.1 ResetMetrics (v1.1+)

Description

This action resets the summary metrics related to this device.

- This action shall reset any time intervals or counted values for this device.

Action URI

{Base URI of target resource}/Actions/NetworkAdapterMetrics.ResetMetrics

Action parameters

This action takes no parameters.

6.86.5 Example response

```
{
  "@odata.type": "#NetworkAdapterMetrics.v1_1_0.NetworkAdapterMetrics",
  "Id": "NetworkAdapterMetrics",
  "Name": "Network Adapter Metrics",
  "HostBusRXPercent": 35.53,
  "HostBusTXPercent": 14.17,
  "CPUCorePercent": 8.35,
  "NCSIRXFrames": 0,
  "NCSITXFrames": 0,
  "NCSIRXBytes": 0,
  "NCSITXBytes": 0,
  "RXBytes": 7754199970,
  "RXMulticastFrames": 1941,
  "RXUnicastFrames": 27193387,
  "TXBytes": 9436506547,
  "TXMulticastFrames": 153,
  "TXUnicastFrames": 18205770,
  "@odata.id": "/redfish/v1/Chassis/1U/NetworkAdapters/Slot1/Metrics"
}
```

6.87 NetworkDeviceFunction 1.11.0

Version	v1.11	v1.10	v1.9	v1.8	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	...
Release	2025.2	2025.1	2022.2	2021.4	2021.2	2021.1	2020.3	2020.1	2018.2	2017.3	2017.1	...

6.87.1 Description

The `NetworkDeviceFunction` schema represents a logical interface that a network adapter exposes.

- This resource shall represent a logical interface that a network adapter exposes in a Redfish implementation.

6.87.2 URIs

`/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/NetworkDeviceFunctions/{NetworkDeviceFunctionId}`

6.87.3 Properties

Property	Type	Attributes	Notes
AllowDeny (v1.7+) {	object		The link to the collection of allow and deny permissions for packets leaving and arriving to this network device function. This property shall contain a link to a resource collection of type <code>AllowDenyCollection</code> that contains the permissions for packets leaving and arriving to this network device function. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>AllowDeny</i> . See the <i>AllowDeny</i> schema for details.
}			
AssignablePhysicalNetworkPorts (v1.5+) [{	array		An array of physical ports to which this network device function can be assigned. This property shall contain an array of links to resources of type <code>Port</code> that are the physical ports to which this network device function can be assigned.
@odata.id	string	<i>read-only</i>	Link to a <i>Port</i> resource. See the Links section and the <i>Port</i> schema for details.
}]			
AssignablePhysicalPorts (deprecated v1.5) [{	array		An array of physical ports to which this network device function can be assigned. This property shall contain an array of links to resources of type <code>NetworkPort</code> that are the physical ports to which this network device function can be assigned. <i>Deprecated in v1.5 and later. This property has been deprecated in favor of the <code>AssignablePhysicalNetworkPorts</code> property.</i>
@odata.id	string	<i>read-only</i>	Link to a <i>NetworkPort</i> resource. See the Links section and the <i>NetworkPort</i> schema for details.
}]			
BootMode	string (enum)	<i>read-write</i> (null)	The boot mode configured for this network device function. This property shall contain the boot mode configured for this network device function. If the value is not <code>Disabled</code>, this network device function shall be configured for boot by using the specified technology. <i>For the possible property values, see <code>BootMode</code> in Property details.</i>

Property	Type	Attributes	Notes
DeviceEnabled	boolean	<i>read-write</i> (null)	An indication of whether the network device function is enabled. This property shall indicate whether the network device function is enabled. The operating system shall not enumerate or see disabled network device functions.
Ethernet {	object		The Ethernet capabilities, status, and configuration values for this network device function. This property shall contain Ethernet capabilities, status, and configuration values for this network device function.
AdditionalProtocols (v1.10+) []	array (string (enum))	<i>read-only</i>	- The protocols supported by the hardware or firmware on the device. - This property shall contain the list of protocols supported by the hardware or firmware on the device. <i>For the possible property values, see AdditionalProtocols in Property details.</i>
EthernetInterfaces (v1.7+) {	object	(null)	The Ethernet interface collection that contains the interfaces on this network device function. This property shall contain a link to a collection of type <code>EthernetInterfaceCollection</code> that represent the Ethernet interfaces present on this network device function. This property shall only be present if this NetworkDeviceFunction is not associated with a ComputerSystem, such as when in a ResourcePool or representing an Ethernet based storage device. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>EthernetInterface</i> . See the EthernetInterface schema for details.
}			
MACAddress	string	<i>read-write</i> (null)	The currently configured MAC address. This property shall contain the effective current MAC address of this network device function. If an assignable MAC address is not supported, this is a read-only alias of the <code>PermanentMACAddress</code>. Pattern: <code>^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})\$</code>

Property	Type	Attributes	Notes
MTUSize	integer	<i>read-write (null)</i>	The hardware maximum transmission unit (MTU) configured for this network device function. The hardware maximum transmission unit (MTU) configured for this network device function. This value serves as a default for the OS driver when booting, but may be overridden by the OS. After the OS boots and while the driver is loaded, the effective MTU size may be found in the associated <code>EthernetInterface</code> resource.
MTUSizeMaximum (v1.5+)	integer	<i>read-only (null)</i>	The largest maximum transmission unit (MTU) size supported for this network device function. This property shall contain the largest maximum transmission unit (MTU) size supported for this network device function.
PermanentMACAddress	string	<i>read-only (null)</i>	The permanent MAC address assigned to this function. This property shall contain the permanent MAC Address of this function. Typically, this value is programmed during manufacturing. This address is not assignable. Pattern: <code>^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})\$</code>
VLAN (v1.3+) {	object		The VLAN information for this interface. If this network interface supports more than one VLAN, this property is not present. This property shall contain the VLAN for this interface. If this interface supports more than one VLAN, the <code>VLAN</code> property shall not be present and the <code>VLANs</code> property shall be present instead.
Tagged (v1.3+)	boolean	<i>read-write (null)</i>	An indication of whether this VLAN is tagged or untagged for this interface. This property shall indicate whether this VLAN is tagged or untagged for this interface.
VLANEnable	boolean	<i>read-write required on create (null)</i>	An indication of whether this VLAN is enabled for this VLAN network interface. This property shall indicate whether this VLAN is enabled for this VLAN network interface.
VLANId	integer	<i>read-write required on create (null)</i>	The ID for this VLAN. This property shall contain the ID for this VLAN.
VLANPriority (v1.2+)	integer	<i>read-write (null)</i>	The priority for this VLAN. This property shall contain the priority for this VLAN.

Property	Type	Attributes	Notes
}			
VLANs (v1.3+, deprecated v1.7) {	object		The link to a collection of VLANs. This property is used only if the interface supports more than one VLAN. This property shall contain a link to a resource collection of type <code>VlanNetworkInterfaceCollection</code>. If this property is used, the <code>VLANEnabled</code> and <code>VLAN Id</code> property shall not be used. Contains a link to a resource. <i>Deprecated in v1.7 and later. This property has been deprecated in favor of representing multiple VLANs as <code>EthernetInterface</code> resources.</i>
@odata.id	string	read-only	Link to Collection of <code>VlanNetworkInterface</code> . See the <code>VlanNetworkInterface</code> schema for details.
}			
}			
FibreChannel {	object		The Fibre Channel capabilities, status, and configuration values for this network device function. This property shall contain Fibre Channel capabilities, status, and configuration values for this network device function.
AllowFIPVLANDiscovery	boolean	read-write (null)	An indication of whether the FCoE Initialization Protocol (FIP) populates the FCoE VLAN ID. For FCoE connections, this boolean property shall indicate whether the FIP VLAN Discovery Protocol determines the FCoE VLAN ID selected by the network device function for the FCoE connection. If <code>true</code> and the FIP VLAN discovery succeeds, the <code>FCoEActiveVLANId</code> property shall reflect the FCoE VLAN ID to use for all FCoE traffic. If <code>false</code> or if the FIP VLAN Discovery protocol fails, the <code>FCoELocalVLANId</code> shall be used for all FCoE traffic and the <code>FCoEActiveVLANId</code> shall reflect the <code>FCoELocalVLANId</code>.
BootTargets [{	array		An array of Fibre Channel boot targets configured for this network device function. This property shall contain an array of Fibre Channel boot targets configured for this network device function.
BootPriority	integer	read-write (null)	The relative priority for this entry in the boot targets array. This property shall contain the relative priority for this entry in the boot targets array. Lower numbers shall represent higher priority, with zero being the highest priority. The <code>BootPriority</code> shall be unique for all entries of the <code>BootTargets</code> array.

Property	Type	Attributes	Notes
LUNID	string	<i>read-write</i> (null)	The logical unit number (LUN) ID from which to boot on the device to which the corresponding WWPN refers. This property shall contain the logical unit number (LUN) ID from which to boot on the device to which the corresponding WWPN refers.
WWPN	string	<i>read-write</i> (null)	The World Wide Port Name (WWPN) from which to boot. This property shall contain World Wide Port Name (WWPN) from which to boot.
}}			
FCoEActiveVLANId	integer	<i>read-only</i> (null)	The active FCoE VLAN ID. For FCoE connections, this property shall contain <code>null</code> or a VLAN ID currently being used for FCoE traffic. When the FCoE link is down this value shall be <code>null</code>. When the FCoE link is up this value shall be either the <code>FCoELocalVLANId</code> property or a VLAN discovered through the FIP protocol.
FCoELocalVLANId	integer	<i>read-write</i> (null)	The locally configured FCoE VLAN ID. For FCoE connections, this property shall contain the VLAN ID configured locally by setting this property. This value shall be used for FCoE traffic to this network device function during boot unless <code>AllowFIPVLANDiscovery</code> is <code>true</code> and a valid FCoE VLAN ID is found through the FIP VLAN Discovery Protocol.
FibreChannelId (v1.3+)	string	<i>read-only</i> (null)	The Fibre Channel ID that the switch assigns for this interface. This property shall indicate the Fibre Channel ID that the switch assigns for this interface.
PermanentWWNN	string	<i>read-only</i> (null)	The permanent World Wide Node Name (WWNN) address assigned to this function. This property shall contain the permanent World Wide Node Name (WWNN) of this function. Typically, this value is programmed during manufacturing. This address is not assignable. Pattern: <code>^[0-9A-Fa-f]{2}[:-]{7}([0-9A-Fa-f]{2})\$</code>
PermanentWWPN	string	<i>read-only</i> (null)	The permanent World Wide Port Name (WWPN) address assigned to this function. This property shall contain the permanent World Wide Port Name (WWPN) of this function. Typically, this value is programmed during manufacturing. This address is not assignable.

Property	Type	Attributes	Notes
WWNN	string	<i>read-write</i> (null)	The currently configured World Wide Node Name (WWNN) address of this function. This property shall contain the effective current World Wide Node Name (WWNN) of this function. If an assignable WWNN is not supported, this is a read-only alias of the permanent WWNN. Pattern: <code>^([0-9A-Fa-f]{2}[:-]){7}([0-9A-Fa-f]{2})\$</code>
WWNSource	string (enum)	<i>read-write</i> (null)	The configuration source of the World Wide Names (WWN) for this World Wide Node Name (WWNN) and World Wide Port Name (WWPN) connection. This property shall contain the configuration source of the World Wide Name (WWN) for this World Wide Node Name (WWNN) and World Wide Port Name (WWPN) connection. <i>For the possible property values, see WWNSource in Property details.</i>
WWPN	string	<i>read-write</i> (null)	The currently configured World Wide Port Name (WWPN) address of this function. This property shall contain the effective current World Wide Port Name (WWPN) of this function. If an assignable WWPN is not supported, this is a read-only alias of the permanent WWPN. Pattern: <code>^([0-9A-Fa-f]{2}[:-]){7}([0-9A-Fa-f]{2})\$</code>
}			
HTTPBoot (v1.9+) {	object		The HTTP and HTTPS boot capabilities, status, and configuration values for this network device function. This property shall contain HTTP and HTTPS boot capabilities, status, and configuration values for this network device function.
BootMediaURI (v1.9+)	string (URI)	<i>read-write</i> (null)	The URI of the boot media loaded with this network device function. This property shall contain the URI of the boot media loaded with this network device function. An empty string shall indicate no boot media is configured. All other values shall begin with <code>http://</code> or <code>https://</code>.
}			
InfiniBand (v1.5+) {	object		The InfiniBand capabilities, status, and configuration values for this network device function. This property shall contain InfiniBand capabilities, status, and configuration values for this network device function.

Property	Type	Attributes	Notes
MTUSize (v1.5+)	integer	<i>read-write</i> (null)	The maximum transmission unit (MTU) configured for this network device function.
NodeGUID (v1.5+)	string	<i>read-only</i> (null)	This is the currently configured node GUID of the network device function. This property shall contain the effective current node GUID of this virtual port of this network device function. If an assignable node GUID is not supported, this is a read-only alias of the PermanentNodeGUID. Pattern: <code>^([0-9A-Fa-f]{4}[:-]){3}([0-9A-Fa-f]{4})\$</code>
PermanentNodeGUID (v1.5+)	string	<i>read-only</i> (null)	The permanent node GUID assigned to this network device function. This property shall contain the permanent node GUID of this network device function. Typically, this value is programmed during manufacturing. This address is not assignable. Pattern: <code>^([0-9A-Fa-f]{4}[:-]){3}([0-9A-Fa-f]{4})\$</code>
PermanentPortGUID (v1.5+)	string	<i>read-only</i> (null)	The permanent port GUID assigned to this network device function. This property shall contain the permanent port GUID of this network device function. Typically, this value is programmed during manufacturing. This address is not assignable. Pattern: <code>^([0-9A-Fa-f]{4}[:-]){3}([0-9A-Fa-f]{4})\$</code>
PermanentSystemGUID (v1.5+)	string	<i>read-only</i> (null)	The permanent system GUID assigned to this network device function. This property shall contain the permanent system GUID of this network device function. Typically, this value is programmed during manufacturing. This address is not assignable. Pattern: <code>^([0-9A-Fa-f]{4}[:-]){3}([0-9A-Fa-f]{4})\$</code>
PortGUID (v1.5+)	string	<i>read-only</i> (null)	The currently configured port GUID of the network device function. This property shall contain the effective current virtual port GUID of this network device function. If an assignable port GUID is not supported, this is a read-only alias of the PermanentPortGUID. Pattern: <code>^([0-9A-Fa-f]{4}[:-]){3}([0-9A-Fa-f]{4})\$</code>
SupportedMTUSizes (v1.5+) []	array (integer, null)	<i>read-only</i>	The maximum transmission unit (MTU) sizes supported for this network device function. This property shall contain an array of the maximum transmission unit (MTU) sizes supported for this network device function.

Property	Type	Attributes	Notes
SystemGUID (v1.5+)	string	<i>read-only</i> (null)	This is the currently configured system GUID of the network device function. This property shall contain the effective current system GUID of this virtual port of this network device function. If an assignable system GUID is not supported, this is a read-only alias of the PermanentSystemGUID. Pattern: <code>^([0-9A-Fa-f]{4}[:-]){3}([0-9A-Fa-f]{4})\$</code>
}			
iSCSIBoot {	object		The iSCSI boot capabilities, status, and configuration values for this network device function. This property shall contain iSCSI boot capabilities, status, and configuration values for this network device function.
AuthenticationMethod	string (enum)	<i>read-write</i> (null)	The iSCSI boot authentication method for this network device function. This property shall contain the iSCSI boot authentication method for this network device function. <i>For the possible property values, see AuthenticationMethod in Property details.</i>
CHAPSecret	string	<i>read-write</i> (null)	The shared secret for CHAP authentication. This property shall contain the shared secret for CHAP authentication.
CHAPUsername	string	<i>read-write</i> (null)	The username for CHAP authentication. This property shall contain the username for CHAP authentication.
InitiatorDefaultGateway	string	<i>read-write</i> (null)	The IPv6 or IPv4 iSCSI boot default gateway. This property shall contain the IPv6 or IPv4 iSCSI boot default gateway.
InitiatorIPAddress	string	<i>read-write</i> (null)	The IPv6 or IPv4 address of the iSCSI initiator. This property shall contain the IPv6 or IPv4 address of the iSCSI boot initiator.
InitiatorName	string	<i>read-write</i> (null)	The iSCSI initiator name. This property shall contain the iSCSI boot initiator name. This property should match formats defined in RFC3720 or RFC3721.

Property	Type	Attributes	Notes
InitiatorNetmask	string	<i>read-write (null)</i>	The IPv6 or IPv4 netmask of the iSCSI boot initiator. This property shall contain the IPv6 or IPv4 netmask of the iSCSI boot initiator.
IPAddressType	string (enum)	<i>read-write (null)</i>	The type of IP address being populated in the iSCSIBoot IP address fields. This property shall contain the type of IP address being populated in the iSCSIBoot IP address fields. Mixing IPv6 and IPv4 addresses on the same network device function shall not be permissible. <i>For the possible property values, see IPAddressType in Property details.</i>
IPMaskDNSViaDHCP	boolean	<i>read-write (null)</i>	An indication of whether the iSCSI boot initiator uses DHCP to obtain the initiator name, IP address, and netmask. This property shall indicate whether the iSCSI boot initiator uses DHCP to obtain the initiator name, IP address, and netmask.
MutualCHAPSecret	string	<i>read-write (null)</i>	The CHAP secret for two-way CHAP authentication. This property shall contain the CHAP secret for two-way CHAP authentication.
MutualCHAPUsername	string	<i>read-write (null)</i>	The CHAP username for two-way CHAP authentication. This property shall contain the CHAP username for two-way CHAP authentication.
PrimaryDNS	string	<i>read-write (null)</i>	The IPv6 or IPv4 address of the primary DNS server for the iSCSI boot initiator. This property shall contain the IPv6 or IPv4 address of the primary DNS server for the iSCSI boot initiator.
PrimaryLUN	integer	<i>read-write (null)</i>	The logical unit number (LUN) for the primary iSCSI boot target. This property shall contain the logical unit number (LUN) for the primary iSCSI boot target.
PrimaryTargetIPAddress	string	<i>read-write (null)</i>	The IPv4 or IPv6 address for the primary iSCSI boot target. This property shall contain the IPv4 or IPv6 address for the primary iSCSI boot target.

Property	Type	Attributes	Notes
PrimaryTargetName	string	<i>read-write</i> (null)	The name of the iSCSI primary boot target. This property shall contain the name of the primary iSCSI boot target. This property should match formats defined in RFC3720 or RFC3721.
PrimaryTargetTCPPort	integer	<i>read-write</i> (null)	The TCP port for the primary iSCSI boot target. This property shall contain the TCP port for the primary iSCSI boot target.
PrimaryVLANEnable	boolean	<i>read-write</i> (null)	An indication of whether the primary VLAN is enabled. This property shall indicate whether this VLAN is enabled for the primary iSCSI boot target.
PrimaryVLANId	integer	<i>read-write</i> (null)	The 802.1q VLAN ID to use for iSCSI boot from the primary target. This property shall contain the 802.1q VLAN ID to use for iSCSI boot from the primary target. This VLAN ID is only used if <code>PrimaryVLANEnable</code> is <code>true</code>.
RouterAdvertisementEnabled	boolean	<i>read-write</i> (null)	An indication of whether IPv6 router advertisement is enabled for the iSCSI boot target. This property shall indicate whether IPv6 router advertisement is enabled for the iSCSI boot target. This setting shall apply to only IPv6 configurations.
SecondaryDNS	string	<i>read-write</i> (null)	The IPv6 or IPv4 address of the secondary DNS server for the iSCSI boot initiator. This property shall contain the IPv6 or IPv4 address of the secondary DNS server for the iSCSI boot initiator.
SecondaryLUN	integer	<i>read-write</i> (null)	The logical unit number (LUN) for the secondary iSCSI boot target. This property shall contain the logical unit number (LUN) for the secondary iSCSI boot target.
SecondaryTargetIPAddress	string	<i>read-write</i> (null)	The IPv4 or IPv6 address for the secondary iSCSI boot target. This property shall contain the IPv4 or IPv6 address for the secondary iSCSI boot target.

Property	Type	Attributes	Notes
SecondaryTargetName	string	<i>read-write</i> (null)	The name of the iSCSI secondary boot target. This property shall contain the name of the secondary iSCSI boot target. This property should match formats defined in RFC3720 or RFC3721.
SecondaryTargetTCPPort	integer	<i>read-write</i> (null)	The TCP port for the secondary iSCSI boot target. This property shall contain the TCP port for the secondary iSCSI boot target.
SecondaryVLANEnable	boolean	<i>read-write</i> (null)	An indication of whether the secondary VLAN is enabled. This property shall indicate whether this VLAN is enabled for the secondary iSCSI boot target.
SecondaryVLANId	integer	<i>read-write</i> (null)	The 802.1q VLAN ID to use for iSCSI boot from the secondary target. This property shall contain the 802.1q VLAN ID to use for iSCSI boot from the secondary target. This VLAN ID is only used if <code>SecondaryVLANEnable</code> is <code>true</code>.
TargetInfoViaDHCP	boolean	<i>read-write</i> (null)	An indication of whether the iSCSI boot target name, LUN, IP address, and netmask should be obtained from DHCP. This property shall indicate whether the iSCSI boot target name, LUN, IP address, and netmask should be obtained from DHCP.
}			
Limits (v1.7+) [{	array		The byte and packet limits for this network device function. This property shall contain an array of byte and packet limits for this network device function.
BurstBytesPerSecond (v1.7+)	integer	<i>read-write</i> (null)	The maximum number of bytes per second in a burst for this network device function. This property shall contain the maximum number of bytes per second in a burst allowed for this network device function.
BurstPacketsPerSecond (v1.7+)	integer	<i>read-write</i> (null)	The maximum number of packets per second in a burst for this network device function. This property shall contain the maximum number of packets per second in a burst allowed for this network device function.

Property	Type	Attributes	Notes
Direction (v1.7+)	string (enum)	<i>read-write</i> (null)	Indicates the direction of the data to which this limit applies. This property shall indicate the direction of the data to which this limit applies for this network device function. <i>For the possible property values, see Direction in Property details.</i>
SustainedBytesPerSecond (v1.7+)	integer	<i>read-write</i> (null)	The maximum number of sustained bytes per second for this network device function. This property shall contain the maximum number of sustained bytes per second allowed for this network device function.
SustainedPacketsPerSecond (v1.7+)	integer	<i>read-write</i> (null)	The maximum number of sustained packets per second for this network device function. This property shall contain the maximum number of sustained packets per second allowed for this network device function.
}]			
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Endpoints (v1.2+) [{	array		An array of links to endpoints associated with this network device function. This property shall contain an array of links to resources of type <code>Endpoint</code> that are associated with this network device function.
@odata.id	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}]			

Property	Type	Attributes	Notes
EthernetInterface (v1.4+, deprecated v1.7) {	object		The link to a virtual Ethernet interface that was created when one of the network device function VLANs is represented as a virtual NIC for the purpose of showing the IP address associated with that VLAN. This property shall contain a link to a resource of type <code>EthernetInterface</code> that represents a virtual interface that was created when one of the network device function VLANs is represented as a virtual NIC for the purpose of showing the IP address associated with that VLAN. The <code>EthernetInterfaceType</code> property of that resource shall contain the value <code>Virtual</code>. See the <i>EthernetInterface</i> schema for details on this property. <i>Deprecated in v1.7 and later. This property has been deprecated in favor of EthernetInterfaces as each NetworkDeviceFunction could have more than one EthernetInterface.</i>
@odata.id	string	<i>read-only</i>	Link to a <code>EthernetInterface</code> resource. See the Links section and the <i>EthernetInterface</i> schema for details.
}			
EthernetInterfaces (v1.7+) [{	array		The system Ethernet interfaces that use this network device function. This includes physical Ethernet interfaces or VLANs. Each member of this property is subordinate a <code>ComputerSystem</code> resource. This property shall contain an array of links to resources of type <code>EthernetInterface</code> that represent physical or VLAN Ethernet interfaces for systems that use this network device function. The members shall be subordinate to a <code>ComputerSystem</code> resource.
@odata.id	string	<i>read-only</i>	Link to a <code>EthernetInterface</code> resource. See the Links section and the <i>EthernetInterface</i> schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
OffloadProcessors (v1.7+) [{	array		The processors that perform offload computation for this network function, such as with a SmartNIC. This property shall contain an array of links to resources of type <code>Processor</code> that represent the processors that performs offload computation for this network function, such as with a SmartNIC. This property shall not be present if <code>offloadSystem</code> is present.
@odata.id	string	<i>read-only</i>	Link to a <code>Processor</code> resource. See the Links section and the <i>Processor</i> schema for details.
}]			

Property	Type	Attributes	Notes
OffloadSystem (v1.7+) {	object		The system that performs offload computation for this network function, such as with a SmartNIC. This property shall contain a link to a resource of type <code>ComputerSystem</code> that represents the system that performs offload computation for this network function, such as with a SmartNIC. The <code>SystemType</code> property contained in the referenced <code>ComputerSystem</code> resource should contain the value <code>DPU</code>. This property shall not be present if <code>OffloadProcessors</code> is present. See the <i>ComputerSystem</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>ComputerSystem</code> resource. See the Links section and the <i>ComputerSystem</i> schema for details.
}			
PCleFunction {	object		The link to the PCIe function associated with this network device function. This property shall contain a link to a resource of type <code>PCleFunction</code> that represents the PCIe function associated with this network device function. See the <i>PCleFunction</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>PCleFunction</code> resource. See the Links section and the <i>PCleFunction</i> schema for details.
}			
PhysicalNetworkPortAssignment (v1.5+) {	object		The physical port to which this network device function is currently assigned. This property shall contain a link to a resource of type <code>Port</code> to which this network device function is currently assigned. This value shall be one of the <code>AssignablePhysicalPorts</code> array members. See the <i>Port</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>Port</code> resource. See the Links section and the <i>Port</i> schema for details.
}			

Property	Type	Attributes	Notes
PhysicalPortAssignment (v1.3+, deprecated v1.5) {	object		The physical port to which this network device function is currently assigned. This property shall contain a link to a resource of type <code>NetworkPort</code> to which this network device function is currently assigned. This value shall be one of the <code>AssignablePhysicalPorts</code> array members. See the <code>NetworkPort</code> schema for details on this property. <i>Deprecated in v1.5 and later. This property has been deprecated in favor of the <code>PhysicalNetworkPortAssignment</code> property.</i>
@odata.id	string	read-only	Link to a <code>NetworkPort</code> resource. See the Links section and the <code>NetworkPort</code> schema for details.
}			
}			
MaxVirtualFunctions	integer	read-only (null)	The number of virtual functions that are available for this network device function. This property shall contain the number of virtual functions that are available for this network device function.
Metrics (v1.6+) {	object	(null)	The link to the metrics associated with this network function. This property shall contain a link to a resource of type <code>NetworkDeviceFunctionMetrics</code> that contains the metrics associated with this network function. See the <code>NetworkDeviceFunctionMetrics</code> schema for details on this property.
@odata.id	string	read-only	Link to a <code>NetworkDeviceFunctionMetrics</code> resource. See the Links section and the <code>NetworkDeviceFunctionMetrics</code> schema for details.
}			
NetDevFuncCapabilities []	array (string (enum))	read-only (null)	- An array of capabilities for this network device function. - This property shall contain an array of capabilities for this network device function. <i>For the possible property values, see <code>NetDevFuncCapabilities</code> in Property details.</i>
NetDevFuncType	string (enum)	read-write (null)	The configured capability of this network device function. This property shall contain the configured capability of this network device function. <i>For the possible property values, see <code>NetDevFuncType</code> in Property details.</i>

Property	Type	Attributes	Notes
PhysicalNetworkPortAssignment (v1.5+, deprecated v1.8) {	object		The physical port to which this network device function is currently assigned. This property shall contain a link to a resource of type <code>Port</code> that is the physical port to which this network device function is currently assigned. This value shall be one of the <code>AssignablePhysicalNetworkPorts</code> array members. See the <code>Port</code> schema for details on this property. <i>Deprecated in v1.8 and later. This property has been deprecated in favor of <code>PhysicalNetworkPortAssignment</code> within <code>Links</code> to avoid loops on expand.</i>
@odata.id	string	read-only	Link to a <code>Port</code> resource. See the <code>Links</code> section and the <code>Port</code> schema for details.
}			
PhysicalPortAssignment (deprecated v1.3) {	object		The physical port to which this network device function is currently assigned. This property shall contain a link to a resource of type <code>NetworkPort</code> that is the physical port to which this network device function is currently assigned. This value shall be one of the <code>AssignablePhysicalPorts</code> array members. See the <code>NetworkPort</code> schema for details on this property. <i>Deprecated in v1.3 and later. This property has been deprecated and moved to the <code>Links</code> property to avoid loops on expand.</i>
@odata.id	string	read-only	Link to a <code>NetworkPort</code> resource. See the <code>Links</code> section and the <code>NetworkPort</code> schema for details.
}			
SAVIEEnabled (v1.7+)	boolean	read-write (null)	Indicates if Source Address Validation Improvement (SAVI) is enabled for this network device function. This property shall indicate if the RFC7039-defined Source Address Validation Improvement (SAVI) is enabled for this network device function.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <code>Status</code>.

Property	Type	Attributes	Notes
VirtualFunctionAllocation (v1.11+)	integer	<i>read-write</i>	The number of virtual functions allocated to this device. This property shall contain the number virtual functions allocated to this device. This property should contain a value that is a multiple of the value contained by the <code>MinAssignmentGroupSize</code> property of the corresponding <code>Controllers</code> array member within the parent <code>NetworkAdapter</code> resource. The value shall not exceed the value contained in the <code>MaxVirtualFunctions</code> property.
VirtualFunctionsEnabled	boolean	<i>read-only</i> (null)	An indication of whether single root input/output virtualization (SR-IOV) virtual functions are enabled for this network device function. This property shall indicate whether single root input/output virtualization (SR-IOV) virtual functions are enabled for this network device function.

6.87.4 Property details

6.87.4.1 AdditionalProtocols

- The protocols supported by the hardware or firmware on the device.
 - This property shall contain the list of protocols supported by the hardware or firmware on the device.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
CXL	Compute Express Link. This value shall indicate conformance to the Compute Express Link Specification.
DisplayPort	DisplayPort. This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.

string	Description
eMMC	Embedded MultiMediaCard (e.MMC). This value shall indicate conformance to the JEDEC JESD84-B51A specification.
Ethernet	Ethernet. This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	Fibre CONnection (FICON). This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).
GenZ	GenZ. This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.

string	Description
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.
NVLink	NVLink. This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. This value shall indicate conformance to the NVM Express over Fabrics Specification.

string	Description
OEM	OEM-specific. This value shall indicate conformance to an OEM-specific architecture, and the OEM section may include additional information.
PCIe	PCI Express. This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
QPI	Intel QuickPath Interconnect (QPI). This value shall indicate conformance to the Intel QuickPath Interconnect (QPI) protocol.
RoCE	RDMA over Converged Ethernet Protocol. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.

string	Description
TFTP	Trivial File Transfer Protocol (TFTP). This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UET	Ultra Ethernet Transport. This value shall indicate conformance to the Ultra Ethernet specifications.
UHCI	Universal Host Controller Interface (UHCI). This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
UPI	Intel UltraPath Interconnect (UPI). This value shall indicate conformance to the Intel UltraPath Interconnect (UPI) protocol.
USB	Universal Serial Bus (USB). This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. This value shall indicate conformance to the VESA SVGA Specification.

6.87.4.2 AuthenticationMethod

The iSCSI boot authentication method for this network device function.

- This property shall contain the iSCSI boot authentication method for this network device function.

string	Description
CHAP	iSCSI Challenge Handshake Authentication Protocol (CHAP) authentication is used.
MutualCHAP	iSCSI Mutual Challenge Handshake Authentication Protocol (CHAP) authentication is used.
None	No iSCSI authentication is used.

6.87.4.3 BootMode

The boot mode configured for this network device function.

- This property shall contain the boot mode configured for this network device function. If the value is not `Disabled`, this network device function shall be configured for boot by using the specified technology.

string	Description
Disabled	Do not indicate to UEFI/BIOS that this device is bootable.
FibreChannel	Boot this device by using the embedded Fibre Channel support and configuration. Only applicable if the <code>NetDevFuncType</code> is <code>FibreChannel</code> .
FibreChannelOverEthernet	Boot this device by using the embedded Fibre Channel over Ethernet (FCoE) boot support and configuration. Only applicable if the <code>NetDevFuncType</code> is <code>FibreChannelOverEthernet</code> .
HTTP (v1.9+)	Boot this device by using the embedded HTTP/HTTPS support. Only applicable if the <code>NetDevFuncType</code> is <code>Ethernet</code> .
iSCSI	Boot this device by using the embedded iSCSI boot support and configuration. Only applicable if the <code>NetDevFuncType</code> is <code>iSCSI</code> OR <code>Ethernet</code> .
PXE	Boot this device by using the embedded PXE support. Only applicable if the <code>NetDevFuncType</code> is <code>Ethernet</code> OR <code>InfiniBand</code> .

6.87.4.4 Direction

Indicates the direction of the data to which this limit applies.

- This property shall indicate the direction of the data to which this limit applies for this network device function.

string	Description
Egress	Indicates that this limit is enforced on packets and bytes transmitted by the network device function.
Ingress	Indicates that this limit is enforced on packets and bytes received by the network device function.
None	Indicates that this limit not enforced.

6.87.4.5 IPAddressType

The type of IP address being populated in the iSCSIBoot IP address fields.

- This property shall contain the type of IP address being populated in the iSCSIBoot IP address fields. Mixing

IPv6 and IPv4 addresses on the same network device function shall not be permissible.

string	Description
IPv4	IPv4 addressing is used for all IP-fields in this object.
IPv6	IPv6 addressing is used for all IP-fields in this object.

6.87.4.6 NetDevFuncCapabilities

- An array of capabilities for this network device function.
 - This property shall contain an array of capabilities for this network device function.

string	Description
Disabled	Neither enumerated nor visible to the operating system.
Ethernet	Appears to the operating system as an Ethernet device.
FibreChannel	Appears to the operating system as a Fibre Channel device.
FibreChannelOverEthernet	Appears to the operating system as an FCoE device.
InfiniBand	Appears to the operating system as an InfiniBand device.
iSCSI	Appears to the operating system as an iSCSI device.

6.87.4.7 NetDevFuncType

The configured capability of this network device function.

- This property shall contain the configured capability of this network device function.

string	Description
Disabled	Neither enumerated nor visible to the operating system.
Ethernet	Appears to the operating system as an Ethernet device.
FibreChannel	Appears to the operating system as a Fibre Channel device.
FibreChannelOverEthernet	Appears to the operating system as an FCoE device.
InfiniBand (v1.5+)	Appears to the operating system as an InfiniBand device.
iSCSI	Appears to the operating system as an iSCSI device.

6.87.4.8 WWNSource

The configuration source of the World Wide Names (WWN) for this World Wide Node Name (WWNN) and World Wide Port Name (WWPN) connection.

- This property shall contain the configuration source of the World Wide Name (WWN) for this World Wide Node Name (WWNN) and World Wide Port Name (WWPN) connection.

string	Description
ConfiguredLocally	The set of FC/FCoE boot targets was applied locally through API or UI.
ProvidedByFabric	The set of FC/FCoE boot targets was applied by the Fibre Channel fabric.

6.87.5 Example response

```
{
  "@odata.type": "#NetworkDeviceFunction.v1_11_0.NetworkDeviceFunction",
  "Id": "111111111100",
  "Name": "Network Device Function View",
  "NetDevFuncType": "Ethernet",
  "DeviceEnabled": true,
  "NetDevFuncCapabilities": [
    "Ethernet",
    "FibreChannel"
  ],
  "Ethernet": {
    "PermanentMACAddress": "00:0C:29:9A:98:ED",
    "MACAddress": "00:0C:29:9A:98:ED",
    "MTUSize": 1500,
    "VLAN": {
      "VLANEnable": true,
      "VLANId": 101
    }
  },
  "iSCSIBoot": {
    "IPAddressType": "IPv4",
    "InitiatorIPAddress": "16.0.11.6",
    "InitiatorName": "iqn.2005-03.com.acme:database-server",
    "InitiatorDefaultGateway": "169.0.16.1",
    "InitiatorNetmask": "255.255.252.0",
    "TargetInfoViaDHCP": false,
    "PrimaryTargetName": "iqn.2005-03.com.acme:image-server",
    "PrimaryTargetIPAddress": "169.0.15.1",
    "PrimaryTargetTCPPort": 3260,
    "PrimaryLUN": 5,
  }
}
```



```

    "PrimaryVLANEnable": true,
    "PrimaryVLANId": 1001,
    "PrimaryDNS": "16.0.10.21",
    "SecondaryTargetName": "iqn.2005-03.com.acme:image-server",
    "SecondaryTargetIPAddress": "16.0.11.5",
    "SecondaryTargetTCPPort": 3260,
    "SecondaryLUN": 5,
    "SecondaryVLANEnable": true,
    "SecondaryVLANId": 1002,
    "SecondaryDNS": "169.0.10.22",
    "IPMaskDNSViaDHCP": false,
    "RouterAdvertisementEnabled": false,
    "AuthenticationMethod": "CHAP",
    "CHAPUsername": "yosemite",
    "CHAPSecret": "usrpasswd",
    "MutualCHAPUsername": "yosemite",
    "MutualCHAPSecret": "usrpasswd"
  },
  "FibreChannel": {
    "PermanentWWPN": "10:00:B0:5A:DD:BB:74:E0",
    "PermanentWWNN": "10:00:B0:5A:DD:BB:A1:B3",
    "WWPN": "10:00:B0:5A:DD:BB:74:E0",
    "WWNN": "10:00:B0:5A:DD:C4:D3:BB",
    "WWNSource": "ConfiguredLocally",
    "FCoELocalVLANId": 1001,
    "AllowFIPVLANDiscovery": true,
    "FCoEActiveVLANId": 2001,
    "BootTargets": [
      {
        "WWPN": "10:00:B0:5A:DD:BB:74:FA",
        "LUNID": "3",
        "BootPriority": 0
      }
    ]
  },
  "AssignablePhysicalNetworkPorts": [
    {
      "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/Ports/1"
    }
  ],
  "BootMode": "Disabled",
  "VirtualFunctionsEnabled": true,
  "MaxVirtualFunctions": 16,
  "VirtualFunctionAllocation": 8,
  "Links": {
    "PCIeFunction": {
      "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/NIC/PCIeFunctions/1"
    },
    "PhysicalNetworkPortAssignment": {
      "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/Ports/1"
    }
  }
}

```

```
    }
  },
  "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/NetworkDeviceFunctions/11111111100"
}
```

6.88 NetworkDeviceFunctionMetrics 1.2.0

Version	v1.2	v1.1	v1.0
Release	2024.1	2021.2	2021.1

6.88.1 Description

The `NetworkDeviceFunctionMetrics` schema contains usage and health statistics for a network function of a network adapter.

- This resource shall represent the network metrics for a single network function of a network adapter in a Redfish implementation.

6.88.2 URIs

`/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/NetworkDeviceFunctions/{NetworkDeviceFunctionId}/Metrics`

6.88.3 Properties

Property	Type	Attributes	Notes
Ethernet {	object		The network function metrics specific to Ethernet adapters. This property shall contain network function metrics specific to Ethernet adapters.
NumOffloadedIPv4Conns	integer	read-only (null)	The total number of offloaded TCP/IPv4 connections. This property shall contain the total number of offloaded TCP/IPv4 connections.

Property	Type	Attributes	Notes
NumOffloadedIPv6Conns	integer	<i>read-only</i> (null)	The total number of offloaded TCP/IPv6 connections. This property shall contain the total number of offloaded TCP/IPv6 connections.
}			
FibreChannel (v1.1+) {	object		The network function metrics specific to Fibre Channel adapters. This property shall contain network function metrics specific to Fibre Channel adapters.
PortLoginAccepts (v1.1+)	integer	<i>read-only</i> (null)	The total number of port login (PLOGI) accept (ACC) responses. This property shall contain the total number of PLOGI ACC responses received by this Fibre Channel function.
PortLoginRejects (v1.1+)	integer	<i>read-only</i> (null)	The total number of port login (PLOGI) reject (RJT) responses. This property shall contain the total number of PLOGI RJT responses received by this Fibre Channel function.
PortLoginRequests (v1.1+)	integer	<i>read-only</i> (null)	The total number of port login (PLOGI) requests transmitted. This property shall contain the total number of PLOGI requests sent by this function.
RXCongestionFPINs (v1.1+)	integer	<i>read-only</i> (null)	The total number of Congestion Fabric Performance Impact Notifications (FPINs) received. This property shall contain the total number of Congestion FPINs received by this Fibre Channel function.
RXDeliveryFPINs (v1.1+)	integer	<i>read-only</i> (null)	The total number of Delivery Fabric Performance Impact Notifications (FPINs) received. This property shall contain the total number of Delivery FPINs received by this Fibre Channel function.
RXExchanges (v1.1+)	integer	<i>read-only</i> (null)	The total number of Fibre Channel exchanges received. This property shall contain the total number of Fibre Channel exchanges received.
RXLinkIntegrityFPINs (v1.1+)	integer	<i>read-only</i> (null)	The total number of Link Integrity Fabric Performance Impact Notifications (FPINs) received. This property shall contain the total number of Link Integrity FPINs received by this Fibre Channel function.

Property	Type	Attributes	Notes
RXPeerCongestionFPINs (v1.1+)	integer	<i>read-only</i> (null)	The total number of Peer Congestion Fabric Performance Impact Notifications (FPINs) received. This property shall contain the total number of Peer Congestion FPINs received by this Fibre Channel function.
RXSequences (v1.1+)	integer	<i>read-only</i> (null)	The total number of Fibre Channel sequences received. This property shall contain the total number of Fibre Channel sequences received.
TXCongestionFPINs (v1.1+)	integer	<i>read-only</i> (null)	The total number of Congestion Fabric Performance Impact Notifications (FPINs) sent. This property shall contain the total number of Congestion FPINs sent by this Fibre Channel function.
TXDeliveryFPINs (v1.1+)	integer	<i>read-only</i> (null)	The total number of Delivery Fabric Performance Impact Notifications (FPINs) sent. This property shall contain the total number of Delivery FPINs sent by this Fibre Channel function.
TXExchanges (v1.1+)	integer	<i>read-only</i> (null)	The total number of Fibre Channel exchanges transmitted. This property shall contain the total number of Fibre Channel exchanges transmitted.
TXLinkIntegrityFPINs (v1.1+)	integer	<i>read-only</i> (null)	The total number of Link Integrity Fabric Performance Impact Notifications (FPINs) sent. This property shall contain the total number of Link Integrity FPINs sent by this Fibre Channel function.
TXPeerCongestionFPINs (v1.1+)	integer	<i>read-only</i> (null)	The total number of Peer Congestion Fabric Performance Impact Notifications (FPINs) sent. This property shall contain the total number of Peer Congestion FPINs sent by this Fibre Channel function.
TXSequences (v1.1+)	integer	<i>read-only</i> (null)	The total number of Fibre Channel sequences transmitted. This property shall contain the total number of Fibre Channel sequences transmitted.
}			

Property	Type	Attributes	Notes
RXAvgQueueDepthPercent	number (%)	<i>read-only</i> (<i>null</i>)	The average RX queue depth as the percentage. This property shall contain the average RX queue depth as a percentage, typically 0 to 100 .
RXBytes	integer (bytes)	<i>read-only</i> (<i>null</i>)	The total number of bytes received on a network function. This property shall contain the total number of bytes received on a network function, inclusive of all protocol overhead.
RXFrames	integer	<i>read-only</i> (<i>null</i>)	The total number of frames received on a network function. This property shall contain the total number of frames received on a network function.
RXMulticastFrames	integer	<i>read-only</i> (<i>null</i>)	The total number of good multicast frames received on a network function since reset. This property shall contain the total number of good multicast frames received on a network function since reset, including host and remote management passthrough traffic.
RXQueuesEmpty	boolean	<i>read-only</i> (<i>null</i>)	Whether nothing is in a network function's RX queues to DMA. This property shall indicate whether nothing is in a network function's RX queues to DMA.
RXQueuesFull	integer	<i>read-only</i> (<i>null</i>)	The number of RX queues that are full. This property shall contain the number of RX queues that are full.
RXUnicastFrames	integer	<i>read-only</i> (<i>null</i>)	The total number of good unicast frames received on a network function since reset. This property shall contain the total number of good unicast frames received on a network function since reset.
TXAvgQueueDepthPercent	number (%)	<i>read-only</i> (<i>null</i>)	The average TX queue depth as the percentage. This property shall contain the average TX queue depth as a percentage, typically 0 to 100 .
TXBytes	integer (bytes)	<i>read-only</i> (<i>null</i>)	The total number of bytes sent on a network function. This property shall contain the total number of bytes sent on a network function, inclusive of all protocol overhead.

Property	Type	Attributes	Notes
TXFrames	integer	<i>read-only</i> (null)	The total number of frames sent on a network function. This property shall contain the total number of frames sent on a network function.
TXMulticastFrames	integer	<i>read-only</i> (null)	The total number of good multicast frames transmitted on a network function since reset. This property shall contain the total number of good multicast frames transmitted on a network function since reset, including host and remote management passthrough traffic.
TXQueuesEmpty	boolean	<i>read-only</i> (null)	Whether all TX queues for a network function are empty. This property shall indicate whether all TX queues for a network function are empty.
TXQueuesFull	integer	<i>read-only</i> (null)	The number of TX queues that are full. This property shall contain the number of TX queues that are full.
TXUnicastFrames	integer	<i>read-only</i> (null)	The total number of good unicast frames transmitted on a network function since reset. This property shall contain the total number of good unicast frames transmitted on a network function since reset, including host and remote management passthrough traffic.

6.88.4 Actions

6.88.4.1 ResetMetrics (v1.2+)

Description

This action resets the summary metrics related to this device.

- This action shall reset any time intervals or counted values for this device.

Action URI

{Base URI of target resource}/Actions/NetworkDeviceFunctionMetrics.ResetMetrics

Action parameters

This action takes no parameters.

6.88.5 Example response

```
{
  "@odata.type": "#NetworkDeviceFunctionMetrics.v1_2_0.NetworkDeviceFunctionMetrics",
  "Id": "NetworkDeviceFunctionMetrics",
  "Name": "Network Device Function Metrics",
  "TXAvgQueueDepthPercent": 13.7,
  "RXAvgQueueDepthPercent": 21.2,
  "RXFrames": 27193387,
  "RXBytes": 7754199970,
  "RXUnicastFrames": 26193387,
  "RXMulticastFrames": 1000000,
  "TXFrames": 18205770,
  "TXBytes": 9436506547,
  "TXUnicastFrames": 17205770,
  "TXMulticastFrames": 1000000,
  "TXQueuesEmpty": false,
  "RXQueuesEmpty": false,
  "TXQueuesFull": 0,
  "RXQueuesFull": 0,
  "Ethernet": {
    "NumOffloadedIPv4Conns": 0,
    "NumOffloadedIPv6Conns": 0
  },
  "@odata.id": "/redfish/v1/Chassis/1U/NetworkAdapters/Slot1/NetworkDeviceFunctions/SC2KP1F0/Metrics"
}
```

6.89 NetworkInterface 1.2.3

Version	v1.2	v1.1	v1.0
Release	2020.3	2017.1	2016.3

6.89.1 Description

The `NetworkInterface` schema describes links to the network adapters, network ports, and network device functions, and represents the functionality available to the containing system.

- This resource contains links to the network adapters, network ports, and network device functions, and represents the functionality available to the containing system.

6.89.2 URIs

```

/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/NetworkInterfaces/{NetworkInterfaceId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/
NetworkInterfaces/{NetworkInterfaceId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/NetworkInterfaces/{NetworkInterfaceId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/NetworkInterfaces/
{NetworkInterfaceId}
/redfish/v1/Systems/{ComputerSystemId}/NetworkInterfaces/{NetworkInterfaceId}

```

6.89.3 Properties

Property	Type	Attributes	Notes
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
NetworkAdapter {	object		The link to the network adapter that contains this network interface. This property shall contain a link to a resource of type <code>NetworkAdapter</code> that represents the physical container associated with this network interface. See the <code>NetworkAdapter</code> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>NetworkAdapter</code> resource. See the Links section and the <code>NetworkAdapter</code> schema for details.
}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
NetworkDeviceFunctions {	object		The link to the network device functions associated with this network interface. This does not include Ethernet network device functions. This property shall contain a link to a resource collection of type <code>NetworkDeviceFunctionCollection</code>. The members of this collection shall not contain <code>NetworkDeviceFunction</code> resources whose <code>NetDevFuncType</code> property contains <code>Ethernet</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <code>NetworkDeviceFunction</code> . See the <code>NetworkDeviceFunction</code> schema for details.
}			

Property	Type	Attributes	Notes
NetworkPorts (<i>deprecated v1.2</i>) {	object		The link to the network ports associated with this network interface. This property shall contain a link to a resource collection of type <code>NetworkPortCollection</code>. Contains a link to a resource. <i>Deprecated in v1.2 and later. This property has been deprecated in favor of the <code>Ports</code> property.</i>
@odata.id	string	<i>read-only</i>	Link to Collection of <i>NetworkPort</i> . See the NetworkPort schema for details.
}			
Ports (v1.2+) {	object		The link to the ports associated with this network interface. This property shall contain a link to a resource collection of type <code>PortCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Port</i> . See the Port schema for details.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

6.89.4 Example response

```
{
  "@odata.type": "#NetworkInterface.v1_2_3.NetworkInterface",
  "Id": "9fa725a1",
  "Name": "Network Device View",
  "NetworkPorts": {
    "@odata.id": "/redfish/v1/Systems/1/NetworkInterfaces/9fd725a1/NetworkPorts"
  },
  "NetworkDeviceFunctions": {
    "@odata.id": "/redfish/v1/Systems/1/NetworkInterfaces/9fd725a1/NetworkDeviceFunctions"
  },
  "Links": {
    "NetworkAdapter": {
      "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1"
    }
  },
  "@odata.id": "/redfish/v1/Systems/1/NetworkInterfaces/9fd725a1"
}
```

6.90 NetworkPort 1.4.3 (deprecated)

Version	v1.4 <i>Deprecated</i>	v1.3	v1.2	v1.1	v1.0
Release	2020.4	2020.3	2018.2	2017.1	2016.3

This schema has been deprecated and use in new implementations is discouraged except to retain compatibility with existing products. This schema has been deprecated in favor of the `Port` schema.

6.90.1 Description

The `NetworkPort` schema describes a network port, which is a discrete physical port that can connect to a network.

- This resource shall represent a discrete physical port that can connect to a network in a Redfish implementation.

6.90.2 URIs

/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/NetworkPorts/{NetworkPortId} (deprecated)

6.90.3 Properties

Property	Type	Attributes	Notes
ActiveLinkTechnology	string (enum)	<i>read-write</i> (null)	Network port active link technology. • This property shall contain the configured link technology of this port. <i>For the possible property values, see ActiveLinkTechnology in Property details.</i>
AssociatedNetworkAddresses []	array (string, null)	<i>read-only</i>	An array of configured MAC or WWN network addresses that are associated with this network port, including the programmed address of the lowest-numbered network device function, the configured but not active address, if applicable, the address for hardware port teaming, or other network addresses. • This property shall contain an array of configured network addresses that are associated with this network port, including the programmed address of the lowest-numbered network device function, the configured but not active address if applicable, the address for hardware port teaming, or other network addresses.

Property	Type	Attributes	Notes
CurrentLinkSpeedMbps (v1.2+)	integer (Mbit/s)	<i>read-write</i> (null)	Network port current link speed. This property shall contain the current configured link speed of this port.
EEEEnabled	boolean	<i>read-write</i> (null)	An indication of whether IEEE 802.3az Energy-Efficient Ethernet (EEE) is enabled for this network port. This property shall indicate whether IEEE 802.3az Energy-Efficient Ethernet (EEE) is enabled for this network port.
FCFabricName (v1.2+)	string	<i>read-only</i> (null)	The FC Fabric Name provided by the switch. This property shall indicate the FC Fabric Name provided by the switch.
FCPortConnectionType (v1.2+)	string (enum)	<i>read-only</i> (null)	The connection type of this port. This property shall contain the connection type for this port. <i>For the possible property values, see FCPortConnectionType in Property details.</i>
FlowControlConfiguration	string (enum)	<i>read-write</i> (null)	The locally configured 802.3x flow control setting for this network port. This property shall contain the locally configured 802.3x flow control setting for this network port. <i>For the possible property values, see FlowControlConfiguration in Property details.</i>
FlowControlStatus	string (enum)	<i>read-only</i> (null)	The 802.3x flow control behavior negotiated with the link partner for this network port (Ethernet-only). This property shall contain the 802.3x flow control behavior negotiated with the link partner for this network port (Ethernet-only). <i>For the possible property values, see FlowControlStatus in Property details.</i>
LinkStatus	string (enum)	<i>read-only</i> (null)	The status of the link between this port and its link partner. This property shall contain the link status between this port and its link partner. <i>For the possible property values, see LinkStatus in Property details.</i>
MaxFrameSize (v1.2+)	integer (bytes)	<i>read-only</i> (null)	The maximum frame size supported by the port. This property shall contain the maximum frame size supported by the port.

Property	Type	Attributes	Notes
NetDevFuncMaxBWAlloc [{	array		An array of maximum bandwidth allocation percentages for the network device functions associated with this port. This property shall contain an array of maximum bandwidth allocation percentages for the network device functions associated with this port.
MaxBWAllocPercent	integer (%)	<i>read-write (null)</i>	The maximum bandwidth allocation percentage allocated to the corresponding network device function instance. This property shall contain the maximum bandwidth percentage allocation for the associated network device function.
NetworkDeviceFunction {	object		The link to the network device function associated with this bandwidth setting of this network port. This property shall contain a link to a resource of type <code>NetworkDeviceFunction</code> that represents the network device function associated with this bandwidth setting of this network port. See the <i>NetworkDeviceFunction</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>NetworkDeviceFunction</code> resource. See the Links section and the <i>NetworkDeviceFunction</i> schema for details.
}			
}]			
NetDevFuncMinBWAlloc [{	array		An array of minimum bandwidth allocation percentages for the network device functions associated with this port. This property shall contain an array of minimum bandwidth percentage allocations for each of the network device functions associated with this port.
MinBWAllocPercent	integer (%)	<i>read-write (null)</i>	The minimum bandwidth allocation percentage allocated to the corresponding network device function instance. This property shall contain the minimum bandwidth percentage allocation for the associated network device function. The sum total of all minimum percentages shall not exceed 100.
NetworkDeviceFunction {	object		The link to the network device function associated with this bandwidth setting of this network port. This property shall contain a link to a resource of type <code>NetworkDeviceFunction</code> that represents the network device function associated with this bandwidth setting of this network port. See the <i>NetworkDeviceFunction</i> schema for details on this property.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a NetworkDeviceFunction resource. See the Links section and the <i>NetworkDeviceFunction</i> schema for details.
}			
}]			
NumberDiscoveredRemotePorts (v1.2+)	integer	<i>read-only</i> (null)	The number of ports not on this adapter that this port has discovered. This property shall contain the number of ports not on this adapter that this port has discovered.
PhysicalPortNumber	string	<i>read-only</i> (null)	The physical port number label for this port. This property shall contain the physical port number on the network adapter hardware that this network port corresponds to. This value should match a value visible on the hardware.
PortMaximumMTU	integer	<i>read-only</i> (null)	The largest maximum transmission unit (MTU) that can be configured for this network port. This property shall contain the largest maximum transmission unit (MTU) that can be configured for this network port.
SignalDetected	boolean	<i>read-only</i> (null)	An indication of whether the port has detected enough signal on enough lanes to establish a link. This property shall indicate whether the port has detected enough signal on enough lanes to establish a link.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
SupportedEthernetCapabilities []	array (string (enum))	<i>read-only</i> (null)	- The set of Ethernet capabilities that this port supports. - This property shall contain an array of zero or more Ethernet capabilities supported by this port. For the possible property values, see <i>SupportedEthernetCapabilities</i> in Property details.
SupportedLinkCapabilities [{	array		The link capabilities of this port. This property shall describe the static capabilities of the port, irrespective of transient conditions such as cabling, interface module presence, or remote link partner status or configuration.

Property	Type	Attributes	Notes
AutoSpeedNegotiation (v1.2+)	boolean	<i>read-only</i> (null)	An indication of whether the port is capable of autonegotiating speed. This property shall indicate whether the port is capable of autonegotiating speed.
CapableLinkSpeedMbps (v1.2+) []	array (integer, null)	<i>read-only</i>	The set of link speed capabilities of this port. This property shall contain all of the possible network link speed capabilities of this port.
LinkNetworkTechnology	string (enum)	<i>read-only</i> (null)	The link network technology capabilities of this port. This property shall contain a network technology capability of this port. <i>For the possible property values, see LinkNetworkTechnology in Property details.</i>
LinkSpeedMbps (deprecated v1.2)	integer (Mbit/s)	<i>read-only</i> (null)	The speed of the link in Mbit/s when this link network technology is active. This property shall contain the speed of the link in megabits per second (Mbit/s) units for this port when this link network technology is active. <i>Deprecated in v1.2 and later. This property has been deprecated in favor of the CapableLinkSpeedMbps property.</i>
}]			
VendorId (v1.2+)	string	<i>read-only</i> (null)	The vendor Identification for this port. This property shall indicate the vendor identification string information as provided by the manufacturer of this port.
WakeOnLANEnabled	boolean	<i>read-write</i> (null)	An indication of whether Wake on LAN (WoL) is enabled for this network port. This property shall indicate whether Wake on LAN (WoL) is enabled for this network port.

6.90.4 Property details

6.90.4.1 ActiveLinkTechnology

Network port active link technology.

- This property shall contain the configured link technology of this port.

string	Description
Ethernet	The port is capable of connecting to an Ethernet network.
FibreChannel	The port is capable of connecting to a Fibre Channel network.
InfiniBand	The port is capable of connecting to an InfiniBand network.

6.90.4.2 FCPortConnectionType

The connection type of this port.

- This property shall contain the connection type for this port.

string	Description
ExtenderFabric	This port connection type is an extender fabric port.
Generic	This port connection type is a generic fabric port.
NotConnected	This port is not connected.
NPort	This port connects through an N-port to a switch.
PointToPoint	This port connects in a point-to-point configuration.
PrivateLoop	This port connects in a private loop configuration.
PublicLoop	This port connects in a public configuration.

6.90.4.3 FlowControlConfiguration

The locally configured 802.3x flow control setting for this network port.

- This property shall contain the locally configured 802.3x flow control setting for this network port.

string	Description
None	No IEEE 802.3x flow control is enabled on this port.
RX	The link partner can initiate IEEE 802.3x flow control.
TX	This station can initiate IEEE 802.3x flow control.
TX_RX	This station or the link partner can initiate IEEE 802.3x flow control.

6.90.4.4 FlowControlStatus

The 802.3x flow control behavior negotiated with the link partner for this network port (Ethernet-only).

- This property shall contain the 802.3x flow control behavior negotiated with the link partner for this network port (Ethernet-only).

string	Description
None	No IEEE 802.3x flow control is enabled on this port.
RX	The link partner can initiate IEEE 802.3x flow control.
TX	This station can initiate IEEE 802.3x flow control.
TX_RX	This station or the link partner can initiate IEEE 802.3x flow control.

6.90.4.5 LinkNetworkTechnology

The link network technology capabilities of this port.

- This property shall contain a network technology capability of this port.

string	Description
Ethernet	The port is capable of connecting to an Ethernet network.
FibreChannel	The port is capable of connecting to a Fibre Channel network.
InfiniBand	The port is capable of connecting to an InfiniBand network.

6.90.4.6 LinkStatus

The status of the link between this port and its link partner.

- This property shall contain the link status between this port and its link partner.

string	Description
Down	The port is enabled but link is down.
Starting (v1.3+)	This link on this interface is starting. A physical link has been established, but the port is not able to transfer data.

string	Description
Training (v1.3+)	This physical link on this interface is training.
Up	The port is enabled and link is good (up).

6.90.4.7 SupportedEthernetCapabilities

- The set of Ethernet capabilities that this port supports.
 - This property shall contain an array of zero or more Ethernet capabilities supported by this port.

string	Description
EEE	IEEE 802.3az Energy-Efficient Ethernet (EEE) is supported on this port.
WakeOnLAN	Wake on LAN (WoL) is supported on this port.

6.90.5 Example response

```
{
  "@odata.type": "#NetworkPort.v1_4_3.NetworkPort",
  "Id": "1",
  "Name": "Network Port View",
  "PhysicalPortNumber": "1",
  "LinkStatus": "Up",
  "SupportedLinkCapabilities": [
    {
      "AutoSpeedNegotiation": true,
      "LinkNetworkTechnology": "Ethernet",
      "CapableLinkSpeedMbps": [
        10,
        100,
        10000
      ]
    }
  ],
  "ActiveLinkTechnology": "Ethernet",
  "SupportedEthernetCapabilities": [
    "WakeOnLAN",
    "EEE"
  ],
  "NetDevFuncMinBWAlloc": [
    {
      "NetworkDeviceFunction": {
        "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/NetworkDeviceFunctions/1111111111100"
      }
    }
  ]
}
```

```
    },
    "MinBWAllocPercent": 25
  }
],
"NetDevFuncMaxBWAlloc": [
  {
    "NetworkDeviceFunction": {
      "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/NetworkDeviceFunctions/111111111100"
    },
    "MaxBWAllocPercent": 100
  }
],
"AssociatedNetworkAddresses": [
  "00:0C:29:9A:98:ED",
  "00:0C:29:9A:98:EF"
],
"EEEEnabled": true,
"WakeOnLANEnabled": true,
"PortMaximumMTU": 1500,
"FlowControlStatus": "None",
"FlowControlConfiguration": "None",
"SignalDetected": true,
"@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/NetworkPorts/1"
}
```

6.91 OperatingConfig 1.0.4

Version	v1.0
Release	2020.2

6.91.1 Description

The `OperatingConfig` schema specifies a configuration that can be used when the processor is operational.

- This resource shall represent an operational configuration for a processor in the Redfish Specification.

6.91.2 URIs

`/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/OperatingConfigs/{OperatingConfigId}`

6.91.3 Properties

Property	Type	Attributes	Notes
BaseSpeedMHz	integer (MHz)	<i>read-only</i> (<i>null</i>)	The base (nominal) clock speed of the processor in MHz. This property shall contain the base (nominal) clock speed of the processor in MHz.
BaseSpeedPrioritySettings [{	array		The clock speed for sets of cores when the configuration is operational. This property shall contain an array of objects that specify the clock speed for sets of cores when the configuration is operational.
BaseSpeedMHz	integer (MHz)	<i>read-only</i> (<i>null</i>)	The clock speed to configure the set of cores in MHz. This property shall contain the clock speed to configure the set of cores in MHz.
CoreCount	integer	<i>read-only</i> (<i>null</i>)	The number of cores to configure with a specified speed. This property shall contain the number of cores to configure with the speed specified by the <code>BaseSpeedMHz</code> property. The sum of all <code>CoreCount</code> properties shall equal the value of the <code>TotalAvailableCoreCount</code> property.
CoreIDs []	array (integer, null)	<i>read-only</i>	The identifier of the cores to configure with the specified speed. This property shall contain an array identifying the cores to configure with the speed specified by the <code>BaseSpeedMHz</code> property. The length of the array shall equal the value of the <code>CoreCount</code> property.
}]			
MaxJunctionTemperatureCelsius	integer (Celsius)	<i>read-only</i> (<i>null</i>)	The maximum temperature of the junction in degree Celsius units. This property shall contain the maximum temperature of the junction in degree Celsius units.
MaxSpeedMHz	integer (MHz)	<i>read-only</i> (<i>null</i>)	The maximum clock speed to which the processor can be configured in MHz. This property shall contain the maximum clock speed to which the processor can be configured in MHz.
TDPWatts	integer (Watts)	<i>read-only</i> (<i>null</i>)	The thermal design point of the processor in watt units. This property shall contain the thermal design point of the processor in watt units.

Property	Type	Attributes	Notes
TotalAvailableCoreCount	integer	<i>read-only</i> (null)	The number of cores in the processor that can be configured. This property shall contain the number of cores in the processor that can be configured.
TurboProfile [{	array		The turbo profiles for the processor. A turbo profile is the maximum turbo clock speed as a function of the number of active cores. The property shall contain an array of objects that specify the turbo profile for a set of active cores.
ActiveCoreCount	integer	<i>read-only</i> (null)	The number of active cores to be configured with the specified maximum clock speed. This property shall contain the number of cores to be configured with the maximum turbo clock speed. The value shall be less than or equal to the <code>TotalAvailableCoreCount</code> property.
MaxSpeedMHz	integer (MHz)	<i>read-only</i> (null)	The maximum turbo clock speed that correspond to the number of active cores in MHz. This property shall contain the maximum turbo clock speed that correspond to the number of active cores in MHz.
}]			

6.91.4 Example response

```
{
  "@odata.type": "#OperatingConfig.v1_0_4.OperatingConfig",
  "Id": "0",
  "Name": "Processor Profile",
  "TotalAvailableCoreCount": 28,
  "TDPWatts": 150,
  "BaseSpeedMHz": 2500,
  "MaxSpeedMHz": 4100,
  "MaxJunctionTemperatureCelsius": 90,
  "TurboProfile": [
    {
      "ActiveCoreCount": 2,
      "MaxSpeedMHz": 4100
    },
    {
      "ActiveCoreCount": 4,
      "MaxSpeedMHz": 4000
    }
  ]
}
```

```

    {
      "ActiveCoreCount": 8,
      "MaxSpeedMHz": 3800
    },
    {
      "ActiveCoreCount": 28,
      "MaxSpeedMHz": 3200
    }
  ],
  "BaseSpeedPrioritySettings": [
    {
      "CoreCount": 8,
      "CoreIDs": [
        0,
        2,
        3,
        4,
        5,
        6,
        7,
        8
      ],
      "BaseSpeedMHz": 2900
    },
    {
      "CoreCount": 20,
      "BaseSpeedMHz": 2200
    }
  ],
  "@odata.id": "/redfish/v1/Systems/operating-config-example/Processors/CPU1/OperatingConfigs/0"
}
```

6.92 OperatingSystem 1.0.2

Version	v1.0
Release	2023.2

6.92.1 Description

The `OperatingSystem` schema represents the operating system and software running on a computer system.

- This resource shall represent the operating system and software running on a computer system.

6.92.2 URIs

/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/OperatingSystem
 /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/OperatingSystem
 /redfish/v1/Systems/{ComputerSystemId}/OperatingSystem

6.92.3 Properties

Property	Type	Attributes	Notes
Applications {	object		The link to the collection of applications running under this operating system. This property shall contain a link to a resource collection of type <code>ApplicationCollection</code> that represent the applications running under this operating system. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Application</i> . See the Application schema for details.
}			
ContainerEngines [{	array		The container engines running in this operating system. This property shall contain the container engines running in this operating system.
ManagementURIs []	array (URI) (string, null)	<i>read-only</i>	The URIs to manage this container engine. This property shall contain an array of URIs to management interfaces for this container engine. This is typically a web UI or API provided by the container engine.
SupportedImageTypes []	array (string (enum))	<i>read-only (null)</i>	- The supported image types for this container engine. - This property shall contain the supported image types for this container engine. <i>For the possible property values, see SupportedImageTypes in Property details.</i>
Type	string (enum)	<i>read-only (null)</i>	The type of container engine. This property shall contain the type for this container engine. <i>For the possible property values, see Type in Property details.</i>
Version	string	<i>read-only (null)</i>	The version of this container engine. This property shall contain the version of this container engine.
}]			

Property	Type	Attributes	Notes
ContainerImages {	object		The link to the collection of container images available to container engines on this operating system. This property shall contain a link to a resource collection of type <code>ContainerImageCollection</code> that represent the container images available to container engines on this operating system. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>ContainerImage</i> . See the ContainerImage schema for details.
}			
Containers {	object		The link to the collection of containers running under this operating system. This property shall contain a link to a resource collection of type <code>ContainerCollection</code> that represent the containers running under this operating system. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Container</i> . See the Container schema for details.
}			
Kernel {	object	(null)	The kernel information for this operating system. This property shall contain the kernel information for this operating system.
Machine	string	<i>read-only</i> (null)	The machine hardware name of the kernel. This property shall contain the machine hardware name of the kernel. For strict POSIX operating systems, the value shall contain the output of <code>uname -m</code>.
Name	string	<i>read-only</i> (null)	The name of the kernel. This property shall contain the name of the kernel. For strict POSIX operating systems, the value shall contain the output of <code>uname -s</code>. For Microsoft Windows, the value shall contain the string name from the output of <code>ver</code>, from Command Prompt, prior to the first square brace ([), which is typically <code>Microsoft Windows</code>.
Release	string	<i>read-only</i> (null)	The release of the kernel. This property shall contain the release of the kernel. For strict POSIX operating systems, the value shall contain the output of <code>uname -r</code>. For Microsoft Windows, the value shall contain the decimal-delimited version from the output of <code>ver</code>, from Command Prompt, within the square braces ([and]), following the regular expression <code>^\d+\.\d+\.\d+\.\d+\$</code>.

Property	Type	Attributes	Notes
Version	string	<i>read-only</i> (null)	The version of the kernel. This property shall contain the version of the kernel. For strict POSIX operating systems, the value shall contain the output of <code>uname -v</code>.
}			
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
SoftwareImage {	object		The link to the software image for this operating system. This property shall contain a link to a resource of type <code>SoftwareInventory</code> that represents the software image from which this operating system runs. See the <code>SoftwareInventory</code> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>SoftwareInventory</code> resource. See the Links section and the <code>SoftwareInventory</code> schema for details.
}			
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
Type	string (enum)	<i>read-only</i> (null)	The type of operating system. This property shall contain the type for this operating system. <i>For the possible property values, see Type in Property details.</i>
UptimeSeconds	integer	<i>read-only</i> (null)	The wall-clock time this operating system has been running in seconds. This property shall contain the wall-clock time this operating system has been running in seconds.
VirtualMachineEngines [{	array		The virtual machine engines running in this operating system. This property shall contain the virtual machine engines running in this operating system.

Property	Type	Attributes	Notes
ManagementURIs []	array (URI) (string, null)	<i>read-only</i>	The URIs to manage this virtual machine engine. This property shall contain an array of URIs to management interfaces for this virtual machine engine. This is typically a web UI or API provided by the virtual machine engine.
SupportedImageTypes []	array (string (enum))	<i>read-only (null)</i>	- The supported image types for this container engine. - This property shall contain the supported image types for this container engine. <i>For the possible property values, see SupportedImageTypes in Property details.</i>
Type	string (enum)	<i>read-only (null)</i>	The type of virtual machine engine. This property shall contain the type for this virtual machine engine. <i>For the possible property values, see Type in Property details.</i>
Version	string	<i>read-only (null)</i>	The version of this virtual machine engine. This property shall contain the version of this virtual machine engine.
}]			

6.92.4 Property details

6.92.4.1 SupportedImageTypes

6.92.4.1.1 In ContainerEngines:

- The supported image types for this container engine.
 - This property shall contain the supported image types for this container engine.

string	Description
DockerV1	Docker V1. This value shall indicate a Docker Image Specification Version 1-defined Docker image.
DockerV2	Docker V2. This value shall indicate a Docker Image Manifest Version 2-defined Docker image.

string	Description
OCI	OCI (Open Container Initiative). This value shall indicate an Open Container Specification-defined OCI (Open Container Initiative) image.

6.92.4.1.2 In VirtualMachineEngines:

- The supported image types for this container engine.
 - This property shall contain the supported image types for this container engine.

string	Description
OVA	OVA (Open Virtual Appliance). This value shall indicate a DSP0243-defined OVA (Open Virtual Appliance) image.
OVF	OVF (Open Virtualization Format). This value shall indicate a DSP0243-defined OVF (Open Virtualization Format) image.
QCOW	QCOW (QEMU Copy-on-Write). This value shall indicate a QEMU-defined QCOW (QEMU Copy-on-Write) image.
QCOW2	QCOW2 (QEMU Copy-on-Write version 2). This value shall indicate a QEMU-defined QCOW2 (QEMU Copy-on-Write version 2) image.
Raw	Raw disk image. This value shall indicate a raw disk image.
VDI	VDI (Virtual Disk Image). This value shall indicate an Oracle VM VirtualBox-defined VDI (Virtual Disk Image).
VHD	VHD (Virtual Hard Disk). This value shall indicate a Microsoft Open Specification Promise-defined VHD (Virtual Hard Disk) image.
VMDK	VMDK (Virtual Machine Disk). This value shall indicate a VMware-defined VMDK (Virtual Machine Disk) image.

6.92.4.2 Type

6.92.4.2.1 In top level:

The type of operating system.

- This property shall contain the type for this operating system.

string	Description
AIX	IBM AIX.
BSD	Berkeley Software Distribution.
HPUX	HPE HP-UX.
Hypervisor	A bare-metal hypervisor.
IBMi	IBM i.
Linux	Linux.
macOS	Apple macOS.
Solaris	Oracle Solaris.
Windows	Microsoft Windows.

6.92.4.2.2 In ContainerEngines:

The type of container engine.

- This property shall contain the type for this container engine.

string	Description
containerd	containerd. • This value shall indicate the container engine is containerd.
CRI-O	CRI-O. • This value shall indicate the container engine is CRI-O.

string	Description
Docker	Docker. This value shall indicate the container engine is Docker.

6.92.4.2.3 In VirtualMachineEngines:

The type of virtual machine engine.

- This property shall contain the type for this virtual machine engine.

string	Description
HyperV	Microsoft Hyper-V. This value shall indicate the virtual machine engine is Microsoft Hyper-V.
KVM	KVM (Kernel-based Virtual Machine). This value shall indicate the virtual machine engine is Linux KVM (Kernel-based Virtual Machine).
PowerVM	IBM PowerVM. This value shall indicate the virtual machine engine is IBM PowerVM.
QEMU	QEMU (Quick Emulator). This value shall indicate the virtual machine engine is QEMU (Quick Emulator). If QEMU is acting as a frontend for another virtual machine engine, such as Xen or KVM, VirtualMachineEngines should contain additional entries to represent the backend virtual machine engines.
VirtualBox	Oracle VM VirtualBox. This value shall indicate the virtual machine engine is Oracle VM VirtualBox. If VirtualBox is acting as a frontend for another virtual machine engine, such as HyperV, VirtualMachineEngines should contain additional entries to represent the backend virtual machine engines.
VMwareESX	VMware ESX or ESXi. This value shall indicate the virtual machine engine is VMware ESX or ESXi.
Xen	Xen. This value shall indicate the virtual machine engine is Xen.

6.92.5 Example response

```
{
  "@odata.type": "#OperatingSystem.v1_0_2.OperatingSystem",
  "Id": "OperatingSystem",
  "Name": "OperatingSystem running on web-srv344",
  "UptimeSeconds": 6720,
  "Kernel": {
    "Name": "Linux",
    "Release": "5.10.13-x86_64",
    "Version": "#1 SMP Thu Feb 4 13:56:42 EST 2021",
    "Machine": "x86_64"
  },
  "Type": "Linux",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "Applications": {
    "@odata.id": "/redfish/v1/Systems/VM1/OperatingSystem/Applications"
  },
  "ContainerEngines": [
    {
      "Type": "Docker",
      "Version": "20.10.5",
      "SupportedImageTypes": [
        "DockerV1",
        "DockerV2",
        "OCI"
      ],
      "ManagementURIs": [
        "https://192.168.0.12:5555"
      ]
    }
  ],
  "ContainerImages": {
    "@odata.id": "/redfish/v1/Systems/VM1/OperatingSystem/ContainerImages"
  },
  "Containers": {
    "@odata.id": "/redfish/v1/Systems/VM1/OperatingSystem/Containers"
  },
  "Links": {
    "SoftwareImage": {
      "@odata.id": "/redfish/v1/UpdateService/SoftwareInventory/ContosoLinux"
    }
  },
  "@odata.id": "/redfish/v1/Systems/VM1/OperatingSystem"
}
```

6.93 OutboundConnection 1.0.2

Version	v1.0
Release	2023.2

6.93.1 Description

The `OutboundConnection` schema defines how the Redfish service connects to a remote client over a WebSocket connection. This allows a service behind a firewall to establish a connection to a remote client outside of the firewall.

- This resource shall represent the connection configuration necessary to connect to a remote client. Services shall initiate the outbound connection over a WebSocket defined in the 'Outbound connections' clause of the Redfish Specification.

6.93.2 URIs

/redfish/v1/AccountService/OutboundConnections/{*OutboundConnectionId*}

6.93.3 Properties

Property	Type	Attributes	Notes
Authentication	string (enum)	<i>read-only required on create (null)</i>	The authentication mechanism for the WebSocket connection. • This property shall contain the authentication mechanism for the WebSocket connection. <i>For the possible property values, see Authentication in Property details.</i>

Property	Type	Attributes	Notes
Certificates {	object		The link to a collection of server certificates for the remote client referenced by the <code>EndpointURI</code> property. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that represents the server certificates for the remote client referenced by the <code>EndpointURI</code> property. If the <code>Authentication</code> property contains <code>MTLS</code>, the service shall compare the certificates in this collection with the certificate obtained during handshaking with the WebSocket service to verify the identity of the remote client prior to completing the connection. If the remote client cannot be verified, the service shall not complete the connection. Regardless of the contents of this collection, services may perform additional verification based on other factors, such as the configuration of the <code>SecurityPolicy</code> resource. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
ClientCertificates {	object		The link to a collection of client identity certificates provided to the remote client referenced by the <code>EndpointURI</code> property. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that represents the client identity certificates for the service. If the <code>Authentication</code> property contains <code>MTLS</code>, these certificates are provided to the remote client referenced by the <code>EndpointURI</code> property as part of TLS handshaking. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
ConnectionEnabled	boolean	<i>read-write (null)</i>	Indicates if the outbound connection is enabled. This property shall indicate if the outbound connection is enabled. If <code>true</code>, the service shall attempt to establish an outbound connection to the remote client specified by the <code>EndpointURI</code> property. If <code>false</code>, the service shall not attempt to establish a connection to the remote client and shall close the connection if one is already established. When a connection is established, the service shall create a Session resource to represent the active connection. When a connection is closed, the service shall delete the connection's respective Session resource. If the client does not provide this property, the service shall default this value to <code>true</code>.

Property	Type	Attributes	Notes
EndpointURI	string (URI)	<i>read-only required on create</i>	The URI of the WebSocket connection to the remote client. This property shall contain the WebSocket URI to the external web service of the remote client. The value shall follow the URI format defined in RFC6455. Services shall reject URIs that do not contain the scheme <code>wss</code>.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
Session {	object	(null)	The link to the session for this outbound connection. This property shall contain the link to a resource of type <code>Session</code> that represents the active connection for this outbound connection. See the <code>Session</code> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Session resource. See the Links section and the <code>Session</code> schema for details.
}			
}			
PreUpgradeHTTPHeaders {	object		The HTTP headers to send to the remote client during the initial connection prior to the WebSocket upgrade. This property is an empty object in responses. This property shall contain an object consisting of the names and values of HTTP headers to send to the remote client during the initial connection prior to the WebSocket upgrade. This property shall be an empty object in responses.
(pattern)	string	<i>read-write</i>	Property names follow regular expression pattern <code>"^[^:\s]+\$"</code>
}			
RetryPolicy {	object		The retry policy for this outbound connection. This property shall contain the retry policy for this outbound connection. If not specified by the client in the create request, the service shall assume <code>ConnectionRetryPolicy</code> contains <code>None</code>.

Property	Type	Attributes	Notes
ConnectionRetryPolicy	string (enum)	<i>read-only (null)</i>	The type of retry policy for this outbound connection. This property shall contain the type of retry policy for this outbound connection. <i>For the possible property values, see ConnectionRetryPolicy in Property details.</i>
RetryCount	integer	<i>read-write (null)</i>	The number of retries to attempt if the retry policy specifies a maximum number of retries. This property shall contain the number of retries to attempt if the retry policy specifies a maximum number of retries.
RetryIntervalMinutes	integer	<i>read-write (null)</i>	The retry interval in minutes. This property shall contain the interval for the service to retry connecting to remote client in minutes.
}			
Roles []	array (string, null)	<i>read-only required on create</i>	The Redfish roles that contain the privileges of the remote client for the outbound connection. This property shall contain the Redfish roles that contain the privileges of the remote client for the outbound connection.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
WebSocketPingIntervalMinutes	integer	<i>read-write required on create (null)</i>	Interval for sending the WebSocket ping opcode in minutes. The value 0 indicates the ping opcode is not sent. This property shall contain the interval for the service to send the WebSocket ping opcode to the remote client in minutes. If 0, the service shall not send the WebSocket ping opcode to the remote client.

6.93.4 Property details

6.93.4.1 Authentication

The authentication mechanism for the WebSocket connection.

- This property shall contain the authentication mechanism for the WebSocket connection.

string	Description
JWT	JSON Web Token. This value shall indicate an RFC7519-defined JSON Web Token (JWT) is specified in one of the HTTP headers in the <code>PreUpgradeHTTPHeaders</code> property. This is typically encoded in the <code>Authorization</code> header with the scheme <code>Bearer</code>.
MTLS	Mutual TLS. This value shall indicate the service will exchange and verify certificates during TLS handshaking when establishing the outbound connecting.
None	No authentication. This value shall indicate the service does not provide any authentication information to the remote client.
OEM	OEM-specific. This value shall indicate an OEM-specific authentication mechanism.

6.93.4.2 ConnectionRetryPolicy

The type of retry policy for this outbound connection.

- This property shall contain the type of retry policy for this outbound connection.

string	Description
None	No retries. This value shall indicate the service will not attempt to re-establish the outbound connection if the connection is dropped or not established. If the connection is dropped or not established, the service shall set the <code>ConnectionEnabled</code> property to <code>false</code>.
RetryCount	Retry until a maximum count is reached. This value shall indicate the service will attempt to re-establish the outbound connection at the interval specified by the <code>RetryIntervalMinutes</code> property until the number of retries reaches the count specified by the <code>RetryCount</code> property. If the limit is reached, the service shall set the <code>ConnectionEnabled</code> property to <code>false</code>. If a connection is established, the service shall reset the count.
RetryForever	Retry forever. This value shall indicate the service will attempt to re-establish the outbound connection at the interval specified by the <code>RetryIntervalMinutes</code> property regardless of the number of retries.

6.93.5 Example response

```
{
  "@odata.type": "#OutboundConnection.v1_0_2.OutboundConnection",
  "Id": "1",
  "Name": "Outbound Connection to contoso app",
  "Status": {
    "Health": "OK",
    "HealthRollup": "OK",
    "State": "Enabled"
  },
  "Authentication": "MTLS",
  "Certificates": {
    "@odata.id": "/redfish/v1/AccountService/OutboundConnections/1/Certificates"
  },
  "ClientCertificates": {
    "@odata.id": "/redfish/v1/AccountService/OutboundConnections/1/ClientCertificates"
  },
  "ConnectionEnabled": true,
  "EndpointURI": "wss://ws.contoso.com:443",
  "RetryPolicy": {
    "ConnectionRetryPolicy": "RetryCount",
    "RetryIntervalMinutes": 5,
    "RetryCount": 60
  },
  "Roles": [
    "Administrator"
  ],
  "WebSocketPingIntervalMinutes": 10,
  "@odata.id": "/redfish/v1/AccountService/OutboundConnections/1"
}
```

6.94 Outlet 1.4.4

Version	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2021.4	2021.3	2021.2	2020.3	2019.4

6.94.1 Description

The `Outlet` schema contains a definition for an electrical outlet.

- This resource shall be used to represent an electrical outlet for a Redfish implementation.

6.94.2 URIs

/redfish/v1/PowerEquipment/ElectricalBuses/{PowerDistributionId}/Outlets/{OutletId}
 /redfish/v1/PowerEquipment/FloorPDUs/{PowerDistributionId}/Outlets/{OutletId}
 /redfish/v1/PowerEquipment/PowerShelves/{PowerDistributionId}/Outlets/{OutletId}
 /redfish/v1/PowerEquipment/RackPDUs/{PowerDistributionId}/Outlets/{OutletId}
 /redfish/v1/PowerEquipment/TransferSwitches/{PowerDistributionId}/Outlets/{OutletId}

6.94.3 Properties

Property	Type	Attributes	Notes
ConfigurationLocked (v1.4+)	boolean	<i>read-write</i>	Indicates whether the configuration is locked. This property shall indicate whether modification requests to this resource are not permitted. If <code>true</code>, services shall reject modification requests to other properties in this resource.
CurrentAmps {}	object		The current (A) for this outlet. This property shall contain the current, in ampere units, for this outlet. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Current</code>. This property shall not be present if <code>PhaseWiringType</code> contains a value that indicates a 4-wire or greater configuration, such as <code>TwoPhase4Wire</code>. For more information about this property, see <code>SensorCurrentExcerpt</code> in Property Details.
ElectricalConsumerNames (v1.3+) []	array (string, null)	<i>read-write</i>	An array of names of downstream devices that are powered by this outlet. This property shall contain an array of user-assigned identifying strings that describe downstream devices that are powered by this outlet.
ElectricalContext	string (enum)	<i>read-only</i> (null)	The combination of current-carrying conductors. This property shall contain the combination of current-carrying conductors that distribute power. For the possible property values, see <code>ElectricalContext</code> in Property details.

Property	Type	Attributes	Notes
EnergykWh {	object (excerpt)		The energy (kWh) for this outlet. This property shall contain the total energy, in kilowatt-hour units, for this outlet that represents the <code>Total ElectricalContext</code> sensor when multiple energy sensors exist for this outlet. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>EnergykWh</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
ApparentkVAh (v1.5+)	number (kV.A.h)	<i>read-only</i> (null)	Apparent energy (kVAh). This property shall contain the apparent energy, in kilovolt-ampere-hour units, for an electrical energy measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>EnergykWh</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
LifetimeReading (v1.1+)	number	<i>read-only</i> (null)	The total accumulation value for this sensor. This property shall contain the total accumulation of the <code>Reading</code> property over the sensor's lifetime. This value shall not be reset by the <code>ResetMetrics</code> action.
ReactivekVARh (v1.5+)	number (kV.A.h)	<i>read-only</i> (null)	Reactive energy (kVARh). This property shall contain the reactive energy, in kilovolt-ampere-hours (reactive) units, for an electrical energy measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>EnergykWh</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
SensorResetTime	string (date-time)	<i>read-only</i> (null)	The date and time when the time-based properties were last reset. This property shall contain the date and time when the <code>ResetMetrics</code> action was last performed or when the service last reset the time-based property values.
}			

Property	Type	Attributes	Notes
FrequencyHz {	object (excerpt)		The frequency (Hz) for this outlet. This property shall contain the frequency, in hertz units, for this outlet. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Frequency</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			
IndicatorLED (deprecated v1.1)	string (enum)	<i>read-write</i> (null)	The state of the indicator LED, which identifies the outlet. This property shall contain the indicator light state for the indicator light associated with this outlet. <i>For the possible property values, see IndicatorLED in Property details. Deprecated in v1.1 and later. This property has been deprecated in favor of the <code>LocationIndicatorActive</code> property.</i>
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
BranchCircuit {	object	(null)	A reference to the branch circuit related to this outlet. This property shall contain a link to a resource of type <code>Circuit</code> that represent the branch circuit associated with this outlet. See the <code>Circuit</code> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>Circuit</code> resource. See the Links section and the <code>Circuit</code> schema for details.
}			
Chassis (v1.3+) [{	array		Any array of links to chassis connected to this outlet. This property shall contain an array of links to resources of type <code>Chassis</code> that represent the chassis connected to this outlet.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-write</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.
}}			
DistributionCircuits (v1.3+) [{	array		An array of links to mains or input circuits powered by this outlet. This property shall contain an array of links to resources of type <code>Circuit</code> that represent the circuits powered by this outlet. This property is used to show a connection to an input circuit downstream in a power distribution chain.
@odata.id	string	<i>read-write</i>	Link to a Circuit resource. See the Links section and the <i>Circuit</i> schema for details.
}}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
PowerSupplies (v1.3+) [{	array		An array of links to the power supplies connected to this outlet. This property shall contain an array of links to resources of type <code>PowerSupply</code> that represent the power supplies connected to this outlet.
@odata.id	string	<i>read-write</i>	Link to a PowerSupply resource. See the Links section and the <i>PowerSupply</i> schema for details.
}}			
}			
LocationIndicatorActive (v1.1+)	boolean	<i>read-write</i> (null)	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of <code>IndicatorLED</code> in this resource, if supported, to reflect the implementation of the locating function.
NominalVoltage	string (enum)	<i>read-only</i> (null)	The nominal voltage for this outlet. This property shall contain the nominal voltage for this outlet, in volt units. <i>For the possible property values, see NominalVoltage in Property details.</i>
OutletType	string (enum)	<i>read-only</i> (null)	The type of receptacle according to NEMA, IEC, or regional standards. This property shall contain the type of physical receptacle used for this outlet, as defined by IEC, NEMA, or regional standards. <i>For the possible property values, see OutletType in Property details.</i>

Property	Type	Attributes	Notes
PhaseWiringType	string (enum)	<i>read-only</i> (<i>null</i>)	The number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires). This property shall contain the number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires). <i>For the possible property values, see PhaseWiringType in Property details.</i>
PolyPhaseCurrentAmps {	object	(<i>null</i>)	The current readings for this outlet. This property shall contain the current readings for this outlet. For 3-wire outlets, this property shall contain a duplicate copy of the current sensor referenced in the <code>CurrentAmps</code> property, if present. For other outlets, this property should contain multiple current sensor readings used to fully describe the outlet.
Line1 {	object		Line 1 current (A). This property shall contain the line current, in ampere units, for L1. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Current</code>. This property shall not be present if the equipment does not include an L1 measurement. For more information about this property, see <code>SensorCurrentExcerpt</code> in Property Details.
Line2 {	object		Line 2 current (A). This property shall contain the line current, in ampere units, for L2. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Current</code>. This property shall not be present if the equipment does not include an L2 measurement. For more information about this property, see <code>SensorCurrentExcerpt</code> in Property Details.
Line3 {	object		Line 3 current (A). This property shall contain the line current, in ampere units, for L3. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Current</code>. This property shall not be present if the equipment does not include an L3 measurement. For more information about this property, see <code>SensorCurrentExcerpt</code> in Property Details.

Property	Type	Attributes	Notes
Neutral {}	object		Neutral line current (A). This property shall contain the line current, in ampere units, for the Neutral line. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Current</code>. This property shall not be present if the equipment does not include a Neutral line measurement. For more information about this property, see <code>SensorCurrentExcerpt</code> in Property Details.
}			
PolyPhaseVoltage {	object	(null)	The voltage readings for this outlet. This property shall contain the voltage readings for this outlet. For 3-wire outlets, this property shall contain a duplicate copy of the voltage sensor referenced in the <code>Voltage</code> property, if present. For other outlets, this property should contain multiple voltage sensor readings used to fully describe the outlet.
Line1ToLine2 {}	object		The Line 1 to Line 2 voltage (V) for this outlet. This property shall contain the line-to-line voltage, in volt units, between L1 and L2. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Voltage</code>. This property shall not be present if the equipment does not include an L1-L2 measurement. For more information about this property, see <code>SensorVoltageExcerpt</code> in Property Details.
Line1ToNeutral {}	object		The Line 1 to Neutral voltage (V) for this outlet. This property shall contain the line-to-line voltage, in volt units, between L1 and Neutral. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Voltage</code>. This property shall not be present if the equipment does not include an L1-Neutral measurement. For more information about this property, see <code>SensorVoltageExcerpt</code> in Property Details.
Line2ToLine3 {}	object		The Line 2 to Line 3 voltage (V) for this outlet. This property shall contain the line-to-line voltage, in volt units, between L2 and L3. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Voltage</code>. This property shall not be present if the equipment does not include an L2-L3 measurement. For more information about this property, see <code>SensorVoltageExcerpt</code> in Property Details.

Property	Type	Attributes	Notes
Line2ToNeutral {}	object		The Line 2 to Neutral voltage (V) for this outlet. This property shall contain the line-to-line voltage, in volt units, between L2 and Neutral. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Voltage</code>. This property shall not be present if the equipment does not include an L2-Neutral measurement. For more information about this property, see <code>SensorVoltageExcerpt</code> in Property Details.
Line3ToLine1 {}	object		The Line 3 to Line 1 voltage (V) for this outlet. This property shall contain the line-to-line voltage, in volt units, between L3 and L1. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Voltage</code>. This property shall not be present if the equipment does not include an L3-L1 measurement. For more information about this property, see <code>SensorVoltageExcerpt</code> in Property Details.
Line3ToNeutral {}	object		The Line 3 to Neutral voltage (V) for this outlet. This property shall contain the line-to-line voltage, in volt units, between L3 and Neutral. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Voltage</code>. This property shall not be present if the equipment does not include an L3-Neutral measurement. For more information about this property, see <code>SensorVoltageExcerpt</code> in Property Details.
}			
PowerControlLocked (v1.4+)	boolean	<i>read-write</i>	Indicates whether power control requests are locked. This property shall indicate whether requests to the <code>PowerControl</code> action are locked. If <code>true</code>, services shall reject requests to the <code>PowerControl</code> action.
PowerCycleDelaySeconds	number	<i>read-write (null)</i>	The number of seconds to delay power on after a <code>PowerControl</code> action to cycle power. Zero seconds indicates no delay. This property shall contain the number of seconds to delay power on after a <code>PowerControl</code> action to cycle power. The value <code>0</code> shall indicate no delay to power on.

Property	Type	Attributes	Notes
PowerEnabled	boolean	<i>read-only (null)</i>	Indicates if the outlet can be powered. This property shall indicate the power enable state of the outlet. The value <code>true</code> shall indicate that the outlet can be powered on, and <code>false</code> shall indicate that the outlet cannot be powered.
PowerLoadPercent (v1.2+) {	object (excerpt)		The power load (percent) for this outlet. This property shall contain the power load, in percent units, for this outlet that represents the <code>Total ElectricalContext</code> for this outlet. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Percent</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
DataSourceUri	string (URI)	<i>read-only (null)</i>	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only (null)</i>	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			
PowerOffDelaySeconds	number	<i>read-write (null)</i>	The number of seconds to delay power off after a <code>PowerControl</code> action. Zero seconds indicates no delay to power off. This property shall contain the number of seconds to delay power off after a <code>PowerControl</code> action. The value <code>0</code> shall indicate no delay to power off.
PowerOnDelaySeconds	number	<i>read-write (null)</i>	The number of seconds to delay power up after a power cycle or a <code>PowerControl</code> action. Zero seconds indicates no delay to power up. This property shall contain the number of seconds to delay power up after a power cycle or a <code>PowerControl</code> action. The value <code>0</code> shall indicate no delay to power up.
PowerRestoreDelaySeconds	number	<i>read-write (null)</i>	The number of seconds to delay power on after power has been restored. Zero seconds indicates no delay. This property shall contain the number of seconds to delay power on after a power fault. The value <code>0</code> shall indicate no delay to power on.

Property	Type	Attributes	Notes
PowerRestorePolicy	string (enum)	<i>read-write</i>	The desired power state of the outlet when power is restored after a power loss. This property shall contain the desired <code>PowerState</code> of the outlet when power is applied. The value <code>LastState</code> shall return the outlet to the <code>PowerState</code> it was in when power was lost. <i>For the possible property values, see <code>PowerRestorePolicy</code> in Property details.</i>
PowerState	string (enum)	<i>read-only</i> (null)	The power state of the outlet. This property shall contain the power state of the outlet. <i>For the possible property values, see <code>PowerState</code> in Property details.</i>
PowerStateInTransition (v1.4+)	boolean	<i>read-only</i>	Indicates whether the power state is undergoing a delayed transition. This property shall indicate whether the <code>PowerState</code> property will undergo a transition between on and off states due to a configured delay. The transition may be due to the configuration of the power on, off, or restore delay properties. If <code>true</code>, the <code>PowerState</code> property will transition at the conclusion of a configured delay.
PowerWatts {	object (excerpt)		The power (W) for this outlet. This property shall contain the total power, in watt units, for this outlet that represents the <code>Total ElectricalContext</code> sensor when multiple power sensors exist for this outlet. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Power</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
ApparentVA	number (V.A)	<i>read-only</i> (null)	The product of voltage and current for an AC circuit, in volt-ampere units. This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
PhaseAngleDegrees (v1.5+)	number	<i>read-only</i> (null)	The phase angle (degrees) between the current and voltage waveforms. This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>Power</code>, and shall not appear in sensors with other <code>ReadingType</code> values.

Property	Type	Attributes	Notes
PowerFactor	number	<i>read-only</i> (null)	The power factor for this sensor. This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. <code>PowerFactor</code> is expressed in unit-less 1/100ths. This property can appear in sensors containing a <code>ReadingType</code> value of <code>Power</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
ReactiveVAR	number (V.A)	<i>read-only</i> (null)	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			
RatedCurrentAmps	number (A)	<i>read-only</i> (null)	The rated maximum current allowed for this outlet. This property shall contain the rated maximum current for this outlet, in ampere units, after any required de-rating, due to safety agency or other regulatory requirements, has been applied.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
UserLabel (v1.3+)	string	<i>read-write</i>	A user-assigned label. This property shall contain a user-assigned label used to identify this resource. If a value has not been assigned by a user, the value of this property shall be an empty string.

Property	Type	Attributes	Notes
Voltage {}	object		The voltage (V) for this outlet. This property shall contain the voltage, in volt units, for this outlet. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Voltage</code>. This property shall not be present if <code>PhaseWiringType</code> contains a value that indicates a 4-wire or greater configuration, such as <code>TwoPhase4Wire</code>. For more information about this property, see <code>SensorVoltageExcerpt</code> in Property Details.
VoltageType	string (enum)	<i>read-only (null)</i>	The type of voltage applied to the outlet. This property shall contain the type of voltage applied to the outlet. <i>For the possible property values, see <code>VoltageType</code> in Property details.</i>

6.94.4 Actions

6.94.4.1 PowerControl

Description

This action turns the outlet on or off.

- This action shall control the power state of the outlet.

Action URI

{Base URI of target resource}/Actions/Outlet.PowerControl

Action parameters

Parameter Name	Type	Attributes	Notes
PowerState	string (enum)	<i>optional</i>	The desired power state of the outlet. This parameter shall contain the desired power state of the outlet. <i>For the possible property values, see <code>PowerState</code> in Property details.</i>

Request Example

```
{
  "PowerState": "PowerCycle"
}
```

6.94.4.2 ResetMetrics

Description

This action resets metrics related to this outlet.

- This action shall reset any time intervals or counted values for this outlet.

Action URI

{Base URI of target resource}/Actions/Outlet.ResetMetrics

Action parameters

This action takes no parameters.

6.94.5 Property details

6.94.5.1 ElectricalContext

The combination of current-carrying conductors.

- This property shall contain the combination of current-carrying conductors that distribute power.

string	Description
Line1	The circuits that share the L1 current-carrying conductor. • This value shall represent a circuit that shares the L1 current-carrying conductor, such as circuits with phase wiring types of Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.
Line1ToLine2	The circuit formed by L1 and L2 current-carrying conductors. • This value shall represent a circuit formed by L1 and L2 current-carrying conductors, such as circuits with phase wiring types of Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.

string	Description
Line1ToNeutral	The circuit formed by L1 and neutral current-carrying conductors. This value shall represent a circuit formed by L1 and neutral current-carrying conductors, such as circuits with phase wiring types of Single-phase / 3-Wire, Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.
Line1ToNeutralAndL1L2	The circuit formed by L1, L2, and neutral current-carrying conductors. This value shall represent a circuit formed by L1, L2, and neutral current-carrying conductors, such as circuits with phase wiring types of Two-phase/ 4-Wire or Three-phase / 5-Wire.
Line2	The circuits that share the L2 current-carrying conductor. This value shall represent a circuit that shares the L2 current-carrying conductor, such as circuits with phase wiring types of Two-phase / 4-Wire or Three-phase / 4-Wire or 5-Wire.
Line2ToLine3	The circuit formed by L2 and L3 current-carrying conductors. This value shall represent a circuit formed by L2 and L3 current-carrying conductors, such as circuits with phase wiring types of Three-phase / 4-Wire or 5-Wire.
Line2ToNeutral	The circuit formed by L2 and neutral current-carrying conductors. This value shall represent a circuit formed by L2 and neutral current-carrying conductors, such as circuits with phase wiring types of Two-phase / 4-Wire or Three-phase / 5-Wire.
Line2ToNeutralAndL1L2	The circuit formed by L1, L2, and Neutral current-carrying conductors. This value shall represent a circuit formed by L1, L2, and neutral current-carrying conductors, such as circuits with phase wiring types of Two-phase/ 4-Wire or Three-phase / 5-Wire.
Line2ToNeutralAndL2L3	The circuits formed by L2, L3, and neutral current-carrying conductors. This value shall represent a circuit formed by L2, L3, and neutral current-carrying conductors, such as circuits with a phase wiring type of Three-phase / 5-Wire.
Line3	The circuits that share the L3 current-carrying conductor. This value shall represent a circuit that shares the L3 current-carrying conductor, such as circuits with phase wiring types of Three-phase / 4-Wire or 5-Wire.
Line3ToLine1	The circuit formed by L3 and L1 current-carrying conductors. This value shall represent a circuit formed by L3 and L1 current-carrying conductors, such as circuits with phase wiring types of Three-phase / 4-Wire or 5-Wire.

string	Description
Line3ToNeutral	The circuit formed by L3 and neutral current-carrying conductors. This value shall represent a circuit formed by L3 and neutral current-carrying conductors, such as circuits with a phase wiring type of Three-phase / 5-Wire.
Line3ToNeutralAndL3L1	The circuit formed by L3, L1, and neutral current-carrying conductors. This value shall represent a circuit formed by L3, L1, and neutral current-carrying conductors, such as circuits with a phase wiring type of Three-phase / 5-Wire.
LineToLine	The circuit formed by two current-carrying conductors. This value shall represent a circuit formed by two current-carrying conductors, such as circuits with phase wiring types of Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.
LineToNeutral	The circuit formed by a line and neutral current-carrying conductor. This value shall represent a circuit formed by a line and neutral current-carrying conductor, such as circuits with phase wiring types of Single-phase / 3-Wire, Two-phase / 4-Wire, or Three-phase / 4-Wire or 5-Wire.
Neutral	The grounded current-carrying return circuit of current-carrying conductors. This value shall represent the grounded current-carrying return circuit of current-carrying conductors, such as circuits with phase wiring types of Single-phase / 3-Wire, Two-phase / 4-Wire, or Three-phase / 5-Wire.
Total	The circuit formed by all current-carrying conductors. This value shall represent the circuits formed by all current-carrying conductors for any phase wiring type.

6.94.5.2 IndicatorLED

The state of the indicator LED, which identifies the outlet.

- This property shall contain the indicator light state for the indicator light associated with this outlet.

string	Description
Blinking	The indicator LED is blinking. This value shall represent that the indicator LED is in a blinking state where the LED is being turned on and off in repetition. If the service does not support this value, it shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code.

string	Description
Lit	The indicator LED is lit. This value shall represent that the indicator LED is in a solid on state. If the service does not support this value, it shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code.
Off	The indicator LED is off. This value shall represent that the indicator LED is in a solid off state. If the service does not support this value, it shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code.

6.94.5.3 NominalVoltage

The nominal voltage for this outlet.

- This property shall contain the nominal voltage for this outlet, in volt units.

string	Description
AC100To127V	AC 100-127V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 100-127VAC. Range values are generally used to describe support on device inputs or inlets.
AC100To240V	AC 100-240V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 100-240VAC. Range values are generally used to describe support on device inputs or inlets.
AC100To277V	AC 100-277V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 100-277VAC. Range values are generally used to describe support on device inputs or inlets.
AC120V	AC 120V nominal. This value shall indicate the device supports a nominal voltage of 120VAC. Specific values are generally used to describe support on device outputs or outlets.
AC200To240V	AC 200-240V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 200-240VAC. Range values are generally used to describe support on device inputs or inlets.

string	Description
AC200To277V	AC 200-277V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 200-277VAC. Range values are generally used to describe support on device inputs or inlets.
AC208V	AC 208V nominal. This value shall indicate the device supports a nominal voltage of 208VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC230V	AC 230V nominal. This value shall indicate the device supports a nominal voltage of 230VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC240AndDC380V	AC 200-240V and DC 380V. This value shall indicate the device supports a nominal voltage in the complete range of 200-240VAC or a value of 380VDC. Range values are generally used to describe support on device inputs or inlets.
AC240V	AC 240V nominal. This value shall indicate the device supports a nominal voltage of 240VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC277AndDC380V	AC 200-277V and DC 380V. This value shall indicate the device supports a nominal voltage in the complete range of 200-277VAC or a value of 380VDC. Range values are generally used to describe support on device inputs or inlets.
AC277V	AC 277V nominal. This value shall indicate the device supports a nominal voltage of 277VAC. Specific AC high-voltage values may be used to describe support on device inputs or outputs.
AC400V	AC 400V or 415V nominal. This value shall indicate the device supports a nominal voltage of 400VAC or 415VAC. Specific AC high-voltage values may be used to describe support on device inputs or outputs.
AC480V	AC 480V nominal. This value shall indicate the device supports a nominal voltage of 480VAC. Specific AC high-voltage values may be used to describe support on device inputs or outputs.
DC12V	DC 12V nominal. This value shall indicate the device supports a nominal voltage of 12VDC.

string	Description
DC16V	DC 16V nominal. This value shall indicate the device supports a nominal voltage of 16VDC.
DC1_8V	DC 1.8V nominal. This value shall indicate the device supports a nominal voltage of 1.8VDC.
DC240V	DC 240V nominal. This value shall indicate the device supports a nominal voltage of 240VDC.
DC380V	High-voltage DC (380V). This value shall indicate the device supports a nominal voltage of 380VDC.
DC3_3V	DC 3.3V nominal. This value shall indicate the device supports a nominal voltage of 3.3VDC.
DC48V	DC 48V nominal. This value shall indicate the device supports a nominal voltage of 48VDC.
DC5V	DC 5V nominal. This value shall indicate the device supports a nominal voltage of 5VDC.
DC9V	DC 9V nominal. This value shall indicate the device supports a nominal voltage of 9VDC.
DCNeg48V	-48V DC. This value shall indicate the device supports a nominal voltage of -48VDC.

6.94.5.4 OutletType

The type of receptacle according to NEMA, IEC, or regional standards.

- This property shall contain the type of physical receptacle used for this outlet, as defined by IEC, NEMA, or regional standards.

string	Description
BS_1363_Type_G	BS 1363 Type G (250V; 13A). This value shall represent a receptacle that matches the British BS 1363 Type G receptacle (250V; 13A).
BusConnection (v1.3+)	Electrical bus connection. This value shall represent a direct connection to an electrical bus.
CEE_7_Type_E	CEE 7/7 Type E (250V; 16A). This value shall represent a receptacle that matches the French specified CEE 7/7 Type E receptacle (250V; 16A).
CEE_7_Type_F	CEE 7/7 Type F (250V; 16A). This value shall represent a receptacle that matches the Schuko specified CEE 7/7 Type F receptacle (250V; 16A).
IEC_60320_C13	IEC C13 (250V; 10A or 15A). This value shall represent a receptacle that matches the IEC 60320 Sheet F C13 specified receptacle (250V; 10A per IEC, 15A per UL).
IEC_60320_C19	IEC C19 (250V; 16A or 20A). This value shall represent a receptacle that matches the IEC 60320 Sheet J C19 specified receptacle (250V; 16A per IEC, 20A per UL).
NEMA_5_15R	NEMA 5-15R (120V; 15A). This value shall represent a receptacle that matches the NEMA specified 5-15 receptacle (120V; 15A). The current is commonly de-rated to 12A if it is protected by a 15A breaker.
NEMA_5_20R	NEMA 5-20R (120V; 20A). This value shall represent a receptacle that matches the NEMA specified 5-20 receptacle that exhibits a T-slot (120V; 20A). The current is commonly de-rated to 16A if it is protected by a 20A breaker.
NEMA_L5_20R	NEMA L5-20R (120V; 20A). This value shall represent a receptacle that matches the NEMA specified locking L5-20 receptacle (120V; 20A). The current is commonly de-rated to 16A if it is protected by a 20A breaker.
NEMA_L5_30R	NEMA L5-30R (120V; 30A). This value shall represent a receptacle that matches the NEMA specified locking L5-30 receptacle (120V; 30A). The current is commonly de-rated to 24A if it is protected by a 30A breaker.

string	Description
NEMA_L6_20R	NEMA L6-20R (250V; 20A). This value shall represent a receptacle that matches the NEMA specified locking L6-20 receptacle (250V; 20A). The current is commonly de-rated to 16A if it is protected by a 20A breaker.
NEMA_L6_30R	NEMA L6-30R (250V; 30A). This value shall represent a receptacle that matches the NEMA specified locking L6-30 receptacle (250V; 30A). The current is commonly de-rated to 24A if it is protected by a 30A breaker.
SEV_1011_TYPE_12	SEV 1011 Type 12 (250V; 10A). This value shall represent a receptacle that matches the SEV 1011 specified Type 12 receptacle (250V; 10A).
SEV_1011_TYPE_23	SEV 1011 Type 23 (250V; 16A). This value shall represent a receptacle that matches the SEV 1011 specified Type 23 receptacle (250V; 16A).

6.94.5.5 PhaseWiringType

The number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires).

- This property shall contain the number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires).

string	Description
OneOrTwoPhase3Wire	Single or two-phase / 3-wire (Line1, Line2 or Neutral, Protective Earth). This value shall represent a single or two-phase / 3-wire (Line1, Line2 or Neutral, Protective Earth) wiring. This value shall be used when both phase configurations are supported. This is most common where detachable cordsets are used. If poly-phase properties such as <code>PolyPhaseVoltage</code> are supported, the service should populate the measurements as if the circuit is wired as Line1, Neutral, and Protective Earth.
OnePhase3Wire	Single-phase / 3-wire (Line1, Neutral, Protective Earth). This value shall represent a single-phase / 3-wire (Line1, Neutral, Protective Earth) wiring.
ThreePhase4Wire	Three-phase / 4-wire (Line1, Line2, Line3, Protective Earth). This value shall represent a three-phase / 4-wire (Line1, Line2, Line3, Protective Earth) wiring.

string	Description
ThreePhase5Wire	Three-phase / 5-wire (Line1, Line2, Line3, Neutral, Protective Earth). This value shall represent a three-phase / 5-wire (Line1, Line2, Line3, Neutral, Protective Earth) wiring.
TwoPhase3Wire	Two-phase / 3-wire (Line1, Line2, Protective Earth). This value shall represent a two-phase / 3-wire (Line1, Line2, Protective Earth) wiring.
TwoPhase4Wire	Two-phase / 4-wire (Line1, Line2, Neutral, Protective Earth). This value shall represent a two-phase / 4-wire (Line1, Line2, Neutral, Protective Earth) wiring.

6.94.5.6 PowerRestorePolicy

The desired power state of the outlet when power is restored after a power loss.

- This property shall contain the desired `PowerState` of the outlet when power is applied. The value `LastState` shall return the outlet to the `PowerState` it was in when power was lost.

string	Description
AlwaysOff	Always remain powered off when external power is applied.
AlwaysOn	Always power on when external power is applied.
LastState	Return to the last power state (on or off) when external power is applied.

6.94.5.7 PowerState

6.94.5.7.1 In top level:

The power state of the outlet.

- This property shall contain the power state of the outlet.

string	Description
Off	The resource is powered off. The components within the resource might continue to have AUX power.
On	The resource is powered on.
Paused	The resource is paused.

string	Description
PoweringOff	A temporary state between on and off. The components within the resource can take time to process the power off action.
PoweringOn	A temporary state between off and on. The components within the resource can take time to process the power on action.

6.94.5.7.2 In Actions: PowerControl:

The desired power state of the outlet.

- This parameter shall contain the desired power state of the outlet.

string	Description
Off	Power off.
On	Power on.
PowerCycle	Power cycle. • This value shall indicate the resource will transition to a power off state, then transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.

6.94.5.8 SensorCurrentExcerpt

The `Sensor` schema describes a sensor and its properties. This object is an excerpt of the `Sensor` resource located at the URI shown in `DataSourceUri`.

CrestFactor (v1.1+)	number	read-only (null)	The crest factor for this sensor. • This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	read-only (null)	The sensor value. • This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.

THDPercent (v1.1+)	number (%)	read- only (null)	The total harmonic distortion percent (% THD). This property shall contain the total harmonic distortion of the <code>Reading</code> property in percent units, typically <code>0</code> to <code>100</code>.

