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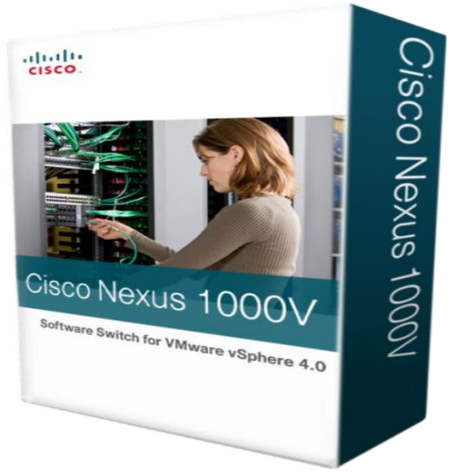
The Nexus 1000V on Microsoft Hyper-V: Expanding the Virtual Edge

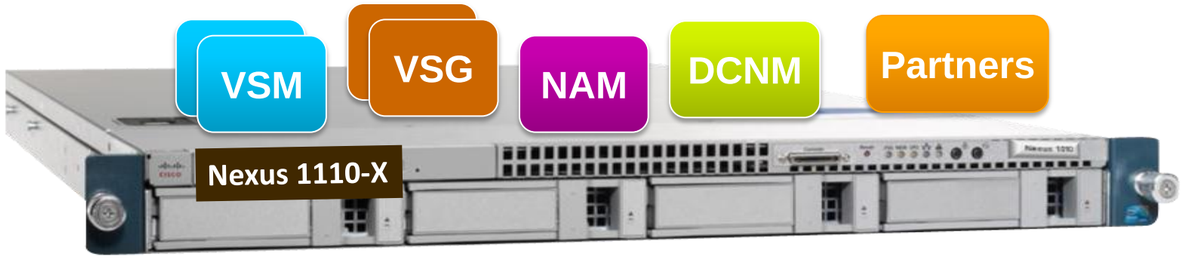
BRKVIR-2017

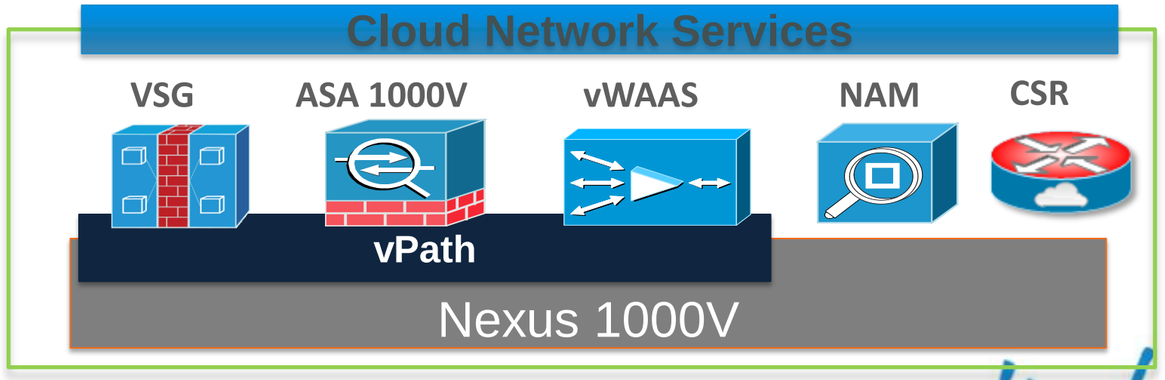
TOMORROW starts here.

Agenda

- Cisco's Virtual Networking Vision
- Cisco Nexus 1000V Portfolio Overview
  - Recent Pricing Changes
  - Architectural Overview
  - Services Architecture
- Cisco Nexus 1000V for Hyper-V
  - Port-profiles & network segments
  - SCVMM Networking Concetps
  - Powershell & SCOM
  - Deploying N1KV
- Demo
- Q&A





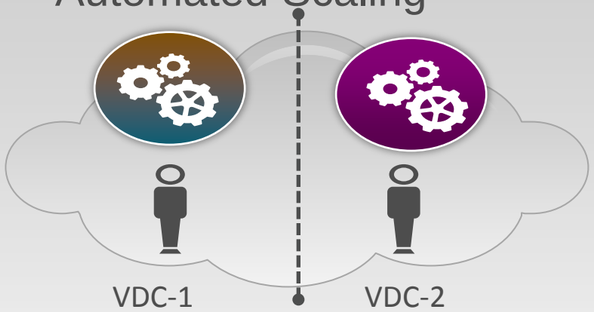


Forward-Looking Information

The information presented here on Nexus 1000V for Windows Server 2012 is under development and is subject to change before the general availability of these products.

Physical → Virtual → Cloud Journey

PHYSICAL WORKLOAD	VIRTUAL WORKLOAD	CLOUD WORKLOAD
• One app per Server • Static • Manual provisioning	• Many apps per Server • Mobile • Dynamic provisioning	• Multi-tenant per Server • Elastic • Automated Scaling



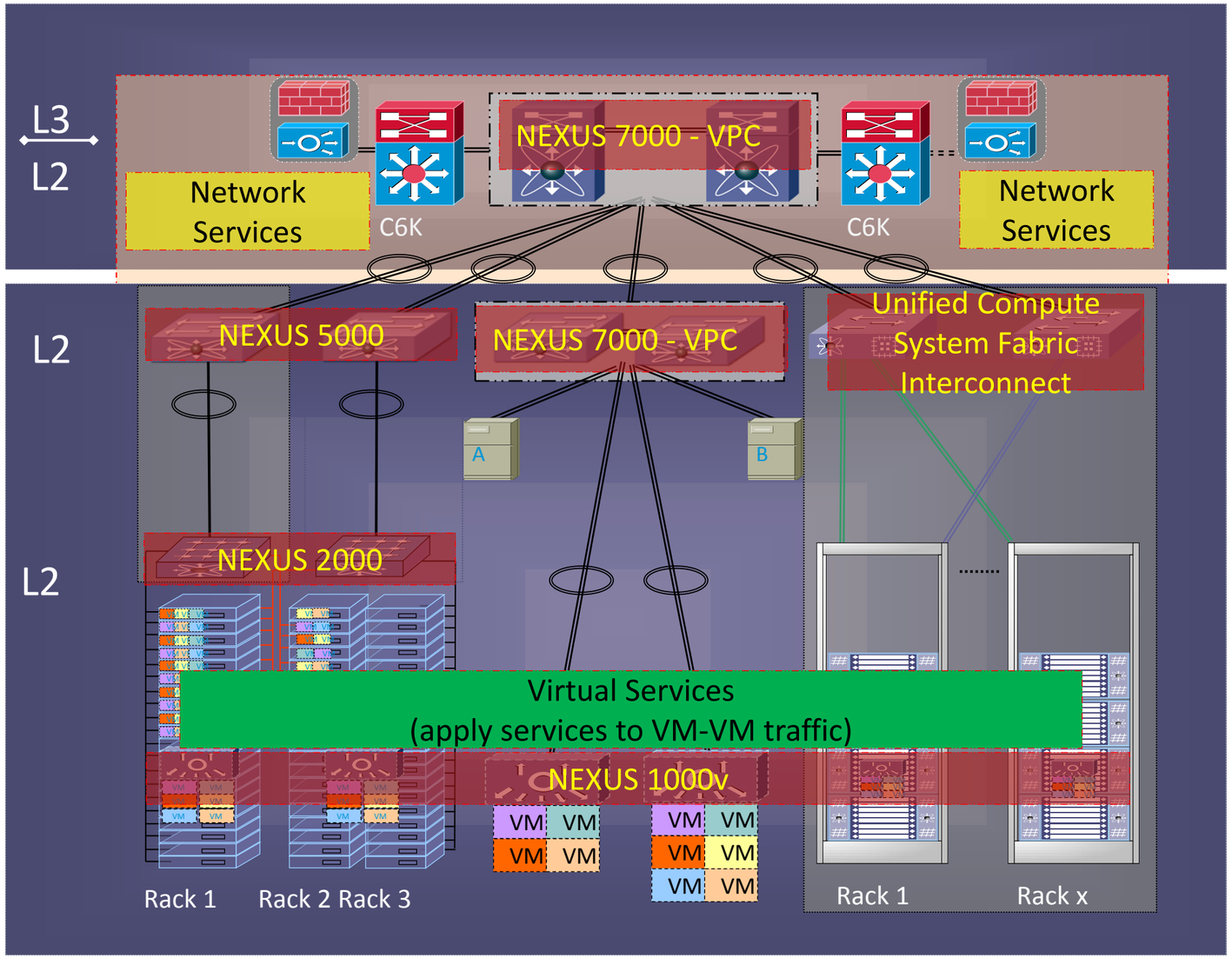
CONSISTENCY: Policy, Features, Security, Management, Separation of Duties

