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Foreword

The *SMASH Implementation Requirements* (DSP0217) was prepared by the Server Management Working Group and Server Desktop Mobile Platforms (SDMP) Working Group of the DMTF.

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Introduction

This specification describes the conformance requirements for implementing the System Management Architecture for Server Hardware (SMASH) version 2.0.

SMASH Implementation Requirements

1 Scope

This document specifies the requirements for implementing the System Management Architecture for Server Hardware (SMASH) version 2.0. This document specifies those requirements by defining which other DMTF specifications are required, conditional, and optional. The mandatory specifications to be implemented are defined in clause 4. The optional and conditional specifications are defined in clauses 5, 7, 8, and 9.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

2.1 Approved References

DMTF DSP0200, *CIM Operations over HTTP 1.3,*
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DMTF DSP0214, *Server Management Command Line Protocol Specification, 1.0*,
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DMTF DSP0216, *SM CLP to CIM Common Mapping Specification, 1.0*,
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DMTF DSP0230, *WS-CIM Mapping Specification, 1.0*,
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188 DMTF DSP0810, *Record Log Profile SM CLP Command Mapping Specification, 1.0*,
189 http://www.dmtf.org/standards/published_documents/DSP0810_1.0.pdf

190 DMTF DSP0811, *Simple Identity Management Profile SM CLP Command Mapping Specification, 1.0*,
191 http://www.dmtf.org/standards/published_documents/DSP0811_1.0.pdf

192 DMTF DSP0812, *Physical Asset Profile SM CLP Command Mapping Specification, 1.0*,
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206 DMTF DSP0820, *Telnet Service Profile SM CLP Command Mapping Specification, 1.0*,
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DMTF DSP0830, *Role Based Authorization Profile SM CLP Command Mapping Specification, 1.0*,
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DMTF DSP0836, *KVM Redirection Profile SM CLP Command Mapping Specification, 1.0*,
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DMTF DSP1015, *Power Supply Profile, 1.0*,
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DMTF DSP1016, *Telnet Service Profile, 1.0*,
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DMTF DSP1018, *Service Processor Profile, 1.1*,
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DMTF DSP1020, *Pass-Through Module Profile, 1.0*,
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DMTF DSP1029, *OS Status Profile, 1.0*,
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316 DMTF DSP1054, *Indications Profile, 1.0*,
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322 DMTF DSP1074, *Indicator LED Profile, 1.0*,
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IETF RFC 2246, T. Dierks et al., *The TLS Protocol Version 1.0*, http://www.ietf.org/rfc/rfc2246.txt

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3 Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

3.1
can

used for statements of possibility and capability, whether material, physical, or causal

3.2
cannot

used for statements of possibility and capability, whether material, physical, or causal

3.3
conditional

indicates requirements to be followed strictly in order to conform to the document when the specified conditions are met

3.4
mandatory

indicates requirements to be followed strictly in order to conform to the document and from which no deviation is permitted

3.5
may

indicates a course of action permissible within the limits of the document

3.6
need not

indicates a course of action permissible within the limits of the document

3.7
optional

indicates a course of action permissible within the limits of the document

3.8
shall
indicates requirements to be followed strictly in order to conform to the document and from which no deviation is permitted

3.9
shall not
indicates requirements to be followed in order to conform to the document and from which no deviation is permitted

3.10
should
indicates that among several possibilities, one is recommended as particularly suitable, without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required

3.11
should not
indicates that a certain possibility or course of action is deprecated but not prohibited

4 Mandatory Specification Requirements

This clause lists mandatory profiles and protocols that are required for this specification.

4.1 Mandatory Profile Requirements

At least one of the following profiles shall be implemented:

- DMTF DSP1004, *Base Server Profile,* 1.0
- DMTF DSP1018, *Service Processor Profile,* 1.1
- DMTF DSP1008, *Modular System Profile,* 1.0

4.2 Mandatory Protocol Requirements

At least one of the following protocols shall be implemented:

- DMTF DSP0214, *Server Management Command Line Protocol Specification,* 1.0
- DMTF DSP0226, *Web Services for Management*, 1.0

5 Conditional Profile Specification Requirements

This clause details the requirements for profiles and their associated mapping specifications. Implementations may expose different sets of Profiles via the protocols. This implies that a Mapping Specification for a Profile is only required if the Profile is exposed through the CLP irrespective of whether or not it is exposed via WS Management. Unless otherwise indicated, profile version is 1.0 for each profile referenced in this clause.