6.94.5.9 SensorVoltageExcerpt

The `Sensor` schema describes a sensor and its properties. This object is an excerpt of the `Sensor` resource located at the URI shown in `DataSourceUri`.

CrestFactor (v1.1+)	number	read- only (null)	The crest factor for this sensor. This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	read- only (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	read- only (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
THDPercent (v1.1+)	number (%)	read- only (null)	The total harmonic distortion percent (% THD). This property shall contain the total harmonic distortion of the <code>Reading</code> property in percent units, typically <code>0</code> to <code>100</code>.

6.94.5.10 VoltageType

The type of voltage applied to the outlet.

- This property shall contain the type of voltage applied to the outlet.

string	Description
AC	Alternating Current (AC) outlet.
DC	Direct Current (DC) outlet.

6.94.6 Example response

```
{
  "@odata.type": "#Outlet.v1_4_4.Outlet",
  "Id": "A1",
  "Name": "Outlet A1, Branch Circuit A",
  "Status": {
    "Health": "OK",
    "State": "Enabled"
  },
  "PhaseWiringType": "OnePhase3Wire",
  "VoltageType": "AC",
  "OutletType": "NEMA_5_20R",
  "RatedCurrentAmps": 20,
  "NominalVoltage": "AC120V",
  "LocationIndicatorActive": true,
  "PowerOnDelaySeconds": 4,
  "PowerOffDelaySeconds": 0,
  "PowerState": "On",
  "PowerEnabled": true,
  "Voltage": {
    "DataSourceUri": "/redfish/v1/Chassis/PDU/Sensors/VoltageA1",
    "Reading": 117.5
  },
  "PolyPhaseVoltage": {
    "Line1ToNeutral": {
      "DataSourceUri": "/redfish/v1/Chassis/PDU/Sensors/VoltageA1",
      "Reading": 117.5
    }
  },
  "CurrentAmps": {
    "DataSourceUri": "/redfish/v1/Chassis/PDU/Sensors/CurrentA1",
    "Reading": 1.68
  },
  "PolyPhaseCurrentAmps": {
    "Line1": {
      "DataSourceUri": "/redfish/v1/Chassis/PDU/Sensors/CurrentA1",
      "Reading": 1.68
    }
  },
  "PowerWatts": {
    "DataSourceUri": "/redfish/v1/Chassis/PDU/Sensors/PowerA1",
    "Reading": 197.4,
    "ApparentVA": 197.4,
    "ReactiveVAR": 0,
    "PowerFactor": 1
  },
  "FrequencyHz": {
    "DataSourceUri": "/redfish/v1/Chassis/PDU/Sensors/FrequencyA1",

```

```
      "Reading": 60
    },
    "EnergykWh": {
      "DataSourceUri": "/redfish/v1/Chassis/PDU/Sensors/EnergyA1",
      "Reading": 36166
    },
    "Actions": {
      "#Outlet.PowerControl": {
        "target": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A1/Outlet.PowerControl"
      },
      "#Outlet.ResetMetrics": {
        "target": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A1/Outlet.ResetMetrics"
      }
    },
    "Links": {
      "BranchCircuit": {
        "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Branches/A"
      }
    },
    "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A1"
  }
}
```

6.95 OutletGroup 1.2.0

Version	v1.2	v1.1	v1.0
Release	2024.1	2021.4	2019.4

6.95.1 Description

The `OutletGroup` schema contains definitions for an electrical outlet group.

- This resource shall be used to represent an electrical outlet group for a Redfish implementation.

6.95.2 URIs

`/redfish/v1/PowerEquipment/ElectricalBuses/{PowerDistributionId}/OutletGroups/{OutletGroupId}`
`/redfish/v1/PowerEquipment/PowerShelves/{PowerDistributionId}/OutletGroups/{OutletGroupId}`
`/redfish/v1/PowerEquipment/RackPDUs/{PowerDistributionId}/OutletGroups/{OutletGroupId}`
`/redfish/v1/PowerEquipment/TransferSwitches/{PowerDistributionId}/OutletGroups/{OutletGroupId}`

6.95.3 Properties

Property	Type	Attributes	Notes
ConfigurationLocked (v1.1+)	boolean	<i>read-write</i>	Indicates whether the configuration is locked. This property shall indicate whether modification requests to this resource are not permitted. If <code>true</code>, services shall reject modification requests to other properties in this resource.
CreatedBy	string	<i>read-write (null)</i>	The creator of this outlet group. This property shall contain the name of the person or application that created this outlet group.
EnergykWh {	object (excerpt)		The energy (kWh) for this outlet group. This property shall contain the total energy, in kilowatt-hour units, for this outlet group that represents the <code>Total</code> <code>ElectricalContext</code> sensor when multiple energy sensors exist for this outlet group. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>EnergykWh</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
ApparentkVAh (v1.5+)	number (kV.A.h)	<i>read-only (null)</i>	Apparent energy (kVAh). This property shall contain the apparent energy, in kilovolt-ampere-hour units, for an electrical energy measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>EnergykWh</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
DataSourceUri	string (URI)	<i>read-only (null)</i>	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
LifetimeReading (v1.1+)	number	<i>read-only (null)</i>	The total accumulation value for this sensor. This property shall contain the total accumulation of the <code>Reading</code> property over the sensor's lifetime. This value shall not be reset by the <code>ResetMetrics</code> action.
ReactivekVARh (v1.5+)	number (kV.A.h)	<i>read-only (null)</i>	Reactive energy (kVARh). This property shall contain the reactive energy, in kilovolt-ampere-hours (reactive) units, for an electrical energy measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>EnergykWh</code>, and shall not appear in sensors with other <code>ReadingType</code> values.

Property	Type	Attributes	Notes
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
SensorResetTime	string (date-time)	<i>read-only</i> (null)	The date and time when the time-based properties were last reset. This property shall contain the date and time when the <code>ResetMetrics</code> action was last performed or when the service last reset the time-based property values.
}			
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
OutletGroups (v1.2+) [{	array		The set of outlet groups in this outlet group. This property shall be an array of links to resources of type <code>OutletGroup</code> that represent the outlet groups in this outlet group. This allows representation of a group of outlet groups. The outlet groups referenced by this property shall not contain other outlet groups. Services shall only populate either the link for <code>Outlets</code> or <code>OutletGroups</code>, but not both.
@odata.id	string	<i>read-write</i>	Link to another OutletGroup resource.
}]			
Outlets [{	array		The set of outlets in this outlet group. This property shall be an array of links to resources of type <code>Outlet</code> that represent the outlets in this outlet group.
@odata.id	string	<i>read-write</i>	Link to a Outlet resource. See the Links section and the <i>Outlet</i> schema for details.
}]			
}			
OutletGroupType (v1.2+)	string (enum)	<i>read-only</i>	The type of outlet group that this resource represents. This property shall describe the type of this outlet group. <i>For the possible property values, see OutletGroupType in Property details.</i>

Property	Type	Attributes	Notes
PowerControlLocked (v1.1+)	boolean	<i>read-write</i>	Indicates whether power control requests are locked. This property shall indicate whether requests to the <code>PowerControl</code> action are locked. If <code>true</code>, services shall reject requests to the <code>PowerControl</code> action.
PowerCycleDelaySeconds	number	<i>read-write (null)</i>	The number of seconds to delay power on after a <code>PowerControl</code> action to cycle power. Zero seconds indicates no delay. This property shall contain the number of seconds to delay power on after a <code>PowerControl</code> action to cycle power. The value <code>0</code> shall indicate no delay to power on.
PowerEnabled	boolean	<i>read-only (null)</i>	Indicates if the outlet group can be powered. This property shall contain the power enable state of the outlet group. The value <code>true</code> shall indicate that the group can be powered on, and the value <code>false</code> shall indicate that the group cannot be powered.
PowerOffDelaySeconds	number	<i>read-write (null)</i>	The number of seconds to delay power off after a <code>PowerControl</code> action. Zero seconds indicates no delay to power off. This property shall contain the number of seconds to delay power off after a <code>PowerControl</code> action. The value <code>0</code> shall indicate no delay to power off.
PowerOnDelaySeconds	number	<i>read-write (null)</i>	The number of seconds to delay power up after a power cycle or a <code>PowerControl</code> action. Zero seconds indicates no delay to power up. This property shall contain the number of seconds to delay power up after a power cycle or a <code>PowerControl</code> action. The value <code>0</code> shall indicate no delay to power up.
PowerRestoreDelaySeconds	number	<i>read-write (null)</i>	The number of seconds to delay power on after power has been restored. Zero seconds indicates no delay. This property shall contain the number of seconds to delay power on after a power fault. The value <code>0</code> shall indicate no delay to power on.
PowerRestorePolicy	string (enum)	<i>read-write</i>	The desired power state of the outlet group when power is restored after a power loss. This property shall contain the desired <code>PowerState</code> of the outlet group when power is applied. The value <code>LastState</code> shall return the outlet group to the <code>PowerState</code> it was in when power was lost. <i>For the possible property values, see <code>PowerRestorePolicy</code> in Property details.</i>

Property	Type	Attributes	Notes
PowerState	string (enum)	<i>read-only</i> (<i>null</i>)	The power state of the outlet group. This property shall contain the power state of the outlet group. <i>For the possible property values, see PowerState in Property details.</i>
PowerStateInTransition (v1.1+)	boolean	<i>read-only</i>	Indicates whether the power state is undergoing a delayed transition. This property shall indicate whether the <code>PowerState</code> property will undergo a transition between on and off states due to a configured delay. The transition may be due to the configuration of the power on, off, or restore delay properties. If <code>true</code>, the <code>PowerState</code> property will transition at the conclusion of a configured delay.
PowerWatts {	object (excerpt)		The power (W) for this outlet group. This property shall contain the total power, in watt units, for this outlet group that represents the <code>Total ElectricalContext</code> sensor when multiple power sensors exist for this outlet group. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Power</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
ApparentVA	number (V.A)	<i>read-only</i> (<i>null</i>)	The product of voltage and current for an AC circuit, in volt-ampere units. This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
DataSourceUri	string (URI)	<i>read-only</i> (<i>null</i>)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
PhaseAngleDegrees (v1.5+)	number	<i>read-only</i> (<i>null</i>)	The phase angle (degrees) between the current and voltage waveforms. This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>Power</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
PowerFactor	number	<i>read-only</i> (<i>null</i>)	The power factor for this sensor. This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. <code>PowerFactor</code> is expressed in unit-less 1/100ths. This property can appear in sensors containing a <code>ReadingType</code> value of <code>Power</code>, and shall not appear in sensors of other <code>ReadingType</code> values.

Property	Type	Attributes	Notes
ReactiveVAR	number (V.A)	<i>read-only</i> (<i>null</i>)	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
Reading	number	<i>read-only</i> (<i>null</i>)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

6.95.4 Actions

6.95.4.1 PowerControl

Description

This action turns the outlet group on or off.

- This action shall control the power state of the outlet group.

Action URI

{Base URI of target resource}/Actions/OutletGroup.PowerControl

Action parameters

Parameter Name	Type	Attributes	Notes
PowerState	string (enum)	optional	The desired power state of the outlet group. This parameter shall contain the desired power state of the outlet group. <i>For the possible property values, see PowerState in Property details.</i>

Request Example

```
{
  "PowerState": "Off"
}
```

6.95.4.2 ResetMetrics

Description

This action resets metrics related to this outlet group.

- This action shall reset any time intervals or counted values for this outlet group.

Action URI

{Base URI of target resource}/Actions/OutletGroup.ResetMetrics

Action parameters

This action takes no parameters.

6.95.5 Property details

6.95.5.1 OutletGroupType

The type of outlet group that this resource represents.

- This property shall describe the type of this outlet group.

string	Description
HardwareDefined	A group that is hardware-defined. This value shall represent an outlet group that is hardware-defined.
UserDefined	A group that is user-defined. This value shall represent an outlet group that is user-defined.

6.95.5.2 PowerRestorePolicy

The desired power state of the outlet group when power is restored after a power loss.

- This property shall contain the desired `PowerState` of the outlet group when power is applied. The value `LastState` shall return the outlet group to the `PowerState` it was in when power was lost.

string	Description
AlwaysOff	Always remain powered off when external power is applied.
AlwaysOn	Always power on when external power is applied.
LastState	Return to the last power state (on or off) when external power is applied.

6.95.5.3 PowerState

6.95.5.3.1 In top level:

The power state of the outlet group.

- This property shall contain the power state of the outlet group.

string	Description
Off	The resource is powered off. The components within the resource might continue to have AUX power.
On	The resource is powered on.
Paused	The resource is paused.
PoweringOff	A temporary state between on and off. The components within the resource can take time to process the power off action.

string	Description
PoweringOn	A temporary state between off and on. The components within the resource can take time to process the power on action.

6.95.5.3.2 In Actions: PowerControl:

The desired power state of the outlet group.

- This parameter shall contain the desired power state of the outlet group.

string	Description
Off	Power off.
On	Power on.
PowerCycle	Power cycle. • This value shall indicate the resource will transition to a power off state, then transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.

6.95.6 Example response

```
{
  "@odata.type": "#OutletGroup.v1_2_0.OutletGroup",
  "Id": "Rack5Storage",
  "Name": "Outlet Group Rack5Storage",
  "Status": {
    "Health": "OK",
    "State": "Enabled"
  },
  "CreatedBy": "Bob",
  "PowerOnDelaySeconds": 4,
  "PowerOffDelaySeconds": 0,
  "PowerState": "On",
  "PowerEnabled": true,
  "PowerWatts": {
    "DataSourceUri": "/redfish/v1/Chassis/PDU/Sensors/GroupPowerA",
    "Reading": 412.36
  },
  "EnergykWh": {
    "DataSourceUri": "/redfish/v1/Chassis/PDU/Sensors/GroupEnergyA",
    "Reading": 26880
  },
}
```

```

    "Links": {
      "Outlets": [
        {
          "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A1"
        },
        {
          "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A2"
        },
        {
          "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A3"
        }
      ]
    },
    "Actions": {
      "#OutletGroup.PowerControl": {
        "target": "/redfish/v1/PowerEquipment/RackPDUs/1/OutletGroups/Rack5Storage/OutletGroup.PowerControl"
      },
      "#OutletGroup.ResetMetrics": {
        "target": "/redfish/v1/PowerEquipment/RackPDUs/1/OutletGroups/Rack5Storage/OutletGroup.ResetMetrics"
      }
    },
    "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/OutletGroups/Rack5Storage"
  }

```

6.96 PCIeDevice 1.19.0

Version	v1.19	v1.18	v1.17	v1.16	v1.15	v1.14	v1.13	v1.12	v1.11	v1.10	v1.9	...
Release	2025.2	2025.1	2024.4	2024.3	2024.2	2024.1	2023.3	2023.2	2022.3	2022.2	2021.4	...

6.96.1 Description

The `PCIeDevice` schema describes the properties of a PCIe device that is attached to a system. It also describes the location, such as a slot, socket, or bay, where a unit can be installed, by populating a resource instance with an absent state if a unit is not present.

- This resource shall represent a PCIe device in a Redfish implementation. It may also represent a location, such as a slot, socket, or bay, where a unit may be installed, but the `State` property within the `Status` property contains `Absent`.

6.96.2 URIs

```

/redfish/v1/Chassis/{ChassisId}/PCleDevices/{PCleDeviceId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/PCleDevices/
{PCleDeviceId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/PCleDevices/{PCleDeviceId}
/redfish/v1/Systems/{ComputerSystemId}/PCleDevices/{PCleDeviceId}

```

6.96.3 Properties

Property	Type	Attributes	Notes
Assembly (v1.2+) {	object		The link to the assembly associated with this PCIe device. This property shall contain a link to a resource of type <code>Assembly</code>. See the <i>Assembly</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>Assembly</i> resource. See the Links section and the <i>Assembly</i> schema for details.
}			
AssetTag	string	<i>read-write</i> (null)	The user-assigned asset tag for this PCIe device. This property shall contain an identifying string that tracks the PCIe device for inventory purposes.
CXLDevice (v1.11+) {	object	(null)	The CXL-specific properties of this PCIe device. This property shall contain CXL-specific properties of this PCIe device.
CapableProtocolVersions (v1.18+) []	array (string (enum))	<i>read-only</i> (null)	- An array of the CXL specification revisions supported by this device. - This property shall contain an array of the CXL specification revisions that this device supports. For the possible property values, see <i>CapableProtocolVersions</i> in <i>Property details</i>.
CurrentProtocolVersion (v1.18+)	string (enum)	<i>read-only</i> (null)	The revision of the CXL specification in use by this device. This property shall contain the negotiated CXL specification revision in use by this device. For the possible property values, see <i>CurrentProtocolVersion</i> in <i>Property details</i>.

Property	Type	Attributes	Notes
DeviceType (v1.11+)	string (enum)	<i>read-only</i> (null)	The CXL device type. This property shall contain the CXL device type. <i>For the possible property values, see DeviceType in Property details.</i>
DynamicCapacity (v1.12+) {	object	(null)	The CXL dynamic capacity device (DCD) information for this CXL device. This property shall contain the CXL dynamic capacity device (DCD) information for this CXL device.
AddCapacityPoliciesSupported (v1.12+) []	array (string (enum))	<i>read-only</i> (null)	- The set of selection policies supported by the CXL device when dynamic capacity is added. - This property shall contain the CXL Specification-defined dynamic capacity policies that are supported by this CXL device when dynamic capacity is added. <i>For the possible property values, see AddCapacityPoliciesSupported in Property details.</i>
MaxDynamicCapacityRegions (v1.12+)	integer	<i>read-only</i> (null)	The maximum number of dynamic capacity memory regions available per host from this CXL device. This property shall contain the maximum number of dynamic capacity memory regions available per host from this CXL device.
MaxHosts (v1.12+)	integer	<i>read-only</i> (null)	The maximum number of hosts supported by this CXL device. This property shall contain the maximum number of hosts supported by this CXL device.
MemoryBlockSizesSupported (v1.12+) [{	array		The set of memory block sizes supported by memory regions in this CXL device. This property shall contain the set of memory block sizes supported by memory regions in this CXL device.
BlockSizeMiB (v1.12+) []	array (mebibytes) (integer, null)	<i>read-only</i>	Set of memory block sizes supported by this memory region defined in mebibytes (MiB). This property shall contain the set of memory block sizes supported by this memory region, with units in MiB.
RegionNumber (v1.12+)	integer	<i>read-only</i> (null)	The memory region number. This property shall contain the memory region number.

Property	Type	Attributes	Notes
}}			
ReleaseCapacityPoliciesSupported (v1.12+) []	array (string (enum))	<i>read-only</i> (null)	- The set of removal policies supported by the CXL device when dynamic capacity is released. - This property shall contain the CXL Specification-defined dynamic capacity policies that are supported by this CXL device when dynamic capacity is released. <i>For the possible property values, see ReleaseCapacityPoliciesSupported in Property details.</i>
SanitizationOnReleaseSupport (v1.12+) [{	array		An indication of whether the sanitization on capacity release is configurable for the memory regions in this CXL device. This property shall indicate whether the sanitization on capacity release is configurable for the memory regions in this CXL device.
RegionNumber (v1.12+)	integer	<i>read-only</i> (null)	The memory region number. This property shall contain the memory region number.
SanitizationOnReleaseSupported (v1.12+)	boolean	<i>read-only</i> (null)	An indication of whether the sanitization on capacity release is configurable for this memory region. This property shall indicate whether the sanitization on capacity release is configurable for this memory region.
}}			
TotalDynamicCapacityMiB (v1.12+)	integer (mebibytes)	<i>read-only</i> (null)	The total memory media capacity of the CXL device available for dynamic assignment in mebibytes (MiB). This property shall contain the total memory media capacity of the CXL device available for dynamic assignment in mebibytes (MiB).
}			
EgressPortCongestionSupport (v1.11+)	boolean	<i>read-only</i> (null)	Indicates whether the CXL device supports egress port congestion management. This property shall indicate whether the CXL device supports the CXL Specification-defined 'Egress Port Congestion' mechanism.

Property	Type	Attributes	Notes
MaxNumberLogicalDevices (v1.11+)	integer	<i>read-only (null)</i>	The maximum number of logical devices supported by this CXL device. This property shall contain the maximum number of logical devices supported by this CXL device.
TemporaryThroughputReductionEnabled (v1.14+)	boolean	<i>read-write (null)</i>	Indicates whether temporary throughput reduction is enabled. This property shall indicate whether the CXL Specification-defined 'Temporary Throughput Reduction' mechanism is enabled on this device.
TemporaryThroughputReductionSupported (v1.14+)	boolean	<i>read-only (null)</i>	Indicates whether temporary throughput reduction is supported. This property shall indicate whether the CXL Specification-defined 'Temporary Throughput Reduction' mechanism is supported on this device.
ThroughputReductionSupport (v1.11+, deprecated v1.14)	boolean	<i>read-only (null)</i>	Indicates whether the CXL device supports throughput reduction. This property shall indicate whether the CXL device supports the CXL Specification-defined 'Throughput Reduction' mechanism. <i>Deprecated in v1.14 and later. This property has been deprecated in favor of <code>TemporaryThroughputReductionSupported</code> to align with the CXL Specification-defined FMAPI command.</i>
Timestamp (v1.11+)	string (date-time)	<i>read-write</i>	The timestamp set on the CXL device. This property shall contain the timestamp set on the CXL device.
}			
CXLLogicalDevices (v1.11+) {	object		The link to the collection of CXL logical devices within this PCIe device. This property shall contain a link to a resource collection of type <code>CXLLogicalDeviceCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <code>CXLLogicalDevice</code> . See the <code>CXLLogicalDevice</code> schema for details.
}			

Property	Type	Attributes	Notes
DeviceType	string (enum)	<i>read-only</i>	The device type for this PCIe device. This property shall contain the device type of the PCIe device such as <code>SingleFunction</code> or <code>MultiFunction</code>. <i>For the possible property values, see DeviceType in Property details.</i>
EnvironmentMetrics (v1.7+) {	object		The link to the environment metrics for this PCIe device. This property shall contain a link to a resource of type <code>EnvironmentMetrics</code> that specifies the environment metrics for this PCIe device. See the <i>EnvironmentMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>EnvironmentMetrics</i> resource. See the Links section and the <i>EnvironmentMetrics</i> schema for details.
}			
FirmwareVersion	string	<i>read-only</i> (null)	The version of firmware for this PCIe device. This property shall contain the firmware version of the PCIe device.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Chassis [{	array		An array of links to the chassis in which the PCIe device is contained. This property shall contain an array of links to resources of type <code>Chassis</code> that represent the physical containers associated with this resource.
@odata.id	string	<i>read-only</i>	Link to a <i>Chassis</i> resource. See the Links section and the <i>Chassis</i> schema for details.
}]			
ConnectedPClePorts (v1.19+) [{	array		An array of links to the remote PCIe ports to which this device is connected. This property shall contain an array of links to resources of type <code>Port</code> that represent the remote PCIe ports to which this device is connected.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a Port resource. See the Links section and the <i>Port</i> schema for details.
}}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCleFunctions (<i>deprecated v1.4</i>) [{	array		An array of links to PCIe functions exposed by this device. This property shall contain an array of links to resources of type <code>PCIEFunction</code> that represent the PCIe functions this device exposes. <i>Deprecated in v1.4 and later. This property has been deprecated in favor of the <code>PCIEFunctions</code> property in the root that provides a link to a resource collection.</i>
@odata.id	string	<i>read-only</i>	Link to a PCIeFunction resource. See the Links section and the <i>PCIEFunction</i> schema for details.
}}			
Processors (<i>v1.12+</i>) [{	array		An array of links to the processors that are directly connected or directly bridged to this PCIe device. This property shall contain an array of links to resources of type <code>Processor</code> that represent processors that are directly connected or directly bridged to this PCIe device.
@odata.id	string	<i>read-only</i>	Link to a Processor resource. See the Links section and the <i>Processor</i> schema for details.
}}			
Switch (<i>v1.10+</i>) {	object	(<i>null</i>)	The link to a switch that is associated with this PCIe device. This property shall contain a link to a resource of type <code>Switch</code> that is associated with this PCIe device. See the <i>Switch</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Switch resource. See the Links section and the <i>Switch</i> schema for details.
}			
}			

Property	Type	Attributes	Notes
LocationIndicatorActive (v1.12+)	boolean	<i>read-write</i> (null)	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource.
Manufacturer	string	<i>read-only</i> (null)	The manufacturer of this PCIe device. This property shall contain the name of the organization responsible for producing the PCIe device. This organization may be the entity from whom the PCIe device is purchased, but this is not necessarily true.
Model	string	<i>read-only</i> (null)	The model number for the PCIe device. This property shall contain the name by which the manufacturer generally refers to the PCIe device.
PartNumber	string	<i>read-only</i> (null)	The part number for this PCIe device. This property shall contain a part number assigned by the organization that is responsible for producing or manufacturing the PCIe device.
PCleFunctions (v1.4+) {	object		The link to the collection of PCIe functions associated with this PCIe device. This property shall contain a link to a resource collection of type <code>PCleFunctionCollection</code>. This property should not be present if <code>DeviceType</code> contains <code>Retimer</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>PCleFunction</i> . See the <i>PCleFunction</i> schema for details.
}			
PCleInterface (v1.3+) {	object		The PCIe interface details for this PCIe device. This property shall contain details for the PCIe interface that connects this PCIe device to its host or upstream switch.
LanesInUse (v1.3+)	integer	<i>read-only</i> (null)	The number of PCIe lanes in use by this device. This property shall contain the number of PCIe lanes in use by this device, which shall be equal to or less than the <code>MaxLanes</code> property value.

Property	Type	Attributes	Notes
MaxLanes (v1.3+)	integer	<i>read-only</i> (null)	The number of PCIe lanes supported by this device. This property shall contain the maximum number of PCIe lanes supported by this device.
MaxPCleType (v1.3+)	string (enum)	<i>read-only</i> (null)	The highest version of the PCIe specification supported by this device. This property shall contain the maximum PCIe specification that this device supports. <i>For the possible property values, see MaxPCleType in Property details.</i>
Oem (v1.3+) {}	object		See the OEM object definition in the Using this guide clause.
PCleType (v1.3+)	string (enum)	<i>read-only</i> (null)	The version of the PCIe specification in use by this device. This property shall contain the negotiated PCIe interface version in use by this device. <i>For the possible property values, see PCleType in Property details.</i>
}			
ReadyToRemove (v1.7+)	boolean	<i>read-write</i> (null)	An indication of whether the PCIe device is prepared by the system for removal. This property shall indicate whether the PCIe device is ready for removal. Setting the value to <code>true</code> shall cause the service to perform appropriate actions to quiesce the device. A task may spawn while the device is quiescing.
SerialNumber	string	<i>read-only</i> (null)	The serial number for this PCIe device. This property shall contain a manufacturer-allocated number that identifies the PCIe device.
SKU	string	<i>read-only</i> (null)	The SKU for this PCIe device. This property shall contain the stock-keeping unit number for this PCIe device.
Slot (v1.9+) {	object	(null)	Information about the slot for this PCIe device. This property shall contain information about the PCIe slot for this PCIe device.

Property	Type	Attributes	Notes
HotPluggable (v1.12+)	boolean	<i>read-only</i> (null)	An indication of whether this PCIe slot supports hotplug. This property shall indicate whether this PCIe slot supports hotplug.
Lanes (v1.9+)	integer	<i>read-only</i> (null)	The number of PCIe lanes supported by this slot. This property shall contain the maximum number of PCIe lanes supported by the slot.
LaneSplitting (v1.9+)	string (enum)	<i>read-only</i> (null)	The lane splitting strategy used in the PCIe slot. This property shall contain lane splitting information of the associated PCIe slot. <i>For the possible property values, see LaneSplitting in Property details.</i>
Location (v1.9+) {}	object		The location of the PCIe slot. This property shall contain part location information, including a <code>ServiceLabel</code> property, of the associated PCIe slot. For property details, see Location.
PCleType (v1.9+)	string (enum)	<i>read-only</i> (null)	The PCIe specification this slot supports. This property shall contain the maximum PCIe specification that this slot supports. <i>For the possible property values, see PCleType in Property details.</i>
SlotType (v1.9+)	string (enum)	<i>read-only</i> (null)	The PCIe slot type. This property shall contain the PCIe slot type. <i>For the possible property values, see SlotType in Property details.</i>
}			
SparePartNumber (v1.6+)	string	<i>read-only</i> (null)	The spare part number of the PCIe device. This property shall contain the spare part number of the PCIe device.
StagedVersion (v1.11+)	string	<i>read-only</i>	The staged firmware version for this PCIe device; this firmware is not yet active. This property shall contain the staged firmware version for this PCIe device; this firmware is not yet active.

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
UUID (v1.5+)	string (uuid)	<i>read-only (null)</i>	The UUID for this PCIe device. This property shall contain the universally unique identifier number for this PCIe device. Pattern: <code>^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\$</code>

6.96.4 Property details

6.96.4.1 AddCapacityPoliciesSupported

- The set of selection policies supported by the CXL device when dynamic capacity is added.
 - This property shall contain the CXL Specification-defined dynamic capacity policies that are supported by this CXL device when dynamic capacity is added.

string	Description
Contiguous	Contiguous add capacity policy. This value shall indicate the CXL Specification-defined contiguous add capacity policy.
Free	Free add capacity policy. This value shall indicate the CXL Specification-defined free add capacity policy.
Prescriptive	Prescriptive add or release policy. This value shall indicate the CXL Specification-defined prescriptive add or release policy.
TagBased	Tag-based release policy. This value shall indicate the CXL Specification-defined tag-based release policy.

6.96.4.2 CapableProtocolVersions

- An array of the CXL specification revisions supported by this device.
 - This property shall contain an array of the CXL specification revisions that this device supports.

string	Description
CXL1_1	CXL protocol specification revision 1.1.
CXL2_0	CXL protocol specification revision 2.0.
CXL3_0	CXL protocol specification revision 3.0.
CXL3_1	CXL protocol specification revision 3.1.
CXL3_2	CXL protocol specification revision 3.2.

6.96.4.3 CurrentProtocolVersion

The revision of the CXL specification in use by this device.

- This property shall contain the negotiated CXL specification revision in use by this device.

string	Description
CXL1_1	CXL protocol specification revision 1.1.
CXL2_0	CXL protocol specification revision 2.0.
CXL3_0	CXL protocol specification revision 3.0.
CXL3_1	CXL protocol specification revision 3.1.
CXL3_2	CXL protocol specification revision 3.2.

6.96.4.4 DeviceType

6.96.4.4.1 In top level:

The device type for this PCIe device.

- This property shall contain the device type of the PCIe device such as `SingleFunction` or `MultiFunction`.

string	Description
MultiFunction	A multi-function PCIe device.
Retimer (v1.10+)	A PCIe retimer device.
Simulated	A PCIe device that is not currently physically present, but is being simulated by the PCIe infrastructure.

string	Description
SingleFunction	A single-function PCIe device.

6.96.4.4.2 In CXLDevice:

The CXL device type.

- This property shall contain the CXL device type.

string	Description
Type1	A CXL Type 1 device. • This value shall indicate a CXL Specification-defined Type 1 device.
Type2	A CXL Type 2 device. • This value shall indicate a CXL Specification-defined Type 2 device.
Type3	A CXL Type 3 device. • This value shall indicate a CXL Specification-defined Type 3 device.

6.96.4.5 LaneSplitting

The lane splitting strategy used in the PCIe slot.

- This property shall contain lane splitting information of the associated PCIe slot.

string	Description
Bifurcated	The slot is bifurcated to split the lanes with associated devices.
Bridged	The slot has a bridge to share the lanes with associated devices.
None	The slot has no lane splitting.

6.96.4.6 MaxPCleType

The highest version of the PCIe specification supported by this device.

- This property shall contain the maximum PCIe specification that this device supports.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.
Gen6 (v1.16+)	A PCIe v6.0 slot.

6.96.4.7 PCIeType

The version of the PCIe specification in use by this device.

- This property shall contain the negotiated PCIe interface version in use by this device.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.
Gen6 (v1.16+)	A PCIe v6.0 slot.

6.96.4.8 ReleaseCapacityPoliciesSupported

- The set of removal policies supported by the CXL device when dynamic capacity is released.
 - This property shall contain the CXL Specification-defined dynamic capacity policies that are supported by this CXL device when dynamic capacity is released.

string	Description
Contiguous	Contiguous add capacity policy. • This value shall indicate the CXL Specification-defined contiguous add capacity policy.

string	Description
Free	Free add capacity policy. This value shall indicate the CXL Specification-defined free add capacity policy.
Prescriptive	Prescriptive add or release policy. This value shall indicate the CXL Specification-defined prescriptive add or release policy.
TagBased	Tag-based release policy. This value shall indicate the CXL Specification-defined tag-based release policy.

6.96.4.9 SlotType

The PCIe slot type.

- This property shall contain the PCIe slot type.

string	Description
EDSFF (v1.17+)	EDSFF slot.
FullLength	Full-Length PCIe slot.
HalfLength	Half-Length PCIe slot.
LowProfile	Low-Profile or Slim PCIe slot.
M2	PCIe M.2 slot.
Mini	Mini PCIe slot.
OCP3Large	Open Compute Project 3.0 large form factor slot.
OCP3Small	Open Compute Project 3.0 small form factor slot.
OEM	An OEM-specific slot.
U2	U.2 / SFF-8639 slot or bay.

6.96.5 Example response

```
{  
  "@odata.type": "#PCIeDevice.v1_19_0.PCIeDevice",  
}
```

```

    "Id": "NIC",
    "Name": "Simple Two-Port NIC",
    "Description": "Simple Two-Port NIC PCIe Device",
    "AssetTag": "ORD-4302015-18432RS",
    "Manufacturer": "Contoso",
    "Model": "SuperNIC 2000",
    "SKU": "89587433",
    "SerialNumber": "2M220100SL",
    "PartNumber": "232-4598D7",
    "DeviceType": "MultiFunction",
    "FirmwareVersion": "12.342-343",
    "Status": {
      "State": "Enabled",
      "Health": "OK",
      "HealthRollup": "OK"
    },
    "PCIeInterface": {
      "PCIeType": "Gen2",
      "MaxPCIeType": "Gen3",
      "LanesInUse": 4,
      "MaxLanes": 4
    },
    "PCIeFunctions": {
      "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/NIC/PCIeFunctions"
    },
    "Links": {
      "Chassis": [
        {
          "@odata.id": "/redfish/v1/Chassis/1"
        }
      ]
    },
    "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/NIC"
  }

```

6.97 PCIeFunction 1.6.0

Version	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2024.1	2022.3	2022.2	2021.1	2018.1	2017.1	2016.2

6.97.1 Description

The `PCIeFunction` schema describes the properties of a PCIe function that is attached to a system.

- This resource shall represent a PCIe function in a Redfish implementation.

6.97.2 URIs

```
/redfish/v1/Chassis/{ChassisId}/PCleDevices/{PCleDeviceId}/PCleFunctions/{PCleFunctionId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/PCleDevices/
{PCleDeviceId}/PCleFunctions/{PCleFunctionId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/PCleDevices/{PCleDeviceId}/
PCleFunctions/{PCleFunctionId}
/redfish/v1/Systems/{ComputerSystemId}/PCleDevices/{PCleDeviceId}/PCleFunctions/{PCleFunctionId}
```

6.97.3 Properties

Property	Type	Attributes	Notes
BusNumber (v1.6+)	string	<i>read-only</i> (null)	The bus number of this PCIe function. This property shall contain the PCIe bus number of the PCIe device function. This property shall not be present if the PCIe device function is fabric-attached or is shared with multiple systems. Pattern: <code>^0[xX][0-9a-fA-F]{2}\$</code>
ClassCode	string	<i>read-only</i> (null)	The Class Code of this PCIe function. This property shall contain the PCI Class Code, Subclass, and Programming Interface of the PCIe device function in the order listed. Pattern: <code>^0[xX]([0-9A-Fa-f]{2}){3}\$</code>
DeviceClass	string (enum)	<i>read-only</i>	The class for this PCIe function. This property shall contain the device class of the PCIe device function, such as storage, network, or memory. <i>For the possible property values, see DeviceClass in Property details.</i>
DeviceId	string	<i>read-only</i> (null)	The Device ID of this PCIe function. This property shall contain the PCI Device ID of the PCIe device function with the most significant byte shown first. Pattern: <code>^0[xX]([0-9A-Fa-f]{2}){2}\$</code>
DeviceNumber (v1.6+)	string	<i>read-only</i> (null)	The device number of this PCIe function. This property shall contain the PCIe device number of the PCIe device function. This property shall not be present if the PCIe device function is fabric-attached or is shared with multiple systems. Pattern: <code>^0[xX][0-1][0-9a-fA-F]{1}\$</code>

Property	Type	Attributes	Notes
Enabled (v1.3+)	boolean	<i>read-write</i>	An indication of whether this PCIe device function is enabled. The value of this property shall indicate if this PCIe device function is enabled.
FunctionId	integer	<i>read-only</i> (null)	The PCIe function number. This property shall contain the PCIe function number within a given PCIe device.
FunctionNumber (v1.6+)	string	<i>read-only</i> (null)	The function number of this PCIe function. This property shall contain the PCIe function number of the PCIe device function. This property shall not be present if the PCIe device function is fabric-attached or is shared with multiple systems. Pattern: <code>^0[xX][0-7]\$</code>
FunctionProtocol (v1.5+)	string (enum)	<i>read-only</i> (null)	The PCIe function protocol. This property shall contain the protocol supported by this PCIe function. <i>For the possible property values, see FunctionProtocol in Property details.</i>
FunctionType	string (enum)	<i>read-only</i>	The type of the PCIe function. This property shall contain the function type of the PCIe device function such as physical or virtual. <i>For the possible property values, see FunctionType in Property details.</i>
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
CXLLogicalDevice (v1.5+) {	object	(null)	The link to the CXL logical device to which this function is assigned. This property shall contain a link to a resource of type <code>CXLLogicalDevice</code> that represents the CXL logical device to which this PCIe function is assigned. See the <i>CXLLogicalDevice</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a CXLLogicalDevice resource. See the Links section and the <i>CXLLogicalDevice</i> schema for details.
}			
Drives [{	array		An array of links to the drives that this PCIe function produces. This property shall contain an array of links to resources of type <code>Drive</code> that represent the drives associated with this PCIe function.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a Drive resource. See the Links section and the <i>Drive</i> schema for details.
}}			
EthernetInterfaces [{	array		An array of links to the Ethernet interfaces that this PCIe function produces. This property shall contain an array of links to resources of type <code>EthernetInterface</code> that represent the network interfaces associated with this PCIe function.
@odata.id	string	<i>read-only</i>	Link to a EthernetInterface resource. See the Links section and the <i>EthernetInterface</i> schema for details.
}}			
MemoryDomains (v1.5+) [{	array		An array of links to the memory domains that the PCIe function produces. This property shall contain an array of links to resources of type <code>MemoryDomain</code> that represent the memory domains associated with this PCIe function.
@odata.id	string	<i>read-only</i>	Link to a MemoryDomain resource. See the Links section and the <i>MemoryDomain</i> schema for details.
}}			
NetworkDeviceFunctions (v1.2+) [{	array		An array of links to the network device functions that the PCIe function produces. This property shall contain an array of links to resources of type <code>NetworkDeviceFunction</code> that represent the network device functions associated with this PCIe function.
@odata.id	string	<i>read-only</i>	Link to a NetworkDeviceFunction resource. See the Links section and the <i>NetworkDeviceFunction</i> schema for details.
}}			
Oem { }	object		See the OEM object definition in the Using this guide clause.
PCleDevice {	object		The link to the PCIe device on which this function resides. This property shall contain a link to a resource of type <code>PCleDevice</code> that represents the PCIe devices on which this function resides. See the <i>PCleDevice</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a PCleDevice resource. See the Links section and the <i>PCleDevice</i> schema for details.

Property	Type	Attributes	Notes
}			
Processor (v1.4+) {	object	(null)	The link to a processor that is hosted on this PCIe function. This property shall link to a resource of type <code>Processor</code> that represents the processor that is hosted on this PCIe function. See the <i>Processor</i> schema for details on this property.
@odata.id	string	read-only	Link to a Processor resource. See the Links section and the <i>Processor</i> schema for details.
}			
StorageControllers [{	array		An array of links to the storage controllers that this PCIe function produces. This property shall contain an array of links to referenceable members of type <code>StorageController</code> that represent the storage controllers associated with this PCIe function.
@odata.id	string	read-only	Link to a StorageController resource. See the Links section and the <i>Storage</i> schema for details.
}]			
}			
RevisionId	string	read-only (null)	The Revision ID of this PCIe function. This property shall contain the PCI Revision ID of the PCIe device function. Pattern: <code>^0[xX]([0-9A-Fa-f]{2}){1}\$</code>
SegmentNumber (v1.6+)	string	read-only (null)	The segment number of this PCIe function. This property shall contain the PCIe segment number of the PCIe device function. This property shall not be present if the PCIe device function is fabric-attached or is shared with multiple systems. Pattern: <code>^0[xX][0-9a-fA-F]{4}\$</code>
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <i>Status</i>.
SubsystemId	string	read-only (null)	The Subsystem ID of this PCIe function. This property shall contain the PCI Subsystem ID of the PCIe device function with the most significant byte shown first. Pattern: <code>^0[xX]([0-9A-Fa-f]{2}){2}\$</code>

Property	Type	Attributes	Notes
SubsystemVendorId	string	<i>read-only</i> (null)	The Subsystem Vendor ID of this PCIe function. This property shall contain the PCI Subsystem Vendor ID of the PCIe device function with the most significant byte shown first. Pattern: <code>^0[xX]([0-9A-Fa-f]{2}){2}\$</code>
VendorId	string	<i>read-only</i> (null)	The Vendor ID of this PCIe function. This property shall contain the PCI Vendor ID of the PCIe device function with the most significant byte shown first. Pattern: <code>^0[xX]([0-9A-Fa-f]{2}){2}\$</code>

6.97.4 Property details

6.97.4.1 DeviceClass

The class for this PCIe function.

- This property shall contain the device class of the PCIe device function, such as storage, network, or memory.

string	Description
Bridge	A bridge.
CommunicationController	A communication controller.
Coprocessor	A coprocessor.
DisplayController	A display controller.
DockingStation	A docking station.
EncryptionController	An encryption controller.
GenericSystemPeripheral	A generic system peripheral.
InputDeviceController	An input device controller.
IntelligentController	An intelligent controller.
MassStorageController	A mass storage controller.
MemoryController	A memory controller.
MultimediaController	A multimedia controller.

string	Description
NetworkController	A network controller.
NonEssentialInstrumentation	A non-essential instrumentation.
Other	Other class. The function Class Code needs to be verified.
ProcessingAccelerators	A processing accelerators.
Processor	A processor.
SatelliteCommunicationsController	A satellite communications controller.
SerialBusController	A serial bus controller.
SignalProcessingController	A signal processing controller.
UnassignedClass	An unassigned class.
UnclassifiedDevice	An unclassified device.
WirelessController	A wireless controller.

6.97.4.2 FunctionProtocol

The PCIe function protocol.

- This property shall contain the protocol supported by this PCIe function.

string	Description
CXL	A PCIe function supporting CXL extensions.
PCIe	A standard PCIe function.

6.97.4.3 FunctionType

The type of the PCIe function.

- This property shall contain the function type of the PCIe device function such as physical or virtual.

string	Description
Physical	A physical PCIe function.

string	Description
Virtual	A virtual PCIe function.

6.97.5 Example response

```
{
  "@odata.type": "#PCIeFunction.v1_6_0.PCIeFunction",
  "Id": "2",
  "Name": "FC Port 2",
  "Description": "FC Port 2",
  "FunctionId": 2,
  "FunctionType": "Physical",
  "DeviceClass": "NetworkController",
  "DeviceId": "0xABCD",
  "VendorId": "0xABCD",
  "ClassCode": "0x010802",
  "RevisionId": "0x00",
  "SubsystemId": "0xABCD",
  "SubsystemVendorId": "0xABCD",
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "HealthRollup": "OK"
  },
  "Links": {
    "PCIeDevice": {
      "@odata.id": "/redfish/v1/Chassis/1/PCIeDevices/FC"
    }
  },
  "@odata.id": "/redfish/v1/Chassis/1/PCIeDevices/FC/PCIeFunctions/2"
}
```

6.98 PCIeSlots 1.6.1 (deprecated)

Version	v1.6 <i>Deprecated</i>	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2023.2	2021.3	2020.3	2020.1	2019.4	2019.1	2018.2

This schema has been deprecated and use in new implementations is discouraged except to retain compatibility with existing products. This schema has been deprecated in favor of the `PCIeDevice` schema. Empty PCIe slots should be represented by `PCIeDevice` resources using the `Absent` value of the `State` property within `Status`.

6.98.1 Description

The `PCIESlots` schema describes PCIe slot properties.

- This resource shall represent a set of PCIe slot information for a Redfish implementation.

6.98.2 URIs

/redfish/v1/Chassis/{ChassisId}/PCIESlots

6.98.3 Properties

Property	Type	Attributes	Notes
Slots [{	array		An array of PCI Slot information. This array shall contain an entry for each PCIe slot, including empty slots (with no device or card installed).
HotPluggable (v1.1+)	boolean	<i>read-only</i> (null)	An indication of whether this PCIe slot supports hotplug. This property shall contain indicating whether this PCIe slot supports hotplug.
Lanes	integer	<i>read-only</i> (null)	The number of PCIe lanes supported by this slot. This property shall contain the maximum number of PCIe lanes supported by the slot.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCleDevice [{	array		An array of links to the PCIe devices contained in this slot. This property shall contain an array of links to resources of type <code>PCleDevice</code> with which this physical slot is associated. If the <code>State</code> property in <code>Status</code> of this slot is <code>Absent</code>, this property shall not appear in the resource.
@odata.id	string	<i>read-only</i>	Link to a PCleDevice resource. See the Links section and the <code>PCleDevice</code> schema for details.
}]			

Property	Type	Attributes	Notes
Processors (v1.5+) [{	array		An array of links to the processors that are directly connected or directly bridged to this PCIe slot. This property shall contain an array of links to resources of type <code>Processor</code> that represent processors that are directly connected or directly bridged to this PCIe slot.
@odata.id	string	<i>read-only</i>	Link to a Processor resource. See the Links section and the <i>Processor</i> schema for details.
}}			
}			
Location {}	object		The location of the PCIe slot. This property shall contain part location information, including a <code>ServiceLabel</code> of the associated PCIe slot. For property details, see Location.
LocationIndicatorActive (v1.4+)	boolean	<i>read-write</i> (null)	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of <code>IndicatorLED</code> in this resource, if supported, to reflect the implementation of the locating function.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCleType	string (enum)	<i>read-only</i> (null)	The PCIe specification supported by this slot. This property shall contain the maximum PCIe specification that this slot supports. For the possible property values, see <i>PCleType</i> in Property details.
SlotType	string (enum)	<i>read-only</i> (null)	The PCIe slot type for this slot. This property shall contain the slot type as specified by the PCIe specification. For the possible property values, see <i>SlotType</i> in Property details.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
}}			

6.98.4 Property details

6.98.4.1 PCIeType

The PCIe specification supported by this slot.

- This property shall contain the maximum PCIe specification that this slot supports.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.
Gen6	A PCIe v6.0 slot.

6.98.4.2 SlotType

The PCIe slot type for this slot.

- This property shall contain the slot type as specified by the PCIe specification.

string	Description
FullLength	Full-Length PCIe slot.
HalfLength	Half-Length PCIe slot.
LowProfile	Low-Profile or Slim PCIe slot.
M2	PCIe M.2 slot.
Mini	Mini PCIe slot.
OCP3Large (v1.2+)	Open Compute Project 3.0 large form factor slot.
OCP3Small (v1.2+)	Open Compute Project 3.0 small form factor slot.
OEM	An OEM-specific slot.

string	Description
U2 (v1.3+)	U.2 / SFF-8639 slot or bay.

6.98.5 Example response

```
{
  "@odata.type": "#PCIESlots.v1_6_1.PCIESlots",
  "Id": "1",
  "Name": "PCIe Slot Information",
  "Slots": [
    {
      "PCIeType": "Gen3",
      "Lanes": 16,
      "SlotType": "FullLength",
      "Status": {
        "State": "Enabled"
      },
      "Location": {
        "PartLocation": {
          "ServiceLabel": "Slot 1",
          "LocationOrdinalValue": 1,
          "LocationType": "Slot",
          "Orientation": "LeftToRight",
          "Reference": "Rear"
        }
      },
      "Links": {
        "PCIeDevice": [
          {
            "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/NIC"
          }
        ]
      }
    },
    {
      "PCIeType": "Gen4",
      "Lanes": 4,
      "SlotType": "FullLength",
      "Status": {
        "State": "Absent"
      },
      "Location": {
        "PartLocation": {
          "ServiceLabel": "Slot 2",
          "LocationOrdinalValue": 2,
          "LocationType": "Slot",
          "Orientation": "LeftToRight",

```

```
        "Reference": "Rear"
      }
    },
    {
      "PCIEType": "Gen3",
      "Lanes": 1,
      "SlotType": "HalfLength",
      "Status": {
        "State": "Absent"
      },
      "Location": {
        "PartLocation": {
          "ServiceLabel": "Slot 3",
          "LocationOrdinalValue": 3,
          "LocationType": "Slot",
          "Orientation": "LeftToRight",
          "Reference": "Rear"
        }
      }
    }
  ],
  "@odata.id": "/redfish/v1/Chassis/1/PCIESlots"
}
```

6.99 Port 1.16.0

Version	v1.16	v1.15	v1.14	v1.13	v1.12	v1.11	v1.10	v1.9	v1.8	v1.7	v1.6	...
Release	2025.1	2024.4	2024.3	2024.2	2024.1	2023.3	2023.2	2023.1	2022.3	2022.2	2021.4	...

6.99.1 Description

The `Port` schema contains properties that describe a port of a switch, controller, chassis, or any other device that could be connected to another entity.

- This resource contains a simple port for a Redfish implementation.

6.99.2 URIs

`/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}`
`/redfish/v1/Chassis/{ChassisId}/MediaControllers/{MediaControllerId}/Ports/{PortId}`
`/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Ports/{PortId}`

/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/Ports/{PortId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/
{StorageControllerId}/Ports/{PortId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/StorageControllers/
{StorageControllerId}/Ports/{PortId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/
{FabricAdapterId}/Ports/{PortId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/
GraphicsControllers/{GraphicsControllerId}/Ports/{PortId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/
{ProcessorId}/Ports/{PortId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/
{StorageId}/Controllers/{StorageControllerId}/Ports/{PortId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/
{StorageId}/StorageControllers/{StorageControllerId}/Ports/{PortId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/USBControllers/
{USBControllerId}/Ports/{PortId}
/redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Ports/{PortId}
/redfish/v1/Managers/{ManagerId}/DedicatedNetworkPorts/{PortId}
/redfish/v1/Managers/{ManagerId}/USBPorts/{PortId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/Ports/{PortId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Ports/{PortId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Ports/
{PortId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/
Ports/{PortId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/GraphicsControllers/
{GraphicsControllerId}/Ports/{PortId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/Ports/
{PortId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/
{StorageControllerId}/Ports/{PortId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/
StorageControllers/{StorageControllerId}/Ports/{PortId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/USBControllers/{USBControllerId}/
Ports/{PortId}
/redfish/v1/Storage/{StorageId}/Controllers/{StorageControllerId}/Ports/{PortId}
/redfish/v1/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Ports/{PortId}
/redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}
/redfish/v1/Systems/{ComputerSystemId}/GraphicsControllers/{GraphicsControllerId}/Ports/{PortId}
/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/Ports/{PortId}
/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Ports/{PortId}
/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Ports/{PortId}
/redfish/v1/Systems/{ComputerSystemId}/USBControllers/{USBControllerId}/Ports/{PortId}

6.99.3 Properties

Property	Type	Attributes	Notes
ActiveWidth (v1.2+)	integer	<i>read-only</i>	The number of active lanes for this interface. This property shall contain the number of active lanes for this interface.
CapableProtocolVersions (v1.4+) []	array (string, null)	<i>read-only</i>	The protocol versions capable of being sent over this port. This property shall contain the protocol versions capable of being sent over this port. This property should only be used for protocols where the version and not the speed is of primary interest such as USB, DisplayPort, or HDMI.
ConfiguredSpeedGbps (v1.16+)	number (Gbit/s)	<i>read-write</i> (null)	The speed to which this port is configured to train when autonegotiation is disabled. This property shall contain the unidirectional speed to which this port is configured to train. This value includes overhead associated with the protocol. If <code>AutoSpeedNegotiationEnabled</code> contains <code>true</code>, this property shall be ignored.
ConfiguredWidth (v1.16+)	integer	<i>read-write</i> (null)	The number of lanes, phys, or other physical transport links to which this port is configured to train when autonegotiation is disabled. This property shall contain the number of physical transport links to which this port is configured to train. If <code>AutoSpeedNegotiationEnabled</code> contains <code>true</code>, this property shall be ignored.
CurrentProtocolVersion (v1.4+)	string	<i>read-only</i> (null)	The protocol version being sent over this port. This property shall contain the protocol version being sent over this port. This property should only be used for protocols where the version and not the speed is of primary interest such as USB, DisplayPort, or HDMI.
CurrentSpeedGbps	number (Gbit/s)	<i>read-only</i> (null)	The current speed of this port. This property shall contain the unidirectional speed of this port currently negotiated and running. This value includes overhead associated with the protocol.

Property	Type	Attributes	Notes
CXL (v1.8+) {	object	(null)	CXL properties for this port. This property shall contain CXL-specific properties for this port.
Congestion (v1.8+) {	object	(null)	The congestion properties for this CXL port. This property shall contain the congestion properties for this CXL port.
BackpressureSampleInterval (v1.8+)	integer	read-write (null)	The interval for the CXL Specification-defined 'Egress Port Congestion' mechanism to take samples in nanoseconds. This property shall contain the CXL Specification-defined 'Backpressure Sample Interval' in nanoseconds.
CompletionCollectionInterval (v1.8+)	integer	read-write (null)	The interval for the CXL Specification-defined 'Completion Counting' mechanism to collect the number of transmitted responses in a single counter in nanoseconds. This property shall contain the CXL Specification-defined 'Completion Collection Interval' in nanoseconds.
CongestionTelemetryEnabled (v1.8+)	boolean	read-write (null)	Indicates whether congestion telemetry collection is enabled for this port. This property shall indicate whether congestion telemetry collection is enabled for this port.
EgressModeratePercentage (v1.8+)	integer (%)	read-write (null)	The threshold for moderate egress port congestion as a percentage. This property shall contain the threshold for moderate egress port congestion for the CXL Specification-defined 'Egress Port Congestion' mechanism as a percentage, 0 to 100 .
EgressSeverePercentage (v1.8+)	integer (%)	read-write (null)	The threshold for severe egress port congestion as a percentage. This property shall contain the CXL Specification-defined 'Egress Severe Percentage' as a percentage, 0 to 100 .

Property	Type	Attributes	Notes
MaxSustainedRequestCmpBias (v1.8+)	integer	<i>read-write</i> (null)	The estimated maximum sustained sum of requests and recent responses across the entire device, serving as the basis for the CXL Specification-defined 'QoS Limit Fraction'. This property shall contain the CXL Specification-defined 'ReqCmpBasis'.
}			
ConnectedDeviceMode (v1.8+)	string (enum)	<i>read-only</i> (null)	The connected device mode. This property shall contain the CXL Specification-defined 'Connected Device Mode'. <i>For the possible property values, see ConnectedDeviceMode in Property details.</i>
ConnectedDeviceType (v1.8+)	string (enum)	<i>read-only</i> (null)	The connected device type. This property shall contain the CXL Specification-defined 'Connected Device Type'. <i>For the possible property values, see ConnectedDeviceType in Property details.</i>
CurrentPortConfigurationState (v1.8+)	string (enum)	<i>read-only</i> (null)	The current port configuration state. This property shall contain the CXL Specification-defined 'Current Port Configuration State'. <i>For the possible property values, see CurrentPortConfigurationState in Property details.</i>
MaxLogicalDeviceCount (v1.8+)	integer	<i>read-only</i> (null)	The maximum number of logical devices supported. This property shall contain the CXL Specification-defined 'Supported LD Count'.
QoSTelemetryCapabilities (v1.8+) {	object	(null)	The quality of service telemetry capabilities for this CXL port. This property shall contain the quality of service telemetry capabilities for this CXL port.
EgressPortBackpressureSupported (v1.8+)	boolean	<i>read-only</i> (null)	Indicates whether the port supports the CXL Specification-defined 'Egress Port Backpressure' mechanism. This property shall indicate whether the port supports the CXL Specification-defined 'Egress Port Backpressure' mechanism.

Property	Type	Attributes	Notes
TemporaryThroughputReductionSupported (v1.8+, deprecated v1.12)	boolean	read-only (null)	Indicates whether the port supports the CXL Specification-defined 'Temporary Throughput Reduction' mechanism. This property shall indicate whether the port supports the CXL Specification-defined 'Temporary Throughput Reduction' mechanism. <i>Deprecated in v1.12 and later. This property has been deprecated in favor of <code>TemporaryThroughputReductionSupported</code> in <code>PCIeDevice</code>.</i>
}			
SupportedCXLModes (v1.11+) []	array (string (enum))	read-only (null)	- The supported device modes. - This property shall contain the CXL Specification-defined 'Supported CXL Modes'. This property shall not contain the value <code>Disconnected</code>. <i>For the possible property values, see <code>SupportedCXLModes</code> in Property details.</i>
TemporaryThroughputReductionEnabled (v1.8+, deprecated v1.12)	boolean	read-write (null)	Indicates whether temporary throughput reduction is enabled. This property shall indicate whether the CXL Specification-defined 'Temporary Throughput Reduction' mechanism is enabled. <i>Deprecated in v1.12 and later. This property has been deprecated in favor of <code>TemporaryThroughputReductionEnabled</code> in <code>PCIeDevice</code>.</i>
}			
Enabled (v1.4+, deprecated v1.10)	boolean	read-write	An indication of whether this port is enabled. The value of this property shall indicate if this port is enabled. Disabling a port will disconnect any devices only connected to the system through this port. <i>Deprecated in v1.10 and later. This property has been deprecated in favor of <code>InterfaceEnabled</code>.</i>
EnvironmentMetrics (v1.4+) {	object		The link to the environment metrics for this port or any attached small form-factor pluggable (SFP) device. This property shall contain a link to a resource of type <code>EnvironmentMetrics</code> that represents the environment metrics for this port or any attached small form-factor pluggable (SFP) device. See the <code>EnvironmentMetrics</code> schema for details on this property.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a EnvironmentMetrics resource. See the Links section and the <i>EnvironmentMetrics</i> schema for details.
}			
Ethernet (v1.3+) {	object	(null)	Ethernet properties for this port. This property shall contain Ethernet-specific properties of the port.
AssociatedMACAddresses (v1.4+) []	array (string, null)	<i>read-only</i>	An array of configured MAC addresses that are associated with this network port, including the programmed address of the lowest-numbered network device function, the configured but not active address, if applicable, the address for hardware port teaming, or other network addresses. This property shall contain an array of configured MAC addresses that are associated with this network port, including the programmed address of the lowest-numbered network device function, the configured but not active address if applicable, the address for hardware port teaming, or other network addresses. Pattern: <code>^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})\$</code>
EEEEnabled (v1.5+)	boolean	<i>read-write</i> (null)	Indicates whether IEEE 802.3az Energy-Efficient Ethernet (EEE) is enabled on this port. This property shall indicate whether IEEE 802.3az Energy-Efficient Ethernet (EEE) is enabled on this port.
FlowControlConfiguration (v1.3+)	string (enum)	<i>read-write</i> (null)	The locally configured 802.3x flow control setting for this port. This property shall contain the locally configured 802.3x flow control setting for this port. <i>For the possible property values, see FlowControlConfiguration in Property details.</i>
FlowControlStatus (v1.3+)	string (enum)	<i>read-only</i> (null)	The 802.3x flow control behavior negotiated with the link partner for this port. This property shall contain the 802.3x flow control behavior negotiated with the link partner for this port. <i>For the possible property values, see FlowControlStatus in Property details.</i>

Property	Type	Attributes	Notes
LLDPEnabled (v1.4+)	boolean	<i>read-write</i>	Enable/disable LLDP for this port. This property shall contain the state indicating whether to enable LLDP for a port. If LLDP is disabled at the adapter level, this property shall be ignored.
LLDPReceive (v1.4+) {	object	(null)	LLDP data being received on this link. This property shall contain the LLDP data being received on this link.
ChassisId (v1.4+)	string	<i>read-only</i> (null)	Link Layer Data Protocol (LLDP) chassis ID received from the remote partner across this link. This property shall contain the chassis ID received from the remote partner across this link. If no such chassis ID has been received, this property should not be present.
ChassisIdSubtype (v1.4+)	string (enum)	<i>read-only</i> (null)	The type of identifier used for the chassis ID received from the remote partner across this link. This property shall contain the IEEE 802.1AB-2009 chassis ID subtype received from the remote partner across this link. If no such chassis ID subtype has been received, this property should not be present. <i>For the possible property values, see ChassisIdSubtype in Property details.</i>
ManagementAddressIPv4 (v1.4+)	string	<i>read-only</i> (null)	The IPv4 management address received from the remote partner across this link. This property shall contain the IPv4 management address received from the remote partner across this link. If no such management address has been received, this property should not be present. Pattern: <code>^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$</code>
ManagementAddressIPv6 (v1.4+)	string	<i>read-only</i> (null)	The IPv6 management address received from the remote partner across this link. This property shall contain the IPv6 management address received from the remote partner across this link. If no such management address has been received, this property should not be present.

Property	Type	Attributes	Notes
ManagementAddressMAC (v1.4+)	string	<i>read-only</i> (null)	The management MAC address received from the remote partner across this link. This property shall contain the management MAC address received from the remote partner across this link. If no such management address has been received, this property should not be present. Pattern: <code>^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})\$</code>
ManagementVlanId (v1.4+)	integer	<i>read-only</i> (null)	The management VLAN ID received from the remote partner across this link. This property shall contain the management VLAN ID received from the remote partner across this link. If no such management VLAN ID has been received, this property should not be present.
PortId (v1.4+)	string	<i>read-only</i> (null)	A colon-delimited string of hexadecimal octets identifying a port. This property shall contain a colon-delimited string of hexadecimal octets identifying the port received from the remote partner across this link. If no such port ID has been received, this property should not be present. Pattern: <code>^([0-9A-F]{2})([:]([0-9A-F]{2})){0,63}\$</code>
PortIdSubtype (v1.4+)	string (enum)	<i>read-only</i> (null)	The port ID subtype received from the remote partner across this link. This property shall contain the port ID subtype from IEEE 802.1AB-2009 Table 8-3 received from the remote partner across this link. If no such port ID subtype has been received, this property should not be present. <i>For the possible property values, see PortIdSubtype in Property details.</i>
SystemCapabilities (v1.8+) []	array (string (enum))	<i>read-only</i> (null)	- The system capabilities received from the remote partner across this link. - This property shall contain the system capabilities received from the remote partner across this link. If no such system capabilities have been received, this property shall not be present. This property shall not contain the value <code>None</code>. <i>For the possible property values, see SystemCapabilities in Property details.</i>

Property	Type	Attributes	Notes
SystemDescription (v1.8+)	string	<i>read-only</i> (null)	The system description received from the remote partner across this link. This property shall contain the system description received from the remote partner across this link. If no such system description has been received, this property shall not be present.
SystemName (v1.8+)	string	<i>read-only</i> (null)	The system name received from the remote partner across this link. This property shall contain the system name received from the remote partner across this link. If no such system name has been received, this property shall not be present.
}			
LLDPTransmit (v1.4+) {	object	(null)	LLDP data being transmitted on this link. This property shall contain the LLDP data being transmitted on this link.
ChassisId (v1.4+)	string	<i>read-write</i> (null)	Link Layer Data Protocol (LLDP) chassis ID. This property shall contain the chassis ID to be transmitted from this endpoint. If no such chassis ID is to be transmitted, this value shall be an empty string.
ChassisIdSubtype (v1.4+)	string (enum)	<i>read-write</i> (null)	The type of identifier used for the chassis ID. This property shall contain the IEEE 802.1AB-2009 chassis ID subtype to be transmitted from this endpoint. If no such chassis ID subtype is to be transmitted, this value shall be <code>NotTransmitted</code>. <i>For the possible property values, see ChassisIdSubtype in Property details.</i>
ManagementAddressIPv4 (v1.4+)	string	<i>read-write</i> (null)	The IPv4 management address to be transmitted from this endpoint. This property shall contain the IPv4 management address to be transmitted from this endpoint. If no such management address is to be transmitted, this value shall be an empty string. Pattern: <code>(^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$) (^\$)</code>

Property	Type	Attributes	Notes
ManagementAddressIPv6 (v1.4+)	string	<i>read-write</i> (null)	The IPv6 management address to be transmitted from this endpoint. This property shall contain the IPv6 management address to be transmitted from this endpoint. If no such management address is to be transmitted, this value shall be an empty string.
ManagementAddressMAC (v1.4+)	string	<i>read-write</i> (null)	The management MAC address to be transmitted from this endpoint. This property shall contain the management MAC address to be transmitted from this endpoint. If no such management address is to be transmitted, this value shall be an empty string. Pattern: <code>(^[0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})\$ ^\$</code>
ManagementVlanId (v1.4+)	integer	<i>read-write</i> (null)	The management VLAN ID to be transmitted from this endpoint. This property shall contain the management VLAN ID to be transmitted from this endpoint. If no such port ID is to be transmitted, this value shall be <code>4095</code>.
PortId (v1.4+)	string	<i>read-write</i> (null)	A colon-delimited string of hexadecimal octets identifying a port to be transmitted from this endpoint. This property shall contain a colon-delimited string of hexadecimal octets identifying the port for an LLDP endpoint. If no such port ID is to be transmitted, this value shall be an empty string. Pattern: <code>(^[0-9A-F]{2})([:][0-9A-F]{2}){0,63}\$ ^\$</code>
PortIdSubtype (v1.4+)	string (enum)	<i>read-write</i> (null)	The port ID subtype to be transmitted from this endpoint. This property shall contain the port ID subtype from IEEE 802.1AB-2009 Table 8-3 to be transmitted from this endpoint. If no such port ID subtype is to be transmitted, this value shall be <code>NotTransmitted</code>. <i>For the possible property values, see PortIdSubtype in Property details.</i>

Property	Type	Attributes	Notes
SystemCapabilities (v1.8+) []	array (string (enum))	<i>read-write (null)</i>	- The system capabilities to be transmitted from this endpoint. - This property shall contain the system capabilities to be transmitted from this endpoint. If no such system capabilities are to be transmitted, this value shall be an empty array. If this property contains the value <code>None</code>, an empty set of system capabilities is transmitted from this endpoint. <i>For the possible property values, see SystemCapabilities in Property details.</i>
SystemDescription (v1.8+)	string	<i>read-write (null)</i>	The system description to be transmitted from this endpoint. This property shall contain the system description to be transmitted from this endpoint. If no such system description is to be transmitted, this value shall be an empty string.
SystemName (v1.8+)	string	<i>read-write (null)</i>	The system name to be transmitted from this endpoint. This property shall contain the system name to be transmitted from this endpoint. If no such system name is to be transmitted, this value shall be an empty string.
}			
SupportedEthernetCapabilities (v1.3+, deprecated v1.5) []	array (string (enum))	<i>read-only (null)</i>	- The set of Ethernet capabilities that this port supports. - This property shall contain an array of Ethernet capabilities supported by this port. <i>For the possible property values, see SupportedEthernetCapabilities in Property details. Deprecated in v1.5 and later. This property has been deprecated in favor of individual fields for the various properties.</i>
WakeOnLANEnabled (v1.5+)	boolean	<i>read-write (null)</i>	Indicates whether Wake on LAN (WoL) is enabled on this port. This property shall indicate whether Wake on LAN (WoL) is enabled on this port.
}			
FibreChannel (v1.3+) {	object	<i>(null)</i>	Fibre Channel properties for this port. This property shall contain Fibre Channel-specific properties of the port.

Property	Type	Attributes	Notes
AssociatedWorldWideNames (v1.4+) []	array (string, null)	<i>read-only</i>	An array of configured World Wide Names (WWN) that are associated with this network port, including the programmed address of the lowest-numbered network device function, the configured but not active address, if applicable, the address for hardware port teaming, or other network addresses. This property shall contain an array of configured World Wide Names (WWN) that are associated with this network port, including the programmed address of the lowest-numbered network device function, the configured but not active address if applicable, the address for hardware port teaming, or other network addresses. Pattern: <code>^([0-9A-Fa-f]{2}[:-]){7}([0-9A-Fa-f]{2})\$</code>
FabricName (v1.3+)	string	<i>read-only</i> (null)	The Fibre Channel Fabric Name provided by the switch. This property shall indicate the Fibre Channel Fabric Name provided by the switch.
NumberDiscoveredRemotePorts (v1.3+)	integer	<i>read-only</i> (null)	The number of ports not on the associated device that the associated device has discovered through this port. This property shall contain the number of ports not on this associated device that this port has discovered.
PortConnectionType (v1.3+)	string (enum)	<i>read-only</i> (null)	The connection type of this port. This property shall contain the connection type for this port. <i>For the possible property values, see PortConnectionType in Property details.</i>
}			
FunctionMaxBandwidth (v1.4+) [{	array		An array of maximum bandwidth allocation percentages for the functions associated with this port. This property shall contain an array of maximum bandwidth allocation percentages for the functions associated with this port.
AllocationPercent (v1.4+)	integer (%)	<i>read-write</i> (null)	The maximum bandwidth allocation percentage allocated to the corresponding network device function instance. This property shall contain the maximum bandwidth percentage allocation, 0 to 100, for the associated network device function.

Property	Type	Attributes	Notes
NetworkDeviceFunction (v1.4+) {	object		The link to the network device function associated with this bandwidth setting of this network port. This property shall contain a link to a resource of type <code>NetworkDeviceFunction</code> that represents the network device function associated with this bandwidth setting of this network port. See the <i>NetworkDeviceFunction</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>NetworkDeviceFunction</i> resource. See the Links section and the <i>NetworkDeviceFunction</i> schema for details.
}			
}]			
FunctionMinBandwidth (v1.4+) [{	array		An array of minimum bandwidth allocation percentages for the functions associated with this port. This property shall contain an array of minimum bandwidth percentage allocations for each of the functions associated with this port.
AllocationPercent (v1.4+)	integer (%)	<i>read-write (null)</i>	The minimum bandwidth allocation percentage allocated to the corresponding network device function instance. This property shall contain the minimum bandwidth percentage allocation, <code>0</code> to <code>100</code>, for the associated network device function. The sum of all minimum percentages shall not exceed <code>100</code>.
NetworkDeviceFunction (v1.4+) {	object		The link to the network device function associated with this bandwidth setting of this network port. This property shall contain a link to a resource of type <code>NetworkDeviceFunction</code> that represents the network device function associated with this bandwidth setting of this network port. See the <i>NetworkDeviceFunction</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>NetworkDeviceFunction</i> resource. See the Links section and the <i>NetworkDeviceFunction</i> schema for details.
}			
}]			

Property	Type	Attributes	Notes
GenZ (v1.2+) {	object		Gen-Z specific properties. This property shall contain Gen-Z specific properties for this interface.
LPRT (v1.2+) {	object		The Linear Packet Relay Table for the port. This property shall contain a link to a resource collection of type <code>RouteEntryCollection</code>, and shall represent the Gen-Z Core Specification-defined Linear Packet Relay Table for this port. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>RouteEntry</i> . See the <i>RouteEntry</i> schema for details.
}			
MPRT (v1.2+) {	object		The Multi-subnet Packet Relay Table for the port. This property shall contain a link to a resource collection of type <code>RouteEntryCollection</code>, and shall represent the Gen-Z Core Specification-defined Multi-subnet Packet Relay Table for this port. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>RouteEntry</i> . See the <i>RouteEntry</i> schema for details.
}			
VCAT (v1.2+) {	object		The Virtual Channel Action Table for the port. This property shall contain a link to a resource collection of type <code>VCATEntryCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>VCATEntry</i> . See the <i>VCATEntry</i> schema for details.
}			
}			
HostDevice (v1.15+)	string (enum)	<i>read-write</i> (null)	The current host device for this port. This property shall contain the current host device of port. For the possible property values, see <i>HostDevice</i> in Property details.

Property	Type	Attributes	Notes
InfiniBand (v1.6+) {	object	(null)	InfiniBand properties for this port. This property shall contain InfiniBand-specific properties of the port.
AssociatedNodeGUIDs (v1.6+) []	array (string, null)	read-only	An array of configured node GUIDs that are associated with this network port, including the programmed address of the lowest-numbered network device function, the configured but not active address, if applicable, the address for hardware port teaming, or other network addresses. This property shall contain an array of configured node GUIDs that are associated with this network port, including the programmed address of the lowest-numbered network device function, the configured but not active address if applicable, the address for hardware port teaming, or other network addresses. Pattern: <code>^([0-9A-Fa-f]{4}[:-]){3}([0-9A-Fa-f]{4})\$</code>
AssociatedPortGUIDs (v1.6+) []	array (string, null)	read-only	An array of configured port GUIDs that are associated with this network port, including the programmed address of the lowest-numbered network device function, the configured but not active address, if applicable, the address for hardware port teaming, or other network addresses. This property shall contain an array of configured port GUIDs that are associated with this network port, including the programmed address of the lowest-numbered network device function, the configured but not active address if applicable, the address for hardware port teaming, or other network addresses. Pattern: <code>^([0-9A-Fa-f]{4}[:-]){3}([0-9A-Fa-f]{4})\$</code>
AssociatedSystemGUIDs (v1.6+) []	array (string, null)	read-only	An array of configured system GUIDs that are associated with this network port, including the programmed address of the lowest-numbered network device function, the configured but not active address, if applicable, the address for hardware port teaming, or other network addresses. This property shall contain an array of configured system GUIDs that are associated with this network port, including the programmed address of the lowest-numbered network device function, the configured but not active address if applicable, the address for hardware port teaming, or other network addresses. Pattern: <code>^([0-9A-Fa-f]{4}[:-]){3}([0-9A-Fa-f]{4})\$</code>
}			

Property	Type	Attributes	Notes
InterfaceEnabled (v1.2+)	boolean	<i>read-write</i> (null)	An indication of whether the port is enabled. This property shall indicate whether the port is enabled. When disabled, no traffic of any type, such as link protocol traffic and management traffic, is sent or received by the port.
LinkConfiguration (v1.3+) [{	array		The link configuration of this port. This property shall contain the static capabilities and configuration settings of the port.
AutoSpeedNegotiationCapable (v1.3+)	boolean	<i>read-only</i> (null)	An indication of whether the port is capable of autonegotiating speed. This property shall indicate whether the port is capable of autonegotiating speed.
AutoSpeedNegotiationEnabled (v1.3+)	boolean	<i>read-write</i> (null)	Controls whether this port is configured to enable autonegotiating speed. This property shall indicate whether the port is configured to autonegotiate speed.
CapableLinkSpeedGbps (v1.3+) []	array (Gbit/s) (number, null)	<i>read-only</i>	The set of link speed capabilities of this port. This property shall contain all of the possible network link speed capabilities of this port. This value includes overhead associated with the protocol.
ConfiguredNetworkLinks (v1.3+) [{	array		The set of link speed and width pairs this port is configured to use for autonegotiation. This property shall contain the set of link speed and width pairs to which this port is restricted for autonegotiation purposes. An empty array shall indicate autoconfiguration uses any available link speed and width pairs.
ConfiguredLinkSpeedGbps (v1.3+)	number (Gbit/s)	<i>read-write</i> (null)	The link speed per lane this port is configured to use for autonegotiation. This property shall contain the network link speed per lane this port is configured to allow for autonegotiation purposes. This value includes overhead associated with the protocol.

Property	Type	Attributes	Notes
ConfiguredWidth (v1.3+)	integer	<i>read-write</i> (null)	The link width this port is configured to use for autonegotiation in conjunction with the link speed. This property shall contain the network link width this port is configured to use for autonegotiation purposes.
}]			
LinkNetworkTechnology (v1.16+)	string (enum)	<i>read-only</i> (null)	The link network technology for this link configuration. This property shall contain the link network technology for this link configuration. <i>For the possible property values, see LinkNetworkTechnology in Property details.</i>
}]			
LinkNetworkTechnology (v1.2+)	string (enum)	<i>read-only</i> (null)	The current link network technology for this port. This property shall contain the current network technology for this port. <i>For the possible property values, see LinkNetworkTechnology in Property details.</i>
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
AssociatedEndpoints [{	array		An array of links to the endpoints at the other end of the link. This property shall contain an array of links to resources of type <code>Endpoint</code> that represent the endpoints to which this port is connected.
@odata.id	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}]			
Cables (v1.5+) [{	array		An array of links to the cables connected to this port. This property shall contain an array of links to resources of type <code>Cable</code> that represent the cables connected to this port.
@odata.id	string	<i>read-only</i>	Link to a Cable resource. See the Links section and the <i>Cable</i> schema for details.

Property	Type	Attributes	Notes
}]			
ConnectedPorts (v1.2+) [{	array		An array of links to the remote device ports at the other end of the link. This property shall contain an array of links to resources of type <code>Port</code> that represent the remote device ports to which this port is connected.
@odata.id	string	<i>read-only</i>	Link to another Port resource.
}]			
ConnectedSwitches [{	array		An array of links to the switches at the other end of the link. This property shall contain an array of links to resources of type <code>Switch</code> that represent the switches to which this port is connected.
@odata.id	string	<i>read-only</i>	Link to a Switch resource. See the Links section and the <i>Switch</i> schema for details.
}]			
ConnectedSwitchPorts [{	array		An array of links to the switch ports at the other end of the link. This property shall contain an array of links to resources of type <code>Port</code> that represent the switch ports to which this port is connected.
@odata.id	string	<i>read-only</i>	Link to another Port resource.
}]			
EthernetInterfaces (v1.7+) [{	array		The links to the Ethernet interfaces this port provides. This property shall contain an array of links to resources of type <code>EthernetInterface</code> that represent the Ethernet interfaces this port provides. This property shall not include Ethernet interfaces that are not directly associated to a physical port.
@odata.id	string	<i>read-only</i>	Link to a <code>EthernetInterface</code> resource. See the Links section and the <i>EthernetInterface</i> schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
}			
LinkState (v1.2+)	string (enum)	<i>read-write</i>	The desired link state for this interface. This property shall contain the desired link state for this interface. <i>For the possible property values, see LinkState in Property details.</i>
LinkStatus (v1.2+)	string (enum)	<i>read-only</i>	The link status for this interface. This property shall contain the link status for this interface. <i>For the possible property values, see LinkStatus in Property details.</i>
LinkTransitionIndicator (v1.2+)	integer	<i>read-write</i>	The number of link state transitions for this interface. This property shall contain the number of link state transitions for this interface.
Location (v1.1+) {}	object		The location of the port. This property shall contain the location information of the associated port. For property details, see Location.
LocationIndicatorActive (v1.3+)	boolean	<i>read-write</i> (null)	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of <code>IndicatorLED</code> in this resource, if supported, to reflect the implementation of the locating function.
MaxFrameSize (v1.3+)	integer (bytes)	<i>read-only</i> (null)	The maximum frame size supported by the port. This property shall contain the maximum frame size supported by the port.
MaxSpeedGbps	number (Gbit/s)	<i>read-only</i> (null)	The maximum speed of this port as currently configured. This property shall contain the maximum unidirectional speed of which this port is capable of being configured. If capable of autonegotiation, the system shall attempt to negotiate at the maximum speed set. This value includes overhead associated with the protocol.

Property	Type	Attributes	Notes
Metrics (v1.2+) {	object	(null)	The link to the metrics associated with this port. This property shall contain a link to the metrics associated with this port. See the <i>PortMetrics</i> schema for details on this property.
@odata.id	string	read-only	Link to a PortMetrics resource. See the Links section and the <i>PortMetrics</i> schema for details.
}			
PortId	string	read-only (null)	The hardware-defined identifier of this port. This property shall contain the hardware-defined identifier of this port. The human-readable name of this port is described in the <code>ServiceLabel</code> property within <code>Location</code> for this port.
PortMedium (v1.2+)	string (enum)	read-only (null)	The physical connection medium for this port. This property shall contain the physical connection medium for this port. For the possible property values, see <i>PortMedium</i> in Property details.
PortProtocol	string (enum)	read-only (null)	The protocol being sent over this port. This property shall contain the protocol being sent over this port. For the possible property values, see <i>PortProtocol</i> in Property details.
PortType	string (enum)	read-write (null)	The type of this port. This property shall contain the port type for this port. For the possible property values, see <i>PortType</i> in Property details.
RemotePortId (v1.8+)	string	read-only (null)	The identifier of the remote port to which this port is connected. This property shall contain the identifier of the remote port, such as a switch or device, to which this port is connected.

Property	Type	Attributes	Notes
SFP (v1.4+) {	object	(null)	The small form-factor pluggable (SFP) device associated with this port. This property shall contain data about the small form-factor pluggable (SFP) device currently occupying this port.
DateCode (v1.14+)	string	read-only (null)	The manufacturing date code for this SFP. This property shall contain the manufacturing date code for this SFP as determined by the vendor or supplier.
FiberConnectionType (v1.4+)	string (enum)	read-only (null)	The type of fiber connection currently used by this SFP. This property shall contain the fiber connection type used by the SFP. <i>For the possible property values, see FiberConnectionType in Property details.</i>
Manufacturer (v1.4+)	string	read-only (null)	The manufacturer of this SFP. This property shall contain the name of the organization responsible for producing the SFP. This organization may be the entity from which the SFP is purchased, but this is not necessarily true.
MediumType (v1.4+)	string (enum)	read-only (null)	The medium type connected to this SFP. This property shall contain the medium type used by the SFP. <i>For the possible property values, see MediumType in Property details.</i>
PartNumber (v1.4+)	string	read-only (null)	The part number for this SFP. This property shall contain the manufacturer-provided part number for the SFP.
SerialNumber (v1.4+)	string	read-only (null)	The serial number for this SFP. This property shall contain a manufacturer-allocated number that identifies the SFP.
Status (v1.4+) {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

Property	Type	Attributes	Notes
SupportedSFPTypes (v1.4+) []	array (string (enum))	<i>read-only</i> (null)	- The types of SFP devices that can be attached to this port. - This property shall contain an array of SFP device types supported by this port. <i>For the possible property values, see SupportedSFPTypes in Property details.</i>
Type (v1.4+)	string (enum)	<i>read-only</i> (null)	The type of SFP device that is attached to this port. This property shall contain the SFP device type currently attached to this port. <i>For the possible property values, see Type in Property details.</i>
VendorOUI (v1.13+)	string	<i>read-only</i> (null)	The IEEE OUI of the vendor of this SFP. This property shall contain the IEEE organizationally unique identifier (OUI) of the vendor of this SFP. Pattern: <code>^([0-9A-Fa-f]{2}-){2}([0-9A-Fa-f]{2})\$</code>
Version (v1.13+)	string	<i>read-only</i> (null)	The hardware version of this SFP. This property shall contain the hardware version of this SFP as determined by the vendor or supplier.
}			
SignalDetected (v1.2+)	boolean	<i>read-only</i> (null)	An indication of whether a signal is detected on this interface. This property shall indicate whether a signal that is appropriate for this link technology is detected for this port.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
Width	integer	<i>read-only</i> (null)	The number of lanes, phys, or other physical transport links that this port contains. This property shall contain the number of physical transport links that this port contains.

6.99.4 Actions

6.99.4.1 Reset

Description

This action resets this port.

- This action shall reset this port.

Action URI

{Base URI of target resource}/Actions/Port.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	optional	The type of reset. • This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset. <i>For the possible property values, see ResetType in Property details.</i>

Request Example

```
{
  "ResetType": "ForceRestart"
}
```

6.99.4.2 ResetPPB (v1.8+)

Description

This action resets the PCI-to-PCI bridge (PPB) for this port.

- This action shall reset the PCI-to-PCI bridge (PPB) for this port.

Action URI

{Base URI of target resource}/Actions/Port.ResetPPB

Action parameters

This action takes no parameters.

6.99.5 Property details

6.99.5.1 ChassisIdSubtype

The type of identifier used for the chassis ID received from the remote partner across this link.

- This property shall contain the IEEE 802.1AB-2009 chassis ID subtype received from the remote partner across this link. If no such chassis ID subtype has been received, this property should not be present.

string	Description
AgentId	Agent circuit ID, based on the agent-local identifier of the circuit as defined in RFC3046.
ChassisComp	Chassis component, based on the value of entPhysicalAlias in RFC4133.
IfAlias	Interface alias, based on the ifAlias MIB object.
IfName	Interface name, based on the ifName MIB object.
LocalAssign	Locally assigned, based on an alphanumeric value locally assigned.
MacAddr	MAC address, based on an agent-detected unicast source address as defined in IEEE standard 802.
NetworkAddr	Network address, based on an agent-detected network address.
NotTransmitted	No data to be sent to/received from remote partner.
PortComp	Port component, based on the value of entPhysicalAlias in RFC4133.

6.99.5.2 ConnectedDeviceMode

The connected device mode.

- This property shall contain the CXL Specification-defined 'Connected Device Mode'.

string	Description
CXL68BFlitAndVH	CXL 68B flit and VH. This value shall indicate the connected device mode is CXL 68B flit and VH.

string	Description
CXLLatencyOptimized256BFlit	CXL latency-optimized 256B flit. This value shall indicate the connected device mode is CXL latency-optimized 256B flit.
Disconnected	The connection is not CXL or is disconnected. This value shall indicate the connection is not CXL or is disconnected.
PBR	Port-based routing (PBR). This value shall indicate the connected device mode is port-based routing (PBR).
RCD	Restricted CXL device (RCD). This value shall indicate the connected device mode is restricted CXL device (RCD).
Standard256BFlit	Standard 256B flit. This value shall indicate the connected device mode is standard 256B flit.

6.99.5.3 ConnectedDeviceType

The connected device type.

- This property shall contain the CXL Specification-defined 'Connected Device Type'.

string	Description
None	No device detected. This value shall indicate no device is detected.
PCleDevice	PCIe device. This value shall indicate the connected device is a PCIe device.
Type1	CXL Type 1 device. This value shall indicate the connected device is a CXL Type 1 device.
Type2	CXL Type 2 device. This value shall indicate the connected device is a CXL Type 2 device.

string	Description
Type3MLD	CXL Type 3 multi-logical device (MLD). This value shall indicate the connected device is a CXL Type 3 multi-logical device (MLD).
Type3SLD	CXL Type 3 single logical device (SLD). This value shall indicate the connected device is a CXL Type 3 single logical device (SLD).

6.99.5.4 CurrentPortConfigurationState

The current port configuration state.

- This property shall contain the CXL Specification-defined 'Current Port Configuration State'.

string	Description
BindInProgress	Bind in progress. This value shall indicate a bind is in progress for the port.
Disabled	Disabled. This value shall indicate the port is disabled.
DSP	Downstream port (DSP). This value shall indicate the port is enabled as a downstream port (DSP).
FabricLink (v1.11+)	Fabric link. This value shall indicate the port is enabled as a fabric link to another switch.
Reserved (deprecated v1.11)	Reserved. This value shall indicate the port is in a reserved state. <i>Deprecated in v1.11 and later. This value has been deprecated in favor of <code>FabricLink</code>.</i>
UnbindInProgress	Unbind in progress. This value shall indicate an unbind is in progress for the port.
USP	Upstream port (USP). This value shall indicate the port is enabled as an upstream port (USP).

6.99.5.5 FiberConnectionType

The type of fiber connection currently used by this SFP.

- This property shall contain the fiber connection type used by the SFP.

string	Description
MultiMode	The connection is using multi mode operation.
SingleMode	The connection is using single mode operation.

6.99.5.6 FlowControlConfiguration

The locally configured 802.3x flow control setting for this port.

- This property shall contain the locally configured 802.3x flow control setting for this port.

string	Description
None	No IEEE 802.3x flow control is enabled on this port.
RX	IEEE 802.3x flow control might be initiated by the link partner.
TX	IEEE 802.3x flow control might be initiated by this station.
TX_RX	IEEE 802.3x flow control might be initiated by this station or the link partner.

6.99.5.7 FlowControlStatus

The 802.3x flow control behavior negotiated with the link partner for this port.

- This property shall contain the 802.3x flow control behavior negotiated with the link partner for this port.

string	Description
None	No IEEE 802.3x flow control is enabled on this port.
RX	IEEE 802.3x flow control might be initiated by the link partner.
TX	IEEE 802.3x flow control might be initiated by this station.
TX_RX	IEEE 802.3x flow control might be initiated by this station or the link partner.

6.99.5.8 HostDevice

The current host device for this port.

- This property shall contain the current host device of port.

string	Description
Manager	The port is connected to a manager device. • This value shall indicate the port is connected to a manager device.
None	The port is not connected to any host device. • This value shall indicate the port is not connected to any host device.
System	The port is connected to a computer system device. • This value shall indicate the port is connected to a computer system device.

6.99.5.9 LinkNetworkTechnology

The link network technology for this link configuration.

- This property shall contain the link network technology for this link configuration.

string	Description
Ethernet	The port is capable of connecting to an Ethernet network.
FibreChannel	The port is capable of connecting to a Fibre Channel network.
GenZ	The port is capable of connecting to a Gen-Z fabric.
InfiniBand	The port is capable of connecting to an InfiniBand network.
PCIe	The port is capable of connecting to PCIe and CXL fabrics.

6.99.5.10 LinkState

The desired link state for this interface.

- This property shall contain the desired link state for this interface.

string	Description
Disabled	The link is disabled and not operational. This value shall indicate the link is disabled and not operational. The port is not allowed to establish a connection with the remote port. However, other types of traffic, such as management traffic, may be sent or received by the port.
Enabled	The link is enabled and operational. This value shall indicate the link is enabled and operational. The port is allowed to establish a connection with the remote port.

6.99.5.11 LinkStatus

The link status for this interface.

- This property shall contain the link status for this interface.

string	Description
LinkDown	The link on this interface is down.
LinkUp	This link on this interface is up.
NoLink	No physical link detected on this interface.
Starting	This link on this interface is starting. A physical link has been established, but the port is not able to transfer data.
Training	This physical link on this interface is training.

6.99.5.12 MediumType

The medium type connected to this SFP.

- This property shall contain the medium type used by the SFP.

string	Description
Copper	The medium connected is copper.
FiberOptic	The medium connected is fiber optic.

6.99.5.13 PortConnectionType

The connection type of this port.

- This property shall contain the connection type for this port.

string	Description
DPort (v1.5+)	This port connection type is a diagnostic port.
EPort (v1.5+)	This port connection type is an extender fabric port.
EXPort (v1.5+)	This port connection type is an external fabric port.
ExtenderFabric	This port connection type is an extender fabric port.
FLPort (v1.5+)	This port connects in a fabric loop configuration.
FPort (v1.5+)	This port connection type is a fabric port.
Generic	This port connection type is a generic fabric port.
GPort (v1.5+)	This port connection type is a generic fabric port.
NLPort (v1.5+)	This port connects in a node loop configuration.
NotConnected	This port is not connected.
NPort	This port connects through an N-port to a switch.
NPPort (v1.5+)	This port connection type is a proxy N-port for N-port virtualization.
PointToPoint	This port connects in a point-to-point configuration.
PrivateLoop	This port connects in a private loop configuration.
PublicLoop	This port connects in a public configuration.
TEPort (v1.5+)	This port connection type is a trunking extender fabric port.
UPort (v1.5+)	This port connection type is unassigned.

6.99.5.14 PortIdSubtype

The port ID subtype received from the remote partner across this link.

- This property shall contain the port ID subtype from IEEE 802.1AB-2009 Table 8-3 received from the remote partner across this link. If no such port ID subtype has been received, this property should not be present.

string	Description
AgentId	Agent circuit ID, based on the agent-local identifier of the circuit as defined in RFC3046.
ChassisComp	Chassis component, based on the value of entPhysicalAlias in RFC4133.
IfAlias	Interface alias, based on the ifAlias MIB object.
IfName	Interface name, based on the ifName MIB object.
LocalAssign	Locally assigned, based on an alphanumeric value locally assigned.
MacAddr	MAC address, based on an agent-detected unicast source address as defined in IEEE standard 802.
NetworkAddr	Network address, based on an agent-detected network address.
NotTransmitted	No data to be sent to/received from remote partner.
PortComp	Port component, based on the value of entPhysicalAlias in RFC4133.

6.99.5.15 PortMedium

The physical connection medium for this port.

- This property shall contain the physical connection medium for this port.

string	Description
Electrical	This port has an electrical cable connection.
Optical	This port has an optical cable connection.

6.99.5.16 PortProtocol

The protocol being sent over this port.

- This property shall contain the protocol being sent over this port.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). • This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.

string	Description
CXL	Compute Express Link. This value shall indicate conformance to the Compute Express Link Specification.
DisplayPort	DisplayPort. This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
eMMC	Embedded MultiMediaCard (e.MMC). This value shall indicate conformance to the JEDEC JESD84-B51A specification.
Ethernet	Ethernet. This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	Fibre CONnection (FICON). This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).
GenZ	GenZ. This value shall indicate conformance to the Gen-Z Core Specification.

string	Description
HDMI	HDMI. This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.
NVLink	NVLink. This value shall indicate conformance to the NVIDIA NVLink protocol.

string	Description
NVMe	Non-Volatile Memory Express (NVMe). This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. This value shall indicate conformance to an OEM-specific architecture, and the OEM section may include additional information.
PCIe	PCI Express. This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
QPI	Intel QuickPath Interconnect (QPI). This value shall indicate conformance to the Intel QuickPath Interconnect (QPI) protocol.
RoCE	RDMA over Converged Ethernet Protocol. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial ATA Attachment. This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.

string	Description
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UET	Ultra Ethernet Transport. This value shall indicate conformance to the Ultra Ethernet specifications.
UHCI	Universal Host Controller Interface (UHCI). This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
UPI	Intel UltraPath Interconnect (UPI). This value shall indicate conformance to the Intel UltraPath Interconnect (UPI) protocol.
USB	Universal Serial Bus (USB). This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. This value shall indicate conformance to the VESA SVGA Specification.

6.99.5.17 PortType

The type of this port.

- This property shall contain the port type for this port.

string	Description
BidirectionalPort	This port connects to any type of device.
DownstreamPort	This port connects to a target device.
InterswitchPort	This port connects to another switch.
ManagementPort	This port connects to a switch manager.
UnconfiguredPort	This port has not yet been configured.
UpstreamPort	This port connects to a host device.

6.99.5.18 ResetType

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property shall contain the value <code>on</code>.
ForceRestart	Shut down immediately and non-gracefully and restart the unit. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>on</code>.

string	Description
FullPowerCycle	Full power cycle the unit. Behaves like removing utility lines, followed by restoring utility lines to the resource. This value shall indicate the resource will perform a full power cycle as if utility lines to the resource are removed and restored. This is different from <code>PowerCycle</code> in that it's as close to a true power cycle as possible. For example, removing AC power cables from an enclosure and then restoring the AC power cables. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>. If a service supports this value but there are no other distinct power cycle flows, the service shall support <code>PowerCycle</code> as an alias to <code>FullPowerCycle</code>. This type of reset may cause the manager providing the Redfish service to power cycle. If the manager providing the Redfish service is affected by this type of reset, the service shall send the action response before resetting to prevent client timeouts.
GracefulRestart	Shut down gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
GracefulShutdown	Shut down gracefully and power off. This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a paused state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Paused</code>.

string	Description
PowerCycle	Power cycle the unit. Behaves like a power removal, followed by a power restore to the resource. This value shall indicate the resource will perform a power cycle. This is different from <code>FullPowerCycle</code> in that it typically performs localized power sequencing of the resource while external power is still present. For example, turning DC voltage regulators off and then turning DC voltage regulators back on. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
PushPowerButton	Simulate the pressing of the physical power button on this unit. This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.

6.99.5.19 SupportedCXLModes

- The supported device modes.
 - This property shall contain the CXL Specification-defined 'Supported CXL Modes'. This property shall not contain the value 'Disconnected'.

string	Description
CXL68BFlitAndVH	CXL 68B flit and VH. This value shall indicate the connected device mode is CXL 68B flit and VH.
CXLlatencyOptimized256BFlit	CXL latency-optimized 256B flit. This value shall indicate the connected device mode is CXL latency-optimized 256B flit.

string	Description
Disconnected	The connection is not CXL or is disconnected. This value shall indicate the connection is not CXL or is disconnected.
PBR	Port-based routing (PBR). This value shall indicate the connected device mode is port-based routing (PBR).
RCD	Restricted CXL device (RCD). This value shall indicate the connected device mode is restricted CXL device (RCD).
Standard256BFlit	Standard 256B flit. This value shall indicate the connected device mode is standard 256B flit.

6.99.5.20 SupportedEthernetCapabilities

- The set of Ethernet capabilities that this port supports.
 - This property shall contain an array of Ethernet capabilities supported by this port.

string	Description
EEE	IEEE 802.3az Energy-Efficient Ethernet (EEE) is supported on this port.
WakeOnLAN	Wake on LAN (WoL) is supported on this port.

6.99.5.21 SupportedSFPTypes

- The types of SFP devices that can be attached to this port.
 - This property shall contain an array of SFP device types supported by this port.

string	Description
cSFP	The SFP conforms to the CSFP MSA Specification.
MiniSASHD	The SFP conforms to the SFF Specification SFF-8644.
OSFP	The SFP conforms to the OSFP Specification.
QSFP	The SFP conforms to the SFF Specification for QSFP.
QSFP14	The SFP conforms to the SFF Specification for QSFP14.

string	Description
QSFP28	The SFP conforms to the SFF Specification for QSFP28.
QSFP56	The SFP conforms to the SFF Specification for QSFP56.
QSFPDD	The SFP conforms to the QSFP Double Density Specification.
QSFPPlus	The SFP conforms to the SFF Specification for QSFP+.
SFP	The SFP conforms to the SFF Specification for SFP.
SFP28	The SFP conforms to the SFF Specification for SFP+ and IEEE 802.3by Specification.
SFPDD	The SFP conforms to the SFP-DD MSA Specification.
SFPPlus	The SFP conforms to the SFF Specification for SFP+.

6.99.5.22 SystemCapabilities

- The system capabilities received from the remote partner across this link.
 - This property shall contain the system capabilities received from the remote partner across this link. If no such system capabilities have been received, this property shall not be present. This property shall not contain the value `None`.

string	Description
Bridge	Bridge. This value shall indicate the IEEE802.1AB-defined 'bridge' capability.
DOCSISCableDevice	DOCSIS cable device. This value shall indicate the IEEE802.1AB-defined 'DOCSIS cable device' capability.
None	The system capabilities are transmitted, but no capabilities are set. This value shall indicate the system capabilities are transmitted, but no capabilities are set.
Other	Other. This value shall indicate the IEEE802.1AB-defined 'other' capability.
Repeater	Repeater. This value shall indicate the IEEE802.1AB-defined 'repeater' capability.

string	Description
Router	Router. This value shall indicate the IEEE802.1AB-defined 'router' capability.
Station	Station. This value shall indicate the IEEE802.1AB-defined 'station' capability.
Telephone	Telephone. This value shall indicate the IEEE802.1AB-defined 'telephone' capability.
WLANAccessPoint	WLAN access point. This value shall indicate the IEEE802.1AB-defined 'WLAN access point' capability.

6.99.5.23 Type

The type of SFP device that is attached to this port.

- This property shall contain the SFP device type currently attached to this port.

string	Description
cSFP	The SFP conforms to the CSFP MSA Specification.
MiniSASHD	The SFP conforms to the SFF Specification SFF-8644.
OSFP (v1.9+)	The SFP conforms to the OSFP Specification.
QSFP	The SFP conforms to the SFF Specification for QSFP.
QSFP14	The SFP conforms to the SFF Specification for QSFP14.
QSFP28	The SFP conforms to the SFF Specification for QSFP28.
QSFP56	The SFP conforms to the SFF Specification for QSFP56.
QSFPDD (v1.9+)	The SFP conforms to the QSFP Double Density Specification.
QSFPPlus	The SFP conforms to the SFF Specification for QSFP+.
SFP	The SFP conforms to the SFF Specification for SFP.
SFP28	The SFP conforms to the SFF Specification for SFP+ and IEEE 802.3by Specification.
SFPDD	The SFP conforms to the SFP-DD MSA Specification.

string	Description
SFPPlus	The SFP conforms to the SFF Specification for SFP+.

6.99.6 Example response

```
{
  "@odata.type": "#Port.v1_16_0.Port",
  "Id": "1",
  "Name": "SAS Port 1",
  "Description": "SAS Port 1",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "PortId": "1",
  "PortProtocol": "SAS",
  "PortType": "BidirectionalPort",
  "CurrentSpeedGbps": 48,
  "Width": 4,
  "ConfiguredSpeedGbps": 48,
  "ConfiguredWidth": 4,
  "MaxSpeedGbps": 48,
  "Links": {
    "AssociatedEndpoints": [
      {
        "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints/Initiator1"
      }
    ]
  },
  "@odata.id": "/redfish/v1/Fabrics/SAS/Switches/Switch1/Ports/1"
}
```

6.100 PortMetrics 1.7.0

Version	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2024.3	2024.1	2023.2	2022.3	2022.1	2021.2	2021.1	2019.4

6.100.1 Description

The `PortMetrics` schema contains usage and health statistics for a switch device or component port summary.

- This resource shall represent the port metrics for a switch device or component port summary in a Redfish implementation.

6.100.2 URIs

```

/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/Metrics
/redfish/v1/Chassis/{ChassisId}/MediaControllers/{MediaControllerId}/Ports/{PortId}/Metrics
/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Ports/{PortId}/Metrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/Ports/{PortId}/Metrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/
{StorageControllerId}/Ports/{PortId}/Metrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/StorageControllers/
{StorageControllerId}/Ports/{PortId}/Metrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/
{FabricAdapterId}/Ports/{PortId}/Metrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/
GraphicsControllers/{GraphicsControllerId}/Ports/{PortId}/Metrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/
{ProcessorId}/Ports/{PortId}/Metrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/
{StorageId}/Controllers/{StorageControllerId}/Ports/{PortId}/Metrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/
{StorageId}/StorageControllers/{StorageControllerId}/Ports/{PortId}/Metrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/USBControllers/
{USBControllerId}/Ports/{PortId}/Metrics
/redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Ports/{PortId}/Metrics
/redfish/v1/Managers/{ManagerId}/DedicatedNetworkPorts/{PortId}/Metrics
/redfish/v1/Managers/{ManagerId}/USBPorts/{PortId}/Metrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/Ports/{PortId}/Metrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Ports/{PortId}/
Metrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Ports/
{PortId}/Metrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/
Ports/{PortId}/Metrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/GraphicsControllers/
{GraphicsControllerId}/Ports/{PortId}/Metrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/Ports/
{PortId}/Metrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/
{StorageControllerId}/Ports/{PortId}/Metrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/
StorageControllers/{StorageControllerId}/Ports/{PortId}/Metrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/USBControllers/{USBControllerId}/

```

Ports/{PortId}/Metrics

/redfish/v1/Storage/{StorageId}/Controllers/{StorageControllerId}/Ports/{PortId}/Metrics

/redfish/v1/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Ports/{PortId}/Metrics

/redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/Metrics

/redfish/v1/Systems/{ComputerSystemId}/GraphicsControllers/{GraphicsControllerId}/Ports/{PortId}/Metrics

/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/Ports/{PortId}/Metrics

/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Ports/{PortId}/Metrics

/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Ports/{PortId}/Metrics

/redfish/v1/Systems/{ComputerSystemId}/USBControllers/{USBControllerId}/Ports/{PortId}/Metrics

6.100.3 Properties

Property	Type	Attributes	Notes
CXL (v1.4+) {	object		The port metrics specific to CXL ports. This property shall contain the port metrics specific to CXL ports.
BackpressureAveragePercentage (v1.4+)	integer (%)	read-only	The average congestion of the port as a percentage. This property shall contain CXL Specification-defined 'Backpressure Average Percentage' as a percentage, typically 0 to 100 .
}			
FibreChannel (v1.2+) {	object		The Fibre Channel-specific port metrics for network ports. This property shall contain Fibre Channel-specific port metrics for network ports.
CorrectableFECErrors (v1.2+)	integer	read-only (null)	The total number of correctable forward error correction (FEC) errors. This property shall contain the total number of times this port has received traffic with correctable forward error correction (FEC) errors.
InvalidCRCs (v1.2+)	integer	read-only (null)	The total number of invalid cyclic redundancy checks (CRCs). This property shall contain the total number of invalid cyclic redundancy checks (CRCs) observed on this port.
InvalidTXWords (v1.2+)	integer	read-only (null)	The total number of invalid transmission words. This property shall contain the total number of times this port has received invalid transmission words.

Property	Type	Attributes	Notes
LinkFailures (v1.2+)	integer	<i>read-only</i> (null)	The total number of link failures. This property shall contain the total number of link failures observed on this port.
LossesOfSignal (v1.2+)	integer	<i>read-only</i> (null)	The total number of losses of signal. This property shall contain the total number of times this port has lost signal.
LossesOfSync (v1.2+)	integer	<i>read-only</i> (null)	The total number of losses of sync. This property shall contain the total number of times this port has lost sync.
RXBBCreditZero (v1.2+)	integer	<i>read-only</i> (null)	The number of times the receive buffer-to-buffer credit count transitioned to zero. This property shall contain the number of times the receive buffer-to-buffer credit count transitioned to zero since last counter reset.
RXExchanges (v1.2+)	integer	<i>read-only</i> (null)	The total number of Fibre Channel exchanges received. This property shall contain the total number of Fibre Channel exchanges received.
RXSequences (v1.2+)	integer	<i>read-only</i> (null)	The total number of Fibre Channel sequences received. This property shall contain the total number of Fibre Channel sequences received.
TXBBCredits (v1.2+)	integer	<i>read-only</i> (null)	The number of transmit buffer-to-buffer credits the port is configured to use. This property shall contain the number of transmit buffer-to-buffer credits the port is configured to use.
TXBBCreditZero (v1.2+)	integer	<i>read-only</i> (null)	The number of times the transmit buffer-to-buffer credit count transitioned to zero. This property shall contain the number of times the transmit buffer-to-buffer credit count transitioned to zero since last counter reset.

Property	Type	Attributes	Notes
TXBCCreditZeroDurationMilliseconds (v1.2+)	integer (ms)	<i>read-only</i> (null)	The total amount of time the port has been blocked from transmitting due to lack of buffer credits. This property shall contain the total amount of time in milliseconds the port has been blocked from transmitting due to lack of buffer credits since the last counter reset.
TXExchanges (v1.2+)	integer	<i>read-only</i> (null)	The total number of Fibre Channel exchanges transmitted. This property shall contain the total number of Fibre Channel exchanges transmitted.
TXSequences (v1.2+)	integer	<i>read-only</i> (null)	The total number of Fibre Channel sequences transmitted. This property shall contain the total number of Fibre Channel sequences transmitted.
UncorrectableFECErrors (v1.2+)	integer	<i>read-only</i> (null)	The total number of uncorrectable forward error correction (FEC) errors. This property shall contain the total number of times this port has received traffic with uncorrectable forward error correction (FEC) errors.
}			
GenZ {	object		The port metrics specific to Gen-Z ports. This property shall contain the port metrics specific to Gen-Z ports.
AccessKeyViolations	integer	<i>read-only</i> (null)	The total number of Access Key Violations detected. This property shall contain the total number of Access Key Violations detected for packets received or transmitted on this interface.
EndToEndCRCErrors	integer	<i>read-only</i> (null)	The total number of ECRC transient errors detected. This property shall contain total number of ECRC transient errors detected in received link-local and end-to-end packets.
LinkNTE	integer	<i>read-only</i> (null)	The total number of link-local non-transient errors detected. This property shall contain the total number of link-local non-transient errors detected on this interface.

Property	Type	Attributes	Notes
LLRRecovery	integer	<i>read-only (null)</i>	The total number of times Link-Level Reliability (LLR) recovery has been initiated. This property shall contain the total number of times Link-level Reliability (LLR) recovery has been initiated by this interface. This is not to be confused with the number of packets retransmitted due to initiating LLR recovery.
MarkedECN	integer	<i>read-only (null)</i>	The number of packets with the Congestion ECN bit set. This property shall contain the number of packets that the component set the Congestion ECN bit prior to transmission through this interface.
NonCRCTransientErrors	integer	<i>read-only (null)</i>	The total number transient errors detected that are unrelated to CRC validation. This property shall contain the total number of transient errors detected that are unrelated to CRC validation, which covers link-local and end-to-end packets, such as malformed Link Idle packets or PLA signal errors.
PacketCRCErrors	integer	<i>read-only (null)</i>	The total number of PCRC transient errors detected. This property shall contain the total number of PCRC transient errors detected in received link-local and end-to-end packets.
PacketDeadlineDiscards	integer	<i>read-only (null)</i>	The number of packets discarded due to the Congestion Deadline subfield reaching zero. This property shall contain the number of packets discarded by this interface due to the Congestion Deadline subfield reaching zero prior to packet transmission.
ReceivedECN	integer	<i>read-only (null)</i>	The number of packets received on this interface with the Congestion ECN bit set. This property shall contain the number of packets received on this interface with the Congestion ECN bit set.
RXStompedECRC	integer	<i>read-only (null)</i>	The total number of packets received with a stomped ECRC field. This property shall contain the total number of packets that this interface received with a stomped ECRC field.

Property	Type	Attributes	Notes
TXStompedECRC	integer	<i>read-only (null)</i>	The total number of packets that this interface stomped the ECRC field. This property shall contain the total number of packets that this interfaced stomped the ECRC field.
}			
Networking (v1.1+) {	object		The port metrics for network ports, including Ethernet, Fibre Channel, and InfiniBand, that are not specific to one of these protocols. This property shall contain port metrics for network ports, including Ethernet, Fibre Channel, and InfiniBand, that are not specific to one of these protocols.
RDMAProtectionErrors (v1.1+)	integer	<i>read-only (null)</i>	The total number of RDMA protection errors. This property shall contain the total number of RDMA protection errors.
RDMAProtocolErrors (v1.1+)	integer	<i>read-only (null)</i>	The total number of RDMA protocol errors. This property shall contain the total number of RDMA protocol errors.
RDMARXBytes (v1.1+)	integer	<i>read-only (null)</i>	The total number of RDMA bytes received on a port since reset. This property shall contain the total number of RDMA bytes received on a port since reset.
RDMARXRequests (v1.1+)	integer	<i>read-only (null)</i>	The total number of RDMA requests received on a port since reset. This property shall contain the total number of RDMA requests received on a port since reset.
RDMATXBytes (v1.1+)	integer	<i>read-only (null)</i>	The total number of RDMA bytes transmitted on a port since reset. This property shall contain the total number of RDMA bytes transmitted on a port since reset.
RDMATXReadRequests (v1.1+)	integer	<i>read-only (null)</i>	The total number of RDMA read requests transmitted on a port since reset. This property shall contain the total number of RDMA read requests transmitted on a port since reset.

Property	Type	Attributes	Notes
RDMATXRequests (v1.1+)	integer	<i>read-only</i> (null)	The total number of RDMA requests transmitted on a port since reset. This property shall contain the total number of RDMA requests transmitted on a port since reset.
RDMATXSendRequests (v1.1+)	integer	<i>read-only</i> (null)	The total number of RDMA send requests transmitted on a port since reset. This property shall contain the total number of RDMA send requests transmitted on a port since reset.
RDMATXWriteRequests (v1.1+)	integer	<i>read-only</i> (null)	The total number of RDMA write requests transmitted on a port since reset. This property shall contain the total number of RDMA write requests transmitted on a port since reset.
RXBroadcastFrames (v1.1+)	integer	<i>read-only</i> (null)	The total number of valid broadcast frames received on a port since reset. This property shall contain the total number of valid broadcast frames received on a port since reset, including host and remote management passthrough traffic.
RXDiscards (v1.1+)	integer	<i>read-only</i> (null)	The total number of frames discarded in a port's receive path since reset. This property shall contain the total number of frames discarded in a port's receive path since reset.
RXFalseCarrierErrors (v1.1+)	integer	<i>read-only</i> (null)	The total number of false carrier errors received from phy on a port since reset. This property shall contain the total number of false carrier errors received from phy on a port since reset.
RXFCSErrors (v1.1+)	integer	<i>read-only</i> (null)	The total number of frames received with frame check sequence (FCS) errors on a port since reset. This property shall contain the total number of frames received with frame check sequence (FCS) errors on a port since reset.
RXFrameAlignmentErrors (v1.1+)	integer	<i>read-only</i> (null)	The total number of frames received with alignment errors on a port since reset. This property shall contain the total number of frames received with alignment errors on a port since reset.