Switching	**Nexus 7K/5K/3K/2K**	**Nexus 1000V, VM-FEX**
Routing	**ASR, ISR**	**Cloud Services Router (CSR 1000V)**
Services	**WAAS, ASA, NAM**	**vWAAS, VSG, ASA 1000V, vNAM***

** 1H CY 2013

End to End DC Switching Portfolio

Advanced Features & Strong Partner Ecosystem



Aggregation

- Typical L3/L2 boundary.
- Physical network services

Unified Access

- Non-blocking paths to servers & IP storage devices

Virtual Access

- Virtual network switches
- Virtual services with horizontal scaling

Cisco Virtual Networking Vision

Nexus 1000V

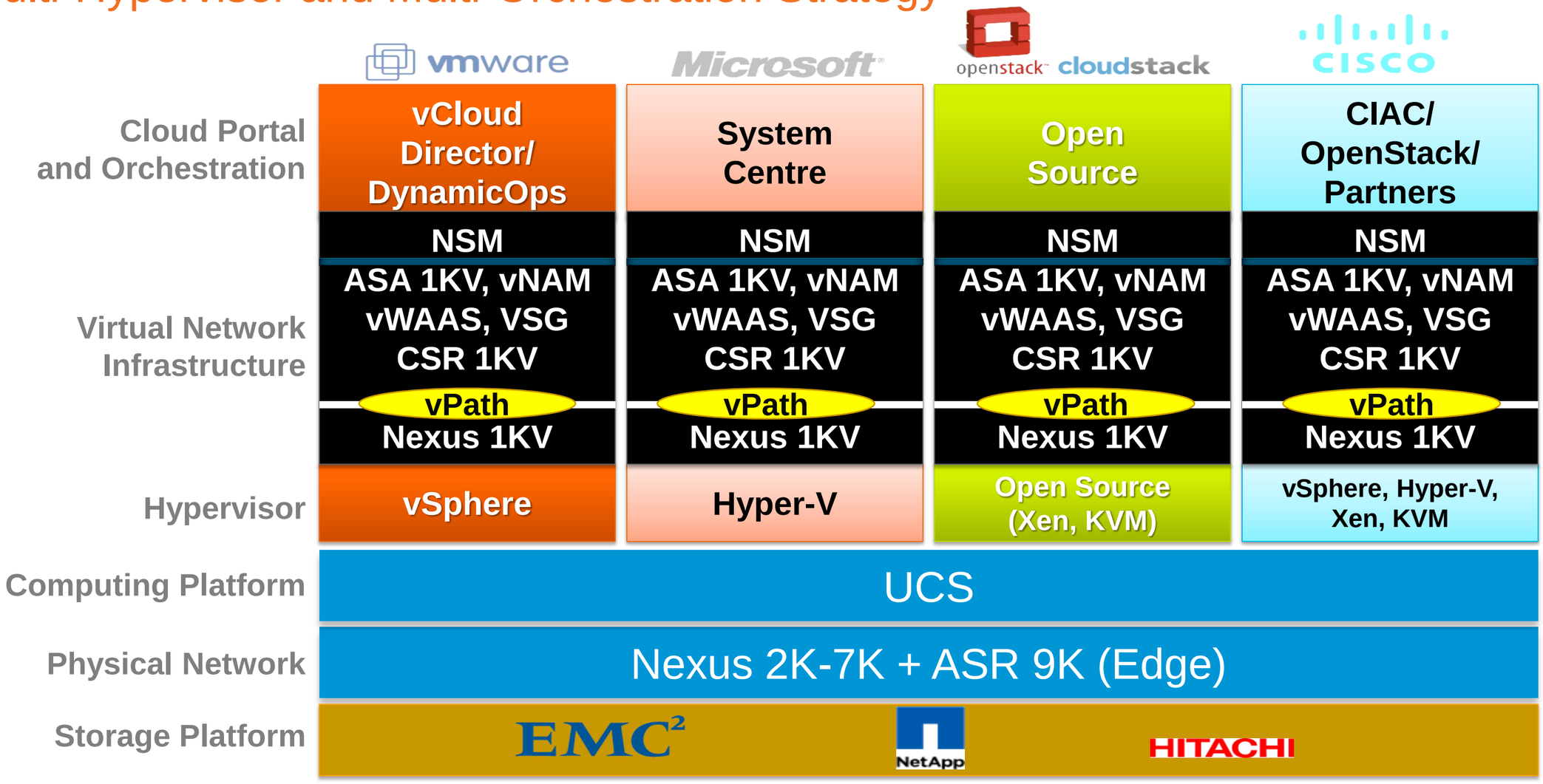
Multi-Cloud

Multi-Services

Multi-Hypervisor

Cloud Technology Stacks

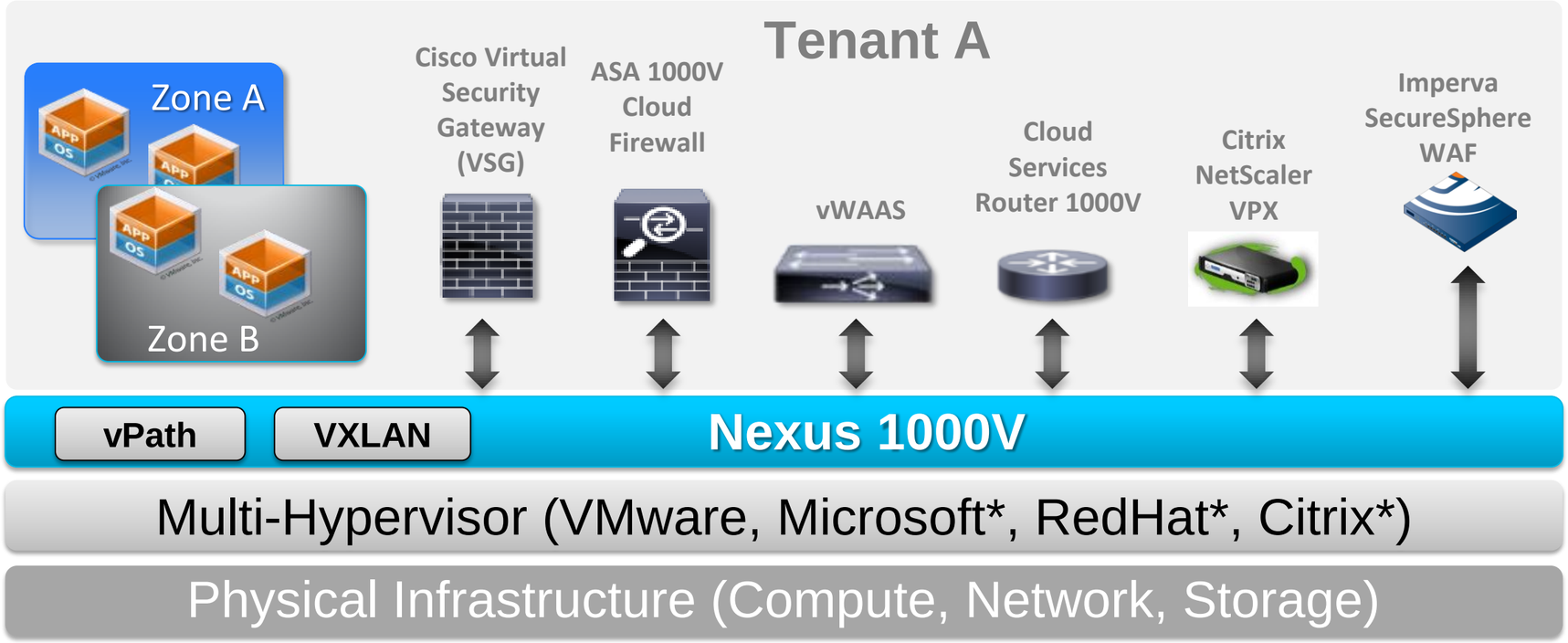
Multi-Hypervisor and Multi-Orchestration Strategy



