



Network Port Profiles Based Provisioning and Deployment Models for Virtual Networking

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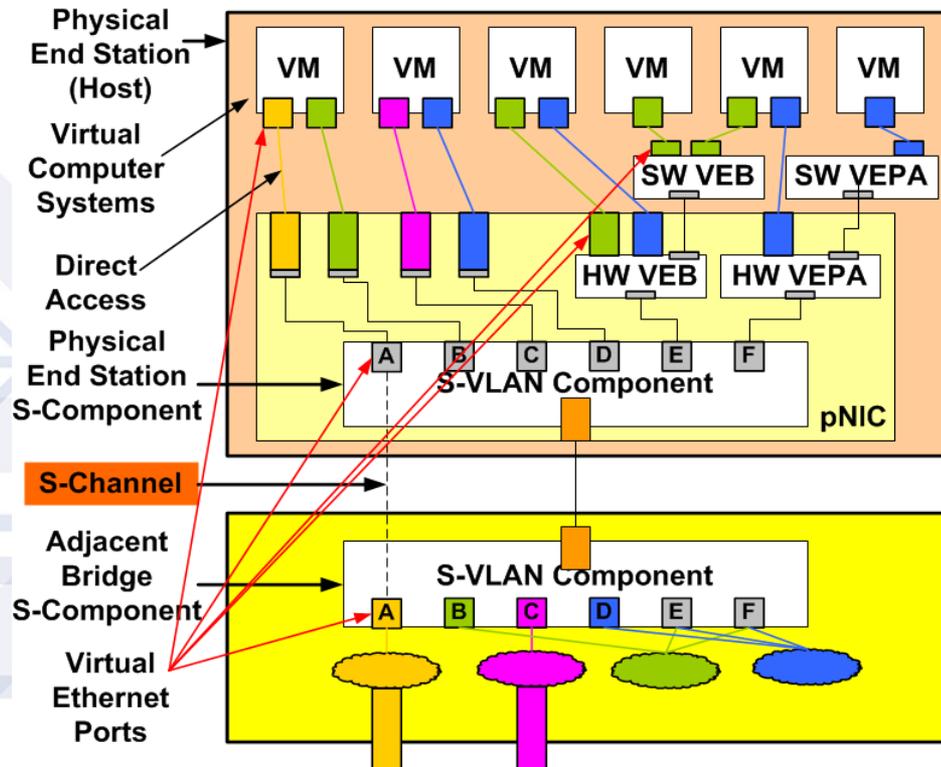
Agenda

- 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

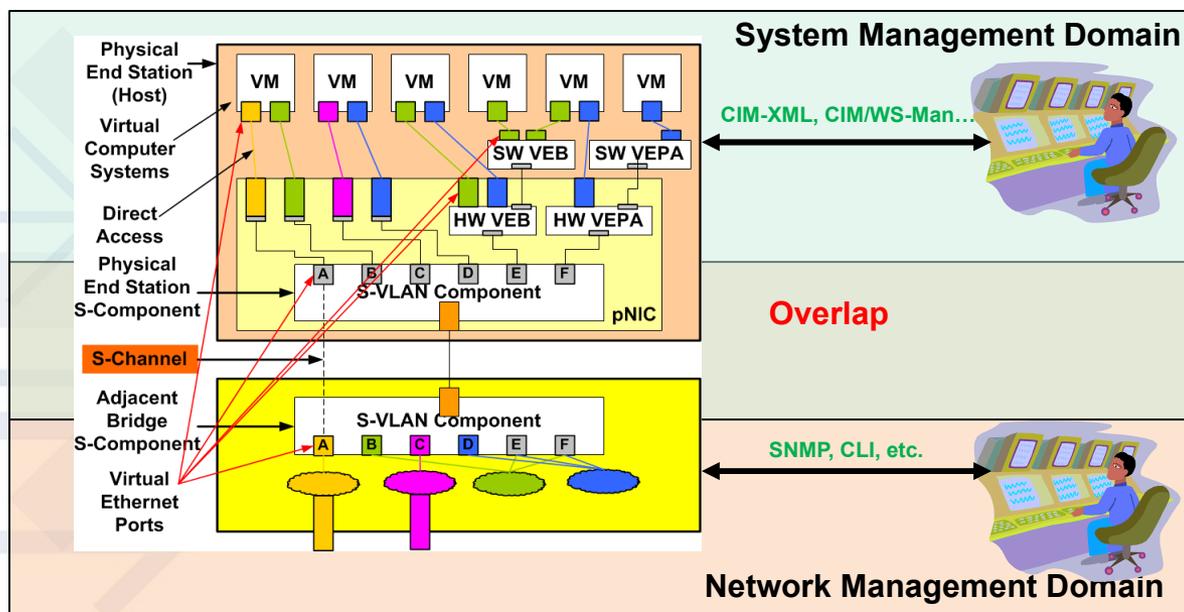
- Virtual networking enables connectivity between virtual systems
- Virtual network consists of virtual Ethernet ports and switches
- Virtual network components connectivity to network (shown below)