Property	Type	Attributes	Notes
RXFrames (v1.1+)	integer	<i>read-only</i> (null)	The total number of frames received on a port since reset. This property shall contain the total number of frames received on a port since reset.
RXMulticastFrames (v1.1+)	integer	<i>read-only</i> (null)	The total number of valid multicast frames received on a port since reset. This property shall contain the total number of valid multicast frames received on a port since reset, including host and remote management passthrough traffic.
RXOversizeFrames (v1.1+)	integer	<i>read-only</i> (null)	The total number of frames that exceed the maximum frame size. This property shall contain the total number of frames that exceed the maximum frame size.
RXPauseXOFFFrames (v1.1+)	integer	<i>read-only</i> (null)	The total number of flow control frames from the network to pause transmission. This property shall contain the total number of flow control frames from the network to pause transmission.
RXPauseXONFrames (v1.1+)	integer	<i>read-only</i> (null)	The total number of flow control frames from the network to resume transmission. This property shall contain the total number of flow control frames from the network to resume transmission.
RXPFCFrames (v1.1+)	integer	<i>read-only</i> (null)	The total number of priority flow control (PFC) frames received on a port since reset. This property shall contain the total number of priority flow control (PFC) frames received on a port since reset.
RXUndersizeFrames (v1.1+)	integer	<i>read-only</i> (null)	The total number of frames that are smaller than the minimum frame size of 64 bytes. This property shall contain the total number of frames that are smaller than the minimum frame size of 64 bytes.
RXUnicastFrames (v1.1+)	integer	<i>read-only</i> (null)	The total number of valid unicast frames received on a port since reset. This property shall contain the total number of valid unicast frames received on a port since reset.

Property	Type	Attributes	Notes
TXBroadcastFrames (v1.1+)	integer	<i>read-only</i> (null)	The total number of good broadcast frames transmitted on a port since reset. This property shall contain the total number of good broadcast frames transmitted on a port since reset, including host and remote management passthrough traffic.
TXDiscards (v1.1+)	integer	<i>read-only</i> (null)	The total number of frames discarded in a port's transmit path since reset. This property shall contain the total number of frames discarded in a port's transmit path since reset.
TXExcessiveCollisions (v1.1+)	integer	<i>read-only</i> (null)	The number of times a single transmitted frame encountered more than 15 collisions. This property shall contain the number of times a single transmitted frame encountered more than 15 collisions.
TXFrames (v1.1+)	integer	<i>read-only</i> (null)	The total number of frames transmitted on a port since reset. This property shall contain the total number of frames transmitted on a port since reset.
TXLateCollisions (v1.1+)	integer	<i>read-only</i> (null)	The total number of collisions that occurred after one slot time as defined by IEEE 802.3. This property shall contain the total number of collisions that occurred after one slot time as defined by IEEE 802.3.
TXMulticastFrames (v1.1+)	integer	<i>read-only</i> (null)	The total number of good multicast frames transmitted on a port since reset. This property shall contain the total number of good multicast frames transmitted on a port since reset, including host and remote management passthrough traffic.
TXMultipleCollisions (v1.1+)	integer	<i>read-only</i> (null)	The times that a transmitted frame encountered 2-15 collisions. This property shall contain the times that a transmitted frame encountered 2-15 collisions.
TXPauseXOFFFrames (v1.1+)	integer	<i>read-only</i> (null)	The total number of XOFF frames transmitted to the network. This property shall contain the total number of XOFF frames transmitted to the network.

Property	Type	Attributes	Notes
TXPauseXONFrames (v1.1+)	integer	<i>read-only</i> (null)	The total number of XON frames transmitted to the network. This property shall contain the total number of XON frames transmitted to the network.
TXPFCFrames (v1.1+)	integer	<i>read-only</i> (null)	The total number of priority flow control (PFC) frames sent on a port since reset. This property shall contain the total number of priority flow control (PFC) frames sent on a port since reset.
TXSingleCollisions (v1.1+)	integer	<i>read-only</i> (null)	The times that a successfully transmitted frame encountered a single collision. This property shall contain the times that a successfully transmitted frame encountered a single collision.
TXUnicastFrames (v1.1+)	integer	<i>read-only</i> (null)	The total number of good unicast frames transmitted on a port since reset. This property shall contain the total number of good unicast frames transmitted on a port since reset, including host and remote management passthrough traffic.
}			
PCleErrors (v1.3+) {	object		The PCIe errors associated with this port. This property shall contain the PCIe errors associated with this port.
BadDLLPCount (v1.15+)	integer	<i>read-only</i> (null)	The total number of Bad DLLPs issued on the PCIe link by the receiver. This property shall contain the total number of Bad DLLPs issued on the PCIe link by the receiver. A Bad DLLP in the context of PCIe communication is a packet that has encountered errors at the data link layer. When a DLLP is considered bad, it means it has been corrupted or is incorrectly formatted, potentially due to transmission errors, hardware failures, or other issues that affect its integrity.

Property	Type	Attributes	Notes
BadTLPCount (v1.15+)	integer	<i>read-only (null)</i>	The total number of Bad TLPs issued on the PCIe link by the receiver. This property shall contain the total number of Bad TLPs issued on the PCIe link by the receiver. A Bad TLP in the context of PCIe communication is a packet that cannot be properly processed due to errors at the transaction layer. These errors could include corrupted data, incorrect packet formatting, invalid header information, or a mismatched checksum.
CorrectableErrorCount (v1.8+)	integer	<i>read-only (null)</i>	The total number of PCIe correctable errors for this device. This property shall contain the total number of PCIe correctable errors for this device.
FatalErrorCount (v1.8+)	integer	<i>read-only (null)</i>	The total number of PCIe fatal errors for this device. This property shall contain the total number of PCIe fatal errors for this device.
L0ToRecoveryCount (v1.8+)	integer	<i>read-only (null)</i>	The total number of times the PCIe link states transitioned from L0 to the recovery state for this device. This property shall contain the total number of times the PCIe link transitioned from L0 to the recovery state for this device.
NAKReceivedCount (v1.8+)	integer	<i>read-only (null)</i>	The total number of NAKs issued on the PCIe link by the receiver. This property shall contain the total number of NAKs issued on the PCIe link by the receiver. A NAK is issued by the receiver when it detects that a TLP from this device was missed. This could be because this device did not transmit it, or because the receiver could not properly decode the packet.
NAKSentCount (v1.8+)	integer	<i>read-only (null)</i>	The total number of NAKs issued on the PCIe link by this device. This property shall contain the total number of NAKs issued on the PCIe link by this device. A NAK is issued by the device when it detects that a TLP from the receiver was missed. This could be because the receiver did not transmit it, or because this device could not properly decode the packet.
NonFatalErrorCount (v1.8+)	integer	<i>read-only (null)</i>	The total number of PCIe non-fatal errors for this device. This property shall contain the total number of PCIe non-fatal errors for this device.

Property	Type	Attributes	Notes
ReplayCount (v1.8+)	integer	<i>read-only</i> (null)	The total number of PCIe replays issued by this device. This property shall contain the total number of replays issued on the PCIe link by this device. A replay is a retransmission of a TLP and occurs because the ACK timer is expired, which means that the receiver did not send the ACK or this device did not properly decode the ACK.
ReplayRolloverCount (v1.8+)	integer	<i>read-only</i> (null)	The total number of PCIe replay rollovers issued by this device. This property shall contain the total number of replay rollovers issued on the PCIe link by this device. A replay rollover occurs when consecutive replays failed to resolve the errors on the link, which means that this device forced the link into the recovery state.
UnsupportedRequestCount (v1.13+)	integer	<i>read-only</i> (null)	The total number of PCIe unsupported requests received by this device. This property shall contain the total number of PCIe unsupported requests received by this device.
}			
RXBytes (v1.1+)	integer (bytes)	<i>read-only</i> (null)	The total number of bytes received on a port since reset. This property shall contain the total number of bytes received on a port since reset, including host and remote management passthrough traffic, and inclusive of all protocol overhead.
RXErrors (v1.1+)	integer	<i>read-only</i> (null)	The total number of received errors on a port since reset. This property shall contain the total number of received errors on a port since reset.
SAS (v1.1+) [{	array		The physical (phy) metrics for Serial Attached SCSI (SAS). Each member represents a single phy. This property shall contain an array of physical-related metrics for Serial Attached SCSI (SAS). Each member in the array shall represent a single phy.
InvalidDwordCount (v1.1+)	integer	<i>read-only</i> (null)	The number of invalid dwords that have been received by the phy outside of phy reset sequences. This property shall contain the number of invalid dwords that have been received by the phy outside of phy reset sequences.

Property	Type	Attributes	Notes
LossOfDwordSynchronizationCount (v1.1+)	integer	<i>read-only</i> (null)	The number of times the phy has restarted the link reset sequence because it lost dword synchronization. This property shall contain the number of times the phy has restarted the link reset sequence because it lost dword synchronization.
PhyResetProblemCount (v1.5+)	integer	<i>read-only</i> (null)	The number of times a phy reset problem has occurred. This property shall contain the number of times a phy reset problem has occurred.
RunningDisparityErrorCount (v1.1+)	integer	<i>read-only</i> (null)	The number of dwords containing running disparity errors that have been received by the phy outside of phy reset sequences. This property shall contain the number of dwords containing running disparity errors that have been received by the phy outside of phy reset sequences.
}]			
Transceivers (v1.1+) [{	array		The metrics for the transceivers in this port. Each member represents a single transceiver. This property shall contain an array of transceiver-related metrics for this port. Each member in the array shall represent a single transceiver.
RXInputPowerMilliWatts (v1.1+)	number (milliWatts)	<i>read-only</i> (null)	The RX input power value of a small form-factor pluggable (SFP) transceiver. This property shall contain the RX input power value of a small form-factor pluggable (SFP) transceiver.
SupplyVoltage (v1.1+)	number (Volts)	<i>read-only</i> (null)	The supply voltage of a small form-factor pluggable (SFP) transceiver. This property shall contain the supply voltage of a small form-factor pluggable (SFP) transceiver.
TXBiasCurrentMilliAmps (v1.1+)	number (mA)	<i>read-only</i> (null)	The TX bias current value of a small form-factor pluggable (SFP) transceiver. This property shall contain the TX bias current value of a small form-factor pluggable (SFP) transceiver.

Property	Type	Attributes	Notes
TXOutputPowerMilliWatts (v1.1+)	number (milliWatts)	<i>read-only</i> (<i>null</i>)	The TX output power value of a small form-factor pluggable (SFP) transceiver. This property shall contain the TX output power value of a small form-factor pluggable (SFP) transceiver.
WavelengthNanometers (v1.7+)	string (nm)	<i>read-only</i> (<i>null</i>)	The laser wavelength, in nanometers, for a small form-factor pluggable (SFP) transceiver. This property shall contain the laser wavelength, in nanometers, for a small form-factor pluggable (SFP) transceiver. This property shall not be present for non-optic SFP mediums.
}]			
TXBytes (v1.1+)	integer (bytes)	<i>read-only</i> (<i>null</i>)	The total number of bytes transmitted on a port since reset. This property shall contain the total number of bytes transmitted on a port since reset, including host and remote management passthrough traffic, and inclusive of all protocol overhead.
TxEErrors (v1.1+)	integer	<i>read-only</i> (<i>null</i>)	The total number of transmission errors on a port since reset. This property shall contain the total number of transmission errors on a port since reset.

6.100.4 Actions

6.100.4.1 ResetMetrics (v1.6+)

Description

This action resets the summary metrics related to this device.

- This action shall reset any time intervals or counted values for this device.

Action URI

{Base URI of target resource}/Actions/PortMetrics.ResetMetrics

Action parameters

This action takes no parameters.

6.100.5 Example response

```
{
  "@odata.type": "#PortMetrics.v1_7_0.PortMetrics",
  "Id": "Metrics",
  "Name": "Gen-Z Port 1 Metrics",
  "GenZ": {
    "PacketCRCErrors": 24,
    "EndToEndCRCErrors": 3,
    "RXStompedECRC": 1,
    "TXStompedECRC": 2,
    "NonCRCTransientErrors": 2,
    "LLRRecovery": 1,
    "MarkedECN": 1,
    "PacketDeadlineDiscards": 1,
    "AccessKeyViolations": 1,
    "LinkNTE": 1,
    "ReceivedECN": 1
  },
  "@odata.id": "/redfish/v1/Fabrics/GenZ/Switches/Switch1/Ports/1/Metrics"
}
```

6.101 Power 1.7.3 (deprecated)

Version	v1.7 <i>Deprecated</i>	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2020.4	2019.3	2017.3	2017.2	2017.1	2016.2	2016.1	1.0

This schema has been deprecated and use in new implementations is discouraged except to retain compatibility with existing products. This schema has been deprecated in favor of the `PowerSubsystem` schema.

6.101.1 Description

The `Power` schema describes power metrics and represents the properties for power consumption and power limiting.

- This resource shall contain the power metrics for a Redfish implementation.

6.101.2 URIs

`/redfish/v1/Chassis/{ChassisId}/Power` (deprecated)

6.101.3 Properties

Property	Type	Attributes	Notes
PowerControl [{	array		The set of power control functions, including power reading and limiting. This property shall contain the set of power control readings and settings.
@odata.id	string (URI)	<i>read-only required</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
Actions (v1.3+) { }	object		The available actions for this resource. This property shall contain the available actions for this resource.
MemberId	string	<i>read-only required</i>	The unique identifier for the member within an array. This property shall contain the unique identifier for this member within an array. For services supporting Redfish v1.6 or higher, this value shall contain the zero-based array index.
Name	string	<i>read-only (null)</i>	The power control function name. This property shall contain the name of the power control function name.
Oem { }	object		See the OEM object definition in the Using this guide clause.
PhysicalContext (v1.4+)	string (enum)	<i>read-only</i>	The area, device, or set of devices to which this power control applies. This property shall contain a description of the affected device(s) or region within the chassis to which this power control applies. <i>For the possible property values, see PhysicalContext in Property details.</i>
PowerAllocatedWatts	number (Watts)	<i>read-only (null)</i>	The total amount of power that has been allocated or budgeted to chassis. This property shall represent the total power currently allocated or budgeted to the chassis.
PowerAvailableWatts	number (Watts)	<i>read-only (null)</i>	The amount of reserve power capacity, in watt units, that remains. This value is the PowerCapacityWatts value minus the <code>PowerAllocatedWatts</code> value. This property shall represent the amount of reserve power capacity, in watt units, that remains. This value is the PowerCapacityWatts value minus the <code>PowerAllocatedWatts</code> value.

Property	Type	Attributes	Notes
PowerCapacityWatts	number (Watts)	<i>read-only</i> (<i>null</i>)	The total amount of power that can be allocated to the chassis. This value can be either the power supply capacity or the power budget that an upstream chassis assigns to this chassis. This property shall represent the total power capacity that can be allocated to the chassis.
PowerConsumedWatts	number (Watts)	<i>read-only</i> (<i>null</i>)	The actual power that the chassis consumes, in watt units. This property shall represent the actual power that the chassis consumes, in watt units.
PowerLimit {	object		The power limit status and configuration information for this chassis. This property shall contain power limit status and configuration information for this chassis.
CorrectionInMs	integer (ms)	<i>read-write</i> (<i>null</i>)	The time required for the limiting process to reduce power consumption to below the limit. This property shall represent the time interval in ms required for the limiting process to react and reduce the power consumption below the limit.
LimitException	string (enum)	<i>read-write</i> (<i>null</i>)	The action that is taken if the power cannot be maintained below the <code>LimitInWatts</code> . This property shall represent the action to be taken if the resource power consumption cannot be limited below the specified limit after several correction time periods. <i>For the possible property values, see <code>LimitException</code> in Property details.</i>
LimitInWatts	number (Watts)	<i>read-write</i> (<i>null</i>)	The power limit, in watt units. If <code>null</code> , power capping is disabled. This property shall represent the power capping limit, in watt units, for the resource. If <code>null</code>, power capping shall be disabled.
}			
PowerMetrics {	object		The power readings for this chassis. This property shall contain power metrics for power readings, such as interval, minimum, maximum, and average power consumption, for the chassis.

Property	Type	Attributes	Notes
AverageConsumedWatts	number (Watts)	<i>read-only</i> (null)	The average power level over the measurement window over the last <code>IntervalInMin</code> minutes. This property shall represent the average power level that occurred over the last <code>IntervalInMin</code> minutes.
IntervalInMin	integer (min)	<i>read-only</i> (null)	The time interval, or window, over which the power metrics are measured. This property shall represent the time interval or window, in minutes, over which the power metrics are measured.
MaxConsumedWatts	number (Watts)	<i>read-only</i> (null)	The highest power consumption level, in watt units, that has occurred over the measurement window within the last <code>IntervalInMin</code> minutes. This property shall represent the maximum power level, in watt units, that occurred within the last <code>IntervalInMin</code> minutes.
MinConsumedWatts	number (Watts)	<i>read-only</i> (null)	The lowest power consumption level, in watt units, over the measurement window that occurred within the last <code>IntervalInMin</code> minutes. This property shall represent the minimum power level, in watt units, that occurred within the last <code>IntervalInMin</code> minutes.
}			
PowerRequestedWatts	number (Watts)	<i>read-only</i> (null)	The potential power, in watt units, that the chassis requests, which might be higher than the current level being consumed because the requested power includes a budget that the chassis wants for future use. This property shall represent the amount of power, in watt units, that the chassis currently requests to be budgeted for future use.
RelatedItem [{	array		An array of links to resources or objects associated with this power limit. This property shall contain an array of links to resources or objects associated with this power limit.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
}]			
PowerSupplies [{	array		The set of power supplies associated with this system or device. This property shall contain the set of power supplies associated with this system or device.
@odata.id	string (URI)	<i>read-only required</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
Actions (v1.3+) {}	object		The available actions for this resource. This property shall contain the available actions for this resource.
Assembly (v1.5+) {	object		The link to the assembly resource associated with this power supply. This property shall contain a link to a resource of type <code>Assembly</code>. See the <i>Assembly</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Assembly resource. See the Links section and the <i>Assembly</i> schema for details.
}			
EfficiencyPercent (v1.5+)	number (%)	<i>read-only (null)</i>	The measured efficiency of this power supply as a percentage. This property shall contain the measured power efficiency, as a percentage, of the associated power supply.
FirmwareVersion	string	<i>read-only (null)</i>	The firmware version for this power supply. This property shall contain the firmware version as defined by the manufacturer for the associated power supply.

Property	Type	Attributes	Notes
HotPluggable (v1.5+)	boolean	<i>read-only (null)</i>	An indication of whether this device can be inserted or removed while the equipment is in operation. This property shall indicate whether the device can be inserted or removed while the underlying equipment otherwise remains in its current operational state. Devices indicated as hot-pluggable shall allow the device to become operable without altering the operational state of the underlying equipment. Devices that cannot be inserted or removed from equipment in operation, or devices that cannot become operable without affecting the operational state of that equipment, shall be indicated as not hot-pluggable.
IndicatorLED (v1.2+)	string (enum)	<i>read-write (null)</i>	The state of the indicator LED, which identifies the power supply. This property shall contain the indicator light state for the indicator light associated with this power supply. <i>For the possible property values, see IndicatorLED in Property details.</i>
InputRanges (v1.1+) [{	array		The input ranges that the power supply can use. This property shall contain a collection of ranges usable by the power supply unit.
InputType (v1.1+)	string (enum)	<i>read-only (null)</i>	The Input type (AC or DC). This property shall contain the input type (AC or DC) of the associated range. <i>For the possible property values, see InputType in Property details.</i>
MaximumFrequencyHz (v1.1+)	number (Hz)	<i>read-only (null)</i>	The maximum line input frequency at which this power supply input range is effective. This property shall contain the value, in hertz units, of the maximum line input frequency that the power supply is capable of consuming for this range.
MaximumVoltage (v1.1+)	number (Volts)	<i>read-only (null)</i>	The maximum line input voltage at which this power supply input range is effective. This property shall contain the value, in volt units, of the maximum line input voltage that the power supply is capable of consuming for this range.
MinimumFrequencyHz (v1.1+)	number (Hz)	<i>read-only (null)</i>	The minimum line input frequency at which this power supply input range is effective. This property shall contain the value, in hertz units, of the minimum line input frequency that the power supply is capable of consuming for this range.

Property	Type	Attributes	Notes
MinimumVoltage (v1.1+)	number (Volts)	<i>read-only</i> (null)	The minimum line input voltage at which this power supply input range is effective. This property shall contain the value, in volt units, of the minimum line input voltage that the power supply is capable of consuming for this range.
Oem (v1.1+) {}	object		See the OEM object definition in the Using this guide clause.
OutputWattage (v1.1+)	number (Watts)	<i>read-only</i> (null)	The maximum capacity of this power supply when operating in this input range. This property shall contain the maximum amount of power, in watt units, that the associated power supply is rated to deliver while operating in this input range.
}}			
LastPowerOutputWatts	number (Watts)	<i>read-only</i> (null)	The average power output of this power supply. This property shall contain the average power output, measured in watt units, of the associated power supply.
LineInputVoltage	number (Volts)	<i>read-only</i> (null)	The line input voltage at which the power supply is operating. This property shall contain the value in volt units of the line input voltage (measured or configured for) that the power supply has been configured to operate with or is currently receiving.
LineInputVoltageType	string (enum)	<i>read-only</i> (null)	The line voltage type supported as an input to this power supply. This property shall contain the type of input line voltage supported by the associated power supply. <i>For the possible property values, see LineInputVoltageType in Property details.</i>
Location (v1.5+) {}	object		The location of the power supply. This property shall contain the location information of the associated power supply. For property details, see Location.
Manufacturer (v1.1+)	string	<i>read-only</i> (null)	The manufacturer of this power supply. This property shall contain the name of the organization responsible for producing the power supply. This organization may be the entity from whom the power supply is purchased, but this is not necessarily true.

Property	Type	Attributes	Notes
MemberId	string	<i>read-only required</i>	The unique identifier for the member within an array. This property shall contain the unique identifier for this member within an array. For services supporting Redfish v1.6 or higher, this value shall contain the zero-based array index.
Model	string	<i>read-only (null)</i>	The model number for this power supply. This property shall contain the model information as defined by the manufacturer for the associated power supply.
Name	string	<i>read-only (null)</i>	The name of the power supply. This property shall contain a descriptive name for the associated power supply.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PartNumber	string	<i>read-only (null)</i>	The part number for this power supply. This property shall contain the part number as defined by the manufacturer for the associated power supply.
PowerCapacityWatts	number (Watts)	<i>read-only (null)</i>	The maximum capacity of this power supply. This property shall contain the maximum amount of power, in watt units, that the associated power supply is rated to deliver.
PowerInputWatts (v1.5+)	number (Watts)	<i>read-only (null)</i>	The measured input power of this power supply. This property shall contain the measured input power, in watt units, of the associated power supply.
PowerOutputWatts (v1.5+)	number (Watts)	<i>read-only (null)</i>	The measured output power of this power supply. This property shall contain the measured output power, in watt units, of the associated power supply.
PowerSupplyType	string (enum)	<i>read-only (null)</i>	The power supply type (AC or DC). This property shall contain the input power type (AC or DC) of the associated power supply. <i>For the possible property values, see PowerSupplyType in Property details.</i>

Property	Type	Attributes	Notes
Redundancy [{}]	array (object)		The common redundancy definition and structure used in other Redfish schemas. - The set of redundancy groups for this power supply. - This property shall contain an array of links to the redundancy groups to which this power supply belongs. For property details, see Redundancy.
RelatedItem [{	array		An array of links to resources or objects associated with this power supply. This property shall contain an array of links to resources or objects associated with this power supply.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
SerialNumber	string	<i>read-only</i> (null)	The serial number for this power supply. This property shall contain the serial number as defined by the manufacturer for the associated power supply.
SparePartNumber	string	<i>read-only</i> (null)	The spare part number for this power supply. This property shall contain the spare or replacement part number as defined by the manufacturer for the associated power supply.
Status { }	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
}]			
Redundancy [{}]	array (object)		The common redundancy definition and structure used in other Redfish schemas. - The redundancy information for the set of power supplies in this chassis. - This property shall contain redundancy information for the set of power supplies in this system or device. For property details, see Redundancy.

Property	Type	Attributes	Notes
Voltages [{	array		The set of voltage sensors for this chassis. This property shall contain the set of voltage sensors for this chassis.
@odata.id	string (URI)	<i>read-only required</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
Actions (v1.3+) { }	object		The available actions for this resource. This property shall contain the available actions for this resource.
LowerThresholdCritical	number (Volts)	<i>read-only (null)</i>	The value at which the reading is below normal range but not yet fatal. This property shall contain the value at which the <code>ReadingVolts</code> property is below the normal range but is not yet fatal. The value of the property shall use the same units as the <code>ReadingVolts</code> property.
LowerThresholdFatal	number (Volts)	<i>read-only (null)</i>	The value at which the reading is below normal range and fatal. This property shall contain the value at which the <code>ReadingVolts</code> property is below the normal range and is fatal. The value of the property shall use the same units as the <code>ReadingVolts</code> property.
LowerThresholdNonCritical	number (Volts)	<i>read-only (null)</i>	The value at which the reading is below normal range. This property shall contain the value at which the <code>ReadingVolts</code> property is below normal range. The value of the property shall use the same units as the <code>ReadingVolts</code> property.
MaxReadingRange	number (Volts)	<i>read-only (null)</i>	Maximum value for this sensor. This property shall indicate the highest possible value for the <code>ReadingVolts</code> property. The value of the property shall use the same units as the <code>ReadingVolts</code> property.
MemberId	string	<i>read-only required</i>	The unique identifier for the member within an array. This property shall contain the unique identifier for this member within an array. For services supporting Redfish v1.6 or higher, this value shall contain the zero-based array index.
MinReadingRange	number (Volts)	<i>read-only (null)</i>	Minimum value for this sensor. This property shall indicate the lowest possible value for the <code>ReadingVolts</code> property. The value of the property shall use the same units as the <code>ReadingVolts</code> property.

Property	Type	Attributes	Notes
Name	string	<i>read-only</i> (null)	Voltage sensor name. This property shall contain the name of the voltage sensor.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PhysicalContext	string (enum)	<i>read-only</i>	The area or device to which this voltage measurement applies. This property shall contain a description of the affected device or region within the chassis to which this voltage measurement applies. <i>For the possible property values, see PhysicalContext in Property details.</i>
ReadingVolts	number (Volts)	<i>read-only</i> (null)	The reading of the voltage sensor. This property shall contain the voltage sensor's reading.
RelatedItem [{	array		An array of links to resources or objects to which this voltage measurement applies. This property shall contain an array of links to resources or objects to which this voltage measurement applies.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
SensorNumber	integer	<i>read-only</i> (null)	A numerical identifier to represent the voltage sensor. This property shall contain a numerical identifier for this voltage sensor that is unique within this resource.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
UpperThresholdCritical	number (Volts)	<i>read-only</i> (null)	The value at which the reading is above normal range but not yet fatal. This property shall contain the value at which the <code>ReadingVolts</code> property is above the normal range but is not yet fatal. The value of the property shall use the same units as the <code>ReadingVolts</code> property.

Property	Type	Attributes	Notes
UpperThresholdFatal	number (Volts)	<i>read-only</i> (null)	The value at which the reading is above normal range and fatal. This property shall contain the value at which the <code>ReadingVolts</code> property is above the normal range and is fatal. The value of the property shall use the same units as the <code>ReadingVolts</code> property.
UpperThresholdNonCritical	number (Volts)	<i>read-only</i> (null)	The value at which the reading is above normal range. This property shall contain the value at which the <code>ReadingVolts</code> property is above the normal range. The value of the property shall use the same units as the <code>ReadingVolts</code> property.
}}]			

6.101.4 Actions

6.101.4.1 PowerSupplyReset (v1.6+)

Description

This action resets the targeted power supply.

- This action shall reset a power supply specified by the `MemberId` from the `PowerSupplies` array. A `GracefulRestart` `ResetType` shall reset the power supply but shall not affect the power output. A `ForceRestart` `ResetType` can affect the power supply output.

Action URI

{Base URI of target resource}/Actions/Power.PowerSupplyReset

Action parameters

Parameter Name	Type	Attributes	Notes
MemberId	string	<i>required</i>	The <code>MemberId</code> of the power supply within the <code>PowerSupplies</code> array on which to perform the reset. This parameter shall contain the identifier of the member within the <code>PowerSupplies</code> array on which to perform the reset.

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	<i>optional</i>	The type of reset. This parameter shall contain the type of reset. The service can accept a request without the parameter and shall perform a <code>GracefulRestart</code>. <i>For the possible property values, see <code>ResetType</code> in Property details.</i>

Request Example

```
{  
  "MemberId": "0",  
  "ResetType": "ForceRestart"  
}
```

6.101.5 Property details

6.101.5.1 IndicatorLED

The state of the indicator LED, which identifies the power supply.

- This property shall contain the indicator light state for the indicator light associated with this power supply.

string	Description
Blinking	The indicator LED is blinking. This value shall represent that the indicator LED is in a blinking state where the LED is being turned on and off in repetition. If the service does not support this value, it shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code.
Lit	The indicator LED is lit. This value shall represent that the indicator LED is in a solid on state. If the service does not support this value, it shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code.
Off	The indicator LED is off. This value shall represent that the indicator LED is in a solid off state. If the service does not support this value, it shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code.

6.101.5.2 InputType

The Input type (AC or DC).

- This property shall contain the input type (AC or DC) of the associated range.

string	Description
AC	Alternating Current (AC) input range.
DC	Direct Current (DC) input range.

6.101.5.3 LimitException

The action that is taken if the power cannot be maintained below the `LimitInWatts`.

- This property shall represent the action to be taken if the resource power consumption cannot be limited below the specified limit after several correction time periods.

string	Description
HardPowerOff	Turn the power off immediately when the limit is exceeded.
LogEventOnly	Log an event when the limit is exceeded, but take no further action.
NoAction	Take no action when the limit is exceeded.
Oem	Take an OEM-defined action.

6.101.5.4 LineInputVoltageType

The line voltage type supported as an input to this power supply.

- This property shall contain the type of input line voltage supported by the associated power supply.

string	Description
AC120V (v1.1+)	AC 120V nominal input.
AC240V (v1.1+)	AC 240V nominal input.
AC277V (v1.1+)	AC 277V nominal input.

string	Description
ACandDCWideRange (v1.1+)	Wide range AC or DC input.
ACHighLine (deprecated v1.1)	277V AC input. <i>Deprecated in v1.1 and later. This value has been deprecated in favor of AC277V.</i>
ACLowLine (deprecated v1.1)	100-127V AC input. <i>Deprecated in v1.1 and later. This value has been deprecated in favor of AC120V.</i>
ACMidLine (deprecated v1.1)	200-240V AC input. <i>Deprecated in v1.1 and later. This value has been deprecated in favor of AC240V.</i>
ACWideRange (v1.1+)	Wide range AC input.
DC240V (v1.1+)	DC 240V nominal input.
DC380V	High-voltage DC input (380V).
DCNeg48V	-48V DC input.
Unknown	The power supply line input voltage type cannot be determined.

6.101.5.5 PhysicalContext

The area, device, or set of devices to which this power control applies.

- This property shall contain a description of the affected device(s) or region within the chassis to which this power control applies.

string	Description
Accelerator	An accelerator.
ACInput	An AC electrical input or input-related circuit.
ACMaintenanceBypassInput	An AC electrical maintenance bypass input.
ACOutput	An AC electrical output or output-related circuit. This value shall indicate an electrical output or an output-related circuit, such as a branch output, which is not terminated as a power outlet.
ACStaticBypassInput	An AC electrical static bypass input.
ACUtilityInput	An AC electrical utility input. This value shall indicate an electrical input, where the source is an electrical utility as opposed to a backup or locally-generated power source. This value is intended to differentiate multiple electrical inputs between utility, maintenance bypass, or static bypass values. For general purpose usage, the value of <code>ACInput</code> is preferred.

string	Description
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	A compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC electrical bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	An expansion bay. This value shall indicate a location that provides for the expansion of functionality of a system, such as a PCIe slot that can accept an option card.
ExpansionSubsystem	A group of expansion bays. This value shall indicate a group of expansion bays and the devices installed in those bays.
Fan	A fan.
Filter	A filter.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.

string	Description
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Manager	A management controller, such as a BMC (baseboard management controller).
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	A networking bay. This value shall indicate a location that provides for the expansion of networking functionality of a system, by the addition of networking devices.
NetworkingDevice	A networking device.
PowerOutlet	An electrical outlet. This value shall indicate an electrical outlet or receptacle.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	A power supply bay. This value shall indicate a location that provides for the installation of a power supply or similar devices.
Pump	A pump.
Rectifier	A rectifier device.
Reservoir	A reservoir.
Room	The room.
StorageBay	A storage bay. This value shall indicate a location that provides for the expansion of storage functionality of a system, by the addition of storage devices.
StorageDevice	A storage device.
StorageSubsystem	A storage subsystem. This value shall indicate a storage subsystem, which may consist of one or more storage controllers, storage devices, or related components.

string	Description
Switch	A switch device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.101.5.6 PowerSupplyType

The power supply type (AC or DC).

- This property shall contain the input power type (AC or DC) of the associated power supply.

string	Description
AC	Alternating Current (AC) power supply.
ACorDC	The power supply supports both DC and AC.
DC	Direct Current (DC) power supply.
Unknown	The power supply type cannot be determined.

6.101.5.7 ResetType

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and shall perform a `GracefulRestart`.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.
ForceOn	Turn on the unit immediately. This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property shall contain the value <code>on</code>.
ForceRestart	Shut down immediately and non-gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>on</code>.
FullPowerCycle	Full power cycle the unit. Behaves like removing utility lines, followed by restoring utility lines to the resource. This value shall indicate the resource will perform a full power cycle as if utility lines to the resource are removed and restored. This is different from <code>PowerCycle</code> in that it's as close to a true power cycle as possible. For example, removing AC power cables from an enclosure and then restoring the AC power cables. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>on</code>. If a service supports this value but there are no other distinct power cycle flows, the service shall support <code>PowerCycle</code> as an alias to <code>FullPowerCycle</code>. This type of reset may cause the manager providing the Redfish service to power cycle. If the manager providing the Redfish service is affected by this type of reset, the service shall send the action response before resetting to prevent client timeouts.
GracefulRestart	Shut down gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>on</code>.
GracefulShutdown	Shut down gracefully and power off. This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.

string	Description
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a paused state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Paused</code>.
PowerCycle	Power cycle the unit. Behaves like a power removal, followed by a power restore to the resource. This value shall indicate the resource will perform a power cycle. This is different from <code>FullPowerCycle</code> in that it typically performs localized power sequencing of the resource while external power is still present. For example, turning DC voltage regulators off and then turning DC voltage regulators back on. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
PushPowerButton	Simulate the pressing of the physical power button on this unit. This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.

6.101.6 Example response

```
{
  "@odata.type": "#Power.v1_7_3.Power",
  "Id": "Power",
  "Name": "Power",
  "PowerControl": [
    {
      "@odata.id": "/redfish/v1/Chassis/1U/Power#/PowerControl/0",
      "MemberId": "0",
      "Name": "Server Power Control",
      "PowerConsumedWatts": 344,
      "PowerRequestedWatts": 800,
      "PowerAvailableWatts": 0,
      "PowerCapacityWatts": 800,
      "PowerAllocatedWatts": 800,
      "PowerMetrics": {
        "IntervalInMin": 30,
        "MinConsumedWatts": 271,
        "MaxConsumedWatts": 489,
        "AverageConsumedWatts": 319
      },
      "PowerLimit": {
        "LimitInWatts": 500,
        "LimitException": "LogEventOnly",
        "CorrectionInMs": 50
      },
      "RelatedItem": [
        {
          "@odata.id": "/redfish/v1/Systems/437XR1138R2"
        },
        {
          "@odata.id": "/redfish/v1/Chassis/1U"
        }
      ],
      "Status": {
        "State": "Enabled",
        "Health": "OK"
      }
    }
  ],
  "Voltages": [
    {
      "@odata.id": "/redfish/v1/Chassis/1U/Power#/Voltages/0",
      "MemberId": "0",
      "Name": "VRM1 Voltage",
      "SensorNumber": 11,
      "Status": {
        "State": "Enabled",

```

```

        "Health": "OK"
    },
    "ReadingVolts": 12,
    "UpperThresholdNonCritical": 12.5,
    "UpperThresholdCritical": 13,
    "UpperThresholdFatal": 15,
    "LowerThresholdNonCritical": 11.5,
    "LowerThresholdCritical": 11,
    "LowerThresholdFatal": 10,
    "MinReadingRange": 0,
    "MaxReadingRange": 20,
    "PhysicalContext": "VoltageRegulator",
    "RelatedItem": [
        {
            "@odata.id": "/redfish/v1/Systems/437XR1138R2"
        },
        {
            "@odata.id": "/redfish/v1/Chassis/1U"
        }
    ]
},
{
    "@odata.id": "/redfish/v1/Chassis/1U/Power#/Voltages/1",
    "MemberId": "1",
    "Name": "VRM2 Voltage",
    "SensorNumber": 12,
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "ReadingVolts": 5,
    "UpperThresholdNonCritical": 5.5,
    "UpperThresholdCritical": 7,
    "LowerThresholdNonCritical": 4.75,
    "LowerThresholdCritical": 4.5,
    "MinReadingRange": 0,
    "MaxReadingRange": 20,
    "PhysicalContext": "VoltageRegulator",
    "RelatedItem": [
        {
            "@odata.id": "/redfish/v1/Systems/437XR1138R2"
        },
        {
            "@odata.id": "/redfish/v1/Chassis/1U"
        }
    ]
}
],
"PowerSupplies": [
    {

```

```

    "@odata.id": "/redfish/v1/Chassis/1U/Power#/PowerSupplies/0",
    "MemberId": "0",
    "Name": "Power Supply Bay",
    "Status": {
      "State": "Enabled",
      "Health": "Warning"
    },
    "PowerSupplyType": "AC",
    "LineInputVoltageType": "ACWideRange",
    "LineInputVoltage": 120,
    "PowerCapacityWatts": 800,
    "LastPowerOutputWatts": 325,
    "Model": "499253-B21",
    "Manufacturer": "ManufacturerName",
    "FirmwareVersion": "1.00",
    "SerialNumber": "1Z0000001",
    "PartNumber": "0000001A3A",
    "SparePartNumber": "0000001A3A",
    "InputRanges": [
      {
        "InputType": "AC",
        "MinimumVoltage": 100,
        "MaximumVoltage": 120,
        "OutputWattage": 800
      },
      {
        "InputType": "AC",
        "MinimumVoltage": 200,
        "MaximumVoltage": 240,
        "OutputWattage": 1300
      }
    ],
    "RelatedItem": [
      {
        "@odata.id": "/redfish/v1/Chassis/1U"
      }
    ]
  },
  "Actions": {
    "#Power.PowerSupplyReset": {
      "target": "/redfish/v1/Chassis/1U/Power/Actions/Power.PowerSupplyReset"
    }
  },
  "@odata.id": "/redfish/v1/Chassis/1U/Power"
}

```

6.102 PowerDistribution 1.4.0

Version	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2024.1	2022.3	2021.3	2021.2	2019.4

6.102.1 Description

The `PowerDistribution` schema contains the definitions for a power distribution component or unit, such as a floor power distribution unit (PDU) or switchgear.

- This resource shall represent a power distribution component or unit for a Redfish implementation.

6.102.2 URIs

```
/redfish/v1/PowerEquipment/ElectricalBuses/{PowerDistributionId}
/redfish/v1/PowerEquipment/FloorPDUs/{PowerDistributionId}
/redfish/v1/PowerEquipment/PowerShelves/{PowerDistributionId}
/redfish/v1/PowerEquipment/RackPDUs/{PowerDistributionId}
/redfish/v1/PowerEquipment/Switchgear/{PowerDistributionId}
/redfish/v1/PowerEquipment/TransferSwitches/{PowerDistributionId}
```

6.102.3 Properties

Property	Type	Attributes	Notes
AssetTag	string	<i>read-write</i> (null)	The user-assigned asset tag for this equipment. This property shall contain the user-assigned asset tag, which is an identifying string that tracks the equipment for inventory purposes. Modifying this property may modify the <code>AssetTag</code> in the containing <code>Chassis</code> resource.
Branches {	object		A link to the branch circuits for this equipment. This property shall contain a link to a resource collection of type <code>CircuitCollection</code> that contains the branch circuits for this equipment. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Circuit</i> . See the Circuit schema for details.

Property	Type	Attributes	Notes
}			
EquipmentType	string (enum)	<i>read-only required</i>	The type of equipment this resource represents. This property shall contain the type of equipment this resource represents. <i>For the possible property values, see EquipmentType in Property details.</i>
Feeders {	object		A link to the feeder circuits for this equipment. This property shall contain a link to a resource collection of type CircuitCollection that contains the feeder circuits for this equipment. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Circuit</i> . See the <i>Circuit</i> schema for details.
}			
FirmwareVersion	string	<i>read-only</i>	The firmware version of this equipment. This property shall contain a string describing the firmware version of this equipment as provided by the manufacturer.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Chassis [{	array		An array of links to the chassis that contain this equipment. This property shall contain an array of links to resources of type Chassis that represent the physical containers associated with this resource.
@odata.id	string	<i>read-only</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.
}]			
Facility {	object		A link to the facility that contains this equipment. This property shall contain a link to a resource of type Facility that represents the facility that contains this equipment. See the <i>Facility</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Facility resource. See the Links section and the <i>Facility</i> schema for details.

Property	Type	Attributes	Notes
}			
ManagedBy [{	array		An array of links to the managers responsible for managing this equipment. This property shall contain an array of links to resources of type <code>Manager</code> that represent the managers that manage this equipment.
@odata.id	string	<i>read-only</i>	Link to a Manager resource. See the Links section and the <i>Manager</i> schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
Location {}	object		The location of the equipment. This property shall contain the location information of the associated equipment. For property details, see Location.
Mains {	object		A link to the power input circuits for this equipment. This property shall contain a link to a resource collection of type <code>CircuitCollection</code> that contains the power input circuits for this equipment. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Circuit</i> . See the Circuit schema for details.
}			
MainsRedundancy (v1.1+) {}	object		The redundancy information for the mains (input) circuits for this equipment. This property shall contain redundancy information for the mains (input) circuits for this equipment. The values of the <code>RedundancyGroup</code> array shall reference resources of type <code>Circuit</code>. For property details, see RedundantGroup.
Manufacturer	string	<i>read-only</i> (null)	The manufacturer of this equipment. This property shall contain the name of the organization responsible for producing the equipment. This organization may be the entity from which the equipment is purchased, but this is not necessarily true.

Property	Type	Attributes	Notes
Metrics {	object		A link to the summary metrics for this equipment. This property shall contain a link to a resource of type <code>PowerDistributionMetrics</code>. See the <i>PowerDistributionMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>PowerDistributionMetrics</i> resource. See the Links section and the <i>PowerDistributionMetrics</i> schema for details.
}			
Model	string	<i>read-only (null)</i>	The product model number of this equipment. This property shall contain the manufacturer-provided model information of this equipment.
OutletGroups {	object		A link to the outlet groups for this equipment. This property shall contain a link to a resource collection of type <code>OutletCollection</code> that contains the outlet groups for this equipment. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>OutletGroup</i> . See the <i>OutletGroup</i> schema for details.
}			
Outlets {	object		A link to the outlets for this equipment. This property shall contain a link to a resource collection of type <code>OutletCollection</code> that contains the outlets for this equipment. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Outlet</i> . See the <i>Outlet</i> schema for details.
}			
PartNumber	string	<i>read-only (null)</i>	The part number for this equipment. This property shall contain the manufacturer-provided part number for the equipment.
PowerCapacityVA (v1.4+)	integer (V.A)	<i>read-only (null)</i>	The maximum power capacity, rated as apparent power, of this equipment, in volt-ampere units. This property shall contain the maximum power capacity, rated as apparent power, of this equipment, in volt-ampere units.

Property	Type	Attributes	Notes
PowerSupplies (v1.1+, deprecated v1.3) {	object		The link to the collection of power supplies for this equipment. This property shall contain a link to a resource collection of type <code>PowerSupplyCollection</code>. Contains a link to a resource. <i>Deprecated in v1.3 and later. This property has been deprecated in favor of the <code>PowerSupplies</code> link in the <code>Chassis</code> resource.</i>
@odata.id	string	read-only	Link to Collection of <code>PowerSupply</code> . See the <code>PowerSupply</code> schema for details.
}			
PowerSupplyRedundancy (v1.1+, deprecated v1.3) [{}]	array (object)		The redundancy information for the devices in a redundancy group. - The redundancy information for the set of power supplies for this equipment. - This property shall contain redundancy information for the set of power supplies for this equipment. The values of the <code>RedundancyGroup</code> array shall reference resources of type <code>PowerSupply</code>. For property details, see <code>RedundantGroup</code>. <i>Deprecated in v1.3 and later. This property has been deprecated in favor of the <code>PowerSupplyRedundancy</code> property in the <code>Chassis</code> resource.</i>
ProductionDate	string (date-time)	read-only (null)	The production or manufacturing date of this equipment. This property shall contain the date of production or manufacture for this equipment.
Sensors (deprecated v1.3) {	object		A link to the collection of sensors located in the equipment and sub-components. This property shall be a link to a resource collection of type <code>SensorCollection</code> that contains the sensors located in the equipment and sub-components. Contains a link to a resource. <i>Deprecated in v1.3 and later. This property has been deprecated in favor of the <code>Sensors</code> link in the <code>Chassis</code> resource.</i>
@odata.id	string	read-only	Link to Collection of <code>Sensor</code> . See the <code>Sensor</code> schema for details.
}			
SerialNumber	string	read-only (null)	The serial number for this equipment. This property shall contain a manufacturer-allocated number that identifies the equipment.

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
Subfeeds {	object		A link to the subfeed circuits for this equipment. This property shall contain a link to a resource collection of type <code>CircuitCollection</code> that contains the subfeed circuits for this equipment. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Circuit</i> . See the Circuit schema for details.
}			
TransferConfiguration {	object	<i>(null)</i>	The configuration settings for an automatic transfer switch. This property shall contain the configuration information regarding an automatic transfer switch function for this resource.
ActiveMainsId	string	<i>read-write (null)</i>	The mains circuit that is switched on and qualified to supply power to the output circuit. This property shall contain the mains circuit that is switched on and qualified to supply power to the output circuit. The value shall be a string that matches the <code>Id</code> property value of a circuit contained in the collection referenced by the <code>Mains</code> property.
AutoTransferEnabled	boolean	<i>read-write (null)</i>	Indicates if the qualified alternate mains circuit is automatically switched on when the preferred mains circuit becomes unqualified and is automatically switched off. This property shall indicate if the qualified alternate mains circuit is automatically switched on when the preferred mains circuit becomes unqualified and is automatically switched off.
ClosedTransitionAllowed	boolean	<i>read-write (null)</i>	Indicates if a make-before-break switching sequence of the mains circuits is permitted when they are both qualified and in synchronization. This property shall indicate if a make-before-break switching sequence of the mains circuits is permitted when they are both qualified and in synchronization.

Property	Type	Attributes	Notes
ClosedTransitionTimeoutSeconds	integer	<i>read-write</i> (null)	The time in seconds to wait for a closed transition to occur. This property shall contain the time in seconds to wait for a closed transition to occur.
PreferredMainsId	string	<i>read-write</i> (null)	The preferred source for the mains circuit to this equipment. This property shall contain the preferred source for mains circuit to this equipment. The value shall be a string that matches the <code>Id</code> property value of a circuit contained in the collection referenced by the <code>Mains</code> property.
RetransferDelaySeconds	integer	<i>read-write</i> (null)	The time in seconds to delay the automatic transfer from the alternate mains circuit back to the preferred mains circuit. This property shall contain the time in seconds to delay the automatic transfer from the alternate mains circuit back to the preferred mains circuit.
RetransferEnabled	boolean	<i>read-write</i> (null)	Indicates if the automatic transfer is permitted from the alternate mains circuit back to the preferred mains circuit after the preferred mains circuit is qualified again and the retransfer delay time has expired. This property shall indicate if the automatic transfer is permitted from the alternate mains circuit back to the preferred mains circuit after the preferred mains circuit is qualified again and the <code>RetransferDelaySeconds</code> time has expired.
TransferDelaySeconds	integer	<i>read-write</i> (null)	The time in seconds to delay the automatic transfer from the preferred mains circuit to the alternate mains circuit when the preferred mains circuit is disqualified. This property shall contain the time in seconds to delay the automatic transfer from the preferred mains circuit to the alternate mains circuit when the preferred mains circuit is disqualified. A value of zero shall mean it transfers as fast as possible.
TransferInhibit	boolean	<i>read-write</i> (null)	Indicates if any transfer is inhibited. This property shall indicate if any transfer is inhibited.
}			
TransferCriteria {	object	(null)	The criteria used to initiate a transfer for an automatic transfer switch. This property shall contain the criteria for initiating a transfer within an automatic transfer switch function for this resource.

Property	Type	Attributes	Notes
OverNominalFrequencyHz	number (Hz)	<i>read-write</i> (null)	The frequency in hertz units over the nominal value that satisfies a criterion for transfer. This property shall contain the frequency in hertz units over the nominal value that satisfies a criterion for transfer.
OverVoltageRMSPercentage	number (%)	<i>read-write</i> (null)	The positive percentage of voltage RMS over the nominal value that satisfies a criterion for transfer. This property shall contain the positive percentage of voltage RMS over the nominal value that satisfies a criterion for transfer.
TransferSensitivity	string (enum)	<i>read-write</i> (null)	The sensitivity to voltage waveform quality to satisfy the criterion for initiating a transfer. This property shall contain the setting that adjusts the analytical sensitivity of the detection of the quality of voltage waveform that satisfies a criterion for transfer. <i>For the possible property values, see TransferSensitivity in Property details.</i>
UnderNominalFrequencyHz	number (Hz)	<i>read-write</i> (null)	The frequency in hertz units under the nominal value that satisfies a criterion for transfer. This property shall contain the frequency in hertz units under the nominal value that satisfies a criterion for transfer.
UnderVoltageRMSPercentage	number (%)	<i>read-write</i> (null)	The negative percentage of voltage RMS under the nominal value that satisfies a criterion for transfer. This property shall contain the negative percentage of voltage RMS under the nominal value that satisfies a criterion for transfer.
}			
UserLabel (v1.3+)	string	<i>read-write</i>	A user-assigned label. This property shall contain a user-assigned label used to identify this resource. If a value has not been assigned by a user, the value of this property shall be an empty string.
UUID	string (uuid)	<i>read-only</i> (null)	The UUID for this equipment. This property shall contain the UUID for the equipment. Pattern: <code>^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\$</code>

Property	Type	Attributes	Notes
Version	string	read-only (null)	The hardware version of this equipment. This property shall contain the hardware version of this equipment as determined by the vendor or supplier.

6.102.4 Actions

6.102.4.1 TransferControl

Description

This action transfers control to the alternative input circuit.

- This action shall transfer power input from the existing mains circuit to the alternative mains circuit.

Action URI

{Base URI of target resource}/Actions/PowerDistribution.TransferControl

Action parameters

This action takes no parameters.

6.102.5 Property details

6.102.5.1 EquipmentType

The type of equipment this resource represents.

- This property shall contain the type of equipment this resource represents.

string	Description
AutomaticTransferSwitch	An automatic power transfer switch.
BatteryShelf (v1.3+)	A battery shelf or battery-backed unit (BBU).
Bus (v1.2+)	An electrical bus.
FloorPDU	A power distribution unit providing feeder circuits for further power distribution.
ManualTransferSwitch	A manual power transfer switch.

string	Description
PowerShelf (v1.1+)	A power shelf.
RackPDU	A power distribution unit providing outlets for a rack or similar quantity of devices.
Switchgear	Electrical switchgear.

6.102.5.2 TransferSensitivity

The sensitivity to voltage waveform quality to satisfy the criterion for initiating a transfer.

- This property shall contain the setting that adjusts the analytical sensitivity of the detection of the quality of voltage waveform that satisfies a criterion for transfer.

string	Description
High	High sensitivity for initiating a transfer.
Low	Low sensitivity for initiating a transfer.
Medium	Medium sensitivity for initiating a transfer.

6.102.6 Example response

```
{
  "@odata.type": "#PowerDistribution.v1_4_0.PowerDistribution",
  "Id": "1",
  "EquipmentType": "RackPDU",
  "Name": "RackPDU1",
  "FirmwareVersion": "4.3.0",
  "Version": "1.03b",
  "ProductionDate": "2017-01-11T08:00:00Z",
  "Manufacturer": "Contoso",
  "Model": "ZAP4000",
  "SerialNumber": "29347ZT536",
  "PartNumber": "AA-23",
  "UUID": "32354641-4135-4332-4a35-313735303734",
  "AssetTag": "PDX-92381",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "Location": {
    "Placement": {
```



```
        "Row": "North 1"
      }
    },
    "Mains": {
      "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Mains"
    },
    "Branches": {
      "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Branches"
    },
    "Outlets": {
      "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets"
    },
    "OutletGroups": {
      "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/OutletGroups"
    },
    "Metrics": {
      "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Metrics"
    },
    "Links": {
      "Facility": {
        "@odata.id": "/redfish/v1/Facilities/Room237"
      },
      "Chassis": [
        {
          "@odata.id": "/redfish/v1/Chassis/PDU"
        }
      ]
    },
    "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1"
  }
}
```

6.103 PowerDistributionMetrics 1.4.0

Version	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2025.1	2021.4	2021.2	2021.1	2019.4

6.103.1 Description

The `PowerDistributionMetrics` schema contains metrics of a power distribution component or unit, such as a floor power distribution unit (PDU) or switchgear.

- This resource shall represent the metrics of a power distribution component or unit for a Redfish implementation.

6.103.2 URIs

/redfish/v1/PowerEquipment/ElectricalBuses/{PowerDistributionId}/Metrics
 /redfish/v1/PowerEquipment/FloorPDUs/{PowerDistributionId}/Metrics
 /redfish/v1/PowerEquipment/PowerShelves/{PowerDistributionId}/Metrics
 /redfish/v1/PowerEquipment/RackPDUs/{PowerDistributionId}/Metrics
 /redfish/v1/PowerEquipment/Switchgear/{PowerDistributionId}/Metrics
 /redfish/v1/PowerEquipment/TransferSwitches/{PowerDistributionId}/Metrics

6.103.3 Properties

Property	Type	Attributes	Notes
AbsoluteHumidity (v1.3+) {}	object		Absolute humidity (g/m³). This property shall contain the absolute (volumetric) humidity sensor reading, in grams per cubic meter units, for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>AbsoluteHumidity</code>. For more information about this property, see <code>SensorExcerpt</code> in Property Details.
AmbientTemperatureCelsius (v1.4+) {}	object		Ambient temperature (Celsius). This property shall contain the ambient temperature, in degree Celsius units, for this resource. The ambient temperature shall be the temperature measured at a point exterior to the <code>Chassis</code> containing this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Temperature</code>. This property shall only be present, if supported, in resource instances subordinate to a <code>Chassis</code> or <code>CoolingUnit</code> resource. For more information about this property, see <code>SensorExcerpt</code> in Property Details.
EnergykWh {	object (excerpt)		Energy consumption (kWh). This property shall contain the total energy, in kilowatt-hour units, for this resource that represents the <code>Total</code> <code>ElectricalContext</code> sensor when multiple energy sensors exist. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Energykwh</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.

Property	Type	Attributes	Notes
ApparentkVAh (v1.5+)	number (kV.A.h)	<i>read-only</i> (null)	Apparent energy (kVAh). This property shall contain the apparent energy, in kilovolt-ampere-hour units, for an electrical energy measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>EnergykWh</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
LifetimeReading (v1.1+)	number	<i>read-only</i> (null)	The total accumulation value for this sensor. This property shall contain the total accumulation of the <code>Reading</code> property over the sensor's lifetime. This value shall not be reset by the <code>ResetMetrics</code> action.
ReactivekVARh (v1.5+)	number (kV.A.h)	<i>read-only</i> (null)	Reactive energy (kVARh). This property shall contain the reactive energy, in kilovolt-ampere-hours (reactive) units, for an electrical energy measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>EnergykWh</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
SensorResetTime	string (date-time)	<i>read-only</i> (null)	The date and time when the time-based properties were last reset. This property shall contain the date and time when the <code>ResetMetrics</code> action was last performed or when the service last reset the time-based property values.
}			
HumidityPercent (v1.1+) {}	object		Humidity (percent). This property shall contain the humidity, in percent units, for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Humidity</code>. For more information about this property, see <code>SensorExcerpt</code> in Property Details.

Property	Type	Attributes	Notes
PowerLoadPercent (v1.2+) {}	object		The power load (percent) for this equipment. This property shall contain the power load, in percent units, for this device that represents the <code>Total ElectricalContext</code> for this device. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Percent</code>. For more information about this property, see <code>SensorExcerpt</code> in Property Details.
PowerWatts {	object (excerpt)		Power consumption (W). This property shall contain the total power, in watt units, for this resource that represents the <code>Total ElectricalContext</code> sensor when multiple power sensors exist. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Power</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
ApparentVA	number (V.A)	<i>read-only (null)</i>	The product of voltage and current for an AC circuit, in volt-ampere units. This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the <code>Power ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
DataSourceUri	string (URI)	<i>read-only (null)</i>	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
PhaseAngleDegrees (v1.5+)	number	<i>read-only (null)</i>	The phase angle (degrees) between the current and voltage waveforms. This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>Power</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
PowerFactor	number	<i>read-only (null)</i>	The power factor for this sensor. This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. <code>PowerFactor</code> is expressed in unit-less 1/100ths. This property can appear in sensors containing a <code>ReadingType</code> value of <code>Power</code>, and shall not appear in sensors of other <code>ReadingType</code> values.

Property	Type	Attributes	Notes
ReactiveVAR	number (V.A)	<i>read-only</i> (<i>null</i>)	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
Reading	number	<i>read-only</i> (<i>null</i>)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			
TemperatureCelsius (v1.1+) { }	object		Temperature (Celsius). This property shall contain the temperature, in degree Celsius units, for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Temperature</code>. For more information about this property, see SensorExcerpt in Property Details.

6.103.4 Actions

6.103.4.1 ResetMetrics

Description

This action resets the summary metrics related to this equipment.

- This action shall reset any time intervals or counted values for this equipment.

Action URI

{Base URI of target resource}/Actions/PowerDistributionMetrics.ResetMetrics

Action parameters

This action takes no parameters.

6.103.5 Property details

6.103.5.1 SensorExcerpt

The `Sensor` schema describes a sensor and its properties. This object is an excerpt of the `Sensor` resource located at the URI shown in `DataSourceUri`.

DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	read-only (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.

6.103.6 Example response

```
{
  "@odata.type": "#PowerDistributionMetrics.v1_4_0.PowerDistributionMetrics",
  "Id": "Metrics",
  "Name": "Summary Metrics",
  "PowerWatts": {
    "DataSourceUri": "/redfish/v1/Chassis/PDU/Sensors/PDUPower",
    "Reading": 6438,
    "ApparentVA": 6300,
    "ReactiveVAR": 100,
    "PowerFactor": 0.93
  },
  "EnergykWh": {
    "DataSourceUri": "/redfish/v1/Chassis/PDU/Sensors/PDUEnergy",
    "Reading": 56438
  },
  "TemperatureCelsius": {
    "DataSourceUri": "/redfish/v1/Chassis/PDU/Sensors/PDUTemp",
    "Reading": 26.3
  },
  "HumidityPercent": {
    "DataSourceUri": "/redfish/v1/Chassis/PDU/Sensors/PDUHumidity",
    "Reading": 52.7
  },
  "Actions": {
    "#PowerDistributionMetrics.ResetMetrics": {
```

```
        "target": "/redfish/v1/PowerEquipment/RackPDUs/1/Metrics/PowerDistributionMetrics.ResetMetrics"
      },
      "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Metrics"
    }
  }
```

6.104 PowerDomain 1.2.2

Version	v1.2	v1.1	v1.0
Release	2021.3	2021.2	2019.4

6.104.1 Description

The `PowerDomain` schema contains the definition for the DCIM power domain.

- This resource shall represent a DCIM power domain for a Redfish implementation.

6.104.2 URIs

/redfish/v1/Facilities/{FacilityId}/PowerDomains/{PowerDomainId}

6.104.3 Properties

Property	Type	Attributes	Notes
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
ElectricalBuses (v1.2+) [{	array		An array of links to the electrical buses in this power domain. • This property shall contain an array of links to resources of type <code>PowerDistribution</code> that represent the electrical buses in this power domain.
@odata.id	string	read-write	Link to a <code>PowerDistribution</code> resource. See the Links section and the <code>PowerDistribution</code> schema for details.
}]			

Property	Type	Attributes	Notes
FloorPDUs [{	array		An array of links to the floor power distribution units in this power domain. This property shall contain an array of links to resources of type <code>PowerDistribution</code> that represent the floor power distribution units in this power domain.
@odata.id	string	<i>read-write</i>	Link to a <code>PowerDistribution</code> resource. See the Links section and the <code>PowerDistribution</code> schema for details.
}]			
ManagedBy [{	array		An array of links to the managers responsible for managing this power domain. This property shall contain an array of links to resources of type <code>Manager</code> that represent the managers that manage this power domain.
@odata.id	string	<i>read-only</i>	Link to a <code>Manager</code> resource. See the Links section and the <code>Manager</code> schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
PowerShelves (v1.1+) [{	array		An array of links to the power shelves in this power domain. This property shall contain an array of links to resources of type <code>PowerDistribution</code> that represent the power shelves in this power domain.
@odata.id	string	<i>read-write</i>	Link to a <code>PowerDistribution</code> resource. See the Links section and the <code>PowerDistribution</code> schema for details.
}]			
RackPDUs [{	array		An array of links to the rack-level power distribution units in this power domain. This property shall contain an array of links to resources of type <code>PowerDistribution</code> that represent the rack-level power distribution units in this power domain.
@odata.id	string	<i>read-write</i>	Link to a <code>PowerDistribution</code> resource. See the Links section and the <code>PowerDistribution</code> schema for details.
}]			
Switchgear [{	array		An array of links to the switchgear in this power domain. This property shall contain an array of links to resources of type <code>PowerDistribution</code> that represent the switchgear in this power domain.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-write</i>	Link to a PowerDistribution resource. See the Links section and the <i>PowerDistribution</i> schema for details.
}}			
TransferSwitches [{	array		An array of links to the transfer switches in this power domain. This property shall contain an array of links to resources of type <code>PowerDistribution</code> that represent the transfer switches in this power domain.
@odata.id	string	<i>read-write</i>	Link to a PowerDistribution resource. See the Links section and the <i>PowerDistribution</i> schema for details.
}}			
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

6.104.4 Example response

```
{
  "@odata.type": "#PowerDomain.v1_2_2.PowerDomain",
  "Id": "Row1",
  "Name": "Row #1 Domain",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "Links": {
    "ManagedBy": [
      {
        "@odata.id": "/redfish/v1/Managers/BMC"
      }
    ],
    "RackPDUs": [
      {
        "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1"
      }
    ]
  },
  "@odata.id": "/redfish/v1/Facilities/Room237/PowerDomains/Row1"
}
```

6.105 PowerEquipment 1.2.3

Version	v1.2	v1.1	v1.0
Release	2021.3	2021.2	2019.4

6.105.1 Description

The `PowerEquipment` schema represents the set of power equipment managed by a Redfish service.

- This resource shall represent the set of power equipment for a Redfish implementation.

6.105.2 URIs

/redfish/v1/PowerEquipment

6.105.3 Properties

Property	Type	Attributes	Notes
ElectricalBuses (v1.2+) {	object		The link to a collection of electrical buses. This property shall contain a link to a resource collection of type <code>PowerDistributionCollection</code> that contains a set of electrical bus units. Contains a link to a resource.
@odata.id	string	read-only	Link to Collection of <i>PowerDistribution</i> . See the <i>PowerDistribution</i> schema for details.
}			
FloorPDUs {	object		A link to a collection of floor power distribution units. This property shall contain a link to a resource collection of type <code>PowerDistributionCollection</code> that contains a set of floor power distribution units. Contains a link to a resource.
@odata.id	string	read-only	Link to Collection of <i>PowerDistribution</i> . See the <i>PowerDistribution</i> schema for details.
}			

Property	Type	Attributes	Notes
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
ManagedBy [{	array		An array of links to the managers responsible for managing this power equipment. This property shall contain an array of links to resources of type <code>Manager</code> that represent the managers that manage this power equipment.
@odata.id	string	<i>read-only</i>	Link to a Manager resource. See the Links section and the <i>Manager</i> schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
PowerShelves (v1.1+) {	object		A link to a collection of power shelves. This property shall contain a link to a resource collection of type <code>PowerDistributionCollection</code> that contains a set of power shelves. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>PowerDistribution</i> . See the PowerDistribution schema for details.
}			
RackPDUs {	object		A link to a collection of rack-level power distribution units. This property shall contain a link to a resource collection of type <code>PowerDistributionCollection</code> that contains a set of rack-level power distribution units. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>PowerDistribution</i> . See the PowerDistribution schema for details.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
Switchgear {	object		A link to a collection of switchgear. This property shall contain a link to a resource collection of type <code>PowerDistributionCollection</code> that contains a set of switchgear. Contains a link to a resource.

Property	Type	Attributes	Notes
@odata.id	string	read-only	Link to Collection of <i>PowerDistribution</i> . See the PowerDistribution schema for details.
}			
TransferSwitches	object		A link to a collection of transfer switches. This property shall contain a link to a resource collection of type <code>PowerDistributionCollection</code> that contains a set of transfer switches. Contains a link to a resource.
@odata.id	string	read-only	Link to Collection of <i>PowerDistribution</i> . See the PowerDistribution schema for details.
}			

6.105.4 Example response

```

{
  "@odata.type": "#PowerEquipment.v1_2_3.PowerEquipment",
  "Id": "PowerEquipment",
  "Name": "DCIM Power Equipment",
  "Status": {
    "State": "Enabled",
    "HealthRollup": "OK"
  },
  "FloorPDUs": {
    "@odata.id": "/redfish/v1/PowerEquipment/FloorPDUs"
  },
  "RackPDUs": {
    "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs"
  },
  "TransferSwitches": {
    "@odata.id": "/redfish/v1/PowerEquipment/TransferSwitches"
  },
  "@odata.id": "/redfish/v1/PowerEquipment"
}

```

6.106 PowerSubsystem 1.1.3

Version	v1.1	v1.0
Release	2021.2	2020.4

6.106.1 Description

This `PowerSubsystem` schema contains the definition for the power subsystem of a chassis.

- This resource shall represent a power subsystem for a Redfish implementation.

6.106.2 URIs

/redfish/v1/Chassis/{ChassisId}/PowerSubsystem

6.106.3 Properties

Property	Type	Attributes	Notes
Allocation {	object		Power allocation for this subsystem when it represents a subset of the power infrastructure for the chassis or its upstream chassis, such as a chassis containing multiple server blades. This property shall contain the set of properties describing the allocation of power for this subsystem as part of the power infrastructure for the chassis or an upstream chassis. This property should not be present in resources that are not part of a shared power infrastructure.
AllocatedWatts	number (Watts)	read-only (null)	The total amount of power that has been allocated or budgeted to this subsystem. This property shall represent the total power currently allocated or budgeted to this subsystem.
RequestedWatts	number (Watts)	read-only (null)	The potential power, in watt units, that the subsystem requests, which might be higher than the current level being consumed because the requested power includes a budget that the subsystem wants for future use. This property shall represent the amount of power, in watt units, that the subsystem currently requests to be budgeted for future use.
}			
Batteries (v1.1+) {	object		The link to the collection of batteries within this subsystem. This property shall contain a link to a resource collection of type <code>BatteryCollection</code>. Contains a link to a resource.
@odata.id	string	read-only	Link to Collection of <i>Battery</i> . See the Battery schema for details.
}			

Property	Type	Attributes	Notes
CapacityWatts	number (Watts)	<i>read-only</i> (null)	The total amount of power that can be allocated to this subsystem. This value can be either the power supply capacity or the power budget that an upstream chassis assigns to this subsystem. This property shall represent the total power capacity that can be allocated to this subsystem.
PowerSupplies {	object		The link to the collection of power supplies within this subsystem. This property shall contain a link to a resource collection of type <code>PowerSupplyCollection</code> . Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>PowerSupply</i> . See the <i>PowerSupply</i> schema for details.
}			
PowerSupplyRedundancy [{}]	array (object)		The redundancy information for the devices in a redundancy group. - The redundancy information for the set of power supplies in this subsystem. - This property shall contain redundancy information for the set of power supplies in this subsystem. The values of the <code>RedundancyGroup</code> array shall reference resources of type <code>PowerSupply</code> . For property details, see <i>RedundantGroup</i>.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <i>Status</i>.

6.106.4 Example response

```
{
  "@odata.type": "#PowerSubsystem.v1_1_3.PowerSubsystem",
  "Id": "PowerSubsystem",
  "Name": "Power Subsystem for Chassis",
  "CapacityWatts": 2000,
  "Allocation": {
    "RequestedWatts": 1500,
    "AllocatedWatts": 1200
  },
  "PowerSupplyRedundancy": [
    {
      "RedundancyType": "Failover",
      "MaxSupportedInGroup": 2,

```

```
        "MinNeededInGroup": 1,
        "RedundancyGroup": [
            {
                "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay1"
            },
            {
                "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay2"
            }
        ],
        "Status": {
            "State": "UnavailableOffline",
            "Health": "OK"
        }
    },
    "PowerSupplies": {
        "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies"
    },
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem"
}
```

6.107 PowerSupply 1.6.0

Version	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2024.1	2022.2	2022.1	2021.4	2021.3	2021.1	2020.4

6.107.1 Description

The `PowerSupply` schema describes a power supply unit. It also describes the location, such as a slot, socket, or bay, where a unit can be installed, by populating a resource instance with an absent state if a unit is not present.

- This resource shall represent a power supply unit for a Redfish implementation. It may also represent a location, such as a slot, socket, or bay, where a unit may be installed, but the `State` property within the `Status` property contains `Absent`.

6.107.2 URIs

/redfish/v1/Chassis/{ChassisId}/PowerSubsystem/PowerSupplies/{PowerSupplyId}

/redfish/v1/PowerEquipment/PowerShelves/{PowerDistributionId}/PowerSupplies/{PowerSupplyId} (deprecated)

6.107.3 Properties

Property	Type	Attributes	Notes
Assembly {	object		The link to the assembly associated with this power supply. This property shall contain a link to a resource of type <code>Assembly</code>. See the <i>Assembly</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>Assembly</i> resource. See the Links section and the <i>Assembly</i> schema for details.
}			
Certificates (v1.6+) {	object		The link to a collection of certificates for device identity and attestation. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that contains certificates for device identity and attestation. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the <i>Certificate</i> schema for details.
}			
EfficiencyRatings [{	array		The efficiency ratings of this power supply. This property shall contain an array of efficiency ratings for this power supply.
EfficiencyPercent	number (%)	<i>read-only</i> (null)	The rated efficiency of this power supply at the specified load. This property shall contain the rated efficiency, as a percentage, 0 to 100, of this power supply at the specified load.
LoadPercent	number (%)	<i>read-only</i> (null)	The electrical load for this rating. This property shall contain the load, as a percentage, 0 to 100, of this power supply at which this efficiency rating is valid.
}]			

Property	Type	Attributes	Notes
ElectricalSourceManagerURIs (v1.2+) []	array (URI) (string, null)	<i>read-write</i>	The URIs of the management interfaces for the upstream electrical source connections for this power supply. This property shall contain an array of URIs to the management applications or devices that provide monitoring or control of the upstream electrical sources that provide power to this power supply.
ElectricalSourceNames (v1.2+) []	array (string, null)	<i>read-write</i>	The names of the upstream electrical sources, such as circuits or outlets, connected to this power supply. This property shall contain an array of strings that identify the upstream electrical sources, such as the names of circuits or outlets, that provide power to this power supply.
FirmwareVersion	string	<i>read-only</i> (null)	The firmware version for this power supply. This property shall contain the firmware version as defined by the manufacturer for this power supply.
HotPluggable	boolean	<i>read-only</i> (null)	An indication of whether this device can be inserted or removed while the equipment is in operation. This property shall indicate whether the device can be inserted or removed while the underlying equipment otherwise remains in its current operational state. Devices indicated as hot-pluggable shall allow the device to become operable without altering the operational state of the underlying equipment. Devices that cannot be inserted or removed from equipment in operation, or devices that cannot become operable without affecting the operational state of that equipment, shall be indicated as not hot-pluggable.
InputNominalVoltageType	string (enum)	<i>read-only</i> (null)	The nominal voltage type that is detected on the line input to this power supply. This property shall contain the nominal voltage type that is detected on the line input to this power supply. This value shall be one of the values shown in the <code>NominalVoltageType</code> property in the <code>InputRanges</code> array, if present. If the line input voltage is unknown, out of range, or there is no input provided to the power supply, the value shall be <code>null</code>. <i>For the possible property values, see <code>InputNominalVoltageType</code> in Property details.</i>
InputRanges [{	array		The input ranges that the power supply can use. This property shall contain a collection of ranges usable by this power supply.

Property	Type	Attributes	Notes
CapacityWatts	number (Watts)	<i>read-only</i> (<i>null</i>)	The maximum capacity of this power supply when operating in this input range. This property shall contain the maximum amount of power, in watt units, that the associated power supply is rated to deliver while operating in this input range.
NominalVoltageType	string (enum)	<i>read-only</i> (<i>null</i>)	The input voltage range. This property shall contain the input voltage type of the associated range. <i>For the possible property values, see NominalVoltageType in Property details.</i>
}]			
LineInputStatus (v1.3+)	string (enum)	<i>read-only</i> (<i>null</i>)	The status of the line input. This property shall contain the status of the power line input for this power supply. <i>For the possible property values, see LineInputStatus in Property details.</i>
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
Outlet (<i>deprecated v1.4</i>) {	object		A link to the outlet connected to this power supply. This property shall contain a link to a resource of type <code>Outlet</code> that represents the outlet connected to this power supply. See the <i>Outlet</i> schema for details on this property. <i>Deprecated in v1.4 and later. This property has been deprecated in favor of the <code>PowerOutlets</code> property to allow for consistent modeling of power supplies with multiple outlet support.</i>
@odata.id	string	<i>read-write</i>	Link to a Outlet resource. See the Links section and the <i>Outlet</i> schema for details.
}			
PoweringChassis (v1.4+) [{	array		An array of links to the chassis that are directly powered by this power supply. This property shall contain an array of links to resources of type <code>Chassis</code> that represent the chassis directly powered by this power supply. This property shall not be present if the power supply is only providing power to its containing parent chassis.
@odata.id	string	<i>read-only</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.

Property	Type	Attributes	Notes
}]			
PowerOutlets (v1.2+) [{	array		An array of links to the outlets that provide power to this power supply. This property shall contain an array of links to resources of type <code>Outlet</code> that represent the outlets that provide power to this power supply.
@odata.id	string	<i>read-write</i>	Link to a Outlet resource. See the Links section and the <i>Outlet</i> schema for details.
}]			
}			
Location {}	object		The location of the power supply. This property shall contain the location information of the power supply. For a resource in the <code>Absent</code> state, this property describes the empty location, such as a slot, socket, or bay, to represent the available capacity. For property details, see Location.
LocationIndicatorActive	boolean	<i>read-write (null)</i>	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource.
Manufacturer	string	<i>read-only (null)</i>	The manufacturer of this power supply. This property shall contain the name of the organization responsible for producing the power supply. This organization may be the entity from whom the power supply is purchased, but this is not necessarily true.
Metrics {	object		The link to the power supply metrics resource associated with this power supply. This property shall contain a link to a resource of type <code>PowerSupplyMetrics</code>. See the <i>PowerSupplyMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a PowerSupplyMetrics resource. See the Links section and the <i>PowerSupplyMetrics</i> schema for details.
}			
Model	string	<i>read-only (null)</i>	The model number for this power supply. This property shall contain the model information as defined by the manufacturer for this power supply.

Property	Type	Attributes	Notes
OutputNominalVoltageType (v1.5+)	string (enum)	<i>read-only</i> (null)	The nominal output voltage type of this power supply. This property shall contain the nominal voltage type of the single output line of this power supply. This property is intended to describe power supply types that connect to additional power infrastructure components, such as a rectifier component in a modular power system. This property shall not be present for power supplies not intended to connect to additional power infrastructure components. <i>For the possible property values, see OutputNominalVoltageType in Property details.</i>
OutputRails [{	array		The output power rails provided by this power supply. This property shall contain an array of output power rails provided by this power supply. The elements shall be ordered in ascending nominal voltage order. This ordering is necessary for consistency with <code>Sensor</code> properties in an associated <code>PowerSupplyMetrics</code> resource.
NominalVoltage	number	<i>read-only</i> (null)	The nominal voltage of this output power rail. This property shall contain the nominal voltage of the associated output power rail.
PhysicalContext	string (enum)	<i>read-only</i>	The area or device to which this power rail applies. This property shall contain a description of the device or region within the chassis to which this power rail applies. <i>For the possible property values, see PhysicalContext in Property details.</i>
}]			
PartNumber	string	<i>read-only</i> (null)	The part number for this power supply. This property shall contain the part number as defined by the manufacturer for this power supply.
PhaseWiringType	string (enum)	<i>read-only</i> (null)	The number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires) provided for the power supply input connector. This property shall contain the number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires) included in the input connector for the power supply. <i>For the possible property values, see PhaseWiringType in Property details.</i>
PlugType	string (enum)	<i>read-only</i> (null)	The type of plug according to NEMA, IEC, or regional standards. This property shall contain the type of physical plug used for the input to this power supply, as defined by IEC, NEMA, or regional standards. <i>For the possible property values, see PlugType in Property details.</i>

Property	Type	Attributes	Notes
PowerCapacityWatts	number (Watts)	<i>read-only</i> (null)	The maximum capacity of this power supply. This property shall contain the maximum amount of power, in watt units, that this power supply is rated to deliver.
PowerSupplyType	string (enum)	<i>read-only</i> (null)	The power supply type (AC or DC). This property shall contain the input power type (AC or DC) of this power supply. <i>For the possible property values, see <code>PowerSupplyType</code> in Property details.</i>
ProductionDate (v1.1+)	string (date-time)	<i>read-only</i> (null)	The production or manufacturing date of this power supply. This property shall contain the date of production or manufacture for this power supply.
Replaceable (v1.5+)	boolean	<i>read-only</i> (null)	An indication of whether this component can be independently replaced as allowed by the vendor's replacement policy. This property shall indicate whether this component can be independently replaced as allowed by the vendor's replacement policy. A value of <code>false</code> indicates the component needs to be replaced by policy as part of another component. If the <code>LocationType</code> property of this component contains <code>Embedded</code>, this property shall contain <code>false</code>.
SerialNumber	string	<i>read-only</i> (null)	The serial number for this power supply. This property shall contain the serial number as defined by the manufacturer for this power supply.
SparePartNumber	string	<i>read-only</i> (null)	The spare part number for this power supply. This property shall contain the spare or replacement part number as defined by the manufacturer for this power supply.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <code>Status</code>.
Version (v1.1+)	string	<i>read-only</i> (null)	The hardware version of this power supply. This property shall contain the hardware version of this power supply as determined by the vendor or supplier.

6.107.4 Actions

6.107.4.1 Reset

Description

This action resets the power supply.

- This action shall reset a power supply. A `GracefulRestart` `ResetType` shall reset the power supply but shall not affect the power output. A `ForceRestart` `ResetType` can affect the power supply output.

Action URI

{Base URI of target resource}/Actions/PowerSupply.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	<i>optional</i>	The type of reset. • This parameter shall contain the type of reset. The service can accept a request without the parameter and shall perform a <code>GracefulRestart</code>. <i>For the possible property values, see <code>ResetType</code> in Property details.</i>

Request Example

```
{
  "ResetType": "ForceRestart"
}
```

6.107.5 Property details

6.107.5.1 InputNominalVoltageType

The nominal voltage type that is detected on the line input to this power supply.

- This property shall contain the nominal voltage type that is detected on the line input to this power supply. This value shall be one of the values shown in the `NominalVoltageType` property in the `InputRanges` array, if present. If the line input voltage is unknown, out of range, or there is no input provided to the power supply, the value

shall be `null`.

string	Description
AC100To127V	AC 100-127V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 100-127VAC. Range values are generally used to describe support on device inputs or inlets.
AC100To240V	AC 100-240V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 100-240VAC. Range values are generally used to describe support on device inputs or inlets.
AC100To277V	AC 100-277V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 100-277VAC. Range values are generally used to describe support on device inputs or inlets.
AC120V	AC 120V nominal. This value shall indicate the device supports a nominal voltage of 120VAC. Specific values are generally used to describe support on device outputs or outlets.
AC200To240V	AC 200-240V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 200-240VAC. Range values are generally used to describe support on device inputs or inlets.
AC200To277V	AC 200-277V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 200-277VAC. Range values are generally used to describe support on device inputs or inlets.
AC208V	AC 208V nominal. This value shall indicate the device supports a nominal voltage of 208VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC230V	AC 230V nominal. This value shall indicate the device supports a nominal voltage of 230AC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC240AndDC380V	AC 200-240V and DC 380V. This value shall indicate the device supports a nominal voltage in the complete range of 200-240VAC or a value of 380VDC. Range values are generally used to describe support on device inputs or inlets.

string	Description
AC240V	AC 240V nominal. This value shall indicate the device supports a nominal voltage of 240VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC277AndDC380V	AC 200-277V and DC 380V. This value shall indicate the device supports a nominal voltage in the complete range of 200-277VAC or a value of 380VDC. Range values are generally used to describe support on device inputs or inlets.
AC277V	AC 277V nominal. This value shall indicate the device supports a nominal voltage of 277VAC. Specific AC high-voltage values may be used to describe support on device inputs or outputs.
AC400V	AC 400V or 415V nominal. This value shall indicate the device supports a nominal voltage of 400VAC or 415VAC. Specific AC high-voltage values may be used to describe support on device inputs or outputs.
AC480V	AC 480V nominal. This value shall indicate the device supports a nominal voltage of 480VAC. Specific AC high-voltage values may be used to describe support on device inputs or outputs.
DC12V	DC 12V nominal. This value shall indicate the device supports a nominal voltage of 12VDC.
DC16V	DC 16V nominal. This value shall indicate the device supports a nominal voltage of 16VDC.
DC1_8V	DC 1.8V nominal. This value shall indicate the device supports a nominal voltage of 1.8VDC.
DC240V	DC 240V nominal. This value shall indicate the device supports a nominal voltage of 240VDC.
DC380V	High-voltage DC (380V). This value shall indicate the device supports a nominal voltage of 380VDC.
DC3_3V	DC 3.3V nominal. This value shall indicate the device supports a nominal voltage of 3.3VDC.

string	Description
DC48V	DC 48V nominal. This value shall indicate the device supports a nominal voltage of 48VDC.
DC5V	DC 5V nominal. This value shall indicate the device supports a nominal voltage of 5VDC.
DC9V	DC 9V nominal. This value shall indicate the device supports a nominal voltage of 9VDC.
DCNeg48V	-48V DC. This value shall indicate the device supports a nominal voltage of -48VDC.

6.107.5.2 LineInputStatus

The status of the line input.

- This property shall contain the status of the power line input for this power supply.

string	Description
LossOfInput	No power detected at line input.
Normal	Line input is within normal operating range.
OutOfRange	Line input voltage or current is outside of normal operating range.

6.107.5.3 NominalVoltageType

The input voltage range.

- This property shall contain the input voltage type of the associated range.

string	Description
AC100To127V	AC 100-127V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 100-127VAC. Range values are generally used to describe support on device inputs or inlets.

string	Description
AC100To240V	AC 100-240V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 100-240VAC. Range values are generally used to describe support on device inputs or inlets.
AC100To277V	AC 100-277V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 100-277VAC. Range values are generally used to describe support on device inputs or inlets.
AC120V	AC 120V nominal. This value shall indicate the device supports a nominal voltage of 120VAC. Specific values are generally used to describe support on device outputs or outlets.
AC200To240V	AC 200-240V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 200-240VAC. Range values are generally used to describe support on device inputs or inlets.
AC200To277V	AC 200-277V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 200-277VAC. Range values are generally used to describe support on device inputs or inlets.
AC208V	AC 208V nominal. This value shall indicate the device supports a nominal voltage of 208VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC230V	AC 230V nominal. This value shall indicate the device supports a nominal voltage of 230VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC240AndDC380V	AC 200-240V and DC 380V. This value shall indicate the device supports a nominal voltage in the complete range of 200-240VAC or a value of 380VDC. Range values are generally used to describe support on device inputs or inlets.
AC240V	AC 240V nominal. This value shall indicate the device supports a nominal voltage of 240VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC277AndDC380V	AC 200-277V and DC 380V. This value shall indicate the device supports a nominal voltage in the complete range of 200-277VAC or a value of 380VDC. Range values are generally used to describe support on device inputs or inlets.

string	Description
AC277V	AC 277V nominal. This value shall indicate the device supports a nominal voltage of 277VAC. Specific AC high-voltage values may be used to describe support on device inputs or outputs.
AC400V	AC 400V or 415V nominal. This value shall indicate the device supports a nominal voltage of 400VAC or 415VAC. Specific AC high-voltage values may be used to describe support on device inputs or outputs.
AC480V	AC 480V nominal. This value shall indicate the device supports a nominal voltage of 480VAC. Specific AC high-voltage values may be used to describe support on device inputs or outputs.
DC12V	DC 12V nominal. This value shall indicate the device supports a nominal voltage of 12VDC.
DC16V	DC 16V nominal. This value shall indicate the device supports a nominal voltage of 16VDC.
DC1_8V	DC 1.8V nominal. This value shall indicate the device supports a nominal voltage of 1.8VDC.
DC240V	DC 240V nominal. This value shall indicate the device supports a nominal voltage of 240VDC.
DC380V	High-voltage DC (380V). This value shall indicate the device supports a nominal voltage of 380VDC.
DC3_3V	DC 3.3V nominal. This value shall indicate the device supports a nominal voltage of 3.3VDC.
DC48V	DC 48V nominal. This value shall indicate the device supports a nominal voltage of 48VDC.
DC5V	DC 5V nominal. This value shall indicate the device supports a nominal voltage of 5VDC.

string	Description
DC9V	DC 9V nominal. This value shall indicate the device supports a nominal voltage of 9VDC.
DCNeg48V	-48V DC. This value shall indicate the device supports a nominal voltage of -48VDC.

6.107.5.4 OutputNominalVoltageType

The nominal output voltage type of this power supply.

- This property shall contain the nominal voltage type of the single output line of this power supply. This property is intended to describe power supply types that connect to additional power infrastructure components, such as a rectifier component in a modular power system. This property shall not be present for power supplies not intended to connect to additional power infrastructure components.

string	Description
AC100To127V	AC 100-127V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 100-127VAC. Range values are generally used to describe support on device inputs or inlets.
AC100To240V	AC 100-240V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 100-240VAC. Range values are generally used to describe support on device inputs or inlets.
AC100To277V	AC 100-277V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 100-277VAC. Range values are generally used to describe support on device inputs or inlets.
AC120V	AC 120V nominal. This value shall indicate the device supports a nominal voltage of 120VAC. Specific values are generally used to describe support on device outputs or outlets.
AC200To240V	AC 200-240V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 200-240VAC. Range values are generally used to describe support on device inputs or inlets.

string	Description
AC200To277V	AC 200-277V nominal. This value shall indicate the device supports a nominal voltage in the complete range of 200-277VAC. Range values are generally used to describe support on device inputs or inlets.
AC208V	AC 208V nominal. This value shall indicate the device supports a nominal voltage of 208VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC230V	AC 230V nominal. This value shall indicate the device supports a nominal voltage of 230VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC240AndDC380V	AC 200-240V and DC 380V. This value shall indicate the device supports a nominal voltage in the complete range of 200-240VAC or a value of 380VDC. Range values are generally used to describe support on device inputs or inlets.
AC240V	AC 240V nominal. This value shall indicate the device supports a nominal voltage of 240VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC277AndDC380V	AC 200-277V and DC 380V. This value shall indicate the device supports a nominal voltage in the complete range of 200-277VAC or a value of 380VDC. Range values are generally used to describe support on device inputs or inlets.
AC277V	AC 277V nominal. This value shall indicate the device supports a nominal voltage of 277VAC. Specific AC high-voltage values may be used to describe support on device inputs or outputs.
AC400V	AC 400V or 415V nominal. This value shall indicate the device supports a nominal voltage of 400VAC or 415VAC. Specific AC high-voltage values may be used to describe support on device inputs or outputs.
AC480V	AC 480V nominal. This value shall indicate the device supports a nominal voltage of 480VAC. Specific AC high-voltage values may be used to describe support on device inputs or outputs.
DC12V	DC 12V nominal. This value shall indicate the device supports a nominal voltage of 12VDC.

string	Description
DC16V	DC 16V nominal. This value shall indicate the device supports a nominal voltage of 16VDC.
DC1_8V	DC 1.8V nominal. This value shall indicate the device supports a nominal voltage of 1.8VDC.
DC240V	DC 240V nominal. This value shall indicate the device supports a nominal voltage of 240VDC.
DC380V	High-voltage DC (380V). This value shall indicate the device supports a nominal voltage of 380VDC.
DC3_3V	DC 3.3V nominal. This value shall indicate the device supports a nominal voltage of 3.3VDC.
DC48V	DC 48V nominal. This value shall indicate the device supports a nominal voltage of 48VDC.
DC5V	DC 5V nominal. This value shall indicate the device supports a nominal voltage of 5VDC.
DC9V	DC 9V nominal. This value shall indicate the device supports a nominal voltage of 9VDC.
DCNeg48V	-48V DC. This value shall indicate the device supports a nominal voltage of -48VDC.

6.107.5.5 PhaseWiringType

The number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires) provided for the power supply input connector.

- This property shall contain the number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires) included in the input connector for the power supply.

string	Description
OneOrTwoPhase3Wire	Single or two-phase / 3-wire (Line1, Line2 or Neutral, Protective Earth). This value shall represent a single or two-phase / 3-wire (Line1, Line2 or Neutral, Protective Earth) wiring. This value shall be used when both phase configurations are supported. This is most common where detachable cordsets are used. If poly-phase properties such as <code>PolyPhaseVoltage</code> are supported, the service should populate the measurements as if the circuit is wired as Line1, Neutral, and Protective Earth.
OnePhase3Wire	Single-phase / 3-wire (Line1, Neutral, Protective Earth). This value shall represent a single-phase / 3-wire (Line1, Neutral, Protective Earth) wiring.
ThreePhase4Wire	Three-phase / 4-wire (Line1, Line2, Line3, Protective Earth). This value shall represent a three-phase / 4-wire (Line1, Line2, Line3, Protective Earth) wiring.
ThreePhase5Wire	Three-phase / 5-wire (Line1, Line2, Line3, Neutral, Protective Earth). This value shall represent a three-phase / 5-wire (Line1, Line2, Line3, Neutral, Protective Earth) wiring.
TwoPhase3Wire	Two-phase / 3-wire (Line1, Line2, Protective Earth). This value shall represent a two-phase / 3-wire (Line1, Line2, Protective Earth) wiring.
TwoPhase4Wire	Two-phase / 4-wire (Line1, Line2, Neutral, Protective Earth). This value shall represent a two-phase / 4-wire (Line1, Line2, Neutral, Protective Earth) wiring.

6.107.5.6 PhysicalContext

The area or device to which this power rail applies.

- This property shall contain a description of the device or region within the chassis to which this power rail applies.

string	Description
Accelerator	An accelerator.
ACInput	An AC electrical input or input-related circuit.
ACMaintenanceBypassInput	An AC electrical maintenance bypass input.

string	Description
ACOutput	An AC electrical output or output-related circuit. This value shall indicate an electrical output or an output-related circuit, such as a branch output, which is not terminated as a power outlet.
ACStaticBypassInput	An AC electrical static bypass input.
ACUtilityInput	An AC electrical utility input. This value shall indicate an electrical input, where the source is an electrical utility as opposed to a backup or locally-generated power source. This value is intended to differentiate multiple electrical inputs between utility, maintenance bypass, or static bypass values. For general purpose usage, the value of <code>ACInput</code> is preferred.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	A compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC electrical bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	An expansion bay. This value shall indicate a location that provides for the expansion of functionality of a system, such as a PCIe slot that can accept an option card.
ExpansionSubsystem	A group of expansion bays. This value shall indicate a group of expansion bays and the devices installed in those bays.
Fan	A fan.

string	Description
Filter	A filter.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Manager	A management controller, such as a BMC (baseboard management controller).
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	A networking bay. This value shall indicate a location that provides for the expansion of networking functionality of a system, by the addition of networking devices.
NetworkingDevice	A networking device.
PowerOutlet	An electrical outlet. This value shall indicate an electrical outlet or receptacle.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	A power supply bay. This value shall indicate a location that provides for the installation of a power supply or similar devices.
Pump	A pump.
Rectifier	A rectifier device.
Reservoir	A reservoir.

string	Description
Room	The room.
StorageBay	A storage bay. This value shall indicate a location that provides for the expansion of storage functionality of a system, by the addition of storage devices.
StorageDevice	A storage device.
StorageSubsystem	A storage subsystem. This value shall indicate a storage subsystem, which may consist of one or more storage controllers, storage devices, or related components.
Switch	A switch device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.107.5.7 PlugType

The type of plug according to NEMA, IEC, or regional standards.

- This property shall contain the type of physical plug used for the input to this power supply, as defined by IEC, NEMA, or regional standards.

string	Description
California_CS8265	California Standard CS8265 (Single-phase 250V; 50A; 2P3W). This value shall represent a plug that matches the 'California Standard' CS8265 style plug (Single-phase 250V; 50A; 2P3W).

string	Description
California_CS8365	California Standard CS8365 (Three-phase 250V; 50A; 3P4W). This value shall represent a plug that matches the 'California Standard' CS8365 style plug (Three-phase 250V; 50A; 3P4W).
Field_208V_3P4W_60A	Field-wired; Three-phase 200-250V; 60A; 3P4W. This value shall represent field-wired input that is three-phase 200-250V; 60A; 3P4W.
Field_400V_3P5W_32A	Field-wired; Three-phase 200-240/346-415V; 32A; 3P5W. This value shall represent field-wired input that is three-phase 200-240/346-415V; 32A; 3P5W.
IEC_60309_316P6	IEC 60309 316P6 (Single-phase 200-250V; 16A; 1P3W; Blue, 6-hour). This value shall represent a plug that matches the IEC 60309 316P6 plug (Single-phase 200-250V; 16A; 1P3W; Blue, 6-hour).
IEC_60309_332P6	IEC 60309 332P6 (Single-phase 200-250V; 32A; 1P3W; Blue, 6-hour). This value shall represent a plug that matches the IEC 60309 332P6 plug (Single-phase 200-250V; 32A; 1P3W; Blue, 6-hour).
IEC_60309_363P6	IEC 60309 363P6 (Single-phase 200-250V; 63A; 1P3W; Blue, 6-hour). This value shall represent a plug that matches the IEC 60309 363P6 plug (Single-phase 200-250V; 63A; 1P3W; Blue, 6-hour).
IEC_60309_460P9	IEC 60309 460P9 (Three-phase 200-250V; 60A; 3P4W; Blue; 9-hour). This value shall represent a plug that matches the IEC 60309 460P9 plug (Three-phase 200-250V; 60A; 3P4W; Blue; 9-hour).
IEC_60309_516P6	IEC 60309 516P6 (Three-phase 200-240/346-415V; 16A; 3P5W; Red; 6-hour). This value shall represent a plug that matches the IEC 60309 516P6 plug (Three-phase 200-240/346-415V; 16A; 3P5W; Red; 6-hour).
IEC_60309_532P6	IEC 60309 532P6 (Three-phase 200-240/346-415V; 32A; 3P5W; Red; 6-hour). This value shall represent a plug that matches the IEC 60309 plug 532P6 (Three-phase 200-240/346-415V; 32A; 3P5W; Red; 6-hour).
IEC_60309_560P9	IEC 60309 560P9 (Three-phase 120-144/208-250V; 60A; 3P5W; Blue; 9-hour). This value shall represent a plug that matches the IEC 60309 plug 560P9 (Three-phase 120-144/208-250V; 60A; 3P5W; Blue; 9-hour).

string	Description
IEC_60309_563P6	IEC 60309 563P6 (Three-phase 200-240/346-415V; 63A; 3P5W; Red; 6-hour). This value shall represent a plug that matches the IEC 60309 563P6 plug (Three-phase 200-240/346-415V; 63A; 3P5W; Red; 6-hour).
IEC_60320_C14	IEC C14 (Single-phase 250V; 10A; 1P3W). This value shall represent a plug that matches the IEC 60320 specified C14 input (Single-phase 250V; 10A; 1P3W).
IEC_60320_C20	IEC C20 (Single-phase 250V; 16A; 1P3W). This value shall represent a plug that matches the IEC 60320 specified C20 input (Single-phase 250V; 16A; 1P3W).
NEMA_5_15P	NEMA 5-15P (Single-phase 125V; 15A; 1P3W). This value shall represent a plug that matches the NEMA specified 5-15 straight (non-locking) plug (Single-phase 125V; 15A; 1P3W).
NEMA_5_20P	NEMA 5-20P (Single-phase 125V; 20A; 1P3W). This value shall represent a plug that matches the NEMA specified 5-20 straight (non-locking) plug that exhibits a T-slot (Single-phase 125V; 20A; 1P3W).
NEMA_6_15P	NEMA 6-15P (Single-phase 250V; 15A; 2P3W). This value shall represent a plug that matches the NEMA specified 6-15 straight (non-locking) plug (Single-phase 250V; 15A; 2P3W).
NEMA_6_20P	NEMA 6-20P (Single-phase 250V; 20A; 2P3W). This value shall represent a plug that matches the NEMA specified 6-20 straight (non-locking) plug (Single-phase 250V; 20A; 2P3W).
NEMA_L14_20P	NEMA L14-20P (Split-phase 125/250V; 20A; 2P4W). This value shall represent a plug that matches the NEMA specified locking L14-20 plug (Split-phase 125/250V; 20A; 2P4W).
NEMA_L14_30P	NEMA L14-30P (Split-phase 125/250V; 30A; 2P4W). This value shall represent a plug that matches the NEMA specified locking L14-30 plug (Split-phase 125/250V; 30A; 2P4W).
NEMA_L15_20P	NEMA L15-20P (Three-phase 250V; 20A; 3P4W). This value shall represent a plug that matches the NEMA specified locking L15-20 plug (Three-phase 250V; 20A; 3P4W).

string	Description
NEMA_L15_30P	NEMA L15-30P (Three-phase 250V; 30A; 3P4W). This value shall represent a plug that matches the NEMA specified locking L15-30 plug (Three-phase 250V; 30A; 3P4W).
NEMA_L21_20P	NEMA L21-20P (Three-phase 120/208V; 20A; 3P5W). This value shall represent a plug that matches the NEMA specified locking L21-20 plug (Three-phase 120/208V; 20A; 3P5W).
NEMA_L21_30P	NEMA L21-30P (Three-phase 120/208V; 30A; 3P5W). This value shall represent a plug that matches the NEMA specified locking L21-30 plug (Three-phase 120/208V; 30A; 3P5W).
NEMA_L22_20P	NEMA L22-20P (Three-phase 277/480V; 20A; 3P5W). This value shall represent a plug that matches the NEMA specified locking L22-20 plug (Three-phase 277/480V; 20A; 3P5W).
NEMA_L22_30P	NEMA L22-30P (Three-phase 277/480V; 30A; 3P5W). This value shall represent a plug that matches the NEMA specified locking L22-30 plug (Three-phase 277/480V; 30A; 3P5W).
NEMA_L5_15P	NEMA L5-15P (Single-phase 125V; 15A; 1P3W). This value shall represent a plug that matches the NEMA specified locking L5-15 plug (Single-phase 125V; 15A; 1P3W).
NEMA_L5_20P	NEMA L5-20P (Single-phase 125V; 20A; 1P3W). This value shall represent a plug that matches the NEMA specified locking L5-20 plug (Single-phase 125V; 20A; 1P3W).
NEMA_L5_30P	NEMA L5-30P (Single-phase 125V; 30A; 1P3W). This value shall represent a plug that matches the NEMA specified locking L5-30 plug (Single-phase 125V; 30A; 1P3W).
NEMA_L6_15P	NEMA L6-15P (Single-phase 250V; 15A; 2P3W). This value shall represent a plug that matches the NEMA specified locking L6-15 plug (Single-phase 250V; 15A; 2P3W).
NEMA_L6_20P	NEMA L6-20P (Single-phase 250V; 20A; 2P3W). This value shall represent a plug that matches the NEMA specified locking L6-20 plug (Single-phase 250V; 20A; 2P3W).

string	Description
NEMA_L6_30P	NEMA L6-30P (Single-phase 250V; 30A; 2P3W). This value shall represent a plug that matches the NEMA specified locking L6-30 plug (Single-phase 250V; 30A; 2P3W).

6.107.5.8 PowerSupplyType

The power supply type (AC or DC).

- This property shall contain the input power type (AC or DC) of this power supply.

string	Description
AC	Alternating Current (AC) power supply.
ACorDC	The power supply supports both DC and AC.
DC	Direct Current (DC) power supply.
DCRegulator (v1.5+)	Direct Current (DC) voltage regulator.

6.107.5.9 ResetType

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and shall perform a `GracefulRestart`.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.
ForceOn	Turn on the unit immediately. This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property shall contain the value <code>on</code>.

string	Description
ForceRestart	Shut down immediately and non-gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
FullPowerCycle	Full power cycle the unit. Behaves like removing utility lines, followed by restoring utility lines to the resource. This value shall indicate the resource will perform a full power cycle as if utility lines to the resource are removed and restored. This is different from <code>PowerCycle</code> in that it's as close to a true power cycle as possible. For example, removing AC power cables from an enclosure and then restoring the AC power cables. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>. If a service supports this value but there are no other distinct power cycle flows, the service shall support <code>PowerCycle</code> as an alias to <code>FullPowerCycle</code>. This type of reset may cause the manager providing the Redfish service to power cycle. If the manager providing the Redfish service is affected by this type of reset, the service shall send the action response before resetting to prevent client timeouts.
GracefulRestart	Shut down gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
GracefulShutdown	Shut down gracefully and power off. This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.

string	Description
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a paused state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Paused</code>.
PowerCycle	Power cycle the unit. Behaves like a power removal, followed by a power restore to the resource. This value shall indicate the resource will perform a power cycle. This is different from <code>FullPowerCycle</code> in that it typically performs localized power sequencing of the resource while external power is still present. For example, turning DC voltage regulators off and then turning DC voltage regulators back on. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
PushPowerButton	Simulate the pressing of the physical power button on this unit. This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.

6.107.6 Example response

```

{
  "@odata.type": "#PowerSupply.v1_6_0.PowerSupply",
  "Id": "Bay1",
  "Name": "Power Supply Bay 1",
  "Status": {
    "State": "Enabled",
    "Health": "Warning"
  },
  "LineInputStatus": "Normal",
  "Model": "RKS-440DC",

```



```
"Manufacturer": "Contoso Power",
"FirmwareVersion": "1.00",
"SerialNumber": "3488247",
"PartNumber": "23456-133",
"SparePartNumber": "93284-133",
"LocationIndicatorActive": false,
"HotPluggable": false,
"PowerCapacityWatts": 400,
"PhaseWiringType": "OnePhase3Wire",
"PlugType": "IEC_60320_C14",
"InputRanges": [
  {
    "NominalVoltageType": "AC200To240V",
    "CapacityWatts": 400
  },
  {
    "NominalVoltageType": "AC120V",
    "CapacityWatts": 350
  },
  {
    "NominalVoltageType": "DC380V",
    "CapacityWatts": 400
  }
],
"EfficiencyRatings": [
  {
    "LoadPercent": 25,
    "EfficiencyPercent": 75
  },
  {
    "LoadPercent": 50,
    "EfficiencyPercent": 85
  },
  {
    "LoadPercent": 90,
    "EfficiencyPercent": 80
  }
],
"OutputRails": [
  {
    "NominalVoltage": 3.3,
    "PhysicalContext": "SystemBoard"
  },
  {
    "NominalVoltage": 5,
    "PhysicalContext": "SystemBoard"
  },
  {
    "NominalVoltage": 12,
    "PhysicalContext": "StorageDevice"
  }
]
```

```

    }
  ],
  "Location": {
    "PartLocation": {
      "ServiceLabel": "PSU 1",
      "LocationType": "Bay",
      "LocationOrdinalValue": 0
    }
  },
  "Links": {
    "Outlet": {
      "@odata.id": "https://redfishpdu.contoso.com/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A4"
    }
  },
  "Assembly": {
    "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay1/Assembly"
  },
  "Metrics": {
    "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay1/Metrics"
  },
  "Actions": {
    "#PowerSupply.Reset": {
      "target": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay1/PowerSupply.Reset"
    }
  },
  "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay1"
}

```

6.108 PowerSupplyMetrics 1.1.2

Version	v1.1	v1.0
Release	2023.1	2020.4

6.108.1 Description

The `PowerSupplyMetrics` schema contains definitions for the metrics of a power supply.

- This resource shall be used to represent the metrics of a power supply unit for a Redfish implementation.

6.108.2 URIs

`/redfish/v1/Chassis/{ChassisId}/PowerSubsystem/PowerSupplies/{PowerSupplyId}/Metrics`

`/redfish/v1/PowerEquipment/PowerShelves/{PowerDistributionId}/PowerSupplies/{PowerSupplyId}/Metrics`

6.108.3 Properties

Property	Type	Attributes	Notes
EnergykWh {	object (excerpt)		The energy consumption (kWh) of this unit. This property shall contain the total energy, in kilowatt-hour units, for this unit that represents the <code>Total</code> <code>ElectricalContext</code> sensor when multiple energy sensors exist. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>EnergykWh</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
ApparentkVAh (v1.5+)	number (kV.A.h)	<i>read-only</i> (null)	Apparent energy (kVAh). This property shall contain the apparent energy, in kilovolt-ampere-hour units, for an electrical energy measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>EnergykWh</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
LifetimeReading (v1.1+)	number	<i>read-only</i> (null)	The total accumulation value for this sensor. This property shall contain the total accumulation of the <code>Reading</code> property over the sensor's lifetime. This value shall not be reset by the <code>ResetMetrics</code> action.
ReactivekVARh (v1.5+)	number (kV.A.h)	<i>read-only</i> (null)	Reactive energy (kVARh). This property shall contain the reactive energy, in kilovolt-ampere-hours (reactive) units, for an electrical energy measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>EnergykWh</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
SensorResetTime	string (date-time)	<i>read-only</i> (null)	The date and time when the time-based properties were last reset. This property shall contain the date and time when the <code>ResetMetrics</code> action was last performed or when the service last reset the time-based property values.

Property	Type	Attributes	Notes
}			
FanSpeedPercent (<i>deprecated v1.1</i>) {	object (excerpt)		The fan speed (percent) for this power supply. This property shall contain the fan speed, in percent units, for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Percent</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>. <i>Deprecated in v1.1 and later. This property has been deprecated in favor of <code>FanSpeedsPercent</code> to support multiple fans within a power supply.</i>
DataSourceUri	string (URI)	<i>read-only</i> (<i>null</i>)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (<i>null</i>)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
SpeedRPM (v1.2+)	number ({rev}/min)	<i>read-only</i> (<i>null</i>)	The rotational speed. This property shall contain a reading of the rotational speed of the device in revolutions per minute (RPM) units.
}			
FanSpeedsPercent (v1.1+) [{	array (excerpt)		Fan speeds (percent). This property shall contain the fan speeds, in percent units, for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Percent</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
DataSourceUri	string (URI)	<i>read-only</i> (<i>null</i>)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
DeviceName (v1.2+)	string	<i>read-only</i> (<i>null</i>)	The name of the device. This property shall contain the name of the device associated with this sensor. If the device is represented by a resource, the value shall contain the value of the <code>Name</code> property of the associated resource.

Property	Type	Attributes	Notes
PhysicalContext	string (enum)	<i>read-write</i> (null)	The area or device to which this sensor measurement applies. This property shall contain a description of the affected component or region within the equipment to which this sensor measurement applies. <i>For the possible property values, see <code>PhysicalContext</code> in Property details.</i>
PhysicalSubContext	string (enum)	<i>read-write</i> (null)	The usage or location within a device to which this sensor measurement applies. This property shall contain a description of the usage or sub-region within the equipment to which this sensor measurement applies. This property generally differentiates multiple sensors within the same <code>PhysicalContext</code> instance. <i>For the possible property values, see <code>PhysicalSubContext</code> in Property details.</i>
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
SpeedRPM (v1.2+)	number ({rev}/min)	<i>read-only</i> (null)	The rotational speed. This property shall contain a reading of the rotational speed of the device in revolutions per minute (RPM) units.
}]			
FrequencyHz {	object (excerpt)		The frequency (Hz) for this power supply. This property shall contain the frequency, in hertz units, for this power supply. This object is an excerpt of the <i>Sensor</i> resource located at the URI shown in <code>DataSourceUri</code>.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			

Property	Type	Attributes	Notes
InputCurrentAmps {	object (excerpt)		The input current (A) for this power supply. This property shall contain the input current, in ampere units, for this power supply. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Current</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
CrestFactor (v1.1+)	number	<i>read-only</i> (null)	The crest factor for this sensor. This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
THDPercent (v1.1+)	number (%)	<i>read-only</i> (null)	The total harmonic distortion percent (% THD). This property shall contain the total harmonic distortion of the <code>Reading</code> property in percent units, typically 0 to 100.
}			
InputPowerWatts {	object (excerpt)		The input power (W) for this power supply. This property shall contain the input power, in watt units, for this power supply. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Power</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
ApparentVA	number (V.A)	<i>read-only</i> (null)	The product of voltage and current for an AC circuit, in volt-ampere units. This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.

Property	Type	Attributes	Notes
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
PhaseAngleDegrees (v1.5+)	number	<i>read-only</i> (null)	The phase angle (degrees) between the current and voltage waveforms. This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>Power</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
PowerFactor	number	<i>read-only</i> (null)	The power factor for this sensor. This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. <code>PowerFactor</code> is expressed in unit-less 1/100ths. This property can appear in sensors containing a <code>ReadingType</code> value of <code>Power</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
ReactiveVAR	number (V.A)	<i>read-only</i> (null)	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			
InputVoltage {	object (excerpt)		The input voltage (V) for this power supply. This property shall contain the input voltage, in volt units, for this power supply. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Voltage</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
CrestFactor (v1.1+)	number	<i>read-only</i> (null)	The crest factor for this sensor. This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.

Property	Type	Attributes	Notes
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
THDPercent (v1.1+)	number (%)	<i>read-only</i> (null)	The total harmonic distortion percent (% THD). This property shall contain the total harmonic distortion of the <code>Reading</code> property in percent units, typically 0 to 100.
}			
OutputPowerWatts {	object (excerpt)		The total power output (W) for this power supply. This property shall contain the total output power, in watt units, for this power supply. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Power</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
ApparentVA	number (V.A)	<i>read-only</i> (null)	The product of voltage and current for an AC circuit, in volt-ampere units. This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
PhaseAngleDegrees (v1.5+)	number	<i>read-only</i> (null)	The phase angle (degrees) between the current and voltage waveforms. This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>Power</code>, and shall not appear in sensors with other <code>ReadingType</code> values.

Property	Type	Attributes	Notes
PowerFactor	number	<i>read-only</i> (null)	The power factor for this sensor. This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. <code>PowerFactor</code> is expressed in unit-less 1/100ths. This property can appear in sensors containing a <code>ReadingType</code> value of <code>Power</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
ReactiveVAR	number (V.A)	<i>read-only</i> (null)	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			
RailCurrentAmps [{	array (excerpt)		The output currents (A) for this power supply. This property shall contain the output currents, in ampere units, for this power supply. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Current</code>. The sensors shall appear in the same array order as the <code>OutputRails</code> property in the associated <code>PowerSupply</code> resource. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
CrestFactor (v1.1+)	number	<i>read-only</i> (null)	The crest factor for this sensor. This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.

Property	Type	Attributes	Notes
THDPercent (v1.1+)	number (%)	<i>read-only</i> (null)	The total harmonic distortion percent (% THD). This property shall contain the total harmonic distortion of the <code>Reading</code> property in percent units, typically 0 to 100.
}}			
RailPowerWatts [{	array (excerpt)		The output power readings (W) for this power supply. This property shall contain the output power readings, in watt units, for this power supply. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Power</code>. The sensors shall appear in the same array order as the <code>OutputRails</code> property in the associated <code>PowerSupply</code> resource. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
ApparentVA	number (V.A)	<i>read-only</i> (null)	The product of voltage and current for an AC circuit, in volt-ampere units. This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
PhaseAngleDegrees (v1.5+)	number	<i>read-only</i> (null)	The phase angle (degrees) between the current and voltage waveforms. This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>Power</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
PowerFactor	number	<i>read-only</i> (null)	The power factor for this sensor. This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. <code>PowerFactor</code> is expressed in unit-less 1/100ths. This property can appear in sensors containing a <code>ReadingType</code> value of <code>Power</code>, and shall not appear in sensors of other <code>ReadingType</code> values.