Solutions: Vblock, FlexPOD, VMDC, VDI, HCS, Cross-DC Mobility

Cisco Cloud Services

Hypervisor agnostic multi-services platform



Nexus 1000V

- Distributed switch
- NX-OS consistency

7000+ Customers

VSG

- VM-level controls
- Zone-based FW

Shipping

ASA 1000V

- Edge firewall, VPN
- Protocol Inspection

Shipping

vWAAS

- WAN optimisation
- App, traffic

Shipping

CSR 1000V (Cloud Router)

- WAN L3 gateway
- Routing and VPN

CY2013

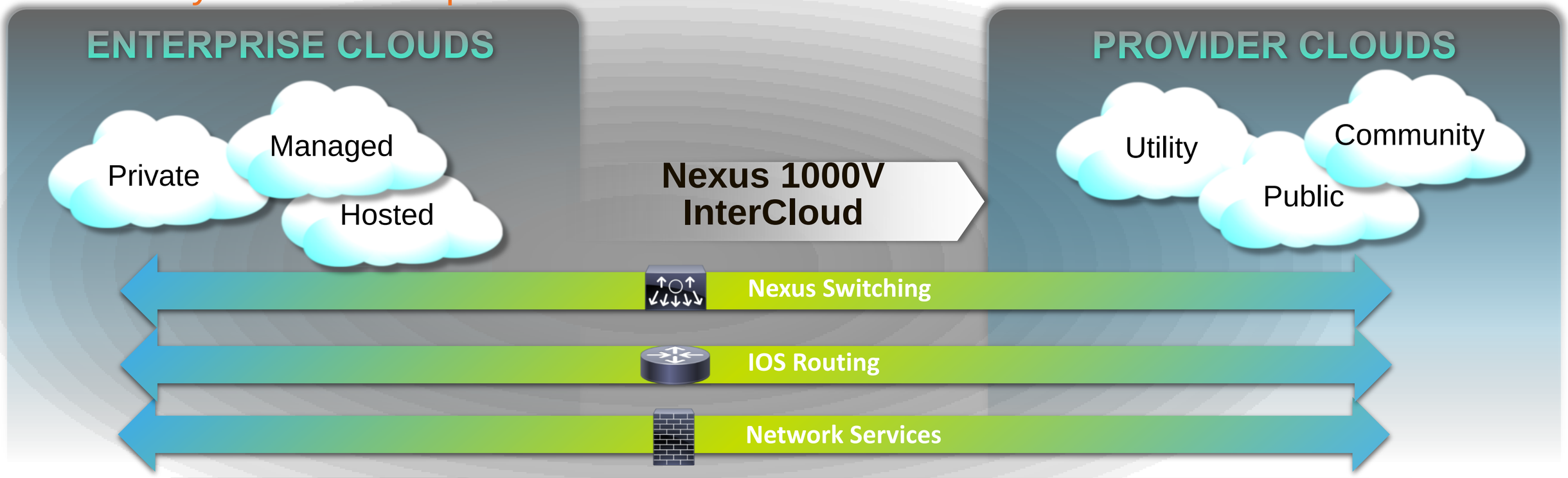
Ecosystem Services

- Citrix NetScaler VPX virtual ADC
- Imperva Web App. Firewall

CY2013

Cisco Nexus1000V InterCloud:

Securely Extend Enterprise Environment into Provider Cloud



Secure — Enterprise-Grade Crypto and Firewalling within & across clouds

Simple — Transparent Application Migration; Centralised Management

Flexible — Choice of Provider Clouds and Hypervisors

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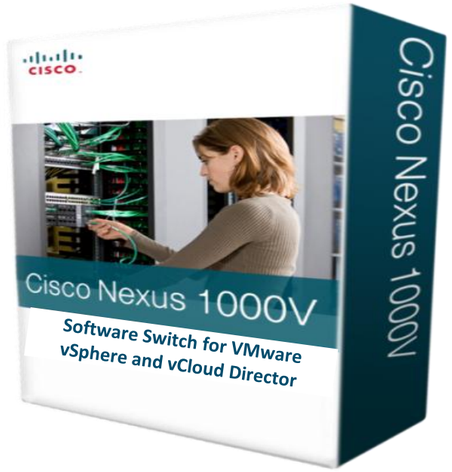

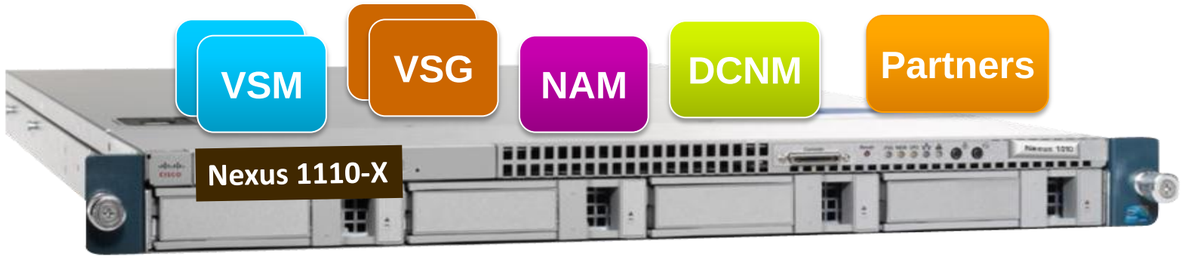

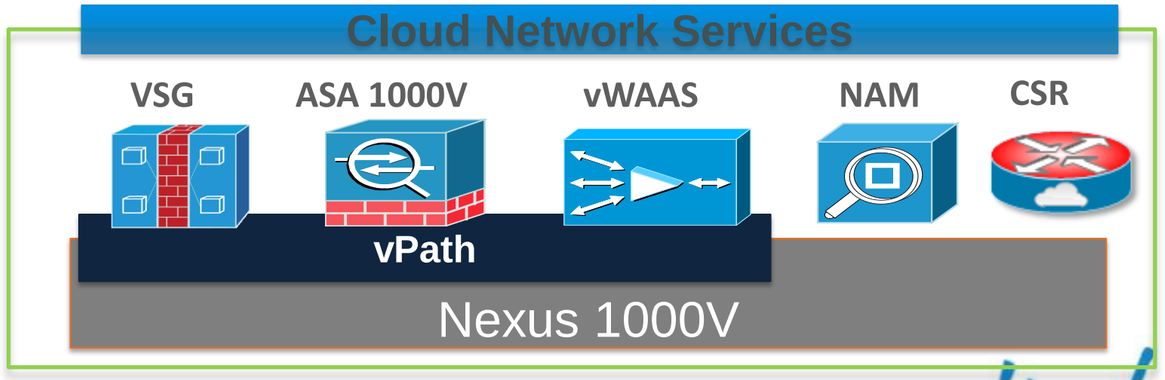

Cisco Nexus 1000V is Available in Two Editions

Essential & Advanced

	Essential ($0)	Advanced ($695/cpu)
VLANs, ACL, QoS	✓	✓
vPath	✓	✓
VXLAN	✓	✓
LACP	✓	✓
Multicast	✓	✓
Netflow, ERSPAN	✓	✓
Management	✓	✓
vTracker	✓	✓
vCenter Plugin	✓	✓
Virtual Security Gateway		✓
Cisco TrustSec SXP Support		✓
DHCP Snooping		✓
IP Source Guard		✓
Dynamic ARP Inspection		✓