5.1 Base Server Profile

The *Base Server Profile* may be implemented. If the *Base Server Profile* is implemented, the following requirements shall be met:

411 If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the
412 optional behavior of implementing the *SMASH Collections Profile* specified in the *Base Server Profile*
413 shall be implemented. The *Base Server Profile SM CLP Command Mapping Specification* shall be
414 implemented.

415 5.2 Boot Control Profile

416 The *Boot Control Profile* may be implemented. If the *Boot Control Profile* is implemented, the following
417 requirements shall be met:

418 If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented and the
419 profile is exposed using the SM CLP, the *Boot Control Profile SM CLP Command Mapping*
420 *Specification* shall be implemented.

421 5.3 Service Processor Profile

422 The *Service Processor Profile* may be implemented. If the *Service Processor Profile* is implemented, the
423 following requirements shall be met:

424 If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented and the
425 profile is exposed using the SM CLP, the optional behavior of implementing the *SMASH Collections*
426 *Profile* specified in the *Service Processor Profile* shall be implemented. The *Service Processor*
427 *Profile SM CLP Command Mapping Specification* shall be implemented.

428 5.4 CLP Service Profile

429 If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented and the
430 profile is exposed using the SM CLP, the *CLP Service Profile* shall be implemented.

431 Either the optional behavior of implementing the *SSH Service Profile* specified in the *CLP Service Profile*
432 or the optional behavior of implementing the *Telnet Service Profile* specified in the *CLP Service Profile*
433 should be implemented. The *CLP Service Profile SM CLP Command Mapping Specification* shall be
434 implemented.

435 5.5 CPU Profile

436 The *CPU Profile* may be implemented. If the *CPU Profile* is implemented and the profile is exposed using
437 the SM CLP, the following requirements shall be met:

438 If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the
439 *CPU Profile SM CLP Command Mapping Specification* shall be implemented.

440 5.6 Device Tray Profile

441 The *Device Tray Profile* may be implemented. If the *Device Tray Profile* is implemented and the profile is
442 exposed using the SM CLP, the following requirements shall be met:

443 If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the
444 *Device Tray Profile SM CLP Command Mapping Specification* shall be implemented.

445 5.7 DHCP Client Profile

446 The *DHCP Client Profile* may be implemented. If the *DHCP Client Profile* is implemented and the profile is
447 exposed using the SM CLP, the following requirements shall be met:

448 If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the
449 *DHCP Client Profile SM CLP Command Mapping Specification* shall be implemented.

5.8 DNS Client Profile

The *DNS Client Profile* may be implemented. If the *DNS Client Profile* is implemented and the profile is exposed using the SM CLP, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the *DNS Client Profile SM CLP Command Mapping Specification* shall be implemented.

5.9 Ethernet Port Profile

The *Ethernet Port Profile* may be implemented. If the *Ethernet Port Profile* is implemented and the profile is exposed using the SM CLP, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the *Ethernet Port Profile SM CLP Command Mapping Specification* shall be implemented.

5.10 Fan Profile

The *Fan Profile* may be implemented. If the *Fan Profile* is implemented and the profile is exposed using the SM CLP, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the *Fan Profile SM CLP Command Mapping Specification* shall be implemented.

5.11 IP Interface Profile

The *IP Interface Profile* may be implemented. If the *IP Interface Profile* is implemented and the profile is exposed using the SM CLP, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the *IP Interface Profile SM CLP Command Mapping Specification* shall be implemented.

5.12 Modular System Profile

The *Modular System Profile* may be implemented. If the *Modular System Profile* is implemented and the profile is exposed using the SM CLP, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the *Modular System Profile SM CLP Command Mapping Specification* shall be implemented.

5.13 Pass-through Module Profile

The *Pass-through Module Profile* may be implemented. If the *Pass-through Module Profile* is implemented and the profile is exposed using the SM CLP, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the *Pass-through Module Profile SM CLP Command Mapping Specification* shall be implemented.

5.14 Physical Asset Profile

The *Physical Asset Profile* may be implemented. If the *Physical Asset Profile* is implemented and the profile is exposed using the SM CLP, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the *Physical Asset Profile SM CLP Command Mapping Specification* shall be implemented.