Management Challenges with Virtual Networking

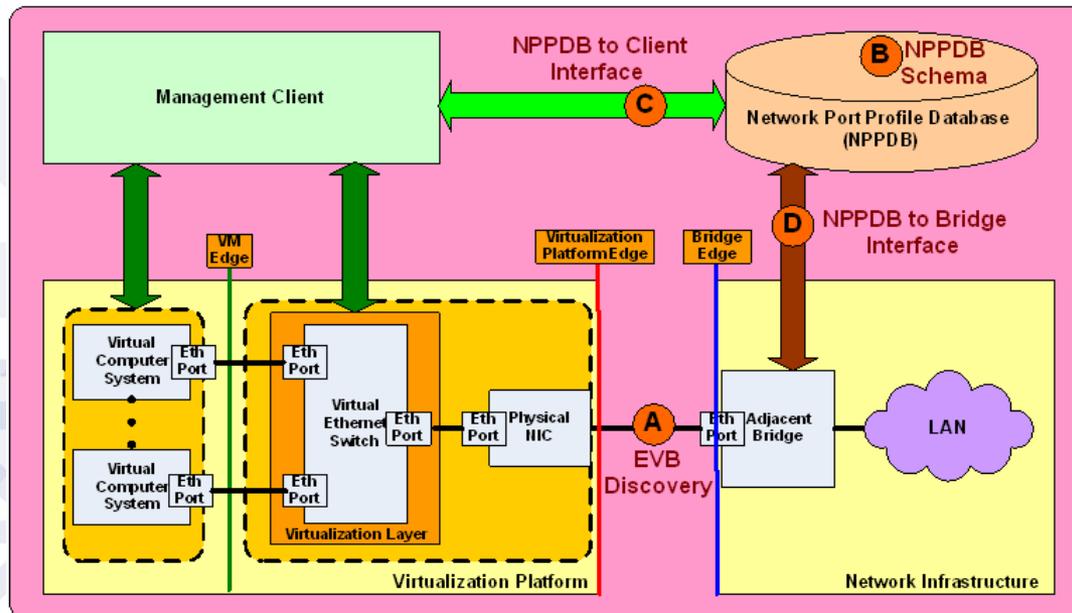
- Multiple Management Domains
- Lack of a unified programmatic management interface
- Possibility of inconsistent configuration of managed objects
- Lack of common configuration information
- Disparity between the capabilities of bridges





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

- Extensibility**

Bandwidth
Reservation

```
<?xml version="1.0" encoding="UTF-8"?>
<nppns:NetworkPortProfile ...>
  <epasd:NetworkPortProfileID>http://www.dmtf.org/portporfiles</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>
```