Start using Cisco Nexus 1000V Today

Essential Edition – No licensing or procurement needed

Download Software v2.1 from cisco.com → Install Nexus 1000V Using new Installer App → Create Port Profiles & Start Using N1KV

Advanced Edition – Get a 60-day free trial when you use essential

Download Software v2.1 from cisco.com → Install Nexus 1000V Using new Installer App → Change Switch mode to **Advanced*** & Start Using N1KV

Existing N1KV 1.x Customers

- Get free upgrade to v2.1 Advanced Edition (at no cost)
- This upgrade also includes free VSG licenses
- Existing TAC support contract will include VSG support

Seamless upgrade to Advanced Edition

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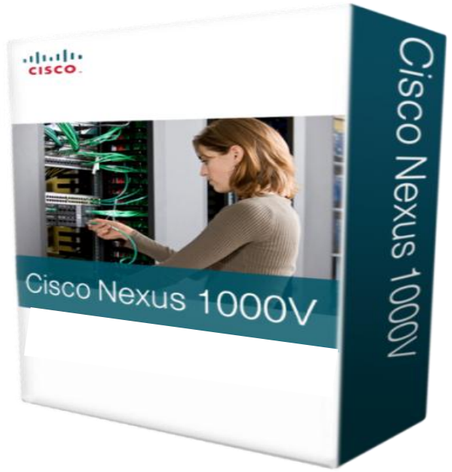
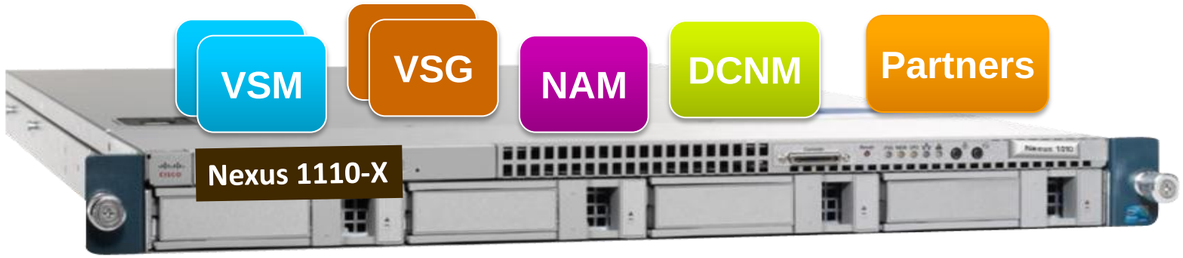
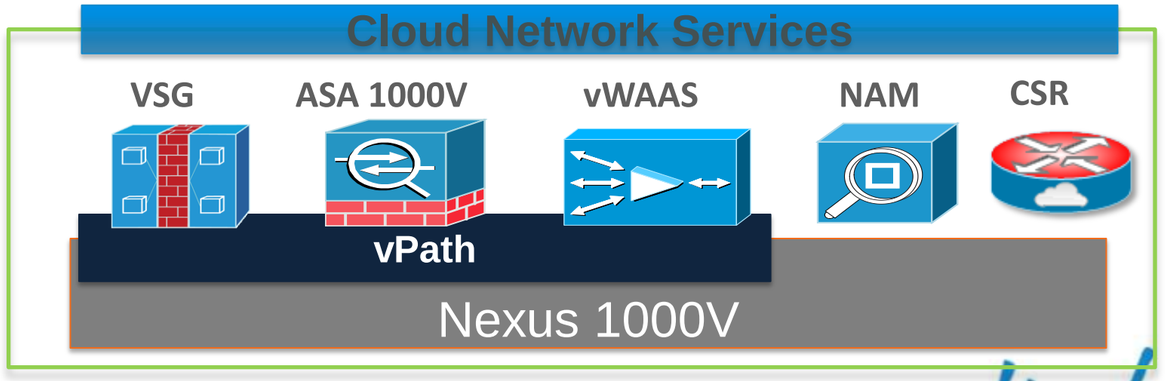
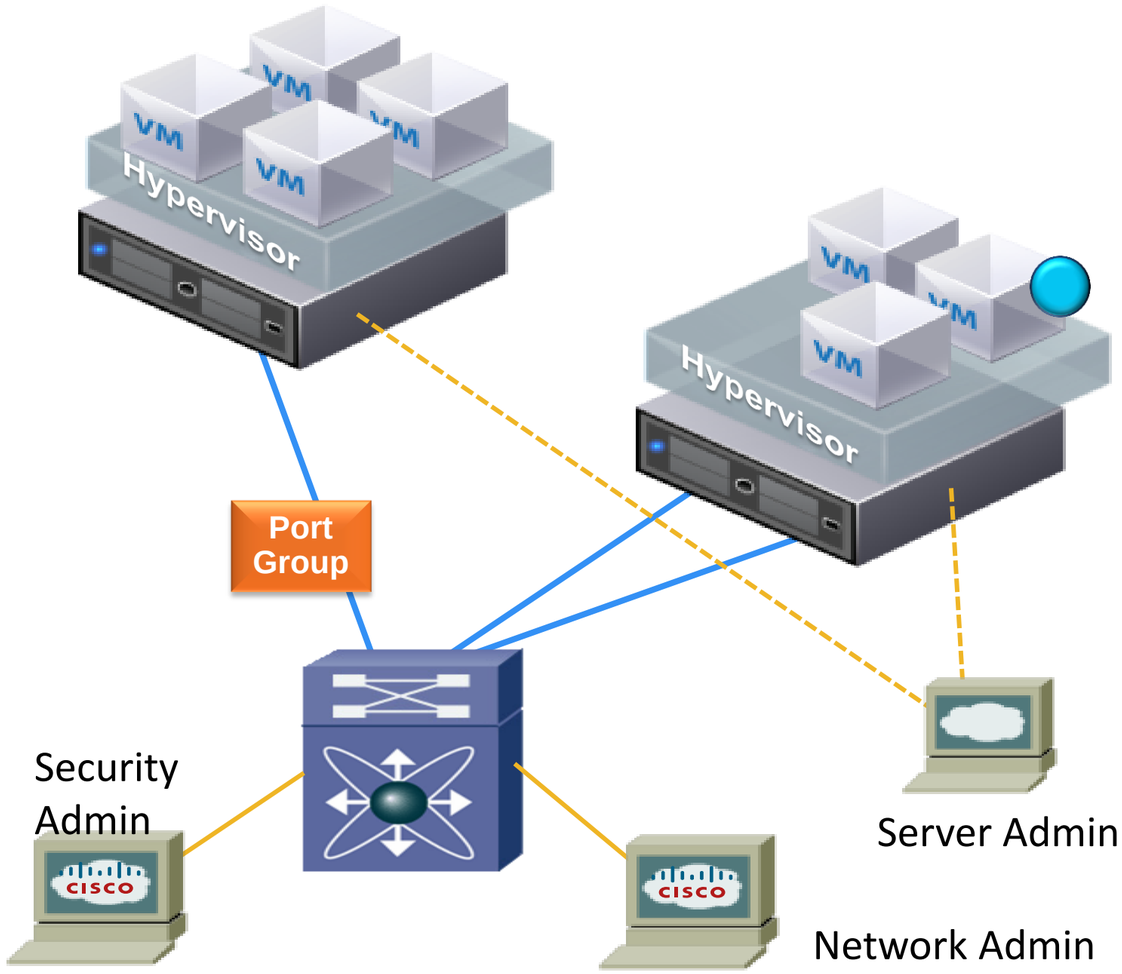






