Open Software Defined Data Center

DMTF Incubator Whitepaper

Software Defined Data Center – Concept

- “At the core of the software-defined datacenter is an abstracted and pooled set of shared resources. But the secret sauce is in the automation that slices up and allocates those shared resources on-demand, without manual tinkering “ – Forrester

Also:

- “SDDC is the phrase used to refer to a data center where the entire infrastructure is virtualized and delivered as a service.” - VMware

DMTF – The Open SDDC Incubator

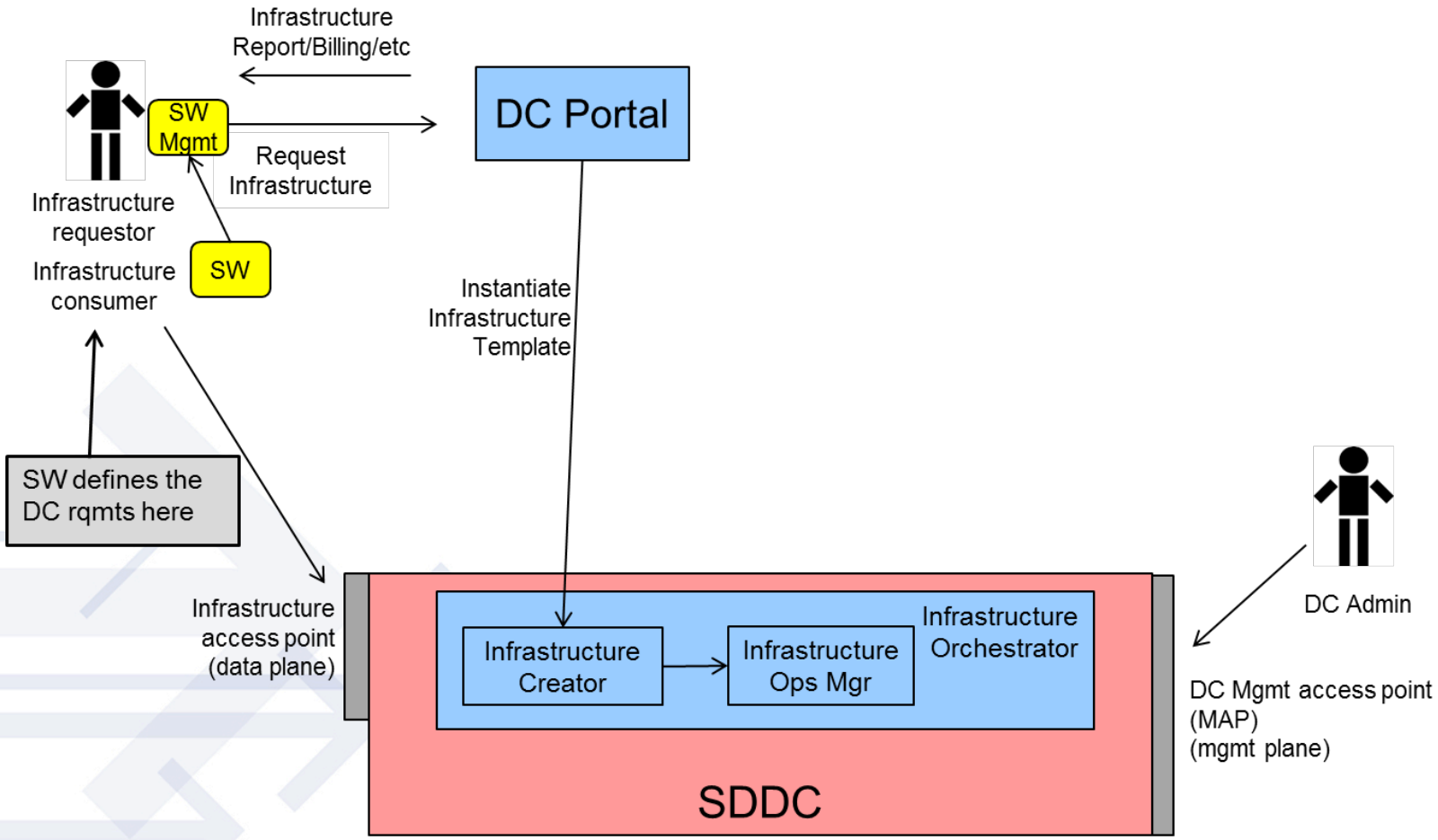
Chartered to lead an open initiative to enable the realization of the SDDC by providing:

- A clear definition and scope of the SDDC concept.
- New work items for existing chartered working groups.
- Expanding the scope of existing chartered working groups.
- Recommendations to create new working groups where needed.