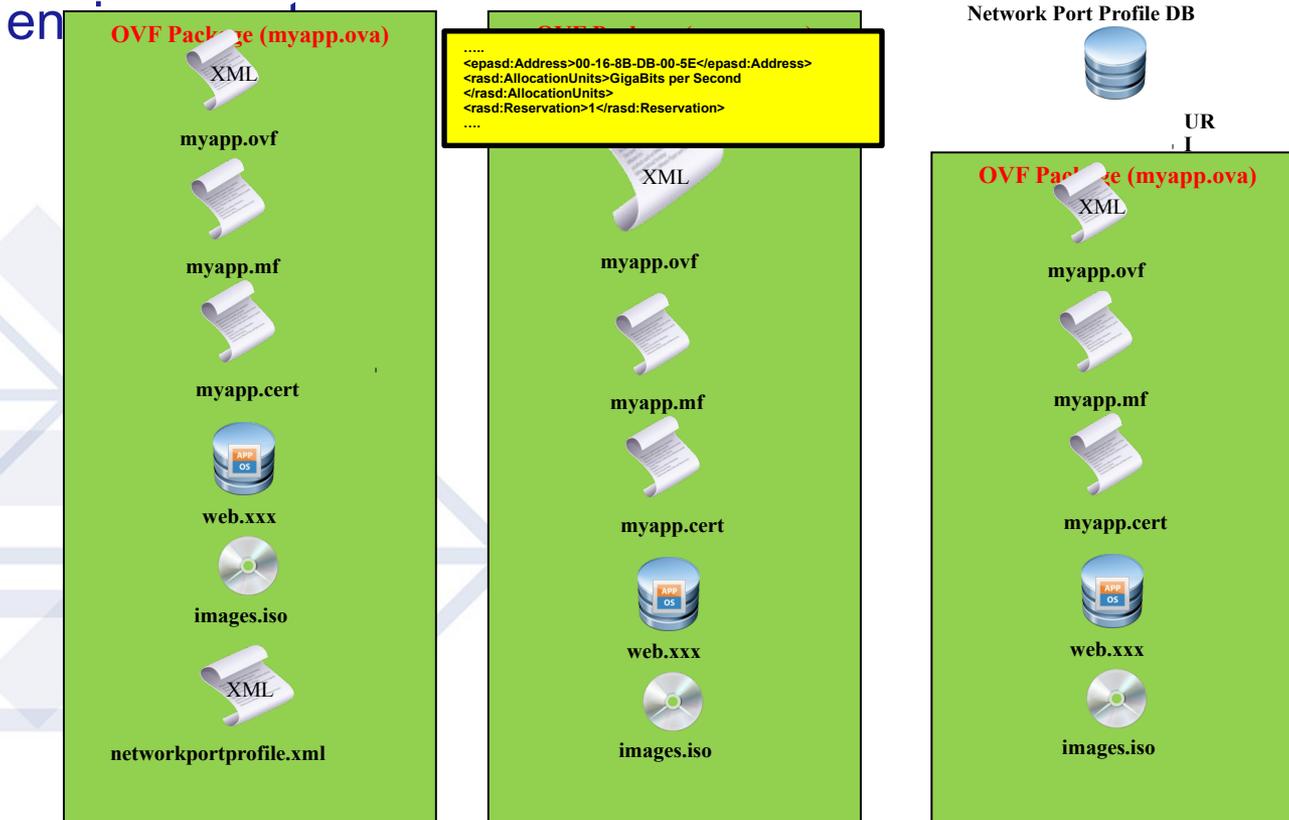
Allowed
MAC/VLAN
Pairs

```
<?xml version="1.0" encoding="UTF-8"?>
<nppns:NetworkPortProfile ....>
  <epasd:NetworkPortProfileID>http://www.dmtf.org/portporfiles</epasd:NetworkPortProfileID>
  <epasd:NetworkPortProfileIDType>2</epasd:NetworkPortProfileIDType>
  <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

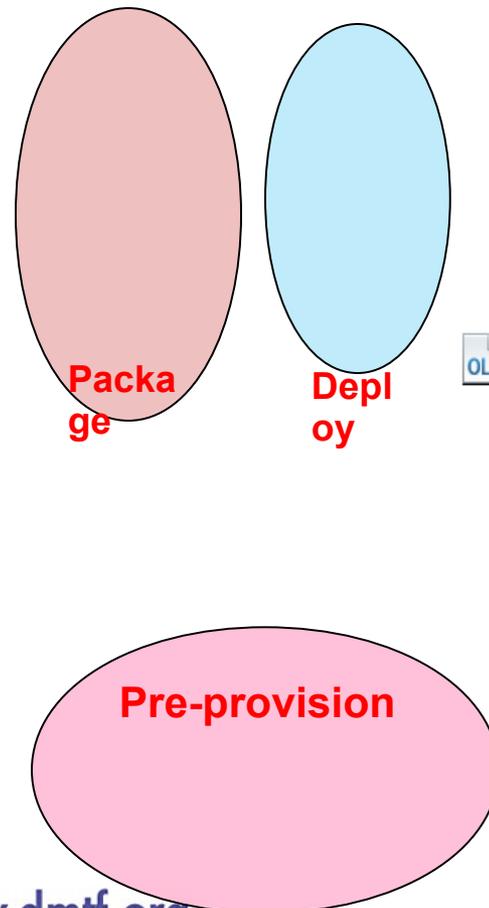
- OVF – DMTF standard for packaging, distributing, and deploying VMs
- Network port profile XML schema and OVF provide an interoperable way of provisioning and deploying networks in virtualized environments





Network Port Profile – Use Case 1

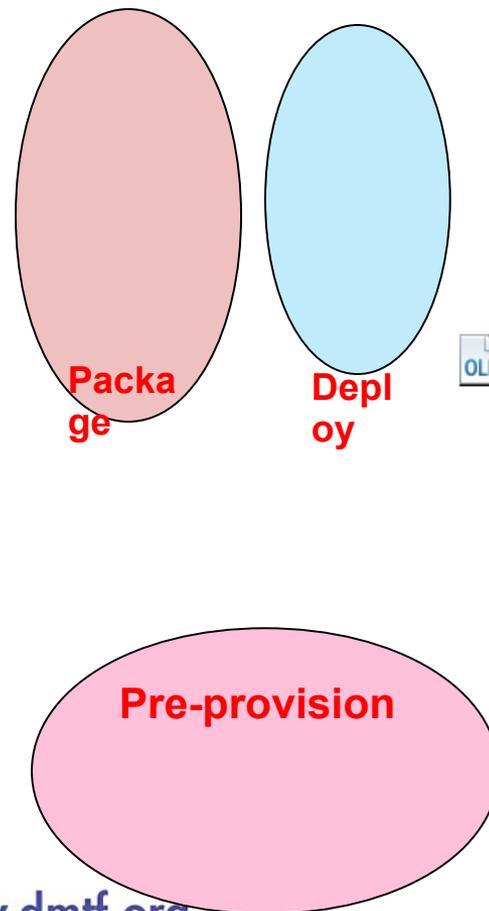