Property	Type	Attributes	Notes
ReactiveVAR	number (V.A)	<i>read-only</i> (null)	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}]			
RailVoltage [{	array (excerpt)		The output voltages (V) for this power supply. This property shall contain the output voltages, in volt units, for this power supply. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>voltage</code>. The sensors shall appear in the same array order as the <code>OutputRails</code> property in the associated <code>PowerSupply</code> resource. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
CrestFactor (v1.1+)	number	<i>read-only</i> (null)	The crest factor for this sensor. This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
THDPercent (v1.1+)	number (%)	<i>read-only</i> (null)	The total harmonic distortion percent (% THD). This property shall contain the total harmonic distortion of the <code>Reading</code> property in percent units, typically <code>0</code> to <code>100</code>.
}]			

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
TemperatureCelsius {	object (excerpt)		The temperature (C) for this power supply. This property shall contain the temperature, in degree Celsius units, for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Temperature</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			

6.108.4 Actions

6.108.4.1 ResetMetrics

Description

This action resets the summary metrics related to this equipment.

- This action shall reset any time intervals or counted values for this equipment.

Action URI

{Base URI of target resource}/Actions/PowerSupplyMetrics.ResetMetrics

Action parameters

This action takes no parameters.

6.108.5 Property details

6.108.5.1 PhysicalContext

The area or device to which this sensor measurement applies.

- This property shall contain a description of the affected component or region within the equipment to which this sensor measurement applies.

string	Description
Accelerator	An accelerator.
ACInput	An AC electrical input or input-related circuit.
ACMaintenanceBypassInput	An AC electrical maintenance bypass input.
ACOutput	An AC electrical output or output-related circuit. • This value shall indicate an electrical output or an output-related circuit, such as a branch output, which is not terminated as a power outlet.
ACStaticBypassInput	An AC electrical static bypass input.
ACUtilityInput	An AC electrical utility input. • This value shall indicate an electrical input, where the source is an electrical utility as opposed to a backup or locally-generated power source. This value is intended to differentiate multiple electrical inputs between utility, maintenance bypass, or static bypass values. For general purpose usage, the value of <code>ACInput</code> is preferred.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. • This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	A compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.

string	Description
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC electrical bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	An expansion bay. This value shall indicate a location that provides for the expansion of functionality of a system, such as a PCIe slot that can accept an option card.
ExpansionSubsystem	A group of expansion bays. This value shall indicate a group of expansion bays and the devices installed in those bays.
Fan	A fan.
Filter	A filter.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Manager	A management controller, such as a BMC (baseboard management controller).
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	A networking bay. This value shall indicate a location that provides for the expansion of networking functionality of a system, by the addition of networking devices.
NetworkingDevice	A networking device.

string	Description
PowerOutlet	An electrical outlet. This value shall indicate an electrical outlet or receptacle.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	A power supply bay. This value shall indicate a location that provides for the installation of a power supply or similar devices.
Pump	A pump.
Rectifier	A rectifier device.
Reservoir	A reservoir.
Room	The room.
StorageBay	A storage bay. This value shall indicate a location that provides for the expansion of storage functionality of a system, by the addition of storage devices.
StorageDevice	A storage device.
StorageSubsystem	A storage subsystem. This value shall indicate a storage subsystem, which may consist of one or more storage controllers, storage devices, or related components.
Switch	A switch device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.108.5.2 PhysicalSubContext

The usage or location within a device to which this sensor measurement applies.

- This property shall contain a description of the usage or sub-region within the equipment to which this sensor measurement applies. This property generally differentiates multiple sensors within the same `PhysicalContext` instance.

string	Description
Input	The input.
Output	The output.

6.108.6 Example response

```
{
  "@odata.type": "#PowerSupplyMetrics.v1_1_2.PowerSupplyMetrics",
  "Id": "Metrics",
  "Name": "Metrics for Power Supply 1",
  "Status": {
    "State": "Enabled",
    "Health": "Warning"
  },
  "InputVoltage": {
    "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1InputVoltage",
    "Reading": 230.2
  },
  "InputCurrentAmps": {
    "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1InputCurrent",
    "Reading": 5.19
  },
  "InputPowerWatts": {
    "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1InputPower",
    "Reading": 937.4
  },
  "RailVoltage": [
    {
      "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_3VOutput",
      "Reading": 3.31
    },
    {
      "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_5VOutput",
      "Reading": 5.03
    },
  ]
}
```



```
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_12VOutput",
        "Reading": 12.06
    },
],
"RailCurrentAmps": [
    {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_3VCurrent",
        "Reading": 9.84
    },
    {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_5VCurrent",
        "Reading": 1.25
    },
    {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_12Current",
        "Reading": 2.58
    }
],
"OutputPowerWatts": {
    "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1OutputPower",
    "Reading": 937.4
},
"RailPowerWatts": [
    {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_3VPower",
        "Reading": 79.84
    },
    {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_5VPower",
        "Reading": 26.25
    },
    {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_12VPower",
        "Reading": 91.58
    }
],
"EnergykWh": {
    "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1Energy",
    "Reading": 325675
},
"FrequencyHz": {
    "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1InputFrequency",
    "Reading": 60
},
"TemperatureCelsius": {
    "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1Temp",
    "Reading": 43.9
},
"FanSpeedPercent": {
    "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1Fan",
```

```
    "Reading": 68,
    "SpeedRPM": 3290
  },
  "Actions": {
    "#PowerSupplyMetrics.ResetMetrics": {
      "target": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay1/Metrics/PowerSupplyMetrics.ResetMetrics"
    }
  },
  "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay1/Metrics"
}
```

6.109 PrivilegeRegistry 1.1.5

Version	v1.1	v1.0
Release	2017.1	2016.3

6.109.1 Description

The `PrivilegeRegistry` schema describes the operation-to-privilege mappings.

- This resource shall contain operation-to-privilege mappings.

6.109.2 Properties

Property	Type	Attributes	Notes
Mappings [{	array		The mappings between entities and the relevant privileges that access those entities. This property shall describe the mappings between entities and the relevant privileges that access those entities.
Entity	string	<i>read-only</i>	The resource name, such as <code>Manager</code> . This property shall contain the resource name, such as <code>Manager</code>.
OperationMap {	object		List mapping between HTTP methods and privilege required for the resource. This property shall list the mapping between HTTP methods and the privilege required for the resource.

Property	Type	Attributes	Notes
DELETE [{	array		The privilege required to complete an HTTP <code>DELETE</code> operation. This property shall contain the privilege required to complete an HTTP <code>DELETE</code> operation.
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the <code>PrivilegesUsed</code> and <code>OEMPrivilegesUsed</code> properties.
}]			
GET [{	array		The privilege required to complete an HTTP <code>GET</code> operation. This property shall contain the privilege required to complete an HTTP <code>GET</code> operation.
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the <code>PrivilegesUsed</code> and <code>OEMPrivilegesUsed</code> properties.
}]			
HEAD [{	array		The privilege required to complete an HTTP <code>HEAD</code> operation. This property shall contain the privilege required to complete an HTTP <code>HEAD</code> operation.
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the <code>PrivilegesUsed</code> and <code>OEMPrivilegesUsed</code> properties.
}]			
PATCH [{	array		The privilege required to complete an HTTP <code>PATCH</code> operation. This property shall contain the privilege required to complete an HTTP <code>PATCH</code> operation.

Property	Type	Attributes	Notes
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the <code>PrivilegesUsed</code> and <code>OEMPrivilegesUsed</code> properties.
}]			
POST [{	array		The privilege required to complete an HTTP <code>POST</code> operation. This property shall contain the privilege required to complete an HTTP <code>POST</code> operation.
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the <code>PrivilegesUsed</code> and <code>OEMPrivilegesUsed</code> properties.
}]			
PUT [{	array		The privilege required to complete an HTTP <code>PUT</code> operation. This property shall contain the privilege required to complete an HTTP <code>PUT</code> operation.
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the <code>PrivilegesUsed</code> and <code>OEMPrivilegesUsed</code> properties.
}]			
}			
PropertyOverrides [{	array		The privilege overrides of properties within a resource. This property shall contain the privilege overrides of properties, such as the <code>Password</code> property in the <code>ManagerAccount</code> resource.
OperationMap {	object		The mapping between the HTTP operation and the privilege required to complete the operation. This property shall contain the mapping between the HTTP operation and the privilege required to complete the operation.

Property	Type	Attributes	Notes
DELETE [{	array		The privilege required to complete an HTTP <code>DELETE</code> operation. This property shall contain the privilege required to complete an HTTP <code>DELETE</code> operation.
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the <code>PrivilegesUsed</code> and <code>OEMPrivilegesUsed</code> properties.
}]			
GET [{	array		The privilege required to complete an HTTP <code>GET</code> operation. This property shall contain the privilege required to complete an HTTP <code>GET</code> operation.
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the <code>PrivilegesUsed</code> and <code>OEMPrivilegesUsed</code> properties.
}]			
HEAD [{	array		The privilege required to complete an HTTP <code>HEAD</code> operation. This property shall contain the privilege required to complete an HTTP <code>HEAD</code> operation.
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the <code>PrivilegesUsed</code> and <code>OEMPrivilegesUsed</code> properties.
}]			
PATCH [{	array		The privilege required to complete an HTTP <code>PATCH</code> operation. This property shall contain the privilege required to complete an HTTP <code>PATCH</code> operation.

Property	Type	Attributes	Notes
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the <code>PrivilegesUsed</code> and <code>OEMPrivilegesUsed</code> properties.
}]			
POST [{	array		The privilege required to complete an HTTP <code>POST</code> operation. This property shall contain the privilege required to complete an HTTP <code>POST</code> operation.
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the <code>PrivilegesUsed</code> and <code>OEMPrivilegesUsed</code> properties.
}]			
PUT [{	array		The privilege required to complete an HTTP <code>PUT</code> operation. This property shall contain the privilege required to complete an HTTP <code>PUT</code> operation.
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the <code>PrivilegesUsed</code> and <code>OEMPrivilegesUsed</code> properties.
}]			
}			
Targets []	array (string, null)	<i>read-only</i>	The set of URIs, resource types, or properties. This property shall contain the array of URIs, resource types, or properties. For example, <code>/redfish/v1/Systems/1</code>, <code>Manager</code>, or <code>Password</code>. When the <code>Targets</code> property is not present, no override is specified.
}]			

Property	Type	Attributes	Notes
ResourceURIOverrides [{	array		The privilege overrides of resource URIs. This property shall contain the privilege overrides of resource URIs. The target lists the resource URI and the new privileges.
OperationMap {	object		The mapping between the HTTP operation and the privilege required to complete the operation. This property shall contain the mapping between the HTTP operation and the privilege required to complete the operation.
DELETE [{	array		The privilege required to complete an HTTP DELETE operation. This property shall contain the privilege required to complete an HTTP DELETE operation.
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
GET [{	array		The privilege required to complete an HTTP GET operation. This property shall contain the privilege required to complete an HTTP GET operation.
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
HEAD [{	array		The privilege required to complete an HTTP HEAD operation. This property shall contain the privilege required to complete an HTTP HEAD operation.

Property	Type	Attributes	Notes
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the <code>PrivilegesUsed</code> and <code>OEMPrivilegesUsed</code> properties.
}]			
PATCH [{	array		The privilege required to complete an HTTP <code>PATCH</code> operation. This property shall contain the privilege required to complete an HTTP <code>PATCH</code> operation.
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the <code>PrivilegesUsed</code> and <code>OEMPrivilegesUsed</code> properties.
}]			
POST [{	array		The privilege required to complete an HTTP <code>POST</code> operation. This property shall contain the privilege required to complete an HTTP <code>POST</code> operation.
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the <code>PrivilegesUsed</code> and <code>OEMPrivilegesUsed</code> properties.
}]			
PUT [{	array		The privilege required to complete an HTTP <code>PUT</code> operation. This property shall contain the privilege required to complete an HTTP <code>PUT</code> operation.
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the <code>PrivilegesUsed</code> and <code>OEMPrivilegesUsed</code> properties.

Property	Type	Attributes	Notes
}}			
}			
Targets []	array (string, null)	<i>read-only</i>	The set of URIs, resource types, or properties. This property shall contain the array of URIs, resource types, or properties. For example, <code>/redfish/v1/Systems/1</code>, <code>Manager</code>, or <code>Password</code>. When the <code>Targets</code> property is not present, no override is specified.
}}			
SubordinateOverrides [{	array		The privilege overrides of the subordinate resource. This property shall contain the privilege overrides of the subordinate resource. The target lists are identified by resource type.
OperationMap {	object		The mapping between the HTTP operation and the privilege required to complete the operation. This property shall contain the mapping between the HTTP operation and the privilege required to complete the operation.
DELETE [{	array		The privilege required to complete an HTTP <code>DELETE</code> operation. This property shall contain the privilege required to complete an HTTP <code>DELETE</code> operation.
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the <code>PrivilegesUsed</code> and <code>OEMPrivilegesUsed</code> properties.
}}			
GET [{	array		The privilege required to complete an HTTP <code>GET</code> operation. This property shall contain the privilege required to complete an HTTP <code>GET</code> operation.
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the <code>PrivilegesUsed</code> and <code>OEMPrivilegesUsed</code> properties.
}}			

Property	Type	Attributes	Notes
HEAD [{	array		The privilege required to complete an HTTP HEAD operation. This property shall contain the privilege required to complete an HTTP HEAD operation.
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
PATCH [{	array		The privilege required to complete an HTTP PATCH operation. This property shall contain the privilege required to complete an HTTP PATCH operation.
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
POST [{	array		The privilege required to complete an HTTP POST operation. This property shall contain the privilege required to complete an HTTP POST operation.
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
PUT [{	array		The privilege required to complete an HTTP PUT operation. This property shall contain the privilege required to complete an HTTP PUT operation.

Property	Type	Attributes	Notes
Privilege []	array (string)	<i>read-only</i>	An array of privileges that are required to complete a specific HTTP operation on a resource. This array shall contain an array of privileges that are required to complete a specific HTTP operation on a resource. This set of strings match zero or more strings in the <code>PrivilegesUsed</code> and <code>OEMPrivilegesUsed</code> properties.
}}			
}			
Targets []	array (string, null)	<i>read-only</i>	The set of URIs, resource types, or properties. This property shall contain the array of URIs, resource types, or properties. For example, <code>/redfish/v1/Systems/1</code>, <code>Manager</code>, or <code>Password</code>. When the <code>Targets</code> property is not present, no override is specified.
}}			
}}			
OEMPrivilegesUsed []	array (string)	<i>read-only</i>	The set of OEM privileges used in this mapping. This property shall contain an array of OEM privileges used in this mapping.
PrivilegesUsed []	array (string (enum))	<i>read-only</i>	- The set of Redfish standard privileges used in this mapping. - This property shall contain an array of Redfish standard privileges used in this mapping. <i>For the possible property values, see PrivilegesUsed in Property details.</i>

6.109.3 Property details

6.109.3.1 PrivilegesUsed

- The set of Redfish standard privileges used in this mapping.
 - This property shall contain an array of Redfish standard privileges used in this mapping.

string	Description
AdministrateStorage	Administrator for storage subsystems and storage systems found in the storage collection and storage system collection respectively.
AdministrateSystems	Administrator for systems found in the systems collection. Able to manage boot configuration, keys, and certificates for systems.

string	Description
ConfigureComponents	Can configure components that this service manages.
ConfigureCompositionInfrastructure	Can view and configure composition service resources. This value shall be used to indicate the user can view and configure composition service resources without matching the <code>Client</code> property in the <code>ResourceBlock</code> or <code>CompositionReservation</code> resources.
ConfigureManager	Can configure managers.
ConfigureSelf	Can change the password for the current user account, log out of their own sessions, and perform operations on resources they created. Services will need to be aware of resource ownership to map this privilege to an operation from a particular user.
ConfigureUsers	Can configure users and their accounts.
Login	Can log in to the service and read resources.
NoAuth	Authentication is not required. This value shall be used to indicate an operation does not require authentication. This privilege shall not be used in Redfish roles.
OperateStorageBackup	Operator for storage backup functionality for storage subsystems and storage systems found in the storage collection and storage system collection respectively.
OperateSystems	Operator for systems found in the systems collection. Able to perform resets and configure interfaces.

6.109.4 Example response

```
{
  "@odata.type": "#PrivilegeRegistry.v1_1_4.PrivilegeRegistry",
  "Id": "Contoso_1.0.1_PrivilegeRegistry",
  "Name": "Privilege Map",
  "PrivilegesUsed": [
    "Login",
    "ConfigureManager",
    "ConfigureUsers",
    "ConfigureComponents",
    "ConfigureSelf"
  ],
  "OEMPrivilegesUsed": [],
  "Mappings": [
    {
      "Entity": "Manager",
      "OperationMap": {
        "GET": [
```

```
        {
            "Privilege": [
                "Login"
            ]
        },
        "HEAD": [
            {
                "Privilege": [
                    "Login"
                ]
            }
        ],
        "PATCH": [
            {
                "Privilege": [
                    "ConfigureManager"
                ]
            }
        ],
        "POST": [
            {
                "Privilege": [
                    "ConfigureManager"
                ]
            }
        ],
        "PUT": [
            {
                "Privilege": [
                    "ConfigureManager"
                ]
            }
        ],
        "DELETE": [
            {
                "Privilege": [
                    "ConfigureManager"
                ]
            }
        ]
    },
    {
        "@odata.id": "/redfish/v1/JobService"
    }
}
```

6.110 Processor 1.20.1

Version	v1.20	v1.19	v1.18	v1.17	v1.16	v1.15	v1.14	v1.13	v1.12	v1.11	v1.10	...
Release	2024.1	2023.3	2023.1	2022.3	2022.2	2022.1	2021.4	2021.2	2021.1	2020.4	2020.3	...

6.110.1 Description

The `Processor` schema describes the information about a single processor that a system contains. A processor includes both performance characteristics, clock speed, architecture, core count, and so on, and compatibility, such as the CPU ID instruction results. It also describes the location, such as a slot, socket, or bay, where a unit can be installed, by populating a resource instance with an absent state if a unit is not present.

- This resource shall represent a single processor that a system contains. A processor includes both performance characteristics, clock speed, architecture, core count, and so on, and compatibility, such as the CPU ID instruction results. It may also represent a location, such as a slot, socket, or bay, where a unit may be installed, but the `State` property within the `Status` property contains `Absent`.

6.110.2 URIs

```

/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Processors/{ProcessorId}
/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Processors/{ProcessorId}/SubProcessors/
{ProcessorId2}
/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Processors/{ProcessorId}/SubProcessors/
{ProcessorId2}/SubProcessors/{ProcessorId3}
/redfish/v1/Chassis/{ChassisId}/Processors/{ProcessorId}
/redfish/v1/Chassis/{ChassisId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}
/redfish/v1/Chassis/{ChassisId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}/SubProcessors/
{ProcessorId3}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/SubProcessors/
{ProcessorId2}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/SubProcessors/
{ProcessorId2}/SubProcessors/{ProcessorId3}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/
{ProcessorId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/
{ProcessorId}/SubProcessors/{ProcessorId2}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/
{ProcessorId}/SubProcessors/{ProcessorId2}/SubProcessors/{ProcessorId3}

```

```

/redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}/
SubProcessors/{ProcessorId3}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/
SubProcessors/{ProcessorId2}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/
SubProcessors/{ProcessorId2}/SubProcessors/{ProcessorId3}
/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}
/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}
/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}/SubProcessors/
{ProcessorId3}

```

6.110.3 Properties

Property	Type	Attributes	Notes
AccelerationFunctions (v1.4+) {	object		The link to the collection of acceleration functions associated with this processor. This property shall contain a link to a resource collection of type <code>AccelerationFunctionCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>AccelerationFunction</i> . See the <i>AccelerationFunction</i> schema for details.
}			
AdditionalFirmwareVersions (v1.15+) {	object		The additional firmware versions of the processor. This property shall contain the additional firmware versions of the processor.
Bootloader (v1.7+)	string	<i>read-only</i> (null)	The bootloader version contained in this software, such as U-Boot or UEFI. This property shall contain the bootloader version contained in this software.
BootParameters (v1.11+)	string	<i>read-only</i> (null)	The version of the configuration file that contains the initial boot parameters of this software, such as parameters for U-Boot. This property shall contain the version of the configuration file that contains the initial boot parameters of this software.

Property	Type	Attributes	Notes
FactoryConfiguration (v1.11+)	string	<i>read-only</i> (null)	The version of the configuration that contains the factory default runtime configuration parameters of this software. This property shall contain the version of the configuration that contains the factory default runtime configuration parameters of this software.
Kernel (v1.7+)	string	<i>read-only</i> (null)	The kernel version contained in this software. This property shall contain the kernel version contained in this software. For strict POSIX software, the value shall contain the output of <code>uname -srm</code>. For Microsoft Windows, the value shall contain the output of <code>ver</code>, from Command Prompt.
Microcode (v1.7+)	string	<i>read-only</i> (null)	The microcode version contained in this software, such as processor microcode. This property shall contain the microcode version contained in this software.
Oem (v1.7+) {}	object		See the OEM object definition in the Using this guide clause.
OSDistribution (v1.8+)	string	<i>read-only</i> (null)	The operating system name of this software. This property shall contain the operating system name of this software.
}			
AppliedOperatingConfig (v1.9+) {	object		The link to the operating configuration that is applied to this processor. This property shall contain a link to a resource of type <code>OperatingConfig</code> that specifies the configuration is applied to this processor. See the <i>OperatingConfig</i> schema for details on this property.
@odata.id	string	<i>read-write</i>	Link to a <i>OperatingConfig</i> resource. See the Links section and the <i>OperatingConfig</i> schema for details.
}			
Assembly (v1.2+) {	object		The link to an assembly associated with this processor. This property shall contain a link to a resource of type <code>Assembly</code>. See the <i>Assembly</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>Assembly</i> resource. See the Links section and the <i>Assembly</i> schema for details.
}			

Property	Type	Attributes	Notes
BaseSpeedMHz (v1.10+)	integer (MHz)	<i>read-only</i> (null)	The base (nominal) clock speed of the processor in MHz. This property shall contain the base (nominal) clock speed of the processor in MHz.
BaseSpeedPriorityState (v1.9+)	string (enum)	<i>read-only</i> (null)	The state of the base frequency settings of the operation configuration applied to this processor. This property shall contain the state of the base frequency settings of the operating configuration applied to this processor. <i>For the possible property values, see BaseSpeedPriorityState in Property details.</i>
CacheMemory (v1.20+) {	object		The link to the collection of cache memory associated with this processor. This property shall contain a link to a resource collection of type <code>MemoryCollection</code> that represents the cache memory of this processor. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Memory</i> . See the Memory schema for details.
}			
Certificates (v1.11+) {	object		The link to a collection of certificates for device identity and attestation. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that contains certificates for device identity and attestation. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
Enabled (v1.12+)	boolean	<i>read-write</i>	An indication of whether this processor is enabled. The value of this property shall indicate if this processor is enabled.
EnvironmentMetrics (v1.11+) {	object		The link to the environment metrics for this processor. This property shall contain a link to a resource of type <code>EnvironmentMetrics</code> that specifies the environment metrics for this processor. See the <i>EnvironmentMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a EnvironmentMetrics resource. See the Links section and the <i>EnvironmentMetrics</i> schema for details.
}			

Property	Type	Attributes	Notes
Family (v1.16+)	string	<i>read-only</i> (null)	The processor family. This property shall contain a string that identifies the processor family, as specified by the combination of the <code>EffectiveFamily</code> and <code>EffectiveModel</code> properties.
FirmwareVersion (v1.7+)	string	<i>read-only</i>	The firmware version of the processor. This property shall contain a string describing the firmware version of the processor as provided by the manufacturer.
FPGA (v1.4+) {	object		The properties for processors of the FPGA type. This property shall contain an object containing properties for processors of type <code>FPGA</code>.
ExternalInterfaces (v1.4+) [{	array		An array of the FPGA external interfaces. This property shall contain an array of objects that describe the external connectivity of the FPGA.
Ethernet (v1.4+) {	object		The Ethernet-related information for this interface. This property shall contain an object the describes the Ethernet-related information for this interface.
MaxLanes (v1.4+)	integer	<i>read-only</i> (null)	The number of lanes supported by this interface. This property shall contain the maximum number of lanes supported by this interface.
MaxSpeedMbps (v1.4+)	integer (Mbit/s)	<i>read-only</i> (null)	The maximum speed supported by this interface. This property shall contain the maximum speed supported by this interface.
Oem (v1.4+) {}	object		See the OEM object definition in the Using this guide clause.
}			
InterfaceType (v1.4+)	string (enum)	<i>read-only</i> (null)	The interface type. This property shall contain an enumerated value that describes the type of interface between the system, or external connection, and the processor. <i>For the possible property values, see <code>InterfaceType</code> in Property details.</i>

Property	Type	Attributes	Notes
PCle (v1.4+) {	object		The PCIe-related information for this interface. This property shall contain an object the describes the PCIe-related information for this interface.
LanesInUse (v1.3+)	integer	<i>read-only</i> (null)	The number of PCIe lanes in use by this device. This property shall contain the number of PCIe lanes in use by this device, which shall be equal to or less than the <code>MaxLanes</code> property value.
MaxLanes (v1.3+)	integer	<i>read-only</i> (null)	The number of PCIe lanes supported by this device. This property shall contain the maximum number of PCIe lanes supported by this device.
MaxPCleType (v1.3+)	string (enum)	<i>read-only</i> (null)	The highest version of the PCIe specification supported by this device. This property shall contain the maximum PCIe specification that this device supports. <i>For the possible property values, see <code>MaxPCleType</code> in Property details.</i>
Oem (v1.3+) {}	object		See the OEM object definition in the Using this guide clause.
PCleType (v1.3+)	string (enum)	<i>read-only</i> (null)	The version of the PCIe specification in use by this device. This property shall contain the negotiated PCIe interface version in use by this device. <i>For the possible property values, see <code>PCleType</code> in Property details.</i>
}			
}]			
FirmwareId (v1.4+)	string	<i>read-only</i>	The FPGA firmware identifier. This property shall contain a string describing the FPGA firmware identifier.
FirmwareManufacturer (v1.4+)	string	<i>read-only</i>	The FPGA firmware manufacturer. This property shall contain a string describing the FPGA firmware manufacturer.
FirmwareVersion (v1.4+, deprecated v1.9)	string	<i>read-only</i>	The FPGA firmware version. This property shall contain a string describing the FPGA firmware version. <i>Deprecated in v1.9 and later. This property has been deprecated in favor of the <code>FirmwareVersion</code> property in the root of this resource.</i>

Property	Type	Attributes	Notes
FpgaType (v1.4+)	string (enum)	<i>read-only</i>	The FPGA type. This property shall contain a type of the FPGA device. <i>For the possible property values, see FpgaType in Property details.</i>
HostInterface (v1.4+, deprecated v1.8) {	object		The FPGA interface to the host. This property shall contain an object that describes the connectivity to the host for system software to use. <i>Deprecated in v1.8 and later. This property has been deprecated in favor of the <code>SystemInterface</code> property in the root of this resource.</i>
Ethernet (v1.4+) {	object		The Ethernet-related information for this interface. This property shall contain an object the describes the Ethernet-related information for this interface.
MaxLanes (v1.4+)	integer	<i>read-only</i> (null)	The number of lanes supported by this interface. This property shall contain the maximum number of lanes supported by this interface.
MaxSpeedMbps (v1.4+)	integer (Mbit/s)	<i>read-only</i> (null)	The maximum speed supported by this interface. This property shall contain the maximum speed supported by this interface.
Oem (v1.4+) {}	object		See the OEM object definition in the Using this guide clause.
}			
InterfaceType (v1.4+)	string (enum)	<i>read-only</i> (null)	The interface type. This property shall contain an enumerated value that describes the type of interface between the system, or external connection, and the processor. <i>For the possible property values, see InterfaceType in Property details.</i>
PCle (v1.4+) {	object		The PCIe-related information for this interface. This property shall contain an object the describes the PCIe-related information for this interface.
LanesInUse (v1.3+)	integer	<i>read-only</i> (null)	The number of PCIe lanes in use by this device. This property shall contain the number of PCIe lanes in use by this device, which shall be equal to or less than the <code>MaxLanes</code> property value.

Property	Type	Attributes	Notes
MaxLanes (v1.3+)	integer	<i>read-only</i> (null)	The number of PCIe lanes supported by this device. This property shall contain the maximum number of PCIe lanes supported by this device.
MaxPCleType (v1.3+)	string (enum)	<i>read-only</i> (null)	The highest version of the PCIe specification supported by this device. This property shall contain the maximum PCIe specification that this device supports. <i>For the possible property values, see MaxPCleType in Property details.</i>
Oem (v1.3+) {}	object		See the OEM object definition in the Using this guide clause.
PCleType (v1.3+)	string (enum)	<i>read-only</i> (null)	The version of the PCIe specification in use by this device. This property shall contain the negotiated PCIe interface version in use by this device. <i>For the possible property values, see PCleType in Property details.</i>
}			
}			
Model (v1.4+)	string	<i>read-only</i>	The FPGA model. This property shall contain a model of the FPGA device. <i>For more information about this property, see Property details.</i>
Oem (v1.4+) {}	object		See the OEM object definition in the Using this guide clause.
PCleVirtualFunctions (v1.4+)	integer	<i>read-write</i>	The number of PCIe Virtual Functions. This property shall contain an integer that describes the number of PCIe Virtual Functions configured within the FPGA.
ProgrammableFromHost (v1.4+)	boolean	<i>read-write</i> (null)	An indication of whether the FPGA firmware can be reprogrammed from the host by using system software. This property shall indicate whether the FPGA firmware can be reprogrammed from the host by using system software. If <code>false</code>, system software shall not be able to program the FPGA firmware from the system interface. In either state, a management controller may be able to program the FPGA firmware by using the sideband interface.

Property	Type	Attributes	Notes
ReconfigurationSlots (v1.4+) [{	array		An array of the FPGA reconfiguration slots. An FPGA uses a reconfiguration slot to contain an acceleration function that can change as the FPGA is provisioned. This property shall contain an array of the structures that describe the FPGA reconfiguration slots that the acceleration functions can program.
AccelerationFunction (v1.4+) {	object		The link to the acceleration function that the code programmed into a reconfiguration slot provides. This property shall contain a link to a resource of type <code>AccelerationFunction</code> that represents the code programmed into this reconfiguration slot. See the <i>AccelerationFunction</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>AccelerationFunction</i> resource. See the Links section and the <i>AccelerationFunction</i> schema for details.
}			
ProgrammableFromHost (v1.4+)	boolean	<i>read-write (null)</i>	An indication of whether the reconfiguration slot can be reprogrammed from the host by using system software. This property shall indicate whether the reconfiguration slot can be reprogrammed from the host by using system software. If <code>false</code>, system software shall not be able to program the reconfiguration slot from the system interface. In either state, a management controller may be able to program the reconfiguration slot by using the sideband interface.
SlotId (v1.4+)	string	<i>read-only (null)</i>	The FPGA reconfiguration slot identifier. This property shall contain the FPGA reconfiguration slot identifier.
UUID (v1.4+)	string (uuid)	<i>read-only (null)</i>	The UUID for this reconfiguration slot. This property shall contain a universally unique identifier number for the reconfiguration slot. Pattern: <code>^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\$</code>
}]			
}			

Property	Type	Attributes	Notes
HighSpeedCoreIDs (v1.9+) []	array (integer, null)	<i>read-only</i>	The list of core identifiers corresponding to the cores that have been configured with the higher clock speed from the operating configuration applied to this processor. This property shall contain an array of core identifiers corresponding to the cores that have been configured with the higher clock speed from the operating configuration applied to this processor.
InstructionSet	string (enum)	<i>read-only</i> (null)	The instruction set of the processor. This property shall contain the string that identifies the instruction set of the processor contained in this socket. <i>For the possible property values, see InstructionSet in Property details.</i>
Links (v1.1+) {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Chassis (v1.1+) {	object		The link to the chassis that contains this processor. This property shall contain a link to a resource of type <code>Chassis</code> that represents the physical container associated with this processor. See the <i>Chassis</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.
}			
ConnectedProcessors (v1.4+) [{	array		An array of links to the processors directly connected to this processor. This property shall contain an array of links to resources of type <code>Processor</code> that are directly connected to this processor.
@odata.id	string	<i>read-only</i>	Link to another Processor resource.
}]			
Endpoints (v1.4+) [{	array		An array of links to the endpoints that connect to this processor. This property shall contain an array of links to resources of type <code>Endpoint</code> that represent endpoints associated with this processor.
@odata.id	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}]			

Property	Type	Attributes	Notes
FabricAdapters (v1.17+) [{	array		An array of links to the fabric adapters that present this processor to a fabric. This property shall contain an array of links to resources of type <code>FabricAdapter</code> that represent the fabric adapters that present this processor to a fabric.
@odata.id	string	read-only	Link to a FabricAdapter resource. See the Links section and the <i>FabricAdapter</i> schema for details.
}]			
GraphicsController (v1.12+) {	object	(null)	A link to the graphics controller associated with this processor. This property shall contain a link to a resource of type <code>GraphicsController</code> that is associated with this processor. See the <i>GraphicsController</i> schema for details on this property.
@odata.id	string	read-only	Link to a GraphicsController resource. See the Links section and the <i>GraphicsController</i> schema for details.
}			
Memory (v1.11+) [{	array		An array of links to the memory associated with this processor. This property shall contain an array of links to resources of type <code>Memory</code> that are associated with this processor.
@odata.id	string	read-only	Link to a Memory resource. See the Links section and the <i>Memory</i> schema for details.
}]			
NetworkDeviceFunctions (v1.13+) [{	array		The network device functions to which this processor performs offload computation, such as with a SmartNIC. This property shall contain an array of links to resources of type <code>NetworkDeviceFunction</code> that represent the network device functions to which this processor performs offload computation, such as with a SmartNIC.
@odata.id	string	read-only	Link to a NetworkDeviceFunction resource. See the Links section and the <i>NetworkDeviceFunction</i> schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
PCleDevice (v1.4+) {	object		The link to the PCIe device associated with this processor. This property shall contain a link to a resource of type <code>PCleDevice</code> that represents the PCIe device associated with this processor. See the <i>PCleDevice</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a PCIeDevice resource. See the Links section and the <i>PCleDevice</i> schema for details.
}			
PCleFunctions (v1.4+) [{	array		An array of links to the PCIeFunctions associated with this processor. This property shall contain an array of links to resources of type <code>PCleFunction</code> that represent the PCIe functions associated with this processor.
@odata.id	string	<i>read-only</i>	Link to a PCIeFunction resource. See the Links section and the <i>PCleFunction</i> schema for details.
}]			
}			
Location (v1.2+) {}	object		The location of the processor. This property shall contain the location information of the associated processor. For property details, see Location.
LocationIndicatorActive (v1.10+)	boolean	<i>read-write (null)</i>	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of <code>IndicatorLED</code> in this resource, if supported, to reflect the implementation of the locating function.
Manufacturer	string	<i>read-only (null)</i>	The processor manufacturer. This property shall contain a string that identifies the manufacturer of the processor.
MaxSpeedMHz	integer (MHz)	<i>read-only (null)</i>	The maximum clock speed of the processor. This property shall indicate the maximum rated clock speed of the processor in MHz.

Property	Type	Attributes	Notes
MaxTDPWatts (v1.4+)	integer (Watts)	<i>read-only</i> (null)	The maximum Thermal Design Power (TDP) in watt units. This property shall contain the maximum Thermal Design Power (TDP) in watt units.
Measurements (v1.11+, deprecated v1.14) [{	array		An array of DSP0274-defined measurement blocks. This property shall contain an array of DSP0274-defined measurement blocks. <i>Deprecated in v1.14 and later. This property has been deprecated in favor of the <code>ComponentIntegrity</code> resource.</i>
@odata.id	string	<i>read-only</i>	Link to a MeasurementBlock resource. See the Links section and the <i>SoftwareInventory</i> schema for details.
}]			
MemorySummary (v1.11+) {	object		The summary of all memory associated with this processor. This property shall contain properties that describe the summary of all memory that is associated with this processor.
ECCModeEnabled (v1.13+)	boolean	<i>read-write</i> (null)	An indication of whether memory ECC mode is enabled for this processor. The value of this property shall indicate if memory ECC mode is enabled for this processor. This value shall not affect system memory ECC mode.
Metrics (v1.11+) {	object		The link to the memory metrics associated with all memory of this processor. This property shall contain a link to a resource of type <code>MemoryMetrics</code> that contains the metrics associated with all memory of this processor. See the <i>MemoryMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a MemoryMetrics resource. See the Links section and the <i>MemoryMetrics</i> schema for details.
}			
TotalCacheSizeMiB (v1.11+)	integer (mebibytes)	<i>read-only</i> (null)	Total size of cache memory of this processor. This property shall contain the total size of cache memory of this processor.

Property	Type	Attributes	Notes
TotalMemorySizeMiB (v1.11+)	integer (mebibytes)	<i>read-only</i> (null)	Total size of non-cache volatile or non-volatile memory attached to this processor. Examples include DRAMs and NV-DIMMs that are not configured as block storage. This property shall contain the total size of non-cache volatile or non-volatile memory attached to this processor. Examples include DRAMs and NV-DIMMs that are not configured as block storage. This value indicates the size of memory directly attached or with strong affinity to this processor, not the total memory accessible by the processor. This property shall not be present for implementations where all processors have equal memory performance or access characteristics, such as hop count, for all system memory.
}			
Metrics (v1.4+) {	object		The link to the metrics associated with this processor. This property shall contain a link to a resource of type <code>ProcessorMetrics</code> that contains the metrics associated with this processor. See the <i>ProcessorMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>ProcessorMetrics</i> resource. See the Links section and the <i>ProcessorMetrics</i> schema for details.
}			
MinSpeedMHz (v1.8+)	integer (MHz)	<i>read-only</i> (null)	The minimum clock speed of the processor in MHz. This property shall indicate the minimum rated clock speed of the processor in MHz.
Model	string	<i>read-only</i> (null)	The product model number of this device. This property shall indicate the model information as provided by the manufacturer of this processor. <i>For more information about this property, see Property details.</i>
OperatingConfigs (v1.9+) {	object		The link to the collection of operating configurations that can be applied to this processor. This property shall contain a link to a resource collection of type <code>OperatingConfigCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>OperatingConfig</i> . See the <i>OperatingConfig</i> schema for details.
}			

Property	Type	Attributes	Notes
OperatingSpeedMHz (v1.8+)	integer (MHz)	<i>read-only</i> (null)	Operating speed of the processor in MHz. This property shall contain the operating speed of the processor in MHz. The operating speed of the processor may change more frequently than the manager is able to monitor.
OperatingSpeedRangeMHz (v1.13+) {	object (excerpt)		Range of allowed operating speeds (MHz). This property shall contain the operating speed control, measured in megahertz units, for this resource. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Control</code> with the <code>ControlType</code> property containing the value of <code>FrequencyMHz</code>. This object is an excerpt of the <i>Control</i> resource located at the URI shown in <code>DataSourceUri</code>.
AllowableMax	number	<i>read-only</i> (null)	The maximum possible setting for this control. This property shall indicate the maximum possible value of the <code>SetPoint</code> or <code>SettingMax</code> properties for this control. Services shall not accept values for <code>SetPoint</code> or <code>SettingMax</code> above this value.
AllowableMin	number	<i>read-only</i> (null)	The minimum possible setting for this control. This property shall indicate the minimum possible value of the <code>SetPoint</code> or <code>SettingMin</code> properties for this control. Services shall not accept values for <code>SetPoint</code> or <code>SettingMin</code> below this value.
AllowableNumericValues []	array (number, null)	<i>read-only</i>	The supported values for the set point. This property shall contain the supported values for this control. The units shall follow the value of <code>SetPointUnits</code>. This property should only be present when the set point or range has a limited set of supported values that cannot be accurately described using the <code>Increment</code> property.
ControlMode	string (enum)	<i>read-write</i> (null)	The current operating mode of the control. This property shall contain the operating mode of the control. <i>For the possible property values, see <code>ControlMode</code> in Property details.</i>
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this control. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy. If no source resource is implemented, meaning the excerpt represents the only available data, this property shall not be present.

Property	Type	Attributes	Notes
Reading	number	<i>read-only (null)</i>	The reading of the sensor associated with this control. This property shall contain the value of the <code>Reading</code> property of the <code>Sensor</code> resource directly associated with this control. This property shall not be present if multiple sensors are associated with a single control.
SettingMax	number	<i>read-write (null)</i>	The maximum set point in the allowed range. This property shall contain the maximum desired set point within the acceptable range. The service shall reject values greater than the value of <code>AllowableMax</code>. The units shall follow the value of <code>SetPointUnits</code>.
SettingMin	number	<i>read-write (null)</i>	The minimum set point in the allowed range. This property shall contain the minimum desired set point within the acceptable range. The service shall reject values less than the value of <code>AllowableMin</code>. The units shall follow the value of <code>SetPointUnits</code>.
}			
PartNumber (v1.7+)	string	<i>read-only (null)</i>	The part number of the processor. This property shall contain a part number assigned by the organization that is responsible for producing or manufacturing the processor.
Ports (v1.13+) {	object		The link to the collection of ports for this processor. This property shall contain a link to a resource collection of type <code>PortCollection</code>. It shall contain the interconnect and fabric ports of this processor. It shall not contain ports for <code>GraphicsController</code> resources, <code>USBController</code> resources, or other local adapter-related types of resources. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Port</i> . See the Port schema for details.
}			
PowerState (v1.17+)	string (enum)	<i>read-only (null)</i>	The current power state of the processor. This property shall contain the power state of the processor. If the <code>PowerState</code> property in the associated <code>Chassis</code> resource contains the value <code>off</code>, this property shall contain <code>off</code>. <i>For the possible property values, see PowerState in Property details.</i>

Property	Type	Attributes	Notes
ProcessorArchitecture	string (enum)	<i>read-only (null)</i>	The architecture of the processor. This property shall contain the string that identifies the architecture of the processor contained in this socket. <i>For the possible property values, see ProcessorArchitecture in Property details.</i>
ProcessorId {	object		The identification information for this processor. This object shall contain identification information for this processor. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification. <i>For more information about this property, see Property details.</i>
EffectiveFamily	string	<i>read-only (null)</i>	The effective family for this processor. This property shall contain the effective family information as provided by the manufacturer of this processor. If this property represents raw register data, as determined by the value of the <code>ProcessorArchitecture</code> property, the service shall encode the value as a hex-encoded string following the regular expression pattern <code>^0x[0-9A-Fa-f]+\$</code> or a decimal-encoded string following the regular expression pattern <code>^\d+\$</code>. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification. <i>For more information about this property, see Property details.</i>
EffectiveModel	string	<i>read-only (null)</i>	The effective model for this processor. This property shall contain the effective model information as provided by the manufacturer of this processor. If this property represents raw register data, as determined by the value of the <code>ProcessorArchitecture</code> property, the service shall encode the value as a hex-encoded string following the regular expression pattern <code>^0x[0-9A-Fa-f]+\$</code> or a decimal-encoded string following the regular expression pattern <code>^\d+\$</code>. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification. <i>For more information about this property, see Property details.</i>
IdentificationRegisters	string	<i>read-only (null)</i>	The raw manufacturer-provided processor identification registers for this processor. This property shall contain the raw manufacturer-provided processor-specific identification registers of this processor's features. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification. Pattern: <code>^0x[0-9A-Fa-f]+\$</code> <i>For more information about this property, see Property details.</i>

Property	Type	Attributes	Notes
MicrocodeInfo	string	<i>read-only (null)</i>	The microcode information for this processor. This property shall contain the microcode information as provided by the manufacturer of this processor. If this property represents raw register data, as determined by the value of the <code>ProcessorArchitecture</code> property, the service shall encode the value as a hex-encoded string following the regular expression pattern <code>^0x[0-9A-Fa-f]+\$</code> or a decimal-encoded string following the regular expression pattern <code>^\d+\$</code>. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification. <i>For more information about this property, see Property details.</i>
ProtectedIdentificationNumber (v1.10+)	string	<i>read-only (null)</i>	The Protected Processor Identification Number (PPIN) for this processor. This property shall contain the Protected Processor Identification Number (PPIN) for this processor.
Step	string	<i>read-only (null)</i>	The step value for this processor. This property shall contain the step or revision information as provided by the manufacturer of this processor. If this property represents raw register data, as determined by the value of the <code>ProcessorArchitecture</code> property, the service shall encode the value as a hex-encoded string following the regular expression pattern <code>^0x[0-9A-Fa-f]+\$</code> or a decimal-encoded string following the regular expression pattern <code>^\d+\$</code>. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification. <i>For more information about this property, see Property details.</i>
VendorId	string	<i>read-only (null)</i>	The vendor identification for this processor. This property shall contain the vendor identification information as provided by the manufacturer of this processor. If this property represents raw register data, as determined by the value of the <code>ProcessorArchitecture</code> property, the service shall encode the value as a hex-encoded string following the regular expression pattern <code>^0x[0-9A-Fa-f]+\$</code> or a decimal-encoded string following the regular expression pattern <code>^\d+\$</code>. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification. <i>For more information about this property, see Property details.</i>
}			
ProcessorIndex (v1.16+)	integer	<i>read-only (null)</i>	The logical index of this processor within the system. This property shall contain the zero-based index of the processor, indexed within the next unit of containment. The value of this property shall match the ordering in the operating system topology interfaces, with offset adjustments, if needed.

Property	Type	Attributes	Notes
ProcessorMemory (v1.4+) [{	array		The memory directly attached or integrated within this processor. Examples include internal cache, dedicated memory for the processor, and system memory. This property shall contain the memory directly attached or integrated within this processor.
CapacityMiB (v1.4+)	integer (mebibytes)	read-only (null)	The memory capacity in MiB. This property shall contain the memory capacity in MiB.
IntegratedMemory (v1.4+)	boolean	read-only (null)	An indication of whether this memory is integrated within the processor. This property shall indicate whether this memory is integrated within the processor. Otherwise, it is discrete memory attached to the processor.
MemoryType (v1.4+)	string (enum)	read-only (null)	The type of memory used by this processor. This property shall contain a type of the processor memory type. <i>For the possible property values, see MemoryType in Property details.</i>
SpeedMHz (v1.4+)	integer	read-only (null)	The operating speed of the memory in MHz. This property shall contain the operating speed of the memory in MHz.
}]			
ProcessorType	string (enum)	read-only (null)	The type of processor. This property shall contain the string that identifies the type of processor contained in this socket. <i>For the possible property values, see ProcessorType in Property details.</i>
Replaceable (v1.16+)	boolean	read-only (null)	An indication of whether this component can be independently replaced as allowed by the vendor's replacement policy. This property shall indicate whether this component can be independently replaced as allowed by the vendor's replacement policy. A value of <code>false</code> indicates the component needs to be replaced by policy as part of another component. If the <code>LocationType</code> property of this component contains <code>Embedded</code>, this property shall contain <code>false</code>.
SerialNumber (v1.7+)	string	read-only (null)	The serial number of the processor. This property shall contain a manufacturer-allocated number that identifies the processor.

Property	Type	Attributes	Notes
Socket	string	<i>read-only (null)</i>	The socket or location of the processor. This property shall contain the string that identifies the physical location or socket of the processor.
SparePartNumber (v1.11+)	string	<i>read-only (null)</i>	The spare part number of the processor. This property shall contain the spare part number of the processor.
SpeedLimitMHz (v1.10+)	integer (MHz)	<i>read-write (null)</i>	The clock limit of the processor in MHz. This property shall contain the clock limit of the processor in MHz. This value shall be within the range of <code>MinSpeedMHz</code> and <code>MaxSpeedMHz</code> as provided by the manufacturer of this processor.
SpeedLocked (v1.10+)	boolean	<i>read-write (null)</i>	Indicates whether the clock speed of the processor is fixed at the value specified in the <code>SpeedLimitMHz</code> property. This property shall indicate whether the clock speed of the processor is fixed, where a value <code>true</code> shall indicate that the clock speed is fixed at the value specified in the <code>SpeedLimitMHz</code> property.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <code>Status</code>.
SubProcessors (v1.3+) {}	object		The link to the collection of sub-processors associated with this processor, such as cores or threads, that are part of a processor. This property shall contain a link to a resource collection of type <code>ProcessorCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Processor</i> . See the <i>Processor</i> schema for details.
}			
SystemInterface (v1.8+) {}	object		The interface between the system and the processor. This property shall contain an object that describes the connectivity between the host system and the processor.
Ethernet (v1.4+) {}	object		The Ethernet-related information for this interface. This property shall contain an object the describes the Ethernet-related information for this interface.

Property	Type	Attributes	Notes
MaxLanes (v1.4+)	integer	<i>read-only</i> (null)	The number of lanes supported by this interface. This property shall contain the maximum number of lanes supported by this interface.
MaxSpeedMbps (v1.4+)	integer (Mbit/s)	<i>read-only</i> (null)	The maximum speed supported by this interface. This property shall contain the maximum speed supported by this interface.
Oem (v1.4+) {}	object		See the OEM object definition in the Using this guide clause.
}			
InterfaceType (v1.4+)	string (enum)	<i>read-only</i> (null)	The interface type. This property shall contain an enumerated value that describes the type of interface between the system, or external connection, and the processor. <i>For the possible property values, see InterfaceType in Property details.</i>
PCle (v1.4+) {	object		The PCIe-related information for this interface. This property shall contain an object the describes the PCIe-related information for this interface.
LanesInUse (v1.3+)	integer	<i>read-only</i> (null)	The number of PCIe lanes in use by this device. This property shall contain the number of PCIe lanes in use by this device, which shall be equal to or less than the <code>MaxLanes</code> property value.
MaxLanes (v1.3+)	integer	<i>read-only</i> (null)	The number of PCIe lanes supported by this device. This property shall contain the maximum number of PCIe lanes supported by this device.
MaxPCleType (v1.3+)	string (enum)	<i>read-only</i> (null)	The highest version of the PCIe specification supported by this device. This property shall contain the maximum PCIe specification that this device supports. <i>For the possible property values, see MaxPCleType in Property details.</i>
Oem (v1.3+) {}	object		See the OEM object definition in the Using this guide clause.
PCleType (v1.3+)	string (enum)	<i>read-only</i> (null)	The version of the PCIe specification in use by this device. This property shall contain the negotiated PCIe interface version in use by this device. <i>For the possible property values, see PCleType in Property details.</i>

Property	Type	Attributes	Notes
}			
}			
TDPWatts (v1.4+)	integer (Watts)	<i>read-only</i> (null)	The nominal Thermal Design Power (TDP) in watt units. This property shall contain the nominal Thermal Design Power (TDP) in watt units.
ThrottleCauses (v1.16+) []	array (string (enum))	<i>read-only</i> (null)	- The causes of the processor being throttled. - This property shall contain the causes of the processor being throttled. If <code>Throttled</code> contains <code>false</code>, this property shall contain an empty array. <i>For the possible property values, see ThrottleCauses in Property details.</i>
Throttled (v1.16+)	boolean	<i>read-only</i> (null)	An indication of whether the processor is throttled. This property shall indicate whether the processor is throttled.
TotalCores	integer	<i>read-only</i> (null)	The total number of cores that this processor contains. This property shall indicate the total count of independent processor cores contained within this processor.
TotalEnabledCores (v1.5+)	integer	<i>read-only</i> (null)	The total number of enabled cores that this processor contains. This property shall indicate the total count of enabled independent processor cores contained within this processor.
TotalThreads	integer	<i>read-only</i> (null)	The total number of execution threads that this processor supports. This property shall indicate the total count of independent execution threads that this processor supports.
TurboState (v1.9+)	string (enum)	<i>read-only</i> (null)	The state of turbo for this processor. This property shall contain the state of turbo for this processor. <i>For the possible property values, see TurboState in Property details.</i>
UUID (v1.4+)	string (uuid)	<i>read-only</i> (null)	The UUID for this processor. This property shall contain a universally unique identifier number for the processor. RFC4122 describes methods to use to create the value. The value should be considered to be opaque. Client software should only treat the overall value as a universally unique identifier and should not interpret any subfields within the UUID. Pattern: <code>^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\$</code>

Property	Type	Attributes	Notes
Version (v1.7+)	string	<i>read-only (null)</i>	The hardware version of the processor. This property shall contain the hardware version of the processor as determined by the vendor or supplier.

6.110.4 Actions

6.110.4.1 Reset (v1.6+)

Description

This action resets the processor.

- This action shall reset the processor.

Action URI

{Base URI of target resource}/Actions/Processor.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	<i>optional</i>	The type of reset. This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset. <i>For the possible property values, see ResetType in Property details.</i>

Request Example

```
{
  "ResetType": "ForceRestart"
}
```

6.110.4.2 ResetToDefaults (v1.15+)

Description

The action resets the values of writable properties to factory defaults.

- This action shall reset the values of writable properties in this resource to their default values as specified by the manufacturer.

Action URI

{Base URI of target resource}/Actions/Processor.ResetToDefaults

Action parameters

This action takes no parameters.

6.110.5 Property details

6.110.5.1 BaseSpeedPriorityState

The state of the base frequency settings of the operation configuration applied to this processor.

- This property shall contain the state of the base frequency settings of the operating configuration applied to this processor.

string	Description
Disabled	Base speed priority is disabled.
Enabled	Base speed priority is enabled.

6.110.5.2 ControlMode

The current operating mode of the control.

- This property shall contain the operating mode of the control.

string	Description
Automatic	Automatically adjust control to meet the set point.
Disabled	The control has been disabled.
Manual	No automatic adjustments are made to the control.
Override	User override of the automatic set point value.

6.110.5.3 EffectiveFamily

The effective family for this processor.

- This property shall contain the effective family information as provided by the manufacturer of this processor. If this property represents raw register data, as determined by the value of the `ProcessorArchitecture` property, the service shall encode the value as a hex-encoded string following the regular expression pattern `^0x[0-9A-Fa-f]+$` or a decimal-encoded string following the regular expression pattern `^\d+$`. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification.

For resources with a `ProcessorArchitecture` value of `x86`, this string is derived from the execution of the processor's CPUID instruction using this algorithm:

```
(eax, ebx, ecx, edx) = cpuid(eax=0x1);  
EffectiveFamily = ((eax & 0x00FF0000) >> 20) + ((eax & 0x0F00) >> 8);
```

6.110.5.4 EffectiveModel

The effective model for this processor.

- This property shall contain the effective model information as provided by the manufacturer of this processor. If this property represents raw register data, as determined by the value of the `ProcessorArchitecture` property, the service shall encode the value as a hex-encoded string following the regular expression pattern `^0x[0-9A-Fa-f]+$` or a decimal-encoded string following the regular expression pattern `^\d+$`. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification.

For resources with a `ProcessorArchitecture` value of `x86`, this string is derived from register values resulting from the execution of the processor's CPUID instruction using this algorithm:

```
(eax, ebx, ecx, edx) = cpuid(eax=0x1);  
EffectiveModel = ((eax & 0x000F0000) >> 12) + ((eax & 0x00F0) >> 4);
```

6.110.5.5 FpgaType

The FPGA type.

- This property shall contain a type of the FPGA device.

string	Description
Discrete	The discrete FPGA device.
Integrated	The FPGA device integrated with other processor in the single chip.

6.110.5.6 IdentificationRegisters

The raw manufacturer-provided processor identification registers for this processor.

- This property shall contain the raw manufacturer-provided processor-specific identification registers of this processor's features. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification.

Pattern: `^0x[0-9A-Fa-f]+$`

For resources with a `ProcessorArchitecture` value of x86, this string is derived from register values resulting from execution of the processor's CUID instruction using this algorithm:

```
(eax, ebx, ecx, edx) = cpuid(eax=0xD);
IdentificationRegisters = (edx << 32) + eax;
```

6.110.5.7 InstructionSet

The instruction set of the processor.

- This property shall contain the string that identifies the instruction set of the processor contained in this socket.

string	Description
ARM-A32	ARM 32-bit.
ARM-A64	ARM 64-bit.
IA-64	Intel IA-64.
MIPS32	MIPS 32-bit.
MIPS64	MIPS 64-bit.
OEM	OEM-defined.
PowerISA (v1.4+)	PowerISA-64 or PowerISA-32.

string	Description
RV32 (v1.19+)	RISC-V 32-bit.
RV64 (v1.19+)	RISC-V 64-bit.
x86	x86 32-bit.
x86-64	x86 64-bit.

6.110.5.8 InterfaceType

The interface type.

- This property shall contain an enumerated value that describes the type of interface between the system, or external connection, and the processor.

string	Description
AMBA (v1.8+)	The Arm Advanced Microcontroller Bus Architecture interface.
CCIX (v1.8+)	The Cache Coherent Interconnect for Accelerators interface.
CXL (v1.8+)	The Compute Express Link interface.
Ethernet	An Ethernet interface.
OEM	An OEM-defined interface.
PCIe	A PCI Express interface.
QPI	The Intel QuickPath Interconnect.
UPI	The Intel UltraPath Interconnect.

6.110.5.9 MaxPCleType

The highest version of the PCIe specification supported by this device.

- This property shall contain the maximum PCIe specification that this device supports.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.

string	Description
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.
Gen6 (v1.16+)	A PCIe v6.0 slot.

6.110.5.10 MemoryType

The type of memory used by this processor.

- This property shall contain a type of the processor memory type.

string	Description
Cache (v1.17+)	Processor cache, but no level is determined.
DDR	Double data rate synchronous dynamic random-access memory.
DDR2	Double data rate type two synchronous dynamic random-access memory.
DDR3	Double data rate type three synchronous dynamic random-access memory.
DDR4	Double data rate type four synchronous dynamic random-access memory.
DDR5	Double data rate type five synchronous dynamic random-access memory.
Flash	Flash memory.
GDDR	Synchronous graphics random-access memory.
GDDR2	Double data rate type two synchronous graphics random-access memory.
GDDR3	Double data rate type three synchronous graphics random-access memory.
GDDR4	Double data rate type four synchronous graphics random-access memory.
GDDR5	Double data rate type five synchronous graphics random-access memory.
GDDR5X	Double data rate type five X synchronous graphics random-access memory.
GDDR6	Double data rate type six synchronous graphics random-access memory.
HBM1	High Bandwidth Memory.
HBM2	The second generation of High Bandwidth Memory.

string	Description
HBM2E (v1.17+)	An updated version of the second generation of High Bandwidth Memory.
HBM3	The third generation of High Bandwidth Memory.
L1Cache	L1 cache.
L2Cache	L2 cache.
L3Cache	L3 cache.
L4Cache	L4 cache.
L5Cache	L5 cache.
L6Cache	L6 cache.
L7Cache	L7 cache.
OEM	OEM-defined.
SDRAM	Synchronous dynamic random-access memory.
SGRAM	Synchronous graphics RAM.
SRAM	Static random-access memory.

6.110.5.11 MicrocodeInfo

The microcode information for this processor.

- This property shall contain the microcode information as provided by the manufacturer of this processor. If this property represents raw register data, as determined by the value of the `ProcessorArchitecture` property, the service shall encode the value as a hex-encoded string following the regular expression pattern `^0x[0-9A-Fa-f]+$` or a decimal-encoded string following the regular expression pattern `^\d+$`. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification.

For resources with a `ProcessorArchitecture` value of `x86`, this string shall contain a hex-encoded representation of the 64-bit value derived from register values resulting from the execution of the processor's RDMSR instruction using this algorithm:

```
(eax, edx) = rdmsr(ecx=0x8B);  
MicrocodeInfo = (edx << 32) + eax;
```

6.110.5.12 Model

The FPGA model.

- This property shall contain a model of the FPGA device.

For resources with a `ProcessorArchitecture` value of `x86`, this string shall contain the 48-byte little-endian ASCII string derived from register values resulting from the execution of the processor's CPUID instruction using this algorithm:

```
// Let Model[48] be a 48-byte, little-endian character array
// Let reg, eax, ebx, ecx, edx be 32-bit unsigned integer registers

for (leaf = 0; leaf <= 2; leaf++)
{
    (eax, ebx, ecx, edx) = cpuid(eax = 0x80000002 + leaf);
    regidx = 0;

    for regval in (eax, ebx, ecx, edx)
    {
        ##NB: order must be eax, ebx, ecx, edx
        for (byte = 0; byte <= 3; byte++)
        {
            Model[leaf*16 + regidx*4 + byte] = regval & 0xFF;
            regval = regval >> 8;
        }
        regidx++;
    }
}
```

6.110.5.13 PCIeType

The version of the PCIe specification in use by this device.

- This property shall contain the negotiated PCIe interface version in use by this device.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.

string	Description
Gen5	A PCIe v5.0 slot.
Gen6 (v1.16+)	A PCIe v6.0 slot.

6.110.5.14 PowerState

The current power state of the processor.

- This property shall contain the power state of the processor. If the `PowerState` property in the associated `Chassis` resource contains the value `off`, this property shall contain `off`.

string	Description
Off	The resource is powered off. The components within the resource might continue to have AUX power.
On	The resource is powered on.
Paused	The resource is paused.
PoweringOff	A temporary state between on and off. The components within the resource can take time to process the power off action.
PoweringOn	A temporary state between off and on. The components within the resource can take time to process the power on action.

6.110.5.15 ProcessorArchitecture

The architecture of the processor.

- This property shall contain the string that identifies the architecture of the processor contained in this socket.

string	Description
ARM	ARM.
IA-64	Intel Itanium.
MIPS	MIPS.
OEM	OEM-defined.
Power (v1.4+)	Power.
RISC-V (v1.19+)	RISC-V.

string	Description
x86	x86 or x86-64.

6.110.5.16 ProcessorId

The identification information for this processor.

- This object shall contain identification information for this processor. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification.

This object's properties shall contain values that depend on the `ProcessorArchitecture` property value. For resources with a `ProcessorArchitecture` value of `x86`, some property values are defined using register values resulting from the execution of the CUID or RDMSR instructions.

6.110.5.17 ProcessorType

The type of processor.

- This property shall contain the string that identifies the type of processor contained in this socket.

string	Description
Accelerator	An accelerator.
Core (v1.3+)	A core in a processor.
CPU	A CPU.
DSP	A DSP.
FPGA	An FPGA.
GPU	A GPU.
OEM	An OEM-defined processing unit.
Partition (v1.19+)	A partition in a single processor. • This value shall indicate a partition in a processor that is instantiated from a user configuration to carve out resources in a single processor. An example of this is assigning memory to a set of cores in a GPU.
Thread (v1.3+)	A thread in a processor.

6.110.5.18 ResetType

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property shall contain the value <code>On</code>.
ForceRestart	Shut down immediately and non-gracefully and restart the unit. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
FullPowerCycle	Full power cycle the unit. Behaves like removing utility lines, followed by restoring utility lines to the resource. • This value shall indicate the resource will perform a full power cycle as if utility lines to the resource are removed and restored. This is different from <code>PowerCycle</code> in that it's as close to a true power cycle as possible. For example, removing AC power cables from an enclosure and then restoring the AC power cables. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>. If a service supports this value but there are no other distinct power cycle flows, the service shall support <code>PowerCycle</code> as an alias to <code>FullPowerCycle</code>. This type of reset may cause the manager providing the Redfish service to power cycle. If the manager providing the Redfish service is affected by this type of reset, the service shall send the action response before resetting to prevent client timeouts.
GracefulRestart	Shut down gracefully and restart the unit. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.

string	Description
GracefulShutdown	Shut down gracefully and power off. This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a paused state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Paused</code>.
PowerCycle	Power cycle the unit. Behaves like a power removal, followed by a power restore to the resource. This value shall indicate the resource will perform a power cycle. This is different from <code>FullPowerCycle</code> in that it typically performs localized power sequencing of the resource while external power is still present. For example, turning DC voltage regulators off and then turning DC voltage regulators back on. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
PushPowerButton	Simulate the pressing of the physical power button on this unit. This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.

string	Description
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.

6.110.5.19 Step

The step value for this processor.

- This property shall contain the step or revision information as provided by the manufacturer of this processor. If this property represents raw register data, as determined by the value of the `ProcessorArchitecture` property, the service shall encode the value as a hex-encoded string following the regular expression pattern `^0x[0-9A-Fa-f]+$` or a decimal-encoded string following the regular expression pattern `^\d+$`. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification.

For resources with a `ProcessorArchitecture` value of `x86`, this string is derived from register values resulting from the execution of the processor's CPUID instruction using this algorithm:

```
(eax, ebx, ecx, edx) = cpuid(eax=0x1);  
Step = (eax & 0x000F);
```

6.110.5.20 ThrottleCauses

- The causes of the processor being throttled.
 - This property shall contain the causes of the processor being throttled. If ``Throttled`` contains ``false``, this property shall contain an empty array.

string	Description
ClockLimit	The cause of the processor being throttled is a clock limit.
ManagementDetectedFault	The cause of the processor being throttled is a fault detected by management hardware or firmware.
OEM	The cause of the processor being throttled is OEM-specific.
PowerLimit	The cause of the processor being throttled is a power limit.
ThermalLimit	The cause of the processor being throttled is a thermal limit.

string	Description
Unknown	The cause of the processor being throttled is not known.

6.110.5.21 TurboState

The state of turbo for this processor.

- This property shall contain the state of turbo for this processor.

string	Description
Disabled	Turbo is disabled.
Enabled	Turbo is enabled.

6.110.5.22 VendorId

The vendor identification for this processor.

- This property shall contain the vendor identification information as provided by the manufacturer of this processor. If this property represents raw register data, as determined by the value of the `ProcessorArchitecture` property, the service shall encode the value as a hex-encoded string following the regular expression pattern `^0x[0-9A-Fa-f]+$` or a decimal-encoded string following the regular expression pattern `^\d+$`. For additional property requirements, see the corresponding definition in the Redfish Data Model Specification.

For resources with a `ProcessorArchitecture` value of `x86`, this string shall contain the 12-byte little-endian ASCII string that results from the execution of the processor's CPUID instruction using this algorithm:

```
// Let VendorID[12] be a 12-byte, little-endian character array
// Let reg, eax, ebx, ecx, edx be 32-bit unsigned integer registers

regidx = 0;
(eax, ebx, ecx, edx) = cpuid(eax=0x0);

for regval in (ebx, edx, ecx)
{
    ##NB: order must be ebx, edx, ecx
    for (byte = 0; byte <= 3; byte++)
    {
        VendorID[regidx*4 + byte] = regval & 0xFF;
        regval = regval >> 8;
    }
}
```

```

    }
    regidx++;
}

```

6.110.6 Example response

```

{
  "@odata.type": "#Processor.v1_20_1.Processor",
  "Name": "Processor",
  "Id": "1",
  "Socket": "CPU 1",
  "ProcessorType": "CPU",
  "ProcessorArchitecture": "x86",
  "InstructionSet": "x86-64",
  "Manufacturer": "Intel(R) Corporation",
  "Model": "Multi-Core Intel(R) Xeon(R) processor 7xxx Series",
  "ProcessorId": {
    "VendorId": "GenuineIntel",
    "IdentificationRegisters": "0x34AC34DC8901274A",
    "EffectiveFamily": "0x42",
    "EffectiveModel": "0x61",
    "Step": "0x1",
    "MicrocodeInfo": "0x429943"
  },
  "MaxSpeedMHz": 3700,
  "TotalCores": 8,
  "TotalThreads": 16,
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "Location": {
    "PartLocation": {
      "ServiceLabel": "Processor 1",
      "LocationType": "Socket",
      "LocationOrdinalValue": 0
    }
  },
  "@odata.id": "/redfish/v1/Systems/437XR1138R2/Processors/1"
}

```

6.111 ProcessorMetrics 1.6.4

Version	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0

Release	2022.2	2022.1	2021.3	2021.2	2020.4	2020.1	2018.3

6.111.1 Description

The `ProcessorMetrics` schema contains usage and health statistics for a processor.

- This resource contains the processor metrics for a single processor in a Redfish implementation.

6.111.2 URIs

```

/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Processors/{ProcessorId}/ProcessorMetrics
/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Processors/{ProcessorId}/SubProcessors/
{ProcessorId2}/ProcessorMetrics
/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Processors/{ProcessorId}/SubProcessors/
{ProcessorId2}/SubProcessors/{ProcessorId3}/ProcessorMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/ProcessorMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/SubProcessors/
{ProcessorId2}/ProcessorMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/SubProcessors/
{ProcessorId2}/SubProcessors/{ProcessorId3}/ProcessorMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/
{ProcessorId}/ProcessorMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/
{ProcessorId}/SubProcessors/{ProcessorId2}/ProcessorMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/
{ProcessorId}/SubProcessors/{ProcessorId2}/SubProcessors/{ProcessorId3}/ProcessorMetrics
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/
ProcessorSummary/ProcessorMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/ProcessorMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}/
ProcessorMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}/
SubProcessors/{ProcessorId3}/ProcessorMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/
ProcessorMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/
SubProcessors/{ProcessorId2}/ProcessorMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/
SubProcessors/{ProcessorId2}/SubProcessors/{ProcessorId3}/ProcessorMetrics
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/ProcessorSummary/ProcessorMetrics
/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/ProcessorMetrics
/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}/ProcessorMetrics

```

/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}/SubProcessors/{ProcessorId3}/ProcessorMetrics
 /redfish/v1/Systems/{ComputerSystemId}/ProcessorSummary/ProcessorMetrics

6.111.3 Properties

Property	Type	Attributes	Notes
AverageFrequencyMHz (<i>deprecated v1.1</i>)	number (MHz)	<i>read-only (null)</i>	The average frequency of the processor. This property shall contain average frequency in MHz, across all enabled cores in the processor. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property is not applicable. <i>Deprecated in v1.1 and later. This property has been deprecated in favor of the <code>OperatingSpeedMHz</code> property.</i>
BandwidthPercent	number (%)	<i>read-only (null)</i>	The bandwidth usage of this processor as a percentage. This property shall contain the bandwidth usage of the processor as a percentage, typically 0 to 100. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property shall be the CPU utilization over all processors as a percentage.
Cache [{	array		The processor cache metrics. This property shall contain properties that describe this processor's cache. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property is not applicable.
CacheMiss	number	<i>read-only (null)</i>	The number of cache line misses in millions. This property shall contain the number of cache line misses of the processor or core in millions.
CacheMissesPerInstruction	number	<i>read-only (null)</i>	The number of cache misses per instruction. This property shall contain the number of cache misses per instruction of the processor or core.
HitRatio	number	<i>read-only (null)</i>	The cache line hit ratio. This property shall contain the cache hit ratio of the processor or core.
Level	string	<i>read-only (null)</i>	The cache level. This property shall contain the level of the cache in the processor or core.

Property	Type	Attributes	Notes
OccupancyBytes	integer (bytes)	<i>read-only</i> (null)	The total cache level occupancy in bytes. This property shall contain the total cache occupancy of the processor or core in bytes.
OccupancyPercent	number (%)	<i>read-only</i> (null)	The total cache occupancy percentage. This property shall contain the total cache occupancy percentage, 0 to 100, of the processor or core.
}]			
CacheMetricsTotal (v1.2+) {	object		The total cache metrics for this processor. This property shall contain properties that describe the metrics for all of the cache memory of this processor.
CurrentPeriod (v1.2+) {	object		The cache metrics since the last reset or <code>ClearCurrentPeriod</code> action for this processor. This property shall contain properties that describe the metrics for the current period of cache memory for this processor.
CorrectableECCErrorCount (v1.2+)	integer	<i>read-only</i> (null)	The number of correctable errors of cache memory since reset or <code>ClearCurrentPeriod</code> action for this processor. This property shall contain the number of correctable errors of cache memory since reset or <code>ClearCurrentPeriod</code> action for this processor. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property shall be the sum of <code>CorrectableECCErrorCount</code> over all processors.
UncorrectableECCErrorCount (v1.2+)	integer	<i>read-only</i> (null)	The number of uncorrectable errors of cache memory since reset or <code>ClearCurrentPeriod</code> action for this processor. This property shall contain the number of uncorrectable errors of cache memory since reset or <code>ClearCurrentPeriod</code> action for this processor. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property shall be the sum of <code>UncorrectableECCErrorCount</code> over all processors.
}			
LifeTime (v1.2+) {	object		The cache metrics for the lifetime of this processor. This property shall contain properties that describe the metrics for the lifetime of the cache memory for this processor.

Property	Type	Attributes	Notes
CorrectableECCErrorCount (v1.2+)	integer	<i>read-only</i> (null)	The number of correctable errors for the lifetime of the cache memory. This property shall contain the number of correctable errors for the lifetime of the cache memory. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property shall be the sum of <code>CorrectableECCErrorCount</code> over all processors.
UncorrectableECCErrorCount (v1.2+)	integer	<i>read-only</i> (null)	The number of uncorrectable errors for the lifetime of the cache memory. This property shall contain the number of uncorrectable errors for the lifetime of the cache memory. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property shall be the sum of <code>UncorrectableECCErrorCount</code> over all processors.
}			
}			
ConsumedPowerWatt (<i>deprecated</i> v1.2)	number (Watts)	<i>read-only</i> (null)	The power, in watt units, that the processor has consumed. This property shall contain the power, in watt units, that the processor has consumed. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property shall be the sum of power, in watt units, that all processors have consumed. <i>Deprecated in v1.2 and later. This property has been deprecated in favor of the properties in <code>EnvironmentMetrics</code>.</i>
CoreMetrics [{	array		The processor core metrics. This property shall contain properties that describe the cores of this processor. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property is not applicable.
CoreCache [{	array		The cache metrics of this core in the processor. This property shall contain properties that describe the cache metrics of this core in the processor.
CacheMiss	number	<i>read-only</i> (null)	The number of cache line misses in millions. This property shall contain the number of cache line misses of the processor or core in millions.
CacheMissesPerInstruction	number	<i>read-only</i> (null)	The number of cache misses per instruction. This property shall contain the number of cache misses per instruction of the processor or core.

Property	Type	Attributes	Notes
HitRatio	number	<i>read-only</i> (null)	The cache line hit ratio. This property shall contain the cache hit ratio of the processor or core.
Level	string	<i>read-only</i> (null)	The cache level. This property shall contain the level of the cache in the processor or core.
OccupancyBytes	integer (bytes)	<i>read-only</i> (null)	The total cache level occupancy in bytes. This property shall contain the total cache occupancy of the processor or core in bytes.
OccupancyPercent	number (%)	<i>read-only</i> (null)	The total cache occupancy percentage. This property shall contain the total cache occupancy percentage, 0 to 100, of the processor or core.
}]			
CoreId	string	<i>read-only</i> (null)	The processor core identifier. This property shall contain the identifier of the core within the processor.
CorrectableCoreErrorCount (v1.5+)	integer	<i>read-only</i> (null)	The number of correctable core errors. This property shall contain the number of correctable core errors, such as TLB or cache errors. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property shall be the sum of <code>CorrectableCoreErrorCount</code> over all processors.
CorrectableOtherErrorCount (v1.5+)	integer	<i>read-only</i> (null)	The number of correctable errors of all other components. This property shall contain the number of correctable errors of all other components. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property shall be the sum of <code>CorrectableOtherErrorCount</code> over all processors.
CStateResidency [{	array		The C-state residency of this core in the processor. This property shall contain properties that describe the C-state residency of this core in the processor.

Property	Type	Attributes	Notes
Level	string	<i>read-only</i> (null)	The C-state level, such as C0, C1, or C2. This property shall contain the C-state level, such as C0, C1, or C2. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property is not applicable.
ResidencyPercent	number (%)	<i>read-only</i> (null)	The percentage of time that the processor or core has spent in this particular level of C-state. This property shall contain the percentage of time, 0 to 100, that the processor or core has spent in this particular level of C-state. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property is not applicable.
}]			
InstructionsPerCycle	number	<i>read-only</i> (null)	The number of instructions per clock cycle of this core. This property shall contain the number of instructions per clock cycle of this core in the processor.
IOStallCount	number	<i>read-only</i> (null)	The number of stalled cycles due to I/O operations. This property shall contain the number of stalled cycles due to I/O operations of this core in the processor.
MemoryStallCount	number	<i>read-only</i> (null)	The number of stalled cycles due to memory operations. This property shall contain the number of stalled cycles due to memory operations of this core in the processor.
UncorrectableCoreErrorCount (v1.5+)	integer	<i>read-only</i> (null)	The number of uncorrectable core errors. This property shall contain the number of uncorrectable core errors, such as TLB or cache errors. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property shall be the sum of <code>UncorrectableCoreErrorCount</code> over all processors.
UncorrectableOtherErrorCount (v1.5+)	integer	<i>read-only</i> (null)	The number of uncorrectable errors of all other components. This property shall contain the number of uncorrectable errors of all other components. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property shall be the sum of <code>UncorrectableOtherErrorCount</code> over all processors.
UnhaltedCycles	number	<i>read-only</i> (null)	The unhalted cycles count of this core. This property shall contain the number of unhalted cycles of this core in the processor.

Property	Type	Attributes	Notes
}]			
CoreVoltage (v1.3+) {	object (excerpt)		The core voltage (V) of this processor. The value of this property shall contain the core voltage, in volt units, of this processor. The core voltage of the processor may change more frequently than the manager is able to monitor. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Voltage</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
CrestFactor (v1.1+)	number	<i>read-only</i> (null)	The crest factor for this sensor. This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
THDPercent (v1.1+)	number (%)	<i>read-only</i> (null)	The total harmonic distortion percent (% THD). This property shall contain the total harmonic distortion of the <code>Reading</code> property in percent units, typically 0 to 100.
}			
CorrectableCoreErrorCount (v1.5+)	integer	<i>read-only</i> (null)	The number of correctable core errors. This property shall contain the number of correctable core errors, such as TLB or cache errors. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property shall be the sum of <code>CorrectableCoreErrorCount</code> over all processors.

Property	Type	Attributes	Notes
CorrectableOtherErrorCount (v1.5+)	integer	<i>read-only</i> (null)	The number of correctable errors of all other components. This property shall contain the number of correctable errors of all other components. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property shall be the sum of <code>CorrectableOtherErrorCount</code> over all processors.
FrequencyRatio	number	<i>read-only</i> (null)	The frequency relative to the nominal processor frequency ratio. This property shall contain the frequency relative to the nominal processor frequency ratio of this processor. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property shall be the average <code>FrequencyRatio</code> over all processors.
KernelPercent	number (%)	<i>read-only</i> (null)	The percentage of time spent in kernel mode. This property shall contain total percentage of time, 0 to 100, the processor has spent in kernel mode. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property shall be the average <code>KernelPercent</code> over all processors.
LocalMemoryBandwidthBytes	integer (bytes)	<i>read-only</i> (null)	The local memory bandwidth usage in bytes. This property shall contain the local memory bandwidth usage of this processor in bytes. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property shall be the sum of <code>LocalMemoryBandwidthBytes</code> over all processors.
OperatingSpeedMHz (v1.1+)	integer (MHz)	<i>read-only</i> (null)	Operating speed of the processor in MHz. This property shall contain the operating speed of the processor in MHz. The operating speed of the processor may change more frequently than the manager is able to monitor.
PCleErrors (v1.4+) {	object		The PCIe errors associated with this processor. This property shall contain the PCIe errors associated with this processor.
BadDLLPCount (v1.15+)	integer	<i>read-only</i> (null)	The total number of Bad DLLPs issued on the PCIe link by the receiver. This property shall contain the total number of Bad DLLPs issued on the PCIe link by the receiver. A Bad DLLP in the context of PCIe communication is a packet that has encountered errors at the data link layer. When a DLLP is considered bad, it means it has been corrupted or is incorrectly formatted, potentially due to transmission errors, hardware failures, or other issues that affect its integrity.

Property	Type	Attributes	Notes
BadTLPCount (v1.15+)	integer	<i>read-only (null)</i>	The total number of Bad TLPs issued on the PCIe link by the receiver. This property shall contain the total number of Bad TLPs issued on the PCIe link by the receiver. A Bad TLP in the context of PCIe communication is a packet that cannot be properly processed due to errors at the transaction layer. These errors could include corrupted data, incorrect packet formatting, invalid header information, or a mismatched checksum.
CorrectableErrorCount (v1.8+)	integer	<i>read-only (null)</i>	The total number of PCIe correctable errors for this device. This property shall contain the total number of PCIe correctable errors for this device.
FatalErrorCount (v1.8+)	integer	<i>read-only (null)</i>	The total number of PCIe fatal errors for this device. This property shall contain the total number of PCIe fatal errors for this device.
L0ToRecoveryCount (v1.8+)	integer	<i>read-only (null)</i>	The total number of times the PCIe link states transitioned from L0 to the recovery state for this device. This property shall contain the total number of times the PCIe link transitioned from L0 to the recovery state for this device.
NAKReceivedCount (v1.8+)	integer	<i>read-only (null)</i>	The total number of NAKs issued on the PCIe link by the receiver. This property shall contain the total number of NAKs issued on the PCIe link by the receiver. A NAK is issued by the receiver when it detects that a TLP from this device was missed. This could be because this device did not transmit it, or because the receiver could not properly decode the packet.
NAKSentCount (v1.8+)	integer	<i>read-only (null)</i>	The total number of NAKs issued on the PCIe link by this device. This property shall contain the total number of NAKs issued on the PCIe link by this device. A NAK is issued by the device when it detects that a TLP from the receiver was missed. This could be because the receiver did not transmit it, or because this device could not properly decode the packet.
NonFatalErrorCount (v1.8+)	integer	<i>read-only (null)</i>	The total number of PCIe non-fatal errors for this device. This property shall contain the total number of PCIe non-fatal errors for this device.

Property	Type	Attributes	Notes
ReplayCount (v1.8+)	integer	<i>read-only</i> (null)	The total number of PCIe replays issued by this device. This property shall contain the total number of replays issued on the PCIe link by this device. A replay is a retransmission of a TLP and occurs because the ACK timer is expired, which means that the receiver did not send the ACK or this device did not properly decode the ACK.
ReplayRolloverCount (v1.8+)	integer	<i>read-only</i> (null)	The total number of PCIe replay rollovers issued by this device. This property shall contain the total number of replay rollovers issued on the PCIe link by this device. A replay rollover occurs when consecutive replays failed to resolve the errors on the link, which means that this device forced the link into the recovery state.
UnsupportedRequestCount (v1.13+)	integer	<i>read-only</i> (null)	The total number of PCIe unsupported requests received by this device. This property shall contain the total number of PCIe unsupported requests received by this device.
}			
PowerLimitThrottleDuration (v1.6+)	string (duration)	<i>read-only</i> (null)	The total duration of throttling caused by a power limit of the processor since reset. This property shall contain the total duration of throttling caused by a power limit of the processor since reset. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?</code>?
RemoteMemoryBandwidthBytes	integer (bytes)	<i>read-only</i> (null)	The remote memory bandwidth usage in bytes. This property shall contain the remote memory bandwidth usage of this processor in bytes. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property shall be the sum of <code>RemoteMemoryBandwidthBytes</code> over all processors.
TemperatureCelsius (deprecated v1.2)	number (Celsius)	<i>read-only</i> (null)	The temperature of the processor. This property shall contain the temperature, in degree Celsius units, of the processor. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property shall be the average temperature, in Celsius, over all processors. Deprecated in v1.2 and later. This property has been deprecated in favor of the properties in <code>EnvironmentMetrics</code>.

Property	Type	Attributes	Notes
ThermalLimitThrottleDuration (v1.6+)	string (duration)	<i>read-only</i> (null)	The total duration of throttling caused by a thermal limit of the processor since reset. This property shall contain the total duration of throttling caused by a thermal limit of the processor since reset. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?</code>?
ThrottlingCelsius	number (Celsius)	<i>read-only</i> (null)	The CPU margin to throttle (temperature offset in degree Celsius units). This property shall contain the CPU margin to throttle based on an offset between the maximum temperature in which the processor can operate, and the processor's current temperature. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property is not applicable.
UncorrectableCoreErrorCount (v1.5+)	integer	<i>read-only</i> (null)	The number of uncorrectable core errors. This property shall contain the number of uncorrectable core errors, such as TLB or cache errors. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property shall be the sum of <code>UncorrectableCoreErrorCount</code> over all processors.
UncorrectableOtherErrorCount (v1.5+)	integer	<i>read-only</i> (null)	The number of uncorrectable errors of all other components. This property shall contain the number of uncorrectable errors of all other components. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property shall be the sum of <code>UncorrectableOtherErrorCount</code> over all processors.
UserPercent	number (%)	<i>read-only</i> (null)	The percentage of time spent in user mode. This property shall contain total percentage of time, 0 to 100, the processor has spent in user mode. When this resource is subordinate to the <code>ProcessorSummary</code> object, this property shall be the average UserPercent over all processors.

6.111.4 Actions

6.111.4.1 ClearCurrentPeriod (v1.2+)

Description

This action sets the `CurrentPeriod` property's values to 0.

- This action shall set the `CurrentPeriod` property's values to 0.

Action URI

{Base URI of target resource}/Actions/ProcessorMetrics.ClearCurrentPeriod

Action parameters

This action takes no parameters.

6.111.5 Example response

```
{
  "@odata.type": "#ProcessorMetrics.v1_6_4.ProcessorMetrics",
  "Id": "Metrics",
  "Name": "Processor Metrics",
  "BandwidthPercent": 62,
  "OperatingSpeedMHz": 2400,
  "ThrottlingCelsius": 65,
  "FrequencyRatio": 0.00432,
  "Cache": [
    {
      "Level": "3",
      "CacheMiss": 0.12,
      "HitRatio": 0.719,
      "CacheMissesPerInstruction": 0.00088,
      "OccupancyBytes": 3030144,
      "OccupancyPercent": 90.1
    }
  ],
  "LocalMemoryBandwidthBytes": 18253611008,
  "RemoteMemoryBandwidthBytes": 81788928,
  "KernelPercent": 2.3,
  "UserPercent": 34.7,
  "CoreMetrics": [
    {
      "CoreId": "core0",
      "InstructionsPerCycle": 1.16,
      "UnhaltedCycles": 6254383746,
      "MemoryStallCount": 58372,
      "IOStallCount": 2634872,
      "CoreCache": [
        {
          "Level": "2",
          "CacheMiss": 0.472,
          "HitRatio": 0.57,
          "CacheMissesPerInstruction": 0.00346,
          "OccupancyBytes": 198231,
          "OccupancyPercent": 77.4
        }
      ]
    }
  ],
}
```

```
      "CStateResidency": [
        {
          "Level": "C0",
          "Residency": 1.13
        },
        {
          "Level": "C1",
          "Residency": 26
        },
        {
          "Level": "C3",
          "Residency": 0.00878
        },
        {
          "Level": "C6",
          "Residency": 0.361
        },
        {
          "Level": "C7",
          "Residency": 72.5
        }
      ]
    },
    "@odata.id": "/redfish/v1/Systems/1/Processors/FPGA1/ProcessorMetrics"
  }
}
```

6.112 Pump 1.2.0

Version	v1.2	v1.1	v1.0
Release	2024.4	2024.1	2023.1

6.112.1 Description

The `Pump` schema describes a pump unit for a cooling system or similar device.

- This resource shall represent the management properties for monitoring and management of pumps for a Redfish implementation.

6.112.2 URIs

`/redfish/v1/Chassis/{ChassisId}/ThermalSubsystem/Pumps/{PumpId}`
`/redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/Pumps/{PumpId}`

/redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/Pumps/{PumpId}
 /redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/Pumps/{PumpId}
 /redfish/v1/ThermalEquipment/RPUs/{CoolingUnitId}/Pumps/{PumpId}

6.112.3 Properties

Property	Type	Attributes	Notes
Assembly {	object		The link to the assembly associated with this pump. This property shall contain a link to a resource of type <code>Assembly</code>. See the <i>Assembly</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>Assembly</i> resource. See the Links section and the <i>Assembly</i> schema for details.
}			
AssetTag	string	<i>read-write (null)</i>	The user-assigned asset tag for this equipment. This property shall contain the user-assigned asset tag, which is an identifying string that tracks the equipment for inventory purposes.
Filters {	object		A link to a collection of filters. This property shall contain a link to a resource collection of type <code>FilterCollection</code> that contains a set of filters. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Filter</i> . See the <i>Filter</i> schema for details.
}			
FirmwareVersion	string	<i>read-only</i>	The firmware version of this equipment. This property shall contain a string describing the firmware version of this equipment as provided by the manufacturer.
InletPressurekPa (v1.2+) {	object (excerpt)		The inlet pressure (kPa). This property shall contain the pressure, in kilopascal units, for the inlet to this pump. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>PressurekPa</code>. This object is an excerpt of the <i>Sensor</i> resource located at the URI shown in <code>DataSourceUri</code>.

Property	Type	Attributes	Notes
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			
Location {}	object		The location of the pump. This property shall contain the location information of this pump. For property details, see Location.
LocationIndicatorActive	boolean	<i>read-write</i> (null)	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource.
Manufacturer	string	<i>read-only</i> (null)	The manufacturer of this pump. This property shall contain the name of the organization responsible for producing the pump. This organization may be the entity from whom the pump is purchased, but this is not necessarily true.
Model	string	<i>read-only</i> (null)	The model number for this pump. This property shall contain the model information as defined by the manufacturer for this pump.
PartNumber	string	<i>read-only</i> (null)	The part number for this pump. This property shall contain the part number as defined by the manufacturer for this pump.
PhysicalContext	string (enum)	<i>read-only</i>	The area or device associated with this pump. This property shall contain a description of the affected device or region within the chassis with which this pump is associated. For the possible property values, see <i>PhysicalContext</i> in <i>Property details</i>.
ProductionDate	string (date-time)	<i>read-only</i> (null)	The production or manufacturing date of this equipment. This property shall contain the date of production or manufacture for this equipment.

Property	Type	Attributes	Notes
PumpSpeedPercent {	object (excerpt)		The pump speed (%). This property shall contain the current speed, in percent units, of this pump. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Percent</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
SpeedRPM (v1.2+)	number ({rev}/min)	<i>read-only</i> (null)	The rotational speed. This property shall contain a reading of the rotational speed of the device in revolutions per minute (RPM) units.
}			
PumpType	string (enum)	<i>read-only</i> (null)	The type of pump. This property shall contain the type of pump represented by this resource. <i>For the possible property values, see PumpType in Property details.</i>
SerialNumber	string	<i>read-only</i> (null)	The serial number for this pump. This property shall contain the serial number as defined by the manufacturer for this pump.
ServiceHours	number	<i>read-write</i> (null)	The hours of service this pump has provided. This property shall contain the number of hours of service that the pump has been in operation.
SparePartNumber	string	<i>read-only</i> (null)	The spare part number for this pump. This property shall contain the spare or replacement part number as defined by the manufacturer for this pump.

Property	Type	Attributes	Notes
SpeedControlPercent (v1.1+) {	object (excerpt)		The desired pump speed (%). This property shall contain the desired speed, in percent units, of this pump. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Control</code> with the <code>ControlType</code> property containing the value <code>Percent</code>. This object is an excerpt of the <code>Control</code> resource located at the URI shown in <code>DataSourceUri</code>.
AllowableMax	number	<i>read-only</i> (null)	The maximum possible setting for this control. This property shall indicate the maximum possible value of the <code>SetPoint</code> or <code>SettingMax</code> properties for this control. Services shall not accept values for <code>SetPoint</code> or <code>SettingMax</code> above this value.
AllowableMin	number	<i>read-only</i> (null)	The minimum possible setting for this control. This property shall indicate the minimum possible value of the <code>SetPoint</code> or <code>SettingMin</code> properties for this control. Services shall not accept values for <code>SetPoint</code> or <code>SettingMin</code> below this value.
ControlLoop {	object		The control loop details. This property shall contain the details for the control loop described by this resource.
CoefficientUpdateTime	string (date-time)	<i>read-only</i> (null)	The date and time that the control loop coefficients were changed. This property shall contain the date and time that any of the coefficients for the control loop were last changed.
Differential	number	<i>read-write</i> (null)	The differential coefficient. This property shall contain the coefficient for the differential factor in a control loop.
Integral	number	<i>read-write</i> (null)	The integral coefficient. This property shall contain the coefficient for the integral factor in a control loop.
Proportional	number	<i>read-write</i> (null)	The proportional coefficient. This property shall contain the coefficient for the proportional factor in a control loop.
}			

Property	Type	Attributes	Notes
ControlMode	string (enum)	<i>read-write</i> (null)	The current operating mode of the control. This property shall contain the operating mode of the control. <i>For the possible property values, see ControlMode in Property details.</i>
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this control. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy. If no source resource is implemented, meaning the excerpt represents the only available data, this property shall not be present.
Reading	number	<i>read-only</i> (null)	The reading of the sensor associated with this control. This property shall contain the value of the <code>Reading</code> property of the <code>Sensor</code> resource directly associated with this control. This property shall not be present if multiple sensors are associated with a single control.
SetPoint	number	<i>read-write</i> (null)	The desired set point of the control. This property shall contain the desired set point control value. The units shall follow the value of <code>SetPointUnits</code>. If the <code>DefaultSetPoint</code> property is not supported and if a user-defined set point is not configured, the property may contain <code>null</code> in responses.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
UserLabel	string	<i>read-write</i>	A user-assigned label. This property shall contain a user-assigned label used to identify this resource. If a value has not been assigned by a user, the value of this property shall be an empty string.
Version	string	<i>read-only</i> (null)	The hardware version of this equipment. This property shall contain the hardware version of this equipment as determined by the vendor or supplier.

6.112.4 Actions

6.112.4.1 SetMode (v1.2+)

Description

This action sets the operating mode of the pump.

- This action shall set the operating mode of the pump.

Action URI

{Base URI of target resource}/Actions/Pump.SetMode

Action parameters

Parameter Name	Type	Attributes	Notes
Mode	string (enum)	<i>optional</i>	The desired operating mode of the pump. • This parameter shall contain the desired operating mode of the pump. <i>For the possible property values, see Mode in Property details.</i>

Request Example

```
{
  "Mode": "Disabled"
}
```

6.112.5 Property details

6.112.5.1 ControlMode

The current operating mode of the control.

- This property shall contain the operating mode of the control.

string	Description
Automatic	Automatically adjust control to meet the set point.
Disabled	The control has been disabled.
Manual	No automatic adjustments are made to the control.
Override	User override of the automatic set point value.

6.112.5.2 Mode

The desired operating mode of the pump.

- This parameter shall contain the desired operating mode of the pump.

string	Description
Disabled	Disable the pump. • This value shall indicate a request to disable the pump. Upon successful completion, the <code>State</code> property within <code>Status</code> , shall contain the value <code>Disabled</code> .
Enabled	Enable the pump. • This value shall indicate a request to enable the pump. Upon successful completion, the <code>State</code> property within <code>Status</code> , shall contain the value <code>Enabled</code> .

6.112.5.3 PhysicalContext

The area or device associated with this pump.

- This property shall contain a description of the affected device or region within the chassis with which this pump is associated.

string	Description
Accelerator	An accelerator.
ACInput	An AC electrical input or input-related circuit.
ACMaintenanceBypassInput	An AC electrical maintenance bypass input.

string	Description
ACOutput	An AC electrical output or output-related circuit. This value shall indicate an electrical output or an output-related circuit, such as a branch output, which is not terminated as a power outlet.
ACStaticBypassInput	An AC electrical static bypass input.
ACUtilityInput	An AC electrical utility input. This value shall indicate an electrical input, where the source is an electrical utility as opposed to a backup or locally-generated power source. This value is intended to differentiate multiple electrical inputs between utility, maintenance bypass, or static bypass values. For general purpose usage, the value of <code>ACInput</code> is preferred.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	A compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC electrical bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	An expansion bay. This value shall indicate a location that provides for the expansion of functionality of a system, such as a PCIe slot that can accept an option card.
ExpansionSubsystem	A group of expansion bays. This value shall indicate a group of expansion bays and the devices installed in those bays.
Fan	A fan.

string	Description
Filter	A filter.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Manager	A management controller, such as a BMC (baseboard management controller).
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	A networking bay. This value shall indicate a location that provides for the expansion of networking functionality of a system, by the addition of networking devices.
NetworkingDevice	A networking device.
PowerOutlet	An electrical outlet. This value shall indicate an electrical outlet or receptacle.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	A power supply bay. This value shall indicate a location that provides for the installation of a power supply or similar devices.
Pump	A pump.
Rectifier	A rectifier device.
Reservoir	A reservoir.

string	Description
Room	The room.
StorageBay	A storage bay. This value shall indicate a location that provides for the expansion of storage functionality of a system, by the addition of storage devices.
StorageDevice	A storage device.
StorageSubsystem	A storage subsystem. This value shall indicate a storage subsystem, which may consist of one or more storage controllers, storage devices, or related components.
Switch	A switch device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.112.5.4 PumpType

The type of pump.

- This property shall contain the type of pump represented by this resource.

string	Description
Compressor	A compressor.
Liquid	A water or liquid pump.

6.112.6 Example response

```
{
  "@odata.type": "#Pump.v1_2_0.Pump",
  "Id": "1",
  "PumpType": "Liquid",
  "Name": "Immersion Unit Pump",
  "Version": "1.03b",
  "ProductionDate": "2021-06-24T08:00:00Z",
  "Manufacturer": "Contoso",
  "Model": "UP-JAM",
  "SerialNumber": "29347ZT599",
  "PartNumber": "MAARS",
  "AssetTag": "PDX5-92399",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "PumpSpeedPercent": {
    "Reading": 62,
    "SpeedRPM": 1800
  },
  "@odata.id": "/redfish/v1/ThermalEquipment/ImmersionUnits/1/Pumps/1"
}
```

6.113 RegisteredClient 1.1.2

Version	v1.1	v1.0
Release	2023.1	2021.4

6.113.1 Description

The `RegisteredClient` schema defines the record format for a registered client. It is designed to allow well-behaved clients to register with a Redfish service such that other clients are aware the service might be configured or monitored by the client.

- This resource shall represent a registered client for a Redfish implementation. It is not expected that transient tools, such as a short-lived CLI tool, register. Clients and management tools that live for long periods of time can create `RegisteredClient` resources so that other clients are aware the service might be configured or monitored by the client.

6.113.2 URIs

/redfish/v1/RegisteredClients/{RegisteredClientId}

6.113.3 Properties

Property	Type	Attributes	Notes
ClientType	string (enum)	<i>read-write required</i>	The type of registered client. This property shall contain the type of registered client. <i>For the possible property values, see ClientType in Property details.</i>
ClientURI	string (URI)	<i>read-write</i>	The URI of the registered client. This property shall contain the URI of the registered client.
Context (v1.1+)	string	<i>read-write</i>	A client-supplied data for providing context for its own use. This property shall contain data provided by the owning client used to identify the service, provide context about its state, or other information. The value of this property shall not contain unencrypted sensitive data such as user credentials. Services shall support values of at least 256 bytes in length.
CreatedDate	string (date-time)	<i>read-only</i>	The date and time when the client entry was created. This property shall contain the date and time when the client entry was created.
ExpirationDate	string (date-time)	<i>read-write</i>	The date and time when the client entry will expire. This property shall contain the date and time when the client entry expires. Registered clients that are actively managing or monitoring should periodically update this value. The value should not be more than 7 days after the date when it was last set. If the current date is beyond this date, the service may delete this client entry.
ManagedResources [{	array		An array of resources that the registered client monitors or configures. This property shall contain an array of resources that the registered client monitors or configures. Other clients can use this property to understand which resources are monitored or configured by the registered client.

Property	Type	Attributes	Notes
IncludesSubordinates	boolean	<i>read-write</i> (null)	Indicates whether the subordinate resources of the managed resource are also managed by the registered client. This property shall indicate whether the subordinate resources of the managed resource referenced by the <code>ManagedResourceURI</code> property are also managed by the registered client. If not specified, the value is assumed to be <code>false</code> unless <code>ManagedResourceURI</code> references a resource collection.
ManagedResourceURI	string (URI)	<i>read-write</i> (null)	The URI of the resource or resource collection managed by the registered client. This property shall contain the URI of the Redfish resource or Redfish resource collection managed by the registered client. When the URI references a resource collection, all members of the resource collection may be monitored or configured by the client, and the <code>IncludesSubordinates</code> property shall contain <code>true</code>.
PreferExclusive	boolean	<i>read-write</i> (null)	Indicates whether the registered client expects to have exclusive access to the managed resource. This property shall indicate whether the registered client expects to have exclusive access to the managed resource referenced by the <code>ManagedResourceURI</code> property, and also its subordinate resources if <code>IncludesSubordinates</code> contains <code>true</code>. If not specified, the value is assumed to be <code>false</code>.
}}]			
SubContext (v1.1+)	string	<i>read-write</i>	Additional client-supplied data for providing contextual information for its own use. This property shall contain additional data provided by the owning client used to identify the service, provide context about its state, or other information. The value of this property shall not contain unencrypted sensitive data such as user credentials. Services shall support values of at least 256 bytes in length.

6.113.4 Property details

6.113.4.1 ClientType

The type of registered client.

- This property shall contain the type of registered client.

string	Description
Configure	The registered client performs update, create, and delete operations on the resources listed in the <code>ManagedResources</code> property as well as read operations on the service.
Monitor	The registered client only performs read operations on this service.

6.113.5 Example response

```
{
  "@odata.type": "#RegisteredClient.v1_1_2.RegisteredClient",
  "Id": "2",
  "Name": "ContosoConfigure",
  "ClientType": "Configure",
  "CreatedDate": "2021-09-25T20:12:24Z",
  "Description": "Contoso manager access",
  "ExpirationDate": "2022-10-03T20:00:00Z",
  "ManagedResources": [
    {
      "ManagedResourceURI": "/redfish/v1/Systems",
      "PreferExclusive": true,
      "IncludesSubordinates": true
    },
    {
      "ManagedResourceURI": "/redfish/v1/Chassis",
      "PreferExclusive": true,
      "IncludesSubordinates": true
    }
  ],
  "ClientURI": "https://4.5.6.2/ContosoManager",
  "@odata.id": "/redfish/v1/RegisteredClients/2"
}
```

6.114 Reservoir 1.0.2

Version	v1.0
Release	2023.1

6.114.1 Description

The `Reservoir` schema describes a reservoir unit for a cooling system or similar device.

- This resource shall represent the management properties for monitoring and management of reservoirs for a Redfish implementation.

6.114.2 URIs

/redfish/v1/ThermalEquipment/CDUs/{CoolingUnitId}/Reservoirs/{ReservoirId}
 /redfish/v1/ThermalEquipment/HeatExchangers/{CoolingUnitId}/Reservoirs/{ReservoirId}
 /redfish/v1/ThermalEquipment/ImmersionUnits/{CoolingUnitId}/Reservoirs/{ReservoirId}
 /redfish/v1/ThermalEquipment/RPUs/{CoolingUnitId}/Reservoirs/{ReservoirId}

6.114.3 Properties

Property	Type	Attributes	Notes
Assembly {	object		The link to the assembly associated with this reservoir. • This property shall contain a link to a resource of type <code>Assembly</code>. See the <i>Assembly</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Assembly resource. See the Links section and the <i>Assembly</i> schema for details.
}			
CapacityLiters	number	<i>read-only</i> (null)	The capacity of the reservoir (L). • This property shall contain the capacity of the reservoir in liter units.
Coolant {	object		Details about the coolant used in this unit. • This property shall contain details regarding the coolant contained or used by this unit. See the <i>CoolingLoop</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Coolant resource. See the Links section and the <i>CoolingLoop</i> schema for details.
}			
Filters {	object		A link to a collection of filters. • This property shall contain a link to a resource collection of type <code>FilterCollection</code> that contains a set of filters. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Filter</i> . See the <i>Filter</i> schema for details.
}			

Property	Type	Attributes	Notes
FluidLevelPercent {	object (excerpt)		The fluid capacity filled (percent). This property shall contain the amount of fluid capacity, in percent units, filled in this reservoir. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Percent</code>. Services that support this property shall also return the <code>FluidLevelStatus</code> property. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			
FluidLevelStatus	string (enum)	<i>read-only</i> (null)	The status of the fluid level in this reservoir. This property shall indicate the status of the fluid level in this reservoir. <i>For the possible property values, see <code>FluidLevelStatus</code> in Property details.</i>
InternalPressurekPa {	object (excerpt)		The internal pressure (kPa) reading. This property shall contain the internal pressure, measured in kilopascal units, for the reservoir. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>PressurekPa</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			

Property	Type	Attributes	Notes
Location {}	object		The location of the reservoir. This property shall contain the location information of this reservoir. For property details, see Location.
LocationIndicatorActive	boolean	<i>read-write</i> (null)	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource.
Manufacturer	string	<i>read-only</i> (null)	The manufacturer of this reservoir. This property shall contain the name of the organization responsible for producing the reservoir. This organization may be the entity from whom the reservoir is purchased, but this is not necessarily true.
Model	string	<i>read-only</i> (null)	The model number for this reservoir. This property shall contain the model information as defined by the manufacturer for this reservoir.
PartNumber	string	<i>read-only</i> (null)	The part number for this reservoir. This property shall contain the part number as defined by the manufacturer for this reservoir.
PhysicalContext	string (enum)	<i>read-only</i>	The area or device associated with this reservoir. This property shall contain a description of the affected device or region within the chassis with which this reservoir is associated. <i>For the possible property values, see PhysicalContext in Property details.</i>
ReservoirType	string (enum)	<i>read-only</i> (null)	The type of reservoir. This property shall contain the type of reservoir represented by this resource. <i>For the possible property values, see ReservoirType in Property details.</i>
SerialNumber	string	<i>read-only</i> (null)	The serial number for this reservoir. This property shall contain the serial number as defined by the manufacturer for this reservoir.
SparePartNumber	string	<i>read-only</i> (null)	The spare part number for this reservoir. This property shall contain the spare or replacement part number as defined by the manufacturer for this reservoir.

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
UserLabel	string	<i>read-write</i>	A user-assigned label. This property shall contain a user-assigned label used to identify this resource. If a value has not been assigned by a user, the value of this property shall be an empty string.

6.114.4 Property details

6.114.4.1 FluidLevelStatus

The status of the fluid level in this reservoir.

- This property shall indicate the status of the fluid level in this reservoir.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

6.114.4.2 PhysicalContext

The area or device associated with this reservoir.

- This property shall contain a description of the affected device or region within the chassis with which this reservoir is associated.

string	Description
Accelerator	An accelerator.
ACInput	An AC electrical input or input-related circuit.
ACMaintenanceBypassInput	An AC electrical maintenance bypass input.

string	Description
ACOutput	An AC electrical output or output-related circuit. This value shall indicate an electrical output or an output-related circuit, such as a branch output, which is not terminated as a power outlet.
ACStaticBypassInput	An AC electrical static bypass input.
ACUtilityInput	An AC electrical utility input. This value shall indicate an electrical input, where the source is an electrical utility as opposed to a backup or locally-generated power source. This value is intended to differentiate multiple electrical inputs between utility, maintenance bypass, or static bypass values. For general purpose usage, the value of <code>ACInput</code> is preferred.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	A compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC electrical bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	An expansion bay. This value shall indicate a location that provides for the expansion of functionality of a system, such as a PCIe slot that can accept an option card.
ExpansionSubsystem	A group of expansion bays. This value shall indicate a group of expansion bays and the devices installed in those bays.
Fan	A fan.

string	Description
Filter	A filter.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Manager	A management controller, such as a BMC (baseboard management controller).
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	A networking bay. This value shall indicate a location that provides for the expansion of networking functionality of a system, by the addition of networking devices.
NetworkingDevice	A networking device.
PowerOutlet	An electrical outlet. This value shall indicate an electrical outlet or receptacle.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	A power supply bay. This value shall indicate a location that provides for the installation of a power supply or similar devices.
Pump	A pump.
Rectifier	A rectifier device.
Reservoir	A reservoir.

string	Description
Room	The room.
StorageBay	A storage bay. This value shall indicate a location that provides for the expansion of storage functionality of a system, by the addition of storage devices.
StorageDevice	A storage device.
StorageSubsystem	A storage subsystem. This value shall indicate a storage subsystem, which may consist of one or more storage controllers, storage devices, or related components.
Switch	A switch device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.114.4.3 ReservoirType

The type of reservoir.

- This property shall contain the type of reservoir represented by this resource.

string	Description
Immersion	An immersion cooling tank.
Inline	An inline or integrated reservoir.
Overflow	An overflow reservoir for excess fluid.
Reserve	A reservoir providing reserve fluid capacity.

6.114.5 Example response

```
{
  "@odata.type": "#Reservoir.v1_0_2.Reservoir",
  "Id": "1",
  "ReservoirType": "Reserve",
  "Name": "Cooling Loop Reservoir",
  "Manufacturer": "Contoso",
  "Model": "Tarantino",
  "CapacityLiters": 10,
  "PartNumber": "Pink",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "Location": {
    "Placement": {
      "Row": "North 1"
    }
  },
  "FluidLevelPercent": {
    "Reading": 64.8
  },
  "InternalPressurekPa": {
    "Reading": 138.7
  },
  "@odata.id": "/redfish/v1/ThermalEquipment/CDUs/1/Reservoirs/1"
}
```

6.115 ResourceBlock 1.4.3

Version	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2020.4	2018.3	2018.2	2018.1	2017.1

6.115.1 Description

The `ResourceBlock` schema contains definitions of a resource block, its components, and affinity to composed devices.

- This resource shall represent a resource block for a Redfish implementation.

6.115.2 URIs

/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}

/redfish/v1/ResourceBlocks/{ResourceBlockId}

6.115.3 Properties

Property	Type	Attributes	Notes
Client (v1.4+)	string	<i>read-write</i> (null)	The client to which this resource block is assigned. This property shall contain the client to which this resource block is assigned.
CompositionStatus {	object	<i>required</i>	The composition status details for this resource block. This property shall contain composition status information about this resource block.
CompositionState	string (enum)	<i>read-only</i> <i>required</i> (null)	The current state of the resource block from a composition perspective. This property shall contain an enumerated value that describes the composition state of the resource block. <i>For the possible property values, see CompositionState in Property details.</i>
MaxCompositions (v1.1+)	integer	<i>read-only</i> (null)	The maximum number of compositions in which this resource block can participate simultaneously. This property shall contain a number indicating the maximum number of compositions in which this resource block can participate simultaneously. Services can have additional constraints that prevent this value from being achieved, such as due to system topology and current composed resource utilization. If <code>SharingCapable</code> is <code>false</code>, this value shall be set to <code>1</code>. The service shall support this property if <code>SharingCapable</code> supported.
NumberOfCompositions (v1.1+)	integer	<i>read-only</i> (null)	The number of compositions in which this resource block is currently participating. This property shall contain the number of compositions in which this resource block is currently participating.
Reserved	boolean	<i>read-write</i> (null)	An indication of whether any client has reserved the resource block. This property shall indicate whether any client has reserved the resource block. A client sets this property after the resource block is identified as composed. It shall provide a way for multiple clients to negotiate the ownership of the resource block.