5.15 Power State Management Profile

The *Power State Management Profile 1.0* or *Power State Management Profile 2.0* may be implemented. If the *Power State Management Profile* is implemented and the profile is exposed using the SM CLP, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the *Power State Management Profile SM CLP Command Mapping Specification* shall be implemented.

5.16 Power Supply Profile

The *Power Supply Profile 1.0* or *Power Supply Profile 1.1* may be implemented. If the *Power Supply Profile* is implemented and the profile is exposed using the SM CLP, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the *Power Supply Profile SM CLP Command Mapping Specification* shall be implemented.

5.17 Record Log Profile

The *Record Log Profile 1.0* or *Record Log Profile 2.0* may be implemented. If the *Record Log Profile* is implemented and the profile is exposed using the SM CLP, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the *Record Log Profile SM CLP Command Mapping Specification* shall be implemented.

5.18 Role Based Authorization Profile

The *Role Based Authorization Profile* may be implemented. If the *Role Based Authorization Profile* is implemented and the profile is exposed using the SM CLP, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the *Role Based Authorization Profile SM CLP Command Mapping Specification* shall be implemented.

5.19 Sensors Profile

The *Sensors Profile 1.0* or *Sensors Profile 1.1* may be implemented. If the *Sensors Profile* is implemented and the profile is exposed using the SM CLP, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the *Sensors Profile SM CLP Command Mapping Specification* shall be implemented.

5.20 Shared Device Management Profile

The *Shared Device Management Profile* may be implemented. If the *Shared Device Management Profile* is implemented and the profile is exposed using the SM CLP, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the *Shared Device Management Profile SM CLP Command Mapping Specification* shall be implemented.

5.21 Simple Identity Management Profile

The *Simple Identity Management Profile* may be implemented. If the *Simple Identity Management Profile* is implemented and the profile is exposed using the SM CLP, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the *Simple Identity Management Profile SM CLP Command Mapping Specification* shall be implemented.

5.22 SM CLP Admin Domain Profile

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented and the profile is exposed using the SM CLP, the *SM CLP Admin Domain Profile SM CLP Command Mapping Specification* shall be implemented.

5.23 SMASH Collections Profile

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented and the profile is exposed using the SM CLP, the *SMASH Collections Profile SM CLP Command Mapping Specification* shall be implemented.

5.24 Software Inventory Profile

The *Software Inventory Profile* may be implemented. If the *Software Inventory Profile* is implemented and the profile is exposed using the SM CLP, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the *Software Inventory Profile SM CLP Command Mapping Specification* shall be implemented.

5.25 Software Update Profile

The *Software Update Profile* may be implemented. If the *Software Update Profile* is implemented and the profile is exposed using the SM CLP, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the *Software Update Profile SM CLP Command Mapping Specification* shall be implemented.

5.26 SSH Service Profile

The *SSH Service Profile* may be implemented. If the *SSH Service Profile* is implemented and the profile is exposed using the SM CLP, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the *SSH Service Profile SM CLP Command Mapping Specification* shall be implemented.

5.27 System Memory Profile

The *System Memory Profile* may be implemented. If the *System Memory Profile* is implemented and the profile is exposed using the SM CLP, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the *System Memory Profile SM CLP Command Mapping Specification* shall be implemented.

5.28 Telnet Service Profile

The *Telnet Service Profile* may be implemented. If the *Telnet Service Profile* is implemented and the profile is exposed using the SM CLP, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented, the *Telnet Service Profile SM CLP Command Mapping Specification* shall be implemented.

5.29 Text Console Redirection Profile

The *Text Console Redirection Profile* may be implemented. If the *Text Console Redirection Profile* is implemented, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented and the profile is exposed using the SM CLP, the *Text Console Redirection Profile SM CLP Command Mapping Specification* shall be implemented.

5.30 Platform Watchdog Profile

The *Platform Watchdog Profile* may be implemented. If the *Platform Watchdog Profile* is implemented, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented and the profile is exposed using the SM CLP, the *Platform Watchdog Profile SM CLP Command Mapping Specification* shall be implemented.

5.31 KVM Redirection Profile

The *KVM Redirection Profile* may be implemented. If the *KVM Redirection Profile* is implemented, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented and the profile is exposed using the SM CLP, the *KVM Redirection Profile SM CLP Command Mapping Specification* shall be implemented.