Server Virtualisation Issues

Policy Mobility, Lack of VM Traffic Visibility, Operational Complexity



1. **VM Migration moves VMs across physical ports—the network policy must follow this VM Motion (across racks, PODS, DCs)**
2. **Must view or apply network/security policy to locally switched traffic**
3. **Need to maintain segregation of duties while ensuring non-disruptive operations**

Customer Issues in Virtualised Environments

Operational Complexity

Managing networks across physical & virtual environments

Consistent Operational Model

Choice of Hypervisors

Different types of workloads require different hypervisors

Multi-hypervisor Support

Complex Workloads

Requirement for a secure virtual environment with rich network services

Multi-services support

Cloud Use-cases

Security concerns, and hybrid cloud use-cases

Multi-cloud support

Resource Utilisation

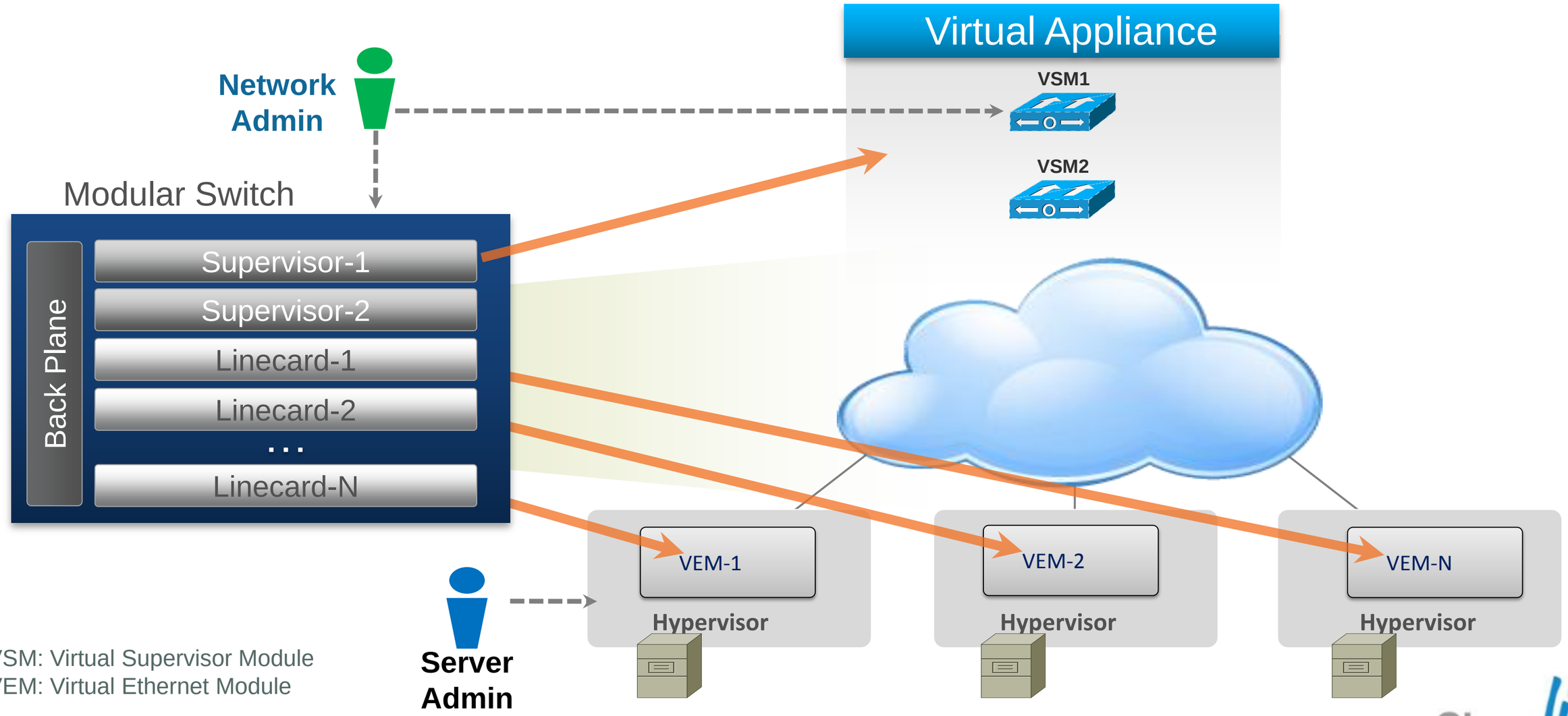
VM Mobility within the DC, across DCs and across clouds.

Overlay Technology Support

Diverse Virtualisation Requirements for DataCentre Customers

Cisco Nexus 1000V Overview

Architecture consistent with other modular switches



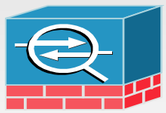
VSM: Virtual Supervisor Module
VEM: Virtual Ethernet Module

Cisco Nexus 1000V Overview

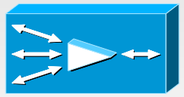
Integrated Switching & Services Platform

Virtual Appliance

ASA1000V

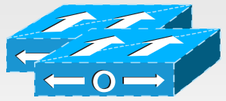


vWAAS

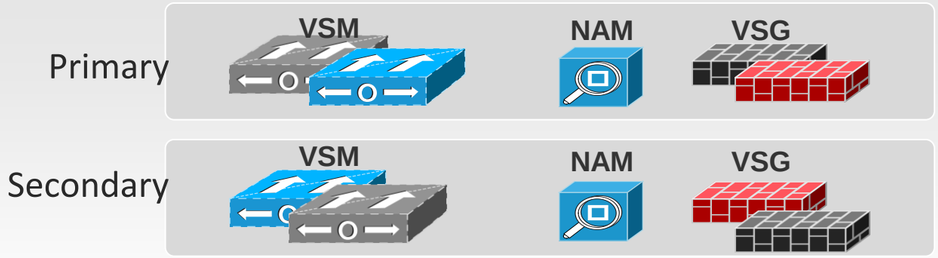


VSG

VSM



Nexus 1110



VSM: Virtual Supervisor Module

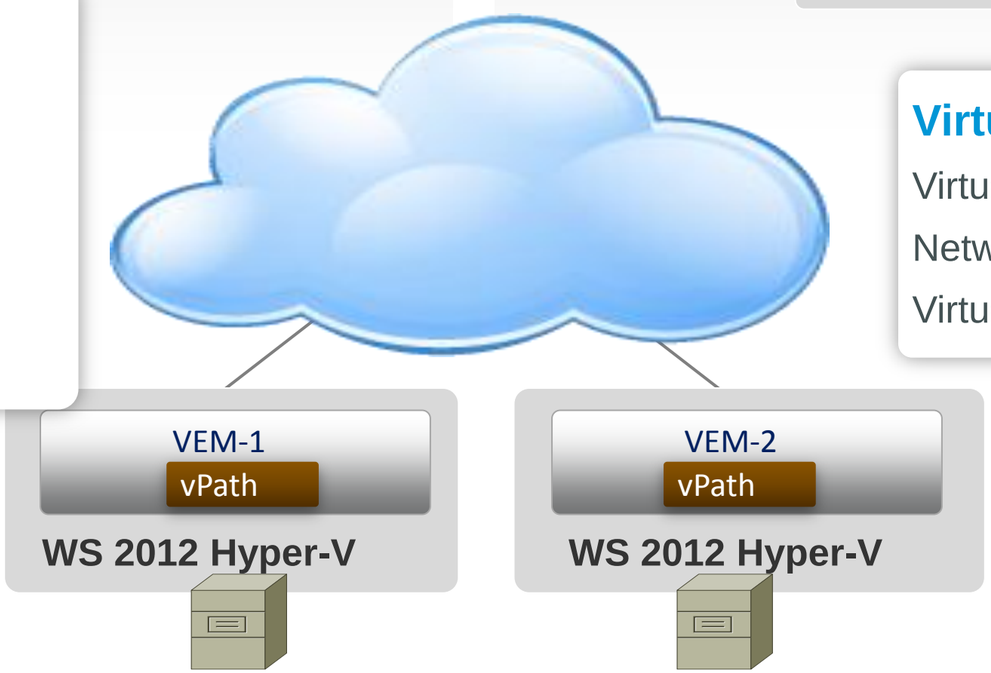
VEM: Virtual Ethernet Module

vPath: Virtual Service Data-path

VSG: Virtual Security Gateway

vWAAS: Virtual WAAS

ASA1000V: Tenant-edge security



Virtual Blades

Virtual Supervisor Module (VSM)