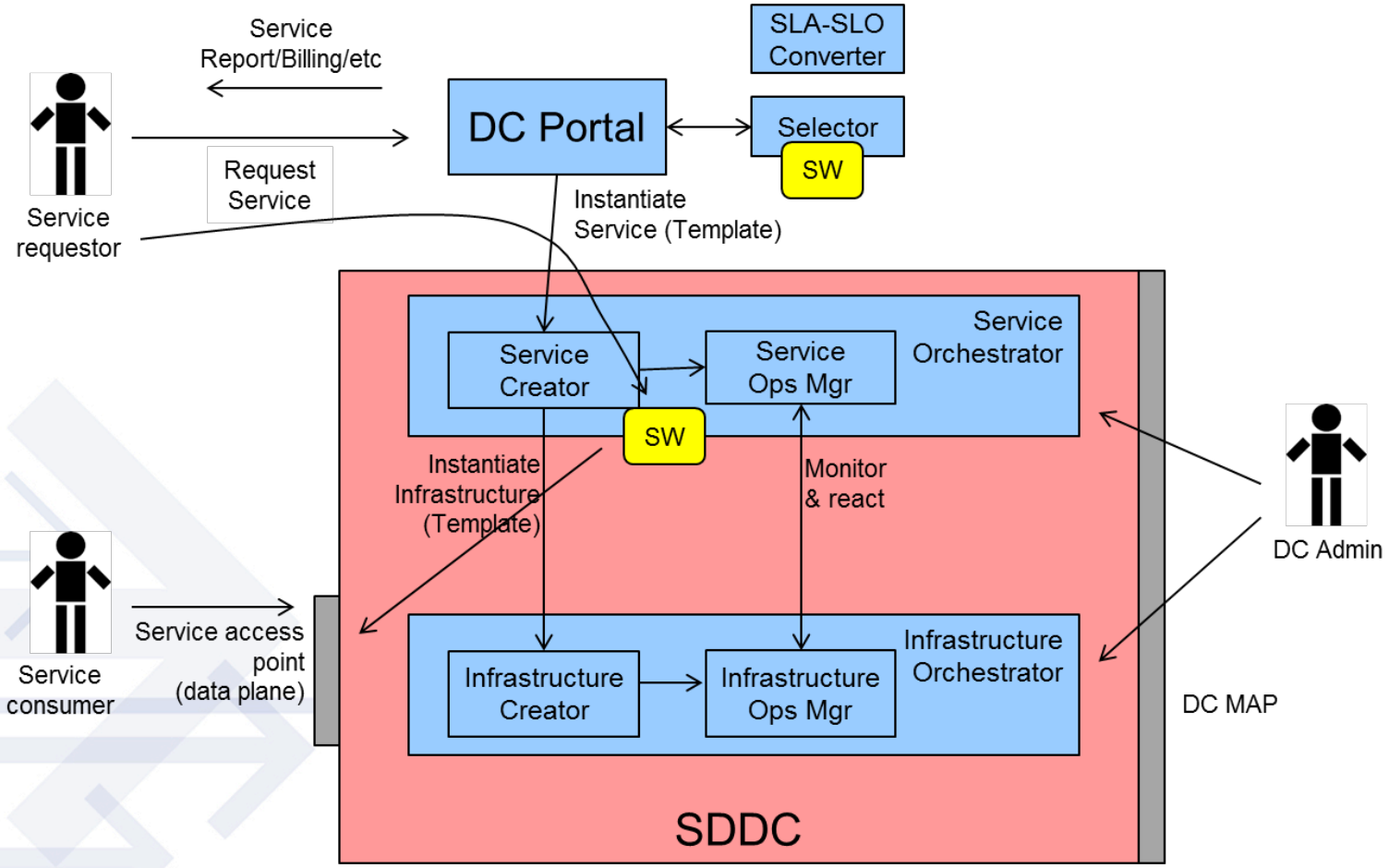
OSDDC Incubator – Deliverables

- Use Cases
  - Data Center Administrator View
  - Data Center User View
- Taxonomy and Terminology
  - What is part of a Data Center (Power & Cooling? Apps and Middleware?)
  - Define components: Software Defined Storage, Software Defined Networking
- High-level Architecture
  - Where does the automation happen?
  - What part of the automation itself is standardized (i.e. Policy)
- Standards Gap Analysis
  - What is the role of existing standards?
  - DMTF standards: CIM, CIMI, OVF, SMASH, SPMF, WBEM, etc. ?
  - Other standards: CAMP, CDMI, ETSI/NFV, ODCA, TOSCA, etc. ?
- White Paper
  - Summarizing the work being done – DSP-IS0501 V1.0.0j

IaaS use case for SDDC



SaaS use case for SDDC



OSDDC Incubator – SDDC Definition

- Software Defined Data Center (SDDC):– a programmatic abstraction of logical compute, network, storage, and other resources, represented as software. These resources are dynamically discovered, provisioned, and configured based on workload requirements. Thus, the SDDC enables policy-driven orchestration of workloads, as well as measurement and management of resources consumed .
- The SDDC Comprises a set of features that include:
  - Logical compute, network, storage, and other resources