5.32 PCI Device Profile

The *PCI Device Profile* may be implemented. If the *PCI Device Profile* is implemented, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented and the profile is exposed using the SM CLP, the *PCI Device Profile SM CLP Command Mapping Specification* shall be implemented.

5.33 OS Status Profile

The *OS Status Profile 1.0* or *OS Status Profile 1.1* may be implemented. If the *OS Status Profile* is implemented, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented and the profile is exposed using the SM CLP, the *OS Status Profile SM CLP Command Mapping Specification* shall be implemented.

5.34 Indicator LED Profile

The *Indicator LED Profile* may be implemented. If the *Indicator LED Profile* is implemented, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented and the profile is exposed using the SM CLP, the *Indicator LED Profile SM CLP Command Mapping Specification* shall be implemented.

5.35 Indications Profile

The *Indications Profile* may be implemented.

If DSP0226, *Web Services for Management Specification* is implemented, the following requirements should be met:

- The *Indications Profile* (DSP1054) should be implemented.
- An instance of concrete subclass of CIM_Indication should be the payload of WS-Event Delivery message. If an instance of CIM_AlertIndication is used as a payload for WS-Event Delivery message, then the contents of the instance should be from DSP8007, the *Platform Message Registry*.
- Any vendor-specific messages that are formulated should be from a published message registry with the owning entity set to other than the DMTF.

5.36 SMI-S Host Hardware Raid Controller Profile

The Host Hardware Raid Controller Profile (HHR Controller Profile) from the *Storage Management Initiative Specification (SMI-S)* may be implemented. If HHR Controller Profile is implemented, the following requirements shall be met:

- SMI-S Host Hardware Raid Profile from the *Storage Management Initiative Specification* shall not be implemented. The scoping class of the SMI-S HHR Controller profile shall be the central class of DSP1018, (*Service Processor Profile*), DSP1008 (*Modular System Profile*), or DSP1004 (*Base Server Profile*).
- HHR Controller Profile and all the HHR Controller Profile referenced profiles shall implement DSP1033 to advertise profile registration and shall not implement the SMI-S Server Profile from the *Storage Management Initiative Specification*.
- HHR Controller Profile and all the HHR Controller Profile referenced profiles may not implement mandatory indications. HHR Controller Profile and all the HHR Controller Profile referenced profiles may not implement the mandatory SMI-S Indication Profile from the *Storage Management Initiative Specification*.

5.37 Media Redirection Profile

The *Media Redirection Profile* may be implemented. If the *Media Redirection Profile* is implemented, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented and the profile is exposed using the SM CLP, the *Media Redirection Profile SM CLP Command Mapping Specification* shall be implemented.

5.38 USB Redirection Profile

The *USB Redirection Profile* may be implemented. If the *USB Redirection Profile* is implemented, the following requirements shall be met:

If DSP0214, the *Server Management Command Line Protocol Specification*, is implemented and the profile is exposed using the SM CLP, the *USB Redirection Profile SM CLP Command Mapping Specification* shall be implemented.

6 Optional Profile Specification Requirements

This clause details the requirements for optional profiles and their associated mapping specifications. Implementations may expose different sets of Profiles via the protocols. This implies that a Mapping Specification for a Profile is only required if the Profile is exposed through the CLP irrespective of whether or not it is exposed via WS-Management.

6.1 Battery Profile 1.0

The *Battery Profile 1.0* may be implemented.

6.2 BIOS Management Profile 1.0

The *BIOS Management Profile 1.0* may be implemented.

6.3 Opaque Management Data Profile 1.0

The *Opaque Management Data Profile 1.0* may be implemented.

6.4 Physical Computer System View Profile 1.0

The *Physical Computer System View Profile 1.0* should be implemented.

6.5 Power State Management Profile 2.0

The *Power State Management Profile 2.0* may be implemented.

6.6 Record Log Profile 2.0

The *Record Log Profile 2.0* may be implemented.

6.7 OS Status Profile 1.1

The *OS Status Profile 1.1* may be implemented.

6.8 Sensors Profile 1.1

The *Sensors Profile 1.1* may be implemented.

6.9 Power Supply Profile 1.1

The *Power Supply Profile 1.1* may be implemented.