Network Analysis Module (NAM)

Virtual Security Gateway (VSG)

vPath

- **Service Binding (Traffic Steering)**
- **Fast-Path Offload**

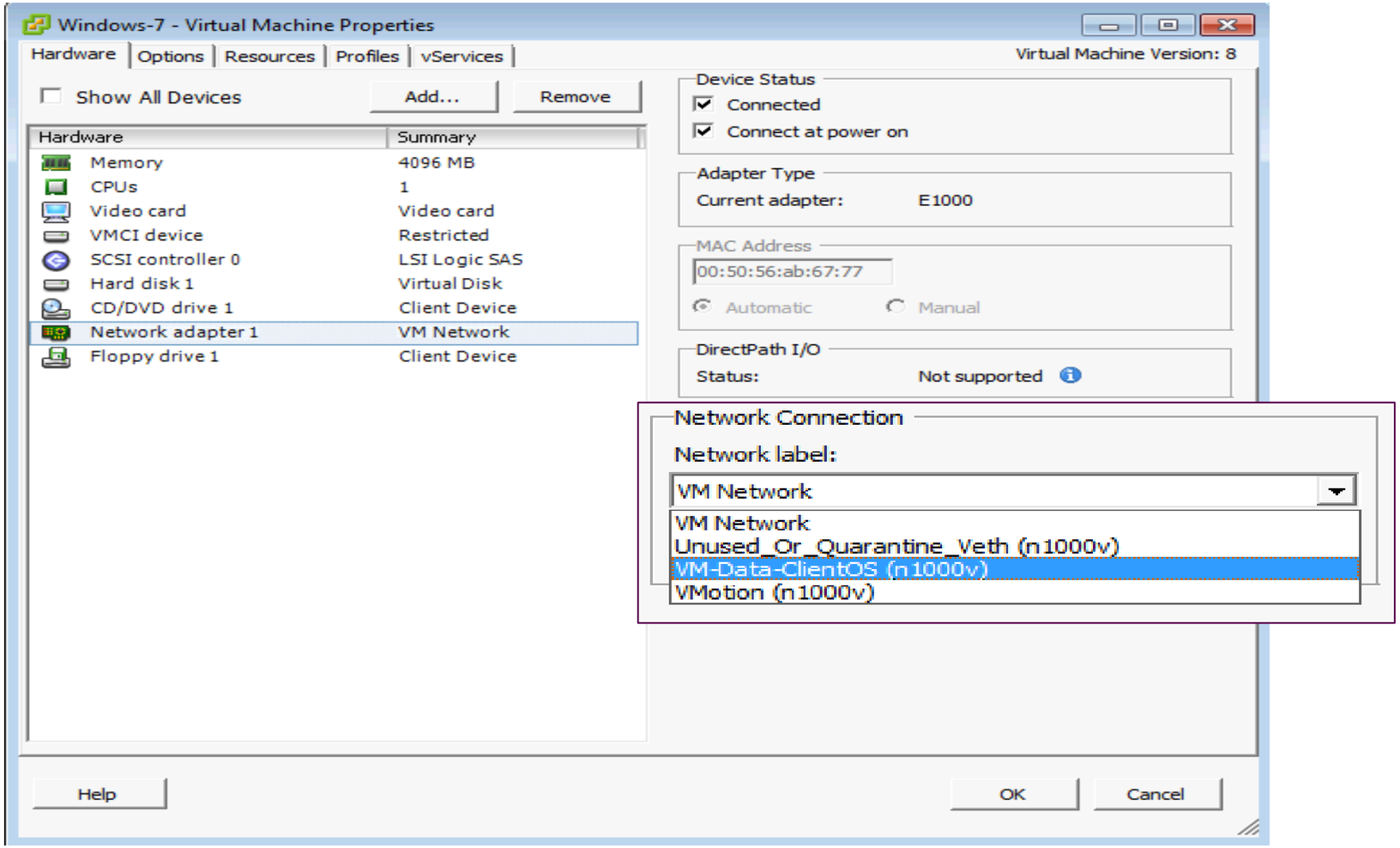
Port Profile Configuration

```
n1000v# show port-profile name VM-Data-ClientOS
port-profile VM-Data-ClientOS
   type: Vethernet
   description:
   status: enabled
   max-ports: 32
   min-ports: 1
   inherit:
   config attributes:
    switchport mode access
    switchport access vlan 110
    no shutdown
   evaluated config attributes:
    switchport mode access
    switchport access vlan 110
    no shutdown
   assigned interfaces:
    Vethernet10
```

Support Commands Include:

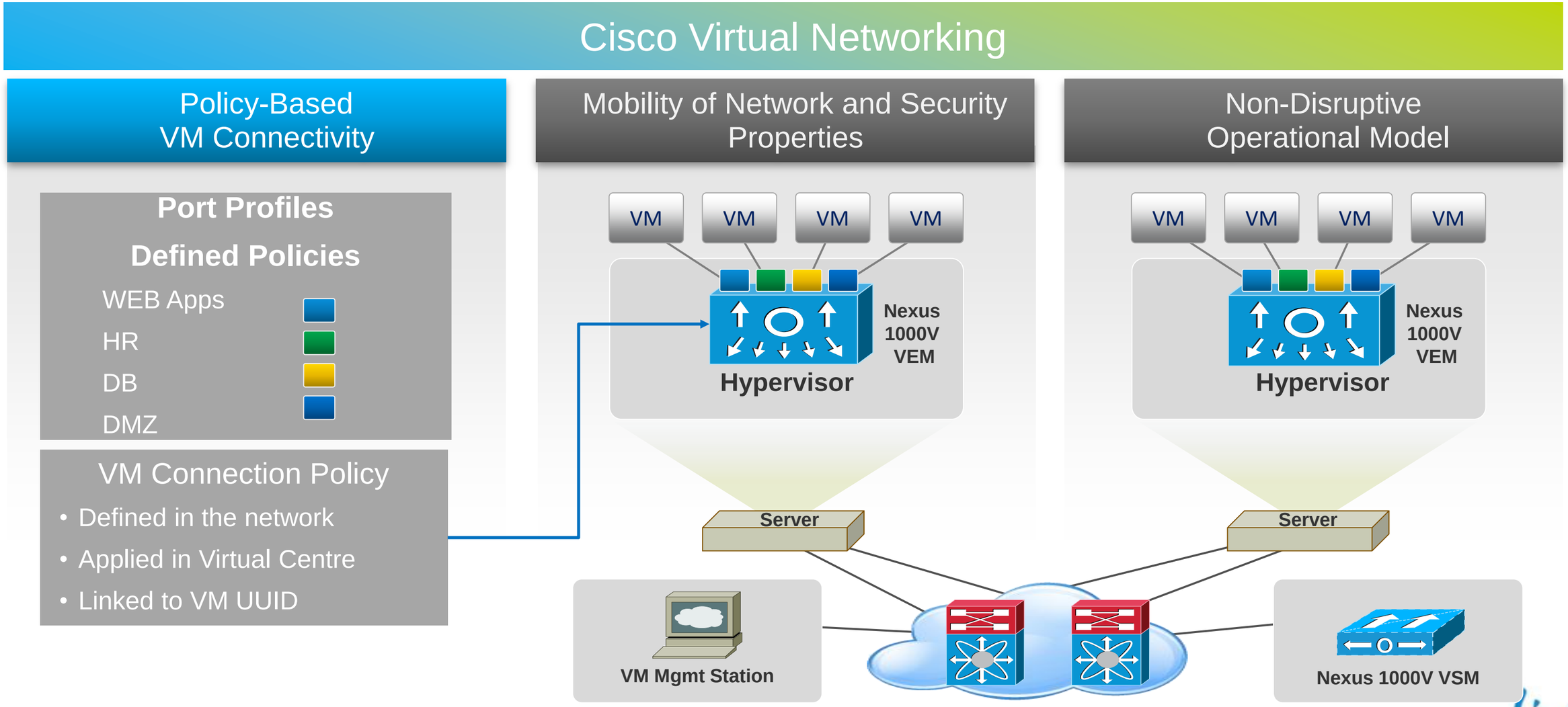
- ✓ Port management
- ✓ VLAN
- ✓ PVLAN
- ✓ Port-Channel
- ✓ ACL
- ✓ Netflow
- ✓ Port security
- ✓ QoS