  - Discovery of resource capabilities
  - Automated provisioning of logical resources based on workload requirements
  - Measurement and management of resources consumed
  - Policy-driven orchestration of resources to meet service requirements of the workloads
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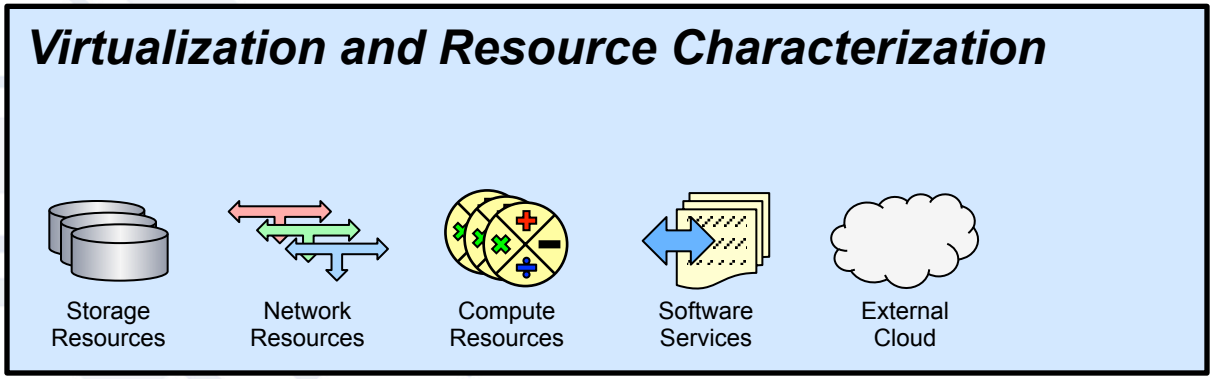
The Role of Virtualization

- **Virtualization** is central to the SDDC and is necessary but not sufficient. The three major building blocks that virtualization delivers are: compute, storage, and network:
  - **Compute Virtualization** – Abstraction of compute resources that can be realized with underlying collection of physical server resources. This concept includes abstraction of the number, type, and identity of physical servers, processors, and memory.
  - **Storage Virtualization** – Abstraction of storage resources that can be realized with underlying physical and logical storage resources. This concept includes abstraction of the number, type, and identity of physical disks.
  - **Network Virtualization** - Abstraction of network resources that can be realized using underlying physical and logical resources. This concept includes abstraction of the number, type, and identity of physical media, connectivity, and protocol.