6.10 IP Configuration 1.0

The *IP Configuration Profile 1.0* may be implemented.

7 Conditional Protocol Implementation Requirements

A SMASH-compliant implementation shall use a CIM-based data model for representing managed resources and services. This clause describes the Management Protocol and Transport Protocol requirements for a SMASH implementation.

7.1 SM CLP Protocol Conditional Requirements

If DSP0214, the *Server Management Command Line Protocol Specification,* is implemented, the following requirements shall be met:

- DSP0216, the *SM CLP to CIM Common Mapping Specification*, shall be implemented.
- DSP0215, the *Server Management Managed Element Addressing Specification*, shall be implemented.

- DSP1005, the *CLP Service Profile*, shall be implemented.

7.2 Management Protocol

If DSP0226, the *Web Services for Management Specification,* is implemented, the following requirements shall be met:

- DSP0227, the *WS-Management – CIM Binding Specification*, shall be implemented.
- DSP0230, the *WS-CIM Mapping Specification*, shall be implemented.
- Implementations shall not support bindings to the protocol other than that specified in DSP0227.

7.2.1 XML Namespaces

The following URI identifies an XML namespace that contains SMASH-specific XML definitions:

```
(1)   http://schemas.dmtf.org/wbem/smash/1
```

Note that the schema location URL is http:/schemas.dmtf.org/wbem/smash/1/dsp8039.xsd

7.2.2 WS-Transfer

It is mandatory for implementations to support WS-Transfer as described in clause 4 of DSP0226. Table 1 defines support for WS-Transfer operations and their respective requirements.

Table 1 – WS-Transfer Operations

Operation	Requirement	Notes
Get	Mandatory	This operation retrieves resource representations. Implementations shall support the Get operation. Profiles require GetInstance support.
Put	Conditional	If a resource can be updated, the service shall support the Put operation. If an implemented profile requires ModifyInstance support, the Put operation shall be supported.
Create	Conditional	This operation creates resource instances. If an implemented profile requires CreateInstance support, the Create operation shall be supported.
Delete	Conditional	This operation deletes resources. If an implemented profile requires DeleteInstance support, the Delete operation shall be supported.

7.2.3 WS-Enumeration

It is mandatory for implementations to support WS-Enumeration as described in clause 5 of DSP0226. Table 2 defines support for WS-Enumeration operations and their respective requirements.

Table 2 – WS-Enumeration Operations

Operation	Requirement	Messages
Enumerate	Mandatory	This operation is used to initiate an enumeration and receive an enumeration context.
Pull	Mandatory	This operation is used to pull a sequence of elements of a resource.

Operation	Requirement	Messages
Renew	Optional	See Rule R5.1-4 in DSP0226. Implementation of this operation is not recommended.
GetStatus	Optional	See Rule R5.1-4 in DSP0226. Implementation of this operation is not recommended.
Release	Mandatory	This operation is used to release an enumeration context.
EnumerationEnd	Optional	See Rule R5.1-4 in DSP0226. Implementation of this operation is not recommended.

It is recommended that the wsman:OptimizeEnumeration option be implemented as a child element of the wsen:Enumerate element. Refer to clause 5.2.3 of DSP0226 for details. The service must accept the element, but it does not have to honor it, as described in Rule R5.2.3-1 of DSP0226.

It is optional for implementations to support the generic enumeration operations that are described in clause 15.1 of DSP0227, except the WS-Management equivalent of EnumerateInstances specified in clause 15.1.5, which is mandatory as indicated in Table 2.

7.2.4 WS-Eventing

Support for WS-Eventing is conditional. A service advertising conformance to the Indications Profile shall support WS-Eventing as described in clause 10 of DSP0226 and further constrained by the definition described in this clause. Table 3 defines support for WS-Eventing operations and their respective requirements.

Table 3 – WS-Eventing Operations

Operation	Requirement	Notes
Subscribe	Mandatory	
Renew	Mandatory	
Unsubscribe	Mandatory	
SubscriptionEnd	Optional	
GetStatus	Optional	See Rule R7.3-1 in DSP0226. Implementation of this operation is not recommended.

7.2.4.1 WS-Eventing Messaging Security

For WS-Eventing the messaging security recommendations defined in Table 4 should be followed.