Server Admin's View of Port-profiles



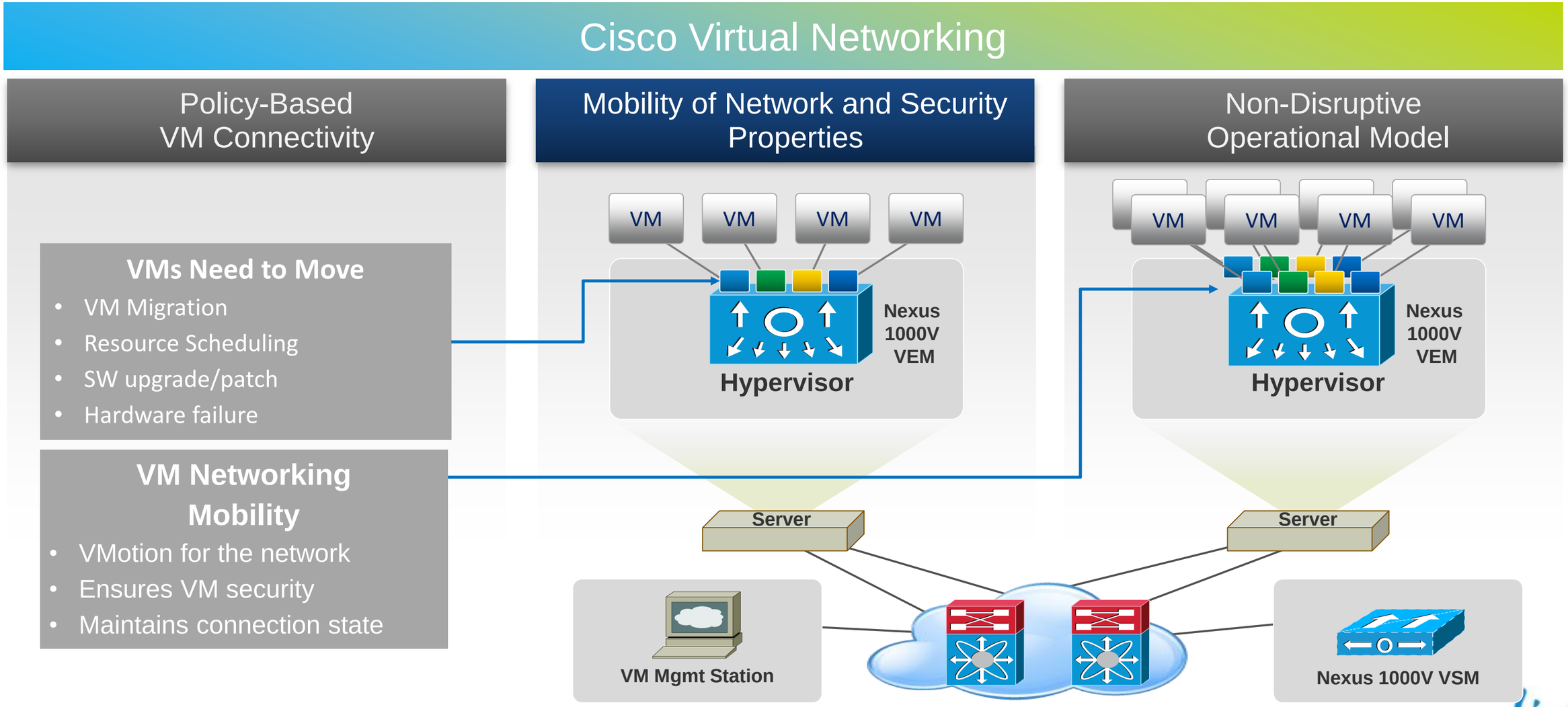
Port Profile Configuration

Faster VM Deployment



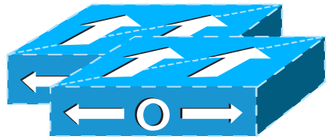
Port Profile Configuration

Policy Mobility with VM Migration



Non-disruptive Operational Model with N1KV

Consistent NX-OS Feature-set and Services



Nexus1000v VSM

VM Mgmt Center

Network Admins

Nexus OS CLI

Server Admins

VM Mgmt Interface

- Create or Update network policies

- Install hypervisor on hosts with N1KV VEM
- Create VM and assign Port profiles to VM

- No hand-off required between network and server admins
- Complete visibility to the VM-to-VM traffic
- Consistent feature-set & CLI for physical & virtual networks
- Same management tools used across physical & virtual networks

Proven Architecture for Virtualisation Use-cases

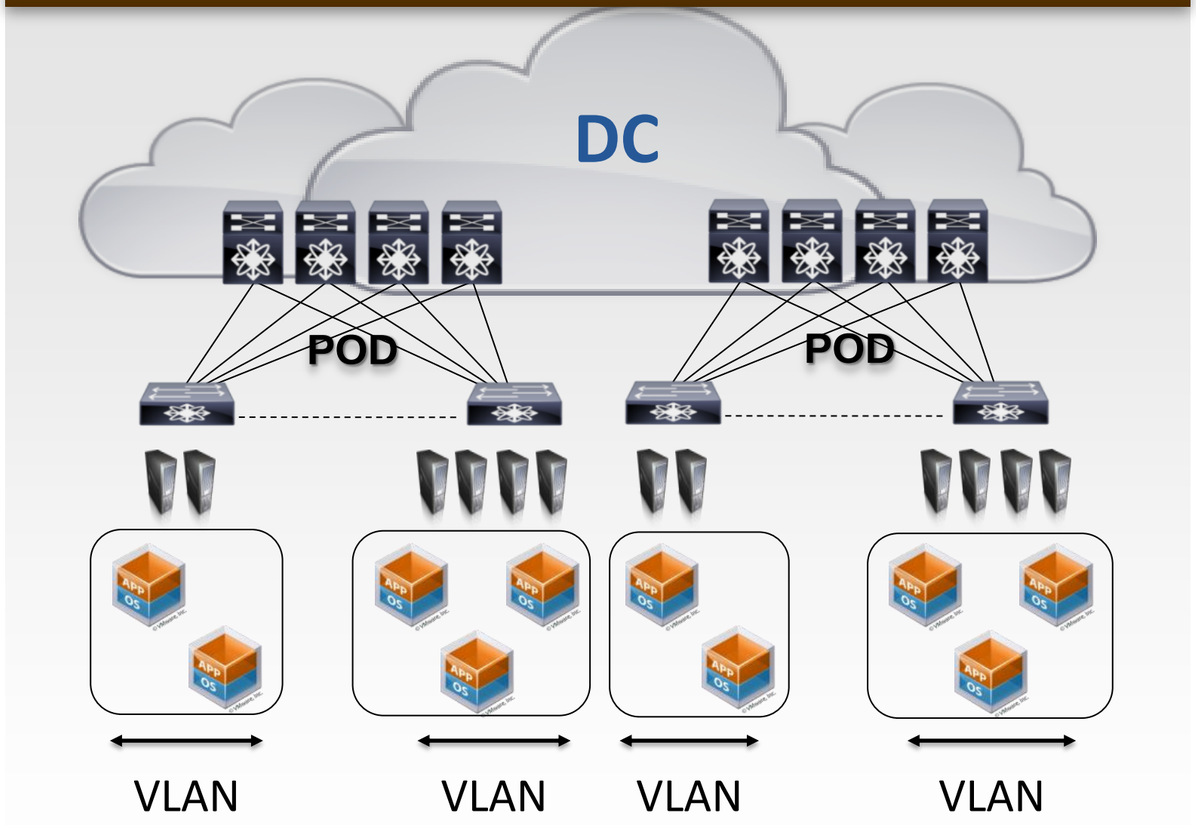
Solution	Nexus 1000V	Nexus 1010	Virtual Security Gateway	Virtual WAAS	NAM (N1010)
Vblock	✓		✓	✓	
FlexPOD	✓	✓			
Virtual Desktop	✓	✓	✓	✓*	✓
Virtual Multi-tenant DC (VMDC)	✓	✓	✓		✓
DC-to-DC vMotion	✓	✓	✓	✓	✓
PCI 2.0	✓	✓	✓		✓
Hosted Collaboration	✓	✓			✓