SDDC Foundations

SDDC Resources are built upon:

- Physical resources
- Software that virtualizes them, and
- Software that instruments and manages other resources

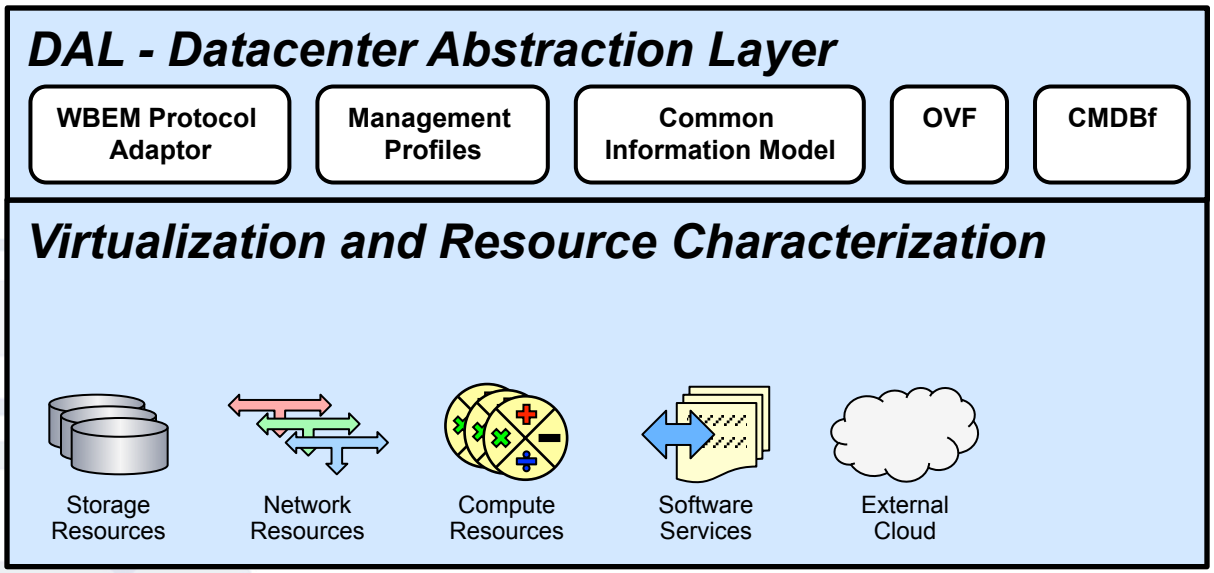


Configuration Management
Monitoring & Event Handling
Performance Metrics
Power & Cooling Metrics
Capability Discovery
- Native RAS
- Embedded Services

Accounting
Fault Management
Security

Datacenter Abstraction

- Provides a set of standards to abstract the underlying complexity:
  - Use of applicable Industry Standards
  - Group these standards into Datacenter Abstraction Layer (DAL)
  - Interface for Orchestration & Provisioning