Table 4 – WS-Eventing Message Security Recommendations

Plane	WS-Eventing Message	Recommended Security Class	Security Principal Requiring Authentication
Control	wse:Subscribe	Class B (as defined in Clause 8), because it can carry sensitive information	Subscriber

Plane	WS-Eventing Message	Recommended Security Class	Security Principal Requiring Authentication
	wse:Renew	Class B (as defined in Clause 8), because it can carry sensitive information	Subscriber
	wse:SubscriptionEnd	Class B (as defined in Clause 8), because it can carry sensitive information	Subscriber
	wse:Unsubscribe	Class B (as defined in Clause 8), because it can carry sensitive information	Subscriber
Delivery	wse:Delivery (Push)	Class A or B (as defined in Clause 8); B for sensitive information or for more compute-intensive information	MAP, but not necessarily with its own credentials
	wse:Delivery (PushWithAck)	Class A or B (as defined in Clause 8); B for sensitive information	MAP, but not necessarily with its own credentials
	wse:Delivery (Batched)	Class A or B (as defined in Clause 8); B for sensitive information	MAP, but not necessarily with its own credentials
	wsen:Pull (Pull delivery)	Class A or B (as defined in Clause 8); B for sensitive information	Subscriber
	Ack of delivery (on a separate connection)	Class A (as defined in Clause 8)	Subscriber

7.2.4.2 WS-Eventing Delivery Mode

DSP0226 defines four standard delivery modes (Push Mode, PushWithAck Mode, Batched Delivery Mode, and Pull Delivery Mode). Two of these delivery modes apply to SMASH as follows:

- Implementations shall support WS-Eventing Push Mode as described in clause 7.2.10 of DSP0226.
- Implementations should support WS-Eventing PushWithAck Mode as described in clause 7.2.11 of DSP0226.

7.2.4.3 Eventing Source Port

Implementations shall use the well known transport ports for eventing.

7.2.4.4 Subscription-Related Property Definition Guidance

The PersistenceType property in a CIM_ListenerDestination instance created internally in response to wse:Subscribe should be set to 3 (Transient).

The value for the FailureTriggerTimeInterval property on the CIM_IndicationSubscription or CIM_FilterCollectionSubscription instance created internally in response to wse:Subscribe should be set to 30 seconds.

7.2.5 Transport Protocol

Implementations shall use HTTP 1.1 as the SOAP transport for DSP0226. For detailed information about the transport protocol required, refer to the *Systems Management Architecture for Server Hardware White Paper* (DSP2001).

7.2.5.1 Transport TCP Port Requirements

Implementations shall support the IANA-defined system ports for product deployment, but may listen on other ports.

- Web Services Protocol Ports shall be supported on the following transport ports and shall be transport specific:
  - HTTP
  - HTTPS
- Support for the following sideband DMTF Web Services Protocol Ports is optional:
  - OOB-WS-HTTP
    - TCP Port 623
  - OOB-WS-HTTPS
    - TCP Port 664

8 Security Implementation Requirements

This clause describes transport requirements, roles and authorization, user account management, and authentication.

8.1 WS Management Protocol Specific Security Requirements

If DSP0226, the *Web Services for Management Specification,* is implemented, the requirements specified in this clause shall be met.

8.1.1 Transport Requirements

SMASH defines two security classes for HTTP 1.1 transport:

1) **Class A**: The security class A requires HTTP digest authentication for the user authentication. For this class, no encryption capabilities are required beyond the encryption of the password during the digest authentication exchange. If security Class A is supported, implementations should support MD5 or SHA-1 as the cryptographic algorithm.
   - **String = "HTTP_DIGEST"**
     - URI = http://schemas.dmtf.org/wbem/wsman/1/wsman/secprofile/http/digest
2) **Class B**: This class defines three security profiles that are based on either TLS or IPsec with specifically selected modes and cryptographic algorithms. For class B compliance, the support for at least one of the following security profiles is mandatory:
   - **String = "HTTP_TLS_1"**
     - URI = http://schemas.dmtf.org/wbem/wsman/1/wsman/secprofile/https/digest
   - **String = "HTTP_TLS_2"**
     - URI = http://schemas.dmtf.org/wbem/wsman/1/wsman/secprofile/https/basic
   - **String = "HTTP_IPSEC"**
     - URI = http://schemas.dmtf.org/wbem/wsman/1/wsman/secprofile/http/digest/ipsec

A SMASH implementation shall support at least one of the preceding security classes. It is recommended that a SMASH implementation be Class B compliant for privacy/confidentiality and additional security.