Property	Type	Attributes	Notes
SharingCapable (v1.1+)	boolean	<i>read-only</i> (null)	An indication of whether this resource block can participate in multiple compositions simultaneously. This property shall indicate whether this resource block can participate in multiple compositions simultaneously. If this property is not provided, it shall be assumed that this resource block is not capable of being shared.
SharingEnabled (v1.1+)	boolean	<i>read-write</i> (null)	An indication of whether this resource block is allowed to participate in multiple compositions simultaneously. This property shall indicate whether this resource block can participate in multiple compositions simultaneously. The service shall reject modifications of this property with the HTTP <code>400 Bad Request</code> status code if this resource block is already being used as part of a composed resource. If <code>false</code>, the service shall not use the <code>ComposedAndAvailable</code> state for this resource block.
}			
ComputerSystems [{	array		An array of links to the computer systems available in this resource block. This property shall contain an array of links to resources of type <code>ComputerSystem</code> that this resource block contains.
@odata.id	string	<i>read-only</i>	Link to a <code>ComputerSystem</code> resource. See the Links section and the <code>ComputerSystem</code> schema for details.
}]			
Drives (v1.3+) [{	array		An array of links to the drives available in this resource block. This property shall contain an array of links to resources of type <code>Drive</code> that this resource block contains.
@odata.id	string	<i>read-only</i>	Link to a <code>Drive</code> resource. See the Links section and the <code>Drive</code> schema for details.
}]			
EthernetInterfaces [{	array		An array of links to the Ethernet interfaces available in this resource block. This property shall contain an array of links to resources of type <code>EthernetInterface</code> that this resource block contains.
@odata.id	string	<i>read-only</i>	Link to a <code>EthernetInterface</code> resource. See the Links section and the <code>EthernetInterface</code> schema for details.
}]			

Property	Type	Attributes	Notes
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Chassis [{	array		An array of links to the chassis in which this resource block is contained. This property shall contain an array of links to resources of type <code>Chassis</code> that represent the physical containers associated with this resource block.
@odata.id	string	<i>read-only</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.
}]			
ComputerSystems [{	array		An array of links to the computer systems that are composed from this resource block. This property shall contain an array of links to resources of type <code>ComputerSystem</code> that represent the computer systems composed from this resource block.
@odata.id	string	<i>read-only</i>	Link to a ComputerSystem resource. See the Links section and the <i>ComputerSystem</i> schema for details.
}]			
ConsumingResourceBlocks (v1.4+) [{	array		An array of links to resource blocks that depend on this resource block. This property shall contain an array of links to resources of type <code>ResourceBlock</code> that represent the resource blocks that depend on this resource block as a component.
@odata.id	string	<i>read-only</i>	Link to another ResourceBlock resource.
}]			
Oem { }	object		See the OEM object definition in the Using this guide clause.
SupplyingResourceBlocks (v1.4+) [{	array		An array of links to resource blocks that this resource block depends on. This property shall contain an array of links to resources of type <code>ResourceBlock</code> that represent the resource blocks that this resource block depends on as components.
@odata.id	string	<i>read-only</i>	Link to another ResourceBlock resource.
}]			

Property	Type	Attributes	Notes
Zones [{	array		An array of links to the zones in which this resource block is bound. This property shall contain an array of links to resources of type <code>Zone</code> that represent the binding constraints associated with this resource block.
@odata.id	string	<i>read-only</i>	Link to a Zone resource. See the Links section and the <i>Zone</i> schema for details.
}]			
}			
Memory [{	array		An array of links to the memory available in this resource block. This property shall contain an array of links to resources of type <code>Memory</code> that this resource block contains.
@odata.id	string	<i>read-only</i>	Link to a Memory resource. See the Links section and the <i>Memory</i> schema for details.
}]			
NetworkInterfaces [{	array		An array of links to the Network Interfaces available in this resource block. This property shall contain an array of links to resources of type <code>NetworkInterface</code> that this resource block contains.
@odata.id	string	<i>read-only</i>	Link to a NetworkInterface resource. See the Links section and the <i>NetworkInterface</i> schema for details.
}]			
Pool (v1.4+)	string (enum)	<i>read-write</i> (null)	The pool to which this resource block belongs. This property shall contain the pool to which this resource block belongs. If this resource block is not assigned to a client, this property shall contain the value <code>Unassigned</code>. If this resource block is assigned to a client, this property shall not contain the value <code>Unassigned</code>. <i>For the possible property values, see Pool in Property details.</i>
Processors [{	array		An array of links to the processors available in this resource block. This property shall contain an array of links to resources of type <code>Processor</code> that this resource block contains.
@odata.id	string	<i>read-only</i>	Link to a Processor resource. See the Links section and the <i>Processor</i> schema for details.
}]			

Property	Type	Attributes	Notes
ResourceBlockType []	array (string (enum))	<i>read-only required</i>	- The types of resources available on this resource block. - This property shall contain an array of enumerated values that describe the type of resources available. <i>For the possible property values, see ResourceBlockType in Property details.</i>
SimpleStorage [{	array		An array of links to the simple storage available in this resource block. This property shall contain an array of links to resources of type <code>SimpleStorage</code> that this resource block contains.
@odata.id	string	<i>read-only</i>	Link to a SimpleStorage resource. See the Links section and the <i>SimpleStorage</i> schema for details.
}]			
Status { }	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
Storage [{	array		An array of links to the storage available in this resource block. This property shall contain an array of links to resources of type <code>Storage</code> that this resource block contains.
@odata.id	string	<i>read-only</i>	Link to a Storage resource. See the Links section and the <i>Storage</i> schema for details.
}]			

6.115.4 Property details

6.115.4.1 CompositionState

The current state of the resource block from a composition perspective.

- This property shall contain an enumerated value that describes the composition state of the resource block.

string	Description
Composed	Final successful state of a resource block that has participated in composition.

string	Description
ComposedAndAvailable (v1.1+)	The resource block is currently participating in one or more compositions, and is available to use in more compositions.
Composing	Intermediate state indicating composition is in progress.
Failed	The final composition resulted in failure and manual intervention might be required to fix it.
Unavailable (v1.2+)	The resource block has been made unavailable by the service, such as due to maintenance being performed on the resource block.
Unused	The resource block is free and can participate in composition.

6.115.4.2 Pool

The pool to which this resource block belongs.

- This property shall contain the pool to which this resource block belongs. If this resource block is not assigned to a client, this property shall contain the value `Unassigned`. If this resource block is assigned to a client, this property shall not contain the value `Unassigned`.

string	Description
Active	This resource block is in the active pool and is contributing to at least one composed resource as a result of a composition request.
Free	This resource block is in the free pool and is not contributing to any composed resources.
Unassigned	This resource block is not assigned to any pools.

6.115.4.3 ResourceBlockType

- The types of resources available on this resource block.
 - This property shall contain an array of enumerated values that describe the type of resources available.

string	Description
Compute	This resource block contains resources of type <code>Processor</code> and <code>Memory</code> in a manner that creates a compute complex.
ComputerSystem	This resource block contains resources of type <code>ComputerSystem</code> .
Expansion	This resource block is capable of changing over time based on its configuration. Different types of devices within this resource block can be added and removed over time.

string	Description
IndependentResource	This resource block is capable of being consumed as a standalone component. This resource block can represent things such as a software platform on one or more computer systems or an appliance that provides composable resources and other services and can be managed independently of the Redfish service.
Memory	This resource block contains resources of type <code>Memory</code> .
Network	This resource block contains network resources, such as resources of type <code>EthernetInterface</code> and <code>NetworkInterface</code> .
Processor	This resource block contains resources of type <code>Processor</code> .
Storage	This resource block contains storage resources, such as resources of type <code>Storage</code> and <code>SimpleStorage</code> .

6.115.5 Example response

```
{
  "@odata.type": "#ResourceBlock.v1_4_3.ResourceBlock",
  "Id": "ComputeBlock1",
  "Name": "Compute Block 1",
  "ResourceBlockType": [
    "Compute",
    "Network"
  ],
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "CompositionStatus": {
    "Reserved": false,
    "CompositionState": "Composed",
    "SharingCapable": false,
    "MaxCompositions": 1,
    "NumberOfCompositions": 1
  },
  "Processors": [
    {
      "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock1/Processors/Block1CPU0"
    },
    {
      "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock1/Processors/Block1CPU1"
    }
  ],
  "Memory": [
    {
```

```

        "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock1/Memory/Block1DIMM0"
      },
      {
        "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock1/Memory/Block1DIMM1"
      },
      {
        "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock1/Memory/Block1DIMM2"
      },
      {
        "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock1/Memory/Block1DIMM3"
      }
    ],
    "EthernetInterfaces": [
      {
        "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock1/EthernetInterfaces/Block1OnboardNIC"
      }
    ],
    "ComputerSystems": [],
    "Links": {
      "ComputerSystems": [
        {
          "@odata.id": "/redfish/v1/Systems/ComposedSystem"
        }
      ],
      "Chassis": [
        {
          "@odata.id": "/redfish/v1/Chassis/ComposableModule1"
        }
      ],
      "Zones": [
        {
          "@odata.id": "/redfish/v1/CompositionService/ResourceZones/1"
        }
      ]
    },
    "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock1"
  }

```

6.116 Role 1.3.3

Version	v1.3	v1.2	v1.1	v1.0
Release	2020.4	2017.2	2017.1	1.0

6.116.1 Description

The `Role` schema contains a Redfish role to use in conjunction with a manager account.

- This resource shall represent the Redfish role for the user account.

6.116.2 URIs

/redfish/v1/AccountService/Roles/{RoleId}

/redfish/v1/Managers/{ManagerId}/RemoteAccountService/Roles/{RoleId}

6.116.3 Properties

Property	Type	Attributes	Notes
AlternateRoleId (v1.3+)	string	<i>read-only</i>	An equivalent role to use when this role is restricted. • This property shall contain a non-restricted <code>RoleId</code> intended to be used in its place when the <code>Restricted</code> property contains the value <code>true</code>.
AssignedPrivileges []	array (string (enum))	<i>read-write</i>	• The Redfish privileges for this role. ◦ This property shall contain the Redfish privileges for this role. For predefined roles, this property shall be read-only. For custom roles, some implementations may prevent writing to this property. <i>For the possible property values, see AssignedPrivileges in Property details.</i>
IsPredefined	boolean	<i>read-only</i>	An indication of whether the role is predefined by Redfish or an OEM rather than a client-defined role. • This property shall indicate whether the role is predefined by Redfish or an OEM as contrasted with a client-defined role. If this property is not present, the value should be assumed to be <code>false</code>.
OemPrivileges []	array (string)	<i>read-write</i>	The OEM privileges for this role. • This property shall contain the OEM privileges for this role. For predefined roles, this property shall be read-only. For custom roles, some implementations may prevent writing to this property.
Restricted (v1.3+)	boolean	<i>read-only</i>	An indication of whether use of the role is restricted. • This property shall indicate whether use of the role is restricted by a service as defined by the 'Restricted roles and restricted privileges' clause of the Redfish Specification. If this property is not present, the value shall be assumed to be <code>false</code>.

Property	Type	Attributes	Notes
RoleId (v1.2+)	string	<i>read-only required</i>	The name of the role. This property shall contain the string name of the role. This property shall contain the same value as the <code>Id</code> property.

6.116.4 Property details

6.116.4.1 AssignedPrivileges

- The Redfish privileges for this role.
 - This property shall contain the Redfish privileges for this role. For predefined roles, this property shall be read-only. For custom roles, some implementations may prevent writing to this property.

string	Description
AdministrateStorage	Administrator for storage subsystems and storage systems found in the storage collection and storage system collection respectively.
AdministrateSystems	Administrator for systems found in the systems collection. Able to manage boot configuration, keys, and certificates for systems.
ConfigureComponents	Can configure components that this service manages.
ConfigureCompositionInfrastructure	Can view and configure composition service resources. This value shall be used to indicate the user can view and configure composition service resources without matching the <code>Client</code> property in the <code>ResourceBlock</code> or <code>CompositionReservation</code> resources.
ConfigureManager	Can configure managers.
ConfigureSelf	Can change the password for the current user account, log out of their own sessions, and perform operations on resources they created. Services will need to be aware of resource ownership to map this privilege to an operation from a particular user.
ConfigureUsers	Can configure users and their accounts.
Login	Can log in to the service and read resources.
NoAuth	Authentication is not required. This value shall be used to indicate an operation does not require authentication. This privilege shall not be used in Redfish roles.
OperateStorageBackup	Operator for storage backup functionality for storage subsystems and storage systems found in the storage collection and storage system collection respectively.

string	Description
OperateSystems	Operator for systems found in the systems collection. Able to perform resets and configure interfaces.

6.116.5 Example response

```
{
  "@odata.type": "#Role.v1_3_3.Role",
  "Id": "Administrator",
  "Name": "User Role",
  "Description": "Admin User Role",
  "IsPredefined": true,
  "AssignedPrivileges": [
    "Login",
    "ConfigureManager",
    "ConfigureUsers",
    "ConfigureSelf",
    "ConfigureComponents"
  ],
  "OemPrivileges": [
    "OemClearLog",
    "OemPowerControl"
  ],
  "@odata.id": "/redfish/v1/AccountService/Roles/Administrator"
}
```

6.117 RouteEntry 1.0.2

Version	v1.0
Release	2019.4

6.117.1 Description

The `RouteEntry` schema describes the content of route entry rows. Each route entry contains route sets that list the possible routes for the route entry.

- This resource shall represent the content of route entry rows in the Redfish Specification.

6.117.2 URIs

`/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/GenZ/MSDT/{MSDTId}`

/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/GenZ/SSDT/{SSDTId}
/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/MSDT/{MSDTId} (deprecated)
/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/GenZ/LPRT/{LPRTId}
/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/GenZ/MPRT/{MPRTId}
/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/LPRT/{LPRTId} (deprecated)
/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/MPRT/{MPRTId} (deprecated)
/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/SSDT/{SSDTId} (deprecated)
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/
{FabricAdapterId}/GenZ/MSDT/{MSDTId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/
{FabricAdapterId}/GenZ/SSDT/{SSDTId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/
{FabricAdapterId}/MSDT/{MSDTId} (deprecated)
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/
{FabricAdapterId}/Ports/{PortId}/GenZ/LPRT/{LPRTId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/
{FabricAdapterId}/Ports/{PortId}/GenZ/MPRT/{MPRTId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/
{FabricAdapterId}/Ports/{PortId}/LPRT/{LPRTId} (deprecated)
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/
{FabricAdapterId}/Ports/{PortId}/MPRT/{MPRTId} (deprecated)
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/
{FabricAdapterId}/SSDT/{SSDTId} (deprecated)
/redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Ports/{PortId}/GenZ/LPRT/{LPRTId}
/redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Ports/{PortId}/GenZ/MPRT/{MPRTId}
/redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Ports/{PortId}/LPRT/{LPRTId} (deprecated)
/redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Ports/{PortId}/MPRT/{MPRTId} (deprecated)
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/
GenZ/MSDT/{MSDTId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/
GenZ/SSDT/{SSDTId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/
MSDT/{MSDTId} (deprecated)
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/
Ports/{PortId}/GenZ/LPRT/{LPRTId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/
Ports/{PortId}/GenZ/MPRT/{MPRTId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/
Ports/{PortId}/LPRT/{LPRTId} (deprecated)
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/
Ports/{PortId}/MPRT/{MPRTId} (deprecated)
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/
SSDT/{SSDTId} (deprecated)
/redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/GenZ/MSDT/{MSDTId}

/redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/GenZ/SSDT/{SSDTId}
 /redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/MSDT/{MSDTId} (deprecated)
 /redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/GenZ/LPRT/{LPRTId}
 /redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/GenZ/MPRT/{MPRTId}
 /redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/LPRT/{LPRTId}
 (deprecated)
 /redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/MPRT/{MPRTId}
 (deprecated)
 /redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/SSDT/{SSDTId} (deprecated)

6.117.3 Properties

Property	Type	Attributes	Notes
MinimumHopCount	integer	<i>read-write</i>	The minimum number of hops. This property shall indicate the minimum hop count used to calculate the computed hop count.
RawEntryHex	string	<i>read-write</i>	The raw data of route entry rows. This property shall contain a binary data that represents the content of route entry rows. Pattern: <code>^0[xX](([a-fA-F] [0-9]){2}){8}\$</code>
RouteSet {	object		The link to the collection of route set entries associated with this route. This property shall contain a link to a resource collection of type <code>RouteSetEntryCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>RouteSetEntry</i> . See the <i>RouteSetEntry</i> schema for details.
}			

6.117.4 Example response

```

{
  "@odata.type": "#RouteEntry.v1_0_2.RouteEntry",
  "Id": "0",
  "Name": "LPRT0",
  "Description": "Gen-Z Port 1 LPRT Entry 0",
  "RawEntryHex": "0x34EF124500000000",
  "RouteSet": {
    "@odata.id": "/redfish/v1/Fabrics/GenZ/Switches/Switch1/Ports/1/LPRT/0/RouteSet"
  }
}

```

```

    },
    "MinimumHopCount": 1,
    "@odata.id": "/redfish/v1/Fabrics/GenZ/Switches/Switch1/Ports/1/LPRT/0"
  }

```

6.118 RouteSetEntry 1.0.2

Version	v1.0
Release	2019.4

6.118.1 Description

The `RouteSetEntry` schema contains the information about a route. It is part of a larger set that contains possible routes for a particular route entry.

- This resource shall represent the content of a route set in the Redfish Specification.

6.118.2 URIs

```

/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/MSDT/{MSDTId}/RouteSet/{RouteId}
/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/LPRT/{LPRTId}/RouteSet/{RouteId}
/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/MPRT/{MPRTId}/RouteSet/{RouteId}
/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/SSDT/{SSDTId}/RouteSet/{RouteId}
/redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Ports/{PortId}/LPRT/{LPRTId}/RouteSet/{RouteId}
/redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Ports/{PortId}/MPRT/{MPRTId}/RouteSet/{RouteId}
/redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/MSDT/{MSDTId}/RouteSet/{RouteId}
/redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/LPRT/{LPRTId}/RouteSet/
{RouteId}
/redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/MPRT/{MPRTId}/
RouteSet/{RouteId}
/redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/SSDT/{SSDTId}/RouteSet/{RouteId}

```

6.118.3 Properties

Property	Type	Attributes	Notes
EgressIdentifier	integer	read-write	The egress interface identifier. This property shall contain the interface identifier corresponding to this route.
HopCount	integer	read-write	The number of hops. This property shall contain the number of hops to the destination component from the indicated egress interface.
Valid	boolean	read-write	An indication of whether the entry is valid. This property shall indicate whether the entry is valid.
VCAction	integer	read-write	The Virtual Channel Action index. This property shall contain the index to the VCAT entry corresponding to this route.

6.118.4 Example response

```
{
  "@odata.type": "#RouteSetEntry.v1_0_2.RouteSetEntry",
  "Id": "0",
  "Name": "RouteSet0",
  "Description": "Gen-Z Port 1 LPRT Entry 0 Route 0",
  "Valid": false,
  "VCAction": 1,
  "HopCount": 2,
  "EgressIdentifier": 0,
  "@odata.id": "/redfish/v1/Fabrics/GenZ/Switches/Switch1/Ports/1/LPRT/0/RouteSet/0"
}
```

6.119 SecureBoot 1.1.2

Version	v1.1	v1.0
Release	2020.1	2016.1

6.119.1 Description

The `SecureBoot` schema contains UEFI Secure Boot information and represents properties for managing the UEFI Secure Boot functionality of a system.

- This resource contains UEFI Secure Boot information for a Redfish implementation.

6.119.2 URIs

/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/SecureBoot
 /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/SecureBoot
 /redfish/v1/Systems/{ComputerSystemId}/SecureBoot

6.119.3 Properties

Property	Type	Attributes	Notes
SecureBootCurrentBoot	string (enum)	<i>read-only</i> (null)	The UEFI Secure Boot state during the current boot cycle. This property shall indicate the UEFI Secure Boot state during the current boot cycle. <i>For the possible property values, see SecureBootCurrentBoot in Property details.</i>
SecureBootDatabases (v1.1+) {	object		A link to the collection of UEFI Secure Boot databases. The value of this property shall be a link to a resource collection of type <code>SecureBootDatabaseCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>SecureBootDatabase</i> . See the <i>SecureBootDatabase</i> schema for details.
}			
SecureBootEnable	boolean	<i>read-write</i> (null)	An indication of whether UEFI Secure Boot is enabled. This property shall indicate whether the UEFI Secure Boot takes effect on next boot. This property can be enabled in UEFI boot mode only.
SecureBootMode	string (enum)	<i>read-only</i> (null)	The current UEFI Secure Boot Mode. This property shall contain the current UEFI Secure Boot mode, as defined in the UEFI Specification. <i>For the possible property values, see SecureBootMode in Property details.</i>

6.119.4 Actions

6.119.4.1 ResetKeys

Description

This action resets the UEFI Secure Boot keys.

- This action shall reset the UEFI Secure Boot key databases. The `ResetAllKeysToDefault` value shall reset all UEFI Secure Boot key databases to their default values. The `DeleteAllKeys` value shall delete the contents of all UEFI Secure Boot key databases. The `DeletePK` value shall delete the contents of the PK Secure Boot key database.

Action URI

{Base URI of target resource}/Actions/SecureBoot.ResetKeys

Action parameters

Parameter Name	Type	Attributes	Notes
ResetKeyType	string (enum)	<i>required</i>	The type of reset or delete to perform on the UEFI Secure Boot databases. This parameter shall specify the type of reset or delete to perform on the UEFI Secure Boot databases. <i>For the possible property values, see ResetKeyType in Property details.</i>

Request Example

```
{
  "ResetKeyType": "DeleteAllKeys"
}
```

6.119.5 Property details

6.119.5.1 ResetKeyType

The type of reset or delete to perform on the UEFI Secure Boot databases.

- This parameter shall specify the type of reset or delete to perform on the UEFI Secure Boot databases.

string	Description
DeleteAllKeys	Delete the contents of all UEFI Secure Boot key databases, including the PK key database. This puts the system in Setup Mode.
DeletePK	Delete the contents of the PK UEFI Secure Boot database. This puts the system in Setup Mode.
ResetAllKeysToDefault	Reset the contents of all UEFI Secure Boot key databases, including the PK key database, to the default values.

6.119.5.2 SecureBootCurrentBoot

The UEFI Secure Boot state during the current boot cycle.

- This property shall indicate the UEFI Secure Boot state during the current boot cycle.

string	Description
Disabled	UEFI Secure Boot is currently disabled.
Enabled	UEFI Secure Boot is currently enabled.

6.119.5.3 SecureBootMode

The current UEFI Secure Boot Mode.

- This property shall contain the current UEFI Secure Boot mode, as defined in the UEFI Specification.

string	Description
AuditMode	UEFI Secure Boot is currently in Audit Mode.
DeployedMode	UEFI Secure Boot is currently in Deployed Mode.
SetupMode	UEFI Secure Boot is currently in Setup Mode.
UserMode	UEFI Secure Boot is currently in User Mode.

6.119.6 Example response

```
{  
  "@odata.type": "#SecureBoot.v1_1_2.SecureBoot",  
}
```

```

    "Id": "SecureBoot",
    "Name": "UEFI Secure Boot",
    "Actions": {
      "#SecureBoot.ResetKeys": {
        "target": "/redfish/v1/Systems/1/SecureBoot/Actions/SecureBoot.ResetKeys",
        "ResetKeyType@Redfish.AllowableValues": [
          "ResetAllKeysToDefault",
          "DeleteAllKeys",
          "DeletePK"
        ]
      }
    },
    "SecureBootEnable": false,
    "SecureBootCurrentBoot": "Disabled",
    "SecureBootMode": "UserMode",
    "SecureBootDatabases": {
      "@odata.id": "/redfish/v1/Systems/1/SecureBoot/SecureBootDatabases"
    },
    "@odata.id": "/redfish/v1/Systems/1/SecureBoot"
  }
}

```

6.120 SecureBootDatabase 1.0.3

Version	v1.0
Release	2020.1

6.120.1 Description

The `SecureBootDatabase` schema describes a UEFI Secure Boot database used to store certificates or hashes.

- This resource shall be used to represent a UEFI Secure Boot database for a Redfish implementation.

6.120.2 URIs

```

/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/SecureBoot/
SecureBootDatabases/{DatabaseId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/SecureBoot/SecureBootDatabases/
{DatabaseId}
/redfish/v1/Systems/{ComputerSystemId}/SecureBoot/SecureBootDatabases/{DatabaseId}

```


6.120.3 Properties

Property	Type	Attributes	Notes
Certificates {	object		A link to the collection of certificates contained in this UEFI Secure Boot database. The value of this property shall be a link to a resource collection of type <code>CertificateCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
Databaseld	string	<i>read-only</i>	This property contains the name of the UEFI Secure Boot database. This property shall contain the name of the UEFI Secure Boot database. This property shall contain the same value as the <code>Id</code> property. The value shall be one of the UEFI-defined Secure Boot databases: <code>PK</code>, <code>KEK</code>, <code>db</code>, <code>dbx</code>, <code>dbr</code>, <code>dbt</code>, <code>PKDefault</code>, <code>KEKDefault</code>, <code>dbDefault</code>, <code>dbxDefault</code>, <code>dbrDefault</code>, OR <code>dbtDefault</code>.
Signatures {	object		A link to the collection of signatures contained in this UEFI Secure Boot database. The value of this property shall be a link to a resource collection of type <code>SignatureCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Signature</i> . See the Signature schema for details.
}			

6.120.4 Actions

6.120.4.1 ResetKeys

Description

This action is used to reset the UEFI Secure Boot keys of this database.

- This action shall perform a reset of this UEFI Secure Boot key database. The `ResetAllKeysToDefault` value shall reset this UEFI Secure Boot key database to the default values. The `DeleteAllKeys` value shall delete the contents of this UEFI Secure Boot key database.

Action URI

{Base URI of target resource}/Actions/SecureBootDatabase.ResetKeys

Action parameters

Parameter Name	Type	Attributes	Notes
ResetKeysType	string (enum)	<i>required</i>	The type of reset or delete to perform on this UEFI Secure Boot database. This parameter shall specify the type of reset or delete to perform on this UEFI Secure Boot database. <i>For the possible property values, see ResetKeysType in Property details.</i>

Request Example

```
{
  "ResetKeysType": "ResetAllKeysToDefault"
}
```

6.120.5 Property details

6.120.5.1 ResetKeysType

The type of reset or delete to perform on this UEFI Secure Boot database.

- This parameter shall specify the type of reset or delete to perform on this UEFI Secure Boot database.

string	Description
DeleteAllKeys	Delete the contents of this UEFI Secure Boot key database.
ResetAllKeysToDefault	Reset the contents of this UEFI Secure Boot key database to the default values.

6.120.6 Example response

```
{
  "@odata.type": "#SecureBootDatabase.v1_0_3.SecureBootDatabase",
  "Id": "PK",
  "Name": "PK - Platform Key",
  "Description": "UEFI PK Secure Boot Database",
  "DatabaseId": "PK",
  "Certificates": {
    "@odata.id": "/redfish/v1/Systems/1/SecureBoot/SecureBootDatabases/PK/Certificates/"
  },
}
```

```
    "Actions": {
      "#SecureBootDatabase.ResetKeys": {
        "target": "/redfish/v1/Systems/1/SecureBoot/SecureBootDatabases/PK/Actions/SecureBootDatabase.ResetKeys",
        "ResetKeyType@Redfish.AllowableValues": [
          "ResetAllKeysToDefault",
          "DeleteAllKeys"
        ]
      }
    },
    "@odata.id": "/redfish/v1/Systems/1/SecureBoot/SecureBootDatabases/PK"
  }
}
```

6.121 SecurityPolicy 1.0.3

Version	v1.0
Release	2022.2

6.121.1 Description

The SecurityPolicy resource provides a central point to configure the security policy of a manager.

- This resource shall represent configurable security-related policies managed by a manager. All security parameters in other resources that are controlled by the manager shall follow the related settings in this security policy. For example, an outbound TLS connection established per an EventDestination resource will follow the values of the properties in the TLS property.

6.121.2 URIs

/redfish/v1/Managers/{ManagerId}/SecurityPolicy

6.121.3 Properties

Property	Type	Attributes	Notes
OverrideParentManager	boolean	<i>read-write</i>	Override the security policy of the parent manager. This property shall indicate whether this security policy overrides the security policy of the managers referenced by the <code>ManagedBy</code> property within the <code>Links</code> property of the <code>Manager</code> resource for this security policy. If this property is absent, the value shall be assumed to be <code>false</code>.
SPDM {	object		The SPDM policy. This property shall contain the policy requirements for SPDM communication and usage.
Allowed {	object		The SPDM policy settings that are allowed, such as the allowable SPDM versions and algorithms. This property shall contain the SPDM policy settings that are allowed, such as the allowable SPDM versions and algorithms.
Algorithms {	object		The SPDM algorithms. This property shall contain the SPDM algorithms.
AEAD []	array (string, null)	<i>read-write</i>	The AEAD algorithms. This property shall contain an array of AEAD algorithms. The allowable values for this property shall be the AEAD algorithm names found in the 'AlgSupported' field of the 'AEAD structure' table in DSP0274, <code>ALL</code>, and <code>NONE</code>. An array containing one element with the value of <code>ALL</code> or an empty array shall indicate all AEAD algorithms. An array containing one element with a value of <code>NONE</code> shall indicate no AEAD algorithms.
BaseAsym []	array (string, null)	<i>read-write</i>	The asymmetric signature algorithms. This property shall contain an array of asymmetric signature algorithms. The allowable values for this property shall be the asymmetric key signature algorithm names found in the 'BaseAsymAlgo' field of the 'NEGOTIATE_ALGORITHMS' request message in DSP0274, <code>ALL</code>, and <code>NONE</code>. An array containing one element with the value of <code>ALL</code> or an empty array shall indicate all asymmetric signature algorithms. An array containing one element with a value of <code>NONE</code> shall indicate no asymmetric signature algorithms.

Property	Type	Attributes	Notes
BaseHash []	array (string, null)	<i>read-write</i>	The hash algorithms. This property shall contain an array of hash algorithms. The allowable values for this property shall be the hash algorithm names found in the 'BaseHashAlgo' field of the 'NEGOTIATE_ALGORITHMS' request message in DSP0274, <code>ALL</code>, and <code>NONE</code>. An array containing one element with the value of <code>ALL</code> or an empty array shall indicate all hash algorithms. An array containing one element with a value of <code>NONE</code> shall indicate no hash algorithms.
}			
Versions []	array (string, null)	<i>read-write</i>	The SPDM versions. This property shall contain an array of SPDM versions. An array containing one element with the value of <code>ALL</code> or an empty array shall indicate all versions. An array containing one element with a value of <code>NONE</code> shall indicate no versions. Pattern: <code>^\d+\.\d+\$ ^NONE\$ ^ALL\$</code>
}			
AllowExtendedAlgorithms	boolean	<i>read-write</i> (null)	An indication of whether SPDM extended algorithms are allowed. This property shall indicate whether SPDM extended algorithms as defined in DSP0274 are allowed.
Denied {	object		The SPDM policy settings that are prohibited, such as the prohibited SPDM versions and algorithms. This property shall contain the SPDM policy settings that are prohibited, such as the prohibited SPDM versions and algorithms.
Algorithms {	object		The SPDM algorithms. This property shall contain the SPDM algorithms.
AEAD []	array (string, null)	<i>read-write</i>	The AEAD algorithms. This property shall contain an array of AEAD algorithms. The allowable values for this property shall be the AEAD algorithm names found in the 'AlgSupported' field of the 'AEAD structure' table in DSP0274, <code>ALL</code>, and <code>NONE</code>. An array containing one element with the value of <code>ALL</code> or an empty array shall indicate all AEAD algorithms. An array containing one element with a value of <code>NONE</code> shall indicate no AEAD algorithms.

Property	Type	Attributes	Notes
BaseAsym []	array (string, null)	<i>read-write</i>	The asymmetric signature algorithms. This property shall contain an array of asymmetric signature algorithms. The allowable values for this property shall be the asymmetric key signature algorithm names found in the 'BaseAsymAlgo' field of the 'NEGOTIATE_ALGORITHMS' request message in DSP0274, <code>ALL</code>, and <code>NONE</code>. An array containing one element with the value of <code>ALL</code> or an empty array shall indicate all asymmetric signature algorithms. An array containing one element with a value of <code>NONE</code> shall indicate no asymmetric signature algorithms.
BaseHash []	array (string, null)	<i>read-write</i>	The hash algorithms. This property shall contain an array of hash algorithms. The allowable values for this property shall be the hash algorithm names found in the 'BaseHashAlgo' field of the 'NEGOTIATE_ALGORITHMS' request message in DSP0274, <code>ALL</code>, and <code>NONE</code>. An array containing one element with the value of <code>ALL</code> or an empty array shall indicate all hash algorithms. An array containing one element with a value of <code>NONE</code> shall indicate no hash algorithms.
}			
Versions []	array (string, null)	<i>read-write</i>	The SPDm versions. This property shall contain an array of SPDm versions. An array containing one element with the value of <code>ALL</code> or an empty array shall indicate all versions. An array containing one element with a value of <code>NONE</code> shall indicate no versions. Pattern: <code>^\d+\.\d+\$ ^NONE\$ ^ALL\$</code>
}			
Enabled	boolean	<i>read-write</i> (null)	An indication of whether SPDm communication with devices is enabled. This property shall indicate whether SPDm communication with devices as defined in DSP0274 is enabled.
RevokedCertificates {	object		The revoked SPDm device certificates. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that represents the set of revoked SPDm device certificates. Certificates in this collection may contain leaf certificates, partial certificate chains, or complete certificate chains, where a partial certificate chain is a chain containing only CA certificates. If <code>VerifyCertificate</code> contains the value <code>true</code> and if an SPDm endpoint verifies successfully against a partial chain or exactly matches a leaf certificate, that SPDm endpoint shall fail authentication. Contains a link to a resource.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
SecureSessionEnabled	boolean	<i>read-write (null)</i>	An indication of whether SPDM secure sessions with devices is enabled. This property shall indicate whether SPDM secure sessions with devices as defined in DSP0274 is enabled.
TrustedCertificates {	object		The trusted SPDM device certificates. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that represents the set of trusted SPDM device certificates. Certificates in this collection may contain leaf certificates, partial certificate chains, or complete certificate chains, where a partial certificate chain is a chain containing only CA certificates. If <code>VerifyCertificate</code> contains the value <code>true</code> and if an SPDM endpoint verifies successfully against a partial chain or exactly matches a leaf certificate, that SPDM endpoint shall be considered verified and other authentications checks are performed. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
VerifyCertificate	boolean	<i>read-write (null)</i>	An indication of whether the manager will verify the certificate of the SPDM endpoint. This property shall indicate whether the manager will verify the certificate of the SPDM endpoint. If <code>true</code>, the manager shall verify the device certificate with the certificates found in the collections referenced by the <code>RevokedCertificates</code> and <code>TrustedCertificates</code> properties. If <code>false</code>, the manager shall not perform verification of the endpoint certificate.
}			
Status {	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
TLS {	object		The TLS policy. This property shall contain the policy requirements for TLS communication and usage.

Property	Type	Attributes	Notes
Client {	object		The TLS policy where the manager acts as a TLS client for communication with servers. This property shall contain the policy requirements and usage for TLS connections where the manager acts as a TLS client.
Allowed {}	object		The TLS policy settings that are allowed, such as the allowable TLS versions and algorithms. This property shall contain the TLS policy settings that are allowed, such as the allowable TLS versions and algorithms. If a value is missing for the same property in the <code>Allowed</code> and <code>Denied</code> object, the missing value shall behave as if the value is present in the same property under the <code>Denied</code> object. If a value conflicts for the same property between the <code>Allowed</code> and <code>Denied</code> object, the value of the same property in the <code>Denied</code> object shall take precedence. A Redfish service can resolve or prevent conflicts at time of request as well. For more information about this property, see <code>TLSPParameterSet</code> in Property Details.
Denied {}	object		The TLS policy settings that are prohibited, such as the prohibited TLS versions and algorithms. This property shall contain the TLS policy settings that are prohibited, such as the prohibited TLS versions and algorithms. If a value is missing for the same property in the <code>Allowed</code> and <code>Denied</code> object, the missing value shall behave as if the value is present in the same property under the <code>Denied</code> object. If a value conflicts for the same property between the <code>Allowed</code> and <code>Denied</code> object, the value of the same property in the <code>Denied</code> object shall take precedence. A Redfish service can resolve or prevent conflicts at time of request as well. For more information about this property, see <code>TLSPParameterSet</code> in Property Details.
RevokedCertificates {	object		The revoked TLS server certificates. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that represents the set of revoked TLS certificates. Certificates in this collection may contain leaf certificates, partial certificate chains, or complete certificate chains, where a partial certificate chain is a chain containing only CA certificates. If <code>VerifyCertificate</code> contains the value <code>true</code> and if a TLS endpoint verifies successfully against a partial chain or exactly matches a leaf certificate, that TLS endpoint shall fail authentication. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			

Property	Type	Attributes	Notes
TrustedCertificates {	object		The trusted TLS server certificates. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that represents the set of trusted TLS certificates. Certificates in this collection may contain leaf certificates, partial certificate chains, or complete certificate chains, where a partial certificate chain is a chain containing only CA certificates. If <code>VerifyCertificate</code> contains the value <code>true</code> and if a TLS endpoint verifies successfully against a partial chain or exactly matches a leaf certificate, that TLS endpoint shall be considered verified and other authentications checks are performed. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
VerifyCertificate	boolean	<i>read-write (null)</i>	An indication of whether the manager will verify the certificate of the remote TLS endpoint. This property shall indicate whether the manager will verify the certificate of the remote endpoint in a TLS connection. If <code>true</code>, the manager shall verify the remote endpoint certificate with the certificates found in the collections referenced by the <code>RevokedCertificates</code> and <code>TrustedCertificates</code> properties. If <code>false</code> or not present, the manager shall not perform verification of the endpoint certificate.
}			
Server {	object		The TLS policy where the manager acts as a TLS server for communication with clients. This property shall contain the policy requirements and usage for TLS connections where the manager acts as a TLS server.
Allowed {}	object		The TLS policy settings that are allowed, such as the allowable TLS versions and algorithms. This property shall contain the TLS policy settings that are allowed, such as the allowable TLS versions and algorithms. If a value is missing for the same property in the <code>Allowed</code> and <code>Denied</code> object, the missing value shall behave as if the value is present in the same property under the <code>Denied</code> object. If a value conflicts for the same property between the <code>Allowed</code> and <code>Denied</code> object, the value of the same property in the <code>Denied</code> object shall take precedence. A Redfish service can resolve or prevent conflicts at time of request as well. For more information about this property, see <code>TLSPolicyParameterSet</code> in Property Details.

Property	Type	Attributes	Notes
Denied {}	object		The TLS policy settings that are prohibited, such as the prohibited TLS versions and algorithms. This property shall contain the TLS policy settings that are prohibited, such as the prohibited TLS versions and algorithms. If a value is missing for the same property in the <code>Allowed</code> and <code>Denied</code> object, the missing value shall behave as if the value is present in the same property under the <code>Denied</code> object. If a value conflicts for the same property between the <code>Allowed</code> and <code>Denied</code> object, the value of the same property in the <code>Denied</code> object shall take precedence. A Redfish service can resolve or prevent conflicts at time of request as well. For more information about this property, see <code>TLSPParameterSet</code> in Property Details.
RevokedCertificates {	object		The revoked TLS server certificates. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that represents the set of revoked TLS certificates. Certificates in this collection may contain leaf certificates, partial certificate chains, or complete certificate chains, where a partial certificate chain is a chain containing only CA certificates. If <code>VerifyCertificate</code> contains the value <code>true</code> and if a TLS endpoint verifies successfully against a partial chain or exactly matches a leaf certificate, that TLS endpoint shall fail authentication. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
TrustedCertificates {	object		The trusted TLS server certificates. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that represents the set of trusted TLS certificates. Certificates in this collection may contain leaf certificates, partial certificate chains, or complete certificate chains, where a partial certificate chain is a chain containing only CA certificates. If <code>VerifyCertificate</code> contains the value <code>true</code> and if a TLS endpoint verifies successfully against a partial chain or exactly matches a leaf certificate, that TLS endpoint shall be considered verified and other authentications checks are performed. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			

Property	Type	Attributes	Notes
VerifyCertificate	boolean	<i>read-write</i> (null)	An indication of whether the manager will verify the certificate of the remote TLS endpoint. This property shall indicate whether the manager will verify the certificate of the remote endpoint in a TLS connection. If <code>true</code>, the manager shall verify the remote endpoint certificate with the certificates found in the collections referenced by the <code>RevokedCertificates</code> and <code>TrustedCertificates</code> properties. If <code>false</code> or not present, the manager shall not perform verification of the endpoint certificate.
}			
}			

6.121.4 Property details

6.121.4.1 TLSParameterSet

The TLS policy settings.

Algorithms {	object		The TLS algorithms. This property shall contain the TLS algorithms.
CipherSuites []	array (string, null)	<i>read-write</i>	The TLS cipher suites. This property shall contain an array of TLS cipher suites. The allowable values for this property shall be the TLS cipher suites listed in 'CipherSuites' defined in, but not limited to, RFC4346, RFC5246, or RFC8446, <code>ALL</code>, and <code>NONE</code>. An array containing one element with the value of <code>ALL</code> or an empty array shall indicate all TLS cipher suites. An array containing one element with a value of <code>NONE</code> shall indicate no TLS cipher suites.
SignatureAlgorithms []	array (string, null)	<i>read-write</i>	The TLS signature algorithms. This property shall contain an array of TLS signature algorithms. The allowable values for this property shall be the TLS signature algorithms listed in 'SignatureScheme' or the concatenation of 'SignatureAlgorithm', <code>'_'</code>, and 'HashAlgorithm' defined in, but not limited to, RFC4346, RFC5246, or RFC8446, <code>ALL</code>, and <code>NONE</code>. An array containing one element with the value of <code>ALL</code> or an empty array shall indicate all TLS signature algorithms. An array containing one element with a value of <code>NONE</code> shall indicate no TLS signature algorithms.
}			

Versions []	array (string, null)	read- write	The TLS versions. This property shall contain an array of TLS versions. An array containing one element with the value of <code>ALL</code> or an empty array shall indicate all versions. An array containing one element with a value of <code>NONE</code> shall indicate no versions. Pattern: <code>^\d+\.\d+\$ ^NONE\$ ^ALL\$</code>

6.121.5 Example response

```
{
  "@odata.type": "#SecurityPolicy.v1_0_3.SecurityPolicy",
  "Id": "ManagerGlobalSecurityPolicy",
  "Status": {
    "Health": "OK",
    "State": "Enabled"
  },
  "OverrideParentManager": true,
  "SPDM": {
    "Enabled": true,
    "SecureSessionEnabled": true,
    "VerifyCertificate": true,
    "TrustedCertificates": {
      "@odata.id": "/redfish/v1/Managers/BMC/SecurityPolicy/SPDM/TrustedCertificates"
    },
    "RevokedCertificates": {
      "@odata.id": "/redfish/v1/Managers/BMC/SecurityPolicy/SPDM/RevokedCertificates"
    },
    "Allowed": {
      "Versions": [
        "ALL"
      ],
      "Algorithms": {
        "AEAD": [
          "AES-GCM-256",
          "AES-GCM-128"
        ],
        "BaseAsym": [
          "TPM_ALG_RSASSA_2048",
          "TPM_ALG_ECDSA_ECC_NIST_P384",
          "TPM_ALG_SM2_ECC_SM2_P256"
        ],
        "BaseHash": [
          "TPM_ALG_SHA_512",
          "TPM_ALG_SHA3_512"
        ]
      }
    },
    "Denied": {
```

```

    "Versions": [
      "NONE"
    ],
    "Algorithms": {
      "AEAD": [],
      "BaseAsym": [
        "EdDSA ed25519"
      ],
      "BaseHash": [
        "TPM_ALG_SHA_256"
      ]
    }
  },
  "AllowExtendedAlgorithms": false
},
"TLS": {
  "Client": {
    "VerifyCertificate": true,
    "TrustedCertificates": {
      "@odata.id": "/redfish/v1/Managers/BMC/SecurityPolicy/TLS/Server/TrustedCertificates"
    },
    "RevokedCertificates": {
      "@odata.id": "/redfish/v1/Managers/BMC/SecurityPolicy/TLS/Server/RevokedCertificates"
    },
    "Allowed": {
      "Versions": [
        "1.2",
        "1.3"
      ],
      "Algorithms": {
        "CipherSuites": [
          "TLS_AES_128_GCM_SHA256",
          "TLS_AES_128_GCM_SHA384"
        ],
        "SignatureAlgorithms": []
      }
    }
  },
  "Denied": {
    "Versions": [
      "1.1"
    ],
    "Algorithms": {
      "CipherSuites": [],
      "SignatureAlgorithms": [
        "rsa_pkcs1_sha1",
        "ecdsa_sha1"
      ]
    }
  }
}
},

```

```

"Server": {
  "VerifyCertificate": false,
  "TrustedCertificates": {
    "@odata.id": "/redfish/v1/Managers/BMC/SecurityPolicy/TLS/Client/TrustedCertificates"
  },
  "RevokedCertificates": {
    "@odata.id": "/redfish/v1/Managers/BMC/SecurityPolicy/TLS/Client/RevokedCertificates"
  },
  "Allowed": {
    "Versions": [
      "1.3"
    ],
    "Algorithms": {
      "CipherSuites": [
        "TLS_AES_128_GCM_SHA256",
        "TLS_AES_128_GCM_SHA384"
      ],
      "SignatureAlgorithms": []
    }
  },
  "Denied": {
    "Versions": [
      "1.1",
      "1.2"
    ],
    "Algorithms": {
      "CipherSuites": [],
      "SignatureAlgorithms": [
        "rsa_pkcs1_sha1",
        "ecdsa_sha1"
      ]
    }
  }
},
"@odata.id": "/redfish/v1/Managers/BMC/SecurityPolicy"
}

```

6.122 Sensor 1.11.0

Version	v1.11	v1.10	v1.9	v1.8	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	...
Release	2025.2	2024.2	2024.1	2023.2	2023.1	2022.2	2021.4	2021.2	2021.1	2020.4	2019.4	...

6.122.1 Description

The `Sensor` schema describes a sensor and its properties.

- This resource shall represent a sensor for a Redfish implementation.

6.122.2 URIs

/redfish/v1/Chassis/{ChassisId}/Sensors/{SensorId}

/redfish/v1/PowerEquipment/FloorPDUs/{PowerDistributionId}/Sensors/{SensorId} (deprecated)

/redfish/v1/PowerEquipment/PowerShelves/{PowerDistributionId}/Sensors/{SensorId} (deprecated)

/redfish/v1/PowerEquipment/RackPDUs/{PowerDistributionId}/Sensors/{SensorId} (deprecated)

/redfish/v1/PowerEquipment/Switchgear/{PowerDistributionId}/Sensors/{SensorId} (deprecated)

/redfish/v1/PowerEquipment/TransferSwitches/{PowerDistributionId}/Sensors/{SensorId} (deprecated)

6.122.3 Properties

Property	Type	Attributes	Notes
Accuracy (deprecated v1.8)	number (%)	read-only (null)	The estimated percent error of measured versus actual values. This property shall contain the percent error +/- of the measured versus actual values of the <code>Reading</code> property. Deprecated in v1.8 and later. This property has been deprecated in favor of <code>ReadingAccuracy</code>.
AdjustedMaxAllowableOperatingValue	number	read-only (null)	The adjusted maximum allowable operating value for this equipment based on the environmental conditions. This property shall contain the adjusted maximum allowable operating value for the equipment that this sensor monitors, as specified by a standards body, manufacturer, or both. The value is adjusted based on environmental conditions. For example, liquid inlet temperature can be adjusted based on the available liquid pressure.
AdjustedMinAllowableOperatingValue	number	read-only (null)	The adjusted minimum allowable operating value for this equipment based on the environmental conditions. This property shall contain the adjusted minimum allowable operating value for the equipment that this sensor monitors, as specified by a standards body, manufacturer, or both. This value is adjusted based on environmental conditions. For example, liquid inlet temperature can be adjusted based on the available liquid pressure.

Property	Type	Attributes	Notes
ApparentkVAh (v1.5+)	number (kV.A.h)	<i>read-only</i> (null)	Apparent energy (kVAh). This property shall contain the apparent energy, in kilovolt-ampere-hour units, for an electrical energy measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>Energykwh</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
ApparentVA	number (V.A)	<i>read-only</i> (null)	The product of voltage and current for an AC circuit, in volt-ampere units. This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
AverageReading (v1.4+)	number	<i>read-only</i> (null)	The average sensor value. This property shall contain the average sensor value over the time specified by the value of the <code>AveragingInterval</code> property. The value shall be reset by the <code>ResetMetrics</code> action or by a service reset of time-based property values.
AveragingInterval (v1.4+)	string (duration)	<i>read-write</i> (null)	The interval over which the average sensor value is calculated. This property shall contain the interval over which the sensor value is averaged to produce the value of the <code>AverageReading</code> property. This property shall only be present if the <code>AverageReading</code> property is present. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?)?\$</code>
AveragingIntervalAchieved (v1.4+)	boolean	<i>read-only</i> (null)	Indicates that enough readings were collected to calculate the average sensor reading over the averaging interval time. This property shall indicate that enough readings were collected to calculate the <code>AverageReading</code> value over the interval specified by the <code>AveragingInterval</code> property. The value shall be reset by the <code>ResetMetrics</code> action. This property shall only be present if the <code>AveragingInterval</code> property is present.
Calibration (v1.4+)	number	<i>read-write</i> (null)	The calibration offset applied to the <code>Reading</code>. This property shall contain the offset applied to the raw sensor value to provide a calibrated value for the sensor as returned by the <code>Reading</code> property. The value of this property shall follow the units of the <code>Reading</code> property for this sensor instance. Updating the value of this property shall not affect the value of the <code>CalibrationTime</code> property.

Property	Type	Attributes	Notes
CalibrationTime (v1.4+)	string (date-time)	<i>read-write</i> (null)	The date and time that the sensor was last calibrated. This property shall contain the date and time that the sensor was last calibrated. This property is intended to reflect the actual time the calibration occurred.
CrestFactor (v1.1+)	number	<i>read-only</i> (null)	The crest factor for this sensor. This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
ElectricalContext	string (enum)	<i>read-only</i> (null)	The combination of current-carrying conductors. This property shall represent the combination of current-carrying conductors that distribute power. <i>For the possible property values, see ElectricalContext in Property details.</i>
Enabled (v1.10+)	boolean	<i>read-write</i> (null)	Indicates whether the sensor is enabled and provides a reading. This property shall indicate whether the sensor is enabled and provides a <code>Reading</code>. The value <code>true</code> shall indicate the sensor is enabled and returns the <code>Reading</code> property with a valid value. The value <code>false</code> shall indicate the sensor is disabled, shall not return the <code>Reading</code> property, and shall not trigger events, logging, or other functionality. This property allows a user to disable a faulty sensor or to otherwise remove it from use.
Implementation (v1.1+)	string (enum)	<i>read-only</i> (null)	The implementation of the sensor. This property shall contain the implementation of the sensor. <i>For the possible property values, see Implementation in Property details.</i>
LifetimeReading (v1.1+)	number	<i>read-only</i> (null)	The total accumulation value for this sensor. This property shall contain the total accumulation of the <code>Reading</code> property over the sensor's lifetime. This value shall not be reset by the <code>ResetMetrics</code> action.
LifetimeStartDateTime (v1.9+)	string (date-time)	<i>read-only</i> (null)	The date and time when the sensor started accumulating readings for the <code>LifetimeReading</code> property. This property shall contain the date and time when the sensor started accumulating readings for the <code>LifetimeReading</code> property. This might contain the same value as the production date of the device that contains this sensor.

Property	Type	Attributes	Notes
Links (v1.3+) {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
AssociatedControls (v1.4+) [{	array		An array of links to the controls that can affect this sensor. This property shall contain an array of links to resources of type <code>Control</code> that represent the controls that can affect this sensor.
@odata.id	string	<i>read-only</i>	Link to a Control resource. See the Links section and the <i>Control</i> schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
LoadPercent (deprecated v1.1)	number (%)	<i>read-only (null)</i>	The power load utilization for this sensor. This property shall indicate the power load utilization percent for this sensor. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values. <i>Deprecated in v1.1 and later. This property has been deprecated in favor of using a sensor instance with a <code>ReadingType</code> of <code>Percent</code> to show utilization values when needed.</i>
Location {}	object		The location information for this sensor. This property shall indicate the location information for this sensor. For property details, see Location.
LowestReading (v1.4+)	number	<i>read-only (null)</i>	The lowest sensor value. This property shall contain the lowest sensor value since the last <code>ResetMetrics</code> action was performed or since the service last reset the time-based property values.
LowestReadingTime (v1.4+)	string (date-time)	<i>read-only (null)</i>	The time when the lowest sensor value occurred. This property shall contain the date and time when the lowest sensor value was observed, as reported as the value of <code>LowestReading</code>.

Property	Type	Attributes	Notes
Manufacturer (v1.9+)	string	<i>read-only</i> (null)	The manufacturer of this sensor. This property shall contain the name of the organization responsible for producing the sensor. This organization may be the entity from whom the sensor is purchased, but this is not necessarily true. This property is generally used only for replaceable or user-configurable sensors.
MaxAllowableOperatingValue	number	<i>read-only</i> (null)	The maximum allowable operating value for this equipment. This property shall contain the maximum allowable operating value for the equipment that this sensor monitors, as specified by a standards body, manufacturer, or both.
MinAllowableOperatingValue	number	<i>read-only</i> (null)	The minimum allowable operating value for this equipment. This property shall contain the minimum allowable operating value for the equipment that this sensor monitors, as specified by a standards body, manufacturer, or both.
Model (v1.9+)	string	<i>read-only</i> (null)	The model number of the sensor. This property shall contain the name by which the manufacturer generally refers to the sensor. This property is generally used only for replaceable or user-configurable sensors.
PartNumber (v1.9+)	string	<i>read-only</i> (null)	The part number of the sensor. This property shall contain a part number assigned by the organization that is responsible for producing or manufacturing the sensor. This property is generally used only for replaceable or user-configurable sensors.
PeakReading	number	<i>read-only</i> (null)	The peak sensor value. This property shall contain the peak sensor value since the last <code>ResetMetrics</code> action was performed or since the service last reset the time-based property values.
PeakReadingTime	string (date-time)	<i>read-only</i> (null)	The time when the peak sensor value occurred. This property shall contain the date and time when the peak sensor value was observed, as reported as the value of <code>PeakReading</code>.

Property	Type	Attributes	Notes
PhaseAngleDegrees (v1.5+)	number	<i>read-only (null)</i>	The phase angle (degrees) between the current and voltage waveforms. This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>Power</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
PhysicalContext	string (enum)	<i>read-write (null)</i>	The area or device to which this sensor measurement applies. This property shall contain a description of the affected component or region within the equipment to which this sensor measurement applies. <i>For the possible property values, see PhysicalContext in Property details.</i>
PhysicalSubContext	string (enum)	<i>read-write (null)</i>	The usage or location within a device to which this sensor measurement applies. This property shall contain a description of the usage or sub-region within the equipment to which this sensor measurement applies. This property generally differentiates multiple sensors within the same <code>PhysicalContext</code> instance. <i>For the possible property values, see PhysicalSubContext in Property details.</i>
PowerFactor	number	<i>read-only (null)</i>	The power factor for this sensor. This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. <code>PowerFactor</code> is expressed in unit-less 1/100ths. This property can appear in sensors containing a <code>ReadingType</code> value of <code>Power</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
Precision	number	<i>read-only (null)</i>	The number of significant digits in the reading. This property shall contain the number of significant digits in the <code>Reading</code> property.
ReactivekVARh (v1.5+)	number (kV.A.h)	<i>read-only (null)</i>	Reactive energy (kVARh). This property shall contain the reactive energy, in kilovolt-ampere-hours (reactive) units, for an electrical energy measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>Energykwh</code>, and shall not appear in sensors with other <code>ReadingType</code> values.

Property	Type	Attributes	Notes
ReactiveVAR	number (V.A)	<i>read-only</i> (null)	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
ReadingAccuracy (v1.8+)	number	<i>read-only</i> (null)	Accuracy (+/-) of the reading. This property shall contain the accuracy of the value of the <code>Reading</code> property for this sensor. The value shall be the absolute value of the maximum deviation of the <code>Reading</code> from its actual value. The value shall be in units that follow the <code>ReadingUnits</code> for this sensor.
ReadingBasis (v1.7+)	string (enum)	<i>read-only</i> (null)	The basis for the reading of this sensor. This property shall indicate the basis or frame of reference for the value of the <code>Reading</code> property. If this property is not present, the value shall be assumed to be <code>Zero</code>. <i>For the possible property values, see ReadingBasis in Property details.</i>
ReadingRangeMax	number	<i>read-only</i> (null)	The maximum possible value for this sensor. This property shall indicate the maximum possible value of the <code>Reading</code> property for this sensor. This value is the range of valid readings for this sensor. Values outside this range are discarded as reading errors.
ReadingRangeMin	number	<i>read-only</i> (null)	The minimum possible value for this sensor. This property shall indicate the minimum possible value of the <code>Reading</code> property for this sensor. This value is the range of valid readings for this sensor. Values outside this range are discarded as reading errors.

Property	Type	Attributes	Notes
ReadingTime (v1.1+)	string (date-time)	<i>read-only</i> (null)	The date and time that the reading was acquired from the sensor. This property shall contain the date and time that the reading data was acquired from the sensor. This value is used to synchronize readings from multiple sensors and does not represent the time at which the resource was accessed.
ReadingType	string (enum)	<i>read-only</i> (null)	The type of sensor. This property shall contain the type of the sensor. <i>For the possible property values, see ReadingType in Property details.</i>
ReadingUnits	string	<i>read-only</i> (null)	The units of the reading, thresholds, and other reading-related properties in UCUM c/s format. This property shall contain the units of the sensor's reading, thresholds, and other reading-related properties. The value shall follow the case-sensitive symbol format defined by the Unified Code for Units of Measure (UCUM), as specified by the 'Units of measure annotation' clause of the Redfish Specification.
RelatedItem (v1.2+) [{	array		An array of links to resources or objects that this sensor services. This property shall contain an array of links to resources or objects that this sensor services.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
SensingFrequency (deprecated v1.1)	number	<i>read-only</i> (null)	The time interval between readings of the physical sensor. This property shall contain the time interval between readings of the physical sensor. <i>Deprecated in v1.1 and later. This property has been deprecated in favor of the SensingInterval property, which uses the duration time format for interoperability.</i>
SensingInterval (v1.1+)	string (duration)	<i>read-only</i> (null)	The time interval between readings of the sensor. This property shall contain the time interval between readings of data from the sensor. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\. \d+)?)S)?</code>

Property	Type	Attributes	Notes
SensorGroup (v1.4+) {}	object		The group of sensors that provide readings for this sensor. This property shall contain information for a group of sensors that provide input for the value of this sensor's reading. If this property is present, the <code>Implementation</code> property shall contain the value <code>Synthesized</code>. The group may be created for redundancy or to improve the accuracy of the reading through multiple sensor inputs. For property details, see RedundantGroup.
SensorResetTime	string (date-time)	<i>read-only</i> (null)	The date and time when the time-based properties were last reset. This property shall contain the date and time when the <code>ResetMetrics</code> action was last performed or when the service last reset the time-based property values.
SerialNumber (v1.9+)	string	<i>read-only</i> (null)	The serial number of the sensor. This property shall contain a manufacturer-allocated number that identifies the sensor. This property is generally used only for replaceable or user-configurable sensors.
SKU (v1.9+)	string	<i>read-only</i> (null)	The SKU of the sensor. This property shall contain the stock-keeping unit number for this sensor. This property is generally used only for replaceable or user-configurable sensors.
SparePartNumber (v1.9+)	string	<i>read-only</i> (null)	The spare part number of the sensor. This property shall contain the spare part number of the sensor. This property is generally used only for replaceable or user-configurable sensors.
SpeedRPM (v1.2+)	number ({rev}/min)	<i>read-only</i> (null)	The rotational speed. This property shall contain a reading of the rotational speed of the device in revolutions per minute (RPM) units.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

Property	Type	Attributes	Notes
THDPercent (v1.1+)	number (%)	<i>read-only (null)</i>	The total harmonic distortion percent (% THD). This property shall contain the total harmonic distortion of the <code>Reading</code> property in percent units, typically 0 to 100.
Thresholds {	object		The set of thresholds defined for this sensor. This property shall contain the set of thresholds that derive a sensor's health and operational range.
LowerCaution {}	object		The value at which the reading is below normal range. This property shall contain the value at which the <code>Reading</code> property is below normal range. The value of the property shall use the same units as the <code>Reading</code> property. For more information about this property, see Threshold in Property Details.
LowerCautionUser (v1.2+) {}	object		A user-defined value at which the reading is considered below normal range. This property shall contain a user-defined value at which the <code>Reading</code> property is considered below the normal range. The value of the property shall use the same units as the <code>Reading</code> property. The <code>Reading</code> property shall be considered below normal range if either the <code>LowerCaution</code> or <code>LowerCautionUser</code> threshold has been violated. This property is used to provide an additional, user-defined threshold value when the <code>LowerCaution</code> threshold is implemented as read-only to reflect a service-defined value that cannot be changed. For more information about this property, see Threshold in Property Details.
LowerCritical {}	object		The value at which the reading is below normal range but not yet fatal. This property shall contain the value at which the <code>Reading</code> property is below the normal range but is not yet fatal. The value of the property shall use the same units as the <code>Reading</code> property. For more information about this property, see Threshold in Property Details.

Property	Type	Attributes	Notes
LowerCriticalUser (v1.2+) {}	object		A user-defined value at which the reading is considered below normal range but not yet fatal. This property shall contain a user-defined value at which the <code>Reading</code> property is considered below the normal range but is not yet fatal. The value of the property shall use the same units as the <code>Reading</code> property. The <code>Reading</code> property shall be considered below normal range if either the <code>LowerCritical</code> or <code>LowerCriticalUser</code> threshold has been violated. This property is used to provide an additional, user-defined threshold value when the <code>LowerCritical</code> threshold is implemented as read-only to reflect a service-defined value that cannot be changed. For more information about this property, see Threshold in Property Details.
LowerFatal {}	object		The value at which the reading is below normal range and fatal. This property shall contain the value at which the <code>Reading</code> property is below the normal range and is fatal. The value of the property shall use the same units as the <code>Reading</code> property. For more information about this property, see Threshold in Property Details.
UpperCaution {}	object		The value at which the reading is above normal range. This property shall contain the value at which the <code>Reading</code> property is above the normal range. The value of the property shall use the same units as the <code>Reading</code> property. For more information about this property, see Threshold in Property Details.
UpperCautionUser (v1.2+) {}	object		A user-defined value at which the reading is considered above normal range. This property shall contain a user-defined value at which the <code>Reading</code> property is considered above the normal range. The value of the property shall use the same units as the <code>Reading</code> property. The <code>Reading</code> property shall be considered above normal range if either the <code>UpperCaution</code> or <code>UpperCautionUser</code> threshold has been violated. This property is used to provide an additional, user-defined threshold value when the <code>UpperCaution</code> threshold is implemented as read-only to reflect a service-defined value that cannot be changed. For more information about this property, see Threshold in Property Details.

Property	Type	Attributes	Notes
UpperCritical {}	object		The value at which the reading is above normal range but not yet fatal. This property shall contain the value at which the <code>Reading</code> property is above the normal range but is not yet fatal. The value of the property shall use the same units as the <code>Reading</code> property. For more information about this property, see Threshold in Property Details.
UpperCriticalUser (v1.2+) {}	object		A user-defined value at which the reading is considered above normal range but not yet fatal. This property shall contain a user-defined value at which the <code>Reading</code> property is considered above the normal range but is not yet fatal. The value of the property shall use the same units as the <code>Reading</code> property. The <code>Reading</code> property shall be considered above normal range if either the <code>UpperCritical</code> or <code>UpperCriticalUser</code> threshold has been violated. This property is used to provide an additional, user-defined threshold value when the <code>UpperCritical</code> threshold is implemented as read-only to reflect a service-defined value that cannot be changed. For more information about this property, see Threshold in Property Details.
UpperFatal {}	object		The value at which the reading is above normal range and fatal. This property shall contain the value at which the <code>Reading</code> property is above the normal range and is fatal. The value of the property shall use the same units as the <code>Reading</code> property. For more information about this property, see Threshold in Property Details.
}			
UserLabel (v1.9+)	string	<i>read-write</i>	A user-assigned label. This property shall contain a user-assigned label used to identify this resource. This property shall only be present if the sensor can be configured for different purposes, or is dependent on configuration or end-user settings. This property shall not be present for embedded sensors with defined functions that cannot be altered. If a value has not been assigned by a user, the value of this property shall be an empty string.
VoltageType	string (enum)	<i>read-only</i> (null)	The voltage type for this sensor. This property shall represent the type of input voltage the sensor monitors. For the possible property values, see <i>VoltageType</i> in Property details.

6.122.4 Actions

6.122.4.1 ResetMetrics

Description

Resets metrics related to this sensor.

- This action shall reset any time intervals or counted values for this sensor. The `SensorResetTime` property shall be updated to reflect the time that this action was performed.

Action URI

{Base URI of target resource}/Actions/Sensor.ResetMetrics

Action parameters

This action takes no parameters.

6.122.4.2 ResetToDefaults (v1.6+)

Description

The action resets the values of writable properties to factory defaults.

- This action shall reset the values of writable properties in this resource to their default values as specified by the manufacturer.

Action URI

{Base URI of target resource}/Actions/Sensor.ResetToDefaults

Action parameters

This action takes no parameters.

6.122.5 Property details

6.122.5.1 Activation

The direction of crossing that activates this threshold.

- This property shall indicate the direction of crossing of the reading for this sensor that activates the threshold.

string	Description
Decreasing	Value decreases below the threshold. This threshold is activated when the reading changes from a value higher than the threshold to a value lower than the threshold.
Disabled (v1.7+)	The threshold is disabled. This value shall indicate the threshold is disabled and no actions shall be taken as a result of the reading crossing the threshold value.
Either	Value crosses the threshold in either direction. This threshold is activated when either the increasing or decreasing conditions are met.
Increasing	Value increases above the threshold. This threshold is activated when the reading changes from a value lower than the threshold to a value higher than the threshold.

6.122.5.2 ElectricalContext

The combination of current-carrying conductors.

- This property shall represent the combination of current-carrying conductors that distribute power.

string	Description
Line1	The circuits that share the L1 current-carrying conductor. This value shall represent a circuit that shares the L1 current-carrying conductor, such as circuits with phase wiring types of Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.
Line1ToLine2	The circuit formed by L1 and L2 current-carrying conductors. This value shall represent a circuit formed by L1 and L2 current-carrying conductors, such as circuits with phase wiring types of Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.
Line1ToNeutral	The circuit formed by L1 and neutral current-carrying conductors. This value shall represent a circuit formed by L1 and neutral current-carrying conductors, such as circuits with phase wiring types of Single-phase / 3-Wire, Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.

string	Description
Line1ToNeutralAndL1L2	The circuit formed by L1, L2, and neutral current-carrying conductors. This value shall represent a circuit formed by L1, L2, and neutral current-carrying conductors, such as circuits with phase wiring types of Two-phase / 4-Wire or Three-phase / 5-Wire.
Line2	The circuits that share the L2 current-carrying conductor. This value shall represent a circuit that shares the L2 current-carrying conductor, such as circuits with phase wiring types of Two-phase / 4-Wire or Three-phase / 4-Wire or 5-Wire.
Line2ToLine3	The circuit formed by L2 and L3 current-carrying conductors. This value shall represent a circuit formed by L2 and L3 current-carrying conductors, such as circuits with phase wiring types of Three-phase / 4-Wire or 5-Wire.
Line2ToNeutral	The circuit formed by L2 and neutral current-carrying conductors. This value shall represent a circuit formed by L2 and neutral current-carrying conductors, such as circuits with phase wiring types of Two-phase / 4-Wire or Three-phase / 5-Wire.
Line2ToNeutralAndL1L2	The circuit formed by L1, L2, and Neutral current-carrying conductors. This value shall represent a circuit formed by L1, L2, and neutral current-carrying conductors, such as circuits with phase wiring types of Two-phase / 4-Wire or Three-phase / 5-Wire.
Line2ToNeutralAndL2L3	The circuits formed by L2, L3, and neutral current-carrying conductors. This value shall represent a circuit formed by L2, L3, and neutral current-carrying conductors, such as circuits with a phase wiring type of Three-phase / 5-Wire.
Line3	The circuits that share the L3 current-carrying conductor. This value shall represent a circuit that shares the L3 current-carrying conductor, such as circuits with phase wiring types of Three-phase / 4-Wire or 5-Wire.
Line3ToLine1	The circuit formed by L3 and L1 current-carrying conductors. This value shall represent a circuit formed by L3 and L1 current-carrying conductors, such as circuits with phase wiring types of Three-phase / 4-Wire or 5-Wire.
Line3ToNeutral	The circuit formed by L3 and neutral current-carrying conductors. This value shall represent a circuit formed by L3 and neutral current-carrying conductors, such as circuits with a phase wiring type of Three-phase / 5-Wire.
Line3ToNeutralAndL3L1	The circuit formed by L3, L1, and neutral current-carrying conductors. This value shall represent a circuit formed by L3, L1, and neutral current-carrying conductors, such as circuits with a phase wiring type of Three-phase / 5-Wire.

string	Description
LineToLine	The circuit formed by two current-carrying conductors. This value shall represent a circuit formed by two current-carrying conductors, such as circuits with phase wiring types of Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.
LineToNeutral	The circuit formed by a line and neutral current-carrying conductor. This value shall represent a circuit formed by a line and neutral current-carrying conductor, such as circuits with phase wiring types of Single-phase / 3-Wire, Two-phase / 4-Wire, or Three-phase / 4-Wire or 5-Wire.
Neutral	The grounded current-carrying return circuit of current-carrying conductors. This value shall represent the grounded current-carrying return circuit of current-carrying conductors, such as circuits with phase wiring types of Single-phase / 3-Wire, Two-phase / 4-Wire, or Three-phase / 5-Wire.
Total	The circuit formed by all current-carrying conductors. This value shall represent the circuits formed by all current-carrying conductors for any phase wiring type.

6.122.5.3 Implementation

The implementation of the sensor.

- This property shall contain the implementation of the sensor.

string	Description
PhysicalSensor	The reading is acquired from a physical sensor.
Reported	The reading is obtained from software or a device.
Synthesized	The reading is obtained by applying a calculation on one or more properties or multiple sensors. The calculation is not provided.

6.122.5.4 PhysicalContext

The area or device to which this sensor measurement applies.

- This property shall contain a description of the affected component or region within the equipment to which this sensor measurement applies.

string	Description
Accelerator	An accelerator.
ACInput	An AC electrical input or input-related circuit.
ACMaintenanceBypassInput	An AC electrical maintenance bypass input.
ACOutput	An AC electrical output or output-related circuit. This value shall indicate an electrical output or an output-related circuit, such as a branch output, which is not terminated as a power outlet.
ACStaticBypassInput	An AC electrical static bypass input.
ACUtilityInput	An AC electrical utility input. This value shall indicate an electrical input, where the source is an electrical utility as opposed to a backup or locally-generated power source. This value is intended to differentiate multiple electrical inputs between utility, maintenance bypass, or static bypass values. For general purpose usage, the value of <code>ACInput</code> is preferred.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	A compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC electrical bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	An expansion bay. This value shall indicate a location that provides for the expansion of functionality of a system, such as a PCIe slot that can accept an option card.

string	Description
ExpansionSubsystem	A group of expansion bays. This value shall indicate a group of expansion bays and the devices installed in those bays.
Fan	A fan.
Filter	A filter.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Manager	A management controller, such as a BMC (baseboard management controller).
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	A networking bay. This value shall indicate a location that provides for the expansion of networking functionality of a system, by the addition of networking devices.
NetworkingDevice	A networking device.
PowerOutlet	An electrical outlet. This value shall indicate an electrical outlet or receptacle.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	A power supply bay. This value shall indicate a location that provides for the installation of a power supply or similar devices.

string	Description
Pump	A pump.
Rectifier	A rectifier device.
Reservoir	A reservoir.
Room	The room.
StorageBay	A storage bay. This value shall indicate a location that provides for the expansion of storage functionality of a system, by the addition of storage devices.
StorageDevice	A storage device.
StorageSubsystem	A storage subsystem. This value shall indicate a storage subsystem, which may consist of one or more storage controllers, storage devices, or related components.
Switch	A switch device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.122.5.5 PhysicalSubContext

The usage or location within a device to which this sensor measurement applies.

- This property shall contain a description of the usage or sub-region within the equipment to which this sensor measurement applies. This property generally differentiates multiple sensors within the same `PhysicalContext` instance.

string	Description
Input	The input.

string	Description
Output	The output.

6.122.5.6 ReadingBasis

The basis for the reading of this sensor.

- This property shall indicate the basis or frame of reference for the value of the `Reading` property. If this property is not present, the value shall be assumed to be `Zero`.

string	Description
Delta	A reading that reports the difference between two measurements. • This value shall indicate a reading that reports the difference between two measurements.
Headroom	A reading that decreases as it approaches a defined reference point. • This value shall indicate a reading that decreases in value as it approaches the reference point. If the value crosses the reference point, the value may be reported as a negative number or may report a value of zero.
Zero	A zero-based reading. • This value shall indicate a reading with zero as its reference point.

6.122.5.7 ReadingType

The type of sensor.

- This property shall contain the type of the sensor.

string	Description
AbsoluteHumidity (v1.5+)	Absolute humidity (g/m ³). • This value shall indicate an absolute (volumetric) humidity measurement, in grams per cubic meter units. The <code>ReadingUnits</code> property shall contain <code>g/m3</code>.

string	Description
AirFlow (deprecated v1.7)	Air flow (cu ft/min). This value shall indicate a measurement of a volume of gas per unit of time, in cubic feet per minute units, that flows through a particular junction. The <code>ReadingUnits</code> property shall contain <code>[ft_i]3/min</code>. <i>Deprecated in v1.7 and later. This value has been deprecated in favor of <code>AirFlowCMM</code> for consistent use of SI units.</i>
AirFlowCMM (v1.7+)	Air flow (m³/min). This value shall indicate a measurement of a volume of gas per unit of time, in cubic meters per minute units, that flows through a particular junction. The <code>ReadingUnits</code> property shall contain <code>m3/min</code>.
Altitude	Altitude (m). This value shall indicate a measurement of altitude, in meter units, defined as the elevation above sea level. The <code>ReadingUnits</code> property shall contain <code>m</code>.
Barometric	Barometric pressure (mm). This value shall indicate a measurement of barometric pressure, in millimeters of a mercury column. The <code>ReadingUnits</code> property shall contain <code>mm[Hg]</code>.
ChargeAh (v1.4+)	Charge (Ah). This value shall indicate the amount of charge, integral of current over time, of the monitored item. If representing metered charge consumption the value shall reflect the charge consumption since the sensor metrics were last reset. The value of the <code>Reading</code> property shall be in ampere-hour units and the <code>ReadingUnits</code> property shall contain <code>A.h</code>.
Current	Current (A). This value shall indicate a measurement of the root mean square (RMS) of instantaneous current calculated over an integer number of line cycles for a circuit. Current is expressed in ampere units and the <code>ReadingUnits</code> property shall contain <code>A</code>.
EnergyJoules	Energy (J). This value shall indicate the energy, integral of real power over time, of the monitored item. If representing metered power consumption the value shall reflect the power consumption since the sensor metrics were last reset. The value of the <code>Reading</code> property shall be in joule units and the <code>ReadingUnits</code> property shall contain <code>J</code>. This value is used for device-level energy consumption measurements, while <code>EnergykWh</code> is used for large-scale consumption measurements.

string	Description
EnergykWh	Energy (kWh). This value shall indicate the energy, integral of real power over time, of the monitored item. If representing metered power consumption the value shall reflect the power consumption since the sensor metrics were last reset. The value of the <code>Reading</code> property shall be in kilowatt-hour units and the <code>ReadingUnits</code> property shall contain <code>kW.h</code>. This value is used for large-scale energy consumption measurements, while <code>EnergyJoules</code> and <code>EnergyWh</code> are used for device-level consumption measurements.
EnergyWh (v1.4+)	Energy (Wh). This value shall indicate the energy, integral of real power over time, of the monitored item. If representing metered power consumption the value shall reflect the power consumption since the sensor metrics were last reset. The value of the <code>Reading</code> property shall be in watt-hour units and the <code>ReadingUnits</code> property shall contain <code>W.h</code>. This value is used for device-level energy consumption measurements, while <code>EnergykWh</code> is used for large-scale consumption measurements.
Frequency	Frequency (Hz). This value shall indicate a frequency measurement, in hertz units. The <code>ReadingUnits</code> property shall contain <code>Hz</code>.
Heat (v1.7+)	Heat (kW). This value shall indicate a heat measurement, in kilowatt units. The <code>ReadingUnits</code> property shall contain <code>kW</code>.
Humidity	Relative humidity (percent). This value shall indicate a relative humidity measurement, in percent units. The <code>ReadingUnits</code> property shall contain <code>%</code>.
LinearAcceleration (v1.11+)	Linear acceleration (m/s²). This value shall indicate a linear acceleration, in meters per square second units. The <code>ReadingUnits</code> property shall contain <code>m/s²</code>.
LinearPosition (v1.11+)	Linear position or distance (m). This value shall indicate a linear position or distance, in meter units. The <code>ReadingUnits</code> property shall contain <code>m</code>.
LinearVelocity (v1.11+)	Linear velocity (m/s). This value shall indicate a linear velocity, in meters per second units. The <code>ReadingUnits</code> property shall contain <code>m/s</code>.

string	Description
LiquidFlow (<i>deprecated v1.7</i>)	Liquid flow (L/s). This value shall indicate a measurement of a volume of liquid per unit of time, in liters per second units, that flows through a particular junction. The <code>ReadingUnits</code> property shall contain <code>L/s</code>. <i>Deprecated in v1.7 and later. This value has been deprecated in favor of <code>LiquidFlowLPM</code> for consistency of units typically expected or reported by <code>Sensor</code> and <code>Control</code> resources.</i>
LiquidFlowLPM (v1.7+)	Liquid flow (L/min). This value shall indicate a measurement of a volume of liquid per unit of time, in liters per minute units, that flows through a particular junction. The <code>ReadingUnits</code> property shall contain <code>L/min</code>.
LiquidLevel	Liquid level (cm). This value shall indicate a measurement of fluid height, in centimeter units, relative to a specified vertical datum and the <code>ReadingUnits</code> property shall contain <code>cm</code>.
Percent (v1.1+)	Percent (%). This value shall indicate a percentage measurement, in percent units. The <code>Reading</code> value, while typically <code>0</code> to <code>100</code>, may exceed <code>100</code> for rate-of-change or similar readings. The <code>ReadingUnits</code> property shall contain <code>%</code>.
Power	Power (W). This value shall indicate the arithmetic mean of product terms of instantaneous voltage and current values measured over integer number of line cycles for a circuit, in watt units. The <code>ReadingUnits</code> property shall contain <code>W</code>.
Pressure (<i>deprecated v1.7</i>)	Pressure (Pa). This value shall indicate a measurement of force, in pascal units, applied perpendicular to the surface of an object per unit area over which that force is distributed. The <code>ReadingUnits</code> property shall contain <code>Pa</code>. <i>Deprecated in v1.7 and later. This value has been deprecated in favor of <code>PressurePa</code> or <code>PressurekPa</code> for consistency of units between <code>Sensor</code> and <code>Control</code> resources.</i>
PressurekPa (v1.5+)	Pressure (kPa). This value shall indicate a measurement of pressure, in kilopascal units, relative to atmospheric pressure. The <code>ReadingUnits</code> property shall contain <code>kPa</code>.
PressurePa (v1.7+)	Pressure (Pa). This value shall indicate a measurement of pressure, in pascal units, relative to atmospheric pressure. The <code>ReadingUnits</code> property shall contain <code>Pa</code>.

string	Description
Rotational	Rotational (RPM). This value shall indicate a measurement of rotational frequency, in revolutions per minute units. The <code>ReadingUnits</code> property shall contain either <code>{rev}/min</code>, which is preferred, or <code>RPM</code>, which is a deprecated value.
RotationalAcceleration (v1.11+)	Rotational acceleration (rad/s^2). This value shall indicate a rotational acceleration, in radians per square second units. The <code>ReadingUnits</code> property shall contain <code>rad/s2</code>.
RotationalPosition (v1.11+)	Rotational position (rad). This value shall indicate a rotational position, in radian units. The <code>ReadingUnits</code> property shall contain <code>rad</code>.
RotationalVelocity (v1.11+)	Rotational velocity (rad/s). This value shall indicate a rotational velocity, in radians per second units. The <code>ReadingUnits</code> property shall contain <code>rad/s</code>.
Temperature	Temperature (C). This value shall indicate a temperature measurement, in degree Celsius units. The <code>ReadingUnits</code> property shall contain <code>Cel</code>.
Valve (v1.11+)	Valve (% open). This value shall indicate a valve position, in percent units. The <code>ReadingUnits</code> property shall contain <code>%</code>. A value of <code>100</code> shall indicate the valve is completely open, and a value of <code>0</code> shall indicate the valve is completely closed.
Voltage	Voltage (VAC or VDC). This value shall indicate a measurement of the root mean square (RMS) of instantaneous voltage calculated over an integer number of line cycles for a circuit. Voltage is expressed in volt units and the <code>ReadingUnits</code> property shall contain <code>v</code>.

6.122.5.8 Threshold

The threshold definition for a sensor.

Activation	string (enum)	read- write (null)	The direction of crossing that activates this threshold. This property shall indicate the direction of crossing of the reading for this sensor that activates the threshold. <i>For the possible property values, see Activation in Property details.</i>
DwellTime	string (duration)	read- write (null)	The duration the sensor value must violate the threshold before the threshold is activated. This property shall indicate the duration the sensor value violates the threshold before the threshold is activated. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?)?\$</code>
HysteresisDuration (v1.7+)	string (duration)	read- write (null)	The duration the sensor value must not violate the threshold before the threshold is deactivated. This property shall indicate the duration the sensor value no longer violates the threshold before the threshold is deactivated. A duration of zero seconds, or if the property is not present in the resource, shall indicate the threshold is deactivated immediately once the sensor value no longer violates the threshold. The threshold shall not deactivate until the conditions of both <code>HysteresisReading</code> and <code>HysteresisDuration</code> are met. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?)?\$</code>
HysteresisReading (v1.7+)	number	read- write (null)	The reading offset from the threshold value required to clear the threshold. This property shall indicate the offset from the reading for this sensor and the threshold value that deactivates the threshold. For example, a value of <code>-2</code> indicates the sensor reading shall fall 2 units below an upper threshold value to deactivate the threshold. The value of the property shall use the same units as the <code>Reading</code> property. A value of <code>0</code>, or if the property is not present in the resource, shall indicate the threshold is deactivated when the sensor value no longer violates the threshold. The threshold shall not deactivate until the conditions of both <code>HysteresisReading</code> and <code>HysteresisDuration</code> are met.
Reading	number	read- write (null)	The threshold value. This property shall indicate the reading for this sensor that activates the threshold. The value of the property shall use the same units as the <code>Reading</code> property.

6.122.5.9 VoltageType

The voltage type for this sensor.

- This property shall represent the type of input voltage the sensor monitors.

string	Description
AC	Alternating current.
DC	Direct current.

6.122.6 Example response

```
{
  "@odata.type": "#Sensor.v1_11_0.Sensor",
  "Id": "CabinetTemp",
  "Name": "Rack Temperature",
  "ReadingType": "Temperature",
  "ReadingTime": "2019-12-25T04:14:33+06:00",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "Reading": 31.6,
  "ReadingUnits": "C",
  "ReadingRangeMin": 0,
  "ReadingRangeMax": 70,
  "Accuracy": 0.25,
  "Precision": 1,
  "SensingInterval": "PT3S",
  "PhysicalContext": "Chassis",
  "Thresholds": {
    "UpperCritical": {
      "Reading": 40,
      "Activation": "Increasing"
    },
    "UpperCaution": {
      "Reading": 35,
      "Activation": "Increasing"
    },
    "LowerCaution": {
      "Reading": 10,
      "Activation": "Increasing"
    }
  },
  "@odata.id": "/redfish/v1/Chassis/1/Sensors/CabinetTemp"
}
```

6.123 SerialInterface 1.3.0

Version	v1.3	v1.2	v1.1	v1.0
Release	2025.2	2023.2	2017.1	1.0

6.123.1 Description

The `SerialInterface` schema describes an asynchronous serial interface, such as an RS-232 interface, available to a system or device.

- This resource shall represent a serial interface as part of the Redfish Specification.

6.123.2 URIs

/redfish/v1/Managers/{ManagerId}/SerialInterfaces/{SerialInterfaceId}

6.123.3 Properties

Property	Type	Attributes	Notes
BitRate	string (enum)	<i>read-write</i>	The receive and transmit rate of data flow, typically in bits per second (bit/s), over the serial connection. This property shall indicate the transmit and receive speed of the serial connection. <i>For the possible property values, see BitRate in Property details.</i>
ConnectorType	string (enum)	<i>read-only</i>	The type of connector used for this interface. This property shall indicate the type of physical connector used for this serial connection. <i>For the possible property values, see ConnectorType in Property details.</i>
DataBits	string (enum)	<i>read-write</i>	The number of data bits that follow the start bit over the serial connection. This property shall indicate number of data bits for the serial connection. <i>For the possible property values, see DataBits in Property details.</i>
FlowControl	string (enum)	<i>read-write</i>	The type of flow control, if any, that is imposed on the serial connection. This property shall indicate the flow control mechanism for the serial connection. <i>For the possible property values, see FlowControl in Property details.</i>
InterfaceEnabled	boolean	<i>read-write</i> (null)	An indication of whether this interface is enabled. This property shall indicate whether this interface is enabled.
Links (v1.2+) {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem { }	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
}			
Modbus (v1.3+) {	object		The Modbus settings for the serial interface. This property shall contain the Modbus settings for this serial interface.
ReadOnly (v1.3+)	boolean	<i>read-write</i> (null)	Indicates if the interface is read only. This property shall indicate if the serial interface is read only. If <code>true</code>, the serial service on this manager shall reject or ignore requests that modify data. This property shall only be present if the <code>Role</code> property contains <code>Server</code>.
Role (v1.3+)	string (enum)	<i>read-write</i>	The role of the serial interface. This property shall contain the role of this serial interface. <i>For the possible property values, see Role in Property details.</i>
ServerId (v1.3+)	integer	<i>read-write</i> (null)	The server identifier for this Modbus RTU interface. This property shall contain the MODBUS over Serial Line Specification and Implementation guide-defined address that identifies this Modbus RTU server. This property shall only be present if the <code>Role</code> property contains <code>Server</code>.
}			
Parity	string (enum)	<i>read-write</i>	The type of parity used by the sender and receiver to detect errors over the serial connection. This property shall indicate parity information for a serial connection. <i>For the possible property values, see Parity in Property details.</i>
PinOut	string (enum)	<i>read-only</i> (null)	The physical pinout configuration for a serial connector. This property shall indicate the physical pinout for the serial connector. <i>For the possible property values, see PinOut in Property details.</i>
SignalType	string (enum)	<i>read-only</i>	The type of signal used for the communication connection. This property shall contain the type of serial signaling in use for the serial connection. <i>For the possible property values, see SignalType in Property details.</i>
StopBits	string (enum)	<i>read-write</i>	The period of time before the next start bit is transmitted. This property shall indicate the stop bits for the serial connection. <i>For the possible property values, see StopBits in Property details.</i>

6.123.4 Property details

6.123.4.1 BitRate

The receive and transmit rate of data flow, typically in bits per second (bit/s), over the serial connection.

- This property shall indicate the transmit and receive speed of the serial connection.

string	Description
115200	A bit rate of 115200 bit/s.
1200	A bit rate of 1200 bit/s.
19200	A bit rate of 19200 bit/s.
230400	A bit rate of 230400 bit/s.
2400	A bit rate of 2400 bit/s.
38400	A bit rate of 38400 bit/s.
4800	A bit rate of 4800 bit/s.
57600	A bit rate of 57600 bit/s.
9600	A bit rate of 9600 bit/s.

6.123.4.2 ConnectorType

The type of connector used for this interface.

- This property shall indicate the type of physical connector used for this serial connection.

string	Description
DB25 Female	A DB25 Female connector.
DB25 Male	A DB25 Male connector.
DB9 Female	A DB9 Female connector.
DB9 Male	A DB9 Male connector.
mUSB	A mUSB connector.

string	Description
RJ11	An RJ11 connector.
RJ45	An RJ45 connector.
USB	A USB connector.
uUSB	A uUSB connector.

6.123.4.3 DataBits

The number of data bits that follow the start bit over the serial connection.

- This property shall indicate number of data bits for the serial connection.

string	Description
5	Five bits of data following the start bit.
6	Six bits of data following the start bit.
7	Seven bits of data following the start bit.
8	Eight bits of data following the start bit.

6.123.4.4 FlowControl

The type of flow control, if any, that is imposed on the serial connection.

- This property shall indicate the flow control mechanism for the serial connection.

string	Description
Hardware	Out-of-band flow control imposed.
None	No flow control imposed.
Software	XON/XOFF in-band flow control imposed.

6.123.4.5 Parity

The type of parity used by the sender and receiver to detect errors over the serial connection.

- This property shall indicate parity information for a serial connection.

string	Description
Even	An even parity bit.
Mark	A mark parity bit.
None	No parity bit.
Odd	An odd parity bit.
Space	A space parity bit.

6.123.4.6 PinOut

The physical pinout configuration for a serial connector.

- This property shall indicate the physical pinout for the serial connector.

string	Description
Cisco	The Cisco pinout configuration.
Cyclades	The Cyclades pinout configuration.
Digi	The Digi pinout configuration.
Modbus2Wire (v1.3+)	The Modbus 2 wire pinout configuration. • This value shall indicate the MODBUS over Serial Line Specification and Implementation guide-defined 2W-MODBUS pinout. This value shall only be used if the <code>SignalType</code> property contains <code>Rs485</code>.
Modbus4Wire (v1.3+)	The Modbus 4 wire pinout configuration. • This value shall indicate the MODBUS over Serial Line Specification and Implementation guide-defined 4W-MODBUS pinout. This value shall only be used if the <code>SignalType</code> property contains <code>Rs485</code>.
ModbusRs232 (v1.3+)	The Modbus RS232 pinout configuration. • This value shall indicate the MODBUS over Serial Line Specification and Implementation guide-defined RS232-MODBUS pinout. This value shall only be used if the <code>SignalType</code> property contains <code>Rs232</code>.

6.123.4.7 Role

The role of the serial interface.

- This property shall contain the role of this serial interface.

string	Description
Client	The serial interface is a client and connects to one or more servers across a serial bus.
Server	The serial interface is a server and allows one or more clients to connect across a serial bus.

6.123.4.8 SignalType

The type of signal used for the communication connection.

- This property shall contain the type of serial signaling in use for the serial connection.

string	Description
Rs232	The serial interface follows RS232.
Rs485	The serial interface follows RS485.

6.123.4.9 StopBits

The period of time before the next start bit is transmitted.

- This property shall indicate the stop bits for the serial connection.

string	Description
1	One stop bit following the data bits.
2	Two stop bits following the data bits.

6.123.5 Example response

```
{
  "@odata.type": "#SerialInterface.v1_3_0.SerialInterface",
  "Id": "TTY0",
  "Name": "Manager Serial Interface 1",
  "Description": "Management for Serial Interface",
  "InterfaceEnabled": true,
  "SignalType": "Rs232",
  "BitRate": "115200",
```

```
    "Parity": "None",
    "DataBits": "8",
    "StopBits": "1",
    "FlowControl": "None",
    "ConnectorType": "RJ45",
    "PinOut": "Cyclades",
    "@odata.id": "/redfish/v1/Managers/BMC/SerialInterfaces/TTY0"
  }
```

6.124 ServiceConditions 1.0.1

Version	v1.0
Release	2021.4

6.124.1 Description

The `ServiceConditions` schema contains definitions for reporting the conditions present in the service that require attention.

- This resource shall be used to represent the overall conditions present in a service for a Redfish implementation.

6.124.2 URIs

/redfish/v1/ServiceConditions

6.124.3 Properties

Property	Type	Attributes	Notes
Conditions [{ }]	array (object)	(null)	A condition that requires attention. • Conditions reported by this service that require attention. ◦ This property shall represent a roll-up of the active conditions requiring attention in resources of this Redfish service. The service may roll up any number of conditions originating from resources in the service, using the <code>ConditionInRelatedResource</code> message from Base Message Registry. The array order of conditions may change as new conditions occur or as conditions are resolved by the service. For property details, see Condition.

Property	Type	Attributes	Notes
HealthRollup	string (enum)	read-only	The health roll-up for all resources. This property shall contain the highest severity of any messages included in the <code>Conditions</code> property. <i>For the possible property values, see HealthRollup in Property details.</i>

6.124.4 Property details

6.124.4.1 HealthRollup

The health roll-up for all resources.

- This property shall contain the highest severity of any messages included in the `Conditions` property.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

6.124.5 Example response

```
{
  "@odata.type": "#ServiceConditions.v1_0_1.ServiceConditions",
  "Name": "Redfish Service Conditions",
  "HealthRollup": "Warning",
  "Conditions": [
    {
      "MessageId": "ThermalEvents.1.0.OverTemperature",
      "Timestamp": "2020-11-08T12:25:00-05:00 ",
      "Message": "Temperature exceeds rated limit in power supply `A`.",
      "Severity": "Warning",
      "MessageArgs": [
        "A"
      ],
      "OriginOfCondition": {
        "@odata.id": "/redfish/v1/Chassis/1/Power"
      },
      "LogEntry": {
        "@odata.id": "/redfish/v1/Managers/1/LogServices/Log1/Entries/1"
      }
    }
  ]
}
```



```
    }
  },
  {
    "MessageId": "Base.1.9.ConditionInRelatedResource",
    "Message": "One or more conditions exist in a related resource. See the OriginOfCondition
property.",
    "Severity": "Warning",
    "OriginOfCondition": {
      "@odata.id": "/redfish/v1/Systems/cpu-memory-example"
    }
  }
],
"@odata.id": "/redfish/v1/ServiceConditions"
}
```

6.125 ServiceRoot 1.19.0

Version	v1.19	v1.18	v1.17	v1.16	v1.15	v1.14	v1.13	v1.12	v1.11	v1.10	v1.9	...
Release	2025.2	2025.1	2024.1	2023.1	2022.3	2022.1	2021.4	2021.3	2021.2	2021.1	2020.3	...

6.125.1 Description

The `ServiceRoot` schema describes the root of the Redfish service, located at the '/redfish/v1' URI. All other resources accessible through the Redfish interface on this device are linked directly or indirectly from the service root.

- This resource shall represent the root of the Redfish service.

6.125.2 URIs

/redfish/v1
/redfish/v1/

6.125.3 Properties

Property	Type	Attributes	Notes
AccountService {	object		The link to the account service. This property shall contain a link to a resource of type <code>AccountService</code> . See the <i>AccountService</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>AccountService</i> resource. See the Links section and the <i>AccountService</i> schema for details.
}			
AggregationService (v1.8+) {	object		The link to the aggregation service. This property shall contain a link to a resource of type <code>AggregationService</code> . See the <i>AggregationService</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>AggregationService</i> resource. See the Links section and the <i>AggregationService</i> schema for details.
}			
AutomationNodes (v1.19+) {	object		The link to a collection of automation nodes. This property shall contain a link to a resource collection of type <code>AutomationNodeCollection</code> . Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>AutomationNode</i> . See the <i>AutomationNode</i> schema for details.
}			
Cables (v1.11+) {	object		The link to a collection of cables. This property shall contain a link to a resource collection of type <code>CableCollection</code> . Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Cable</i> . See the <i>Cable</i> schema for details.
}			

Property	Type	Attributes	Notes
CertificateService (v1.5+) {	object		The link to the certificate service. This property shall contain a link to a resource of type <code>CertificateService</code> . See the <i>CertificateService</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a CertificateService resource. See the Links section and the <i>CertificateService</i> schema for details.
}			
Chassis {	object		The link to a collection of chassis. This property shall contain a link to a resource collection of type <code>ChassisCollection</code> . Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Chassis</i> . See the Chassis schema for details.
}			
ComponentIntegrity (v1.13+) {	object		The link to a collection of component integrity information. This property shall contain a link to a resource collection of type <code>ComponentIntegrityCollection</code> . Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>ComponentIntegrity</i> . See the ComponentIntegrity schema for details.
}			
CompositionService (v1.2+) {	object		The link to the composition service. This property shall contain a link to a resource of type <code>CompositionService</code> . See the <i>CompositionService</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a CompositionService resource. See the Links section and the <i>CompositionService</i> schema for details.
}			
EventService {	object		The link to the event service. This property shall contain a link to a resource of type <code>EventService</code> . See the <i>EventService</i> schema for details on this property.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a EventService resource. See the Links section and the <i>EventService</i> schema for details.
}			
Fabrics (v1.1+) {	object		The link to a collection of fabrics. This property shall contain a link to a resource collection of type <i>FabricCollection</i>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Fabric</i> . See the <i>Fabric</i> schema for details.
}			
Facilities (v1.6+) {	object		The link to a collection of facilities. This property shall contain a link to a resource collection of type <i>FacilityCollection</i>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Facility</i> . See the <i>Facility</i> schema for details.
}			
JobService (v1.4+) {	object		The link to the job service. This property shall contain a link to a resource of type <i>JobService</i>. See the <i>JobService</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a JobService resource. See the Links section and the <i>JobService</i> schema for details.
}			
JsonSchemas {	object		The link to a collection of JSON Schema files. This property shall contain a link to a resource collection of type <i>JsonSchemaFileCollection</i>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>JsonSchemaFile</i> . See the <i>JsonSchemaFile</i> schema for details.
}			
KeyService (v1.11+) {	object		The link to the key service. This property shall contain a link to a resource of type <i>KeyService</i>. See the <i>KeyService</i> schema for details on this property.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a KeyService resource. See the Links section and the <i>KeyService</i> schema for details.
}			
LicenseService (v1.12+) {	object		The link to the license service. This property shall contain a link to a resource of type <i>LicenseService</i>. See the <i>LicenseService</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a LicenseService resource. See the Links section and the <i>LicenseService</i> schema for details.
}			
Links {	object	<i>required</i>	The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
ManagerProvidingService (v1.15+) {	object		The link to the manager that is providing this Redfish service. This property shall contain a link to a resource of type <i>Manager</i> that represents the manager providing this Redfish service. See the <i>Manager</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Manager resource. See the Links section and the <i>Manager</i> schema for details.
}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
Sessions {	object	<i>required</i>	The link to a collection of sessions. This property shall contain a link to a resource collection of type <i>SessionCollection</i>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Session</i> . See the <i>Session</i> schema for details.
}			
}			

Property	Type	Attributes	Notes
Managers {	object		The link to a collection of managers. This property shall contain a link to a resource collection of type <code>ManagerCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Manager</i> . See the Manager schema for details.
}			
NVMeDomains (v1.10+) {	object		The link to a collection of NVMe domains. This property shall contain a link to a resource collection of type <code>NVMeDomainCollection</code>.
PowerEquipment (v1.6+) {	object		The link to a set of power equipment. This property shall contain a link to a resource of type <code>PowerEquipment</code>. See the <i>PowerEquipment</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a PowerEquipment resource. See the Links section and the <i>PowerEquipment</i> schema for details.
}			
Product (v1.3+)	string	<i>read-only (null)</i>	The product associated with this Redfish service. This property shall include the name of the product represented by this Redfish service.
ProtocolFeaturesSupported (v1.3+) {	object		The information about protocol features that the service supports. This property shall contain information about protocol features that the service supports.
DeepOperations (v1.7+) {	object		The information about deep operations that the service supports. This property shall contain information about deep operations that the service supports.
DeepPATCH (v1.7+)	boolean	<i>read-only</i>	An indication of whether the service supports the deep <code>PATCH</code> operation. This property shall indicate whether this service supports the Redfish Specification-defined deep <code>PATCH</code> operation.

Property	Type	Attributes	Notes
DeepPOST (v1.7+)	boolean	<i>read-only</i>	An indication of whether the service supports the deep <code>POST</code> operation. This property shall indicate whether this service supports the Redfish Specification-defined deep <code>POST</code> operation.
MaxLevels (v1.7+)	integer	<i>read-only</i>	The maximum levels of resources allowed in deep operations. This property shall contain the maximum levels of resources allowed in deep operations.
}			
ExcerptQuery (v1.4+)	boolean	<i>read-only</i>	An indication of whether the service supports the <code>excerpt</code> query parameter. This property shall indicate whether this service supports the <code>excerpt</code> query parameter.
ExpandQuery (v1.3+) {	object		The information about the use of <code>\$expand</code> in the service. This property shall contain information about the support of the <code>\$expand</code> query parameter by the service.
ExpandAll (v1.3+)	boolean	<i>read-only</i>	An indication of whether the service supports the asterisk (<code>*</code>) option of the <code>\$expand</code> query parameter. This property shall indicate whether this service supports the asterisk (<code>*</code>) option of the <code>\$expand</code> query parameter.
Levels (v1.3+)	boolean	<i>read-only</i>	An indication of whether the service supports the <code>\$levels</code> option of the <code>\$expand</code> query parameter. This property shall indicate whether the service supports the <code>\$levels</code> option of the <code>\$expand</code> query parameter.
Links (v1.3+)	boolean	<i>read-only</i>	An indication of whether this service supports the tilde (<code>~</code>) option of the <code>\$expand</code> query parameter. This property shall indicate whether this service supports the supports the tilde (<code>~</code>) option of the <code>\$expand</code> query parameter.
MaxLevels (v1.3+)	integer	<i>read-only</i>	The maximum <code>\$levels</code> option value in the <code>\$expand</code> query parameter. This property shall contain the maximum <code>\$levels</code> option value in the <code>\$expand</code> query parameter. This property shall be present if the <code>Levels</code> property contains <code>true</code>.

Property	Type	Attributes	Notes
NoLinks (v1.3+)	boolean	<i>read-only</i>	An indication of whether the service supports the period (.) option of the <code>\$expand</code> query parameter. This property shall indicate whether the service supports the period (.) option of the <code>\$expand</code> query parameter.
}			
FilterQuery (v1.3+)	boolean	<i>read-only</i>	An indication of whether the service supports the <code>\$filter</code> query parameter. This property shall indicate whether this service supports the <code>\$filter</code> query parameter.
FilterQueryComparisonOperations (v1.17+)	boolean	<i>read-only</i>	An indication of whether the service supports the <code>eq</code> , <code>ge</code> , <code>gt</code> , <code>le</code> , <code>lt</code> , and <code>ne</code> options for the <code>\$filter</code> query parameter. This property shall indicate whether the service supports the <code>eq</code>, <code>ge</code>, <code>gt</code>, <code>le</code>, <code>lt</code>, and <code>ne</code> options for the <code>\$filter</code> query parameter. This property shall not be present if <code>FilterQuery</code> contains <code>false</code>.
FilterQueryCompoundOperations (v1.17+)	boolean	<i>read-only</i>	An indication of whether the service supports the <code>()</code> , <code>and</code> , <code>not</code> , and <code>or</code> options for the <code>\$filter</code> query parameter. This property shall indicate whether the service supports the Redfish Specification-defined grouping operators <code>()</code>, <code>and</code>, <code>not</code>, and <code>or</code> options for the <code>\$filter</code> query parameter. This property shall not be present if <code>FilterQuery</code> contains <code>false</code>.
IncludeOriginOfConditionQuery (v1.18+)	boolean	<i>read-only</i>	An indication of whether the service supports the <code>includeoriginofcondition</code> query parameter. This property shall indicate whether the service supports the <code>includeoriginofcondition</code> query parameter.
MultipleHTTPRequests (v1.14+)	boolean	<i>read-only</i>	An indication of whether the service supports multiple outstanding HTTP requests. This property shall indicate whether this service supports multiple outstanding HTTP requests.
OnlyMemberQuery (v1.4+)	boolean	<i>read-only</i>	An indication of whether the service supports the <code>only</code> query parameter. This property shall indicate whether this service supports the <code>only</code> query parameter.

Property	Type	Attributes	Notes
SelectQuery (v1.3+)	boolean	<i>read-only</i>	An indication of whether the service supports the <code>\$select</code> query parameter. This property shall indicate whether this service supports the <code>\$select</code> query parameter.
TopSkipQuery (v1.17+)	boolean	<i>read-only</i>	An indication of whether the service supports both the <code>\$top</code> and <code>\$skip</code> query parameters. This property shall indicate whether this service supports both the <code>\$top</code> and <code>\$skip</code> query parameters.
}			
RedfishVersion	string	<i>read-only</i>	The version of the Redfish service. This property shall represent the Redfish protocol version, as specified in the 'Protocol version' clause of the Redfish Specification, to which this service conforms. Pattern: <code>^\d+\.\d+\.\d+\$</code>
RegisteredClients (v1.13+) {	object		The link to a collection of registered clients. This property shall contain a link to a resource collection of type <code>RegisteredClientCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>RegisteredClient</i> . See the <i>RegisteredClient</i> schema for details.
}			
Registries {	object		The link to a collection of registries. This property shall contain a link to a resource collection of type <code>MessageRegistryFileCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>MessageRegistryFile</i> . See the <i>MessageRegistryFile</i> schema for details.
}			

Property	Type	Attributes	Notes
ResourceBlocks (v1.5+) {	object		The link to a collection of resource blocks. This collection is intended for implementations that do not contain a composition service but that expose resources to an orchestrator that implements a composition service. This property shall contain a link to a resource collection of type <code>ResourceBlockCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>ResourceBlock</i> . See the <i>ResourceBlock</i> schema for details.
}			
ServiceConditions (v1.13+) {	object		The link to the service conditions. This property shall contain a link to a resource of type <code>ServiceConditions</code>. See the <i>ServiceConditions</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>ServiceConditions</i> resource. See the Links section and the <i>ServiceConditions</i> schema for details.
}			
ServiceIdentification (v1.14+)	string	<i>read-only</i>	The vendor or user-provided product and service identifier. This property shall contain a vendor-provided or user-provided value that identifies and associates a discovered Redfish service with a particular product instance. The value of the property shall contain the value of the <code>ServiceIdentification</code> property in the <code>Manager</code> resource providing the Redfish service root resource. The value of this property is used in conjunction with the <code>Product</code> and <code>Vendor</code> properties to match user credentials or other a priori product instance information necessary for initial deployment to the correct, matching Redfish service. This property shall not be present if its value is an empty string or <code>null</code>.
SessionService {	object		The link to the sessions service. This property shall contain a link to a resource of type <code>SessionService</code>. See the <i>SessionService</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>SessionService</i> resource. See the Links section and the <i>SessionService</i> schema for details.
}			

Property	Type	Attributes	Notes
Storage (v1.9+) {	object		The link to a collection of storage subsystems. This property shall contain a link to a resource collection of type <code>StorageCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Storage</i> . See the Storage schema for details.
}			
StorageServices (v1.1+) {}	object		The link to a collection of storage services. This property shall contain a link to a resource collection of type <code>StorageServiceCollection</code>.
StorageSystems (v1.1+) {}	object		The link to a collection of storage systems. This property shall contain a link to a resource collection of type <code>StorageSystemCollection</code>. This collection shall contain computer systems that act as storage servers. The <code>HostingRoles</code> property of each such computer system shall contain a <code>StorageServer</code> entry.
Systems {	object		The link to a collection of systems. This property shall contain a link to a resource collection of type <code>ComputerSystemCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>ComputerSystem</i> . See the ComputerSystem schema for details.
}			
Tasks {	object		The link to the task service. This property shall contain a link to a resource of type <code>TaskService</code>. See the <i>TaskService</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a TaskService resource. See the Links section and the <i>TaskService</i> schema for details.
}			
TelemetryService (v1.4+) {	object		The link to the telemetry service. This property shall contain a link to a resource of type <code>TelemetryService</code>. See the <i>TelemetryService</i> schema for details on this property.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a TelemetryService resource. See the Links section and the <i>TelemetryService</i> schema for details.
}			
ThermalEquipment (v1.16+) {	object		The link to a set of cooling equipment. This property shall contain a link to a resource of type <i>ThermalEquipment</i>. See the <i>ThermalEquipment</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a ThermalEquipment resource. See the Links section and the <i>ThermalEquipment</i> schema for details.
}			
UpdateService (v1.1+) {	object		The link to the update service. This property shall contain a link to a resource of type <i>UpdateService</i>. See the <i>UpdateService</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a UpdateService resource. See the Links section and the <i>UpdateService</i> schema for details.
}			
UUID	string (uuid)	<i>read-only (null)</i>	Unique identifier for a service instance. When SSDP is used, this value contains the same UUID returned in an HTTP 200 OK response from an SSDP M-SEARCH request during discovery. This property shall contain the identifier of the Redfish service instance. If SSDP is used, this value shall contain the same UUID returned in an HTTP 200 OK response from an SSDP M-SEARCH request during discovery. RFC4122 describes methods to use to create a UUID value. The value should be considered to be opaque. Client software should only treat the overall value as a universally unique identifier and should not interpret any subfields within the UUID. Pattern: <code>^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\$</code>
Vendor (v1.5+)	string	<i>read-only (null)</i>	The vendor or manufacturer associated with this Redfish service. This property shall include the name of the manufacturer or vendor represented by this Redfish service. If this property is supported, the vendor name shall not be included in the <i>Product</i> property value.

6.125.4 Property details

6.125.4.1 idRef

@odata.id	string (URI)	read-only	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.

6.125.5 Example response

```
{
  "@odata.type": "#ServiceRoot.v1_19_0.ServiceRoot",
  "Id": "RootService",
  "Name": "Root Service",
  "RedfishVersion": "1.15.0",
  "UUID": "92384634-2938-2342-8820-489239905423",
  "Product": "UR99 1U Server",
  "ProtocolFeaturesSupported": {
    "ExpandQuery": {
      "ExpandAll": true,
      "Levels": true,
      "MaxLevels": 6,
      "Links": true,
      "NoLinks": true
    },
    "SelectQuery": false,
    "FilterQuery": false,
    "OnlyMemberQuery": true,
    "ExcerptQuery": true,
    "MultipleHTTPRequests": true
  },
  "ServiceConditions": {
    "@odata.id": "/redfish/v1/ServiceConditions"
  },
  "Systems": {
    "@odata.id": "/redfish/v1/Systems"
  },
  "Chassis": {
    "@odata.id": "/redfish/v1/Chassis"
  },
  "Managers": {
    "@odata.id": "/redfish/v1/Managers"
  },
  "UpdateService": {
    "@odata.id": "/redfish/v1/UpdateService"
  }
}
```

```

    },
    "CompositionService": {
      "@odata.id": "/redfish/v1/CompositionService"
    },
    "Tasks": {
      "@odata.id": "/redfish/v1/TaskService"
    },
    "SessionService": {
      "@odata.id": "/redfish/v1/SessionService"
    },
    "AccountService": {
      "@odata.id": "/redfish/v1/AccountService"
    },
    "EventService": {
      "@odata.id": "/redfish/v1/EventService"
    },
    "Links": {
      "Sessions": {
        "@odata.id": "/redfish/v1/SessionService/Sessions"
      }
    },
    "@odata.id": "/redfish/v1/"
  }
}

```

6.126 Session 1.8.0

Version	v1.8	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2024.4	2023.2	2022.3	2022.2	2022.1	2020.3	2019.1	2017.1	1.0

6.126.1 Description

The `Session` resource describes a single connection (session) between a client and a Redfish service instance.

- This resource shall represent a session for a Redfish implementation.

6.126.2 URIs

/redfish/v1/SessionService/Sessions/{*SessionId*}

6.126.3 Properties

Property	Type	Attributes	Notes
ClientOriginIPAddress (v1.3+)	string	<i>read-only</i> (null)	The IP address of the client that created the session. This property shall contain the IP address of the client that created the session.
Context (v1.5+)	string	<i>read-only</i> (null)	A client-supplied string that is stored with the session. This property shall contain a client-supplied context that remains with the session through the session's lifetime.
CreatedTime (v1.4+)	string (date-time)	<i>read-only</i> (null)	The date and time when the session was created. This property shall contain the date and time when the session was created.
ExpirationTime (v1.8+)	string (date-time)	<i>read-only</i>	The date and time when the session expires regardless of session activity. This property shall contain the date and time when the session expires regardless of session activity. The service shall delete this resource when the expiration time is reached. If this property is not present, the session does not expire based on an absolute time.
Links (v1.7+) {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
OutboundConnection (v1.7+) {	object		The outbound connection associated with this session. This property shall contain a link to a resource of type <code>OutboundConnection</code> that represents the outbound connection for this session. This property shall be present if <code>SessionType</code> contains <code>OutboundConnection</code>. See the <i>OutboundConnection</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>OutboundConnection</i> resource. See the Links section and the <i>OutboundConnection</i> schema for details.
}			
}			
OemSessionType (v1.2+)	string	<i>read-only</i> (null)	The active OEM-defined session type. This property shall contain the OEM-specific session type that is currently active if <code>SessionType</code> contains <code>OEM</code>.

Property	Type	Attributes	Notes
Password	string	<i>read-only required on create (null)</i>	The password for this session. The value is <code>null</code> in responses. This property shall contain the password for this session. The value shall be <code>null</code> in responses. When creating a session through a Redfish host interface using an <code>AuthNone</code> role, the property shall contain an empty string in the request body.
Roles (v1.7+) []	array (string, null)	<i>read-only</i>	The Redfish roles that contain the privileges of this session. This property shall contain the Redfish roles that contain the privileges of this session.
SessionType (v1.2+)	string (enum)	<i>read-only (null)</i>	The active session type. This property shall represent the type of session that is currently active. <i>For the possible property values, see SessionType in Property details.</i>
Token (v1.6+)	string	<i>read-only (null)</i>	The multi-factor authentication token for this session. The value is <code>null</code> in responses. This property shall contain the multi-factor authentication token for this session. The value shall be <code>null</code> in responses.
UserName	string	<i>read-only required on create (null)</i>	The username for the account for this session. This property shall contain the username that matches an account recognized by the account service. When a creating a session through a Redfish host interface using an <code>AuthNone</code> role, the property shall contain an empty string in the request body.