- Network Infrastructure is pre-provisioned
- OVF package contains no Network Port Profiles
- Network Port Profile configuration is independent from OVF
- VM Admin understands Network Port Profile schema
- VM admin applies Network Port Profile configuration at the time of VM deployment





Network Port Profile – Use Case 2

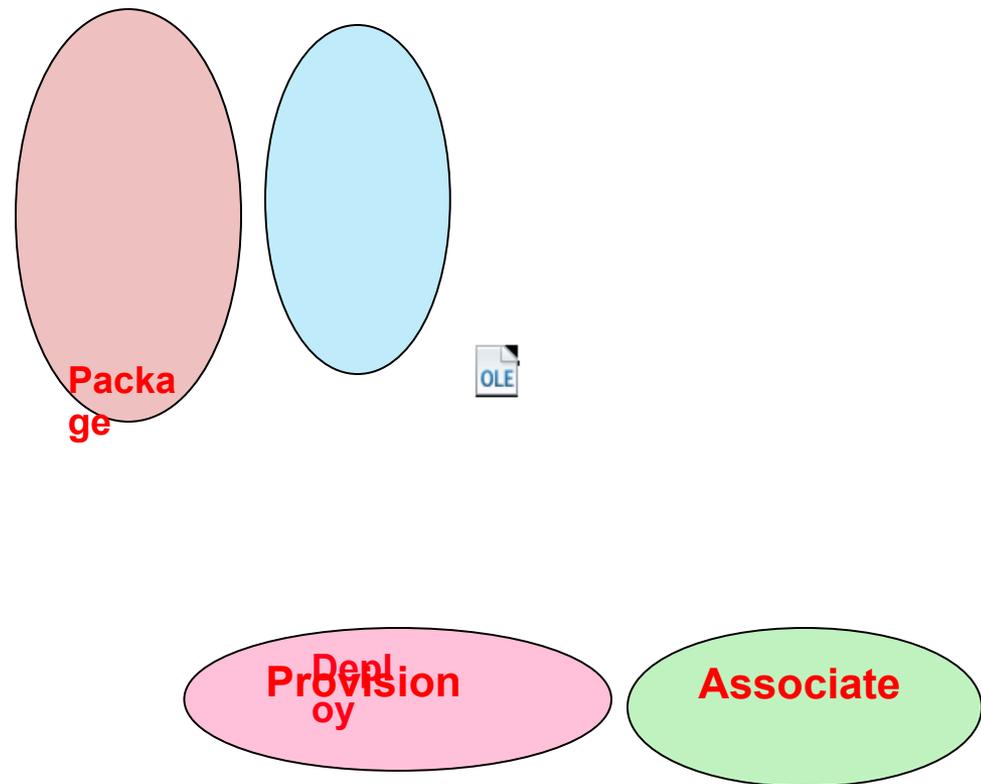
- Network Infrastructure is pre-provisioned
- Network Port Profile info is in the OVF package
- VM Admin understands Network Port Profile metadata and schema
- VM admin applies Network Port Profile configuration during VM deployment
- At the deployment time, Network Port Profile DB is not accessed





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