Refer to 7.2.4.1 for WS-Eventing security requirements.

8.1.2 Cryptographic Algorithms and Cipher Suites

Table 5 lists the required cryptographic algorithms or cipher suites for the security profiles mentioned in this clause.

Table 5- Required Cryptographic Algorithms or Cipher Suites

Security Profile	Required Algorithm(s) or Cipher suite	Notes
"HTTP_DIGEST"	HMAC-MD5 or HMAC-SHA1	
"HTTP_TLS_1"	TLS_RSA_WITH_AES_128_CBC_SHA	TLS version 1.0 or later Refer to RFC 2246, RFC 4346, and RFC 5246. It is recommended that the latest 1.x version of TLS is implemented.
"HTTP_TLS_2"	TLS_RSA_WITH_AES_128_CBC_SHA	TLS version 1.0 or later Refer to RFC 2246, RFC 4346, and RFC 5246. It is recommended that the latest 1.x version of TLS is implemented.
"HTTP_IPSEC"	AES-GCM (key size: 128 bits, ICV or Digest len: 16 B) or AES-CBC (Key size: 128 bits) with HMAC-SHA1-96	Refer to RFC 4301, RFC 4303, and RFC 4106.

8.1.3 Roles and Authorization

Table 6 outlines the Operational Roles supported by implementations and the respective requirements.

Table 6 – Operational Roles Supported

Operational Role	Requirement	Notes
Read-only User	Mandatory	
Operator	Optional	
Administrator	Mandatory	

A SMASH-compliant service should support the administrator and read-only roles. An implementation may support the operator roles.

8.1.4 User Account Management

The authentication and authorization mechanisms defined are tied with user account management. Implementations should support a role-based authorization model.

Each user should have the ability to modify its own account credentials. An account in the administrator role should be able to perform account management for all users. Table 7 outlines the operations supported for user account management and the respective requirements.

772 **Table 7 – User Account Operations**

Operation	Requirement	Notes
Create an account	Optional	Recommended for the administrator role
Delete an account	Optional	Recommended for the administrator role
Enable an account	Optional	
Disable an account	Optional	
Modify the privileges of an account	Optional	
Modify the password of an account	Conditional	Based on implementation of the Simple Identity Management Profile. Recommended for all roles
Change the role of an account	Optional	
Create a group of accounts	Optional	
Delete a group of accounts	Optional	
Add an account to a group	Optional	
Remove an account from a group	Optional	
Change the role of a group	Optional	
Modify the privileges of a group	Optional	
Change the associations of roles and accounts	Optional	Recommended for the administrator role

773 The modifications of privileges include the changing of bindings between accounts or groups and roles.
774 The privileges defined for SMASH 2.0 are static privileges.

775 8.1.5 Authentication Mechanisms

776 Implementations shall support one or two levels of authentication.

777 Table 8 outlines requirements for the three types of authentication mechanisms supported by SMASH 2.0
778 implementations.

779 **Table 8 – Authentication Mechanisms**

Authentication Mechanisms	Requirement	Notes
Machine-Level	Optional	Mandatory for class B security compliance
User-Level	Mandatory	At a minimum
Third-Party	Optional	

780 # 9 Discovery Requirements

781 Multiple discovery stages are required to accumulate the necessary information from the managed
782 system. This clause defines the implementation requirements of the stages involved in discovering
783 managed systems and their management capabilities.

784 ## 9.1 Network Endpoint Discovery Stage

785 The *SMASH White Paper* (DSP2001) describes endpoint discovery methods. A SMASH 2.0 compliant
786 implementation need not support any of the described methods.

787 ## 9.2 WS Management Access Point Discovery

788 If DSP0226, the *Web Services for Management Specification,* is implemented, the requirements specified
789 in this clause shall be met.

790 ### 9.2.1 WS-Management Identify Method

791 Refer to clause 8 of DSP0226 for a definition of the Identify method. A SMASH-compliant management
792 service shall support the Identify method on each SMASH access port that it supports.