6.126.4 Property details

6.126.4.1 SessionType

The active session type.

- This property shall represent the type of session that is currently active.

string	Description
HostConsole	The host's console, which could be connected through Telnet, SSH, or another protocol. This value shall indicate the session is the host's console, which could be connected through Telnet, SSH, or another protocol. If this session is terminated or deleted, the service shall close the connection for the respective host console session.

string	Description
IPMI	Intelligent Platform Management Interface. This value shall indicate the session is an Intelligent Platform Management Interface session. If this session is terminated or deleted, the service shall close the connection for the respective IPMI session.
KVMIP	A Keyboard-Video-Mouse over IP session. This value shall indicate the session is a Keyboard-Video-Mouse over IP session. If this session is terminated or deleted, the service shall close the connection for the respective KVM-IP session.
ManagerConsole	The manager's console, which could be connected through Telnet, SSH, SM CLP, or another protocol. This value shall indicate the session is the manager's console, which could be connected through Telnet, SSH, SM CLP, or another protocol. If this session is terminated or deleted, the service shall close the connection for the respective manager console session.
OEM	OEM type. For OEM session types, see the <code>OemSessionType</code> property. This value shall indicate the session is an OEM-specific session and is further described by the <code>OemSessionType</code> property.
OutboundConnection (v1.7+)	A Redfish Specification-defined outbound connection. See the 'Outbound connections' clause of the Redfish Specification. This value shall indicate the session is an outbound connection defined by the 'Outbound connections' clause of the Redfish Specification. The <code>OutboundConnection</code> property inside the <code>Links</code> property shall contain the link to the outbound connection configuration. If this session is terminated or deleted, the service shall disable the associated <code>OutboundConnection</code> resource.
Redfish	A Redfish session. This value shall indicate the session is a Redfish session defined by the 'Redfish session login authentication' clause of the Redfish Specification. If this session is terminated or deleted, the service shall invalidate the respective session token.
VirtualMedia	Virtual media. This value shall indicate the session is a virtual media session. If this session is terminated or deleted, the service shall close the connection for the respective virtual media session and make the media inaccessible to the host.
WebUI	A non-Redfish web user interface session, such as a graphical interface or another web-based protocol. This value shall indicate the session is a non-Redfish web user interface session. If this session is terminated or deleted, the service shall invalidate the respective session token.

6.126.5 Example response

```

{
  "@odata.type": "#Session.v1_8_0.Session",
  "Id": "1234567890ABCDEF",
  "Name": "User Session",
  "Description": "Manager User Session",
  "UserName": "Administrator",
  "@odata.id": "/redfish/v1/SessionService/Sessions/1234567890ABCDEF"
}
```

6.127 SessionService 1.2.0

Version	v1.2	v1.1	v1.0
Release	2024.4	2016.2	1.0

6.127.1 Description

The `SessionService` schema describes the session service and its properties, with links to the actual list of sessions.

- This resource contains the session service properties for a Redfish implementation.

6.127.2 URIs

/redfish/v1/SessionService

6.127.3 Properties

Property	Type	Attributes	Notes
AbsoluteSessionTimeout (v1.2+)	integer (seconds)	<i>read-write</i>	The maximum number of seconds that a session is open before the service closes the session regardless of activity. This property shall contain the maximum number of seconds that a session is open before the service closes the session regardless of activity.

Property	Type	Attributes	Notes
AbsoluteSessionTimeoutEnabled (v1.2+)	boolean	<i>read-write</i>	An indication of whether an absolute session timeout is applied to sessions. This property shall indicate whether an absolute session timeout is applied to sessions. If <code>true</code>, the service shall close sessions that are open for the number of seconds specified by the <code>AbsoluteSessionTimeout</code> property regardless of session activity. If <code>false</code> or if this property is not present, the service shall not apply an absolute session timeout.
ServiceEnabled	boolean	<i>read-write (null)</i>	An indication of whether this service is enabled. If <code>true</code> , this service is enabled. If <code>false</code> , it is disabled, and new sessions cannot be created, old sessions cannot be deleted, and established sessions can continue operating. This property shall indicate whether this service is enabled. If <code>true</code>, this service is enabled. If <code>false</code>, it is disabled, and new sessions shall not be created, old sessions shall not be deleted, and established sessions can continue operating.
Sessions {	object		The link to a collection of sessions. This property shall contain a link to a resource collection of type <code>SessionCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Session</i> . See the Session schema for details.
}			
SessionTimeout	integer (seconds)	<i>read-write</i>	The number of seconds of inactivity that a session can have before the session service closes the session due to inactivity. This property shall contain the threshold of time in seconds between requests on a specific session at which point the session service shall close the session due to inactivity. The session service shall support any value between the schema-specified minimum and maximum terms.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

6.127.4 Example response

```
{
  "@odata.type": "#SessionService.v1_2_0.SessionService",
  "Id": "SessionService",
  "Name": "Session Service",
  "Description": "Session Service",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "ServiceEnabled": true,
  "SessionTimeout": 30,
  "Sessions": {
    "@odata.id": "/redfish/v1/SessionService/Sessions"
  },
  "@odata.id": "/redfish/v1/SessionService"
}
```

6.128 Signature 1.0.3

Version	v1.0
Release	2020.1

6.128.1 Description

The `Signature` schema describes a signature or a hash.

- This resource contains a signature for a Redfish implementation.

6.128.2 URIs

`/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/SecureBoot/SecureBootDatabases/{DatabaseId}/Signatures/{SignatureId}`
`/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/SecureBoot/SecureBootDatabases/{DatabaseId}/Signatures/{SignatureId}`
`/redfish/v1/Systems/{ComputerSystemId}/SecureBoot/SecureBootDatabases/{DatabaseId}/Signatures/{SignatureId}`

6.128.3 Properties

Property	Type	Attributes	Notes
SignatureString	string	<i>read-only required on create (null)</i>	The string for the signature. This property shall contain the string of the signature, and the format shall follow the requirements specified by the value of the <code>SignatureType</code> property. If the signature contains any private keys, they shall be removed from the string in responses. If the private key for the signature is not known by the service and is needed to use the signature, the client shall provide the private key as part of the string in the <code>POST</code> request.
SignatureType	string	<i>read-only required on create (null)</i>	The format of the signature. This property shall contain the format type for the signature. The format is qualified by the value of the <code>SignatureTypeRegistry</code> property.
SignatureTypeRegistry	string (enum)	<i>read-only required on create (null)</i>	The type of the signature. This property shall contain the type for the signature. <i>For the possible property values, see <code>SignatureTypeRegistry</code> in Property details.</i>
UefiSignatureOwner	string (uuid)	<i>read-only (null)</i>	The UEFI signature owner for this signature. The value of this property shall contain the GUID of the UEFI signature owner for this signature as defined by the UEFI Specification. This property shall only be present if the <code>SignatureTypeRegistry</code> property is <code>UEFI</code>. Pattern: <code>^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\$</code>

6.128.4 Property details

6.128.4.1 SignatureTypeRegistry

The type of the signature.

- This property shall contain the type for the signature.

string	Description
UEFI	A signature defined in the UEFI Specification. This value shall indicate that the <code>SignatureType</code> string contains the #define name of the <code>SignatureType</code> member of the <code>EFI_SIGNATURE_LIST</code>, as defined by the UEFI Specification. This value shall also indicate that the format of the <code>SignatureString</code> is a big-endian hex-encoded string of the binary value specified in the UEFI <code>SignatureData</code> array in <code>EFI_SIGNATURE_DATA</code>, as defined by the UEFI Specification.

6.128.5 Example response

```
{
  "@odata.type": "#Signature.v1_0_3.Signature",
  "Id": "1",
  "Name": "SHA256 Signature",
  "SignatureString": "80B4D96931BF0D02FD91A61E19D14F1DA452E66DB2408CA8604D411F92659F0A",
  "SignatureTypeRegistry": "UEFI",
  "SignatureType": "EFI_CERT_SHA256_GUID",
  "UefiSignatureOwner": "28d5e212-165b-4ca0-909b-c86b9cee0112",
  "@odata.id": "/redfish/v1/Systems/1/SecureBoot/SecureBootDatabases/db/Signatures/1"
}
```

6.129 SimpleStorage 1.3.2

Version	v1.3	v1.2	v1.1	v1.0
Release	2020.3	2017.1	2016.1	1.0

6.129.1 Description

The `SimpleStorage` schema represents the properties of a storage controller and its directly-attached devices.

- This resource contains a storage controller and its directly-attached devices.

6.129.2 URIs

```
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/SimpleStorage/{SimpleStorageId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/SimpleStorage/
{SimpleStorageId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/SimpleStorage/{SimpleStorageId}
```

```
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/SimpleStorage/{SimpleStorageId}
/redfish/v1/Systems/{ComputerSystemId}/SimpleStorage/{SimpleStorageId}
```

6.129.3 Properties

Property	Type	Attributes	Notes
Devices [{	array		The storage devices. This property shall contain a list of storage devices related to this resource.
CapacityBytes (v1.1+)	integer (bytes)	<i>read-only</i> (null)	The size, in bytes, of the storage device. This property shall represent the size, in bytes, of the storage device.
Manufacturer	string	<i>read-only</i> (null)	The name of the manufacturer of this device. This property shall indicate the name of the manufacturer of this storage device.
Model	string	<i>read-only</i> (null)	The product model number of this device. This property shall indicate the model information as provided by the manufacturer of this storage device.
Name	string	<i>read-only</i> <i>required</i>	The name of the resource or array member. This object represents the name of this resource or array member. The resource values shall conform with the Redfish Specification-described requirements. This string value shall be of the 'Name' reserved word format.
Oem {}	object		See the OEM object definition in the Using this guide clause.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
}]			
Links (v1.2+) {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Chassis (v1.2+) {	object		The link to the chassis that contains this simple storage. This property shall contain a link to a resource of type <code>Chassis</code> that represents the physical container associated with this resource. See the <i>Chassis</i> schema for details on this property.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.
}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
Storage (v1.3+){	object		The link to the storage instance that corresponds to this simple storage. This property shall contain a link to a resource of type <code>Storage</code> that represents the same storage subsystem as this resource. See the <i>Storage</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Storage resource. See the Links section and the <i>Storage</i> schema for details.
}			
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <i>Status</i>.
UefiDevicePath	string	<i>read-only</i> (null)	The UEFI device path to access this storage controller. This property shall contain the UEFI device path that identifies and locates the specific storage controller.

6.129.4 Example response

```
{
  "@odata.type": "#SimpleStorage.v1_3_2.SimpleStorage",
  "Id": "1",
  "Name": "Simple Storage Controller",
  "Description": "System SATA",
  "UefiDevicePath": "Acpi(PNP0A03,0)/Pci(1F|1)/Ata(Primary,Master)/HD(Part3, Sig00110011)",
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "HealthRollup": "Warning"
  },
  "Devices": [
    {
      "Name": "SATA Bay 1",
      "Manufacturer": "Contoso",
      "Model": "3000GT8",
      "CapacityBytes": 800000000000,

```



```
      "Status": {
        "State": "Enabled",
        "Health": "OK"
      }
    },
    {
      "Name": "SATA Bay 2",
      "Manufacturer": "Contoso",
      "Model": "3000GT7",
      "CapacityBytes": 4000000000000,
      "Status": {
        "State": "Enabled",
        "Health": "Warning"
      }
    },
    {
      "Name": "SATA Bay 3",
      "Status": {
        "State": "Absent"
      }
    },
    {
      "Name": "SATA Bay 4",
      "Status": {
        "State": "Absent"
      }
    }
  ],
  "@odata.id": "/redfish/v1/Systems/437XR1138R2/SimpleStorage/1"
}
```

6.130 SoftwareInventory 1.12.0

Version	v1.12	v1.11	v1.10	v1.9	v1.8	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	...
Release	2025.2	2025.1	2023.2	2022.3	2022.2	2022.1	2021.4	2021.2	2020.4	2020.1	2018.1	...

6.130.1 Description

The `SoftwareInventory` schema contains an inventory of software components. This can include software components such as BIOS, BMC firmware, firmware for other devices, system drivers, or provider software.

- This resource contains a single software component that this Redfish service manages.

6.130.2 URIs

/redfish/v1/UpdateService/FirmwareInventory/{SoftwareInventoryId}

/redfish/v1/UpdateService/SoftwareInventory/{SoftwareInventoryId}

6.130.3 Properties

Property	Type	Attributes	Notes
Active (v1.12+)	boolean	<i>read-only</i> (null)	This image is active on one or more devices. This property shall indicate that the software image is currently in use on one or more devices.
AdditionalVersions (v1.7+) {	object		The additional versions of this software. This property shall contain the additional versions of this software.
Bootloader (v1.7+)	string	<i>read-only</i> (null)	The bootloader version contained in this software, such as U-Boot or UEFI. This property shall contain the bootloader version contained in this software.
BootParameters (v1.11+)	string	<i>read-only</i> (null)	The version of the configuration file that contains the initial boot parameters of this software, such as parameters for U-Boot. This property shall contain the version of the configuration file that contains the initial boot parameters of this software.
FactoryConfiguration (v1.11+)	string	<i>read-only</i> (null)	The version of the configuration that contains the factory default runtime configuration parameters of this software. This property shall contain the version of the configuration that contains the factory default runtime configuration parameters of this software.
Kernel (v1.7+)	string	<i>read-only</i> (null)	The kernel version contained in this software. This property shall contain the kernel version contained in this software. For strict POSIX software, the value shall contain the output of <code>uname -srm</code>. For Microsoft Windows, the value shall contain the output of <code>ver</code>, from Command Prompt.
Microcode (v1.7+)	string	<i>read-only</i> (null)	The microcode version contained in this software, such as processor microcode. This property shall contain the microcode version contained in this software.

Property	Type	Attributes	Notes
Oem (v1.7+) {}	object		See the OEM object definition in the Using this guide clause.
OSDistribution (v1.8+)	string	<i>read-only</i> (null)	The operating system name of this software. This property shall contain the operating system name of this software.
}			
AssociatedPhysicalContext (v1.10+)	string (enum)	<i>read-only</i>	The area or device to which the software applies. Used to distinguish when different parts of a device have different software components. This property shall contain a description of the physical context for the software inventory data. <i>For the possible property values, see AssociatedPhysicalContext in Property details.</i>
Links (v1.12+) {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
ActiveTargets (v1.12+) [{	array		An array of devices where this software image is currently running. This property shall contain an array of links to resources or objects that represent the devices where this software image is currently running.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
StagedTargets (v1.12+) [{	array		An array of devices where this software image is staged and ready to be activated. This property shall contain an array of links to resources or objects that represent the devices where this software image is staged and ready to be activated.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
}			

Property	Type	Attributes	Notes
LowestSupportedVersion (v1.1+)	string	<i>read-only</i> (null)	The lowest supported version of this software. This property shall represent the lowest supported version of this software. This string is formatted using the same format used for the <code>Version</code> property.
Manufacturer (v1.2+)	string	<i>read-only</i> (null)	The manufacturer or producer of this software. This property shall represent the name of the manufacturer or producer of this software.
Measurement (v1.4+, deprecated v1.6) {	object		A DSP0274-defined measurement block. This property shall contain a DSP0274-defined measurement block. <i>Deprecated in v1.6 and later. This property has been deprecated in favor of the <code>ComponentIntegrity</code> resource.</i>
Measurement (v1.4+)	string	<i>read-only</i> (null)	The hexadecimal string representation of the numeric value of the DSP0274-defined 'Measurement' field of the measurement block. This property shall contain the value of the hexadecimal string representation of the numeric value of the DSP0274-defined 'Measurement' field of the measurement block. Pattern: <code>^[0-9a-fA-F]+\$</code>
MeasurementIndex (v1.5+)	integer	<i>read-only</i> (null)	The DSP0274-defined 'Index' field of the measurement block. This property shall contain the value of the DSP0274-defined 'Index' field of the measurement block.
MeasurementSize (v1.4+)	integer	<i>read-only</i> (null)	The DSP0274-defined 'MeasurementSize' field of the measurement block. This property shall contain the value of the DSP0274-defined 'MeasurementSize' field of the measurement block.
MeasurementSpecification (v1.4+)	integer	<i>read-only</i> (null)	The DSP0274-defined 'MeasurementSpecification' field of the measurement block. This property shall contain the value of the DSP0274-defined 'MeasurementSpecification' field of the measurement block.
}			
RelatedItem (v1.1+) [{	array		An array of links to resources or objects that represent devices to which this software inventory applies. This property shall contain an array of links to resources or objects that represent devices to which this software inventory applies.

Property	Type	Attributes	Notes
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
ReleaseDate (v1.2+)	string (date-time)	<i>read-only</i> (null)	The release date of this software. This property shall contain the date of release or production for this software. If the time of day is unknown, the time of day portion of the property shall contain <code>00:00:00Z</code>.
ReleaseType (v1.10+)	string (enum)	<i>read-only</i> (null)	The type of release. This property shall describe the type of release for the software. <i>For the possible property values, see ReleaseType in Property details.</i>
ResetRequiredOnUpdate (v1.12+)	boolean	<i>read-only</i> (null)	An indication of whether a reset is required to apply an update to this software. This property shall indicate whether a reset is required to apply an update to this software. If <code>true</code>, a reset is required and clients should expect a disruption in communication to targets utilizing this software while applying an update. If <code>false</code>, a reset is not required and communication can be maintained to targets utilizing this software throughout an update.
SoftwareId (v1.1+)	string	<i>read-only</i>	The implementation-specific label that identifies this software. This property shall represent an implementation-specific label that identifies this software. This string correlates with a component repository or database.
Staged (v1.12+)	boolean	<i>read-only</i> (null)	This image is ready to be activated to one or more devices. This property shall indicate that the software image is ready to be activated to one or more devices.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

Property	Type	Attributes	Notes
UefiDevicePaths (v1.1+) []	array (string, null)	<i>read-only</i>	The list of UEFI device paths of the components associated with this software inventory item. This property shall contain a list UEFI device paths of the components associated with this software inventory item. The UEFI device paths shall be formatted as defined by the UEFI Specification.
Updateable	boolean	<i>read-only</i> (null)	An indication of whether the update service can update this software. This property shall indicate whether the update service can update this software. If <code>true</code>, the service can update this software. If <code>false</code>, the service cannot update this software and the software is for reporting purposes only.
Version	string	<i>read-only</i> (null)	The version of this software. This property shall contain the version of this software.
VersionScheme (v1.9+)	string (enum)	<i>read-only</i> (null)	The format of the version. This property shall describe the scheme used to format the value of the <code>Version</code> property. <i>For the possible property values, see VersionScheme in Property details.</i>
WriteProtected (v1.3+)	boolean	<i>read-write</i> (null)	Indicates if the software is write-protected. This property shall indicate whether the software image can be overwritten, where a value <code>true</code> shall indicate that the software cannot be altered or overwritten.

6.130.4 Actions

6.130.4.1 Activate (v1.12+)

Description

This action activates this software inventory instance.

- This action shall activate this software inventory instance.

Action URI

{Base URI of target resource}/Actions/SoftwareInventory.Activate

Action parameters

Parameter Name	Type	Attributes	Notes
Targets [{	array	<i>optional</i>	The target devices to activate this software image. If not specified, the service activates this software image on all applicable devices. This parameter shall contain an array of target devices to activate this software image. If not specified, the service shall activate this software image on all applicable devices.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			

Request Example

```
{
  "Targets": [
    "/redfish/v1/Managers/1"
  ]
}
```

6.130.5 Property details

6.130.5.1 AssociatedPhysicalContext

The area or device to which the software applies. Used to distinguish when different parts of a device have different software components.

- This property shall contain a description of the physical context for the software inventory data.

string	Description
Accelerator	An accelerator.
ACInput	An AC electrical input or input-related circuit.
ACMaintenanceBypassInput	An AC electrical maintenance bypass input.
ACOutput	An AC electrical output or output-related circuit. This value shall indicate an electrical output or an output-related circuit, such as a branch output, which is not terminated as a power outlet.

string	Description
ACStaticBypassInput	An AC electrical static bypass input.
ACUtilityInput	An AC electrical utility input. This value shall indicate an electrical input, where the source is an electrical utility as opposed to a backup or locally-generated power source. This value is intended to differentiate multiple electrical inputs between utility, maintenance bypass, or static bypass values. For general purpose usage, the value of <code>ACInput</code> is preferred.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	A compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC electrical bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	An expansion bay. This value shall indicate a location that provides for the expansion of functionality of a system, such as a PCIe slot that can accept an option card.
ExpansionSubsystem	A group of expansion bays. This value shall indicate a group of expansion bays and the devices installed in those bays.
Fan	A fan.
Filter	A filter.
FPGA	An FPGA.

string	Description
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Manager	A management controller, such as a BMC (baseboard management controller).
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	A networking bay. This value shall indicate a location that provides for the expansion of networking functionality of a system, by the addition of networking devices.
NetworkingDevice	A networking device.
PowerOutlet	An electrical outlet. This value shall indicate an electrical outlet or receptacle.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	A power supply bay. This value shall indicate a location that provides for the installation of a power supply or similar devices.
Pump	A pump.
Rectifier	A rectifier device.
Reservoir	A reservoir.
Room	The room.

string	Description
StorageBay	A storage bay. This value shall indicate a location that provides for the expansion of storage functionality of a system, by the addition of storage devices.
StorageDevice	A storage device.
StorageSubsystem	A storage subsystem. This value shall indicate a storage subsystem, which may consist of one or more storage controllers, storage devices, or related components.
Switch	A switch device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.130.5.2 ReleaseType

The type of release.

- This property shall describe the type of release for the software.

string	Description
Other	The Redfish service does not have enough data to make a determination about this release. This value shall indicate that the Redfish service cannot determine if this release is validated or prototype.
Production	This release is ready for use in production environments. This value shall indicate that the software is ready for use in production environments.

string	Description
Prototype	This release is intended for development or internal use. This value shall indicate that the software is designed for development or internal use.

6.130.5.3 VersionScheme

The format of the version.

- This property shall describe the scheme used to format the value of the `Version` property.

string	Description
DotIntegerNotation	Version formatted as dot-separated integers. This value shall indicate that the value of the <code>Version</code> property contains a sequence of integers separated by period (dot) characters, and shall follow the pattern <code>^\d+(\.\d+)*\$</code> . Leading zeros in the sequence shall be ignored.
OEM	Version follows OEM-defined format. This value shall indicate that the value of the <code>Version</code> property follows a format and rules as defined by the vendor or manufacturer.
SemVer	Version follows Semantic Versioning 2.0 rules. This value shall indicate that the value of the <code>Version</code> property conforms to the format and rules of the Semantic Version 2.0 specification, and may include pre-release or build metadata.

6.130.6 Example response

```
{
  "@odata.type": "#SoftwareInventory.v1_12_0.SoftwareInventory",
  "Id": "BMC",
  "Name": "Contoso BMC Firmware",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "Updateable": true,
  "Manufacturer": "Contoso",
  "ReleaseDate": "2017-08-22T12:00:00",
  "Version": "1.45.455b66-rev4",
  "SoftwareId": "1624A9DF-5E13-47FC-874A-DF3AFF143089",
}
```

```

    "LowestSupportedVersion": "1.30.367a12-rev1",
    "UefiDevicePaths": [
      "BMC(0x1,0x0ABCDEF)"
    ],
    "RelatedItem": [
      {
        "@odata.id": "/redfish/v1/Managers/1"
      }
    ],
    "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/BMC"
  }

```

6.131 Storage 1.19.0

Version	v1.19	v1.18	v1.17	v1.16	v1.15	v1.14	v1.13	v1.12	v1.11	v1.10	v1.9	...
Release	2025.2	2024.4	2024.2	2024.1	2023.1	2022.3	2022.1	2021.4	2021.2	2020.4	2020.3	...

6.131.1 Description

The `Storage` schema defines a storage subsystem and its respective properties. A storage subsystem represents a set of physical or virtual storage controllers and the resources, such as volumes, that can be accessed from that subsystem.

- This resource shall represent a storage subsystem in the Redfish Specification.

6.131.2 URIs

```

/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/
{StorageId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}
/redfish/v1/Storage/{StorageId}
/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}

```

6.131.3 Properties

Property	Type	Attributes	Notes
AutoVolumeCreate (v1.15+)	string (enum)	read-write (null)	Indicates if this storage subsystem automatically creates new volumes for unassigned drives. This property shall indicate if volumes are created automatically for each unassigned drive attached to this storage subsystem. <i>For the possible property values, see AutoVolumeCreate in Property details.</i>
BlockSecurityIDPolicy (v1.18+)	boolean	read-write (null)	Indicates if the storage controller sends a command to block establishment of a TCG-defined security ID (SID) during each drive boot sequence for drives that support it. This property shall indicate if the storage controller sends the TCG-defined 'Block SID' command to block establishment of a TCG-defined security ID (SID) during each drive boot sequence for drives that support it. The value <code>true</code> shall indicate the TCG-defined 'Block SID' command is sent to supporting drives during each drive boot sequence.
ConfigurationLock (v1.16+)	string (enum)	read-write (null)	Indicates whether in-band configuration requests to the storage subsystem are locked. Other properties, such as <code>ConfigurationLockState</code>, contain additional information regarding the status of the configuration lock. This property shall indicate whether configuration requests to the storage subsystem are locked. Services shall reject modification requests that contain the value <code>Partial</code>. Modifying the value of this property may affect the <code>ConfigurationLock</code> property in <code>Drive</code> resources referenced by the <code>Drives</code> property. <i>For the possible property values, see ConfigurationLock in Property details.</i>

Property	Type	Attributes	Notes
Connections (v1.15+) {	object		The collection of links to the connections that this storage subsystem contains. This property shall contain a link to a resource collection of type <code>ConnectionCollection</code>. The members of this collection shall reference Connection resources subordinate to Fabric resources. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Connection</i> . See the Connection schema for details.
}			
ConsistencyGroups (v1.8+) {}	object		The consistency groups, each of which contains a set of volumes that are treated by an application or set of applications as a single resource, that are managed by this storage subsystem. This property shall contain a link to a resource collection of type <code>ConsistencyGroupCollection</code>. The property shall be used when groups of volumes are treated as a single resource by an application or set of applications.
Controllers (v1.9+) {	object		The set of controllers instantiated by this storage subsystem. This property shall contain a link to a resource collection of type <code>StorageControllerCollection</code> that contains the set of storage controllers allocated to this storage subsystem. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>StorageController</i> . See the StorageController schema for details.
}			
Drives [{	array		The set of drives attached to the storage controllers that this resource represents. This property shall contain a set of the drives attached to the storage controllers that this resource represents.
@odata.id	string	<i>read-only</i>	Link to a Drive resource. See the Links section and the <i>Drive</i> schema for details.

Property	Type	Attributes	Notes
}]			
EncryptionMode (v1.14+)	string (enum)	<i>read-write</i> (null)	The encryption mode of this storage subsystem. This property shall contain the encryption mode of this storage subsystem. <i>For the possible property values, see EncryptionMode in Property details.</i>
EndpointGroups (v1.8+) {	object		All of the endpoint groups, each of which contains a set of endpoints that are used for a common purpose such as an ACL or logical identification, that belong to this storage subsystem. This property shall contain a link to a resource collection of type <code>EndpointGroupCollection</code>. This property shall be implemented when atomic control is needed to perform mapping, masking, and zoning operations. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>EndpointGroup</i> . See the <i>EndpointGroup</i> schema for details.
}			
FileSystems (v1.8+) {}	object		All file systems that are allocated by this storage subsystem. This property shall contain a link to a resource collection of type <code>FileSystemCollection</code>. This property shall be used when file systems are shared or exported by the storage subsystem.
HotspareActivationPolicy (v1.14+)	string (enum)	<i>read-write</i> (null)	The policy under which hot spare drives in this storage domain will activate. This property shall contain the policy under which all drives operating as hot spares in this storage domain will activate. <i>For the possible property values, see HotspareActivationPolicy in Property details.</i>
Identifiers (v1.9+) [{ }]	array (object)		Any additional identifiers for a resource. - The durable names for the storage subsystem. - This property shall contain a list of all known durable names for the storage subsystem. For property details, see Identifier.

Property	Type	Attributes	Notes
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
BlockSecurityIDUnsupportedDrives (v1.18+) [{	array		The set of drives in this storage subsystem that do not support blocking of TCG-defined security ID (SID). This property shall contain an array of links to resources of type <code>Drive</code> that represent the drives in this storage subsystem that do not support the TCG-defined 'Block SID' command. This property should only be present if at least one drive does not support the TCG-defined 'Block SID' command.
@odata.id	string	<i>read-only</i>	Link to a Drive resource. See the Links section and the <i>Drive</i> schema for details.
}]			
BlockSecurityIDUpdateUnsuccessfulDrives (v1.18+) [{	array		The set of drives in this storage subsystem for which the most recent attempt to block TCG-defined security ID (SID) failed. This property shall contain an array of links to resources of type <code>Drive</code> that represent the drives in this storage subsystem for which the most recent attempt to block TCG-defined security ID (SID) with the TCG-defined 'Block SID' command failed. This property should only be present if the most recent attempt to block TCG-defined security ID (SID) with the TCG-defined 'Block SID' command failed for at least one drive.
@odata.id	string	<i>read-only</i>	Link to a Drive resource. See the Links section and the <i>Drive</i> schema for details.
}]			
Enclosures [{	array		An array of links to the chassis to which this storage subsystem is attached. This property shall contain an array of links to resources of type <code>Chassis</code> that represent the physical containers attached to this resource.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.
}}			
HostingStorageSystems (v1.11+) [{	array		The storage systems that host this storage subsystem. This property shall contain an array of links to resources of type <i>ComputerSystem</i> that represent the storage systems that host this storage subsystem. The members of this array shall be in the <i>StorageSystems</i> resource collection off the service root.
@odata.id	string	<i>read-only</i>	Link to a ComputerSystem resource. See the Links section and the <i>ComputerSystem</i> schema for details.
}}			
NVMeoFDiscoverySubsystems (v1.15+) [{	array		An array of links to the discovery subsystems that discovered this subsystem in an NVMe-oF environment. This property shall contain an array of links to resources of type <i>Storage</i> that represent the discovery subsystems that discovered this subsystem in an NVMe-oF environment.
@odata.id	string	<i>read-only</i>	Link to another Storage resource.
}}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
SimpleStorage (v1.9+) {	object		The link to the simple storage instance that corresponds to this storage. This property shall contain a link to a resource of type <i>SimpleStorage</i> that represents the same storage subsystem as this resource. See the <i>SimpleStorage</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a SimpleStorage resource. See the Links section and the <i>SimpleStorage</i> schema for details.
}			

Property	Type	Attributes	Notes
StorageServices (v1.9+) [{	array		An array of links to the storage services that connect to this storage subsystem. This property shall contain an array of links to resources of type <code>StorageService</code> with which this storage subsystem is associated.
@odata.id	string (URI)	read-only	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
}			
LocalEncryptionKeyIdentifier (v1.14+)	string	read-only (null)	The local encryption key identifier used by the storage subsystem. This property shall contain the local encryption key identifier used by the storage subsystem when <code>EncryptionMode</code> contains <code>UseLocalKey</code>.
Metrics (v1.18+) {	object	(null)	The link to the metrics associated with this storage subsystem. This property shall contain a link to a resource of type <code>StorageMetrics</code> that represents the metrics associated with this storage subsystem. See the <i>StorageMetrics</i> schema for details on this property.
@odata.id	string	read-only	Link to a <code>StorageMetrics</code> resource. See the Links section and the <i>StorageMetrics</i> schema for details.
}			
NVMeSubsystemProperties (v1.16+) {	object	(null)	Information specific to NVMe Subsystems. This property shall contain information specific to NVMe Subsystems. This property shall only be present if this resource represents an NVMe Subsystem.

Property	Type	Attributes	Notes
ConfigurationLockState (v1.17+) {	object	(null)	The configurable features that are able to be locked from in-band usage on an NVMe subsystem and their current lock state. This property shall contain the configurable features that are able to be locked from in-band usage on an NVMe subsystem and their current lock state.
FirmwareCommit (v1.17+)	string (enum)	read-only (null)	The lock state of the NVMe-defined Firmware Commit command. This property shall contain the lock state of the NVMe-defined Firmware Commit command. <i>For the possible property values, see FirmwareCommit in Property details.</i>
FirmwareImageDownload (v1.17+)	string (enum)	read-only (null)	The lock state of the NVMe-defined Firmware Image Download command. This property shall contain the lock state of the NVMe-defined Firmware Image Download command. <i>For the possible property values, see FirmwareImageDownload in Property details.</i>
Lockdown (v1.17+)	string (enum)	read-only (null)	The lock state of the NVMe-defined Lockdown command. This property shall contain the lock state of the NVMe-defined Lockdown command. <i>For the possible property values, see Lockdown in Property details.</i>
SecuritySend (v1.17+)	string (enum)	read-only (null)	The lock state of the NVMe-defined Security Send command. This property shall contain the lock state of the NVMe-defined Security Send command. <i>For the possible property values, see SecuritySend in Property details.</i>
VPDWrite (v1.17+)	string (enum)	read-only (null)	The lock state of the NVMe-MI-defined VPD Write command. This property shall contain the lock state of the NVMe-MI-defined VPD Write command. <i>For the possible property values, see VPDWrite in Property details.</i>

Property	Type	Attributes	Notes
}			
MaxNamespacesSupported (v1.16+)	number	<i>read-only (null)</i>	The maximum number of namespace attachments supported by this NVMe Subsystem. This property shall contain the maximum number of namespace attachments supported by this NVMe Subsystem. If no maximum is specified, this property should not be implemented.
SharedNamespaceControllerAttachmentSupported (v1.16+)	boolean	<i>read-only (null)</i>	Indicates whether the subsystem supports shared namespace controller attachment, allowing a shared namespace to be attached concurrently to two or more controllers in an NVMe Subsystem. This property shall indicate whether the subsystem supports shared namespace controller attachment, allowing a shared namespace to be attached concurrently to two or more controllers in an NVMe Subsystem.
}			
Redundancy [{}]	array (object)		The common redundancy definition and structure used in other Redfish schemas. - Redundancy information for the storage subsystem. - This property shall contain redundancy information for the storage subsystem. For property details, see Redundancy.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
StorageControllers (deprecated v1.13) [{}]	array		The set of storage controllers that this resource represents. This property shall contain a set of the storage controllers that this resource represents. <i>Deprecated in v1.13 and later. This property has been deprecated in favor of <code>ControlLers</code> to allow for storage controllers to be represented as their own resources.</i>

Property	Type	Attributes	Notes
@odata.id	string (URI)	<i>read-only required</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
Actions (v1.2+) {}	object		The available actions for this resource. This property shall contain the available actions for this resource.
Assembly (v1.4+) {	object		The link to the assembly associated with this storage controller. This property shall contain a link to a resource of type <code>Assembly</code>. See the <i>Assembly</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>Assembly</i> resource. See the Links section and the <i>Assembly</i> schema for details.
}			
AssetTag	string	<i>read-write (null)</i>	The user-assigned asset tag for this storage controller. This property shall track the storage controller for inventory purposes.
CacheSummary (v1.5+) {	object		The cache memory of the storage controller in general detail. This property shall contain properties that describe the cache memory for this resource.
PersistentCacheSizeMiB (v1.5+)	integer (mebibytes)	<i>read-only (null)</i>	The portion of the cache memory that is persistent, measured in MiB. This property shall contain the amount of cache memory that is persistent as measured in mebibytes. This size shall be less than or equal to the <code>TotalCacheSizeMiB</code>.
Status (v1.5+) {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <i>Status</i>.

Property	Type	Attributes	Notes
TotalCacheSizeMiB (v1.5+)	integer (mebibytes)	<i>read-only required (null)</i>	The total configured cache memory, measured in MiB. This property shall contain the amount of configured cache memory as measured in mebibytes.
}			
Certificates (v1.10+) {	object		The link to a collection of certificates for device identity and attestation. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that contains certificates for device identity and attestation. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
ControllerRates (v1.7+) {	object		This property describes the various controller rates used for processes such as volume rebuild or consistency checks. This object shall contain all the rate settings available on the controller.
ConsistencyCheckRatePercent (v1.7+)	integer	<i>read-write (null)</i>	The percentage of controller resources used for performing a data consistency check on volumes. This property shall contain the percentage of controller resources used for checking data consistency on volumes.
RebuildRatePercent (v1.7+)	integer	<i>read-write (null)</i>	The percentage of controller resources used for rebuilding/repairing volumes. This property shall contain the percentage of controller resources used for rebuilding volumes.
TransformationRatePercent (v1.7+)	integer	<i>read-write (null)</i>	The percentage of controller resources used for transforming volumes from one configuration to another. This property shall contain the percentage of controller resources used for transforming volumes.

Property	Type	Attributes	Notes
}			
FirmwareVersion	string	<i>read-only (null)</i>	The firmware version of this storage controller. This property shall contain the firmware version as defined by the manufacturer for the associated storage controller.
Identifiers [{ }]	array (object)		Any additional identifiers for a resource. - The durable names for the storage controller. - This property shall contain a list of all known durable names for the associated storage controller. For property details, see Identifier.
Links (v1.1+) {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Endpoints (v1.1+) [{	array		An array of links to the endpoints that connect to this controller. This property shall contain an array of links to resources of type <code>Endpoint</code> with which this controller is associated.
@odata.id	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCleFunctions (v1.7+) [{	array		An array of links to the PCIe functions that the storage controller produces. This property shall contain an array of links to resources of type <code>PCleFunction</code> that represent the PCIe functions associated with this resource.
@odata.id	string	<i>read-only</i>	Link to a PCIeFunction resource. See the Links section and the <i>PCleFunction</i> schema for details.
}]			

Property	Type	Attributes	Notes
StorageServices (v1.4+, deprecated v1.9) [{	array		An array of links to the storage services that connect to this controller. This property shall contain an array of links to resources of type <code>StorageService</code> with which this controller is associated. <i>Deprecated in v1.9 and later. This property has been deprecated in favor of <code>StorageServices</code> within the <code>Links</code> property at the root level.</i>
@odata.id	string (URI)	read-only	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
}			
Location (v1.4+) { }	object		The location of the storage controller. This property shall contain the location information of the associated storage controller. For property details, see <code>Location</code>.
Manufacturer	string	read-only (null)	The manufacturer of this storage controller. This property shall contain the name of the organization responsible for producing the storage controller. This organization may be the entity from which the storage controller is purchased, but this is not necessarily true.
Measurements (v1.10+, deprecated v1.12) [{	array		An array of DSP0274-defined measurement blocks. This property shall contain an array of DSP0274-defined measurement blocks. <i>Deprecated in v1.12 and later. This property has been deprecated in favor of the <code>ComponentIntegrity</code> resource.</i>
@odata.id	string	read-only	Link to a <code>MeasurementBlock</code> resource. See the <code>Links</code> section and the <code>SoftwareInventory</code> schema for details.
}]			

Property	Type	Attributes	Notes
MemberId	string	<i>read-only required</i>	The unique identifier for the member within an array. This property shall contain the unique identifier for this member within an array. For services supporting Redfish v1.6 or higher, this value shall contain the zero-based array index.
Model	string	<i>read-only (null)</i>	The model number for the storage controller. This property shall contain the name by which the manufacturer generally refers to the storage controller.
Name (v1.3+)	string	<i>read-only (null)</i>	The name of the storage controller. This property shall contain the name of the storage controller.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PartNumber	string	<i>read-only (null)</i>	The part number for this storage controller. This property shall contain a part number assigned by the organization that is responsible for producing or manufacturing the storage controller.
PCIeInterface (v1.5+) {	object		The PCIe interface details for this controller. This property shall contain details on the PCIe interface that connects this PCIe-based controller to its host.
LanesInUse (v1.3+)	integer	<i>read-only (null)</i>	The number of PCIe lanes in use by this device. This property shall contain the number of PCIe lanes in use by this device, which shall be equal to or less than the <code>MaxLanes</code> property value.
MaxLanes (v1.3+)	integer	<i>read-only (null)</i>	The number of PCIe lanes supported by this device. This property shall contain the maximum number of PCIe lanes supported by this device.

Property	Type	Attributes	Notes
MaxPCleType (v1.3+)	string (enum)	<i>read-only</i> (null)	The highest version of the PCIe specification supported by this device. This property shall contain the maximum PCIe specification that this device supports. <i>For the possible property values, see MaxPCleType in Property details.</i>
Oem (v1.3+) {}	object		See the OEM object definition in the Using this guide clause.
PCleType (v1.3+)	string (enum)	<i>read-only</i> (null)	The version of the PCIe specification in use by this device. This property shall contain the negotiated PCIe interface version in use by this device. <i>For the possible property values, see PCleType in Property details.</i>
}			
Ports (v1.7+) {	object		The link to the collection of ports that exist on the storage controller. This property shall contain a link to a resource collection of type <code>PortCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Port</i> . See the Port schema for details.
}			
SerialNumber	string	<i>read-only</i> (null)	The serial number for this storage controller. This property shall contain a manufacturer-allocated number that identifies the storage controller.
SKU	string	<i>read-only</i> (null)	The SKU for this storage controller. This property shall contain the stock-keeping unit number for this storage controller.

Property	Type	Attributes	Notes
SpeedGbps	number (Gbit/s)	<i>read-only (null)</i>	The maximum speed of the storage controller's device interface. This property shall represent the maximum supported speed of the storage bus interface, in Gbit/s. The specified interface connects the controller to the storage devices, not the controller to a host. For example, SAS bus not PCIe host bus.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
SupportedControllerProtocols []	array (string (enum))	<i>read-only</i>	- The supported set of protocols for communicating with this storage controller. - This property shall contain the supported set of protocols for communicating with this storage controller. <i>For the possible property values, see SupportedControllerProtocols in Property details.</i>
SupportedDeviceProtocols []	array (string (enum))	<i>read-only</i>	- The protocols that the storage controller can use to communicate with attached devices. - This property shall contain the set of protocols this storage controller can use to communicate with attached devices. <i>For the possible property values, see SupportedDeviceProtocols in Property details.</i>
SupportedRAIDTypes (v1.6+) []	array (string (enum))	<i>read-only (null)</i>	- The set of RAID types supported by the storage controller. - This property shall contain an array of all the RAID types supported by this controller. <i>For the possible property values, see SupportedRAIDTypes in Property details.</i>
}]			

Property	Type	Attributes	Notes
StorageGroups (v1.8+, deprecated v1.15) {}	object		All of the storage groups, each of which contains a set of volumes and endpoints that are managed as a group for mapping and masking, that belong to this storage subsystem. This property shall contain a link to a resource collection of type <code>StorageGroupsCollection</code>. This property shall be used when implementing mapping and masking. <i>Deprecated in v1.15 and later. This property was deprecated in favor of the <code>Connections</code> property.</i>
StoragePools (v1.8+) {}	object		The set of all storage pools that are allocated by this storage subsystem. A storage pool is the set of storage capacity that can be used to produce volumes or other storage pools. This property shall contain a link to a resource collection of type <code>StoragePoolCollection</code>. This property shall be used when an abstraction of media, rather than references to individual media, are used as the storage data source.
TargetConfigurationLockLevel (v1.17+)	string (enum)	read-write (null)	Indicates the target configuration lock level for the drive based upon the state of the <code>ConfigurationLock</code> property. Other properties, such as <code>ConfigurationLockState</code>, contain additional information regarding the status of the configuration lock. This property shall contain the target configuration lock level for the drive. For NVMe subsystems, services shall implement the locking requirements specified by SNIA's Swordfish NVMe Model Overview and Mapping Guide. <i>For the possible property values, see <code>TargetConfigurationLockLevel</code> in Property details.</i>
Volumes {}	object		The set of volumes that the storage controllers produce. This property shall contain a link to a resource collection of type <code>VolumeCollection</code>.

6.131.4 Actions

6.131.4.1 ImportForeignDrives (v1.19+)

Description

This action imports encrypted foreign drives to a host-based storage controller by supplying encryption access credentials.

- This action shall import encrypted foreign drives to a host-based storage controller by supplying encryption access credentials. Upon successful completion, the EncryptionStatus property of the affected Drive shall change from Foreign to Unlocked .

Action URI

{Base URI of target resource}/Actions/Storage.ImportForeignDrives

Action parameters

Parameter Name	Type	Attributes	Notes
ControllerPassword	string	optional	The current controller password. This parameter is not required if the controller does not currently have a password. • This parameter shall contain the current controller password. Services may reject the action request if this parameter is not provided or the value supplied does not match the current password.
DriveEncryptionKey	string	required	The encryption key to unlock the drives. • This parameter shall contain the encryption key to unlock the drives.
DriveEncryptionKeyIdentifier	string	optional	An encryption key identifier to filter the drives that are imported. If not provided, the controller attempts to import all foreign drives. • This parameter shall contain an encryption key identifier to filter the drives that are imported. If this parameter is not provided, the service shall not perform filtering of foreign drives.

Request Example

```
{
  "ControllerPassword": "P@ssw0rd",
  "DriveEncryptionKey": "566b523d3f955a7fba38a28ec708ca10"
```

```
}

```

6.131.4.2 RekeyExternalKey (v1.16+)

Description

This action causes the controllers of the storage subsystem to request new encryption keys managed by an external key service.

- This action shall cause the controllers of the storage subsystem to request new encryption keys managed by an external key service.

Action URI

{Base URI of target resource}/Actions/Storage.RekeyExternalKey

Action parameters

This action takes no parameters.

6.131.4.3 ResetToDefaults (v1.11+)

Description

The reset action resets the storage device to factory defaults. This can cause the loss of data.

- This action shall reset the storage device. This action can impact other resources.

Action URI

{Base URI of target resource}/Actions/Storage.ResetToDefaults

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	required	The type of reset to defaults. • This parameter shall contain the type of reset to defaults. <i>For the possible property values, see ResetType in Property details.</i>

Request Example

```
{
  "ResetType": "ResetAll"
}
```

6.131.4.4 SetControllerPassword (v1.17+)

Description

This action sets the controller boot password for a host-based storage controller.

- This action shall set the controller boot password for a host-based storage controller.

Action URI

{Base URI of target resource}/Actions/Storage.SetControllerPassword

Action parameters

Parameter Name	Type	Attributes	Notes
CurrentPassword	string	optional	The current controller password. This parameter is not needed if the controller does not currently have a password. • This parameter shall contain the current controller password. Services may reject the action request if this parameter is not provided or the value supplied does not match the current password.
NewPassword	string	required	The new password to set for the controller. • This parameter shall contain the new password to set for the controller.
SecurityKey	string	optional	The security key for the controller. This parameter is not needed if the controller does not have a security key. • This parameter shall contain the controller security key. Services may reject the action request if this parameter is not provided or the value provided does not match the security key for the controller.

Request Example

```
{
  "CurrentPassword": "MyC0nt0s0C0ntr0ller",
}
```

```
"NewPassword": "MyNewC0nt0s0C0ntr0ller",
"SecurityKey": "566b523d3f955a7fba38a28ec708ca10"
}
```

6.131.4.5 SetEncryptionKey

Description

This action sets the local encryption key for the storage subsystem.

- This action shall set the local encryption key for the storage subsystem.

Action URI

{Base URI of target resource}/Actions/Storage.SetEncryptionKey

Action parameters

Parameter Name	Type	Attributes	Notes
CurrentEncryptionKey (v1.14+)	string	optional	The current local encryption key on the storage subsystem. This parameter is not needed if the controller does not currently have an encryption key. • This parameter shall contain the current local encryption key on the storage subsystem. Services may reject the action request if this parameter is not provided or the value supplied does not match the current encryption key.
EncryptionKey	string	required	The local encryption key to set on the storage subsystem. • This parameter shall contain the local encryption key to set on the storage subsystem.
EncryptionKeyIdentifier (v1.14+)	string	optional	The local encryption key identifier used by the storage subsystem. • This property shall contain the local encryption key identifier used by the storage subsystem.

Request Example

```
{
  "EncryptionKey": "566b523d3f955a7fba38a28ec708ca10"
}
```


6.131.5 Property details

6.131.5.1 AutoVolumeCreate

Indicates if this storage subsystem automatically creates new volumes for unassigned drives.

- This property shall indicate if volumes are created automatically for each unassigned drive attached to this storage subsystem.

string	Description
Disabled	Do not automatically create volumes.
NonRAID	Automatically create non-RAID volumes.
RAID0	Automatically create RAID0 volumes.
RAID1	Automatically create RAID1 volumes.

6.131.5.2 ConfigurationLock

Indicates whether in-band configuration requests to the storage subsystem are locked. Other properties, such as `ConfigurationLockState`, contain additional information regarding the status of the configuration lock.

- This property shall indicate whether configuration requests to the storage subsystem are locked. Services shall reject modification requests that contain the value `Partial`. Modifying the value of this property may affect the `ConfigurationLock` property in `Drive` resources referenced by the `Drives` property.

string	Description
Disabled	In-band configuration requests are not locked. • This value shall indicate in-band configuration requests are not locked.
Enabled	In-band configuration requests are locked as specified by <code>TargetConfigurationLockLevel</code> . • This value shall indicate in-band configuration requests are locked as specified by <code>TargetConfigurationLockLevel</code>.
Partial	Some in-band configuration requests are not locked while others are locked. This value is used for status reporting to indicate that the storage subsystem is partially locked and client action is recommended. • This value shall indicate some in-band configuration requests are not locked while others are locked.

6.131.5.3 EncryptionMode

The encryption mode of this storage subsystem.

- This property shall contain the encryption mode of this storage subsystem.

string	Description
Disabled	Encryption is disabled on the storage subsystem.
PasswordOnly (v1.17+)	The storage subsystem uses a password, but no keys for encryption.
PasswordWithExternalKey (v1.17+)	The storage subsystem uses a password and one or more external keys for encryption.
PasswordWithLocalKey (v1.17+)	The storage subsystem uses a password and a local key for encryption.
UseExternalKey	The storage subsystem uses one or more external keys for encryption.
UseLocalKey	The storage subsystem uses a local key for encryption.

6.131.5.4 FirmwareCommit

The lock state of the NVMe-defined Firmware Commit command.

- This property shall contain the lock state of the NVMe-defined Firmware Commit command.

string	Description
CommandUnsupported	The command is not supported, therefore lockdown does not apply.
LockdownUnsupported	The command is supported but is not able to be locked.
Locked	The command is supported and is currently locked.
Unlocked	The command is supported, able to be locked, and is currently unlocked.

6.131.5.5 FirmwareImageDownload

The lock state of the NVMe-defined Firmware Image Download command.

- This property shall contain the lock state of the NVMe-defined Firmware Image Download command.

string	Description
CommandUnsupported	The command is not supported, therefore lockdown does not apply.
LockdownUnsupported	The command is supported but is not able to be locked.
Locked	The command is supported and is currently locked.
Unlocked	The command is supported, able to be locked, and is currently unlocked.

6.131.5.6 HotspareActivationPolicy

The policy under which hot spare drives in this storage domain will activate.

- This property shall contain the policy under which all drives operating as hot spares in this storage domain will activate.

string	Description
OEM	The hot spare drive will take over for the original drive in an algorithm custom to the OEM.
OnDriveFailure	The hot spare drive will take over for the original drive when the original drive has been marked as failed by the storage domain.
OnDrivePredictedFailure	The hot spare drive will take over for the original drive when the original drive has been predicted to fail in the future by the storage domain.

6.131.5.7 idRef

@odata.id	string (URI)	read-only	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.

6.131.5.8 Lockdown

The lock state of the NVMe-defined Lockdown command.

- This property shall contain the lock state of the NVMe-defined Lockdown command.

string	Description
CommandUnsupported	The command is not supported, therefore lockdown does not apply.
LockdownUnsupported	The command is supported but is not able to be locked.
Locked	The command is supported and is currently locked.
Unlocked	The command is supported, able to be locked, and is currently unlocked.

6.131.5.9 MaxPCleType

The highest version of the PCIe specification supported by this device.

- This property shall contain the maximum PCIe specification that this device supports.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.
Gen6 (v1.16+)	A PCIe v6.0 slot.

6.131.5.10 PCleType

The version of the PCIe specification in use by this device.

- This property shall contain the negotiated PCIe interface version in use by this device.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.

string	Description
Gen5	A PCIe v5.0 slot.
Gen6 (v1.16+)	A PCIe v6.0 slot.

6.131.5.11 ResetType

The type of reset to defaults.

- This parameter shall contain the type of reset to defaults.

string	Description
PreserveVolumes	Reset all settings to factory defaults but preserve the configured volumes on the controllers.
ResetAll	Reset all settings to factory defaults and remove all volumes.

6.131.5.12 SecuritySend

The lock state of the NVMe-defined Security Send command.

- This property shall contain the lock state of the NVMe-defined Security Send command.

string	Description
CommandUnsupported	The command is not supported, therefore lockdown does not apply.
LockdownUnsupported	The command is supported but is not able to be locked.
Locked	The command is supported and is currently locked.
Unlocked	The command is supported, able to be locked, and is currently unlocked.

6.131.5.13 SupportedControllerProtocols

- The supported set of protocols for communicating with this storage controller.
 - This property shall contain the supported set of protocols for communicating with this storage controller.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
CXL	Compute Express Link. This value shall indicate conformance to the Compute Express Link Specification.
DisplayPort	DisplayPort. This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
eMMC	Embedded MultiMediaCard (e.MMC). This value shall indicate conformance to the JEDEC JESD84-B51A specification.
Ethernet	Ethernet. This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	Fibre CONnection (FICON). This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).

string	Description
GenZ	GenZ. This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.

string	Description
NVLink	NVLink. This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. This value shall indicate conformance to an OEM-specific architecture, and the OEM section may include additional information.
PCIe	PCI Express. This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
QPI	Intel QuickPath Interconnect (QPI). This value shall indicate conformance to the Intel QuickPath Interconnect (QPI) protocol.
RoCE	RDMA over Converged Ethernet Protocol. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.

string	Description
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UET	Ultra Ethernet Transport. This value shall indicate conformance to the Ultra Ethernet specifications.
UHCI	Universal Host Controller Interface (UHCI). This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
UPI	Intel UltraPath Interconnect (UPI). This value shall indicate conformance to the Intel UltraPath Interconnect (UPI) protocol.
USB	Universal Serial Bus (USB). This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. This value shall indicate conformance to the VESA SVGA Specification.

6.131.5.14 SupportedDeviceProtocols

- The protocols that the storage controller can use to communicate with attached devices.
 - This property shall contain the set of protocols this storage controller can use to communicate with attached devices.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
CXL	Compute Express Link. This value shall indicate conformance to the Compute Express Link Specification.
DisplayPort	DisplayPort. This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
eMMC	Embedded MultiMediaCard (e.MMC). This value shall indicate conformance to the JEDEC JESD84-B51A specification.
Ethernet	Ethernet. This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	Fibre CONnection (FICON). This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).

string	Description
GenZ	GenZ. This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.

string	Description
NVLink	NVLink. This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. This value shall indicate conformance to an OEM-specific architecture, and the OEM section may include additional information.
PCIe	PCI Express. This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
QPI	Intel QuickPath Interconnect (QPI). This value shall indicate conformance to the Intel QuickPath Interconnect (QPI) protocol.
RoCE	RDMA over Converged Ethernet Protocol. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.

string	Description
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UET	Ultra Ethernet Transport. This value shall indicate conformance to the Ultra Ethernet specifications.
UHCI	Universal Host Controller Interface (UHCI). This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
UPI	Intel UltraPath Interconnect (UPI). This value shall indicate conformance to the Intel UltraPath Interconnect (UPI) protocol.
USB	Universal Serial Bus (USB). This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. This value shall indicate conformance to the VESA SVGA Specification.

6.131.5.15 SupportedRAIDTypes

- The set of RAID types supported by the storage controller.
 - This property shall contain an array of all the RAID types supported by this controller.

string	Description
None	A placement policy with no redundancy at the device level.
RAID0	A placement policy where consecutive logical blocks of data are uniformly distributed across a set of independent storage devices without offering any form of redundancy. A placement policy where consecutive logical blocks of data are uniformly distributed across a set of independent storage devices without offering any form of redundancy. This is commonly referred to as data striping. This form of RAID will encounter data loss with the failure of any storage device in the set.
RAID00	A placement policy that creates a RAID 0 stripe set over two or more RAID 0 sets. A placement policy that creates a RAID 0 stripe set over two or more RAID 0 sets. This is commonly referred to as RAID 0+0. This form of data layout is not fault tolerant; if any storage device fails there will be data loss.
RAID01	A data placement policy that creates a mirrored device (RAID 1) over a set of striped devices (RAID 0). A data placement policy that creates a mirrored device (RAID 1) over a set of striped devices (RAID 0). This is commonly referred to as RAID 0+1 or RAID 0/1. Data stored using this form of RAID is able to survive a single RAID 0 data set failure without data loss.
RAID1	A placement policy where each logical block of data is stored on more than one independent storage device. A placement policy where each logical block of data is stored on more than one independent storage device. This is commonly referred to as mirroring. Data stored using this form of RAID is able to survive a single storage device failure without data loss.
RAID10	A placement policy that creates a striped device (RAID 0) over a set of mirrored devices (RAID 1). A placement policy that creates a striped device (RAID 0) over a set of mirrored devices (RAID 1). This is commonly referred to as RAID 1/0. Data stored using this form of RAID is able to survive storage device failures in each RAID 1 set without data loss.
RAID10E	A placement policy that uses a RAID 0 stripe set over two or more RAID 10 sets. A placement policy that uses a RAID 0 stripe set over two or more RAID 10 sets. This is commonly referred to as Enhanced RAID 10. Data stored using this form of RAID is able to survive a single device failure within each nested RAID 1 set without data loss.
RAID10Triple	A placement policy that uses a striped device (RAID 0) over a set of triple mirrored devices (RAID 1Triple). A placement policy that uses a striped device (RAID 0) over a set of triple mirrored devices (RAID 1Triple). This form of RAID can survive up to two failures in each triple mirror set without data loss.

string	Description
RAID1E	A placement policy that uses a form of mirroring implemented over a set of independent storage devices where logical blocks are duplicated on a pair of independent storage devices so that data is uniformly distributed across the storage devices. A placement policy that uses a form of mirroring implemented over a set of independent storage devices where logical blocks are duplicated on a pair of independent storage devices so that data is uniformly distributed across the storage devices. This is commonly referred to as RAID 1 Enhanced. Data stored using this form of RAID is able to survive a single storage device failure without data loss.
RAID1Triple	A placement policy where each logical block of data is mirrored three times across a set of three independent storage devices. A placement policy where each logical block of data is mirrored three times across a set of three independent storage devices. This is commonly referred to as three-way mirroring. This form of RAID can survive two device failures without data loss.
RAID3	A placement policy using parity-based protection where logical bytes of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. A placement policy using parity-based protection where logical bytes of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. Data stored using this form of RAID is able to survive a single storage device failure without data loss. If the storage devices use rotating media, they are assumed to be rotationally synchronized, and the data stripe size should be no larger than the exported block size.
RAID4	A placement policy using parity-based protection where logical blocks of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. A placement policy using parity-based protection where logical blocks of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. Data stored using this form of RAID is able to survive a single storage device failure without data loss.
RAID5	A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and one logical block of parity across a set of 'n+1' independent storage devices where the parity and data blocks are interleaved across the storage devices. A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and one logical block of parity across a set of 'n+1' independent storage devices where the parity and data blocks are interleaved across the storage devices. Data stored using this form of RAID is able to survive a single storage device failure without data loss.

string	Description
RAID50	A placement policy that uses a RAID 0 stripe set over two or more RAID 5 sets of independent storage devices. A placement policy that uses a RAID 0 stripe set over two or more RAID 5 sets of independent storage devices. Data stored using this form of RAID is able to survive a single storage device failure within each RAID 5 set without data loss.
RAID6	A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and two logical blocks of independent parity across a set of 'n+2' independent storage devices where the parity and data blocks are interleaved across the storage devices. A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and two logical blocks of independent parity across a set of 'n+2' independent storage devices where the parity and data blocks are interleaved across the storage devices. Data stored using this form of RAID is able to survive any two independent storage device failures without data loss.
RAID60	A placement policy that uses a RAID 0 stripe set over two or more RAID 6 sets of independent storage devices. A placement policy that uses a RAID 0 stripe set over two or more RAID 6 sets of independent storage devices. Data stored using this form of RAID is able to survive two device failures within each RAID 6 set without data loss.
RAID6TP	A placement policy that uses parity-based protection for storing stripes of 'n' logical blocks of data and three logical blocks of independent parity across a set of 'n+3' independent storage devices where the parity and data blocks are interleaved across the storage devices. A placement policy that uses parity-based protection for storing stripes of 'n' logical blocks of data and three logical blocks of independent parity across a set of 'n+3' independent storage devices where the parity and data blocks are interleaved across the storage devices. This is commonly referred to as Triple Parity RAID. Data stored using this form of RAID is able to survive any three independent storage device failures without data loss.

6.131.5.16 TargetConfigurationLockLevel

Indicates the target configuration lock level for the drive based upon the state of the `ConfigurationLock` property. Other properties, such as `ConfigurationLockState`, contain additional information regarding the status of the configuration lock.

- This property shall contain the target configuration lock level for the drive. For NVMe subsystems, services shall implement the locking requirements specified by SNIA's Swordfish NVMe Model Overview and Mapping Guide.

string	Description
Baseline	The standard configuration lock level, corresponding to applying firmware, updating security keys, and modifying other hardware settings. It does not include managing the volumes or data within the storage subsystem.

6.131.5.17 VPDWrite

The lock state of the NVMe-MI-defined VPD Write command.

- This property shall contain the lock state of the NVMe-MI-defined VPD Write command.

string	Description
CommandUnsupported	The command is not supported, therefore lockdown does not apply.
LockdownUnsupported	The command is supported but is not able to be locked.
Locked	The command is supported and is currently locked.
Unlocked	The command is supported, able to be locked, and is currently unlocked.

6.131.6 Example response

```
{
  "@odata.type": "#Storage.v1_19_0.Storage",
  "Id": "1",
  "Name": "Local Storage Controller",
  "Description": "Integrated RAID Controller",
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "HealthRollup": "OK"
  },
  "StorageControllers": [
    {
      "@odata.id": "/redfish/v1/Systems/437XR1138R2/Storage/1#/StorageControllers/0",
      "MemberId": "0",
      "Name": "Contoso Integrated RAID",
      "Status": {
        "State": "Enabled",
        "Health": "OK"
      },
      "Identifiers": [
        {

```

```

        "DurableNameFormat": "NAA",
        "DurableName": "345C59DBD970859C"
    }
],
"Manufacturer": "Contoso",
"Model": "12Gbs Integrated RAID",
"SerialNumber": "2M220100SL",
"PartNumber": "CT18754",
"SpeedGbps": 12,
"FirmwareVersion": "1.0.0.7",
"SupportedControllerProtocols": [
    "PCIe"
],
"SupportedDeviceProtocols": [
    "SAS",
    "SATA"
]
}
],
"Drives": [
    {
        "@odata.id": "/redfish/v1/Chassis/1U/Drives/35D38F11ACEF7BD3"
    },
    {
        "@odata.id": "/redfish/v1/Chassis/1U/Drives/3F5A8C54207B7233"
    },
    {
        "@odata.id": "/redfish/v1/Chassis/1U/Drives/32ADF365C6C1B7BD"
    },
    {
        "@odata.id": "/redfish/v1/Chassis/1U/Drives/3D58ECBC375FD9F2"
    }
],
"Volumes": {
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/Storage/1/Volumes"
},
"Actions": {
    "#Storage.SetEncryptionKey": {
        "target": "/redfish/v1/Systems/437XR1138R2/Storage/1/Actions/Storage.SetEncryptionKey"
    }
},
"@odata.id": "/redfish/v1/Systems/437XR1138R2/Storage/1"
}

```

6.132 StorageController 1.9.1

Version	v1.9	v1.8	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0

Release	2024.4	2024.3	2023.1	2022.1	2021.4	2021.3	2021.2	2021.1	2020.4	2020.3

6.132.1 Description

The `StorageController` schema describes a storage controller and its properties. A storage controller represents a physical or virtual storage device that produces volumes.

- This resource shall represent a storage controller in the Redfish Specification.

6.132.2 URIs

```

/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/
{StorageControllerId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/
{StorageId}/Controllers/{StorageControllerId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/{StorageControllerId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/
{StorageControllerId}
/redfish/v1/Storage/{StorageId}/Controllers/{StorageControllerId}
/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/{StorageControllerId}

```

6.132.3 Properties

Property	Type	Attributes	Notes
Assembly {	object		The link to the assembly associated with this storage controller. This property shall contain a link to a resource of type <code>Assembly</code>. See the <i>Assembly</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>Assembly</i> resource. See the Links section and the <i>Assembly</i> schema for details.
}			
AssetTag	string	<i>read-write (null)</i>	The user-assigned asset tag for this storage controller. This property shall track the storage controller for inventory purposes.

Property	Type	Attributes	Notes
CacheSummary {	object		The cache memory of the storage controller in general detail. This property shall contain properties that describe the cache memory for this resource.
PersistentCacheSizeMiB	integer (mebibytes)	<i>read-only</i> (null)	The portion of the cache memory that is persistent, measured in MiB. This property shall contain the amount of cache memory that is persistent as measured in mebibytes. This size shall be less than or equal to the <code>TotalCacheSizeMiB</code>.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
TotalCacheSizeMiB	integer (mebibytes)	<i>read-only</i> <i>required</i> (null)	The total configured cache memory, measured in MiB. This property shall contain the amount of configured cache memory as measured in mebibytes.
}			
Certificates (v1.1+) {	object		The link to a collection of certificates for device identity and attestation. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that contains certificates for device identity and attestation. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			

Property	Type	Attributes	Notes
ControllerRates {	object		This property describes the various controller rates used for processes such as volume rebuild or consistency checks. This object shall contain all the rate settings available on the controller.
ConsistencyCheckRatePercent	integer (%)	<i>read-write (null)</i>	The percentage of controller resources used for performing a data consistency check on volumes. This property shall contain the percentage, <code>0</code> to <code>100</code>, of controller resources used for checking data consistency on volumes.
RebuildRatePercent	integer (%)	<i>read-write (null)</i>	The percentage of controller resources used for rebuilding/repairing volumes. This property shall contain the percentage, <code>0</code> to <code>100</code>, of controller resources used for rebuilding volumes.
TransformationRatePercent	integer (%)	<i>read-write (null)</i>	The percentage of controller resources used for transforming volumes from one configuration to another. This property shall contain the percentage, <code>0</code> to <code>100</code>, of controller resources used for transforming volumes.
}			
EnvironmentMetrics (v1.2+) {	object		The link to the environment metrics for this storage controller. This property shall contain a link to a resource of type <code>EnvironmentMetrics</code> that represents the environment metrics for this storage controller. See the <i>EnvironmentMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>EnvironmentMetrics</code> resource. See the Links section and the <i>EnvironmentMetrics</i> schema for details.
}			

Property	Type	Attributes	Notes
FirmwareVersion	string	<i>read-only</i> (null)	The firmware version of this storage controller. This property shall contain the firmware version as defined by the manufacturer for the associated storage controller.
Identifiers [{}]	array (object)		Any additional identifiers for a resource. - The durable names for the storage controller. - This property shall contain a list of all known durable names for the associated storage controller. For property details, see Identifier.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
AttachedVolumes [{	array		An array of links to volumes that are attached to this controller instance. This property shall contain an array of links to resources of type <code>Volume</code> that are attached to this instance of storage controller.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
Batteries (v1.6+) [{	array		The batteries that provide power to this storage controller during a power-loss event. This property shall contain an array of links to resources of type <code>Battery</code> that represent the batteries that provide power to this storage controller during a power-loss event, such as with battery-backed RAID controllers. This property shall not be present if the batteries power the containing chassis as a whole rather than the individual storage controller.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a Battery resource. See the Links section and the <i>Battery</i> schema for details.
}}			
Endpoints [{	array		An array of links to the endpoints that connect to this controller. This property shall contain an array of links to resources of type <i>Endpoint</i> with which this controller is associated.
@odata.id	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}}			
NetworkDeviceFunctions (v1.3+) [{	array		The network device functions that provide connectivity to this controller. This property shall contain an array of links to resources of type <i>NetworkDeviceFunction</i> that represent the devices that provide connectivity to this controller.
@odata.id	string	<i>read-only</i>	Link to a NetworkDeviceFunction resource. See the Links section and the <i>NetworkDeviceFunction</i> schema for details.
}}			
NVMeDiscoveredSubsystems (v1.7+) [{	array		The NVMe subsystems discovered by this discovery controller. This property shall contain an array of links to resources of type <i>Storage</i> that represent the NVMe subsystems discovered by this discovery controller. This property shall only be present if <i>ControllerType</i> in <i>NVMeControllerProperties</i> contains <i>Discovery</i>.
@odata.id	string	<i>read-only</i>	Link to a Storage resource. See the Links section and the <i>Storage</i> schema for details.
}}			
Oem {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
PCleFunctions [{	array		An array of links to the PCIe functions that the storage controller produces. This property shall contain an array of links to resources of type <code>PCleFunction</code> that represent the PCIe functions associated with this resource.
@odata.id	string	<i>read-only</i>	Link to a <code>PCleFunction</code> resource. See the Links section and the <code>PCleFunction</code> schema for details.
}]			
}			
Location {	object		The location of the storage controller. This property shall contain the location information of the associated storage controller. For property details, see <code>Location</code> .
Manufacturer	string	<i>read-only</i> (null)	The manufacturer of this storage controller. This property shall contain the name of the organization responsible for producing the storage controller. This organization may be the entity from which the storage controller is purchased, but this is not necessarily true.
Measurements (v1.1+, deprecated v1.5) [{	array		An array of DSP0274-defined measurement blocks. This property shall contain an array of DSP0274-defined measurement blocks. <i>Deprecated in v1.5 and later. This property has been deprecated in favor of the <code>ComponentIntegrity</code> resource.</i>
@odata.id	string	<i>read-only</i>	Link to a <code>MeasurementBlock</code> resource. See the Links section and the <code>SoftwareInventory</code> schema for details.
}]			
Metrics (v1.7+) {	object	(null)	The link to the metrics associated with this storage controller. This property shall contain a link to the metrics associated with this storage controller. See the <code>StorageControllerMetrics</code> schema for details on this property.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a StorageControllerMetrics resource. See the Links section and the <i>StorageControllerMetrics</i> schema for details.
}			
Model	string	<i>read-only (null)</i>	The model number for the storage controller. This property shall contain the name by which the manufacturer generally refers to the storage controller.
NVMeControllerProperties {	object		The NVMe-related properties for this storage controller. This property shall contain NVMe-related properties for this storage controller.
AllocatedCompletionQueues (v1.4+)	integer	<i>read-only (null)</i>	The number of I/O completion queues allocated to this NVMe I/O controller. This property shall contain the number of I/O completion queues allocated to this NVMe I/O controller.
AllocatedSubmissionQueues (v1.4+)	integer	<i>read-only (null)</i>	The number of I/O submission queues allocated to this NVMe I/O controller. This property shall contain the number of I/O submission queues allocated to this NVMe I/O controller.
ANACharacteristics [{	array		The ANA characteristics and volume information. This property shall contain the ANA characteristics and volume information.
AccessState	string (enum)	<i>read-only (null)</i>	Reported ANA access state. This property shall contain the reported ANA access state. <i>For the possible property values, see AccessState in Property details.</i>
Volume {	object		The specified volume. This property shall contain a link to a resource of type <code>Volume</code>.

Property	Type	Attributes	Notes
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
}]			
ControllerType	string (enum)	<i>read-only</i> (null)	The type of NVMe controller. This property shall contain the type of NVMe controller. <i>For the possible property values, see ControllerType in Property details.</i>
DiscoveryTransportServiceId (v1.9+)	integer	<i>read-only</i> (null)	The NVMe discovery transport service identifier for the discovery controller. This property shall contain the NVMe discovery transport service identifier for the discovery controller. This property shall only be present if <code>ControllerType</code> contains <code>Discovery</code>. For NVMe/TCP, the default value should be <code>8009</code>.
MaxAttachedNamespaces (v1.8+)	integer	<i>read-only</i> (null)	The maximum number of attached namespaces allowed by this NVMe I/O controller. This property shall contain the maximum number of attached namespaces allowed by this NVMe I/O controller.
MaxQueueSize	integer	<i>read-only</i> (null)	The maximum individual queue size that an NVMe I/O controller supports. This property shall contain the maximum individual queue entry size supported per queue. This is a zero-based value, where the minimum value is one, indicating two entries. For PCIe, this applies to both submission and completion queues. For NVMe-oF, this applies only to submission queues.
NVMeControllerAttributes {	object	(null)	The NVMe controller attributes. This property shall contain NVMe controller attributes.

Property	Type	Attributes	Notes
ReportsNamespaceGranularity	boolean	<i>read-only</i> (null)	Indicates whether or not the controller supports reporting of Namespace Granularity. This property shall indicate whether or not the controller supports reporting of Namespace Granularity.
ReportsUUIDList	boolean	<i>read-only</i> (null)	Indicates whether or not the controller supports reporting of a UUID list. This property shall indicate whether or not the controller supports reporting of a UUID list.
Supports128BitHostId	boolean	<i>read-only</i> (null)	Indicates whether or not the controller supports a 128-bit Host Identifier. This property shall indicate whether or not the controller supports a 128-bit Host Identifier.
SupportsEnduranceGroups	boolean	<i>read-only</i> (null)	Indicates whether or not the controller supports Endurance Groups. This property shall indicate whether or not the controller supports Endurance Groups.
SupportsExceedingPowerOfNonOperationalState	boolean	<i>read-only</i> (null)	Indicates whether or not the controller supports exceeding Power of Non-Operational State in order to execute controller-initiated background operations in a non-operational power state. This property shall indicate whether or not the controller supports exceeding Power of Non-Operational State in order to execute controller-initiated background operations in a non-operational power state.
SupportsNVMSets	boolean	<i>read-only</i> (null)	Indicates whether or not the controller supports NVM Sets. This property shall indicate whether or not the controller supports NVM Sets.
SupportsPredictableLatencyMode	boolean	<i>read-only</i> (null)	Indicates whether or not the controller supports Predictable Latency Mode. This property shall indicate whether or not the controller supports Predictable Latency Mode.

Property	Type	Attributes	Notes
SupportsReadRecoveryLevels	boolean	<i>read-only</i> (null)	Indicates whether or not the controller supports Read Recovery Levels. This property shall indicate whether or not the controller supports Read Recovery Levels.
SupportsReservations (v1.2+)	boolean	<i>read-only</i> (null)	Indicates if the controller supports reservations. This property shall indicate if the controller supports reservations.
SupportsSQAssociations	boolean	<i>read-only</i> (null)	Indicates whether or not the controller supports SQ Associations. This property shall indicate whether or not the controller supports SQ Associations.
SupportsTrafficBasedKeepAlive	boolean	<i>read-only</i> (null)	Indicates whether or not the controller supports restarting the Keep Alive Timer if traffic is processed from an admin command or I/O during a Keep Alive Timeout interval. This property shall indicate whether or not the controller supports restarting the Keep Alive Timer if traffic is processed from an admin command or I/O during a Keep Alive Timeout interval.
}			
NVMeSMARTCriticalWarnings {	object	(null)	The NVMe SMART Critical Warnings for this storage controller. This property contains possible triggers for the predictive drive failure warning for the corresponding drive. This property shall contain the NVMe SMART Critical Warnings for this storage controller. This property can contain possible triggers for the predictive drive failure warning for the corresponding drive.
MediaInReadOnly	boolean	<i>read-only</i> (null)	Indicates the media has been placed in read-only mode. This property shall indicate the media has been placed in read-only mode. This is not set when the read-only condition of the media is a result of a change in the write protection state of a namespace.

Property	Type	Attributes	Notes
OverallSubsystemDegraded	boolean	<i>read-only</i> (null)	Indicates that the NVM subsystem reliability has been compromised. This property shall indicate that the NVM subsystem reliability has been compromised.
PMRUnreliable	boolean	<i>read-only</i> (null)	The Persistent Memory Region has become unreliable. This property shall indicate that the Persistent Memory Region has become unreliable. PCIe memory reads can return invalid data or generate poisoned PCIe TLP(s). Persistent Memory Region memory writes might not update memory or might update memory with undefined data. The Persistent Memory Region might also have become non-persistent.
PowerBackupFailed	boolean	<i>read-only</i> (null)	Indicates that the volatile memory backup device has failed. This property shall indicate that the volatile memory backup device has failed.
SpareCapacityWornOut	boolean	<i>read-only</i> (null)	Indicates that the available spare capacity has fallen below the threshold. This property shall indicate that the available spare capacity has fallen below the threshold.
}			
NVMeVersion	string	<i>read-only</i> (null)	The version of the NVMe Base Specification supported. This property shall contain the version of the NVMe Base Specification supported.
}			
PartNumber	string	<i>read-only</i> (null)	The part number for this storage controller. This property shall contain a part number assigned by the organization that is responsible for producing or manufacturing the storage controller.

Property	Type	Attributes	Notes
PCleInterface {	object		The PCIe interface details for this controller. This property shall contain details on the PCIe interface that connects this PCIe-based controller to its host.
LanesInUse (v1.3+)	integer	<i>read-only</i> (null)	The number of PCIe lanes in use by this device. This property shall contain the number of PCIe lanes in use by this device, which shall be equal to or less than the <code>MaxLanes</code> property value.
MaxLanes (v1.3+)	integer	<i>read-only</i> (null)	The number of PCIe lanes supported by this device. This property shall contain the maximum number of PCIe lanes supported by this device.
MaxPCleType (v1.3+)	string (enum)	<i>read-only</i> (null)	The highest version of the PCIe specification supported by this device. This property shall contain the maximum PCIe specification that this device supports. <i>For the possible property values, see MaxPCleType in Property details.</i>
Oem (v1.3+) {}	object		See the OEM object definition in the Using this guide clause.
PCleType (v1.3+)	string (enum)	<i>read-only</i> (null)	The version of the PCIe specification in use by this device. This property shall contain the negotiated PCIe interface version in use by this device. <i>For the possible property values, see PCleType in Property details.</i>
}			
Ports {	object		The link to the collection of ports that exist on the storage controller. This property shall contain a link to a resource collection of type <code>PortCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Port</i> . See the Port schema for details.
}			

Property	Type	Attributes	Notes
SerialNumber	string	<i>read-only</i> (<i>null</i>)	The serial number for this storage controller. This property shall contain a manufacturer-allocated number that identifies the storage controller.
SKU	string	<i>read-only</i> (<i>null</i>)	The SKU for this storage controller. This property shall contain the stock-keeping unit number for this storage controller.
SpeedGbps	number (Gbit/s)	<i>read-only</i> (<i>null</i>)	The maximum speed of the storage controller's device interface. This property shall represent the maximum supported speed of the storage bus interface, in Gbit/s. The specified interface connects the controller to the storage devices, not the controller to a host. For example, SAS bus not PCIe host bus.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
SupportedControllerProtocols []	array (string (enum))	<i>read-only</i>	- The supported set of protocols for communicating with this storage controller. - This property shall contain the supported set of protocols for communicating with this storage controller. <i>For the possible property values, see SupportedControllerProtocols in Property details.</i>
SupportedDeviceProtocols []	array (string (enum))	<i>read-only</i>	- The protocols that the storage controller can use to communicate with attached devices. - This property shall contain the set of protocols this storage controller can use to communicate with attached devices. <i>For the possible property values, see SupportedDeviceProtocols in Property details.</i>

Property	Type	Attributes	Notes
SupportedRAIDTypes []	array (string (enum))	read-only (null)	- The set of RAID types supported by the storage controller. - This property shall contain an array of all the RAID types supported by this controller. <i>For the possible property values, see SupportedRAIDTypes in Property details.</i>

6.132.4 Actions

6.132.4.1 AttachNamespaces (v1.7+)

Description

This action attaches referenced namespaces to the storage controller. Attached namespaces are added to the AttachedVolumes property in Links .

- This action shall attach referenced namespaces to the storage controller. Services shall add the attached namespaces to the AttachedVolumes property in Links .

Action URI

{Base URI of target resource}/Actions/StorageController.AttachNamespaces

Action parameters

Parameter Name	Type	Attributes	Notes
Namespaces [{	array	required	The namespaces to attach to the storage controller. This parameter shall contain an array of links to resources of type Volume that represent the namespaces to attach to the storage controller.
@odata.id	string (URI)	read-only	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			

Response Payload

{			
AttachedVolumes (v1.7+) [{	array	<i>required</i>	An array of links to volumes that are attached to this controller instance. This property shall contain an array of links to resources of type <code>Volume</code> that are attached to this instance of storage controller.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
}			

Request Example

```
{
  "Namespaces": [
    {
      "@odata.id": "/redfish/v1/Systems/1/Storage/NVMe/Volumes/Namespace5"
    }
  ]
}
```

Response Example

```
{
  "Volumes": [
    {
      "@odata.id": "/redfish/v1/Systems/1/Storage/NVMe/Volumes/Namespace1"
    },
    {
      "@odata.id": "/redfish/v1/Systems/1/Storage/NVMe/Volumes/Namespace2"
    },
    {
      "@odata.id": "/redfish/v1/Systems/1/Storage/NVMe/Volumes/Namespace5"
    }
  ]
}
```

6.132.4.2 DetachNamespaces (v1.7+)

Description

This action detaches referenced namespaces from the storage controller. Detached namespaces are removed from the `AttachedVolumes` property in `Links`.

- This action shall detach referenced namespaces from the storage controller. Services shall remove the detached namespaces from the `AttachedVolumes` property in `Links`.

Action URI

{Base URI of target resource}/Actions/StorageController.DetachNamespaces

Action parameters

Parameter Name	Type	Attributes	Notes
Namespaces [{	array	<i>required</i>	The namespaces to detach from the storage controller. This parameter shall contain an array of links to resources of type <code>Volume</code> that represent the namespaces to detach from the storage controller.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			

Response Payload

{			
AttachedVolumes (v1.7+) [{	array	<i>required</i>	An array of links to volumes that are attached to this controller instance. This property shall contain an array of links to resources of type <code>Volume</code> that are attached to this instance of storage controller.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
}			

Request Example

```
{
  "Namespaces": [
    {
      "@odata.id": "/redfish/v1/Systems/1/Storage/NVMe/Volumes/Namespace5"
    }
  ]
}
```

Response Example

```
{
  "Volumes": [
    {
      "@odata.id": "/redfish/v1/Systems/1/Storage/NVMe/Volumes/Namespace1"
    },
    {
      "@odata.id": "/redfish/v1/Systems/1/Storage/NVMe/Volumes/Namespace2"
    }
  ]
}
```

6.132.4.3 SecurityReceive (v1.7+)

Description

This action transfers security protocol data from the controller. The data transferred from the controller contains the status and data result of one or more `SecuritySend` action requests that were previously submitted to the controller.

- This action shall transfer security protocol data from the controller. The contents of the request are specified by the 'SECURITY PROTOCOL IN command' section of the SPC-5 Specification.

Action URI

{Base URI of target resource}/Actions/StorageController.SecurityReceive

Action parameters

Parameter Name	Type	Attributes	Notes
AllocationLength	integer	required	Allocated size for received data. This parameter shall contain the allocated size of the received data, which imposes a maximum length of the data. The response may contain padding to meet this length.
SecurityProtocol	integer	required	The security protocol number. This parameter shall contain the numeric identifier of the security protocol, as defined by the 'SECURITY PROTOCOL field in SECURITY PROTOCOL IN command' table of the SPC-5 Specification, and possibly extended by transport-specific standards. Services shall only accept the values 0, 1, or 2.
SecurityProtocolSpecific	integer	required	The security protocol-specific parameter. This parameter shall contain the security protocol-specific data for the transfer operation. The value is defined by the protocol specified by the SecurityProtocolSpecific parameter.

Response Payload

{			
Data (v1.7+)	string	read-only	The Base64-encoded security protocol data. This property shall contain a Base64-encoded string, with padding characters, of the security protocol data transferred from a controller.
}			

Request Example

```

{
  "SecurityProtocol": 2,
  "SecurityProtocolSpecific": 4100,
  "AllocationLength": 48
}
```

Response Example

```

{
```

```
    "Data": "EAQAAAAAAAAEAAAiAAAAgAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA"
  }
```

6.132.4.4 SecuritySend (v1.7+)

Description

This action transfers security protocol data to the controller. The data transferred to the controller contains security protocol-specific commands to be performed by the controller.

- This action shall transfer security protocol data to the controller. The contents of the request are specified by the 'SECURITY PROTOCOL OUT command' section of the SPC-5 Specification.

Action URI

{Base URI of target resource}/Actions/StorageController.SecuritySend

Action parameters

Parameter Name	Type	Attributes	Notes
Data	string	required	The data to transfer. • This parameter shall contain a Base64-encoded string, with padding characters, of the security protocol data to transfer.
SecurityProtocol	integer	required	The security protocol number. • This parameter shall contain the numeric identifier of the security protocol, as defined by the 'SECURITY PROTOCOL field in SECURITY PROTOCOL OUT command' table of the SPC-5 Specification, and possibly extended by transport-specific standards. Services shall only accept the values 1 or 2 .
SecurityProtocolSpecific	integer	required	The security protocol-specific parameter. • This parameter shall contain the security protocol-specific data for the transfer operation. The value is defined by the protocol specified by the SecurityProtocolSpecific parameter.

Request Example

```
{
```

```
"SecurityProtocol": 2,  
"SecurityProtocolSpecific": 4100,  
"Data": "EAQAAAAAAE="  
}
```

6.132.5 Property details

6.132.5.1 AccessState

Reported ANA access state.

- This property shall contain the reported ANA access state.

string	Description
Inaccessible	Namespaces in this group are inaccessible. Commands are not able to access user data of namespaces in the ANA group.
NonOptimized	Commands processed by a controller that reports this state for an ANA group provide non-optimized access characteristics, such as lower performance or non-optimal use of subsystem resources, to any namespace in the ANA group.
Optimized	Commands processed by a controller provide optimized access to any namespace in the ANA group.
PersistentLoss	The group is persistently inaccessible. Commands are persistently not able to access user data of namespaces in the ANA group.

6.132.5.2 ControllerType

The type of NVMe controller.

- This property shall contain the type of NVMe controller.

string	Description
Admin	The NVMe controller is an admin controller.
Discovery	The NVMe controller is a discovery controller.
IO	The NVMe controller is an I/O controller.

6.132.5.3 MaxPCleType

The highest version of the PCIe specification supported by this device.

- This property shall contain the maximum PCIe specification that this device supports.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.
Gen6 (v1.16+)	A PCIe v6.0 slot.

6.132.5.4 PCleType

The version of the PCIe specification in use by this device.

- This property shall contain the negotiated PCIe interface version in use by this device.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.
Gen6 (v1.16+)	A PCIe v6.0 slot.

6.132.5.5 SupportedControllerProtocols

- The supported set of protocols for communicating with this storage controller.
 - This property shall contain the supported set of protocols for communicating with this storage controller.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
CXL	Compute Express Link. This value shall indicate conformance to the Compute Express Link Specification.
DisplayPort	DisplayPort. This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
eMMC	Embedded MultiMediaCard (e.MMC). This value shall indicate conformance to the JEDEC JESD84-B51A specification.
Ethernet	Ethernet. This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	Fibre CONnection (FICON). This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).

string	Description
GenZ	GenZ. This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.

string	Description
NVLink	NVLink. This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. This value shall indicate conformance to an OEM-specific architecture, and the OEM section may include additional information.
PCIe	PCI Express. This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
QPI	Intel QuickPath Interconnect (QPI). This value shall indicate conformance to the Intel QuickPath Interconnect (QPI) protocol.
RoCE	RDMA over Converged Ethernet Protocol. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.

string	Description
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UET	Ultra Ethernet Transport. This value shall indicate conformance to the Ultra Ethernet specifications.
UHCI	Universal Host Controller Interface (UHCI). This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
UPI	Intel UltraPath Interconnect (UPI). This value shall indicate conformance to the Intel UltraPath Interconnect (UPI) protocol.
USB	Universal Serial Bus (USB). This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. This value shall indicate conformance to the VESA SVGA Specification.

6.132.5.6 SupportedDeviceProtocols

- The protocols that the storage controller can use to communicate with attached devices.
 - This property shall contain the set of protocols this storage controller can use to communicate with attached devices.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
CXL	Compute Express Link. This value shall indicate conformance to the Compute Express Link Specification.
DisplayPort	DisplayPort. This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
eMMC	Embedded MultiMediaCard (e.MMC). This value shall indicate conformance to the JEDEC JESD84-B51A specification.
Ethernet	Ethernet. This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	Fibre CONnection (FICON). This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).

string	Description
GenZ	GenZ. This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.

string	Description
NVLink	NVLink. This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. This value shall indicate conformance to an OEM-specific architecture, and the OEM section may include additional information.
PCIe	PCI Express. This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
QPI	Intel QuickPath Interconnect (QPI). This value shall indicate conformance to the Intel QuickPath Interconnect (QPI) protocol.
RoCE	RDMA over Converged Ethernet Protocol. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.

string	Description
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UET	Ultra Ethernet Transport. This value shall indicate conformance to the Ultra Ethernet specifications.
UHCI	Universal Host Controller Interface (UHCI). This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
UPI	Intel UltraPath Interconnect (UPI). This value shall indicate conformance to the Intel UltraPath Interconnect (UPI) protocol.
USB	Universal Serial Bus (USB). This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. This value shall indicate conformance to the VESA SVGA Specification.

6.132.5.7 SupportedRAIDTypes

- The set of RAID types supported by the storage controller.
 - This property shall contain an array of all the RAID types supported by this controller.

string	Description
None	A placement policy with no redundancy at the device level.
RAID0	A placement policy where consecutive logical blocks of data are uniformly distributed across a set of independent storage devices without offering any form of redundancy. A placement policy where consecutive logical blocks of data are uniformly distributed across a set of independent storage devices without offering any form of redundancy. This is commonly referred to as data striping. This form of RAID will encounter data loss with the failure of any storage device in the set.
RAID00	A placement policy that creates a RAID 0 stripe set over two or more RAID 0 sets. A placement policy that creates a RAID 0 stripe set over two or more RAID 0 sets. This is commonly referred to as RAID 0+0. This form of data layout is not fault tolerant; if any storage device fails there will be data loss.
RAID01	A data placement policy that creates a mirrored device (RAID 1) over a set of striped devices (RAID 0). A data placement policy that creates a mirrored device (RAID 1) over a set of striped devices (RAID 0). This is commonly referred to as RAID 0+1 or RAID 0/1. Data stored using this form of RAID is able to survive a single RAID 0 data set failure without data loss.
RAID1	A placement policy where each logical block of data is stored on more than one independent storage device. A placement policy where each logical block of data is stored on more than one independent storage device. This is commonly referred to as mirroring. Data stored using this form of RAID is able to survive a single storage device failure without data loss.
RAID10	A placement policy that creates a striped device (RAID 0) over a set of mirrored devices (RAID 1). A placement policy that creates a striped device (RAID 0) over a set of mirrored devices (RAID 1). This is commonly referred to as RAID 1/0. Data stored using this form of RAID is able to survive storage device failures in each RAID 1 set without data loss.
RAID10E	A placement policy that uses a RAID 0 stripe set over two or more RAID 10 sets. A placement policy that uses a RAID 0 stripe set over two or more RAID 10 sets. This is commonly referred to as Enhanced RAID 10. Data stored using this form of RAID is able to survive a single device failure within each nested RAID 1 set without data loss.
RAID10Triple	A placement policy that uses a striped device (RAID 0) over a set of triple mirrored devices (RAID 1Triple). A placement policy that uses a striped device (RAID 0) over a set of triple mirrored devices (RAID 1Triple). This form of RAID can survive up to two failures in each triple mirror set without data loss.

string	Description
RAID1E	A placement policy that uses a form of mirroring implemented over a set of independent storage devices where logical blocks are duplicated on a pair of independent storage devices so that data is uniformly distributed across the storage devices. A placement policy that uses a form of mirroring implemented over a set of independent storage devices where logical blocks are duplicated on a pair of independent storage devices so that data is uniformly distributed across the storage devices. This is commonly referred to as RAID 1 Enhanced. Data stored using this form of RAID is able to survive a single storage device failure without data loss.
RAID1Triple	A placement policy where each logical block of data is mirrored three times across a set of three independent storage devices. A placement policy where each logical block of data is mirrored three times across a set of three independent storage devices. This is commonly referred to as three-way mirroring. This form of RAID can survive two device failures without data loss.
RAID3	A placement policy using parity-based protection where logical bytes of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. A placement policy using parity-based protection where logical bytes of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. Data stored using this form of RAID is able to survive a single storage device failure without data loss. If the storage devices use rotating media, they are assumed to be rotationally synchronized, and the data stripe size should be no larger than the exported block size.
RAID4	A placement policy using parity-based protection where logical blocks of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. A placement policy using parity-based protection where logical blocks of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. Data stored using this form of RAID is able to survive a single storage device failure without data loss.
RAID5	A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and one logical block of parity across a set of 'n+1' independent storage devices where the parity and data blocks are interleaved across the storage devices. A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and one logical block of parity across a set of 'n+1' independent storage devices where the parity and data blocks are interleaved across the storage devices. Data stored using this form of RAID is able to survive a single storage device failure without data loss.

string	Description
RAID50	A placement policy that uses a RAID 0 stripe set over two or more RAID 5 sets of independent storage devices. A placement policy that uses a RAID 0 stripe set over two or more RAID 5 sets of independent storage devices. Data stored using this form of RAID is able to survive a single storage device failure within each RAID 5 set without data loss.
RAID6	A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and two logical blocks of independent parity across a set of 'n+2' independent storage devices where the parity and data blocks are interleaved across the storage devices. A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and two logical blocks of independent parity across a set of 'n+2' independent storage devices where the parity and data blocks are interleaved across the storage devices. Data stored using this form of RAID is able to survive any two independent storage device failures without data loss.
RAID60	A placement policy that uses a RAID 0 stripe set over two or more RAID 6 sets of independent storage devices. A placement policy that uses a RAID 0 stripe set over two or more RAID 6 sets of independent storage devices. Data stored using this form of RAID is able to survive two device failures within each RAID 6 set without data loss.
RAID6TP	A placement policy that uses parity-based protection for storing stripes of 'n' logical blocks of data and three logical blocks of independent parity across a set of 'n+3' independent storage devices where the parity and data blocks are interleaved across the storage devices. A placement policy that uses parity-based protection for storing stripes of 'n' logical blocks of data and three logical blocks of independent parity across a set of 'n+3' independent storage devices where the parity and data blocks are interleaved across the storage devices. This is commonly referred to as Triple Parity RAID. Data stored using this form of RAID is able to survive any three independent storage device failures without data loss.

6.132.6 Example response

```
{
  "@odata.type": "#StorageController.v1_9_1.StorageController",
  "Id": "1",
  "Name": "NVMe IO Controller",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "SupportedControllerProtocols": [
    "NVMeOverFabrics"
  ],
}
```

```

    "NVMeControllerProperties": {
      "NVMeVersion": "1.4",
      "ControllerType": "IO",
      "NVMeControllerAttributes": {
        "ReportsUUIDList": false,
        "SupportsSQAssociations": false,
        "ReportsNamespaceGranularity": false,
        "SupportsTrafficBasedKeepAlive": false,
        "SupportsPredictableLatencyMode": false,
        "SupportsEnduranceGroups": false,
        "SupportsReadRecoveryLevels": false,
        "SupportsNVMSets": false,
        "SupportsExceedingPowerOfNonOperationalState": false,
        "Supports128BitHostId": false
      },
      "NVMeSMARTCriticalWarnings": {
        "PMRUnreliable": false,
        "PowerBackupFailed": false,
        "MediaInReadOnly": false,
        "OverallSubsystemDegraded": false,
        "SpareCapacityWornOut": false
      }
    },
    "Links": {
      "Endpoints": [
        {
          "@odata.id": "/redfish/v1/Fabrics/NVMeoF/Endpoints/Initiator1"
        },
        {
          "@odata.id": "/redfish/v1/Fabrics/NVMeoF/Endpoints/Target1"
        }
      ],
      "AttachedVolumes": [
        {
          "@odata.id": "/redfish/v1/Storage/NVMeoF/Volumes/1"
        },
        {
          "@odata.id": "/redfish/v1/Storage/NVMeoF/Volumes/3"
        },
        {
          "@odata.id": "/redfish/v1/Storage/NVMeoF/Volumes/4"
        }
      ]
    },
    "@odata.id": "/redfish/v1/Storage/NVMeoF/Controllers/1"
  }

```

6.133 StorageControllerMetrics 1.0.3

Version	v1.0
Release	2023.1

6.133.1 Description

The usage and health statistics for a storage controller.

- The `StorageControllerMetrics` schema shall contain the usage and health statistics for a storage controller in a Redfish implementation.

6.133.2 URIs

`/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Metrics`
`/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Metrics`
`/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Metrics`
`/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Metrics`
`/redfish/v1/Storage/{StorageId}/Controllers/{StorageControllerId}/Metrics`
`/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Metrics`

6.133.3 Properties

Property	Type	Attributes	Notes
CorrectableECCErrorCount	integer	<i>read-only</i> (null)	The number of correctable errors for the lifetime of the memory of the storage controller. This property shall contain the number of correctable errors for the lifetime of memory of the storage controller.
CorrectableParityErrorCount	integer	<i>read-only</i> (null)	The number of correctable parity errors for the lifetime of the memory of the storage controller. This property shall contain the number of correctable errors for the lifetime of memory of the storage controller.

Property	Type	Attributes	Notes
NVMeSMART {	object		The NVMe SMART metrics for this storage controller. This property shall contain the NVMe SMART metrics for this storage controller as defined by the NVMe SMART/Health Information log page. This property shall only be present for NVMe storage controllers.
AvailableSparePercent	number (%)	<i>read-only (null)</i>	The normalized percentage of the remaining spare capacity available. This property shall contain the NVMe-defined 'Available Spare', which represents the normalized percentage, 0 to 100, of the remaining spare capacity available.
AvailableSpareThresholdPercent	number (%)	<i>read-only (null)</i>	The available spare threshold as a normalized percentage. This property shall contain the NVMe-defined 'Available Spare Threshold' as a percentage, 0 to 100. When the available spare falls below this value, an asynchronous event completion may occur.
CompositeTemperatureCelsius	number (Celsius)	<i>read-only (null)</i>	The composite temperature (C). This property shall contain the composite temperature in degree Celsius units for this storage controller. Services shall derive this value from the NVMe-defined 'Composite Temperature', which represents a composite temperature in kelvin units of the controller and namespaces associated with that controller.
ControllerBusyTimeMinutes	integer	<i>read-only (null)</i>	The total time the controller is busy with I/O commands in minutes. This property shall contain the NVMe-defined 'Controller Busy Time', which represents the total time the controller is busy with I/O commands in minutes.
CriticalCompositeTempTimeMinutes	integer	<i>read-only (null)</i>	The amount of time in minutes that the controller has been operational and that the composite temperature has been greater than or equal to the critical composite temperature threshold. This property shall contain the NVMe-defined 'Critical Composite Temperature Time', which represents the amount of time in minutes that the controller has been operational and that the composite temperature has been greater than or equal to the critical composite temperature threshold.

Property	Type	Attributes	Notes
CriticalWarnings {	object		The NVMe SMART critical warnings. The property shall contain the NVMe-defined 'Critical Warning'. See the <i>StorageController</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a NVMeSMARTCriticalWarnings resource. See the Links section and the <i>StorageController</i> schema for details.
}			
DataUnitsRead	integer	<i>read-only (null)</i>	The number of 512 byte data units the host has read from the controller as part of processing a SMART Data Units Read Command in units of one thousand. This property shall contain the NVMe-defined 'Data Units Read', which represents the number of 512 byte data units the host has read from the controller as part of processing a SMART Data Units Read Command in units of one thousand.
DataUnitsWritten	integer	<i>read-only (null)</i>	The number of 512 byte data units the host has written to the controller as part of processing a User Data Out Command in units of one thousand. This property shall contain the NVMe-defined 'Data Units Written', which represents the number of 512 byte data units the host has written to the controller as part of processing a User Data Out Command in units of one thousand.
EGCriticalWarningSummary {	object		The Endurance Group critical warnings summary. The property shall contain the NVMe-defined 'Endurance Group Critical Warning Summary'.
NamespacesInReadOnlyMode	boolean	<i>read-only (null)</i>	An indication of whether namespaces in one or more Endurance Groups are in read-only mode not as a result of a change in the write protection state of a namespace. This property shall indicate whether namespaces in one or more Endurance Groups are in read-only mode not as a result of a change in the write protection state of a namespace.
ReliabilityDegraded	boolean	<i>read-only (null)</i>	An indication of whether the reliability of one or more Endurance Groups is degraded due to significant media-related errors or any internal error that degrades the NVM subsystem reliability. This property shall indicate whether the reliability of one or more Endurance Groups is degraded due to significant media-related errors or any internal error that degrades the NVM subsystem reliability.

Property	Type	Attributes	Notes
SpareCapacityUnderThreshold	boolean	<i>read-only</i> (null)	An indication of whether the available spare capacity of one or more Endurance Groups is below the threshold. This property shall indicate whether the available spare capacity of one or more Endurance Groups is below the threshold.
}			
HostReadCommands	integer	<i>read-only</i> (null)	The number of SMART Host Read Commands completed by the controller. This property shall contain the NVMe-defined 'Host Read Commands', which represents the number of SMART Host Read Commands completed by the controller.
HostWriteCommands	integer	<i>read-only</i> (null)	The number of User Data Out Commands completed by the controller. This property shall contain the NVMe-defined 'Host Write Commands', which represents the number of User Data Out Commands completed by the controller.
MediaAndDataIntegrityErrors	integer	<i>read-only</i> (null)	The number of occurrences where the controller detected an unrecovered data integrity error. This property shall contain the NVMe-defined 'Media and Data Integrity Errors', which represents the number of occurrences where the controller detected an unrecovered data integrity error.
NumberOfErrorInformationLogEntries	integer	<i>read-only</i> (null)	The number of error information log entries over the life of the controller. This property shall contain the NVMe-defined 'Number of Error Information Log Entries', which represents the number of error information log entries over the life of the controller.
PercentageUsed	number (%)	<i>read-only</i> (null)	The percentage of the NVM subsystem life used. This property shall contain the NVMe-defined 'Percentage Used', which represents a vendor-specific estimate of the percentage of the NVM subsystem life used based on the actual usage and the manufacturer's prediction of NVM life. A value of 100 indicates that the estimated endurance of the NVM in the NVM subsystem has been consumed, but this may not indicate an NVM subsystem failure. The value is allowed to exceed 100. Percentages greater than 254 shall be represented as 255.

Property	Type	Attributes	Notes
PowerCycles	integer	<i>read-only</i> (null)	The number of power cycles. This property shall contain the NVMe-defined 'Power Cycles', which represents the number of power cycles.
PowerOnHours	number	<i>read-only</i> (null)	The number of power-on hours. This property shall contain the NVMe-defined 'Power On Hours', which represents the number of power-on hours.
TemperatureSensorsCelsius []	array (Celsius) (number, null)	<i>read-only</i>	The temperature sensor readings in degree Celsius units for this storage controller. This property shall contain an array of temperature sensor readings in degree Celsius units for this storage controller. Services shall derive each array member from the NVMe-defined 'Temperature Sensor' values, which represent a temperature sensor reading in kelvin units.
ThermalMgmtTemp1TotalTimeSeconds	integer	<i>read-only</i> (null)	The number of seconds the controller transitioned to lower power states or performed vendor-specific thermal-management actions while minimizing the impact on performance in order to attempt to reduce the composite temperature. This property shall contain the NVMe-defined 'Total Time For Thermal Management Temperature 1', which represents the number of seconds the controller transitioned to lower power states or performed vendor-specific thermal-management actions while minimizing the impact on performance in order to attempt to reduce the composite temperature.
ThermalMgmtTemp1TransitionCount	integer	<i>read-only</i> (null)	The number of times the controller transitioned to lower power states or performed vendor-specific thermal-management actions while minimizing the impact on performance in order to attempt to reduce the composite temperature. This property shall contain the NVMe-defined 'Thermal Management Temperature 1 Transition Count', which represents the number of times the controller transitioned to lower power states or performed vendor-specific thermal-management actions while minimizing the impact on performance in order to attempt to reduce the composite temperature.

Property	Type	Attributes	Notes
ThermalMgmtTemp2TotalTimeSeconds	integer	<i>read-only</i> (null)	The number of seconds the controller transitioned to lower power states or performed vendor-specific thermal-management actions regardless of the impact on performance in order to attempt to reduce the composite temperature. This property shall contain the NVMe-defined 'Total Time For Thermal Management Temperature 2', which represents the number of seconds the controller transitioned to lower power states or performed vendor-specific thermal-management actions regardless of the impact on performance in order to attempt to reduce the composite temperature.
ThermalMgmtTemp2TransitionCount	integer	<i>read-only</i> (null)	The number of times the controller transitioned to lower power states or performed vendor-specific thermal-management actions regardless of the impact on performance in order to attempt to reduce the composite temperature. This property shall contain the NVMe-defined 'Thermal Management Temperature 2 Transition Count', which represents the number of times the controller transitioned to lower power states or performed vendor-specific thermal-management actions regardless of the impact on performance in order to attempt to reduce the composite temperature.
UnsafeShutdowns	integer	<i>read-only</i> (null)	The number of unsafe shutdowns. This property shall contain the NVMe-defined 'Unsafe Shutdowns', which represents the number of times when the controller does not report it is safe to power down prior to loss of main power.
WarningCompositeTempTimeMinutes	integer	<i>read-only</i> (null)	The amount of time in minutes that the controller has been operational and that the composite temperature has been greater than or equal to the warning composite temperature threshold. This property shall contain the NVMe-defined 'Warning Composite Temperature Time', which represents the amount of time in minutes that the controller has been operational and that the composite temperature has been greater than or equal to the warning composite temperature threshold.
}			
StateChangeCount	integer	<i>read-only</i> (null)	The number of state changes for this storage controller. This property shall contain the number of times the <code>State</code> property within the <code>Status</code> property of the parent <code>StorageController</code> resource changed.

Property	Type	Attributes	Notes
UncorrectableECCErrorCount	integer	<i>read-only</i> (null)	The number of uncorrectable errors for the lifetime of the memory of the storage controller. This property shall contain the number of uncorrectable errors for the lifetime of memory of the storage controller.
UncorrectableParityErrorCount	integer	<i>read-only</i> (null)	The number of uncorrectable parity errors for the lifetime of the memory of the storage controller. This property shall contain the number of uncorrectable errors for the lifetime of memory of the storage controller.

6.133.4 Example response

```
{
  "@odata.type": "#StorageControllerMetrics.v1_0_3.StorageControllerMetrics",
  "Id": "Metrics",
  "Name": "Storage Controller Metrics for NVMe IO Controller",
  "NVMeSMART": {
    "CriticalWarnings": {
      "PMRUnreliable": false,
      "PowerBackupFailed": false,
      "MediaInReadOnly": false,
      "OverallSubsystemDegraded": false,
      "SpareCapacityWornOut": false
    },
    "CompositeTemperatureCelsius": 34,
    "AvailableSparePercent": 50,
    "AvailableSpareThresholdPercent": 30,
    "PercentageUsed": 50,
    "EGCriticalWarningSummary": {
      "NamespacesInReadOnlyMode": false,
      "ReliabilityDegraded": false,
      "SpareCapacityUnderThreshold": false
    },
    "DataUnitsRead": 0,
    "DataUnitsWritten": 0,
    "HostReadCommands": 0,
    "HostWriteCommands": 0,
    "ControllerBusyTimeMinutes": 20,
    "PowerCycles": 49,
    "PowerOnHours": 3,
    "UnsafeShutdowns": 4,
    "MediaAndDataIntegrityErrors": 0,
    "NumberOfErrorInformationLogEntries": 100,
    "WarningCompositeTempTimeMinutes": 0,
  }
}
```

```
    "CriticalCompositeTempTimeMinutes": 0,
    "TemperatureSensorsCelsius": [
      34,
      34,
      34,
      26,
      31,
      35,
      33,
      32
    ],
    "ThermalMgmtTemp1TransitionCount": 10,
    "ThermalMgmtTemp2TransitionCount": 2,
    "ThermalMgmtTemp1TotalTimeSeconds": 20,
    "ThermalMgmtTemp2TotalTimeSeconds": 42
  },
  "@odata.id": "/redfish/v1/Systems/Sys-1/Storage/SimplestNVMeSSD/Controllers/NVMeIOController/Metrics"
}
```

6.134 StorageMetrics 1.0.0

Version	v1.0
Release	2024.4

6.134.1 Description

The usage and health statistics for a storage subsystem.

- The `StorageMetrics` schema shall contain the usage and health statistics for a storage subsystem in a Redfish implementation.

6.134.2 URIs

`/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Metrics`
`/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Metrics`
`/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Metrics`
`/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Metrics`
`/redfish/v1/Storage/{StorageId}/Metrics`
`/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Metrics`

6.134.3 Properties

Property	Type	Attributes	Notes
CompressionSavingsBytes	integer (bytes)	<i>read-only</i> (<i>null</i>)	Current compression savings on the storage system in bytes. The value shall represent the current compression savings on the storage system in bytes.
DeduplicationSavingsBytes	integer (bytes)	<i>read-only</i> (<i>null</i>)	Current deduplication savings on the storage system in bytes. The value shall represent the current deduplication savings on the storage system in bytes.
IOStatistics {}	object		Statistics for this storage system. The value shall contain the I/O statistics for this storage system. For property details, see IOStatistics v1.0.4).
StateChangeCount	number	<i>read-only</i> (<i>null</i>)	The number of state changes for this storage subsystem. This property shall contain the number of times the <code>State</code> property within the <code>Status</code> property of the parent <code>Storage</code> resource changed.
ThinProvisioningSavingsBytes	integer (bytes)	<i>read-only</i> (<i>null</i>)	Current thin provisioning savings on the storage system in bytes. The value shall represent the current thin provisioning savings on the storage system in bytes.

6.134.4 Example response

```
{
  "@odata.type": "#StorageMetrics.v1_0_0.StorageMetrics",
  "Id": "Metrics",
  "Name": "Storage Metrics",
  "CompressionSavingsBytes": 28238490361,
  "DeduplicationSavingsBytes": 192376223,
  "ThinProvisioningSavingsBytes": 62839028,
  "StateChangeCount": 14,
  "@odata.id": "/redfish/v1/Storage/1/Metrics"
}
```

6.135 Switch 1.10.0

Version	v1.10	v1.9	v1.8	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2025.2	2022.3	2021.4	2021.3	2021.1	2020.4	2020.3	2019.4	2019.2	2017.3	2016.2

6.135.1 Description

The `Switch` schema contains properties that describe a fabric switch.

- This resource contains a switch for a Redfish implementation.

6.135.2 URIs

/redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}

6.135.3 Properties

Property	Type	Attributes	Notes
AssetTag	string	<i>read-write</i> (null)	The user-assigned asset tag for this switch. This property shall contain the user-assigned asset tag, which is an identifying string that tracks the drive for inventory purposes.
Certificates (v1.5+) {	object		The link to a collection of certificates for device identity and attestation. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that contains certificates for device identity and attestation. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
CurrentBandwidthGbps (v1.4+)	number (Gbit/s)	<i>read-only</i> (null)	The current internal bandwidth of this switch. This property shall contain the internal unidirectional bandwidth of this switch currently negotiated and running.