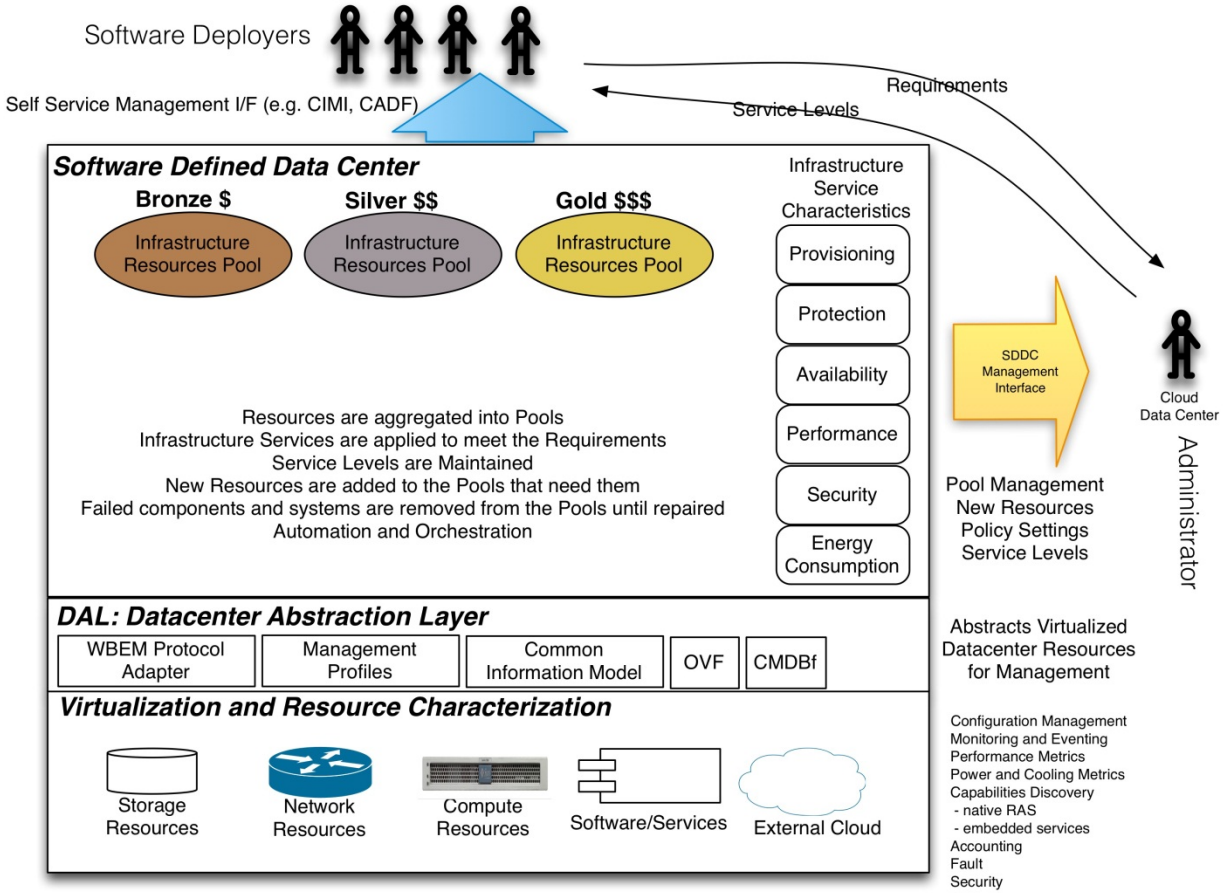
Abstracts Virtualized Datacenter Resources

Configuration Management
Monitoring & Event Handling
Performance Metrics
Power & Cooling Metrics
Capability Discovery
- Native RAS
- Embedded Services

Accounting
Fault Management
Security

The Software Defined Data Center

- SDDC is *a **Concept** with Many possible Architectures*



Other related work

- OASIS - Cloud Application Management for Platforms (CAMP)
- OASIS - Topology and Orchestration Specification for Cloud Applications (TOSCA)
- SNIA - Cloud Data Management Interface (CDMI)
- ETSI/ISG – Network Function Virtualization (NFV)
- IETF/IRTF
- Open Networking Foundation (ONF)
- Open DayLight (ODL)
- Open Data Center Alliance (ODCA)

Standards Gaps - What is Missing???

- Standards for metrics that can drive orchestration layer
  - The “secret sauce”
- Resource Utilization
  - No agreed measures
  - Application and infrastructure level
  - Some work has been done for virtual h/w
- Policy
  - Service Levels – SLO & SLA
  - Some work being done in JTC1 & SC38

Software Defined Data Center Summary

- An emerging area of technology
- Revolutionizing Data Centers
- DMTF is:
  - Defining the area
  - Identifying where existing standards can be used
  - Will develop additional standards where they are needed

For More Information

OSDDC White Paper

http://dmtf.org/sites/default/files/standards/documents/DSP-IS0501_1.0.0j.pdf

OSDDC Incubator

http://members.dmtf.org/apps/org/workgroup/osddc

Questions, Additional Ideas, Thoughts?