Network Port Profiles Based Provisioning and Deployment Models for Virtual Networking

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Agenda

• Virtual Networking
• Management Challenges with Virtual Networking
• Network Port Profile Overview
• Network Port Profile XML Schema
• Network Port Profile Representation in OVF
• Network Port Profile Based Provisioning and Deployment Models
Virtual Networking

- Virtual networking enables connectivity between virtual systems
- Virtual network consists of virtual Ethernet ports and switches
- Virtual network components connectivity to network (shown below)

![Diagram of virtual networking](image)
Management Challenges with Virtual Networking

- Multiple Management Domains
- Lack of a unified programmatic management interface
- Possibility of inconsistent configuration of managed objects
- Lack of common configuration information
- Disparity between the capabilities of bridges

System Management Domain

Network Management Domain

Overlap

- SNMP, CLI, etc.

CIM-XML, CIM/WS-Man...
Network Port Profile

- Refers to a set of networking attributes for virtual machine(s)
  - MAC address, VLAN, QoS…
- Describes a specific configuration of network infrastructure
  - To which virtual machine gets connected to
- Establishes consistent configuration among the bridges
Network Port Profile XML Schema

- DMTF standard that defines structure of Network Port Profile XML docs
- Provides a common way to represent network port profiles
- Uses the XML elements derived from the properties of CIM
  - EthernetPortAllocationSettingData class
- Enables consistent representation of network attributes during packaging/deployment/management of virtual networking components
- Extensible – other elements not derived from CIM can be incorporated

```xml
<?xml version="1.0" encoding="UTF-8"?>
<nppns:NetworkPortProfile ...>
  <epasd:NetworkPortProfileID>http://www.dmtf.org/portprofiles</epasd:NetworkPortProfileID>
  <epasd:NetworkPortProfileIDType>2</epasd:NetworkPortProfileIDType>
  <epasd:Address>00-16-8B-DB-00-5E</epasd:Address>
  <rasd:AllocationUnits>GigaBits per Second</rasd:AllocationUnits>
  <rasd:Reservation>1</rasd:Reservation>
</nppns:NetworkPortProfile>
```

```xml
<?xml version="1.0" encoding="UTF-8"?>
<nppns:NetworkPortProfile ...>
  <epasd:NetworkPortProfileID>http://www.dmtf.org/portprofiles</epasd:NetworkPortProfileID>
  <epasd:NetworkPortProfileIDType>2</epasd:NetworkPortProfileIDType>
  <epasd:Address>00-16-8B-DB-00-5E</epasd:Address>
  <epasd:AllowedToTransmitMACAddresses>00-16-8B-DB-00-5E</epasd:AllowedToTransmitMACAddresses>
  <epasd:AllowedToTransmitMACAddresses>00-17-8B-DA-00-5E</epasd:AllowedToTransmitMACAddresses>
  <epasd:AllowedToTransmitVLANs>5</epasd:AllowedToTransmitVLANs>
  <epasd:AllowedToTransmitVLANs>7</epasd:AllowedToTransmitVLANs>
</nppns:NetworkPortProfile>
```
Open Virtualization Format (OVF) & Network Port Profiles

- OVF – DMTF standard for packaging, distributing, and deploying VMs
- Network port profile XML schema and OVF provide an interoperable way of provisioning and deploying networks in virtualized environments

```
<epasd:Address>00-16-8B-DB-00-5E</epasd:Address>
<rasd:AllocationUnits>GigaBits per Second</rasd:AllocationUnits>
<rasd:Reservation>1</rasd:Reservation>
```
Network Port Profile – Use Case 1

- Network Infrastructure is pre-provisioned
- OVF package contains no Network Port Profiles
- Network Port Profile configuration is independent from OVF
- VM Admin understands Network Port Profile schema
- VM admin applies Network Port Profile configuration at the time of VM deployment
Network Port Profile – Use Case 2

- Network Infrastructure is pre-provisioned
- Network Port Profile info is in the OVF package
- VM Admin understands Network Port Profile metadata and schema
- VM admin applies Network Port Profile configuration during VM deployment
- At the deployment time, Network Port Profile DB is not accessed
Network Port Profile – Use Case 3

- Network Infrastructure is not pre-provisioned
- Network switch accesses Network Port Profile DB during VM deployment
- Network Port profile info is in the OVF package
- VM Admin understands Network Port Profile metadata and schema
- VM admin applies Network Port Profile configuration during VM deployment
- At the deployment time, VM Admin doesn’t access Network Port Profile DB
Summary

• Network port profiles address virtual networking management challenges

• Network port profiles and OVF provide standards-based provisioning and deployment of VMs and virtual networking components for
  • Pre-provisioned network environments
  • or dynamically provisioned network environments