Property	Type	Attributes	Notes
CXL (v1.9+) {	object		CXL properties for this switch. This property shall contain CXL-specific properties for this switch.
MaxVCSsSupported (v1.9+)	integer	read-only	The maximum number of Virtual CXL Switches (VCSs) supported in this switch. This property shall contain the maximum number of Virtual CXL Switches (VCSs) supported in this switch.
NumberOfBoundvPPBs (v1.10+)	integer	read-only	The total number of vPPBs (Virtual PCI-to-PCI Bridges) that are currently bound on this switch. This property shall contain the total number of vPPBs (Virtual PCI-to-PCI Bridges) that are currently bound on this switch.
PBRCapable (v1.10+)	boolean	read-only	An indication of whether the switch is capable of performing port-based routing. This property shall indicate whether the switch is capable of performing port-based routing.
TotalHDMDecoders (v1.10+)	integer	read-only	The total number of HDM (Host Device Memory) decoders available per upstream port. This property shall contain the total number of HDM (Host Device Memory) decoders available per upstream port.
TotalNumervPPBs (v1.9+)	integer	read-only	The total number of virtual PCI-to-PCI bridges (vPPBs) supported in this switch. This property shall contain the total number of virtual PCI-to-PCI bridges (vPPBs) supported in this switch.
VCS (v1.9+, deprecated v1.9) {	object		Virtual CXL Switch (VCS) properties for this switch. This property shall contain Virtual CXL Switch (VCS) properties for this switch. <i>Deprecated in v1.9 and later. This property has been deprecated in favor of <code>VirtualCXLSwitches</code> in <code>CXL</code>.</i>
HDMDecoders (v1.9+)	integer	read-only	The number of Host Device Memory (HDM) Decoders supported by this switch. This property shall contain the number of Host Device Memory (HDM) Decoders supported by this switch.
}			

Property	Type	Attributes	Notes
VirtualCXLSwitches (v1.10+) {	object		The link to the collection of Virtual CXL Switches (VCS) for this CXL switch. This property shall contain a link to a resource collection of type <code>VirtualCXLSwitchCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>VirtualCXLSwitch</i> . See the VirtualCXLSwitch schema for details.
}			
}			
DomainID	integer	<i>read-only (null)</i>	The domain ID for this switch. This property shall contain The domain ID for this switch. This property has a scope of uniqueness within the fabric of which the switch is a member.
Enabled (v1.6+)	boolean	<i>read-write</i>	An indication of whether this switch is enabled. The value of this property shall indicate if this switch is enabled.
EnvironmentMetrics (v1.6+) {	object		The link to the environment metrics for this switch. This property shall contain a link to a resource of type <code>EnvironmentMetrics</code> that specifies the environment metrics for this switch. See the <i>EnvironmentMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a EnvironmentMetrics resource. See the Links section and the <i>EnvironmentMetrics</i> schema for details.
}			
FirmwareVersion (v1.2+)	string	<i>read-only (null)</i>	The firmware version of this switch. This property shall contain the firmware version as defined by the manufacturer for the associated switch.
IndicatorLED (<i>deprecated</i> v1.4)	string (enum)	<i>read-write (null)</i>	The state of the indicator LED, which identifies the switch. This property shall contain the state of the indicator light associated with this switch. <i>For the possible property values, see IndicatorLED in Property details. Deprecated in v1.4 and later. This property has been deprecated in favor of the <code>LocationIndicatorActive</code> property.</i>
IsManaged	boolean	<i>read-write (null)</i>	An indication of whether the switch is in a managed or unmanaged state. This property shall indicate whether this switch is in a managed or unmanaged state.

Property	Type	Attributes	Notes
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Chassis {	object		The link to the chassis that contains this switch. This property shall contain a link to a resource of type <code>Chassis</code> with which this switch is associated. See the <i>Chassis</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.
}			
Endpoints (v1.3+) [{	array		An array of links to the endpoints that connect to this switch. This property shall contain an array of links to resources of type <code>Endpoint</code> with which this switch is associated.
@odata.id	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}]			
ManagedBy [{	array		An array of links to the managers that manage this switch. This property shall contain an array of links to resources of type <code>Manager</code> with which this switch is associated.
@odata.id	string	<i>read-only</i>	Link to a Manager resource. See the Links section and the <i>Manager</i> schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCleDevice (v1.4+) {	object		The link to the PCIe device providing this switch. This property shall contain a link to a resource of type <code>PCleDevice</code> that represents the PCIe device providing this switch. See the <i>PCleDevice</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a PCleDevice resource. See the Links section and the <i>PCleDevice</i> schema for details.
}			
}			

Property	Type	Attributes	Notes
Location (v1.1+) {}	object		The location of the switch. This property shall contain the location information of the associated switch. For property details, see Location.
LocationIndicatorActive (v1.4+)	boolean	read-write (null)	An indicator allowing an operator to physically locate this resource. This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of <code>IndicatorLED</code> in this resource, if supported, to reflect the implementation of the locating function.
LogServices {	object		The link to the collection of log services associated with this switch. This property shall contain a link to a resource collection of type <code>LogServiceCollection</code>. Contains a link to a resource.
@odata.id	string	read-only	Link to Collection of <code>LogService</code> . See the <code>LogService</code> schema for details.
}			
Manufacturer	string	read-only (null)	The manufacturer of this switch. This property shall contain the name of the organization responsible for producing the switch. This organization may be the entity from which the switch is purchased, but this is not necessarily true.
MaxBandwidthGbps (v1.4+)	number (Gbit/s)	read-only (null)	The maximum internal bandwidth of this switch as currently configured. This property shall contain the maximum internal unidirectional bandwidth this switch is capable of being configured. If capable of autonegotiation, the switch shall attempt to negotiate to the specified maximum bandwidth.
Measurements (v1.5+, deprecated v1.8) [{	array		An array of DSP0274-defined measurement blocks. This property shall contain an array of DSP0274-defined measurement blocks. <i>Deprecated in v1.8 and later. This property has been deprecated in favor of the <code>ComponentIntegrity</code> resource.</i>
@odata.id	string	read-only	Link to a <code>MeasurementBlock</code> resource. See the Links section and the <code>SoftwareInventory</code> schema for details.
}]			
Metrics (v1.7+) {	object		The link to the metrics associated with this switch. This property shall contain a link to the metrics associated with this switch. See the <code>SwitchMetrics</code> schema for details on this property.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to a SwitchMetrics resource. See the Links section and the <i>SwitchMetrics</i> schema for details.
}			
Model	string	<i>read-only (null)</i>	The product model number of this switch. This property shall contain the manufacturer-provided model information of this switch.
PartNumber	string	<i>read-only (null)</i>	The part number for this switch. This property shall contain the manufacturer-provided part number for the switch.
Ports {	object		The link to the collection ports for this switch. This property shall contain a link to a resource collection of type <code>PortCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Port</i> . See the Port schema for details.
}			
PowerState	string (enum)	<i>read-only (null)</i>	The current power state of the switch. This property shall contain the power state of the switch. <i>For the possible property values, see PowerState in Property details.</i>
Redundancy [{ }]	array (object)		The common redundancy definition and structure used in other Redfish schemas. - Redundancy information for the switches. - This property shall contain an array that shows how this switch is grouped with other switches for form redundancy sets. For property details, see Redundancy.
SerialNumber	string	<i>read-only (null)</i>	The serial number for this switch. This property shall contain a manufacturer-allocated number that identifies the switch.
SKU	string	<i>read-only (null)</i>	The SKU for this switch. This property shall contain the SKU number for this switch.

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
SupportedProtocols (v1.3+) []	array (string (enum))	read-only	- The protocols this switch supports. - The property shall contain an array of protocols this switch supports. If the value of <code>SwitchType</code> is <code>MultiProtocol</code>, this property shall be required. For the possible property values, see <i>SupportedProtocols in Property details</i>.
SwitchType	string (enum)	read-only (null)	The protocol being sent over this switch. This property shall contain the protocol being sent over this switch. For a switch that supports multiple protocols, the value should be <code>MultiProtocol</code> and the <code>SupportedProtocols</code> property should be used to describe the supported protocols. For the possible property values, see <i>SwitchType in Property details</i>.
TotalSwitchWidth	integer	read-only (null)	The total number of lanes, phys, or other physical transport links that this switch contains. This property shall contain the number of physical transport lanes, phys, or other physical transport links that this switch contains. For PCIe, this value shall be the lane count.
UUID (v1.3+)	string (uuid)	read-only (null)	The UUID for this switch. This property shall contain a universally unique identifier number for the switch. Pattern: <code>^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\$</code>

6.135.4 Actions

6.135.4.1 Reset

Description

This action resets this switch.

- This action shall reset this switch.

Action URI

{Base URI of target resource}/Actions/Switch.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	<i>optional</i>	The type of reset. This parameter shall contain the type of reset. The service can accept a request without this parameter and can complete an implementation-specific default reset. <i>For the possible property values, see ResetType in Property details.</i>

Request Example

```
{
  "ResetType": "ForceRestart"
}
```

6.135.5 Property details

6.135.5.1 IndicatorLED

The state of the indicator LED, which identifies the switch.

- This property shall contain the state of the indicator light associated with this switch.

string	Description
Blinking	The indicator LED is blinking. This value shall represent that the indicator LED is in a blinking state where the LED is being turned on and off in repetition. If the service does not support this value, it shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code.
Lit	The indicator LED is lit. This value shall represent that the indicator LED is in a solid on state. If the service does not support this value, it shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code.

string	Description
Off	The indicator LED is off. This value shall represent that the indicator LED is in a solid off state. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 Bad Request status code.

6.135.5.2 PowerState

The current power state of the switch.

- This property shall contain the power state of the switch.

string	Description
Off	The resource is powered off. The components within the resource might continue to have AUX power.
On	The resource is powered on.
Paused	The resource is paused.
PoweringOff	A temporary state between on and off. The components within the resource can take time to process the power off action.
PoweringOn	A temporary state between off and on. The components within the resource can take time to process the power on action.

6.135.5.3 ResetType

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without this parameter and can complete an implementation-specific default reset.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall contain the value Off.

string	Description
ForceOn	Turn on the unit immediately. This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property shall contain the value <code>On</code>.
ForceRestart	Shut down immediately and non-gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
FullPowerCycle	Full power cycle the unit. Behaves like removing utility lines, followed by restoring utility lines to the resource. This value shall indicate the resource will perform a full power cycle as if utility lines to the resource are removed and restored. This is different from <code>PowerCycle</code> in that it's as close to a true power cycle as possible. For example, removing AC power cables from an enclosure and then restoring the AC power cables. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>. If a service supports this value but there are no other distinct power cycle flows, the service shall support <code>PowerCycle</code> as an alias to <code>FullPowerCycle</code>. This type of reset may cause the manager providing the Redfish service to power cycle. If the manager providing the Redfish service is affected by this type of reset, the service shall send the action response before resetting to prevent client timeouts.
GracefulRestart	Shut down gracefully and restart the unit. This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
GracefulShutdown	Shut down gracefully and power off. This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shut down the resource. For example, when shutting down a computer system, the host operating system is allowed to safely shut down processes and close connections. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Off</code>.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. This value shall indicate the resource will generate a diagnostic interrupt.

string	Description
On	Turn on the unit. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a paused state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>Paused</code>.
PowerCycle	Power cycle the unit. Behaves like a power removal, followed by a power restore to the resource. This value shall indicate the resource will perform a power cycle. This is different from <code>FullPowerCycle</code> in that it typically performs localized power sequencing of the resource while external power is still present. For example, turning DC voltage regulators off and then turning DC voltage regulators back on. If currently in the power on state, the resource will transition to a power off state, then transition to a power on state. If currently in the power off state, the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
PushPowerButton	Simulate the pressing of the physical power button on this unit. This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. This value shall indicate the resource will transition to a power on state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>On</code>.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the <code>PowerState</code> property, if supported, shall contain the value <code>off</code>.

6.135.5.4 SupportedProtocols

- The protocols this switch supports.
 - The property shall contain an array of protocols this switch supports. If the value of `SwitchType` is `MultiProtocol`, this property shall be required.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
CXL	Compute Express Link. This value shall indicate conformance to the Compute Express Link Specification.
DisplayPort	DisplayPort. This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
eMMC	Embedded MultiMediaCard (e.MMC). This value shall indicate conformance to the JEDEC JESD84-B51A specification.
Ethernet	Ethernet. This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	Fibre CONnection (FICON). This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).

string	Description
GenZ	GenZ. This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.

string	Description
NVLink	NVLink. This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. This value shall indicate conformance to an OEM-specific architecture, and the OEM section may include additional information.
PCIe	PCI Express. This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
QPI	Intel QuickPath Interconnect (QPI). This value shall indicate conformance to the Intel QuickPath Interconnect (QPI) protocol.
RoCE	RDMA over Converged Ethernet Protocol. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.

string	Description
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UET	Ultra Ethernet Transport. This value shall indicate conformance to the Ultra Ethernet specifications.
UHCI	Universal Host Controller Interface (UHCI). This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
UPI	Intel UltraPath Interconnect (UPI). This value shall indicate conformance to the Intel UltraPath Interconnect (UPI) protocol.
USB	Universal Serial Bus (USB). This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. This value shall indicate conformance to the VESA SVGA Specification.

6.135.5.5 SwitchType

The protocol being sent over this switch.

- This property shall contain the protocol being sent over this switch. For a switch that supports multiple protocols,

the value should be `MultiProtocol` and the `SupportedProtocols` property should be used to describe the supported protocols.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
CXL	Compute Express Link. This value shall indicate conformance to the Compute Express Link Specification.
DisplayPort	DisplayPort. This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
eMMC	Embedded MultiMediaCard (e.MMC). This value shall indicate conformance to the JEDEC JESD84-B51A specification.
Ethernet	Ethernet. This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	Fibre CONnection (FICON). This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.

string	Description
FTP	File Transfer Protocol (FTP). This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).
GenZ	GenZ. This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.

string	Description
NFSv4	Network File System (NFS) version 4.
NVLink	NVLink. This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. This value shall indicate conformance to an OEM-specific architecture, and the OEM section may include additional information.
PCIe	PCI Express. This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
QPI	Intel QuickPath Interconnect (QPI). This value shall indicate conformance to the Intel QuickPath Interconnect (QPI) protocol.
RoCE	RDMA over Converged Ethernet Protocol. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.

string	Description
SFTP	SSH File Transfer Protocol (SFTP). This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UET	Ultra Ethernet Transport. This value shall indicate conformance to the Ultra Ethernet specifications.
UHCI	Universal Host Controller Interface (UHCI). This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
UPI	Intel UltraPath Interconnect (UPI). This value shall indicate conformance to the Intel UltraPath Interconnect (UPI) protocol.
USB	Universal Serial Bus (USB). This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. This value shall indicate conformance to the VESA SVGA Specification.

6.135.6 Example response

```
{
  "@odata.type": "#Switch.v1_10_0.Switch",
  "Id": "Switch1",
  "Name": "SAS Switch",
  "SwitchType": "SAS",
  "Manufacturer": "Contoso",
  "Model": "SAS1000",
  "SKU": "67B",
  "SerialNumber": "2M220100SL",
  "PartNumber": "76-88883",
  "Ports": {
    "@odata.id": "/redfish/v1/Fabrics/SAS/Switches/Switch1/Ports"
  },
  "Redundancy": [
    {
      "@odata.id": "/redfish/v1/Fabrics/SAS/Switches/Switch1#/Redundancy/0",
      "MemberId": "Redundancy",
      "Mode": "Sharing",
      "MaxNumSupported": 2,
      "MinNumNeeded": 1,
      "Status": {
        "State": "Enabled",
        "Health": "OK"
      }
    },
    "RedundancySet": [
      {
        "@odata.id": "/redfish/v1/Fabrics/SAS/Switches/Switch1"
      },
      {
        "@odata.id": "/redfish/v1/Fabrics/SAS/Switches/Switch2"
      }
    ]
  ]
},
"Links": {
  "Chassis": {
    "@odata.id": "/redfish/v1/Chassis/Switch1"
  },
  "ManagedBy": [
    {
      "@odata.id": "/redfish/v1/Managers/Switch1"
    },
    {
      "@odata.id": "/redfish/v1/Managers/Switch2"
    }
  ]
},
}
```



```
    "Actions": {
      "#Switch.Reset": {
        "target": "/redfish/v1/Fabrics/SAS/Switches/Switch1/Actions/Switch.Reset",
        "ResetType@Redfish.AllowableValues": [
          "ForceRestart",
          "GracefulRestart"
        ]
      }
    },
    "@odata.id": "/redfish/v1/Fabrics/SAS/Switches/Switch1"
  }
```

6.136 SwitchMetrics 1.0.2

Version	v1.0
Release	2021.3

6.136.1 Description

The `SwitchMetrics` schema contains usage and health statistics for a switch device.

- This resource shall represent the metrics for a switch device in a Redfish implementation.

6.136.2 URIs

/redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/SwitchMetrics

6.136.3 Properties

Property	Type	Attributes	Notes
InternalMemoryMetrics {	object		The memory metrics for a switch. • This property shall contain properties that describe the memory metrics for a switch.
CurrentPeriod {	object		The memory metrics since the last reset for this switch. • This property shall contain properties that describe the metrics for the current period of memory for this switch.

Property	Type	Attributes	Notes
CorrectableECCErrCount	integer	<i>read-only</i> (null)	The number of correctable errors of memory since reset. This property shall contain the number of correctable errors of memory since reset.
UncorrectableECCErrCount	integer	<i>read-only</i> (null)	The number of uncorrectable errors of memory since reset. This property shall contain the number of uncorrectable errors of memory since reset.
}			
LifeTime {	object		The memory metrics for the lifetime of this switch. This property shall contain properties that describe the metrics for the lifetime of memory for this switch.
CorrectableECCErrCount	integer	<i>read-only</i> (null)	The number of correctable errors for the lifetime of the memory. This property shall contain the number of correctable errors for the lifetime of memory.
UncorrectableECCErrCount	integer	<i>read-only</i> (null)	The number of uncorrectable errors for the lifetime of the memory. This property shall contain the number of uncorrectable errors for the lifetime of memory.
}			
}			
PCleErrors {	object		The PCIe errors associated with this switch. This property shall contain the PCIe errors associated with this switch.
BadDLLPCount (v1.15+)	integer	<i>read-only</i> (null)	The total number of Bad DLLPs issued on the PCIe link by the receiver. This property shall contain the total number of Bad DLLPs issued on the PCIe link by the receiver. A Bad DLLP in the context of PCIe communication is a packet that has encountered errors at the data link layer. When a DLLP is considered bad, it means it has been corrupted or is incorrectly formatted, potentially due to transmission errors, hardware failures, or other issues that affect its integrity.

Property	Type	Attributes	Notes
BadTLPCount (v1.15+)	integer	<i>read-only</i> (null)	The total number of Bad TLPs issued on the PCIe link by the receiver. This property shall contain the total number of Bad TLPs issued on the PCIe link by the receiver. A Bad TLP in the context of PCIe communication is a packet that cannot be properly processed due to errors at the transaction layer. These errors could include corrupted data, incorrect packet formatting, invalid header information, or a mismatched checksum.
CorrectableErrorCount (v1.8+)	integer	<i>read-only</i> (null)	The total number of PCIe correctable errors for this device. This property shall contain the total number of PCIe correctable errors for this device.
FatalErrorCount (v1.8+)	integer	<i>read-only</i> (null)	The total number of PCIe fatal errors for this device. This property shall contain the total number of PCIe fatal errors for this device.
L0ToRecoveryCount (v1.8+)	integer	<i>read-only</i> (null)	The total number of times the PCIe link states transitioned from L0 to the recovery state for this device. This property shall contain the total number of times the PCIe link transitioned from L0 to the recovery state for this device.
NAKReceivedCount (v1.8+)	integer	<i>read-only</i> (null)	The total number of NAKs issued on the PCIe link by the receiver. This property shall contain the total number of NAKs issued on the PCIe link by the receiver. A NAK is issued by the receiver when it detects that a TLP from this device was missed. This could be because this device did not transmit it, or because the receiver could not properly decode the packet.
NAKSentCount (v1.8+)	integer	<i>read-only</i> (null)	The total number of NAKs issued on the PCIe link by this device. This property shall contain the total number of NAKs issued on the PCIe link by this device. A NAK is issued by the device when it detects that a TLP from the receiver was missed. This could be because the receiver did not transmit it, or because this device could not properly decode the packet.
NonFatalErrorCount (v1.8+)	integer	<i>read-only</i> (null)	The total number of PCIe non-fatal errors for this device. This property shall contain the total number of PCIe non-fatal errors for this device.

Property	Type	Attributes	Notes
ReplayCount (v1.8+)	integer	<i>read-only</i> (null)	The total number of PCIe replays issued by this device. This property shall contain the total number of replays issued on the PCIe link by this device. A replay is a retransmission of a TLP and occurs because the ACK timer is expired, which means that the receiver did not send the ACK or this device did not properly decode the ACK.
ReplayRolloverCount (v1.8+)	integer	<i>read-only</i> (null)	The total number of PCIe replay rollovers issued by this device. This property shall contain the total number of replay rollovers issued on the PCIe link by this device. A replay rollover occurs when consecutive replays failed to resolve the errors on the link, which means that this device forced the link into the recovery state.
UnsupportedRequestCount (v1.13+)	integer	<i>read-only</i> (null)	The total number of PCIe unsupported requests received by this device. This property shall contain the total number of PCIe unsupported requests received by this device.
}			

6.136.4 Actions

6.136.4.1 ClearCurrentPeriod

Description

This action sets the `CurrentPeriod` property's values to 0.

- This action shall set the `CurrentPeriod` property's values to 0.

Action URI

{Base URI of target resource}/Actions/SwitchMetrics.ClearCurrentPeriod

Action parameters

This action takes no parameters.

6.136.5 Example response

```
{
```

```

"@odata.type": "#SwitchMetrics.v1_0_2.SwitchMetrics",
"Id": "SwitchMetrics",
"Name": "PCIe Switch Metrics",
"PCIeErrors": {
  "CorrectableErrorCount": 0,
  "NonFatalErrorCount": 0,
  "FatalErrorCount": 0,
  "L0ToRecoveryCount": 0,
  "ReplayCount": 0,
  "ReplayRolloverCount": 0,
  "NAKSentCount": 0,
  "NAKReceivedCount": 0
},
"InternalMemoryMetrics": {
  "CurrentPeriod": {
    "CorrectableECCErrorCount": 0,
    "UncorrectableECCErrorCount": 0
  },
  "LifeTime": {
    "CorrectableECCErrorCount": 0,
    "UncorrectableECCErrorCount": 0
  }
},
"@odata.id": "/redfish/v1/Fabrics/PCIe/Switches/1/SwitchMetrics"
}

```

6.137 Task 1.7.4

Version	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2022.3	2022.1	2020.3	2018.3	2018.2	2018.1	2017.1	1.0

6.137.1 Description

The **Task** schema contains information about a task that the Redfish task service schedules or executes. Tasks represent operations that take more time than a client typically wants to wait.

- This resource contains a task for a Redfish implementation.

6.137.2 URIs

/redfish/v1/TaskService/Tasks/{TaskId}

/redfish/v1/TaskService/Tasks/{TaskId}/SubTasks/{TaskId2}

6.137.3 Properties

Property	Type	Attributes	Notes
EndTime	string (date-time)	<i>read-only</i>	The date and time when the task was completed. This property will only appear when the task is complete. This property shall indicate the date and time when the task was completed. This property shall not appear if the task is running or otherwise has not been completed. This property shall appear only if the <code>TaskState</code> is <code>Completed</code>, <code>Killed</code>, <code>Cancelled</code>, or <code>Exception</code>.
EstimatedDuration (v1.6+)	string (duration)	<i>read-only</i> (null)	The estimated total time required to complete the task. This property shall indicate the estimated total time needed to complete the task. The value is not expected to change while the task is in progress, but the service may update the value if it obtains new information that significantly changes the expected duration. Services should be conservative in the reported estimate and clients should treat this value as an estimate. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?</code>
HidePayload (v1.3+)	boolean	<i>read-only</i>	An indication of whether the contents of the payload are hidden from view after the task has been created. If <code>true</code>, responses do not return the payload. If <code>false</code>, responses return the payload. If this property is not present when the task is created, the default is <code>false</code>. This property shall indicate whether the contents of the payload should be hidden from view after the task has been created. If <code>true</code>, responses shall not return the <code>Payload</code> property. If <code>false</code>, responses shall return the <code>Payload</code> property. If this property is not present when the task is created, the default is <code>false</code>. This property shall be supported if the <code>Payload</code> property is supported.
Links (v1.7+) {	object		Contains references to other resources that are related to this resource. The <code>Links</code> property, as described by the Redfish Specification, shall contain references to resources that are related to but are not contained by, or subordinate to, this resource.
CreatedResources (v1.7+) [{	array		An array of URIs referencing the resources created as the result of the operation that produced this task. This property shall contain an array of links to resources indicating the resources created as the result of the operation that produced this task. Services shall set this property prior to the task entering its final state.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.

Property	Type	Attributes	Notes
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
Messages [{}]	array (object)		The message that the Redfish service returns. - An array of messages associated with the task. - This property shall contain an array of messages associated with the task. For property details, see Message.
Payload (v1.3+) {	object		The HTTP and JSON request payload details for this task, unless they are hidden from view by the service. This object shall contain information detailing the HTTP and JSON request payload information for executing this task. This property shall not be included in the response if the <code>HidePayload</code> property is <code>true</code>.
HttpHeaders (v1.3+) []	array (string)	read-only	An array of HTTP headers that this task includes. This property shall contain an array of HTTP headers that this task includes.
HttpOperation (v1.3+)	string	read-only	The HTTP operation to perform to execute this task. This property shall contain the HTTP operation to execute for this task.
JsonBody (v1.3+)	string	read-only	The JSON payload to use in the execution of this task. This property shall contain the JSON-formatted payload used for this task.
TargetUri (v1.3+)	string (URI)	read-only	The URI of the target for this task. This property shall contain a link to the location to use as the target for an HTTP operation.
}			
PercentComplete (v1.4+)	integer (%)	read-only (null)	The completion percentage of this task. This property shall indicate the completion progress of the task, reported in percent of completion, 0 to 100. If the task has not been started, the value shall be zero.
StartTime	string (date-time)	read-only	The date and time when the task was started. This property shall indicate the date and time when the task was started.

Property	Type	Attributes	Notes
SubTasks (v1.5+) {	object		The link to a collection of sub-tasks for this task. This property shall contain a link to a resource collection of type <code>TaskCollection</code>. This property shall not be present if this resource represents a sub-task for a task. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Task</i> . See the Task schema for details.
}			
TaskMonitor (v1.2+)	string (URI)	<i>read-only</i>	The URI of the task monitor for this task. This property shall contain a URI to task monitor as defined in the Redfish Specification.
TaskState	string (enum)	<i>read-only</i>	The state of the task. This property shall indicate the state of the task. <i>For the possible property values, see TaskState in Property details.</i>
TaskStatus	string (enum)	<i>read-only</i>	The completion status of the task. This property shall contain the completion status of the task and shall not be set until the task completes. This property should contain <code>Critical</code> if one or more messages in the <code>Messages</code> array contains the severity <code>Critical</code>. This property should contain <code>Warning</code> if one or more messages in the <code>Messages</code> array contains the severity <code>Warning</code> and if no messages contain the severity <code>Critical</code>. This property should contain <code>OK</code> if all messages in the <code>Messages</code> array contain the severity <code>OK</code> or if the array is empty. <i>For the possible property values, see TaskStatus in Property details.</i>

6.137.4 Property details

6.137.4.1 TaskState

The state of the task.

- This property shall indicate the state of the task.

string	Description
Cancelled (v1.2+)	Task has been cancelled by an operator or internal process. This value shall represent that either a <code>DELETE</code> operation on a task monitor or <code>Task</code> resource or by an internal process cancelled the task.
Cancelling (v1.2+)	Task is in the process of being cancelled. This value shall represent that the task is in the process of being cancelled.
Completed	Task was completed. This value shall represent that the task completed successfully or with warnings.
Exception	Task has stopped due to an exception condition. This value shall represent that the task completed with errors.
Interrupted	Task has been interrupted. This value shall represent that the task has been interrupted but is expected to restart and is therefore not complete.
Killed (deprecated v1.2)	Task was terminated. This value shall represent that the task is complete because an operator killed it. <i>Deprecated in v1.2 and later. This value has been deprecated and is being replaced by the <code>Cancelled</code> value, which has more determinate semantics.</i>
New	A new task. This value shall represent that the task is newly created but has not started.
Pending	Task is pending and has not started. This value shall represent that the task is pending some condition and has not yet begun to execute.
Running	Task is running normally. This value shall represent that the task is executing.
Service	Task is running as a service. This value shall represent that the task is now running as a service and expected to continue operation until stopped or killed.
Starting	Task is starting. This value shall represent that the task is starting.

string	Description
Stopping	Task is in the process of stopping. This value shall represent that the task is stopping but is not yet complete.
Suspended	Task has been suspended. This value shall represent that the task has been suspended but is expected to restart and is therefore not complete.

6.137.4.2 TaskStatus

The completion status of the task.

- This property shall contain the completion status of the task and shall not be set until the task completes. This property should contain `Critical` if one or more messages in the `Messages` array contains the severity `Critical`. This property should contain `Warning` if one or more messages in the `Messages` array contains the severity `Warning` and if no messages contain the severity `Critical`. This property should contain `OK` if all messages in the `Messages` array contain the severity `OK` or if the array is empty.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

6.137.5 Example response

```
{
  "@odata.type": "#Task.v1_7_4.Task",
  "Id": "545",
  "Name": "Task 545",
  "TaskMonitor": "/taskmon/545",
  "TaskState": "Completed",
  "StartTime": "2012-03-07T14:44+06:00",
  "EndTime": "2012-03-07T14:45+06:00",
  "TaskStatus": "OK",
  "Messages": [
    {
      "MessageId": "Base.1.0.PropertyNotWritable",
      "RelatedProperties": [
```

```
        "SKU"
      ],
      "Message": "The property SKU is a read only property and cannot be assigned a value",
      "MessageArgs": [
        "SKU"
      ],
      "Severity": "Warning"
    }
  ],
  "@odata.id": "/redfish/v1/TaskService/Tasks/545"
}
```

6.138 TaskService 1.2.1

Version	v1.2	v1.1	v1.0
Release	2021.1	2017.1	1.0

6.138.1 Description

The `TaskService` schema describes a task service that enables management of long-duration operations, includes the properties for the task service itself, and has links to the resource collection of tasks.

- This resource contains a task service for a Redfish implementation.

6.138.2 URIs

/redfish/v1/TaskService

6.138.3 Properties

Property	Type	Attributes	Notes
CompletedTaskOverWritePolicy	string (enum)	read-only	The overwrite policy for completed tasks. This property indicates if the task service overwrites completed task information. • This property shall contain the overwrite policy for completed tasks. This property shall indicate if the task service overwrites completed task information. <i>For the possible property values, see CompletedTaskOverWritePolicy in Property details.</i>

Property	Type	Attributes	Notes
DateTime	string (date-time)	<i>read-only</i> (null)	The current date and time, with UTC offset, setting that the task service uses. This property shall contain the current date and time for the task service, with UTC offset.
LifeCycleEventOnTaskStateChange	boolean	<i>read-only</i>	An indication of whether a task state change sends an event. This property shall indicate whether a task state change sends an event. Services should send an event containing a message defined in the Task Event Message Registry when the state of a task changes.
ServiceEnabled	boolean	<i>read-write</i> (null)	An indication of whether this service is enabled. This property shall indicate whether this service is enabled.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
TaskAutoDeleteTimeoutMinutes (v1.2+)	integer	<i>read-write</i>	The number of minutes after which a completed task is deleted by the service. This property shall contain the number of minutes after which a completed task, where <code>TaskState</code> contains the value <code>Completed</code>, <code>Killed</code>, <code>Cancelled</code>, or <code>Exception</code>, is deleted by the service.
Tasks {	object		The links to the collection of tasks. This property shall contain a link to a resource collection of type <code>TaskCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Task</i> . See the Task schema for details.
}			

6.138.4 Property details

6.138.4.1 CompletedTaskOverWritePolicy

The overwrite policy for completed tasks. This property indicates if the task service overwrites completed task information.

- This property shall contain the overwrite policy for completed tasks. This property shall indicate if the task service overwrites completed task information.

string	Description
Manual	Completed tasks are not automatically overwritten.
Oldest	Oldest completed tasks are overwritten.

6.138.5 Example response

```
{
  "@odata.type": "#TaskService.v1_2_1.TaskService",
  "Id": "TaskService",
  "Name": "Tasks Service",
  "DateTime": "2015-03-13T04:14:33+06:00",
  "CompletedTaskOverWritePolicy": "Manual",
  "LifecycleEventOnTaskStateChange": true,
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "ServiceEnabled": true,
  "Tasks": {
    "@odata.id": "/redfish/v1/TaskService/Tasks"
  },
  "@odata.id": "/redfish/v1/TaskService"
}
```

6.139 TelemetryData 1.0.0

Version	v1.0
Release	2025.2

6.139.1 Description

The `TelemetryData` schema represents bulk telemetry data from a device or service.

- This resource shall represent bulk telemetry data in a Redfish implementation.

6.139.2 URIs

/redfish/v1/TelemetryService/TelemetryData/{*TelemetryDataId*}

6.139.3 Properties

Property	Type	Attributes	Notes
AdditionalData	string	<i>read-only</i>	A Base64-encoded string of the associated telemetry data. This property shall contain a Base64-encoded string, with padding characters, of the associated telemetry data. The contents shall depend on the value of the <code>TelemetryDataType</code> property. The length of the value should not exceed 4 KB. Larger telemetry data payloads should omit this property and use the <code>AdditionalDataURI</code> property to reference the data. If both <code>AdditionalData</code> and <code>AdditionalDataURI</code> are present, <code>AdditionalData</code> shall contain the Base64-encoding of the data retrieved from the URI specified by the <code>AdditionalDataURI</code> property.
AdditionalDataSizeBytes	integer	<i>read-only</i> (null)	The size of the data available at location specified by <code>AdditionalDataURI</code>. This property shall contain the size of the data available at location specified by <code>AdditionalDataURI</code>.
AdditionalDataURI	string (URI)	<i>read-only</i>	The URI at which to access the associated telemetry data. This property shall contain the URI at which to access the associated telemetry data, using the Redfish protocol and authentication methods. If both <code>AdditionalData</code> and <code>AdditionalDataURI</code> are present, <code>AdditionalData</code> shall contain a Base64-encoded string, with padding characters, of the data retrieved from the URI specified by the <code>AdditionalDataURI</code> property.
OEMTelemetryDataType	string	<i>read-only</i> (null)	The OEM-defined type of telemetry data available in the <code>AdditionalData</code> property or retrieved from the URI specified by the <code>AdditionalDataURI</code> property. This property shall contain the OEM-defined type of telemetry data available in the <code>AdditionalData</code> property or retrieved from the URI specified by the <code>AdditionalDataURI</code> property. The value of this property should begin with the organization identifier. This property shall be present if <code>TelemetryDataType</code> is <code>OEM</code>.
TelemetryDataType	string (enum)	<i>read-only</i> (null)	The type of telemetry data available in the <code>AdditionalData</code> property or retrieved from the URI specified by the <code>AdditionalDataURI</code> property. This property shall contain the type of telemetry data available in the <code>AdditionalData</code> property or retrieved from the URI specified by the <code>AdditionalDataURI</code> property. <i>For the possible property values, see <code>TelemetryDataType</code> in Property details.</i>

Property	Type	Attributes	Notes
Timestamp	string (date-time)	read-only (null)	The date and time when the telemetry data was generated. This property shall contain the time when the telemetry data was generated.

6.139.4 Property details

6.139.4.1 TelemetryDataType

The type of telemetry data available in the `AdditionalData` property or retrieved from the URI specified by the `AdditionalDataURI` property.

- This property shall contain the type of telemetry data available in the `AdditionalData` property or retrieved from the URI specified by the `AdditionalDataURI` property.

string	Description
OEM	OEM telemetry data.

6.139.5 Example response

```
{
  "@odata.type": "#TelemetryData.v1_0_0.TelemetryData",
  "Name": "TelemetrySnapshot.1",
  "Timestamp": "2025-11-08T12:25:00-05:00",
  "TelemetryDataType": "OEM",
  "OEMTelemetryDataType": "ContosoAggregator",
  "AdditionalData": "7w04gDjQvhpA5ejg0xty ... HB6u7pp0GprACFq1MD1N",
  "@odata.id": "/redfish/v1/TelemetryService/TelemetryData/TelemetrySnapshot.1"
}
```

6.140 TelemetryService 1.4.0

Version	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2025.2	2020.4	2019.4	2018.3	2018.2

6.140.1 Description

The `TelemetryService` schema describes a telemetry service. The telemetry service is used for collecting and reporting metric data within the Redfish service.

- This resource contains a telemetry service for a Redfish implementation.

6.140.2 URIs

/redfish/v1/TelemetryService

6.140.3 Properties

Property	Type	Attributes	Notes
LogService {	object		The link to a log service that the telemetry service uses. This service can be a dedicated log service or a pointer to a log service under another resource, such as a manager. • This property shall contain a link to a resource of type <code>LogService</code> that this telemetry service uses. See the <i>LogService</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>LogService</i> resource. See the Links section and the <i>LogService</i> schema for details.
}			
MaxReports	integer	<i>read-only (null)</i>	The maximum number of metric reports that this service supports. • This property shall contain the maximum number of metric reports that this service supports.
MetricDefinitions {	object		The link to the collection of metric definitions. • This property shall contain a link to a resource collection of type <code>MetricDefinitionCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>MetricDefinition</i> . See the <i>MetricDefinition</i> schema for details.
}			

Property	Type	Attributes	Notes
MetricReportDefinitions {	object		The link to the collection of metric report definitions. This property shall contain a link to a resource collection of type <code>MetricReportDefinitionCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>MetricReportDefinition</i> . See the <i>MetricReportDefinition</i> schema for details.
}			
MetricReports {	object		The link to the collection of metric reports. This property shall contain a link to a resource collection of type <code>MetricReportCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>MetricReport</i> . See the <i>MetricReport</i> schema for details.
}			
MinCollectionInterval	string (duration)	<i>read-only</i> (null)	The minimum time interval between gathering metric data that this service allows. This property shall contain the minimum time interval between gathering metric data that this service allows. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\. \d+)?)S)?)?\$</code>
ServiceEnabled (v1.2+)	boolean	<i>read-write</i> (null)	An indication of whether this service is enabled. This property shall indicate whether this service is enabled.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <i>Status</i>.
SupportedCollectionFunctions []	array (string (enum))	<i>read-only</i> (null)	An operation to perform over the sample. - The functions that can be performed over each metric. - This property shall contain the function to apply over the collection duration. For the possible property values, see <i>SupportedCollectionFunctions</i> in <i>Property details</i>.

Property	Type	Attributes	Notes
SupportedOEMTelemetryDataTypes (v1.4+) []	array (string, null)	<i>read-only</i>	A list of supported OEM-defined telemetry data types. This property shall contain a list of supported OEM-defined telemetry data types.
SupportedTelemetryDataTypes (v1.4+) []	array (string (enum))	<i>read-only</i> (null)	- A list of supported telemetry data types. - This property shall contain a list of supported telemetry data types. <i>For the possible property values, see SupportedTelemetryDataTypes in Property details.</i>
TelemetryData (v1.4+) {	object		The link to the collection of data telemetry. This property shall contain a link to a resource collection of type <code>TelemetryDataCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>TelemetryData</i> . See the TelemetryData schema for details.
}			
Triggers {	object		The link to the collection of triggers that apply to metrics. This property shall contain a link to a resource collection of type <code>TriggersCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Triggers</i> . See the Triggers schema for details.
}			

6.140.4 Actions

6.140.4.1 ClearMetricReports (v1.3+)

Description

The action to clear the metric reports for this telemetry service.

- This action shall delete all entries found in the metric report collection for this telemetry service.

Action URI

{Base URI of target resource}/Actions/TelemetryService.ClearMetricReports

Action parameters

This action takes no parameters.

6.140.4.2 ClearTelemetryData (v1.4+)**Description**

The action to clear the telemetry data for this telemetry service.

- This action shall delete all entries found in the telemetry data collection for this telemetry service.

Action URI

{Base URI of target resource}/Actions/TelemetryService.ClearTelemetryData

Action parameters

This action takes no parameters.

6.140.4.3 CollectTelemetryData (v1.4+)**Description**

The action to collect the telemetry data from a device or service. When the telemetry data is collected, a new telemetry data resource will be created.

- This action shall collect the telemetry data from a device or service. The `Location` header in the response shall contain a URI to a resource of type `TelemetryData` that contains the telemetry data. The `AdditionalDataURI` property in the referenced `TelemetryData` resource shall contain the URI to download the telemetry data.

Action URI

{Base URI of target resource}/Actions/TelemetryService.CollectTelemetryData

Action parameters

Parameter Name	Type	Attributes	Notes
OEMTelemetryDataType	string	<i>optional</i>	The OEM-defined type of telemetry data to collect. • This parameter shall contain the OEM-defined type of telemetry data to collect. This parameter shall be required if <code>TelemetryDataType</code> is <code>OEM</code>.

Parameter Name	Type	Attributes	Notes
TargetDevices [{	array	<i>optional</i>	An array of devices from which to collect telemetry data. This parameter shall contain an array of devices from which to collect telemetry data.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
TelemetryDataType	string (enum)	<i>required</i>	The type of telemetry data to collect. This parameter shall contain the type of telemetry data to collect. <i>For the possible property values, see TelemetryDataType in Property details.</i>

Response Payload

{			
TelemetryData (v1.4+) []	array (string)	<i>read-only required</i>	An array of links to the collected telemetry data. This property shall contain an array of links to resources of type <code>TelemetryData</code> that represent the collected telemetry data.
}			

Request Example

```
{
  "TelemetryDataType": "OEM",
  "OEMTelemetryDataType": "ContosoAggregator2_0",
  "TargetDevices": [
    "/redfish/v1/Systems/Sys-1/Processors/P1"
  ]
}
```

6.140.4.4 ResetMetricReportDefinitionsToDefaults (v1.3+)

Description

The action to reset the metric report definitions to factory defaults.

- This action shall reset all entries found in the metric report definition collection to factory defaults. This action may delete members of the metric report definition collection.

Action URI

{Base URI of target resource}/Actions/TelemetryService.ResetMetricReportDefinitionsToDefaults

Action parameters

This action takes no parameters.

6.140.4.5 ResetTriggersToDefaults (v1.3+)**Description**

The action to reset the triggers to factory defaults.

- This action shall reset all entries found in the triggers collection to factory defaults. This action may delete members of the triggers collection.

Action URI

{Base URI of target resource}/Actions/TelemetryService.ResetTriggersToDefaults

Action parameters

This action takes no parameters.

6.140.4.6 SubmitTestMetricReport**Description**

This action generates a metric report.

- This action shall cause the event service to immediately generate the metric report as an alert event. Then, this message should be sent to any appropriate event destinations.

Action URI

{Base URI of target resource}/Actions/TelemetryService.SubmitTestMetricReport

Action parameters

Parameter Name	Type	Attributes	Notes
GeneratedMetricReportValues (v1.1+) [{	array	<i>required</i>	The contents of the <code>MetricReportValues</code> in the generated metric report. This parameter shall contain the contents of the <code>MetricReportValues</code> array property in the generated metric report.
MetricDefinition (v1.1+) {	object		The link to the metric definition for this metric. This property shall contain a link to a resource of type <code>MetricDefinition</code> that describes what this metric value captures. See the <code>MetricDefinition</code> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>MetricDefinition</code> resource. See the Links section and the <code>MetricDefinition</code> schema for details.
}			
MetricId (v1.1+)	string	<i>read-only</i> (null)	The metric definitions identifier for this metric. This property shall contain the same value as the <code>Id</code> property of the source metric within the associated metric definition.
MetricProperty (v1.1+)	string (URI)	<i>read-only</i> (null)	The URI for the property from which this metric is derived. The value shall be the URI to the property following the JSON fragment notation, as defined by RFC6901, to identify an individual property in a Redfish resource.
MetricValue (v1.1+)	string	<i>read-only</i> (null)	The metric value, as a string. This property shall contain the metric value, as a string.
Timestamp (v1.1+)	string (date-time)	<i>read-only</i> (null)	The date and time when the metric is obtained. A management application can establish a time series of metric data by retrieving the instances of metric value and sorting them according to their timestamp. The value shall time when the metric value was obtained. Note that this value may be different from the time when this instance is created.
}]			
MetricReportName	string	<i>required</i>	The name of the metric report in generated metric report. This parameter shall contain the name of the generated metric report.

Parameter Name	Type	Attributes	Notes
MetricReportValues <i>(deprecated v1.1)</i>	string	optional	The contents of the <code>MetricReportValues</code> array in the generated metric report. This parameter shall contain the contents of the <code>MetricReportValues</code> array property in the generated metric report. <i>Deprecated in v1.1 and later. This property has been deprecated in favor of using the property <code>GeneratedMetricReportValues</code>.</i>

Request Example

```
{
  "MetricReportName": "TestMetricReport",
  "GeneratedMetricReportValues": [
    {
      "MetricId": "AverageReadingCelsius",
      "MetricValue": "50",
      "Timestamp": "2020-12-06T12:00:00Z",
      "MetricProperty": "/redfish/v1/Chassis/Tray_1/Thermal#/Temperatures/0/ReadingCelsius",
      "MetricDefinition": {
        "@odata.id": "/redfish/v1/TelemetryService/MetricDefinitions/AverageReadingCelsius"
      }
    },
    {
      "MetricId": "AverageReadingCelsius",
      "MetricValue": "53",
      "Timestamp": "2020-12-06T12:00:01Z",
      "MetricProperty": "/redfish/v1/Chassis/Tray_1/Thermal#/Temperatures/0/ReadingCelsius",
      "MetricDefinition": {
        "@odata.id": "/redfish/v1/TelemetryService/MetricDefinitions/AverageReadingCelsius"
      }
    }
  ]
}
```

6.140.5 Property details

6.140.5.1 SupportedCollectionFunctions

An operation to perform over the sample.

- The functions that can be performed over each metric.
 - This property shall contain the function to apply over the collection duration.

string	Description
Average	An averaging function.
Maximum	A maximum function.
Minimum	A minimum function.
Summation	A summation function.

6.140.5.2 SupportedTelemetryDataTypes

- A list of supported telemetry data types.
 - This property shall contain a list of supported telemetry data types.

string	Description
OEM	OEM telemetry data.

6.140.5.3 TelemetryDataType

The type of telemetry data to collect.

- This parameter shall contain the type of telemetry data to collect.

string	Description
OEM	OEM telemetry data.

6.140.6 Example response

```
{
  "@odata.type": "#TelemetryService.v1_4_0.TelemetryService",
  "Id": "TelemetryService",
  "Name": "Telemetry Service",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "SupportedCollectionFunctions": [
    "Average",
    "Minimum",
```



```
    "Maximum"
  ],
  "MetricDefinitions": {
    "@odata.id": "/redfish/v1/TelemetryService/MetricDefinitions"
  },
  "MetricReportDefinitions": {
    "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions"
  },
  "MetricReports": {
    "@odata.id": "/redfish/v1/TelemetryService/MetricReports"
  },
  "Triggers": {
    "@odata.id": "/redfish/v1/TelemetryService/Triggers"
  },
  "LogService": {
    "@odata.id": "/redfish/v1/Managers/1/LogServices/Log1"
  },
  "@odata.id": "/redfish/v1/TelemetryService"
}
```

6.141 Thermal 1.7.3 (deprecated)

Version	v1.7 <i>Deprecated</i>	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2020.4	2019.4	2018.2	2017.3	2017.1	2016.3	2016.1	1.0

This schema has been deprecated and use in new implementations is discouraged except to retain compatibility with existing products. This schema has been deprecated in favor of the `ThermalSubsystem` schema.

6.141.1 Description

The `Thermal` schema describes temperature monitoring and thermal management subsystems, such as cooling fans, for a computer system or similar devices contained within a chassis.

- This resource shall contain the thermal management properties for temperature monitoring and management of cooling fans for a Redfish implementation.

6.141.2 URIs

`/redfish/v1/Chassis/{ChassisId}/Thermal` (deprecated)

6.141.3 Properties

Property	Type	Attributes	Notes
Fans [{	array		The set of fans for this chassis. This property shall contain the set of fans for this chassis.
@odata.id	string (URI)	<i>read-only required</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
Actions (v1.3+) {	object		The available actions for this resource. This property shall contain the available actions for this resource.
Assembly (v1.4+) {	object		The link to the assembly associated with this fan. This property shall contain a link to a resource of type <code>Assembly</code>. See the <i>Assembly</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <i>Assembly</i> resource. See the Links section and the <i>Assembly</i> schema for details.
}			
FanName (deprecated v1.1)	string	<i>read-only (null)</i>	The name of the fan. This property shall contain the name of the fan. <i>Deprecated in v1.1 and later. This property has been deprecated in favor of the <code>Name</code> property.</i>
HotPluggable (v1.4+)	boolean	<i>read-only (null)</i>	An indication of whether this device can be inserted or removed while the equipment is in operation. This property shall indicate whether the device can be inserted or removed while the underlying equipment otherwise remains in its current operational state. Hot-pluggable devices can become operable without altering the operational state of the underlying equipment. Devices that cannot be inserted or removed from equipment in operation, or devices that cannot become operable without affecting the operational state of that equipment, shall not be hot-pluggable.

Property	Type	Attributes	Notes
IndicatorLED (v1.2+)	string (enum)	<i>read-write (null)</i>	The state of the indicator LED, which identifies this fan. This property shall contain the state of the indicator light associated with this fan. <i>For the possible property values, see IndicatorLED in Property details.</i>
Location (v1.4+) {}	object		The location of the fan. This property shall contain the location information of the associated fan. For property details, see Location.
LowerThresholdCritical	integer	<i>read-only (null)</i>	The value at which the reading is below normal range but not yet fatal. This property shall contain the value at which the Reading property is below the normal range but is not yet fatal. The value of the property shall use the same units as the Reading property.
LowerThresholdFatal	integer	<i>read-only (null)</i>	The value at which the reading is below normal range and fatal. This property shall contain the value at which the Reading property is below the normal range and is fatal. The value of the property shall use the same units as the Reading property.
LowerThresholdNonCritical	integer	<i>read-only (null)</i>	The value at which the reading is below normal range. This property shall contain the value at which the Reading property is below normal range. The value of the property shall use the same units as the Reading property.
Manufacturer (v1.2+)	string	<i>read-only (null)</i>	The manufacturer of this fan. This property shall contain the name of the organization responsible for producing the fan. This organization may be the entity from whom the fan is purchased, but this is not necessarily true.
MaxReadingRange	integer	<i>read-only (null)</i>	Maximum value for this sensor. This property shall indicate the highest possible value for the Reading property. The value of the property shall use the same units as the Reading property.

Property	Type	Attributes	Notes
MemberId	string	<i>read-only required</i>	The unique identifier for the member within an array. This property shall contain the unique identifier for this member within an array. For services supporting Redfish v1.6 or higher, this value shall contain the zero-based array index.
MinReadingRange	integer	<i>read-only (null)</i>	Minimum value for this sensor. This property shall indicate the lowest possible value for the <code>Reading</code> property. The value of the property shall use the same units as the <code>Reading</code> property.
Model (v1.2+)	string	<i>read-only (null)</i>	The model number for this fan. This property shall contain the model information as defined by the manufacturer for the associated fan.
Name (v1.1+)	string	<i>read-only (null)</i>	Name of the fan. This property shall contain the name of the fan.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PartNumber (v1.2+)	string	<i>read-only (null)</i>	The part number for this fan. This property shall contain the part number as defined by the manufacturer for the associated fan.
PhysicalContext	string (enum)	<i>read-only</i>	The area or device associated with this fan. This property shall contain a description of the affected device or region within the chassis with which this fan is associated. <i>For the possible property values, see PhysicalContext in Property details.</i>
Reading	integer	<i>read-only (null)</i>	The fan speed. This property shall contain the fan sensor reading.
ReadingUnits (v1.0.1+)	string (enum)	<i>read-only (null)</i>	The units in which the fan reading and thresholds are measured. This property shall contain the units in which the fan reading and thresholds are measured. <i>For the possible property values, see ReadingUnits in Property details.</i>

Property	Type	Attributes	Notes
Redundancy [{}]	array (object)		The common redundancy definition and structure used in other Redfish schemas. - The set of redundancy groups for this fan. - This property shall contain an array of links to the redundancy groups to which this fan belongs. For property details, see Redundancy.
RelatedItem [{	array		An array of links to resources or objects that this fan services. This property shall contain an array of links to resources or objects that this fan services.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
SensorNumber (v1.5+)	integer	<i>read-only</i> (null)	The numerical identifier for this fan speed sensor. This property shall contain a numerical identifier for this fan speed sensor that is unique within this resource.
SerialNumber (v1.2+)	string	<i>read-only</i> (null)	The serial number for this fan. This property shall contain the serial number as defined by the manufacturer for the associated fan.
SparePartNumber (v1.2+)	string	<i>read-only</i> (null)	The spare part number for this fan. This property shall contain the spare or replacement part number as defined by the manufacturer for the associated fan.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

Property	Type	Attributes	Notes
UpperThresholdCritical	integer	<i>read-only (null)</i>	The value at which the reading is above normal range but not yet fatal. This property shall contain the value at which the <code>Reading</code> property is above the normal range but is not yet fatal. The value of the property shall use the same units as the <code>Reading</code> property.
UpperThresholdFatal	integer	<i>read-only (null)</i>	The value at which the reading is above normal range and fatal. This property shall contain the value at which the <code>Reading</code> property is above the normal range and is fatal. The value of the property shall use the same units as the <code>Reading</code> property.
UpperThresholdNonCritical	integer	<i>read-only (null)</i>	The value at which the reading is above normal range. This property shall contain the value at which the <code>Reading</code> property is above the normal range. The value of the property shall use the same units as the <code>Reading</code> property.
}]			
Redundancy [{ }]	array (object)		The common redundancy definition and structure used in other Redfish schemas. - The redundancy information for the set of fans in this chassis. - This property shall contain redundancy information for the fans in this chassis. For property details, see Redundancy.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
Temperatures [{	array		The set of temperature sensors for this chassis. This property shall contain the set of temperature sensors for this chassis.
@odata.id	string (URI)	<i>read-only required</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.

Property	Type	Attributes	Notes
Actions (v1.3+) {}	object		The available actions for this resource. This property shall contain the available actions for this resource.
AdjustedMaxAllowableOperatingValue (v1.4+)	integer (Celsius)	read-only (null)	Adjusted maximum allowable operating temperature for this equipment based on the current environmental conditions present. This property shall indicate the adjusted maximum allowable operating temperature for the equipment monitored by this temperature sensor, as specified by a standards body, manufacturer, or a combination, and adjusted based on environmental conditions present. For example, liquid inlet temperature can be adjusted based on the available liquid pressure.
AdjustedMinAllowableOperatingValue (v1.4+)	integer (Celsius)	read-only (null)	Adjusted minimum allowable operating temperature for this equipment based on the current environmental conditions present. This property shall indicate the adjusted minimum allowable operating temperature for the equipment monitored by this temperature sensor, as specified by a standards body, manufacturer, or a combination, and adjusted based on environmental conditions present. For example, liquid inlet temperature can be adjusted based on the available liquid pressure.
DeltaPhysicalContext (v1.4+)	string (enum)	read-only	The area or device to which the <code>DeltaReadingCelsius</code> temperature measurement applies, relative to <code>PhysicalContext</code>. This property shall contain a description of the affected device or region within the chassis to which the <code>DeltaReadingCelsius</code> temperature measurement applies, relative to <code>PhysicalContext</code>. <i>For the possible property values, see <code>DeltaPhysicalContext</code> in <code>Property details</code>.</i>
DeltaReadingCelsius (v1.4+)	number (Celsius)	read-only (null)	The delta temperature reading. This property shall contain the delta of the values of the temperature readings across this sensor and the sensor at <code>DeltaPhysicalContext</code>.
LowerThresholdCritical	number (Celsius)	read-only (null)	The value at which the reading is below normal range but not yet fatal. This property shall contain the value at which the <code>ReadingCelsius</code> property is below the normal range but is not yet fatal. The value of the property shall use the same units as the <code>ReadingCelsius</code> property.

Property	Type	Attributes	Notes
LowerThresholdFatal	number (Celsius)	<i>read-only</i> (null)	The value at which the reading is below normal range and fatal. This property shall contain the value at which the <code>ReadingCelsius</code> property is below the normal range and is fatal. The value of the property shall use the same units as the <code>ReadingCelsius</code> property.
LowerThresholdNonCritical	number (Celsius)	<i>read-only</i> (null)	The value at which the reading is below normal range. This property shall contain the value at which the <code>ReadingCelsius</code> property is below normal range. The value of the property shall use the same units as the <code>ReadingCelsius</code> property.
LowerThresholdUser (v1.6+)	integer (Celsius)	<i>read-write</i> (null)	The value at which the reading is below the user-defined range. This property shall contain the value at which the <code>ReadingCelsius</code> property is below the user-defined range. The value of the property shall use the same units as the <code>ReadingCelsius</code> property. The value shall be equal to the value of <code>LowerThresholdNonCritical</code>, <code>LowerThresholdCritical</code>, or <code>LowerThresholdFatal</code>, unless set by a user.
MaxAllowableOperatingValue (v1.4+)	integer (Celsius)	<i>read-only</i> (null)	Maximum allowable operating temperature for this equipment. This property shall indicate the maximum allowable operating temperature for the equipment monitored by this temperature sensor, as specified by a standards body, manufacturer, or a combination.
MaxReadingRangeTemp	number (Celsius)	<i>read-only</i> (null)	Maximum value for this sensor. This property shall indicate the highest possible value for the <code>ReadingCelsius</code> property. The value of the property shall use the same units as the <code>ReadingCelsius</code> property.
MemberId	string	<i>read-only</i> <i>required</i>	The unique identifier for the member within an array. This property shall contain the unique identifier for this member within an array. For services supporting Redfish v1.6 or higher, this value shall contain the zero-based array index.
MinAllowableOperatingValue (v1.4+)	integer (Celsius)	<i>read-only</i> (null)	Minimum allowable operating temperature for this equipment. This property shall indicate the minimum allowable operating temperature for the equipment monitored by this temperature sensor, as specified by a standards body, manufacturer, or a combination.

Property	Type	Attributes	Notes
MinReadingRangeTemp	number (Celsius)	<i>read-only</i> (null)	Minimum value for this sensor. This property shall indicate the lowest possible value for the <code>ReadingCelsius</code> property. The value of the property shall use the same units as the <code>ReadingCelsius</code> property.
Name	string	<i>read-only</i> (null)	The temperature sensor name. This property shall contain the name of the temperature sensor.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PhysicalContext	string (enum)	<i>read-only</i>	The area or device to which this temperature measurement applies. This property shall contain a description of the affected device or region within the chassis to which this temperature applies. <i>For the possible property values, see PhysicalContext in Property details.</i>
ReadingCelsius	number (Celsius)	<i>read-only</i> (null)	The temperature (C). This property shall contain the temperature in degree Celsius units.
RelatedItem [{	array		An array of links to resources or objects that represent areas or devices to which this temperature applies. This property shall contain an array of links to resources or objects that represent areas or devices to which this temperature applies.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
SensorNumber	integer	<i>read-only</i> (null)	The numerical identifier of the temperature sensor. This property shall contain a numerical identifier for this temperature sensor that is unique within this resource.

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
UpperThresholdCritical	number (Celsius)	<i>read-only (null)</i>	The value at which the reading is above normal range but not yet fatal. This property shall contain the value at which the <code>ReadingCelsius</code> property is above the normal range but is not yet fatal. The value of the property shall use the same units as the <code>ReadingCelsius</code> property.
UpperThresholdFatal	number (Celsius)	<i>read-only (null)</i>	The value at which the reading is above normal range and fatal. This property shall contain the value at which the <code>ReadingCelsius</code> property is above the normal range and is fatal. The value of the property shall use the same units as the <code>ReadingCelsius</code> property.
UpperThresholdNonCritical	number (Celsius)	<i>read-only (null)</i>	The value at which the reading is above normal range. This property shall contain the value at which the <code>ReadingCelsius</code> property is above the normal range. The value of the property shall use the same units as the <code>ReadingCelsius</code> property.
UpperThresholdUser (v1.6+)	integer (Celsius)	<i>read-write (null)</i>	The value at which the reading is above the user-defined range. This property shall contain the value at which the <code>ReadingCelsius</code> property is above the user-defined range. The value of the property shall use the same units as the <code>ReadingCelsius</code> property. The value shall be equal to the value of <code>UpperThresholdNonCritical</code>, <code>UpperThresholdCritical</code>, or <code>UpperThresholdFatal</code>, unless set by a user.
}}			

6.141.4 Property details

6.141.4.1 DeltaPhysicalContext

The area or device to which the `DeltaReadingCelsius` temperature measurement applies, relative to `PhysicalContext`.

- This property shall contain a description of the affected device or region within the chassis to which the `DeltaReadingCelsius` temperature measurement applies, relative to `PhysicalContext` .

string	Description
Accelerator	An accelerator.
ACInput	An AC electrical input or input-related circuit.
ACMaintenanceBypassInput	An AC electrical maintenance bypass input.
ACOutput	An AC electrical output or output-related circuit. • This value shall indicate an electrical output or an output-related circuit, such as a branch output, which is not terminated as a power outlet.
ACStaticBypassInput	An AC electrical static bypass input.
ACUtilityInput	An AC electrical utility input. • This value shall indicate an electrical input, where the source is an electrical utility as opposed to a backup or locally-generated power source. This value is intended to differentiate multiple electrical inputs between utility, maintenance bypass, or static bypass values. For general purpose usage, the value of <code>ACInput</code> is preferred.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. • This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	A compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC electrical bus.
Exhaust	The air exhaust point or points or region of the chassis.

string	Description
ExpansionBay	An expansion bay. This value shall indicate a location that provides for the expansion of functionality of a system, such as a PCIe slot that can accept an option card.
ExpansionSubsystem	A group of expansion bays. This value shall indicate a group of expansion bays and the devices installed in those bays.
Fan	A fan.
Filter	A filter.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Manager	A management controller, such as a BMC (baseboard management controller).
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	A networking bay. This value shall indicate a location that provides for the expansion of networking functionality of a system, by the addition of networking devices.
NetworkingDevice	A networking device.
PowerOutlet	An electrical outlet. This value shall indicate an electrical outlet or receptacle.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.

string	Description
PowerSupplyBay	A power supply bay. This value shall indicate a location that provides for the installation of a power supply or similar devices.
Pump	A pump.
Rectifier	A rectifier device.
Reservoir	A reservoir.
Room	The room.
StorageBay	A storage bay. This value shall indicate a location that provides for the expansion of storage functionality of a system, by the addition of storage devices.
StorageDevice	A storage device.
StorageSubsystem	A storage subsystem. This value shall indicate a storage subsystem, which may consist of one or more storage controllers, storage devices, or related components.
Switch	A switch device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.141.4.2 IndicatorLED

The state of the indicator LED, which identifies this fan.

- This property shall contain the state of the indicator light associated with this fan.

string	Description
Blinking	The indicator LED is blinking. This value shall represent that the indicator LED is in a blinking state where the LED is being turned on and off in repetition. If the service does not support this value, it shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code.
Lit	The indicator LED is lit. This value shall represent that the indicator LED is in a solid on state. If the service does not support this value, it shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code.
Off	The indicator LED is off. This value shall represent that the indicator LED is in a solid off state. If the service does not support this value, it shall reject <code>PATCH</code> or <code>PUT</code> requests containing this value by returning the HTTP <code>400 Bad Request</code> status code.

6.141.4.3 PhysicalContext

The area or device associated with this fan.

- This property shall contain a description of the affected device or region within the chassis with which this fan is associated.

string	Description
Accelerator	An accelerator.
ACInput	An AC electrical input or input-related circuit.
ACMaintenanceBypassInput	An AC electrical maintenance bypass input.
ACOutput	An AC electrical output or output-related circuit. This value shall indicate an electrical output or an output-related circuit, such as a branch output, which is not terminated as a power outlet.
ACStaticBypassInput	An AC electrical static bypass input.
ACUtilityInput	An AC electrical utility input. This value shall indicate an electrical input, where the source is an electrical utility as opposed to a backup or locally-generated power source. This value is intended to differentiate multiple electrical inputs between utility, maintenance bypass, or static bypass values. For general purpose usage, the value of <code>ACInput</code> is preferred.

string	Description
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	A compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC electrical bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	An expansion bay. This value shall indicate a location that provides for the expansion of functionality of a system, such as a PCIe slot that can accept an option card.
ExpansionSubsystem	A group of expansion bays. This value shall indicate a group of expansion bays and the devices installed in those bays.
Fan	A fan.
Filter	A filter.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.

string	Description
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Manager	A management controller, such as a BMC (baseboard management controller).
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	A networking bay. This value shall indicate a location that provides for the expansion of networking functionality of a system, by the addition of networking devices.
NetworkingDevice	A networking device.
PowerOutlet	An electrical outlet. This value shall indicate an electrical outlet or receptacle.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	A power supply bay. This value shall indicate a location that provides for the installation of a power supply or similar devices.
Pump	A pump.
Rectifier	A rectifier device.
Reservoir	A reservoir.
Room	The room.
StorageBay	A storage bay. This value shall indicate a location that provides for the expansion of storage functionality of a system, by the addition of storage devices.
StorageDevice	A storage device.
StorageSubsystem	A storage subsystem. This value shall indicate a storage subsystem, which may consist of one or more storage controllers, storage devices, or related components.

string	Description
Switch	A switch device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.141.4.4 ReadingUnits

The units in which the fan reading and thresholds are measured.

- This property shall contain the units in which the fan reading and thresholds are measured.

string	Description
Percent	The fan reading and thresholds are measured as a percentage.
RPM	The fan reading and thresholds are measured in revolutions per minute.

6.141.5 Example response

```
{
  "@odata.type": "#Thermal.v1_7_3.Thermal",
  "Id": "Thermal",
  "Name": "Thermal",
  "Temperatures": [
    {
      "@odata.id": "/redfish/v1/Chassis/1U/Thermal#/Temperatures/0",
      "MemberId": "0",
      "Name": "CPU1 Temp",
      "SensorNumber": 5,
      "Status": {
        "State": "Enabled",
        "Health": "OK"
      }
    },
  ],
}
```

```
    "ReadingCelsius": 41,
    "UpperThresholdNonCritical": 42,
    "UpperThresholdCritical": 45,
    "UpperThresholdFatal": 48,
    "MinReadingRangeTemp": 0,
    "MaxReadingRangeTemp": 60,
    "PhysicalContext": "CPU",
    "RelatedItem": [
      {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/Processors/CPU1"
      }
    ]
  },
  {
    "@odata.id": "/redfish/v1/Chassis/1U/Thermal#/Temperatures/1",
    "MemberId": "1",
    "Name": "CPU2 Temp",
    "SensorNumber": 6,
    "Status": {
      "State": "Disabled"
    },
    "UpperThresholdNonCritical": 42,
    "UpperThresholdCritical": 45,
    "UpperThresholdFatal": 48,
    "MinReadingRangeTemp": 0,
    "MaxReadingRangeTemp": 60,
    "PhysicalContext": "CPU",
    "RelatedItem": [
      {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/Processors/CPU2"
      }
    ]
  },
  {
    "@odata.id": "/redfish/v1/Chassis/1U/Thermal#/Temperatures/2",
    "MemberId": "2",
    "Name": "Chassis Intake Temp",
    "SensorNumber": 9,
    "Status": {
      "State": "Enabled",
      "Health": "OK"
    },
    "ReadingCelsius": 25,
    "UpperThresholdUser": 28,
    "UpperThresholdNonCritical": 30,
    "UpperThresholdCritical": 40,
    "UpperThresholdFatal": 50,
    "LowerThresholdUser": 20,
    "LowerThresholdNonCritical": 10,
    "LowerThresholdCritical": 5,
```

```

        "LowerThresholdFatal": 0,
        "MinReadingRangeTemp": 0,
        "MaxReadingRangeTemp": 60,
        "PhysicalContext": "Intake",
        "RelatedItem": [
            {
                "@odata.id": "/redfish/v1/Chassis/1U"
            },
            {
                "@odata.id": "/redfish/v1/Systems/437XR1138R2"
            }
        ]
    },
    "Fans": [
        {
            "@odata.id": "/redfish/v1/Chassis/1U/Thermal#/Fans/0",
            "MemberId": "0",
            "Name": "BaseBoard System Fan",
            "PhysicalContext": "Backplane",
            "Status": {
                "State": "Enabled",
                "Health": "OK"
            },
            "Reading": 2100,
            "ReadingUnits": "RPM",
            "LowerThresholdFatal": 0,
            "MinReadingRange": 0,
            "MaxReadingRange": 5000,
            "Redundancy": [
                {
                    "@odata.id": "/redfish/v1/Chassis/1U/Thermal#/Redundancy/0"
                }
            ],
            "RelatedItem": [
                {
                    "@odata.id": "/redfish/v1/Systems/437XR1138R2"
                },
                {
                    "@odata.id": "/redfish/v1/Chassis/1U"
                }
            ]
        },
        {
            "@odata.id": "/redfish/v1/Chassis/1U/Thermal#/Fans/1",
            "MemberId": "1",
            "Name": "BaseBoard System Fan Backup",
            "PhysicalContext": "Backplane",
            "Status": {
                "State": "Enabled",

```

```

        "Health": "OK"
    },
    "Reading": 2050,
    "ReadingUnits": "RPM",
    "LowerThresholdFatal": 0,
    "MinReadingRange": 0,
    "MaxReadingRange": 5000,
    "Redundancy": [
        {
            "@odata.id": "/redfish/v1/Chassis/1U/Thermal#/Redundancy/0"
        }
    ],
    "RelatedItem": [
        {
            "@odata.id": "/redfish/v1/Systems/437XR1138R2"
        },
        {
            "@odata.id": "/redfish/v1/Chassis/1U"
        }
    ]
},
"Redundancy": [
    {
        "@odata.id": "/redfish/v1/Chassis/1U/Thermal#/Redundancy/0",
        "MemberId": "0",
        "Name": "BaseBoard System Fans",
        "RedundancySet": [
            {
                "@odata.id": "/redfish/v1/Chassis/1U/Thermal#/Fans/0"
            },
            {
                "@odata.id": "/redfish/v1/Chassis/1U/Thermal#/Fans/1"
            }
        ],
        "Mode": "N+m",
        "Status": {
            "State": "Enabled",
            "Health": "OK"
        },
        "MinNumNeeded": 1,
        "MaxNumSupported": 2
    }
],
"@odata.id": "/redfish/v1/Chassis/1U/Thermal"
}

```

6.142 ThermalEquipment 1.2.0

Version	v1.2	v1.1	v1.0
Release	2025.2	2023.2	2023.1

6.142.1 Description

The ThermalEquipment schema represents the set of cooling equipment managed by a Redfish service.

- This resource shall represent the set of cooling equipment for a Redfish implementation.

6.142.2 URIs

/redfish/v1/ThermalEquipment

6.142.3 Properties

Property	Type	Attributes	Notes
CDUs {	object		A link to a collection of coolant distribution units. This property shall contain a link to a resource collection of type CoolingUnitCollection that contains a set of coolant distribution units. Contains a link to a resource.
@odata.id	string	read-only	Link to Collection of CoolingUnit. See the CoolingUnit schema for details.
}			
CoolingLoopRedundancy (v1.1+) [{}]	array (object)		The redundancy information for the devices in a redundancy group. - The redundancy information for cooling loops attached to this equipment. - This property shall contain redundancy information for the set of cooling loops attached to this equipment. The values of the RedundancyGroup array shall reference resources of type CoolingLoop. For property details, see RedundantGroup.

Property	Type	Attributes	Notes
CoolingLoops {	object		A link to a collection of cooling loops. This property shall contain a link to a resource collection of type <code>CoolingLoopCollection</code> that contains the set of cooling loops managed by the service. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>CoolingLoop</i> . See the <i>CoolingLoop</i> schema for details.
}			
HeatExchangers {	object		A link to a collection of heat exchanger units. This property shall contain a link to a resource collection of type <code>CoolingUnitCollection</code> that contains a set of heat exchanger units. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>CoolingUnit</i> . See the <i>CoolingUnit</i> schema for details.
}			
ImmersionUnits {	object		A link to a collection of immersion cooling units. This property shall contain a link to a resource collection of type <code>CoolingUnitCollection</code> that contains a set of immersion cooling units. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>CoolingUnit</i> . See the <i>CoolingUnit</i> schema for details.
}			
RPUs (v1.2+) {	object		A link to a collection of reservoir and pumping units (RPUs). This property shall contain a link to a resource collection of type <code>CoolingUnitCollection</code> that contains a set of reservoir and pumping units. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>CoolingUnit</i> . See the <i>CoolingUnit</i> schema for details.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see <i>Status</i>.

6.142.4 Example response

```
{
  "@odata.type": "#ThermalEquipment.v1_2_0.ThermalEquipment",
  "Id": "ThermalEquipment",
  "Name": "Cooling Equipment",
  "Status": {
    "State": "Enabled",
    "HealthRollup": "OK"
  },
  "CDUs": {
    "@odata.id": "/redfish/v1/ThermalEquipment/CDUs"
  },
  "CoolingLoops": {
    "@odata.id": "/redfish/v1/ThermalEquipment/CoolingLoops"
  },
  "@odata.id": "/redfish/v1/ThermalEquipment"
}
```

6.143 ThermalMetrics 1.3.2

Version	v1.3	v1.2	v1.1	v1.0
Release	2023.2	2023.1	2022.3	2020.4

6.143.1 Description

The ThermalMetrics schema represents the thermal metrics of a chassis.

- This resource shall represent the thermal metrics of a chassis for a Redfish implementation.

6.143.2 URIs

/redfish/v1/Chassis/{ChassisId}/ThermalSubsystem/ThermalMetrics

6.143.3 Properties

Property	Type	Attributes	Notes
AirFlowCubicMetersPerMinute (v1.2+) {}	object		The air flow through the chassis (m³/min). This property shall contain the rate of air flow, in cubic meters per minute units, between the air intake and the air exhaust of this chassis. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>AirFlowCMM</code>. For more information about this property, see <code>SensorExcerpt</code> in Property Details.
DeltaPressurekPa (v1.2+) {}	object		The differential pressure (kPa). This property shall contain the pressure, in kilopascal units, for the difference in pressure between the air intake and the air exhaust of this chassis. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>PressurekPa</code>. For more information about this property, see <code>SensorExcerpt</code> in Property Details.
EnergykWh (v1.3+) {}	object (excerpt)		Energy consumption (kWh) of the thermal management subsystem. This property shall contain the total energy, in kilowatt-hour units, for the thermal subsystem. The value shall include the total energy consumption of devices involved in thermal management of the chassis, such as fans, pumps, and heaters. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>EnergykWh</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
ApparentkVAh (v1.5+)	number (kV.A.h)	<i>read-only</i> (null)	Apparent energy (kVAh). This property shall contain the apparent energy, in kilovolt-ampere-hour units, for an electrical energy measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>EnergykWh</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.

Property	Type	Attributes	Notes
LifetimeReading (v1.1+)	number	<i>read-only</i> (null)	The total accumulation value for this sensor. This property shall contain the total accumulation of the <code>Reading</code> property over the sensor's lifetime. This value shall not be reset by the <code>ResetMetrics</code> action.
ReactivekVARh (v1.5+)	number (kV.A.h)	<i>read-only</i> (null)	Reactive energy (kVARh). This property shall contain the reactive energy, in kilovolt-ampere-hours (reactive) units, for an electrical energy measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>EnergykWh</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
SensorResetTime	string (date-time)	<i>read-only</i> (null)	The date and time when the time-based properties were last reset. This property shall contain the date and time when the <code>ResetMetrics</code> action was last performed or when the service last reset the time-based property values.
}			
HeaterSummary (v1.1+) {	object		The summary of heater metrics for this chassis. This property shall contain the summary of heater metrics for this subsystem.
TotalPrePowerOnHeatingTimeSeconds (v1.1+)	integer	<i>read-only</i> (null)	The total number of seconds all the heaters in the thermal subsystem were active while the respective devices they heat were powered off. This property shall contain the total number of seconds all the heaters in the thermal subsystem were active while the respective devices they heat were powered off.
TotalRuntimeHeatingTimeSeconds (v1.1+)	integer	<i>read-only</i> (null)	The total number of seconds all the heaters in the thermal subsystem were active while the respective devices they heat were powered on. This property shall contain the total number of seconds all the heaters in the thermal subsystem were active while the respective devices they heat were powered on.

Property	Type	Attributes	Notes
}			
PowerWatts (v1.3+) {	object (excerpt)		Power consumption (W) of the thermal management subsystem. This property shall contain the power, in watt units, for the thermal subsystem. The value shall include the total power consumption of devices involved in thermal management of the chassis, such as fans, pumps, and heaters. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Power</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
ApparentVA	number (V.A)	<i>read-only</i> (null)	The product of voltage and current for an AC circuit, in volt-ampere units. This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
PhaseAngleDegrees (v1.5+)	number	<i>read-only</i> (null)	The phase angle (degrees) between the current and voltage waveforms. This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a <code>ReadingType</code> containing <code>Power</code>, and shall not appear in sensors with other <code>ReadingType</code> values.
PowerFactor	number	<i>read-only</i> (null)	The power factor for this sensor. This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. <code>PowerFactor</code> is expressed in unit-less 1/100ths. This property can appear in sensors containing a <code>ReadingType</code> value of <code>Power</code>, and shall not appear in sensors of other <code>ReadingType</code> values.

Property	Type	Attributes	Notes
ReactiveVAR	number (V.A)	<i>read-only</i> (null)	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the <code>Power</code> <code>ReadingType</code>, and shall not appear in sensors of other <code>ReadingType</code> values.
Reading	number	<i>read-only</i> (null)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}			
TemperatureReadingsCelsius [{	array (excerpt)		The temperatures (in degree Celsius units) from all related sensors for this device. This property shall contain the temperatures, in degree Celsius units, for this subsystem. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Temperature</code>. This object is an excerpt of the <code>Sensor</code> resource located at the URI shown in <code>DataSourceUri</code>.
DataSourceUri	string (URI)	<i>read-only</i> (null)	The link to the resource that provides the data for this sensor. This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
DeviceName (v1.2+)	string	<i>read-only</i> (null)	The name of the device. This property shall contain the name of the device associated with this sensor. If the device is represented by a resource, the value shall contain the value of the <code>Name</code> property of the associated resource.
PhysicalContext	string (enum)	<i>read-write</i> (null)	The area or device to which this sensor measurement applies. This property shall contain a description of the affected component or region within the equipment to which this sensor measurement applies. <i>For the possible property values, see PhysicalContext in Property details.</i>

Property	Type	Attributes	Notes
PhysicalSubContext	string (enum)	<i>read-write</i> (<i>null</i>)	The usage or location within a device to which this sensor measurement applies. This property shall contain a description of the usage or sub-region within the equipment to which this sensor measurement applies. This property generally differentiates multiple sensors within the same <code>PhysicalContext</code> instance. <i>For the possible property values, see <code>PhysicalSubContext</code> in Property details.</i>
Reading	number	<i>read-only</i> (<i>null</i>)	The sensor value. This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.
}}]			
TemperatureSummaryCelsius {	object		The summary temperature readings for this chassis. This property shall contain the temperature sensor readings for this subsystem.
Ambient {	object		The ambient temperature (in degree Celsius units) of this subsystem. This property shall contain the temperature, in degree Celsius units, for the ambient temperature of this subsystem. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Temperature</code>. For more information about this property, see <code>SensorExcerpt</code> in Property Details.
Exhaust {	object		The exhaust temperature (in degree Celsius units) of this subsystem. This property shall contain the temperature, in degree Celsius units, for the exhaust temperature of this subsystem. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Temperature</code>. For more information about this property, see <code>SensorExcerpt</code> in Property Details.

Property	Type	Attributes	Notes
Intake {}	object		The intake temperature (in degree Celsius units) of this subsystem. This property shall contain the temperature, in degree Celsius units, for the intake temperature of this subsystem. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Temperature</code>. For more information about this property, see SensorExcerpt in Property Details.
Internal {}	object		The internal temperature (in degree Celsius units) of this subsystem. This property shall contain the temperature, in degree Celsius units, for the internal temperature of this subsystem. The value of the <code>DataSourceUri</code> property, if present, shall reference a resource of type <code>Sensor</code> with the <code>ReadingType</code> property containing the value <code>Temperature</code>. For more information about this property, see SensorExcerpt in Property Details.
}			

6.143.4 Actions

6.143.4.1 ResetMetrics

Description

This action resets the summary metrics related to this equipment.

- This action shall reset any time intervals or counted values for this equipment.

Action URI

{Base URI of target resource}/Actions/ThermalMetrics.ResetMetrics

Action parameters

This action takes no parameters.

6.143.5 Property details

6.143.5.1 PhysicalContext

The area or device to which this sensor measurement applies.

- This property shall contain a description of the affected component or region within the equipment to which this sensor measurement applies.

string	Description
Accelerator	An accelerator.
ACInput	An AC electrical input or input-related circuit.
ACMaintenanceBypassInput	An AC electrical maintenance bypass input.
ACOutput	An AC electrical output or output-related circuit. • This value shall indicate an electrical output or an output-related circuit, such as a branch output, which is not terminated as a power outlet.
ACStaticBypassInput	An AC electrical static bypass input.
ACUtilityInput	An AC electrical utility input. • This value shall indicate an electrical input, where the source is an electrical utility as opposed to a backup or locally-generated power source. This value is intended to differentiate multiple electrical inputs between utility, maintenance bypass, or static bypass values. For general purpose usage, the value of <code>ACInput</code> is preferred.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. • This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	A compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.

string	Description
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC electrical bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	An expansion bay. This value shall indicate a location that provides for the expansion of functionality of a system, such as a PCIe slot that can accept an option card.
ExpansionSubsystem	A group of expansion bays. This value shall indicate a group of expansion bays and the devices installed in those bays.
Fan	A fan.
Filter	A filter.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Manager	A management controller, such as a BMC (baseboard management controller).
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	A networking bay. This value shall indicate a location that provides for the expansion of networking functionality of a system, by the addition of networking devices.
NetworkingDevice	A networking device.

string	Description
PowerOutlet	An electrical outlet. This value shall indicate an electrical outlet or receptacle.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	A power supply bay. This value shall indicate a location that provides for the installation of a power supply or similar devices.
Pump	A pump.
Rectifier	A rectifier device.
Reservoir	A reservoir.
Room	The room.
StorageBay	A storage bay. This value shall indicate a location that provides for the expansion of storage functionality of a system, by the addition of storage devices.
StorageDevice	A storage device.
StorageSubsystem	A storage subsystem. This value shall indicate a storage subsystem, which may consist of one or more storage controllers, storage devices, or related components.
Switch	A switch device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.143.5.2 PhysicalSubContext

The usage or location within a device to which this sensor measurement applies.

- This property shall contain a description of the usage or sub-region within the equipment to which this sensor measurement applies. This property generally differentiates multiple sensors within the same `PhysicalContext` instance.

string	Description
Input	The input.
Output	The output.

6.143.5.3 SensorExcerpt

The `Sensor` schema describes a sensor and its properties. This object is an excerpt of the `Sensor` resource located at the URI shown in `DataSourceUri`.

DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	read-only (null)	The sensor value. • This property shall contain the sensor value. This property shall not be returned if the <code>Enabled</code> property is supported and contains <code>false</code>.

6.143.6 Example response

```
{
  "@odata.type": "#ThermalMetrics.v1_3_2.ThermalMetrics",
  "Id": "ThermalMetrics",
  "Name": "Chassis Thermal Metrics",
  "TemperatureSummaryCelsius": {
    "Internal": {
      "Reading": 39,
      "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/CPU1Temp"
    },
    "Intake": {
      "Reading": 24.8,

```

```
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/IntakeTemp"
    },
    "Ambient": {
        "Reading": 22.5,
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/AmbientTemp"
    },
    "Exhaust": {
        "Reading": 40.5,
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/ExhaustTemp"
    }
},
"PowerWatts": {
    "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/FanTotalPower",
    "Reading": 24.72
},
"EnergykWh": {
    "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/FanTotalEnergy",
    "Reading": 38.84
},
"TemperatureReadingsCelsius": [
    {
        "Reading": 40,
        "DeviceName": "SystemBoard",
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/SysBrdTemp"
    },
    {
        "Reading": 24.8,
        "DeviceName": "Intake",
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/IntakeTemp"
    },
    {
        "Reading": 39,
        "DeviceName": "CPUSubsystem",
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/CPUTemps"
    },
    {
        "Reading": 42,
        "DeviceName": "MemorySubsystem",
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/MemoryTemp"
    },
    {
        "Reading": 33,
        "DeviceName": "PowerSupply",
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PSTemp"
    },
    {
        "Reading": 40.5,
        "DeviceName": "Exhaust",
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/ExhaustTemp"
    }
]
```

```
  ],
  "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/ThermalMetrics"
}
```

6.144 ThermalSubsystem 1.4.0

Version	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2025.2	2023.2	2023.1	2022.3	2020.4

6.144.1 Description

The `ThermalSubsystem` schema contains the definition for the thermal subsystem of a chassis.

- This resource shall represent a thermal subsystem for a Redfish implementation.

6.144.2 URIs

/redfish/v1/Chassis/{ChassisId}/ThermalSubsystem

6.144.3 Properties

Property	Type	Attributes	Notes
CoolantConnectorRedundancy (v1.3+) [{}]	array (object)		The redundancy information for the devices in a redundancy group. • The redundancy information for the coolant connectors in this subsystem. ◦ This property shall contain redundancy information for the set of coolant connectors attached to this equipment. The values of the <code>RedundancyGroup</code> array shall reference resources of type <code>CoolantConnector</code>. For property details, see RedundantGroup.
CoolantConnectors (v1.2+) {	object		A link to the coolant connectors for this equipment. • This property shall contain a link to a resource collection of type <code>CoolantConnectorCollection</code> that contains the coolant connectors for this equipment. Contains a link to a resource.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to Collection of <i>CoolantConnector</i> . See the CoolantConnector schema for details.
}			
FanRedundancy [{}]	array (object)		The redundancy information for the devices in a redundancy group. - The redundancy information for the groups of fans in this subsystem. - This property shall contain redundancy information for the groups of fans in this subsystem. For property details, see RedundantGroup.
Fans {	object		The link to the collection of fans within this subsystem. This property shall contain a link to a resource collection of type <i>FanCollection</i>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Fan</i> . See the Fan schema for details.
}			
Filters (v1.4+) {	object		A link to the filters for this equipment. This property shall contain a link to a resource collection of type <i>FilterCollection</i> that contains the filters for this equipment. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Filter</i> . See the Filter schema for details.
}			
Heaters (v1.1+) {	object		The link to the collection of heaters within this subsystem. This property shall contain a link to a resource collection of type <i>HeaterCollection</i>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Heater</i> . See the Heater schema for details.
}			

Property	Type	Attributes	Notes
LeakDetection (v1.3+) {	object		The link to the leak detection system within this chassis. This property shall contain a link to a resource of type <code>LeakDetection</code>. This link should be used when the leak detection capabilities are tied to, or are internal to, a particular <code>Chassis</code>. For detection capabilities that are tied to a <code>CoolingUnit</code> resource, which may span multiple <code>Chassis</code> resources, populating the <code>LeakDetection</code> resource under <code>CoolingUnit</code> for the relevant equipment is the preferred approach. See the <i>LeakDetection</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>LeakDetection</code> resource. See the Links section and the <i>LeakDetection</i> schema for details.
}			
Pumps (v1.3+) {	object		A link to the pumps for this equipment. This property shall contain a link to a resource collection of type <code>PumpCollection</code> that contains details for the pumps included in this equipment. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Pump</i> . See the Pump schema for details.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
ThermalMetrics {	object		The link to the summary of thermal metrics for this subsystem. This property shall contain a link to a resource of type <code>ThermalMetrics</code>. See the <i>ThermalMetrics</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>ThermalMetrics</code> resource. See the Links section and the <i>ThermalMetrics</i> schema for details.
}			

6.144.4 Example response

```
{
  "@odata.type": "#ThermalSubsystem.v1_4_0.ThermalSubsystem",

```

```
"Id": "ThermalSubsystem",
"Name": "Thermal Subsystem for Chassis",
"FanRedundancy": [
  {
    "RedundancyType": "NPlusM",
    "MaxSupportedInGroup": 2,
    "MinNeededInGroup": 1,
    "RedundancyGroup": [
      {
        "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/Fans/Bay1"
      },
      {
        "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/Fans/Bay2"
      }
    ],
    "Status": {
      "State": "Enabled",
      "Health": "OK"
    }
  },
  {
    "RedundancyType": "NPlusM",
    "MaxSupportedInGroup": 2,
    "MinNeededInGroup": 1,
    "RedundancyGroup": [
      {
        "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/Fans/CPU1"
      },
      {
        "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/Fans/CPU2"
      }
    ],
    "Status": {
      "State": "Disabled"
    }
  }
],
"Fans": {
  "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/Fans"
},
"ThermalMetrics": {
  "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/ThermalMetrics"
},
"Status": {
  "State": "Enabled",
  "Health": "OK"
},
"@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem"
}
```

6.145 Triggers 1.4.0

Version	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2024.1	2023.1	2021.2	2019.1	2018.2

6.145.1 Description

The `Triggers` schema describes a trigger condition that applies to metrics.

- This resource shall contain a trigger condition that applies to metrics.

6.145.2 URIs

/redfish/v1/TelemetryService/Triggers/{*TriggersId*}

6.145.3 Properties

Property	Type	Attributes	Notes
DiscreteTriggerCondition	string (enum)	read-only (null)	The conditions for a discrete metric trigger. • This property shall contain the conditions when a discrete metric triggers. <i>For the possible property values, see DiscreteTriggerCondition in Property details.</i>
DiscreteTriggers [{	array		The list of discrete triggers. • This property shall contain a list of values to which to compare a metric reading. This property shall be present when the <code>DiscreteTriggerCondition</code> property is <code>Specified</code>.
DwellTime	string (duration)	read-write (null)	The amount of time that a trigger event persists before the metric action is performed. • This property shall contain the amount of time that a trigger event persists before the <code>TriggerActions</code> are performed. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?</code> \$
Name	string	read-only (null)	The name of the trigger. • This property shall contain a name for the trigger.

Property	Type	Attributes	Notes
Severity	string (enum)	<i>read-write</i> (null)	The severity of the event message. This property shall contain the <code>Severity</code> property to be used in the event message. <i>For the possible property values, see Severity in Property details.</i>
Value	string	<i>read-write</i> (null)	The discrete metric value that constitutes a trigger event. This property shall contain the value discrete metric that constitutes a trigger event. The <code>DwellTime</code> shall be measured from this point in time.
}}			
EventTriggers (v1.1+) []	array (string, null)	<i>read-write</i>	The array of <code>MessageId</code> values that specify when a trigger condition is met based on an event. This property shall contain an array of <code>MessageId</code> values that specify when a trigger condition is met based on an event. When the service generates an event and if it contains a <code>MessageId</code> within this array, a trigger condition shall be met. The <code>MetricType</code> property should not be present if this resource is configured for event-based triggers. Pattern: <code>^[A-Za-z0-9]+\.\d+\.\d+\.[A-Za-z0-9.]+\$</code>
HysteresisDuration (v1.3+)	string (duration)	<i>read-write</i> (null)	The duration the metric value must not violate the threshold before the threshold is deactivated. This property shall indicate the duration the metric value no longer violates the threshold before the threshold is deactivated. A duration of zero seconds, or if the property is not present in the resource, shall indicate the threshold is deactivated immediately once the metric value no longer violates the threshold. The threshold shall not deactivate until the conditions of both <code>HysteresisReading</code> and <code>HysteresisDuration</code> are met. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?)?\$</code>
HysteresisReading (v1.3+)	number	<i>read-write</i> (null)	The reading offset from the threshold value required to clear the threshold. This property shall indicate the offset from the reading for this sensor and the threshold value that deactivates the threshold. For example, a value of <code>-2</code> indicates the metric reading shall fall 2 units below an upper threshold value to deactivate the threshold. The value of the property shall use the same units as the <code>Reading</code> property. A value of <code>0</code>, or if the property is not present in the resource, shall indicate the threshold is deactivated when the metric value no longer violates the threshold. The threshold shall not deactivate until the conditions of both <code>HysteresisReading</code> and <code>HysteresisDuration</code> are met.

Property	Type	Attributes	Notes
Links (v1.1+) {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
MetricReportDefinitions (v1.1+) [{	array		The metric report definitions that generate new metric reports when a trigger condition is met and when the <code>TriggerActions</code> property contains <code>RedfishMetricReport</code> . This property shall contain a set of links to metric report definitions that generate new metric reports when a trigger condition is met and when the <code>TriggerActions</code> property contains <code>RedfishMetricReport</code>.
@odata.id	string	read-write	Link to a MetricReportDefinition resource. See the Links section and the <i>MetricReportDefinition</i> schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
MetricIds (v1.2+) []	array (string, null)	read-write	The label for the metric definitions that contain the property identifiers for this trigger. It matches the <code>Id</code> property of the corresponding metric definition. This property shall contain the labels for the metric definitions that contain the property identifiers for this trigger. This property shall match the value of the <code>Id</code> property of the corresponding metric definitions.
MetricProperties []	array (URI) (string, null)	read-write	An array of URIs with wildcards and property identifiers for this trigger. Each wildcard, a name contained by a set of curly braces, is replaced with its corresponding entry in the <code>Wildcard</code> array property. This property shall contain an array of URIs with wildcards and property identifiers for this trigger. Use a set of curly braces to delimit each wildcard in the URI. Replace each wildcard with its corresponding entry in the <code>Wildcard</code> array property. A URI that contains wildcards shall link to a resource property to which this trigger definition applies after all wildcards are replaced with their corresponding entries in the Wildcard property. The property identifiers portion of the URI shall follow the RFC6901-defined JSON fragment notation rules.
MetricType	string (enum)	read-only (null)	The metric type of the trigger. This property shall contain the metric type of the trigger. <i>For the possible property values, see MetricType in Property details.</i>

Property	Type	Attributes	Notes
NumericThresholds {	object		The thresholds for a numeric metric trigger. This property shall contain the list of thresholds to which to compare a numeric metric value.
LowerCritical {}	object		The value at which the reading is below normal range and requires attention. This property shall contain the value at which the <code>MetricProperties</code> property is below the normal range and may require attention. The value of the property shall use the same units as the <code>MetricProperties</code> property. For more information about this property, see Threshold in Property Details.
LowerWarning {}	object		The value at which the reading is below normal range. This property shall contain the value at which the <code>MetricProperties</code> property is below the normal range. The value of the property shall use the same units as the <code>MetricProperties</code> property. For more information about this property, see Threshold in Property Details.
UpperCritical {}	object		The value at which the reading is above normal range and requires attention. This property shall contain the value at which the <code>MetricProperties</code> property is above the normal range and may require attention. The value of the property shall use the same units as the <code>MetricProperties</code> property. For more information about this property, see Threshold in Property Details.
UpperWarning {}	object		The value at which the reading is above normal range. This property shall contain the value at which the <code>MetricProperties</code> property is above the normal range. The value of the property shall use the same units as the <code>MetricProperties</code> property. For more information about this property, see Threshold in Property Details.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
TriggerActionMessage (v1.4+)	string (enum)	read-write (null)	The message issued as part of the trigger actions. This property shall contain the message definition used to generate a Redfish event or a log entry as requested by the values of <code>TriggerActions</code>. For the possible property values, see <i>TriggerActionMessage</i> in Property details.

Property	Type	Attributes	Notes
TriggerActions []	array (string (enum))	<i>read-only</i>	The actions to perform when a trigger condition is met. - The actions that the trigger initiates. - This property shall contain the actions that the trigger initiates. <i>For the possible property values, see TriggerActions in Property details.</i>
TriggerEnabled (v1.4+)	boolean	<i>read-write (null)</i>	An indication of whether the trigger is enabled. This property shall indicate whether the trigger is enabled. If <code>true</code>, it is enabled. If <code>false</code>, it is disabled and none of the actions listed in <code>TriggerActions</code> will occur.
Wildcards [{	array		The wildcards and their substitution values for the entries in the <code>MetricProperties</code> array property. This property shall contain the wildcards and their substitution values for the entries in the <code>MetricProperties</code> array property. Each wildcard shall have a corresponding entry in this array property.
Name	string	<i>read-only (null)</i>	The wildcard. This property shall contain the string used as a wildcard when contained by curly braces for a URI segment in <code>MetricProperties</code>.
Values []	array (string, null)	<i>read-write</i>	An array of values to substitute for the wildcard. A single value of <code>*</code> matches all resources. This array property shall contain the list of values to substitute for the wildcard. A single value of <code>*</code> shall indicate that the wildcard matches any available values when substituted for a URI segment. If this property is not present, the value shall be assumed to be <code>*</code>.
}]			

6.145.4 Property details

6.145.4.1 Activation

The direction of crossing that activates this threshold.

- This property shall indicate the direction of crossing of the reading for this metric that activates the threshold.

string	Description
Decreasing	Value decreases below the threshold. This threshold is activated when the reading changes from a value higher than the threshold to a value lower than the threshold.
Disabled (v1.3+)	The threshold is disabled. This value shall indicate the threshold is disabled and no actions shall be taken as a result of the reading crossing the threshold value.
Either	Value crosses the threshold in either direction. This threshold is activated when either the <code>Increasing</code> or <code>Decreasing</code> conditions are met.
Increasing	Value increases above the threshold. This threshold is activated when the reading changes from a value lower than the threshold to a value higher than the threshold.

6.145.4.2 DiscreteTriggerCondition

The conditions for a discrete metric trigger.

- This property shall contain the conditions when a discrete metric triggers.

string	Description
Changed	A discrete trigger condition is met whenever the metric value changes.
Specified	A discrete trigger condition is met when the metric value becomes one of the values that the <code>DiscreteTriggers</code> property lists.

6.145.4.3 MetricType

The metric type of the trigger.

- This property shall contain the metric type of the trigger.

string	Description
Discrete	A discrete value trigger.
Numeric	A numeric value trigger.

6.145.4.4 Severity

The severity of the event message.

- This property shall contain the `Severity` property to be used in the event message.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

6.145.4.5 Threshold

A threshold definition for a metric.

Activation	string (enum)	read- write (null)	The direction of crossing that activates this threshold. This property shall indicate the direction of crossing of the reading for this metric that activates the threshold. <i>For the possible property values, see Activation in Property details.</i>
DwellTime	string (duration)	read- write (null)	The duration the metric value must violate the threshold before the threshold is activated. This property shall indicate the duration the metric value violates the threshold before the threshold is activated. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?</code>
Reading	number	read- write (null)	The threshold value. This property shall indicate the reading for this metric that activates the threshold. The value of the property shall use the same units as the <code>MetricProperties</code> property.

6.145.4.6 TriggerActionMessage

The message issued as part of the trigger actions.

- This property shall contain the message definition used to generate a Redfish event or a log entry as requested by the values of `TriggerActions`.

string	Description
ConnectionSpeed	<code>ConnectionSpeedLow</code> message from the Network Device Message Registry. This value shall indicate that messages generated in response to a trigger action shall utilize the <code>ConnectionSpeedLow</code> message from the Network Device Message Registry.
DriveMediaLife	<code>MediaLifeLeftLow</code> message from the Storage Device Message Registry. This value shall indicate that messages generated in response to a trigger action shall utilize the <code>MediaLifeLeftLow</code> message from the Storage Device Message Registry.
Telemetry	Messages from the Telemetry Message Registry. This value shall indicate that messages generated in response to a trigger action shall utilize messages from the Telemetry Message Registry. If this property is not supplied or supported, this value should be used as the default for this trigger.

6.145.4.7 TriggerActions

The actions to perform when a trigger condition is met.

- The actions that the trigger initiates.
 - This property shall contain the actions that the trigger initiates.

string	Description
LogToLogService	When a trigger condition is met, record in a log. This value indicates that when a trigger condition is met, the service shall log the occurrence of the condition to the log that the <code>LogService</code> property in the telemetry service resource describes. The message for the created log entry shall follow the guidance specified by the <code>TriggerActionMessage</code> property.
RedfishEvent	When a trigger condition is met, the service sends an event to subscribers. This value indicates that when a trigger condition is met, the service shall send an event to subscribers. The message key for the event shall follow the guidance specified by <code>TriggerActionMessage</code>.
RedfishMetricReport	When a trigger condition is met, force an update of the specified metric reports. This value indicates that when a trigger condition is met, the service shall force the metric reports managed by the metric report definitions specified by the <code>MetricReportDefinitions</code> property to be updated, regardless of the <code>MetricReportDefinitionType</code> property value. The actions specified in the <code>ReportActions</code> property of each <code>MetricReportDefinition</code> resource shall be performed.

6.145.5 Example response

```
{
  "@odata.type": "#Triggers.v1_4_0.Triggers",
  "Id": "PlatformPowerCapTriggers",
  "Name": "Triggers for platform power consumed",
  "MetricType": "Numeric",
  "TriggerActions": [
    "RedfishEvent"
  ],
  "NumericThresholds": {
    "UpperCritical": {
      "Reading": 50,
      "Activation": "Increasing",
      "DwellTime": "PT0.001S"
    },
    "UpperWarning": {
      "Reading": 48.1,
      "Activation": "Increasing",
      "DwellTime": "PT0.004S"
    }
  },
  "MetricProperties": [
    "/redfish/v1/Chassis/1/Power#/PowerControl/0/PowerConsumedWatts"
  ],
  "@odata.id": "/redfish/v1/TelemetryService/Triggers/PlatformPowerCapTriggers"
}
```

6.146 TrustedComponent 1.4.0

Version	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2025.2	2023.3	2023.2	2023.1	2022.2

6.146.1 Description

The `TrustedComponent` resource represents a trusted device, such as a TPM.

- This resource shall represent a trusted component in a Redfish implementation.

6.146.2 URIs

`/redfish/v1/Chassis/{ChassisId}/TrustedComponents/{TrustedComponentId}`

6.146.3 Properties

Property	Type	Attributes	Notes
Certificates {	object		The link to a collection of device identity certificates of the trusted component. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that contains device identity certificates of the trusted component. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
FirmwareVersion	string	<i>read-only (null)</i>	The software version of the active software image on the trusted component. This property shall contain a version number associated with the active software image on the trusted component.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
ActiveSoftwareImage {	object		The link to the software inventory resource that represents the active firmware image for this trusted component. This property shall contain a link to a resource of type <code>SoftwareInventory</code> that represents the active firmware image for this trusted component. See the <i>SoftwareInventory</i> schema for details on this property.
@odata.id	string	<i>read-write</i>	Link to a <i>SoftwareInventory</i> resource. See the Links section and the <i>SoftwareInventory</i> schema for details.
}			
ComponentIntegrity [{	array		An array of links to <i>ComponentIntegrity</i> resources for which the trusted component is responsible. This property shall contain an array of links to resources of type <code>ComponentIntegrity</code> that represent the communication established with the trusted component by other resources. The <code>TargetComponentURI</code> property in the referenced <code>ComponentIntegrity</code> resources shall reference this trusted component.
@odata.id	string	<i>read-only</i>	Link to a <i>ComponentIntegrity</i> resource. See the Links section and the <i>ComponentIntegrity</i> schema for details.

Property	Type	Attributes	Notes
}]			
ComponentsProtected [{	array		An array of links to resources that the target component protects. This property shall contain an array of links to resources whose integrity is measured or reported by the trusted component.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
IntegratedInto {	object		A link to a resource to which this trusted component is integrated. This property shall contain a link to a resource to which this trusted component is physically integrated. This property shall be present if <code>TrustedComponentType</code> contains <code>Integrated</code>.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
Owner (v1.2+) {	object		A link to the resource that owns this trusted component. This property shall contain a link to the resource that owns this trusted component. In the case of TPMs, particularly in multiple chassis implementations, this is the resource used to establish a new PCR.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
SoftwareImages [{	array		The images that are associated with this trusted component. This property shall contain an array of links to resources of type <code>SoftwareInventory</code> that represent the firmware images that apply to this trusted component.
@odata.id	string	<i>read-only</i>	Link to a <code>SoftwareInventory</code> resource. See the Links section and the <code>SoftwareInventory</code> schema for details.

Property	Type	Attributes	Notes
}]			
}			
Location (v1.4+) {}	object		The location of the trusted component. This property shall contain the location information of the trusted component. For property details, see Location.
Manufacturer	string	<i>read-only</i> (null)	The manufacturer of this trusted component. This property shall contain the name of the organization responsible for producing the trusted component. This organization may be the entity from whom the trusted component is purchased, but this is not necessarily true.
Model	string	<i>read-only</i> (null)	The model number of the trusted component. This property shall contain the name by which the manufacturer generally refers to the trusted component.
PartNumber	string	<i>read-only</i> (null)	The part number of the trusted component. This property shall contain a part number assigned by the organization that is responsible for producing or manufacturing the trusted component.
SerialNumber	string	<i>read-only</i> (null)	The serial number of the trusted component. This property shall contain a manufacturer-allocated number that identifies the trusted component.
SKU	string	<i>read-only</i> (null)	The SKU of the trusted component. This property shall contain the stock-keeping unit number for this trusted component.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

Property	Type	Attributes	Notes
TPM (v1.1+) {	object		TPM-specific information for this trusted component. This property shall contain TPM-specific information for this trusted component. This property shall only be present for TCG-defined TPM trusted components.
CapabilitiesVendorID (v1.1+)	string	read-only (null)	The capabilities vendor ID for this trusted component. This property shall contain an ASCII string of the 4-byte TCG-defined 'TPM Capabilities Vendor ID' for this trusted component.
HardwareInterfaceVendorID (v1.1+)	string	read-only (null)	The hardware interface vendor ID for this trusted component. This property shall contain the TCG-defined 'TPM Hardware Interface Vendor ID' for this trusted component with the most significant byte shown first. Pattern: <code>^0[xX]([0-9A-Fa-f]{2}){2}\$</code>
}			
TrustedComponentType	string (enum)	read-only required	The type of trusted component, such as any physical distinction about the trusted component. This property shall contain the type of trusted component. For the possible property values, see <i>TrustedComponentType</i> in <i>Property details</i> .
UUID	string (uuid)	read-only (null)	The UUID for this trusted component. This property shall contain a universally unique identifier number for the trusted component. Pattern: <code>^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\$</code>

6.146.4 Actions

6.146.4.1 TPMGetEventLog (v1.3+)

Description

This action retrieves the event log for TPM 2.0 devices.

- This action shall return the event log for TPM 2.0 devices.

Action URI

{Base URI of target resource}/Actions/TrustedComponent.TPMGetEventLog

Action parameters

This action takes no parameters.

Response Payload

{			
EventLog (v1.3+)	string	read-only required	The Base64-encoded event log for the TPM. This property shall contain a Base64-encoded string, with padding characters, of the entire event log defined in the 'Event Logging' section of the 'TCG PC Client Platform Firmware Profile Specification'.
Oem (v1.3+) {}	object		See the OEM object definition in the Using this guide clause.
}			

Response Example

```
{
  "@odata.type": "#TrustedComponent.v1_0_0.TPMGetEventLog",
  "EventLog": "EeAlkj89JWv9CbeGdm1PaARrrMw... TRUNCATED (TYPICALLY KB or MB)"
}
```

6.146.5 Property details

6.146.5.1 TrustedComponentType

The type of trusted component, such as any physical distinction about the trusted component.

- This property shall contain the type of trusted component.

string	Description
Discrete	A discrete trusted component. This value shall indicate that the entity has a well-defined physical boundary within the chassis.

string	Description
Integrated	An integrated trusted component. This value shall indicate that the entity is integrated into another device.

6.146.6 Example response

```
{
  "@odata.type": "#TrustedComponent.v1_4_0.TrustedComponent",
  "Id": "iRoT0",
  "UUID": "A3981CF9-576A-4335-A19F-B8CD7EC2821E",
  "Status": {
    "Health": "OK",
    "State": "Enabled"
  },
  "TrustedComponentType": "Integrated",
  "Certificates": {
    "@odata.id": "/redfish/v1/Chassis/1U/TrustedComponents/iRoT0/Certificates"
  },
  "Links": {
    "ComponentsProtected": [
      {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/Processors/CPU1"
      }
    ],
    "IntegratedInto": {
      "@odata.id": "/redfish/v1/Systems/437XR1138R2/Processors/CPU1"
    },
    "ComponentIntegrity": [
      {
        "@odata.id": "/redfish/v1/ComponentIntegrity/SS-SPDM-1"
      }
    ]
  },
  "@odata.id": "/redfish/v1/Chassis/1U/TrustedComponents/iRoT0"
}
```

6.147 UpdateService 1.16.0

Version	v1.16	v1.15	v1.14	v1.13	v1.12	v1.11	v1.10	v1.9	v1.8	v1.7	v1.6	...
Release	2025.2	2024.4	2024.1	2023.3	2023.2	2021.4	2021.2	2021.1	2019.4	2019.3	2019.2	...

6.147.1 Description

The `UpdateService` schema describes the update service and the properties for the service itself with links to collections of firmware and software inventory. The update service also provides methods for updating software and firmware of the resources in a Redfish service.

- This resource shall represent an update service and the properties that affect the service itself for a Redfish implementation.

6.147.2 URIs

/redfish/v1/UpdateService

6.147.3 Properties

Property	Type	Attributes	Notes
ClientCertificates (v1.10+) {	object		The link to a collection of client identity certificates provided to the server referenced by the <code>ImageURI</code> parameter in <code>SimpleUpdate</code>. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that represents the client identity certificates that are provided to the server referenced by the <code>ImageURI</code> parameter in <code>SimpleUpdate</code> as part of TLS handshaking. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
FirmwareInventory {	object		An inventory of firmware. This property shall contain a link to a resource collection of type <code>SoftwareInventoryCollection</code>. The resource collection should contain the set of software components generally referred to as platform firmware or that does not execute within a host operating system. Software in this collection is generally updated using platform-specific methods or utilities. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>SoftwareInventory</i> . See the SoftwareInventory schema for details.

Property	Type	Attributes	Notes
}			
HttpPushUri (v1.1+, deprecated v1.15)	string (URI)	read-only	The URI used to perform an HTTP or HTTPS push update to the update service. The format of the message is vendor-specific. This property shall contain a URI at which the update service supports an HTTP or HTTPS <code>POST</code> of a software image for the purpose of installing software contained within the image. Access to this URI shall require the same privilege as access to the update service. If the service requires the <code>Content-Length</code> header for <code>POST</code> requests to this URI, the service should return HTTP <code>411 Length Required</code> status code if the client does not include this header in the <code>POST</code> request. The value of this property should not contain a URI of a Redfish resource. See the 'Redfish-defined URIs and relative reference rules' clause in the Redfish Specification. <i>Deprecated in v1.15 and later. This property has been deprecated in favor of the <code>MultipartHttpPushUri</code> property.</i>
HttpPushUriOptions (v1.4+, deprecated v1.15) {	object		The options for <code>HttpPushUri</code>-provided software updates. This property shall contain options and requirements of the service for <code>HttpPushUri</code>-provided software updates. <i>Deprecated in v1.15 and later. This property has been deprecated in favor of the update parameters used with <code>MultipartHttpPushUri</code>-provided software updates.</i>
ForceUpdate (v1.11+)	boolean	read-write	An indication of whether the service should bypass update policies when applying the <code>HttpPushUri</code>-provided image. This property shall indicate whether the service should bypass update policies when applying the <code>HttpPushUri</code>-provided image, such as allowing a component to be downgraded. Services may contain update policies that are never bypassed, such as minimum version enforcement. If this property is not present, it shall be assumed to be <code>false</code>.
HttpPushUriApplyTime (v1.4+) {	object		The settings for when to apply <code>HttpPushUri</code>-provided firmware. This property shall contain settings for when to apply <code>HttpPushUri</code>-provided firmware.

Property	Type	Attributes	Notes
ApplyTime (v1.4+)	string (enum)	read-write	The time when to apply the <code>HttpPushUri</code> -provided software update. This property shall indicate the time when to apply the <code>HttpPushUri</code> -provided software update. <i>For the possible property values, see <code>ApplyTime</code> in Property details.</i>
MaintenanceWindowDurationInSeconds (v1.4+)	integer (seconds)	read-write	The expiry time, in seconds, of the maintenance window. This property shall indicate the end of the maintenance window as the number of seconds after the time specified by the <code>MaintenanceWindowStartTime</code> property. This property shall be required if the <code>HttpPushUriApplyTime</code> property value is <code>AtMaintenanceWindowStart</code> or <code>InMaintenanceWindowOnReset</code>.
MaintenanceWindowStartTime (v1.4+)	string (date-time)	read-write	The start time of a maintenance window. This property shall indicate the date and time when the service can start to apply the <code>HttpPushUri</code> -provided software as part of a maintenance window. This property shall be required if the <code>HttpPushUriApplyTime</code> property value is <code>AtMaintenanceWindowStart</code> or <code>InMaintenanceWindowOnReset</code>.
}			
}			
HttpPushUriOptionsBusy (v1.4+, deprecated v1.15)	boolean	read-write (null)	An indication of whether a client has reserved the <code>HttpPushUriOptions</code> properties for software updates. This property shall indicate whether a client uses the <code>HttpPushUriOptions</code> properties for software updates. When a client uses any <code>HttpPushUriOptions</code> properties for software updates, it should set this property to <code>true</code>. When a client no longer uses <code>HttpPushUriOptions</code> properties for software updates, it should set this property to <code>false</code>. This property can provide multiple clients a way to negotiate ownership of <code>HttpPushUriOptions</code> properties. Clients can use this property to determine whether another client uses <code>HttpPushUriOptions</code> properties for software updates. This property has no functional requirements for the service. <i>Deprecated in v1.15 and later. This property has been deprecated in favor of <code>MultipartHttpPushUri</code> -provided software updates.</i>

Property	Type	Attributes	Notes
HttpPushUriTargets (v1.2+, deprecated v1.15) []	array (URI) (string, null)	read-write	An array of URIs that indicate where to apply the update image. This property shall contain zero or more URIs that indicate where to apply the update image when using the <code>HttpPushUri</code> property to push a software image. These targets should correspond to software inventory instances or their related items. If this property is not present or contains no targets, the service shall apply the software image to all applicable targets, as determined by the service. If the target specifies a device resource, the software image file shall be applied to the specified device. If the target specifies a resource collection, the software image shall be applied to each applicable member of the specified collection. If the target resource specifies an <code>Aggregate</code> resource, the software image file shall be applied to each applicable element of the specified aggregate. If the target resource specifies a <code>ComputerSystem</code> resource, the software image file shall be applied to the applicable components within the specified computer system. <i>Deprecated in v1.15 and later. This property has been deprecated in favor of the update parameters used with <code>MultipartHttpPushUri</code> -provided software updates.</i>
HttpPushUriTargetsBusy (v1.2+, deprecated v1.15)	boolean	read-write (null)	An indication of whether any client has reserved the <code>HttpPushUriTargets</code> property. This property shall indicate whether any client has reserved the <code>HttpPushUriTargets</code> property for firmware updates. A client should set this property to <code>true</code> when it uses <code>HttpPushUriTargets</code> for firmware updates. A client should set it to <code>false</code> when it no longer uses <code>HttpPushUriTargets</code> for updates. The property can provide multiple clients a way to negotiate ownership of <code>HttpPushUriTargets</code> and helps clients determine whether another client is using <code>HttpPushUriTargets</code> to make firmware updates. This property has no functional requirements for the service. <i>Deprecated in v1.15 and later. This property has been deprecated in favor of <code>MultipartHttpPushUri</code> -provided software updates.</i>
MaxImageSizeBytes (v1.5+)	integer (bytes)	read-only (null)	The maximum size in bytes of the software update image that this service supports. This property shall indicate the maximum size of the software update image that clients can send to this update service.