793 In addition to the child element defined in DSP0226, the following extension elements are defined by
794 SMASH as children of the IdentifyResponse element:

```
795 <s:Body>
796    <wsmid:IdentifyResponse>
797       <wsmid:ProtocolVersion> xs:anyURI </wsmid:ProtocolVersion>
798       <wsmid:ProductVendor> xs:string </wsmid:ProductVendor>
799       <wsmid:ProductVersion> xs:string </wsmid:ProductVersion>
800       <SMASH:SMASHVersion> xs:string </SMASH:SMASHVersion>
801       <wsmid:SecurityProfiles>
802          <wsmid:SecurityProfileName> xs:string or URI </wsmid:SecurityProfileName> +
803       </wsmid:SecurityProfiles>
804    </wsmid:IdentifyResponse>
805 </s:Body>
```

806 Table 9 defines the IdentifyResponse payload requirements for SMASH 2.0.

807 **Table 9 – WS-Management IdentifyResponse Payload Elements**

Element	Requirement	Notes
wsmid:IdentifyResponse	Mandatory	The body of the response
wsmid:IdentifyResponse/wsmid:ProtocolVersion	Mandatory	URI identifying DSP0226 1.0

Element	Requirement	Notes
wsmid:IdentifyResponse/wsmid:ProductVendor	Optional	
wsmid:IdentifyResponse/wsmid:ProductVersion	Optional	
wsmid:IdentifyResponse/SMASH:SMASHVersion	Mandatory	Identifies the SMASH version supported, which shall be formatted as "*n.n.n*" Example: "2.0.0"
wsmid:IdentifyResponse/wsmid:SecurityProfiles/ wsmid:SecurityProfileName	Mandatory	String identifying the security profile supported **Class A:** "HTTP_DIGEST": http://schemas.dmtf.org/wbem/wsman/1/ wsman/secprofile/http/digest **Class B:** "HTTP_TLS_1": http://schemas.dmtf.org/wbem/wsman/1/ wsman/secprofile/https/digest" "HTTP_TLS_2": http://schemas.dmtf.org/wbem/wsman/ 1/wsman/secprofile/https/basic" "HTTP_IPSEC": http://schemas.dmtf.org/wbem/wsman/1/ wsman/secprofile/http/digest

9.2.2 wsmid:Identify Security Implementation Requirements

Implementations may support wsmid:Identify without authentication, as described in Rule R10.9-4 of DSP0226.

If an implementation supports wsmid:Identify without authentication, it should support it through a URL that contains the suffix "/wsman-anon/identify."

9.3 RegisteredSpecification Instance

The SMASH implementation should support an instance of CIM_RegisteredSpecification to indicate support for this version of the specification.

Table 10 identifies the element requirements for CIM_RegisteredSpecification.

Table 10 – CIM_RegisteredSpecification Element Requirements

Element	Requirement	Description
Properties		
InstanceID	Mandatory	Key, see schema definition.
SpecificationType	Mandatory	This property shall have a value of 3 ("Initiative Wrapper ").
RegisteredOrganization	Mandatory	This property shall have a value of 2 (DMTF).
RegisteredName	Mandatory	This property shall have a value of "SMASH".
RegisteredVersion	Mandatory	This property shall have a value of "2.1.0".

Element	Requirement	Description
AdvertiseTypes	Mandatory	Required, see Schema definition.
AdvertiseTypeDescriptions	Mandatory	See Schema definition.
Operations		
GetInstance	Mandatory	
EnumerateInstances	Mandatory	
EnumerateInstanceNames	Mandatory	

The instance of CIM_RegisteredSpecification shall be exposed in the interop namespace. The instance to CIM_RegisteredSpecification shall be associated with at least one instance of CIM_RegisteredProfile of one of the mandatory profiles defined in this specification using an instance of CIM_ReferencedSpecification. The Antecedent property of the instance of CIM_ReferencedSpecification shall reference the instance of the CIM_RegisteredProfile. The Dependent property of the instance of CIM_ReferencedSpecification shall reference the instance CIM_RegisteredSpecification.

ANNEX A
(informative)

Change Log

Version	Date	Description
1.0.0	2009-10-14	
2.0.0	2009-08-04	DMTF Standard
2.1.0	2014-12-06	DMTF Standard

Bibliography

DMTF DSP2001, *Systems Management Architecture for Server Hardware (SMASH) Command Line Protocol (CLP) Architecture White Paper, 2.0*, http://www.dmtf.org/standards/published_documents/DSP2001_2.0.pdf