Property	Type	Attributes	Notes
MultipartHttpPushUri (v1.6+)	string (URI)	<i>read-only</i>	The URI used to perform a Redfish Specification-defined multipart HTTP or HTTPS push update to the update service. This property shall contain a URI used to perform a Redfish Specification-defined multipart HTTP or HTTPS <code>POST</code> of a software image for the purpose of installing software contained within the image. The value of this property should not contain a URI of a Redfish resource. See the 'Redfish-defined URIs and relative reference rules' clause in the Redfish Specification.
PublicIdentitySSHKey (v1.13+) {	object		A link to the public key that is used with the <code>SimpleUpdate</code> action for the key-based authentication. The <code>GenerateSSHIdentityKeyPair</code> and <code>RemoveSSHIdentityKeyPair</code> are used to update the key for the <code>SimpleUpdate</code> action. This property shall contain a link to a resource of type <code>Key</code> that represents the public key that is used with the <code>SimpleUpdate</code> action for the key-based authentication. This property shall not be present if a key-pair is not available. See the <code>Key</code> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>Key</code> resource. See the Links section and the <code>Key</code> schema for details.
}			
RemoteServerCertificates (v1.9+) {	object		The link to a collection of server certificates for the server referenced by the <code>ImageURI</code> parameter in <code>SimpleUpdate</code>. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that represents the server certificates for the server referenced by the <code>ImageURI</code> parameter in <code>SimpleUpdate</code>. If <code>VerifyRemoteServerCertificate</code> is <code>true</code>, services shall compare the certificates in this collection with the certificate obtained during handshaking with the image server in order to verify the identity of the image server prior to transferring the image. If the server cannot be verified, the service shall not send the transfer request. If <code>VerifyRemoteServerCertificate</code> is <code>false</code>, the service shall not perform certificate verification with certificates in this collection. Regardless of the contents of this collection, services may perform additional verification based on other factors, such as the configuration of the <code>SecurityPolicy</code> resource. Contains a link to a resource.

Property	Type	Attributes	Notes
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
RemoteServerSSHKeys (v1.12+) {	object		The link to a collection of keys that can be used to authenticate the server referenced by the <code>ImageURI</code> parameter in <code>SimpleUpdate</code>. This property shall contain a link to a resource collection of type <code>KeyCollection</code> that represents the server SSH keys for the server referenced by the <code>ImageURI</code> Parameter in <code>SimpleUpdate</code>. If <code>VerifyRemoteServerSSHKey</code> is <code>true</code>, services shall compare the keys in this collection with the key obtained during handshaking with the image server in order to verify the identity of the image server prior to transferring the image. If the server cannot be verified, the service shall not send the transfer request. If <code>VerifyRemoteServerSSHKey</code> is <code>false</code>, the service shall not perform key verification with keys in this collection. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Key</i> . See the Key schema for details.
}			
ServiceEnabled	boolean	<i>read-write (null)</i>	An indication of whether this service is enabled. This property shall indicate whether this service is enabled.
SoftwareInventory {	object		An inventory of software. This property shall contain a link to a resource collection of type <code>SoftwareInventoryCollection</code>. The resource collection should contain the set of software components executed in the context of a host operating system. This can include device drivers, applications, or offload workloads. Software in this collection is generally updated using operating system-centric methods. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>SoftwareInventory</i> . See the SoftwareInventory schema for details.
}			

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
SupportedUpdateImageFormats (v1.13+) []	array (string (enum))	<i>read-only</i> (null)	- The image format types supported by the service. - This property shall contain the image format types supported by the service. For the possible property values, see <i>SupportedUpdateImageFormats</i> in Property details.
UpdateServiceCapabilities (v1.16+) {	object		A link to the capabilities of the update service. This property shall contain a link to a resource of type <code>UpdateServiceCapabilities</code> that contains the capabilities of the update service. See the <i>UpdateServiceCapabilities</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a <code>UpdateServiceCapabilities</code> resource. See the Links section and the <i>UpdateServiceCapabilities</i> schema for details.
}			
VerifyRemoteServerCertificate (v1.9+)	boolean	<i>read-write</i> (null)	An indication of whether the service will verify the certificate of the server referenced by the <code>ImageURI</code> parameter in <code>SimpleUpdate</code> prior to sending the transfer request. This property shall indicate whether the service will verify the certificate of the server referenced by the <code>ImageURI</code> parameter in <code>SimpleUpdate</code> prior to sending the transfer request with the certificates found in the collection referenced by the <code>RemoteServerCertificates</code> property. If this property is not supported by the service, it shall be assumed to be <code>false</code>. This property should default to <code>false</code> in order to maintain compatibility with older clients. Regardless of the value of this property, services may perform additional verification based on other factors, such as the configuration of the <code>SecurityPolicy</code> resource.

Property	Type	Attributes	Notes
VerifyRemoteServerSSHKey (v1.12+)	boolean	<i>read-write (null)</i>	An indication of whether the service will verify the SSH key of the server referenced by the <code>ImageURI</code> parameter in <code>SimpleUpdate</code> prior to sending the transfer request. This property shall indicate whether the service will verify the SSH key of the server referenced by the <code>ImageURI</code> parameter in <code>SimpleUpdate</code> prior to sending the transfer request with the keys found in the collection referenced by the <code>RemoteServerSSHKeys</code> property. If this property is not supported by the service, it shall be assumed to be <code>false</code>. This property should default to <code>false</code> in order to maintain compatibility with older clients.

6.147.4 Actions

6.147.4.1 Activate (v1.16+)

Description

This action activates specified software inventory instance.

- This action shall activate specified software inventory instance.

Action URI

{Base URI of target resource}/Actions/UpdateService.Activate

Action parameters

Parameter Name	Type	Attributes	Notes
Targets [{	array	<i>required</i>	The target software inventory instances to activate on staged devices. This parameter shall contain an array of target software inventory instances to activate on staged devices. The service shall activate each software image on all applicable devices.
@odata.id	string	<i>read-only</i>	Link to a SoftwareInventory resource. See the Links section and the <i>SoftwareInventory</i> schema for details.
}]			

Request Example

```

{
  "Targets": [
    {
      "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/BIOS-v120"
    },
    {
      "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/BMC-v990"
    }
  ]
}

```

6.147.4.2 GenerateSSHIdentityKeyPair (v1.13+)

Description

This action generates a new SSH identity key-pair to be used with the `UpdateService` resource. The generated public key is stored in the `Key` resource referenced by the `PublicIdentitySSHKey` property. Any existing key-pair is deleted and replaced by the new key-pair.

- This action shall generate a new SSH identity key-pair to be used with the `UpdateService` resource. The service shall store the generated public key in the `Key` resource referenced by the `PublicIdentitySSHKey` property. If the `UpdateService` resource already has an associated SSH identity key-pair, the service shall delete the key-pair and replace it with the new key-pair.

Action URI

{Base URI of target resource}/Actions/UpdateService.GenerateSSHIdentityKeyPair

Action parameters

Parameter Name	Type	Attributes	Notes
Curve	string (enum)	<i>optional</i>	The curve to use with the SSH key if the <code>KeyType</code> parameter contains <code>ECDSA</code>. This parameter shall contain the curve to use with the SSH key. This parameter shall be required if the <code>KeyType</code> parameter contains <code>ECDSA</code> and shall be rejected for other values. <i>For the possible property values, see Curve in Property details.</i>
KeyLength	integer	<i>optional</i>	The length of the SSH key, in bits, if the <code>KeyType</code> parameter contains <code>RSA</code>. This parameter shall contain the length of the SSH key, in bits. This parameter shall be required if the <code>KeyType</code> parameter contains <code>RSA</code> and shall be rejected for other values.

Parameter Name	Type	Attributes	Notes
KeyType	string (enum)	required	The type of SSH key. This parameter shall contain the type of SSH key. <i>For the possible property values, see KeyType in Property details.</i>

Request Example

```
{
  "KeyType": "Ed25519"
}
```

6.147.4.3 RemoveSSHIdentityKeyPair (v1.13+)

Description

This action removes the SSH identity key-pair used with the UpdateService resource.

- This action shall remove the private SSH identity key-pair used with the UpdateService resource.

Action URI

{Base URI of target resource}/Actions/UpdateService.RemoveSSHIdentityKeyPair

Action parameters

This action takes no parameters.

Request Example

```
{}
```

6.147.4.4 SimpleUpdate

Description

This action updates software components.

- This action shall update installed software components in a software image file located at an ImageURI parameter-specified URI.

Action URI

{Base URI of target resource}/Actions/UpdateService.SimpleUpdate

Action parameters

Parameter Name	Type	Attributes	Notes
ForceUpdate (v1.11+)	boolean	<i>optional</i>	An indication of whether the service should bypass update policies when applying the provided image. The default is <code>false</code>. This parameter shall indicate whether the service should bypass update policies when applying the provided image, such as allowing a component to be downgraded. Services may contain update policies that are never bypassed, such as minimum version enforcement. If the client does not provide this parameter, the service shall default this value to <code>false</code>.
ImageURI	string (URI)	<i>required</i>	The URI of the software image to install. This parameter shall contain an RFC3986-defined URI that links to a software image that the update service retrieves to install software in that image. This URI should contain a scheme that describes the transfer protocol. If the <code>TransferProtocol</code> parameter is absent or not supported, and a transfer protocol is not specified by a scheme contained within this URI, the service shall use HTTP to get the image.
Password (v1.4+)	string	<i>optional</i>	The password to access the URI specified by the <code>ImageURI</code> parameter. This parameter shall contain the password to access the URI specified by the <code>ImageURI</code> parameter.
Stage (v1.16+)	boolean	<i>optional</i>	An indication of whether the service stages the image on target devices for a client to activate at a later time. This parameter shall indicate whether the service stages the image on target devices for a client to activate at a later time with the <code>Activate</code> action on the <code>SoftwareInventory</code> resource. If the client does not provide this parameter, the service shall default this value to <code>false</code>.

Parameter Name	Type	Attributes	Notes
Targets (v1.2+) []	array (URI) (string)	<i>optional</i>	An array of URIs that indicate where to apply the update image. This parameter shall contain zero or more URIs that indicate where to apply the update image. These targets should correspond to software inventory instances or their related items. If this parameter is not present or contains no targets, the service shall apply the software image to all applicable targets, as determined by the service. If the target specifies a device resource, the software image file shall be applied to the specified device. If the target specifies a resource collection, the software image shall be applied to each applicable member of the specified collection. If the target resource specifies an <code>Aggregate</code> resource, the software image file shall be applied to each applicable element of the specified aggregate. If the target resource specifies a <code>ComputerSystem</code> resource, the software image file shall be applied to the applicable components within the specified computer system.
TransferProtocol	string (enum)	<i>optional</i>	The network protocol that the update service uses to retrieve the software image file located at the URI specified by the <code>ImageURI</code> parameter. This parameter is ignored if the URI provided in <code>ImageURI</code> contains a scheme. This parameter shall contain the network protocol that the update service shall use to retrieve the software image located at the URI specified by the <code>ImageURI</code> parameter. Services should ignore this parameter if the URI specified by the <code>ImageURI</code> parameter contains a scheme. If this parameter is not provided (or supported), and a transfer protocol is not specified by a scheme contained within this URI, the service shall use HTTP to retrieve the image. <i>For the possible property values, see TransferProtocol in Property details.</i>
Username (v1.4+)	string	<i>optional</i>	The username to access the URI specified by the <code>ImageURI</code> parameter. This parameter shall contain the username to access the URI specified by the <code>ImageURI</code> parameter.

Request Example

```
{
  "ImageURI": "https://images.contoso.org/bmc_0260_2021.bin"
}
```

6.147.4.5 StartUpdate (v1.7+)

Description

This action starts updating all images that have been previously invoked using an `OperationApplyTime` value of `OnStartUpdateRequest`.

- This action shall start an update of software component that have been scheduled with the `OperationApplyTime` value of `OnStartUpdateRequest` .

Action URI

{Base URI of target resource}/Actions/UpdateService.StartUpdate

Action parameters

This action takes no parameters.

6.147.5 Property details

6.147.5.1 ApplyTime

The time when to apply the `HttpPushUri` -provided software update.

- This property shall indicate the time when to apply the `HttpPushUri` -provided software update.

string	Description
AtMaintenanceWindowStart	Apply during an administrator-specified maintenance window. • This value shall indicate the <code>HttpPushUri</code> -provided software is applied during the maintenance window specified by the <code>MaintenanceWindowStartTime</code> and <code>MaintenanceWindowDurationInSeconds</code> properties. A service may perform resets during this maintenance window.
Immediate	Apply immediately. • This value shall indicate the <code>HttpPushUri</code> -provided software is applied immediately.
InMaintenanceWindowOnReset	Apply after a reset but within an administrator-specified maintenance window. • This value shall indicate the <code>HttpPushUri</code> -provided software is applied during the maintenance window specified by the <code>MaintenanceWindowStartTime</code> and <code>MaintenanceWindowDurationInSeconds</code> properties, and if a reset occurs within the maintenance window.
OnReset	Apply on a reset. • This value shall indicate the <code>HttpPushUri</code> -provided software is applied when the system or service is reset.
OnStartUpdateRequest (v1.11+)	Apply when the <code>StartUpdate</code> action of the update service is invoked. • This value shall indicate the <code>HttpPushUri</code> -provided software is applied when the <code>StartUpdate</code> action of the update service is invoked.

string	Description
OnTargetReset (v1.14+)	Apply when the target for the software update is reset. Targets include devices, services, and systems. This value shall indicate the <code>HttpPushUri</code>-provided software is applied when the target is reset.

6.147.5.2 Curve

The curve to use with the SSH key if the `KeyType` parameter contains `ECDSA`.

- This parameter shall contain the curve to use with the SSH key. This parameter shall be required if the `KeyType` parameter contains `ECDSA` and shall be rejected for other values.

string	Description
NISTB233	NIST B-233. This value shall indicate the 'nistb233' curve in RFC5656.
NISTB409	NIST B-409. This value shall indicate the 'nistb409' curve in RFC5656.
NISTK163	NIST K-163. This value shall indicate the 'nistk163' curve in RFC5656.
NISTK233	NIST K-233. This value shall indicate the 'nistk233' curve in RFC5656.
NISTK283	NIST K-283. This value shall indicate the 'nistk283' curve in RFC5656.
NISTK409	NIST K-409. This value shall indicate the 'nistk409' curve in RFC5656.
NISTP192	NIST P-192. This value shall indicate the 'nistp192' curve in RFC5656.
NISTP224	NIST P-224. This value shall indicate the 'nistp224' curve in RFC5656.

string	Description
NISTP256	NIST P-256. This value shall indicate the 'nistp256' curve in RFC5656.
NISTP384	NIST P-384. This value shall indicate the 'nistp384' curve in RFC5656.
NISTP521	NIST P-521. This value shall indicate the 'nistp521' curve in RFC5656.
NISTT571	NIST T-571. This value shall indicate the 'nistt571' curve in RFC5656.

6.147.5.3 KeyType

The type of SSH key.

- This parameter shall contain the type of SSH key.

string	Description
DSA	DSA. This value shall indicate an RFC4253-defined 'ssh-dss' key type.
ECDSA	ECDSA. This value shall indicate an RFC5656-defined ECDSA key type.
Ed25519	Ed25519. This value shall indicate an RFC8709-defined 'ssh-ed25519' key type.
RSA	RSA. This value shall indicate an RFC4253-defined 'ssh-rsa' key type.

6.147.5.4 SupportedUpdateImageFormats

- The image format types supported by the service.
 - This property shall contain the image format types supported by the service.

string	Description
PLDMv1_0	A PLDM for Firmware Update Specification v1.0 image. This value shall indicate an image that conforms to the v1.0 image format as defined in DMTF DSP0267.
PLDMv1_1	A PLDM for Firmware Update Specification v1.1 image. This value shall indicate an image that conforms to the v1.1 image format as defined in DMTF DSP0267.
PLDMv1_2	A PLDM for Firmware Update Specification v1.2 image. This value shall indicate an image that conforms to the v1.2 image format as defined in DMTF DSP0267.
PLDMv1_3	A PLDM for Firmware Update Specification v1.3 image. This value shall indicate an image that conforms to the v1.3 image format as defined in DMTF DSP0267.
UEFICapsule	The image conforms to the capsule format described in the UEFI Specification. This value shall indicate an image that conforms to the UEFI capsule format as defined in the UEFI Specification.
VendorDefined	A vendor-defined image. This value shall indicate a vendor-defined format.

6.147.5.5 TransferProtocol

The network protocol that the update service uses to retrieve the software image file located at the URI specified by the `ImageURI` parameter. This parameter is ignored if the URI provided in `ImageURI` contains a scheme.

- This parameter shall contain the network protocol that the update service shall use to retrieve the software image located at the URI specified by the `ImageURI` parameter. Services should ignore this parameter if the URI specified by the `ImageURI` parameter contains a scheme. If this parameter is not provided (or supported), and a transfer protocol is not specified by a scheme contained within this URI, the service shall use HTTP to retrieve the image.

string	Description
CIFS	Common Internet File System (CIFS).
FTP	File Transfer Protocol (FTP).

string	Description
HTTP	Hypertext Transfer Protocol (HTTP).
HTTPS	Hypertext Transfer Protocol Secure (HTTPS).
NFS (v1.3+)	Network File System (NFS).
NSF (<i>deprecated v1.3</i>)	Network File System (NFS). <i>Deprecated in v1.3 and later. This value has been deprecated in favor of NFS.</i>
OEM	A manufacturer-defined protocol.
SCP	Secure Copy Protocol (SCP).
SFTP (v1.1+)	SSH File Transfer Protocol (SFTP).
TFTP	Trivial File Transfer Protocol (TFTP).

6.147.6 Example response

```
{
  "@odata.type": "#UpdateService.v1_16_0.UpdateService",
  "Id": "UpdateService",
  "Name": "Update service",
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "HealthRollup": "OK"
  },
  "ServiceEnabled": true,
  "HttpPushUri": "/FWUpdate",
  "FirmwareInventory": {
    "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory"
  },
  "SoftwareInventory": {
    "@odata.id": "/redfish/v1/UpdateService/SoftwareInventory"
  },
  "Actions": {
    "#UpdateService.SimpleUpdate": {
      "target": "/redfish/v1/UpdateService/Actions/UpdateService.SimpleUpdate",
      "@Redfish.ActionInfo": "/redfish/v1/UpdateService/SimpleUpdateActionInfo"
    }
  },
  "@odata.id": "/redfish/v1/UpdateService"
}
```

6.148 UpdateServiceCapabilities 1.0.0

Version	v1.0
Release	2025.2

6.148.1 Description

The `UpdateServiceCapabilities` schema contains capabilities of the update service.

- This resource shall represent the update service capabilities for a Redfish implementation.

6.148.2 URIs

/redfish/v1/UpdateService/UpdateServiceCapabilities

6.148.3 Properties

Property	Type	Attributes	Notes
AllowableStaging []	array (string)	read-only	The allowable URIs that a client can specify in the <code>Targets</code> parameter for update requests when requesting to stage an image on target devices. • This property shall contain an array of the allowable URIs that a client can specify in the <code>Targets</code> parameter for <code>SimpleUpdate</code> or <code>MultipartHttpPushUri</code> update requests with <code>Stage</code> set to <code>true</code>.
AllowableTargets []	array (string)	read-only	The allowable URIs that a client can specify in the <code>Targets</code> parameter for update requests. • This property shall contain an array of the allowable URIs that a client can specify in the <code>Targets</code> parameter for <code>SimpleUpdate</code> or <code>MultipartHttpPushUri</code> update requests.

6.148.4 Example response

```
{
  "@odata.type": "#UpdateServiceCapabilities.v1_0_0.UpdateServiceCapabilities",
  "Id": "UpdateServiceCapabilities",
  "Name": "Update Service Capabilities",
```

```
    "AllowableTargets": [
      "/redfish/v1/Managers/BMC",
      "/redfish/v1/Systems/437XR1138R2"
    ],
    "AllowableStaging": [
      "/redfish/v1/Managers/BMC",
      "/redfish/v1/Systems/437XR1138R2"
    ],
    "@odata.id": "/redfish/v1/UpdateService/UpdateServiceCapabilities"
  }
```

6.149 USBController 1.0.1

Version	v1.0
Release	2021.1

6.149.1 Description

The `USBController` schema defines a Universal Serial Bus controller.

- This resource shall represent a USB controller in a Redfish implementation.

6.149.2 URIs

`/redfish/v1/Systems/{ComputerSystemId}/USBControllers/{USBControllerId}`

6.149.3 Properties

Property	Type	Attributes	Notes
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
PCleDevice {	object		A link to the PCIe device that represents this USB controller. This property shall contain a link to a resource of type <code>PCleDevice</code> that represents this USB controller. See the <i>PCleDevice</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a PCIeDevice resource. See the Links section and the <i>PCleDevice</i> schema for details.
}			
Processors [{	array		An array of links to the processors that can utilize this USB controller. This property shall contain an array of links to resources of type <code>Processor</code> that represent processors that can utilize this USB controller.
@odata.id	string	<i>read-only</i>	Link to a Processor resource. See the Links section and the <i>Processor</i> schema for details.
}]			
}			
Manufacturer	string	<i>read-only (null)</i>	The manufacturer of this USB controller. This property shall contain the name of the organization responsible for producing the USB controller. This organization may be the entity from which the USB controller is purchased, but this is not necessarily true.
Model	string	<i>read-only (null)</i>	The product model number of this USB controller. This property shall contain the manufacturer-provided model information of this USB controller.
PartNumber	string	<i>read-only (null)</i>	The part number for this USB controller. This property shall contain the manufacturer-provided part number for the USB controller.
Ports {	object		The ports of the USB controller. This property shall contain a link to a resource collection of type <code>PortCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Port</i> . See the Port schema for details.
}			

Property	Type	Attributes	Notes
SerialNumber	string	<i>read-only</i> (null)	The serial number for this USB controller. This property shall contain a manufacturer-allocated number that identifies the USB controller.
SKU	string	<i>read-only</i> (null)	The SKU for this USB controller. This property shall contain the SKU number for this USB controller.
SparePartNumber	string	<i>read-only</i> (null)	The spare part number of the USB controller. This property shall contain the spare part number of the USB controller.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

6.149.4 Example response

```
{
  "@odata.type": "#USBController.v1_0_1.USBController",
  "Id": "USB1",
  "Name": "Contoso USB Controller 1",
  "Manufacturer": "Contoso",
  "Model": "USBv3",
  "SKU": "80937",
  "SerialNumber": "2M220100SL",
  "PartNumber": "G37891",
  "SparePartNumber": "G37890",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "Ports": {
    "@odata.id": "/redfish/v1/Systems/1/USBControllers/USB1/Ports"
  },
  "Links": {
    "Processors": [
      {
        "@odata.id": "/redfish/v1/Systems/1/Processors/1"
      },
      {
        "@odata.id": "/redfish/v1/Systems/1/Processors/2"
      }
    ]
  }
}
```

```

    },
    "@odata.id": "/redfish/v1/Systems/1/USBControllers/USB1"
  }

```

6.150 VCATEntry 1.0.3

Version	v1.0
Release	2019.4

6.150.1 Description

The `VCATEntry` schema defines an entry in a Virtual Channel Action Table. A Virtual Channel is a mechanism used to create multiple, logical communication streams across a physical link.

- This resource shall represent an entry of Virtual Channel Action Table in a Redfish implementation.

6.150.2 URIs

```

/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/GenZ/REQ-VCAT/{VCATEntryId}
/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/GenZ/RSP-VCAT/{VCATEntryId}
/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/GenZ/VCAT/{VCATEntryId}
/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/VCAT/{VCATEntryId} (deprecated)
/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/REQ-VCAT/{VCATEntryId} (deprecated)
/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/RSP-VCAT/{VCATEntryId} (deprecated)
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/FabricAdapters/
{FabricAdapterId}/GenZ/REQ-VCAT/{VCATEntryId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/FabricAdapters/
{FabricAdapterId}/GenZ/RSP-VCAT/{VCATEntryId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/FabricAdapters/
{FabricAdapterId}/Ports/{PortId}/GenZ/VCAT/{VCATEntryId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/FabricAdapters/
{FabricAdapterId}/Ports/{PortId}/VCAT/{VCATEntryId} (deprecated)
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/FabricAdapters/
{FabricAdapterId}/REQ-VCAT/{VCATEntryId} (deprecated)
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/FabricAdapters/
{FabricAdapterId}/RSP-VCAT/{VCATEntryId} (deprecated)
/redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Ports/{PortId}/GenZ/VCAT/{VCATEntryId}
/redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Ports/{PortId}/VCAT/{VCATEntryId} (deprecated)
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/GenZ/REQ-

```

VCAT/{VCATEntryId}
 /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/GenZ/RSP-VCAT/{VCATEntryId}
 /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/GenZ/VCAT/{VCATEntryId}
 /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/VCAT/{VCATEntryId} (deprecated)
 /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/REQ-VCAT/{VCATEntryId} (deprecated)
 /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/RSP-VCAT/{VCATEntryId} (deprecated)
 /redfish/v1/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/GenZ/REQ-VCAT/{VCATEntryId}
 /redfish/v1/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/GenZ/RSP-VCAT/{VCATEntryId}
 /redfish/v1/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/GenZ/VCAT/{VCATEntryId}
 /redfish/v1/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}/VCAT/{VCATEntryId} (deprecated)
 /redfish/v1/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/REQ-VCAT/{VCATEntryId} (deprecated)
 /redfish/v1/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}/RSP-VCAT/{VCATEntryId} (deprecated)

6.150.3 Properties

Property	Type	Attributes	Notes
RawEntryHex	string	<i>read-write</i> (null)	The hexadecimal value of the Virtual Channel Action Table entries. This property shall contain the hexadecimal value of the Virtual Channel Action Table entries. The length of the hexadecimal value depends on the number of Virtual Channel Action entries supported by the component. Pattern: <code>^0[xX](([a-fA-F] [0-9])*)\$</code>
VCEntries [{	array		An array of entries of the Virtual Channel Action Table. This property shall contain an array of entries of the Virtual Channel Action Table. The length of the array depends on the number of Virtual Channel Action entries supported by the component.
Threshold	string	<i>read-write</i> (null)	The configured threshold. This property shall contain the Gen-Z Core Specification-defined 'TH' 7-bit threshold. Pattern: <code>^0[xX]([a-fA-F] [0-9]){2}\$</code>
VCMask	string	<i>read-write</i> (null)	The bits corresponding to the supported Virtual Channel. This property shall contain a 32-bit value where the bits correspond to a supported Virtual Channel. Pattern: <code>^0[xX](([a-fA-F] [0-9]){2}){4}\$</code>
}]			

6.150.4 Example response

```
{
  "@odata.type": "#VCATEntry.v1_0_3.VCATEntry",
  "Id": "0",
  "Name": "VCAT Entry 0",
  "Description": "Gen-Z Port 1 Virtual Channel Action Table Entry 0",
  "RawEntryHex": "0x123456",
  "VCEntries": [
    {
      "VCMask": "0x00000034",
      "Threshold": "0x12"
    },
    {
      "VCMask": "0x00000034",
      "Threshold": "0x12"
    },
    {
      "VCMask": "0x00000034",
      "Threshold": "0x12"
    },
    {
      "VCMask": "0x00000034",
      "Threshold": "0x12"
    }
  ],
  "@odata.id": "/redfish/v1/Fabrics/GenZ/Switches/Switch1/Ports/1/VCAT/0"
}
```

6.151 VirtualCXLSwitch 1.0.0

Version	v1.0
Release	2025.2

6.151.1 Description

The Virtual CXL Switch describes the virtual component with the CXL switch that is governed by a list of rules as prescribed in the CXL specification.

- This resource shall represent a VCS entity within a CXL switch. The CXL Specification contains the complete definition of a Virtual CXL Switch.

6.151.2 URIs

/redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/VCSs/{VirtualCXLSwitchId}

6.151.3 Properties

Property	Type	Attributes	Notes
HDMDecoders	integer	<i>read-only</i>	The number of HDM (Host Device Memory) decoders present in this Virtual CXL Switch.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Endpoints [{	array		The links to the endpoints designated for this Virtual CXL Switch. This property shall contain an array of links to resources of type <code>Endpoint</code> that represent the endpoints for this Virtual CXL Switch.
@odata.id	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}}			
Oem { }	object		See the OEM object definition in the Using this guide clause.
Port {	object		The link to the local upstream port of the switch that is physically connected to a host or another switch for this Virtual CXL Switch. This property shall contain a link to a resource of type <code>Port</code> that represents the local upstream port of the switch that is physically connected to a host or another switch for this Virtual CXL Switch. See the <i>Port</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Port resource. See the Links section and the <i>Port</i> schema for details.
}			
}			
Status { }	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
VCSId	string	<i>read-only</i>	The Virtual CXL Switch identifier. This property shall contain the identifier of the Virtual CXL Switch.

Property	Type	Attributes	Notes
VPPBs {	object		The link to the collection of vPPBs (Virtual PCI-to-PCI Bridges) for this Virtual CXL Switch. This property shall contain a link to a resource collection of type <code>VirtualPCI2PCIBridgeCollection</code>. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>VirtualPCI2PCIBridge</i> . See the VirtualPCI2PCIBridge schema for details.
}			

6.151.4 Example response

```
{
  "@odata.type": "#VirtualCXLSwitch.v1_0_0.VirtualCXLSwitch",
  "Id": "1",
  "Name": "Virtual CXL Switch 1",
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "HealthRollup": "OK"
  },
  "VCSId": "1",
  "HDMDecoders": 12,
  "VPPBs": {
    "@odata.id": "/redfish/v1/Fabrics/CXL/Switches/CXL/VCSs/1/VPPBs"
  },
  "Links": {
    "Endpoints": [
      {
        "@odata.id": "/redfish/v1/Fabrics/CXL/Endpoints/1"
      }
    ]
  },
  "@odata.id": "/redfish/v1/Fabrics/CXL/Switches/CXL/VCSs/1"
}
```

6.152 VirtualMedia 1.6.5

Version	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2022.3	2021.2	2021.1	2018.3	2017.3	2017.1	1.0

6.152.1 Description

The `VirtualMedia` schema contains properties related to the monitor and control of an instance of virtual media, such as a remote CD, DVD, or USB device. A manager for a system or device provides virtual media functionality.

- This resource shall represent a virtual media service for a Redfish implementation.

6.152.2 URIs

`/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/VirtualMedia/{VirtualMediaId}`

`/redfish/v1/Managers/{ManagerId}/VirtualMedia/{VirtualMediaId}` (deprecated)

`/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/VirtualMedia/{VirtualMediaId}`

`/redfish/v1/Systems/{ComputerSystemId}/VirtualMedia/{VirtualMediaId}`

6.152.3 Properties

Property	Type	Attributes	Notes
Certificates (v1.4+) {	object		The link to a collection of server certificates for the server referenced by the <code>Image</code> property. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that represents the server certificates for the server referenced by the <code>Image</code> property. If <code>VerifyCertificate</code> is <code>true</code>, services shall compare the certificates in this collection with the certificate obtained during handshaking with the image server in order to verify the identity of the image server prior to completing the remote media connection. If the server cannot be verified, the service shall not complete the remote media connection. If <code>VerifyCertificate</code> is <code>false</code>, the service shall not perform certificate verification with certificates in this collection. Regardless of the contents of this collection, services may perform additional verification based on other factors, such as the configuration of the <code>SecurityPolicy</code> resource. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <code>Certificate</code> . See the Certificate schema for details.
}			

Property	Type	Attributes	Notes
ClientCertificates (v1.5+) {	object		The link to a collection of client identity certificates provided to the server referenced by the <code>Image</code> property. This property shall contain a link to a resource collection of type <code>CertificateCollection</code> that represents the client identity certificates that are provided to the server referenced by the <code>Image</code> property as part of TLS handshaking. Contains a link to a resource.
@odata.id	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
ConnectedVia	string (enum)	<i>read-only</i> (null)	The current virtual media connection method. This property shall contain the current connection method from a client to the virtual media that this resource represents. <i>For the possible property values, see ConnectedVia in Property details.</i>
EjectPolicy (v1.6+)	string (enum)	<i>read-write</i> (null)	The ejection policy for the virtual media. This property shall contain the ejection policy for the virtual media. <i>For the possible property values, see EjectPolicy in Property details.</i>
EjectTimeout (v1.6+)	string (duration)	<i>read-write</i> (null)	Timeout value before the virtual media is automatically ejected. This property shall indicate the amount of time before virtual media is automatically ejected when <code>EjectPolicy</code> contains <code>Timed</code>. Pattern: <code>^P(\d+D)?(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?</code>
Image	string (URI)	<i>read-write</i> (null)	The URI of the location of the selected image. This property shall contain the URI of the media attached to the virtual media. This value may specify an absolute URI to remote media or a relative URI to media local to the implementation. A service may allow a relative URI to reference a SoftwareInventory resource. The value <code>null</code> shall indicate no image connection. If the URI specified by this property is not accessible, services should populate the <code>Conditions</code> property in <code>Status</code> with messages that describe the condition.
ImageName	string	<i>read-only</i> (null)	The current image name. This property shall contain the name of the image.
Inserted	boolean	<i>read-write</i> (null)	An indication of whether the media is mounted and visible to the host system. This property shall indicate whether the media is mounted and visible to the host system.

Property	Type	Attributes	Notes
MediaTypes []	array (string (enum))	<i>read-only</i>	- The media types supported as virtual media. - This property shall contain an array of the supported media types for this connection. <i>For the possible property values, see MediaTypes in Property details.</i>
Password (v1.3+)	string	<i>read-write (null)</i>	The password to access the URI specified by the <code>Image</code> property. The value is <code>null</code> in responses. This property shall contain the password to access the URI specified by the <code>Image</code> property. The value shall be <code>null</code> in responses.
Status (v1.4+) {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
TransferMethod (v1.3+)	string (enum)	<i>read-write (null)</i>	The transfer method to use with the image. This property shall describe how the image transfer occurs. <i>For the possible property values, see TransferMethod in Property details.</i>
TransferProtocolType (v1.3+)	string (enum)	<i>read-write (null)</i>	The network protocol to use with the URI specified by the <code>Image</code> property. This property shall contain network protocol to use with the URI specified by the <code>Image</code> property. <i>For the possible property values, see TransferProtocolType in Property details.</i>
UserName (v1.3+)	string	<i>read-write (null)</i>	The username to access the URI specified by the <code>Image</code> property. This property shall contain the username to access the URI specified by the <code>Image</code> property.
VerifyCertificate (v1.4+)	boolean	<i>read-write (null)</i>	An indication of whether the service will verify the certificate of the server referenced by the <code>Image</code> property prior to completing the remote media connection. This property shall indicate whether the service will verify the certificate of the server referenced by the <code>Image</code> property prior to completing the remote media connection with the certificates found in the collection referenced by the <code>Certificates</code> property. If this property is not supported by the service, it shall be assumed to be <code>false</code>. This property should default to <code>false</code> in order to maintain compatibility with older clients. Regardless of the value of this property, services may perform additional verification based on other factors, such as the configuration of the SecurityPolicy resource.
WriteProtected	boolean	<i>read-write (null)</i>	An indication of whether the media is write-protected. This property shall indicate whether the remote device media prevents writing to that media.

6.152.4 Actions

6.152.4.1 EjectMedia (v1.2+)

Description

This action detaches remote media from virtual media.

- This action shall detach the remote media from the virtual media. At the completion of the operation, inserted shall be set to `false` and the image name shall be cleared.

Action URI

{Base URI of target resource}/Actions/VirtualMedia.EjectMedia

Action parameters

This action takes no parameters.

6.152.4.2 InsertMedia (v1.2+)

Description

This action attaches remote media to virtual media.

- This action shall attach remote media to virtual media. Service should reject the request if the `Image` property in the resource does not contain `null`. Users are expected to eject media prior to inserting new media.

Action URI

{Base URI of target resource}/Actions/VirtualMedia.InsertMedia

Action parameters

Parameter Name	Type	Attributes	Notes
Image	string	required	The URI of the media to attach to the virtual media. • This parameter shall contain the URI of the media to be attached to the virtual media. This parameter may specify an absolute URI to remote media or a relative URI to media local to the implementation. A service may allow a relative URI to reference a <code>SoftwareInventory</code> resource. Services may reject this action if the URI is not accessible.

Parameter Name	Type	Attributes	Notes
Inserted	boolean	<i>optional</i>	An indication of whether the image is treated as mounted and visible to the host system upon completion of the action. The default is <code>true</code>. This parameter shall contain whether the image is treated as mounted and visible to the host system upon completion of the action. If the client does not provide this parameter, the service shall default this value to <code>true</code>.
Password (v1.3+)	string	<i>optional</i>	The password to access the URI specified by the <code>Image</code> parameter. This parameter shall contain the password to access the URI specified by the <code>Image</code> parameter.
TransferMethod (v1.3+)	string (enum)	<i>optional</i>	The transfer method to use with the image. This parameter shall contain the transfer method to use with the specified image URI. <i>For the possible property values, see TransferMethod in Property details.</i>
TransferProtocolType (v1.3+)	string (enum)	<i>optional</i>	The network protocol to use with the URI specified by the <code>Image</code> parameter. This parameter shall contain the network protocol to use with the URI specified by the <code>Image</code> parameter. <i>For the possible property values, see TransferProtocolType in Property details.</i>
UserName (v1.3+)	string	<i>optional</i>	The username to access the URI specified by the <code>Image</code> parameter. This parameter shall contain the username to access the URI specified by the <code>Image</code> parameter.
WriteProtected	boolean	<i>optional</i>	An indication of whether the remote media is treated as write-protected. The default is <code>true</code>. This parameter shall contain whether the remote media is treated as write-protected. If the client does not provide this parameter, the service shall default this value to <code>true</code>.

Request Example

```
{
  "Image": "https://192.168.1.225/boot_image.iso",
  "Inserted": true,
  "WriteProtected": true
}
```

6.152.5 Property details

6.152.5.1 ConnectedVia

The current virtual media connection method.

- This property shall contain the current connection method from a client to the virtual media that this resource represents.

string	Description
Applet	Connected to a client application.
NotConnected	No current connection.
Oem	Connected through an OEM-defined method.
URI	Connected to a URI location.

6.152.5.2 EjectPolicy

The ejection policy for the virtual media.

- This property shall contain the ejection policy for the virtual media.

string	Description
AfterUse	The virtual media ejection occurs after the media is used.
OnPowerOff	The virtual media ejection occurs during a system power or reset event.
Persistent	The virtual media mount information persists indefinitely.
Session	The virtual media ejection occurs when a session is terminated. The session might be outside the Redfish service.
Timed	The virtual media ejection occurs when a timer configured by the <code>EjectTimeout</code> property expires.

6.152.5.3 MediaTypes

- The media types supported as virtual media.
 - This property shall contain an array of the supported media types for this connection.

string	Description
CD	A CD-ROM format (ISO) image.
DVD	A DVD-ROM format image.
Floppy	A floppy disk image.
USBStick	An emulation of a USB storage device.

6.152.5.4 TransferMethod

The transfer method to use with the image.

- This parameter shall contain the transfer method to use with the specified image URI.

string	Description
Stream	Stream image file data from the source URI.
Upload	Upload the entire image file from the source URI to the service.

6.152.5.5 TransferProtocolType

The network protocol to use with the URI specified by the `Image` parameter.

- This parameter shall contain the network protocol to use with the URI specified by the `Image` parameter.

string	Description
CIFS	Common Internet File System (CIFS).
FTP	File Transfer Protocol (FTP).
HTTP	Hypertext Transfer Protocol (HTTP).
HTTPS	Hypertext Transfer Protocol Secure (HTTPS).
NFS	Network File System (NFS).
OEM	A manufacturer-defined protocol.
SCP	Secure Copy Protocol (SCP).
SFTP	SSH File Transfer Protocol (SFTP).

string	Description
TFTP	Trivial File Transfer Protocol (TFTP).

6.152.6 Example response

```
{
  "@odata.type": "#VirtualMedia.v1_6_5.VirtualMedia",
  "Id": "CD1",
  "Name": "Virtual CD",
  "MediaTypes": [
    "CD",
    "DVD"
  ],
  "Image": "redfish.dmtf.org/freeImages/freeOS.1.1.iso",
  "ImageName": "mymedia-read-only",
  "ConnectedVia": "Applet",
  "Inserted": true,
  "WriteProtected": false,
  "@odata.id": "/redfish/v1/Managers/BMC/VirtualMedia/CD1"
}
```

6.153 VirtualPCI2PCIBridge 1.0.0

Version	v1.0
Release	2025.2

6.153.1 Description

The `VirtualPCI2PCIBridge` schema describes Virtual PCI-to-PCI Bridge (vPPB) inside a CXL switch that is owned by the host.

- This resource shall represent a Virtual PCI-to-PCI Bridge (vPPB) inside a CXL switch that is host-owned. This can be bound to a port that is either disconnected, connected to a PCIe component, or connected to a CXL component.

6.153.2 URIs

`/redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/VCSS/{VirtualCXLSwitchId}/VPPBs/{VirtualPCI2PCIBridgeId}`

6.153.3 Properties

Property	Type	Attributes	Notes
BindingStatus	string (enum)	<i>read-only</i>	The binding status of the vPPB. This property shall contain the binding status of the vPPB. <i>For the possible property values, see BindingStatus in Property details.</i>
BoundLDId	integer	<i>read-only</i>	The identifier of the bound local logical device. This property shall contain the identifier of the bound local logical device bound to this vPPB. This property shall only be present if <code>BindingStatus</code> contains <code>BoundLD</code>.
BoundPBRId	integer	<i>read-only</i>	The identifier of the bound PBR. This property shall contain the identifier of PBR bound to this vPPB. This property shall only be present if <code>BindingStatus</code> contains <code>BoundPID</code>.
BoundPortId	integer	<i>read-only</i>	The physical port number of the bound port. This property shall contain the physical port number of the port bound to this vPPB. This property shall only be present if <code>BindingStatus</code> contains <code>BoundPhysicalPort</code> or <code>BoundLD</code>.
GCXLID	string	<i>read-only</i> (null)	The GCXLID for the CXL logical device bound to this vPPB. This property shall contain the globally unique CXL logical device identifier (GCXLID) for the CXL logical device that is bound to this vPPB. Pattern: <code>^([0-9A-Fa-f]{2}-){7}[0-9A-Fa-f]{2}:([0-9A-Fa-f]{4})\$</code>
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Endpoints [{	array		The links to the endpoints associated with this vPPB. This property shall contain an array of links to resources of type <code>Endpoint</code> that represent the endpoints associated with this vPPB.
@odata.id	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}]			
Oem { }	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
Port {	object	(null)	The link to the port associated with this vPPB. This property shall contain a link to a resource of type <code>Port</code> that represents the port associated with this vPPB. See the <i>Port</i> schema for details on this property.
@odata.id	string	read-write	Link to a Port resource. See the Links section and the <i>Port</i> schema for details.
}			
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.
VPPBId	string	read-only (null)	The Virtual PCI-PCI Bridge identifier. This property shall contain the identifier of the vPPB. This property shall contain the same value as the <code>Id</code> property.

6.153.4 Property details

6.153.4.1 BindingStatus

The binding status of the vPPB.

- This property shall contain the binding status of the vPPB.

string	Description
BoundLD	This vPPB is bound to a CXL logical device. This value shall indicate the CXL Specification-defined 'Bound LD' state for the vPPB.
BoundPhysicalPort	This vPPB is bound to a physical port. This value shall indicate the CXL Specification-defined 'Bound Physical Port' state for the vPPB.
BoundPID	This vPPB is bound to a PBR ID. This value shall indicate the CXL Specification-defined 'Bound PBR Id' state for the vPPB.

string	Description
Busy	Binding or unbinding is in progress for this vPPB. This value shall indicate the CXL Specification-defined 'Binding or Unbinding' state for the vPPB.
Unbound	This vPPB is in unbound state. This value shall indicate the CXL Specification-defined 'Unbound' state for the vPPB.

6.153.5 Example response

```
{
  "@odata.type": "#VirtualPCI2PCIBridge.v1_0_0.VirtualPCI2PCIBridge",
  "Id": "1",
  "Name": "vPPB 1",
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "HealthRollup": "OK"
  },
  "VPPBId": "1",
  "BindingStatus": "BoundLD",
  "BoundLDId": 6,
  "GCXLID": "4C-1D-96-FF-FE-DD-D8-35:0001",
  "Links": {
    "Endpoints": [
      {
        "@odata.id": "/redfish/v1/Fabrics/CXL/Endpoints/1"
      }
    ],
    "Port": {
      "@odata.id": "/redfish/v1/Fabrics/CXL/Switches/CXL/Ports/D3"
    }
  },
  "@odata.id": "/redfish/v1/Fabrics/CXL/Switches/CXL/VCSs/1/VPPBs/1"
}
```

6.154 VlanNetworkInterface 1.3.1 (deprecated)

Version	<i>v1.3 Deprecated</i>	<i>v1.2</i>	<i>v1.1</i>	<i>v1.0</i>
Release	2021.2	2020.4	2017.1	1.0

This schema has been deprecated and use in new implementations is discouraged except to retain compatibility with existing products. This schema has been deprecated in favor of using individual `EthernetInterface` resources to show VLAN information.

6.154.1 Description

The `VlanNetworkInterface` schema describes a VLAN network instance that is available on a manager, system, or other device.

- This resource contains information for a VLAN network instance that is available on a manager, system, or other device for a Redfish implementation.

6.154.2 URIs

```
/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/NetworkDeviceFunctions/
{NetworkDeviceFunctionId}/Ethernet/VLANs/{VlanNetworkInterfaceId} (deprecated)
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/EthernetInterfaces/{EthernetInterfaceId}/VLANs/
{VlanNetworkInterfaceId} (deprecated)
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/
EthernetInterfaces/{EthernetInterfaceId}/VLANs/{VlanNetworkInterfaceId} (deprecated)
/redfish/v1/Managers/{ManagerId}/EthernetInterfaces/{EthernetInterfaceId}/VLANs/{VlanNetworkInterfaceId}
(deprecated)
/redfish/v1/ResourceBlocks/{ResourceBlockId}/EthernetInterfaces/{EthernetInterfaceId}/VLANs/
{VlanNetworkInterfaceId} (deprecated)
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/EthernetInterfaces/
{EthernetInterfaceId}/VLANs/{VlanNetworkInterfaceId} (deprecated)
/redfish/v1/Systems/{ComputerSystemId}/EthernetInterfaces/{EthernetInterfaceId}/VLANs/{VlanNetworkInterfaceId}
(deprecated)
```

6.154.3 Properties

Property	Type	Attributes	Notes
VLANEnable	boolean	<i>read-write required on create (null)</i>	An indication of whether this VLAN is enabled for this interface. • This property shall indicate whether this VLAN is enabled for this interface.
VLANId	integer	<i>read-write required on create (null)</i>	The ID for this VLAN. • This property shall contain the ID for this VLAN.

Property	Type	Attributes	Notes
VLANPriority (v1.2+)	integer	<i>read-write</i> (<i>null</i>)	The priority for this VLAN. This property shall contain the priority for this VLAN.

6.154.4 Example response

```
{
  "@odata.type": "#VlanNetworkInterface.v1_3_1.VlanNetworkInterface",
  "Id": "1",
  "Name": "VLAN Network Interface",
  "Description": "System NIC 1 VLAN",
  "VLANEnable": true,
  "VLANId": 101,
  "@odata.id": "/redfish/v1/Systems/437XR1138R2/EthernetInterfaces/12446A3B0411/VLANs/1"
}
```

6.155 Volume 1.10.1

Version	v1.10	v1.9	v1.8	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2
Release	1.2.6	1.2.5	1.2.4	1.2.3	1.2.1	1.2.0	1.1.0	1.0.6a	1.0.5

6.155.1 Description

Volume contains properties used to describe a volume, virtual disk, LUN, or other logical storage entity for any system.

- This resource shall be used to represent a volume, virtual disk, logical disk, LUN, or other logical storage for a Redfish implementation.

6.155.2 URIs

```
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Volumes/{VolumeId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/
{StorageId}/Volumes/{VolumeId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Volumes/{VolumeId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Volumes/
{VolumeId}
```

```

/redfish/v1/Storage/{StorageId}/ConsistencyGroups/{ConsistencyGroupId}/Volumes/{VolumeId}
/redfish/v1/Storage/{StorageId}/FileSystems/{FileSystemId}/CapacitySources/{CapacitySourceId}/ProvidingVolumes/
{VolumeId}
/redfish/v1/Storage/{StorageId}/StoragePools/{StoragePoolId}/AllocatedVolumes/{VolumeId}
/redfish/v1/Storage/{StorageId}/StoragePools/{StoragePoolId}/CapacitySources/{CapacitySourceId}/
ProvidingVolumes/{VolumeId}
/redfish/v1/Storage/{StorageId}/Volumes/{VolumeId}
/redfish/v1/StorageServices/{StorageServiceId}/ConsistencyGroups/{ConsistencyGroupId}/Volumes/{VolumeId}
/redfish/v1/StorageServices/{StorageServiceId}/FileSystems/{FileSystemId}/CapacitySources/{CapacitySourceId}/
ProvidingVolumes/{VolumeId}
/redfish/v1/StorageServices/{StorageServiceId}/StoragePools/{StoragePoolId}/AllocatedVolumes/{VolumeId}
/redfish/v1/StorageServices/{StorageServiceId}/StoragePools/{StoragePoolId}/CapacitySources/{CapacitySourceId}/
ProvidingVolumes/{VolumeId}
/redfish/v1/StorageServices/{StorageServiceId}/Volumes/{VolumeId}
/redfish/v1/StorageServices/{StorageServiceId}/Volumes/{VolumeId}/CapacitySources/{CapacitySourceId}/
ProvidingVolumes/{ProvidingVolumeId}
/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/ConsistencyGroups/{ConsistencyGroupId}/Volumes/
{VolumeId}
/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/FileSystems/{FileSystemId}/CapacitySources/
{CapacitySourceId}/ProvidingVolumes/{VolumeId}
/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/StoragePools/{StoragePoolId}/AllocatedVolumes/
{VolumeId}
/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/StoragePools/{StoragePoolId}/CapacitySources/
{CapacitySourceId}/ProvidingVolumes/{VolumeId}
/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Volumes/{VolumeId}

```

6.155.3 Properties

Property	Type	Attributes	Notes
AccessCapabilities (v1.1+) []	array (string (enum))	<i>read-write</i> (null)	Values of StorageAccessCapability describe abilities to read or write storage. - Supported IO access capabilities. - Each entry shall specify a current storage access capability. <i>For the possible property values, see AccessCapabilities in Property details.</i>
AllocatedPools (v1.1+) {}	object		An array of references to StoragePools allocated from this Volume. The value of this property shall contain references to all storage pools allocated from this volume.

Property	Type	Attributes	Notes
ALUA (v1.10+) {	object	(null)	ALUA properties for this volume. This shall identify the ALUA properties for this volume.
ANAGroupId (v1.10+)	number	read-only (null)	The ANA group id for this volume. This shall contain the ANA group id for this volume.
}			
BlockSizeBytes	integer (bytes)	read-only (null)	The size of the smallest addressable unit (Block) of this volume in bytes. This property shall contain size of the smallest addressable unit of the associated volume.
Capacity (v1.1+)		read-write	Capacity utilization. Information about the utilization of capacity allocated to this storage volume.
CapacityBytes	integer (bytes)	read-write (null)	The size in bytes of this Volume. This property shall contain the size in bytes of the associated volume.
CapacitySources (v1.1+) [{	array		An array of space allocations to this volume. Fully or partially consumed storage from a source resource. Each entry provides capacity allocation information from a named source resource.
@odata.id	string (URI)	read-only	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
Compressed (v1.4+)	boolean	read-write (null)	Indicator of whether or not the Volume has compression enabled. This property shall contain a boolean indicator if the Volume is currently utilizing compression or not.

Property	Type	Attributes	Notes
Connections (v1.9+) [{	array		An array of references to Connections that includes this volume. The value of this property shall contain references to all Connections that include this volume.
@odata.id	string	<i>read-only</i>	Link to a Connection resource. See the Links section and the <i>Connection</i> schema for details.
}]			
Deduplicated (v1.4+)	boolean	<i>read-write (null)</i>	Indicator of whether or not the Volume has deduplication enabled. This property shall contain a boolean indicator if the Volume is currently utilizing deduplication or not.
DisplayName (v1.4+)	string	<i>read-write (null)</i>	A user-configurable string to name the volume. This property shall contain a user-configurable string to name the volume.
Encrypted	boolean	<i>read-write (null)</i>	Is this Volume encrypted. This property shall contain a boolean indicator if the Volume is currently utilizing encryption or not.
EncryptionTypes []	array (string (enum))	<i>read-write</i>	- The types of encryption used by this Volume. - This property shall contain the types of encryption used by this Volume. <i>For the possible property values, see EncryptionTypes in Property details.</i>
Identifiers [{ }]	array (object)		Any additional identifiers for a resource. - The Durable names for the volume. - This property shall contain a list of all known durable names for the associated volume. For property details, see Identifier.

Property	Type	Attributes	Notes
InitializeMethod (v1.6+)	string (enum)	<i>read-only (null)</i>	Indicates the Initialization Method used for this volume. If InitializeMethod is not specified, the InitializeMethod should be Foreground. This property shall indicate the initialization method used for this volume. If InitializeMethod is not specified, the InitializeMethod should be Foreground. This value reflects the most recently used Initialization Method, and may be changed using the Initialize Action. <i>For the possible property values, see InitializeMethod in Property details.</i>
IOPerfModeEnabled (v1.5+)	boolean	<i>read-write (null)</i>	Indicates the IO performance mode setting for the volume. This property shall indicate whether IO performance mode is enabled for the volume.
IOStatistics (v1.2+, deprecated v1.10) {}	object		Statistics for this volume. The value shall represent IO statistics for this volume. For property details, see IOStatistics v1.0.4). <i>Deprecated in v1.10 and later. This property is deprecated in favor of the IOStatistics property in VolumeMetrics.</i>
IsBootCapable (v1.7+)	boolean	<i>read-write (null)</i>	This property indicates whether or not the Volume contains a boot image and is capable of booting. This property shall indicate whether or not the Volume contains a boot image and is capable of booting. This property may be settable by an admin or client with visibility into the contents of the volume. This property should only be set to true when VolumeUsage is either not specified, or when VolumeUsage is set to Data or SystemData.
Links {	object		Contains references to other resources that are related to this resource. The Links property, as described by the Redfish Specification, shall contain references to resources that are related to, but not contained by (subordinate to), this resource.

Property	Type	Attributes	Notes
CacheDataVolumes (v1.6+) [{	array		A pointer to the data volumes this volume serves as a cache volume. This shall be a pointer to the cache data volumes this volume serves as a cache volume. The corresponding VolumeUsage property shall be set to CacheOnly when this property is used.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
CacheVolumeSource (v1.6+) {	object	(null)	A pointer to the cache volume source for this volume. This shall be a pointer to the cache volume source for this volume. The corresponding VolumeUsage property shall be set to Data when this property is used.
ClassOfService (v1.1+) {	object		The ClassOfService that this storage volume conforms to. This property shall contain a reference to the ClassOfService that this storage volume conforms to.
ClientEndpoints (v1.4+) [{	array		An array of references to the client Endpoints associated with this volume. The value of this property shall be references to the client Endpoints this volume is associated with.
@odata.id	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}]			
ConsistencyGroups (v1.4+) [{	array		An array of references to the ConsistencyGroups associated with this volume. The value of this property shall be references to the ConsistencyGroups this volume is associated with.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.

Property	Type	Attributes	Notes
}]			
Controllers (v1.9+) [{	array		An array of the Controllers associated with this volume. This parameter shall contain an array of the controllers (of type StorageController) associated with this volume. When the volume is of type NVMe, these may be both the physical and logical controller representations.
@odata.id	string	<i>read-only</i>	Link to a StorageController resource. See the Links section and the <i>StorageController</i> schema for details.
}]			
DedicatedSpareDrives (v1.2+) [{	array		An array of references to the drives which are dedicated spares for this volume. The value of this property shall be a reference to the resources that this volume is associated with and shall reference resources of type Drive. This property shall only contain references to Drive entities which are currently assigned as a dedicated spare and are able to support this Volume.
@odata.id	string	<i>read-write</i>	Link to a Drive resource. See the Links section and the <i>Drive</i> schema for details.
}]			
Drives [{	array		An array of references to the drives which contain this volume. This will reference Drives that either wholly or only partly contain this volume. The value of this property shall be a reference to the resources that this volume is associated with and shall reference resources of type Drive. This property shall only contain references to Drive entities which are currently members of the Volume, not hot spare Drives which are not currently a member of the volume.
@odata.id	string	<i>read-only</i>	Link to a Drive resource. See the Links section and the <i>Drive</i> schema for details.
}]			

Property	Type	Attributes	Notes
JournalingMedia (v1.5+) {}	object	(null)	A pointer to the Resource that serves as a journaling media for this volume. This shall be a pointer to the journaling media used for this Volume to address the write hole issue. Valid when WriteHoleProtectionPolicy property is set to 'Journaling'.
Oem {}	object		See the OEM object definition in the Using this guide clause.
OwningStorageResource (v1.5+) {	object		A pointer to the Storage resource that owns or contains this volume. This shall be a pointer to the Storage resource that owns or contains this volume. See the <i>Storage</i> schema for details on this property.
@odata.id	string	read-only	Link to a Storage resource. See the Links section and the <i>Storage</i> schema for details.
}			
OwningStorageService (v1.4+) {}	object		A pointer to the StorageService that owns or contains this volume. This shall be a pointer to the StorageService that owns or contains this volume.
ProvidingStoragePool (v1.10+) {}	object	(null)	The StoragePool resource that provides this volume resource. This property shall contain a pointer to the StoragePool resource that provides this volume resource.
ServerEndpoints (v1.4+) [{	array		An array of references to the server Endpoints associated with this volume. The value of this property shall be references to the server Endpoints this volume is associated with.
@odata.id	string	read-only	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}]			
SpareResourceSets (v1.3+) [{	array		An array of references to SpareResourceSets. Each referenced SpareResourceSet shall contain resources that may be utilized to replace the capacity provided by a failed resource having a compatible type.

Property	Type	Attributes	Notes
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
StorageGroups (v1.4+) [{	array		An array of references to the StorageGroups associated with this volume. The value of this property shall be references to the StorageGroups this volume is associated with.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
}			
LogicalUnitNumber (v1.4+)	integer	<i>read-only</i> (null)	Indicates the host-visible LogicalUnitNumber assigned to this Volume. This property shall contain host-visible LogicalUnitNumber assigned to this Volume. This property shall only be used when in a single connect configuration and no StorageGroup configuration is used.
LowSpaceWarningThresholdPercents (v1.1+) []	array (%) (integer, null)	<i>read-write</i>	Low space warning. Each time the following value is less than one of the values in the array the LOW_SPACE_THRESHOLD_WARNING event shall be triggered: Across all CapacitySources entries, percent = (SUM(AllocatedBytes) - SUM(ConsumedBytes))/SUM(AllocatedBytes).
Manufacturer (v1.1+)	string	<i>read-only</i> (null)	The manufacturer or OEM of this storage volume. This property shall contain a value that represents the manufacturer or implementer of the storage volume.
MaxBlockSizeBytes (v1.1+)	integer (bytes)	<i>read-only</i> (null)	Max Block size in bytes. This property shall contain size of the largest addressable unit of this storage volume.

Property	Type	Attributes	Notes
MediaSpanCount (v1.4+)	integer	<i>read-only</i> (null)	Indicates the number of media elements used per span in the secondary RAID for a hierarchical RAID type. This property shall indicate the number of media elements used per span in the secondary RAID for a hierarchical RAID type.
Metrics (v1.9+) {}	object		The link to the metrics for this volume. This property shall contain a link to a resource of type VolumeMetrics that specifies the metrics for this volume. IO metrics are reported in the IOStatistics property.
Model (v1.1+)	string	<i>read-only</i> (null)	The model number for this storage volume. The value is assigned by the manufacturer and shall represents a specific storage volume implementation.
NVMeNamespaceProperties (v1.5+) {	object	(null)	This property contains properties to use when Volume is used to describe an NVMe Namespace. This property shall contain properties to use when Volume is used to describe an NVMe Namespace.
FormattedLBASize (v1.5+)	string	<i>read-only</i> (null)	The LBA data size and metadata size combination that the namespace has been formatted with. This property shall contain the LBA data size and metadata size combination that the namespace has been formatted with. This is a 4-bit data structure.
IsShareable (v1.5+)	boolean	<i>read-write</i> (null)	Indicates the namespace is shareable. This property shall indicate whether the namespace is shareable.
LBAFormat (v1.9+) {	object	(null)	Describes the current LBA format ID and detailed properties. This property shall describe the current LBA format ID and corresponding detailed properties, such as the LBA data size and metadata size. Use the LBAFormats property to describe namespace capabilities in a collection capabilities annotation.
LBADataSizeBytes (v1.9+)	integer	<i>read-only</i> (null)	The LBA data size in bytes. This shall be the LBA data size reported in bytes.

Property	Type	Attributes	Notes
LBAFormatType (v1.9+)	string (enum)	<i>read-only</i> (null)	The LBA format type. This shall be the LBA format type. This property is intended for capabilities instrumentation. <i>For the possible property values, see LBAFormatType in Property details.</i>
LBAMetadataSizeBytes (v1.9+)	integer	<i>read-only</i> (null)	The LBA metadata size in bytes. This shall be the LBA metadata size reported in bytes.
RelativePerformance (v1.9+)	string (enum)	<i>read-only</i> (null)	The LBA Relative Performance type. This shall be the LBA Relative Performance type. This field indicates the relative performance of the LBA format indicated relative to other LBA formats supported by the controller. This property is intended for capabilities instrumentation. <i>For the possible property values, see RelativePerformance in Property details.</i>
}			
LBAFormats (v1.9+) [{	array		Describes the LBA format IDs and detailed properties. This property shall describe the LBA format IDs and corresponding detailed properties, such as the LBA data size and metadata size. This property is intended for use in a collection capabilities annotation. Use the LBAFormat property on an instance of a namespace.
LBADataSizeBytes (v1.9+)	integer	<i>read-only</i> (null)	The LBA data size in bytes. This shall be the LBA data size reported in bytes.
LBAFormatType (v1.9+)	string (enum)	<i>read-only</i> (null)	The LBA format type. This shall be the LBA format type. This property is intended for capabilities instrumentation. <i>For the possible property values, see LBAFormatType in Property details.</i>
LBAMetadataSizeBytes (v1.9+)	integer	<i>read-only</i> (null)	The LBA metadata size in bytes. This shall be the LBA metadata size reported in bytes.

Property	Type	Attributes	Notes
RelativePerformance (v1.9+)	string (enum)	<i>read-only</i> (null)	The LBA Relative Performance type. This shall be the LBA Relative Performance type. This field indicates the relative performance of the LBA format indicated relative to other LBA formats supported by the controller. This property is intended for capabilities instrumentation. <i>For the possible property values, see RelativePerformance in Property details.</i>
}}			
LBAFormatsSupported (v1.8+) []	array (string (enum))	<i>read-only</i> (null)	LBAFormatType is defined in the NVMe specification set. This field indicates the LBA data size supported; implementations may report up to 16 values. For more details refer to the appropriate NVMe specification. - A list of the LBA format types supported for the namespace, or potential namespaces. - This shall be a list of the LBA formats supported for the namespace, or potential namespaces. <i>For the possible property values, see LBAFormatsSupported in Property details.</i>
MetadataTransferredAtEndOfDataLBA (v1.5+)	boolean	<i>read-only</i> (null)	This property indicates whether or not the metadata is transferred at the end of the LBA creating an extended data LBA. This property shall indicate whether or not the metadata is transferred at the end of the LBA creating an extended data LBA.
NamespaceFeatures (v1.5+) {	object	(null)	This property contains a set of Namespace Features. This property shall contain a set of Namespace Features.
SupportsAtomicTransactionSize (v1.5+)	boolean	<i>read-only</i> (null)	Indicates that the NVM fields for Namespace preferred write granularity (NPWG), write alignment (NPWA), deallocate granularity (NPDG), deallocate alignment (NPDA) and optimal write size (NOWS) are defined for this namespace and should be used by the host for I/O optimization. This property shall indicate whether or not the NVM fields for Namespace preferred write granularity (NPWG), write alignment (NPWA), deallocate granularity (NPDG), deallocate alignment (NPDA) and optimal write size (NOWS) are defined for this namespace and should be used by the host for I/O optimization.

Property	Type	Attributes	Notes
SupportsDeallocatedOrUnwrittenLBEError (v1.5+)	boolean	<i>read-only</i> (null)	This property indicates that the controller supports deallocated or unwritten logical block error for this namespace. This property shall indicate that the controller supports deallocated or unwritten logical block error for this namespace.
SupportsIOPerformanceHints (v1.5+)	boolean	<i>read-only</i> (null)	Indicates that the Namespace Atomic Write Unit Normal (NAWUN), Namespace Atomic Write Unit Power Fail (NAWUPF), and Namespace Atomic Compare and Write Unit (NACWU) fields are defined for this namespace and should be used by the host for this namespace instead of the controller-level properties AWUN, AWUPF, and ACWU. This property shall indicate that the Namespace Atomic Write Unit Normal (NAWUN), Namespace Atomic Write Unit Power Fail (NAWUPF), and Namespace Atomic Compare and Write Unit (NACWU) fields are defined for this namespace and should be used by the host for this namespace instead of the controller-level properties AWUN, AWUPF, and ACWU.
SupportsNGUIDReuse (v1.5+)	boolean	<i>read-only</i> (null)	This property indicates that the namespace supports the use of an NGUID (namespace globally unique identifier) value. This property shall indicate that the namespace supports the use of an NGUID (namespace globally unique identifier) value.
SupportsThinProvisioning (v1.5+)	boolean	<i>read-only</i> (null)	This property indicates whether or not the NVMe Namespace supports thin provisioning. This property shall indicate whether or not the NVMe Namespace supports thin provisioning. Specifically, the namespace capacity reported may be less than the namespace size.
}			
NamespaceId (v1.5+)	string	<i>read-only</i> (null)	The NVMe Namespace Identifier for this namespace. This property shall contain the NVMe Namespace Identifier for this namespace. This property shall be a hex value. Namespace identifiers are not durable and do not have meaning outside the scope of the NVMe subsystem. NSID 0x0, 0xFFFFFFFF, 0xFFFFFFFFE are special purpose values. Pattern: <code>^0[xX](((a-fA-F) [0-9])*)\$</code>

Property	Type	Attributes	Notes
NamespaceType (v1.9+)	string (enum)	<i>read-only</i> (null)	Identifies the type of namespace. This shall identify the type of namespace. <i>For the possible property values, see NamespaceType in Property details.</i>
NumberLBAFormats (v1.5+)	integer (bytes)	<i>read-only</i> (null)	The number of LBA data size and metadata size combinations supported by this namespace. The value of this property is between 0 and 16. This property shall contain the number of LBA data size and metadata size combinations supported by this namespace. The value of this property is between 0 and 16. LBA formats with an index set beyond this value will not be supported.
NVMeVersion (v1.5+)	string	<i>read-only</i> (null)	The version of the NVMe Base Specification supported. This property shall contain the version of the NVMe Base Specification supported.
SupportsIOPerformanceHints (v1.10+)	boolean	<i>read-only</i> (null)	Indicates whether the namespace supports IO performance hints. This property shall indicate whether the namespace supports IO performance hints.
SupportsMultipleNamespaceAttachments (v1.10+)	boolean	<i>read-only</i> (null)	Indicates whether the namespace may be attached to two or more controllers. This property shall indicate whether the namespace may be attached to two or more controllers.
Type (v1.8+)	string (enum)	<i>read-only</i> (null)	Identifies the type of namespace. This shall identify the type of namespace. <i>For the possible property values, see Type in Property details.</i>
}			
Operations [{	array		The operations currently running on the Volume. This property shall contain a list of all currently running on the Volume.
AssociatedFeaturesRegistry {}	object		A reference to the task associated with the operation if any. This resource shall be used to represent a Feature registry for a Redfish implementation.

Property	Type	Attributes	Notes
Operation (v1.9+)	string (enum)	<i>read-only</i> (null)	The type of the operation. This property shall contain the type of the operation. <i>For the possible property values, see Operation in Property details.</i>
OperationName (deprecated v1.9)	string	<i>read-only</i> (null)	The name of the operation. <i>Deprecated in v1.9 and later. This property is deprecated in favor of the Operation property using the Operation enum.</i>
PercentageComplete	integer	<i>read-only</i> (null)	The percentage of the operation that has been completed.
}]			
OptimumIOSizeBytes	integer (bytes)	<i>read-only</i> (null)	The size in bytes of this Volume's optimum IO size. This property shall contain the optimum IO size to use when performing IO on this volume. For logical disks, this is the stripe size. For physical disks, this describes the physical sector size.
ProvisioningPolicy (v1.4+)	string (enum)	<i>read-write</i> (null)	This property specifies the volume's storage allocation, or provisioning policy. This property shall specify the volume's supported storage allocation policy. <i>For the possible property values, see ProvisioningPolicy in Property details.</i>
RAIDType (v1.3.1+)	string (enum)	<i>read-only</i> (null)	The RAID type of this volume. This property shall contain the RAID type of the associated Volume. <i>For the possible property values, see RAIDType in Property details.</i>
ReadCachePolicy (v1.4+)	string (enum)	<i>read-write</i> (null)	Indicates the read cache policy setting for the Volume. This property shall contain a boolean indicator of the read cache policy for the Volume. <i>For the possible property values, see ReadCachePolicy in Property details.</i>

Property	Type	Attributes	Notes
RecoverableCapacitySourceCount (v1.3+)	integer	<i>read-write</i> (null)	Current number of capacity source resources that are available as replacements. The value is the number of available capacity source resources currently available in the event that an equivalent capacity source resource fails.
RemainingCapacityPercent (v1.2+)	integer	<i>read-only</i> (null)	The percentage of the capacity remaining in the Volume. If present, this value shall return $\{[(\text{SUM}(\text{AllocatedBytes}) - \text{SUM}(\text{ConsumedBytes}))/\text{SUM}(\text{AllocatedBytes})]*100$ represented as an integer value.
RemoteReplicaTargets (v1.8+) []	array (string, null)	<i>read-only</i>	URIs to the resources that are remote target replicas of this source. The value shall reference the URIs to the remote target replicas that are sourced by this replica. Remote indicates that the replica is managed by a separate Swordfish service instance.
ReplicaInfo (v1.1+) {}	object		Describes this storage volume in its role as a target replica. This property shall describe the replica relationship between this storage volume and a corresponding source volume. For property details, see ReplicaInfo v1.4.0).
ReplicaTargets (v1.3+) [{	array		The resources that are target replicas of this source. The value shall reference the target replicas that are sourced by this replica.
@odata.id	string (URI)	<i>read-only</i>	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
ReplicationEnabled (v1.9+)	boolean	<i>read-write</i> (null)	Indicates whether or not replication is enabled on the volume. The property shall indicate whether or not replication is enabled on the volume. This property shall be consistent with the state reflected at the storage pool level.

Property	Type	Attributes	Notes
Status {}	object		The property contains the status of the Volume. The property shall contain the status of the Volume. For property details, see Status.
StorageGroups (v1.1+, deprecated v1.9) {}	object		An array of references to Storage Groups that includes this volume. The value of this property shall contain references to all storage groups that include this volume. <i>Deprecated in v1.9 and later. This property is deprecated in favor of the Connections property.</i>
StripSizeBytes (v1.4+)	integer (bytes)	read-write (null)	The number of blocks (bytes) in a strip in a disk array that uses striped data mapping. The number of consecutively addressed virtual disk blocks (bytes) mapped to consecutively addressed blocks on a single member extent of a disk array. Synonym for stripe depth and chunk size.
VolumeType	string (enum)	read-only (null)	The type of this volume. This property shall contain the type of the associated Volume. <i>For the possible property values, see VolumeType in Property details.</i>
VolumeUsage (v1.4+)	string (enum)	read-only (null)	Indicates the Volume usage type setting for the Volume. This property shall contain the volume usage type for the Volume. <i>For the possible property values, see VolumeUsage in Property details.</i>
WriteCachePolicy (v1.4+)	string (enum)	read-write (null)	Indicates the write cache policy setting for the Volume. This property shall contain a boolean indicator of the write cache policy for the Volume. <i>For the possible property values, see WriteCachePolicy in Property details.</i>
WriteCacheState (v1.4+)	string (enum)	read-only (null)	Indicates the WriteCacheState policy setting for the Volume. This property shall contain the WriteCacheState policy setting for the Volume. <i>For the possible property values, see WriteCacheState in Property details.</i>

Property	Type	Attributes	Notes
WriteHoleProtectionPolicy (v1.4+)	string (enum)	<i>read-write</i>	The policy that the RAID volume is using to address the write hole issue. This property specifies the policy that is enabled to address the write hole issue on the RAID volume. If no policy is enabled at the moment, this property shall be set to 'Off'. <i>For the possible property values, see WriteHoleProtectionPolicy in Property details.</i>

6.155.4 Actions

6.155.4.1 AssignReplicaTarget (v1.4+)

Description

This action is used to establish a replication relationship by assigning an existing volume to serve as a target replica for an existing source volume.

- This action shall be used to establish a replication relationship by assigning an existing volume to serve as a target replica for an existing source volume.

Action URI

{Base URI of target resource}/Actions/Volume.AssignReplicaTarget

Action parameters

Parameter Name	Type	Attributes	Notes
ReplicaType	string (enum)	<i>required</i>	The type of replica relationship to be created. This parameter shall contain the type of replica relationship to be created (e.g., Clone, Mirror, Snap). <i>For the possible property values, see ReplicaType in Property details.</i>
ReplicaUpdateMode	string (enum)	<i>required</i>	The replica update mode (synchronous vs asynchronous). This parameter shall specify the replica update mode. <i>For the possible property values, see ReplicaUpdateMode in Property details.</i>

Parameter Name	Type	Attributes	Notes
TargetVolume	string	<i>required</i>	The Uri to the existing target volume. This parameter shall contain the Uri to the existing target volume.

Request Example

```
{
  "ReplicaUpdateMode": "Synchronous",
  "TargetVolume": "/redfish/v1/Storage/1/ConsistencyGroup/CG_DB2",
  "ReplicaType": "Mirror"
}
```

6.155.4.2 ChangeRAIDLayout (v1.5+)

Description

Request system change the RAID layout of the volume.

- This action shall request the system to change the RAID layout of the volume. Depending on the combination of the submitted parameters, this could be changing the RAID type, changing the span count, changing the number of drives used by the volume, or another configuration change supported by the system. Note that usage of this action while online may potentially cause data loss if the available capacity is reduced.

Action URI

{Base URI of target resource}/Actions/Volume.ChangeRAIDLayout

Action parameters

Parameter Name	Type	Attributes	Notes
Drives [{	array	<i>optional</i>	An array of the drives to be used by the volume. This parameter shall contain an array of the drives to be used by the volume.
@odata.id	string	<i>read-only</i>	Link to a Drive resource. See the Links section and the <i>Drive</i> schema for details.
}]			

Parameter Name	Type	Attributes	Notes
MediaSpanCount	integer	optional	The requested number of media elements used per span in the secondary RAID for a hierarchical RAID type. This parameter shall contain the requested number of media elements used per span in the secondary RAID for a hierarchical RAID type.
RAIDType	string (enum)	optional	The requested RAID type for the volume. This parameter shall contain the requested RAID type for the volume. <i>For the possible property values, see RAIDType in Property details.</i>
StripSizeBytes	integer	optional	The number of blocks (bytes) requested for new strip size. This parameter shall contain the number of blocks (bytes) requested for the strip size.

Request Example

```
{
  "Drives": [
    {
      "@odata.id": "/redfish/v1/Chassis/1U/Drives/Bay1A"
    },
    {
      "@odata.id": "/redfish/v1/Chassis/1U/Drives/Bay2A"
    },
    {
      "@odata.id": "/redfish/v1/Chassis/1U/Drives/Bay3B"
    },
    {
      "@odata.id": "/redfish/v1/Chassis/1U/Drives/Bay4B"
    }
  ],
  "RAIDType": "RAID6"
}
```

6.155.4.3 CheckConsistency

Description

This action is used to force a check of the Volume's parity or redundant data to ensure it matches calculated values.

- This defines the name of the custom action supported on this resource.

Action URI

{Base URI of target resource}/Actions/Volume.CheckConsistency

Action parameters

This action takes no parameters.

6.155.4.4 CreateReplicaTarget (v1.4+)

Description

This action is used to create a new volume resource to provide expanded data protection through a replica relationship with the specified source volume.

- This action shall be used to create a new volume resource to provide expanded data protection through a replica relationship with the specified source volume.

Action URI

{Base URI of target resource}/Actions/Volume.CreateReplicaTarget

Action parameters

Parameter Name	Type	Attributes	Notes
ReplicaType	string (enum)	required	The type of replica relationship to be created. • This parameter shall contain the type of replica relationship to be created (e.g., Clone, Mirror, Snap). <i>For the possible property values, see ReplicaType in Property details.</i>
ReplicaUpdateMode	string (enum)	required	The replica update mode (synchronous vs asynchronous). • This parameter shall specify the replica update mode. <i>For the possible property values, see ReplicaUpdateMode in Property details.</i>
TargetStoragePool	string	required	The Uri to the existing target Storage Pool. • This parameter shall contain the Uri to the existing StoragePool in which to create the target volume.
VolumeName	string	optional	The Name for the new target volume. • This parameter shall contain the Name for the target volume.

Request Example


```
{
  "VolumeName": "Mirror of Volume 65",
  "ReplicaUpdateMode": "Synchronous",
  "TargetStoragePool": "/redfish/v1/Storage/1/StoragePools/PrimaryPool",
  "ReplicaType": "Mirror"
}
```

6.155.4.5 ForceEnable (v1.5+)

Description

Request system force the volume to an enabled state regardless of data loss.

- This action shall request the system to force the volume to enabled state regardless of data loss scenarios.

Action URI

{Base URI of target resource}/Actions/Volume.ForceEnable

Action parameters

This action takes no parameters.

6.155.4.6 Initialize (v1.5+)

Description

This action is used to prepare the contents of the volume for use by the system. If InitializeMethod is not specified in the request body, but the property InitializeMethod is specified, the property InitializeMethod value should be used. If neither is specified, the InitializeMethod should be Foreground.

- This defines the name of the custom action supported on this resource. If InitializeMethod is not specified in the request body, but the property InitializeMethod is specified, the property InitializeMethod value should be used. If neither is specified, the InitializeMethod should be Foreground.

Action URI

{Base URI of target resource}/Actions/Volume.Initialize

Action parameters

Parameter Name	Type	Attributes	Notes
InitializeMethod	string (enum)	<i>optional</i>	The type of initialization to be performed. This defines the property name for the action. <i>For the possible property values, see InitializeMethod in Property details.</i>
InitializeType	string (enum)	<i>optional</i>	The type of initialization to be performed. This defines the property name for the action. <i>For the possible property values, see InitializeType in Property details.</i>

Request Example

```
{  
  "InitializeMethod": "Background",  
  "InitializeType": "Fast"  
}
```

6.155.4.7 RemoveReplicaRelationship (v1.4+)

Description

This action is used to disable data synchronization between a source and target volume, remove the replication relationship, and optionally delete the target volume.

- This action shall be used to disable data synchronization between a source and target volume, remove the replication relationship, and optionally delete the target volume.

Action URI

{Base URI of target resource}/Actions/Volume.RemoveReplicaRelationship

Action parameters

Parameter Name	Type	Attributes	Notes
DeleteTargetVolume	boolean	<i>optional</i>	Indicate whether or not to delete the target volume as part of the operation. This parameter shall indicate whether or not to delete the target volume as part of the operation. If not defined, the system should use its default behavior.

Parameter Name	Type	Attributes	Notes
TargetVolume	string	required	The Uri to the existing target volume. This parameter shall contain the Uri to the existing target volume.

Request Example

```
{
  "TargetVolume": "/redfish/v1/Storage/1/StoragePools/PrimaryPool/AllocatedVolumes/650973452245",
  "DeleteTargetVolume": "false"
}
```

6.155.4.8 ResumeReplication (v1.4+)

Description

This action is used to resume the active data synchronization between a source and target volume, without otherwise altering the replication relationship.

- This action shall be used to resume the active data synchronization between a source and target volume, without otherwise altering the replication relationship.

Action URI

{Base URI of target resource}/Actions/Volume.ResumeReplication

Action parameters

Parameter Name	Type	Attributes	Notes
TargetVolume	string	required	The Uri to the existing target volume. This parameter shall contain the Uri to the existing target volume.

Request Example

```
{
  "TargetVolume": "/redfish/v1/Storage/1/StoragePools/PrimaryPool/AllocatedVolumes/650973452245"
}
```

6.155.4.9 ReverseReplicationRelationship (v1.4+)

Description

This action is used to reverse the replication relationship between a source and target volume.

- This action shall be used to reverse the replication relationship between a source and target volume.

Action URI

{Base URI of target resource}/Actions/Volume.ReverseReplicationRelationship

Action parameters

Parameter Name	Type	Attributes	Notes
TargetVolume	string	required	The Uri to the existing target volume. • This parameter shall contain the Uri to the existing target volume.

Request Example

```
{
  "TargetVolume": "/redfish/v1/Storage/1/StoragePools/PrimaryPool/AllocatedVolumes/650973452245"
}
```

6.155.4.10 SplitReplication (v1.4+)

Description

This action is used to split the replication relationship and suspend data synchronization between a source and target volume.

- This action shall be used to split the replication relationship and suspend data synchronization between a source and target volume.

Action URI

{Base URI of target resource}/Actions/Volume.SplitReplication

Action parameters

Parameter Name	Type	Attributes	Notes
TargetVolume	string	<i>required</i>	The Uri to the existing target volume. This parameter shall contain the Uri to the existing target volume.

Request Example

```
{
  "TargetVolume": "/redfish/v1/Storage/1/StoragePools/PrimaryPool/AllocatedVolumes/650973452245"
}
```

6.155.4.11 SuspendReplication (v1.4+)

Description

This action is used to suspend active data synchronization between a source and target volume, without otherwise altering the replication relationship.

- This action shall be used to suspend active data synchronization between a source and target volume, without otherwise altering the replication relationship.

Action URI

{Base URI of target resource}/Actions/Volume.SuspendReplication

Action parameters

Parameter Name	Type	Attributes	Notes
TargetVolume	string	<i>required</i>	The Uri to the existing target volume. This parameter shall contain the Uri to the existing target volume.

Request Example

```
{
  "TargetVolume": "/redfish/v1/Storage/1/StoragePools/PrimaryPool/AllocatedVolumes/650973452245"
}
```

6.155.5 Property details

6.155.5.1 AccessCapabilities

Values of StorageAccessCapability describe abilities to read or write storage.

- Supported IO access capabilities.
 - Each entry shall specify a current storage access capability.

string	Description
Append	AppendOnly. This enumeration literal shall indicate that the storage may be written only to append.
Execute	Execute access is allowed by the file share. This value shall indicate that Execute access is allowed by the file share.
Read	Read. This enumeration literal shall indicate that the storage may be read.
Streaming	Streaming. This enumeration literal shall indicate that the storage may be read sequentially.
Write	Write Many. This enumeration literal shall indicate that the storage may be written multiple times.
WriteOnce	WriteOnce. This enumeration literal shall indicate that the storage may be written only once.

6.155.5.2 EncryptionTypes

- The types of encryption used by this Volume.
 - This property shall contain the types of encryption used by this Volume.

string	Description
ControllerAssisted	The volume is being encrypted by the storage controller entity.
NativeDriveEncryption	The volume is utilizing the native drive encryption capabilities of the drive hardware.

string	Description
SoftwareAssisted	The volume is being encrypted by software running on the system or the operating system.

6.155.5.3 idRef

@odata.id	string (URI)	read-only	The unique identifier for a resource. The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.

6.155.5.4 InitializeMethod

The type of initialization to be performed.

- This defines the property name for the action.

string	Description
Background	The volume will be available for use immediately, with data erasure and preparation to happen as background tasks.
Foreground	Data erasure and preparation tasks will complete before the volume is presented as available for use.
Skip	The volume will be available for use immediately, with no preparation.

6.155.5.5 InitializeType

The type of initialization to be performed.

- This defines the property name for the action.

string	Description
Fast	The volume is prepared for use quickly, typically by erasing just the beginning and end of the space so that partitioning can be performed.
Slow	The volume is prepared for use slowly, typically by completely erasing the volume.

6.155.5.6 LBAFormatsSupported

LBAFormatType is defined in the NVMe specification set. This field indicates the LBA data size supported; implementations may report up to 16 values. For more details refer to the appropriate NVMe specification.

- A list of the LBA format types supported for the namespace, or potential namespaces.
 - This shall be a list of the LBA formats supported for the namespace, or potential namespaces.

string	Description
LBAFormat0	LBAFormat0 is a required type. Indicates the LBA data size supported.
LBAFormat1	Indicates the LBA data size if supported.
LBAFormat10	Indicates the LBA data size supported if supported.
LBAFormat11	Indicates the LBA data size supported if supported.
LBAFormat12	Indicates the LBA data size supported if supported.
LBAFormat13	Indicates the LBA data size supported if supported.
LBAFormat14	Indicates the LBA data size supported if supported.
LBAFormat15	Indicates the LBA data size supported if supported.
LBAFormat2	Indicates the LBA data size supported if supported.
LBAFormat3	Indicates the LBA data size supported if supported.
LBAFormat4	Indicates the LBA data size supported if supported.
LBAFormat5	Indicates the LBA data size supported if supported.
LBAFormat6	Indicates the LBA data size supported if supported.
LBAFormat7	Indicates the LBA data size supported if supported.
LBAFormat8	Indicates the LBA data size supported if supported.
LBAFormat9	Indicates the LBA data size supported if supported.

6.155.5.7 LBAFormatType

The LBA format type.

- This shall be the LBA format type. This property is intended for capabilities instrumentation.

string	Description
LBAFormat0	LBAFormat0 is a required type. Indicates the LBA data size supported.
LBAFormat1	Indicates the LBA data size if supported.
LBAFormat10	Indicates the LBA data size supported if supported.
LBAFormat11	Indicates the LBA data size supported if supported.
LBAFormat12	Indicates the LBA data size supported if supported.
LBAFormat13	Indicates the LBA data size supported if supported.
LBAFormat14	Indicates the LBA data size supported if supported.
LBAFormat15	Indicates the LBA data size supported if supported.
LBAFormat2	Indicates the LBA data size supported if supported.
LBAFormat3	Indicates the LBA data size supported if supported.
LBAFormat4	Indicates the LBA data size supported if supported.
LBAFormat5	Indicates the LBA data size supported if supported.
LBAFormat6	Indicates the LBA data size supported if supported.
LBAFormat7	Indicates the LBA data size supported if supported.
LBAFormat8	Indicates the LBA data size supported if supported.
LBAFormat9	Indicates the LBA data size supported if supported.

6.155.5.8 NamespaceType

Identifies the type of namespace.

- This shall identify the type of namespace.

string	Description
Block	The namespace is configured for use with a block storage interface.
Computational	The namespace is configured for use with a computational storage interface.
KeyValue	The namespace is configured for use with a KeyValue interface.
ZNS	The namespace is configured for use with a zoned storage interface.

6.155.5.9 Operation

The type of the operation.

- This property shall contain the type of the operation.

string	Description
ChangeRAIDType	A ChangeRAIDType operation is being performed.
ChangeStripSize	A ChangeStripSize operation is being performed.
CheckConsistency	A CheckConsistency operation is being performed.
Compress	A Compress operation is being performed.
Decrypt	A Decrypt operation is being performed.
Deduplicate	A Deduplicate operation is being performed.
Delete	A Delete operation is being performed.
Encrypt	An Encrypt operation is being performed.
Format	A Format operation is being performed.
Initialize	An Initialize operation is being performed.
Rebuild	A Rebuild operation is being performed.
Replicate	A Replicate operation is being performed.
Resize	A Resize operation is being performed.
Sanitize	A Sanitize operation is being performed.

6.155.5.10 ProvisioningPolicy

This property specifies the volume's storage allocation, or provisioning policy.

- This property shall specify the volume's supported storage allocation policy.

string	Description
Fixed	Storage is fully allocated. • This enumeration literal specifies storage shall be fully allocated.

string	Description
Thin	Storage may be over allocated. This enumeration literal specifies storage may be over allocated.

6.155.5.11 RAIDType

The requested RAID type for the volume.

- This parameter shall contain the requested RAID type for the volume.

string	Description
None	A placement policy with no redundancy at the device level.
RAID0	A placement policy where consecutive logical blocks of data are uniformly distributed across a set of independent storage devices without offering any form of redundancy. A placement policy where consecutive logical blocks of data are uniformly distributed across a set of independent storage devices without offering any form of redundancy. This is commonly referred to as data striping. This form of RAID will encounter data loss with the failure of any storage device in the set.
RAID00	A placement policy that creates a RAID 0 stripe set over two or more RAID 0 sets. A placement policy that creates a RAID 0 stripe set over two or more RAID 0 sets. This is commonly referred to as RAID 0+0. This form of data layout is not fault tolerant; if any storage device fails there will be data loss.
RAID01	A data placement policy that creates a mirrored device (RAID 1) over a set of striped devices (RAID 0). A data placement policy that creates a mirrored device (RAID 1) over a set of striped devices (RAID 0). This is commonly referred to as RAID 0+1 or RAID 0/1. Data stored using this form of RAID is able to survive a single RAID 0 data set failure without data loss.
RAID1	A placement policy where each logical block of data is stored on more than one independent storage device. A placement policy where each logical block of data is stored on more than one independent storage device. This is commonly referred to as mirroring. Data stored using this form of RAID is able to survive a single storage device failure without data loss.
RAID10	A placement policy that creates a striped device (RAID 0) over a set of mirrored devices (RAID 1). A placement policy that creates a striped device (RAID 0) over a set of mirrored devices (RAID 1). This is commonly referred to as RAID 1/0. Data stored using this form of RAID is able to survive storage device failures in each RAID 1 set without data loss.

string	Description
RAID10E	A placement policy that uses a RAID 0 stripe set over two or more RAID 10 sets. A placement policy that uses a RAID 0 stripe set over two or more RAID 10 sets. This is commonly referred to as Enhanced RAID 10. Data stored using this form of RAID is able to survive a single device failure within each nested RAID 1 set without data loss.
RAID10Triple	A placement policy that uses a striped device (RAID 0) over a set of triple mirrored devices (RAID 1Triple). A placement policy that uses a striped device (RAID 0) over a set of triple mirrored devices (RAID 1Triple). This form of RAID can survive up to two failures in each triple mirror set without data loss.
RAID1E	A placement policy that uses a form of mirroring implemented over a set of independent storage devices where logical blocks are duplicated on a pair of independent storage devices so that data is uniformly distributed across the storage devices. A placement policy that uses a form of mirroring implemented over a set of independent storage devices where logical blocks are duplicated on a pair of independent storage devices so that data is uniformly distributed across the storage devices. This is commonly referred to as RAID 1 Enhanced. Data stored using this form of RAID is able to survive a single storage device failure without data loss.
RAID1Triple	A placement policy where each logical block of data is mirrored three times across a set of three independent storage devices. A placement policy where each logical block of data is mirrored three times across a set of three independent storage devices. This is commonly referred to as three-way mirroring. This form of RAID can survive two device failures without data loss.
RAID3	A placement policy using parity-based protection where logical bytes of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. A placement policy using parity-based protection where logical bytes of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. Data stored using this form of RAID is able to survive a single storage device failure without data loss. If the storage devices use rotating media, they are assumed to be rotationally synchronized, and the data stripe size should be no larger than the exported block size.
RAID4	A placement policy using parity-based protection where logical blocks of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. A placement policy using parity-based protection where logical blocks of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. Data stored using this form of RAID is able to survive a single storage device failure without data loss.

string	Description
RAID5	A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and one logical block of parity across a set of 'n+1' independent storage devices where the parity and data blocks are interleaved across the storage devices. A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and one logical block of parity across a set of 'n+1' independent storage devices where the parity and data blocks are interleaved across the storage devices. Data stored using this form of RAID is able to survive a single storage device failure without data loss.
RAID50	A placement policy that uses a RAID 0 stripe set over two or more RAID 5 sets of independent storage devices. A placement policy that uses a RAID 0 stripe set over two or more RAID 5 sets of independent storage devices. Data stored using this form of RAID is able to survive a single storage device failure within each RAID 5 set without data loss.
RAID6	A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and two logical blocks of independent parity across a set of 'n+2' independent storage devices where the parity and data blocks are interleaved across the storage devices. A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and two logical blocks of independent parity across a set of 'n+2' independent storage devices where the parity and data blocks are interleaved across the storage devices. Data stored using this form of RAID is able to survive any two independent storage device failures without data loss.
RAID60	A placement policy that uses a RAID 0 stripe set over two or more RAID 6 sets of independent storage devices. A placement policy that uses a RAID 0 stripe set over two or more RAID 6 sets of independent storage devices. Data stored using this form of RAID is able to survive two device failures within each RAID 6 set without data loss.
RAID6TP	A placement policy that uses parity-based protection for storing stripes of 'n' logical blocks of data and three logical blocks of independent parity across a set of 'n+3' independent storage devices where the parity and data blocks are interleaved across the storage devices. A placement policy that uses parity-based protection for storing stripes of 'n' logical blocks of data and three logical blocks of independent parity across a set of 'n+3' independent storage devices where the parity and data blocks are interleaved across the storage devices. This is commonly referred to as Triple Parity RAID. Data stored using this form of RAID is able to survive any three independent storage device failures without data loss.

6.155.5.12 ReadCachePolicy

Indicates the read cache policy setting for the Volume.

- This property shall contain a boolean indicator of the read cache policy for the Volume.

string	Description
AdaptiveReadAhead	A caching technique in which the controller dynamically determines whether to pre-fetch data anticipating future read requests, based on previous cache hit ratio.
Off	The read cache is disabled.
ReadAhead	A caching technique in which the controller pre-fetches data anticipating future read requests.

6.155.5.13 RelativePerformance

The LBA Relative Performance type.

- This shall be the LBA Relative Performance type. This field indicates the relative performance of the LBA format indicated relative to other LBA formats supported by the controller. This property is intended for capabilities instrumentation.

string	Description
Best	Best performance.
Better	Better performance.
Degraded	Degraded performance.
Good	Good performance.

6.155.5.14 ReplicaType

The type of replica relationship to be created.

- This parameter shall contain the type of replica relationship to be created (e.g., Clone, Mirror, Snap).

string	Description
Clone	Create a point in time, full copy the source. • This enumeration literal shall indicate that replication shall create a point in time, full copy the source.
Mirror	Create and maintain a copy of the source. • This enumeration literal shall indicate that replication shall create and maintain a copy of the source.

string	Description
Snapshot	Create a point in time, virtual copy of the source. This enumeration literal shall indicate that replication shall create a point in time, virtual copy of the source.
TokenizedClone	Create a token based clone. This enumeration literal shall indicate that replication shall create a token based clone.

6.155.5.15 ReplicaUpdateMode

The replica update mode (synchronous vs asynchronous).

- This parameter shall specify the replica update mode.

string	Description
Active	Active-Active (i.e. bidirectional) synchronous updates. This enumeration literal shall indicate Active-Active (i.e. bidirectional) synchronous updates.
Adaptive	Allows implementation to switch between synchronous and asynchronous modes. This enumeration literal shall indicate that an implementation may switch between synchronous and asynchronous modes.
Asynchronous	Asynchronous updates. This enumeration literal shall indicate Asynchronous updates.
Synchronous	Synchronous updates. This enumeration literal shall indicate Synchronous updates.

6.155.5.16 Type

Identifies the type of namespace.

- This shall identify the type of namespace.

string	Description
Block	The namespace is configured for use with a block storage interface.

string	Description
Computational	The namespace is configured for use with a computational storage interface.
KeyValue	The namespace is configured for use with a KeyValue interface.
ZNS	The namespace is configured for use with a zoned storage interface.

6.155.5.17 VolumeType

The type of this volume.

- This property shall contain the type of the associated Volume.

string	Description
Mirrored	The volume is a mirrored device.
NonRedundant	The volume is a non-redundant storage device.
RawDevice	The volume is a raw physical device without any RAID or other virtualization applied.
SpannedMirrors	The volume is a spanned set of mirrored devices.
SpannedStripesWithParity	The volume is a spanned set of devices which uses parity to retain redundant information.
StripedWithParity	The volume is a device which uses parity to retain redundant information.

6.155.5.18 VolumeUsage

Indicates the Volume usage type setting for the Volume.

- This property shall contain the volume usage type for the Volume.

string	Description
CacheOnly	The volume is allocated for use as a non-consumable cache only volume. • The volume shall be allocated for use as a non-consumable cache only volume.
Data	The volume is allocated for use as a consumable data volume. • The volume shall be allocated for use as a consumable data volume.

string	Description
ReplicationReserve	The volume is allocated for use as a non-consumable reserved volume for replication use. The volume shall be allocated for use as a non-consumable reserved volume for replication use.
SystemData	The volume is allocated for use as a consumable data volume reserved for system use. The volume shall be allocated for use as a consumable data volume reserved for system use.
SystemReserve	The volume is allocated for use as a non-consumable system reserved volume. The volume shall be allocated for use as a non-consumable system reserved volume.

6.155.5.19 WriteCachePolicy

Indicates the write cache policy setting for the Volume.

- This property shall contain a boolean indicator of the write cache policy for the Volume.

string	Description
Off	The write cache is disabled. Indicates that the write cache shall be disabled.
ProtectedWriteBack	A caching technique in which the completion of a write request is signaled as soon as the data is in cache, and actual writing to non-volatile media is guaranteed to occur at a later time.
UnprotectedWriteBack	A caching technique in which the completion of a write request is signaled as soon as the data is in cache; actual writing to non-volatile media is not guaranteed to occur at a later time.
WriteThrough	A caching technique in which the completion of a write request is not signaled until data is safely stored on non-volatile media.

6.155.5.20 WriteCacheState

Indicates the WriteCacheState policy setting for the Volume.

- This property shall contain the WriteCacheState policy setting for the Volume.

string	Description
Degraded	Indicates an issue with the cache state in which the cache space is diminished or disabled due to a failure or an outside influence such as a discharged battery.

string	Description
Protected	Indicates that the cache state type in use generally protects write requests on non-volatile media.
Unprotected	Indicates that the cache state type in use generally does not protect write requests on non-volatile media.

6.155.5.21 WriteHoleProtectionPolicy

The policy that the RAID volume is using to address the write hole issue.

- This property specifies the policy that is enabled to address the write hole issue on the RAID volume. If no policy is enabled at the moment, this property shall be set to 'Off'.

string	Description
DistributedLog	The policy that distributes additional log among the volume's capacity sources to address write hole issue. • The policy that distributes additional log (e.g. checksum of the parity) among the volume's capacity sources to address write hole issue. Additional data is used to detect data corruption on the volume.
Journaling	The policy that uses separate block device for write-ahead logging to address write hole issue. • The policy that uses separate block device for write-ahead logging to address write hole issue. All write operations on the RAID volume are first logged on dedicated journaling device that is not part of the volume.
Oem	The policy that is Oem specific. • The policy that is Oem specific. The mechanism details are unknown unless provided separately by the Oem.
Off	The volume is not using any policy to address the write hole issue. • The support for addressing the write hole issue is disabled. The volume is not performing any additional activities to close the RAID write hole.

6.155.6 Example response

```
{
  "@odata.type": "#Volume.v1_10_2.Volume",
  "Id": "2",
  "Name": "Virtual Disk 2",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  }
}
```

```

    },
    "Encrypted": false,
    "RAIDType": "RAID0",
    "CapacityBytes": 107374182400,
    "Identifiers": [
      {
        "DurableNameFormat": "UUID",
        "DurableName": "0324c96c-8031-4f5e-886c-50cd90aca854"
      }
    ],
    "Links": {
      "Drives": [
        {
          "@odata.id": "/redfish/v1/Chassis/1U/Drives/3D58ECBC375FD9F2"
        }
      ]
    },
    "Actions": {
      "#Volume.Initialize": {
        "target": "/redfish/v1/Systems/3/Storage/RAIDIntegrated/Volumes/1/Actions/Volume.Initialize",
        "InitializeType@Redfish.AllowableValues": [
          "Fast",
          "Slow"
        ]
      }
    },
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/Storage/1/Volumes/2"
  }
}

```

6.156 Zone 1.6.3

Version	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2020.4	2020.3	2019.4	2019.1	2017.3	2017.1	2016.2

6.156.1 Description

The `Zone` schema describes a simple fabric zone for a Redfish implementation.

- This resource shall represent a simple fabric zone for a Redfish implementation.

6.156.2 URIs

/redfish/v1/CompositionService/ResourceZones/{ZoneId}

/redfish/v1/Fabrics/{FabricId}/Zones/{ZoneId}

6.156.3 Properties

Property	Type	Attributes	Notes
DefaultRoutingEnabled (v1.4+)	boolean	<i>read-write</i> (null)	This property indicates whether routing within this zone is enabled. This property shall indicate whether routing within this zone is enabled.
ExternalAccessibility (v1.3+)	string (enum)	<i>read-write</i> (null)	Indicates accessibility of endpoints in this zone to endpoints outside of this zone. This property shall contain an indication of accessibility of endpoints in this zone to endpoints outside of this zone. <i>For the possible property values, see ExternalAccessibility in Property details.</i>
Identifiers (v1.2+) [{}]	array (object)		Any additional identifiers for a resource. - The durable names for the zone. - This property shall contain a list of all known durable names for the associated zone. For property details, see Identifier.
Links {	object		The links to other resources that are related to this resource. This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
AddressPools (v1.4+) [{	array		An array of links to the address pools associated with this zone. This property shall contain an array of links to resources of type <code>AddressPool</code> with which this zone is associated.
@odata.id	string	<i>read-only</i>	Link to a AddressPool resource. See the Links section and the <i>AddressPool</i> schema for details.
}			
ContainedByZones (v1.4+) [{	array		An array of links to the zone that contain this zone. This property shall contain an array of links to resources of type <code>Zone</code> that represent the zones that contain this zone. The zones referenced by this property shall not be contained by other zones.
@odata.id	string	<i>read-only</i>	Link to another Zone resource.

Property	Type	Attributes	Notes
}]			
ContainsZones (v1.4+) [{	array		An array of links to the zones that are contained by this zone. This property shall contain an array of links to resources of type <code>Zone</code> that represent the zones that are contained by this zone. The zones referenced by this property shall not contain other zones.
@odata.id	string	<i>read-write</i>	Link to another Zone resource.
}]			
Endpoints [{	array		The links to the endpoints that this zone contains. This property shall contain an array of links to resources of type <code>Endpoint</code> that this zone contains.
@odata.id	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}]			
InvolvedSwitches [{	array		The links to the collection of switches in this zone. This property shall contain an array of links to resources of type <code>Switch</code> in this zone.
@odata.id	string	<i>read-only</i>	Link to a Switch resource. See the Links section and the <i>Switch</i> schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
ResourceBlocks (v1.1+) [{	array		The links to the resource blocks with which this zone is associated. This property shall contain an array of links to resources of type <code>ResourceBlock</code> with which this zone is associated.
@odata.id	string	<i>read-only</i>	Link to a ResourceBlock resource. See the Links section and the <i>ResourceBlock</i> schema for details.
}]			
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. This property shall contain any status or health properties of the resource. For property details, see Status.

Property	Type	Attributes	Notes
ZoneType (v1.4+)	string (enum)	<i>read-write</i> (null)	The type of zone. This property shall contain the type of zone that this zone represents. <i>For the possible property values, see ZoneType in Property details.</i>

6.156.4 Actions

6.156.4.1 AddEndpoint (v1.5+)

Description

This action adds an endpoint to a zone.

- This action shall add an endpoint to a zone.

Action URI

{Base URI of target resource}/Actions/Zone.AddEndpoint

Action parameters

Parameter Name	Type	Attributes	Notes
Endpoint {	object	<i>required</i>	The endpoint to add to the zone. This parameter shall contain a link to the specified endpoint to add to the zone. See the <i>Endpoint</i> schema for details on this property.
@odata.id	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}			
EndpointETag	string	<i>optional</i>	The current ETag of the endpoint to add to the zone. This parameter shall contain the current ETag of the endpoint to add to the zone. If the client-provided ETag does not match the current ETag of the endpoint that the <i>Endpoint</i> parameter specifies, the service shall return the HTTP 428 Precondition Required status code to reject the request.
ZoneETag	string	<i>optional</i>	The current ETag of the zone. This parameter shall contain the current ETag of the zone. If the client-provided ETag does not match the current ETag of the zone, the service shall return the HTTP 428 Precondition Required status code to reject the request.

Request Example

```
{
  "Endpoint": {
    "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints/Initiator1"
  },
  "EndpointETag": "W/\\"19472363938\\\"",
  "ZoneETag": "W/\\"99374369273\\\""
}
```

6.156.4.2 RemoveEndpoint (v1.5+)

Description

This action removes an endpoint from a zone.

- This action shall remove an endpoint from a zone.

Action URI

{Base URI of target resource}/Actions/Zone.RemoveEndpoint

Action parameters

Parameter Name	Type	Attributes	Notes
Endpoint {	object	required	The endpoint to remove from the zone. • This parameter shall contain a link to the specified endpoint to remove from the zone. See the <i>Endpoint</i> schema for details on this property.
@odata.id	string	read-only	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}			
EndpointETag	string	optional	The current ETag of the endpoint to remove from the system. • This parameter shall contain the current ETag of the endpoint to remove from the system. If the client-provided ETag does not match the current ETag of the endpoint that the <i>Endpoint</i> parameter specifies, the service shall return the HTTP 428 Precondition Required status code to reject the request.

Parameter Name	Type	Attributes	Notes
ZoneETag	string	<i>optional</i>	The current ETag of the zone. This parameter shall contain the current ETag of the zone. If the client-provided ETag does not match the current ETag of the zone, the service shall return the HTTP 428 Precondition Required status code to reject the request.

Request Example

```
{
  "Endpoint": {
    "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints/Initiator1"
  },
  "EndpointETag": "W/\"19472363938\"",
  "ZoneETag": "W/\"99374369273\""
}
```

6.156.5 Property details

6.156.5.1 ExternalAccessibility

Indicates accessibility of endpoints in this zone to endpoints outside of this zone.

- This property shall contain an indication of accessibility of endpoints in this zone to endpoints outside of this zone.

string	Description
GloballyAccessible	Any external entity with the correct access details, which might include authorization information, can access the endpoints that this zone lists. This value shall indicate that any external entity with the correct access details, which may include authorization information, can access the endpoints that this zone lists, regardless of zone.
NoInternalRouting	Routing is not enabled within this zone. This value shall indicate that implicit routing within this zone is not defined.
NonZonedAccessible	Any external entity that another zone does not explicitly list can access the endpoints that this zone lists. This value shall indicate that any external entity that another zone does not explicitly list can access the endpoints that this zone lists.

string	Description
ZoneOnly	Only accessible by endpoints that this zone explicitly lists. This value shall indicate that endpoints in this zone are only accessible by endpoints that this zone explicitly lists.

6.156.5.2 ZoneType

The type of zone.

- This property shall contain the type of zone that this zone represents.

string	Description
Default	The zone in which all endpoints are added by default when instantiated. This value shall indicate a zone in which all endpoints are added by default when instantiated. This value shall only be used for zones subordinate to the fabric collection.
ZoneOfEndpoints	A zone that contains endpoints. This value shall indicate a zone that contains resources of type <code>Endpoint</code>. This value shall only be used for zones subordinate to the fabric collection.
ZoneOfResourceBlocks (v1.6+)	A zone that contains resource blocks. This value shall indicate a zone that contains resources of type <code>ResourceBlock</code>. This value shall only be used for zones subordinate to the composition service.
ZoneOfZones	A zone that contains zones. This value shall indicate a zone that contains resources of type <code>Zone</code>. This value shall only be used for zones subordinate to the fabric collection.

6.156.6 Example response

```
{
  "@odata.type": "#Zone.v1_6_3.Zone",
  "Id": "1",
  "Name": "SAS Zone 1",
  "Description": "SAS Zone 1",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  }
}
```

```
    },
    "Links": {
      "Endpoints": [
        {
          "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints/Initiator1"
        },
        {
          "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints/Initiator2"
        },
        {
          "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints/Drive1"
        },
        {
          "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints/Drive3"
        }
      ]
    },
    "@odata.id": "/redfish/v1/Fabrics/SAS/Zones/1"
  }
}
```

7 Redfish documentation generator

This document was created using the Redfish Documentation Generator utility, which uses the contents of the Redfish schema files (in JSON schema format) to automatically generate the bulk of the text. The source code for the utility is available for download at DMTF's GitHub repository located at <https://www.github.com/DMTF/Redfish-Tools>.

8 ANNEX A (informative) Change log

Version	Date	Description
2025.2	2025-05-01	DSP8010 version 2025.2
2025.1	2025-02-05	DSP8010 version 2025.1
2024.4	2024-11-27	DSP8010 version 2024.4
2024.3	2024-08-01	DSP8010 version 2024.3
2024.2	2024-06-06	DSP8010 version 2024.2
2024.1	2024-04-04	DSP8010 version 2024.1
2023.3	2023-11-30	DSP8010 version 2023.3
2023.2	2023-08-11	DSP8010 version 2023.2
2023.1	2023-04-06	DSP8010 version 2023.1
2022.3	2022-12-08	DSP8010 version 2022.3
		Added <code>uuid</code> and <code>duration</code> as known string formats.
		Corrected missing <code>required</code> notations on array properties.
		Added supplemental details for <code>HealthRollup</code> .
2022.2	2022-08-04	DSP8010 version 2022.2
		Renamed document to Redfish Data Model Specification.
2022.1	2022-04-15	DSP8010 version 2022.1
2021.4	2021-12-02	DSP8010 version 2021.4
		Added Collection Capabilities section.
2021.3	2021-10-15	DSP8010 version 2021.3
2021.2	2021-08-13	DSP8010 version 2021.2
		Corrected format of UUID from RFC4122.
2021.1	2021-04-16	DSP8010 version 2021.1
		Document formatting updated for Documentation Generator v3.
2020.4	2020-12-01	DSP8010 version 2020.4
2020.3	2020-08-14	DSP8010 version 2020.3

Version	Date	Description
		Corrected issue that caused read-write links to be listed as read-only.
2020.2.1	2020-07-10	Errata release to correct truncated Processor supplemental text.
2020.2	2020-05-08	DSP8010 version 2020.2
2020.1	2020-03-27	DSP8010 version 2020.1
2019.4	2019-12-06	DSP8010 version 2019.4
2019.3	2019-10-11	DSP8010 version 2019.3
2019.2	2019-09-13	DSP8010 version 2019.2
2019.1a	2019-05-03	DSP8010 version 2019.1 Work-in-progress release