*Based on default Citrix configuration

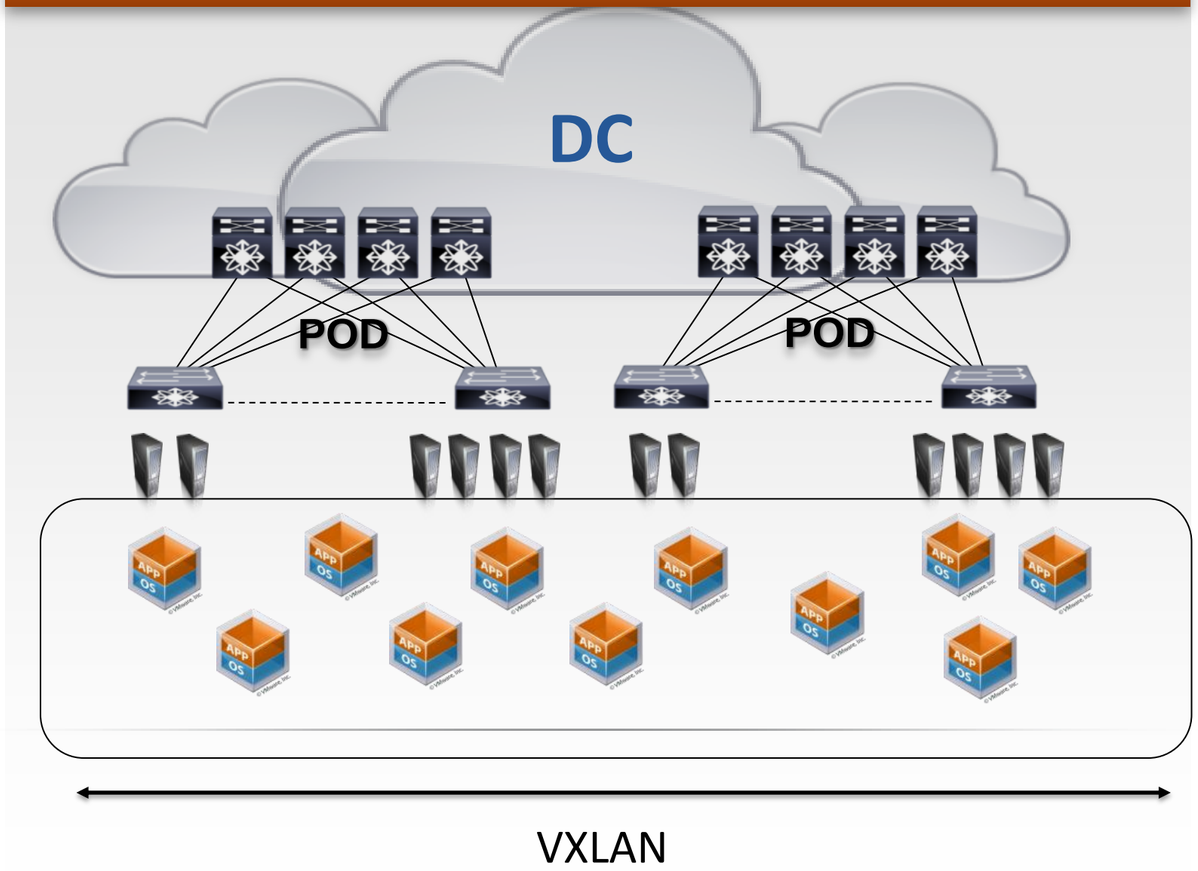
Broader Mobility Diameter with Overlays

Infrastructure Flexibility & Better Resource Utilisation

Limited Rack-wide VM Mobility



Virtual/Cloud Data Centre



Uniform Management Interface Across Physical, Virtual and Across Hypervisors

- NTP
- TACACS+
- RADIUS
- Netflow
- SPAN & ERSPAN
- NX-OS CLI
- SNMP Support
- NetConf/XML
- CDP
- Syslog

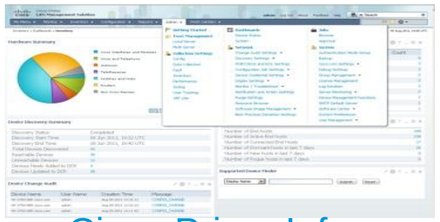
Cisco Nexus 1000V

vm-network-definition (id, vlan, ip-pool) – for network segments
logical-network-definition (name, id, connected-ports) – fabric n/w
virtual-port-profile (type, id, maxports, switch-id) – for vEth
uplink-port-profile (state, type, id, maxports, switch-id) – for PNIC
ip-address-pool (name, dhcp-server, range etc.) – for ip-pools

REST-APIs for manageability

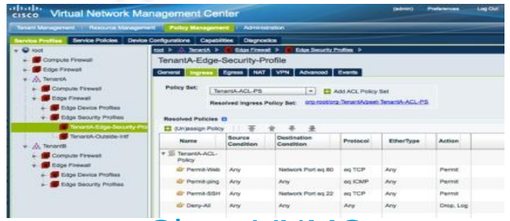
Strong Management Ecosystem

Cisco NMS Support

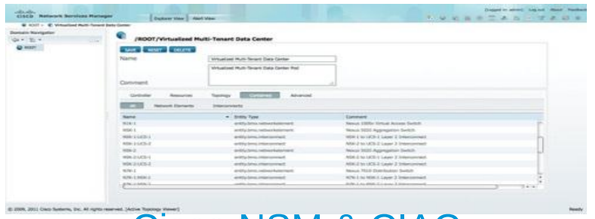


Cisco Prime Infra.

Cisco Prime DCNM



Cisco VNMC



Cisco NSM & CIAC

Systems Management Vendors

bmcsoftware ca IBM EMC²

Other ISVs

solarwinds RSA enVISION Zenoss Jala-oft

Virtualisation Vendors

vmware Microsoft System Center Virtual Machine Manager 2012

Consistent management interfaces across physical & virtual

- NX-OS CLI, SNMP, NetConf/XML, REST*
- CDP, NTP, Telnet/SSH
- Syslog, ACL- Logging, TACACS+, RADIUS
- Netflow, SPAN, ERSPAN, REST-ful APIs

Your existing Mgmt tools work well with Nexus 1000V

*Available in H2CY13

Cisco Nexus 1000V: Customer Benefits

Consistent Networking Features

- NX-OS feature across multiple hypervisors & across physical and virtual environments
- Advanced NX-OS switching features, including security, visibility, QoS, segmentation (VXLAN), port channel, …

Consistent Operational Model

- NX-OS CLI across multiple hypervisors & physical/virtual
- Separation of duties between network & server admins
- Dynamic provisioning and VM mobility awareness
- Leverage existing monitoring and management tools

Consistent Network Services

- Leverage existing virtual services
  Virtual Security Gateway, Virtual WAAS, ASA 1000V, NAM
- Services can be hosted on Nexus 1010

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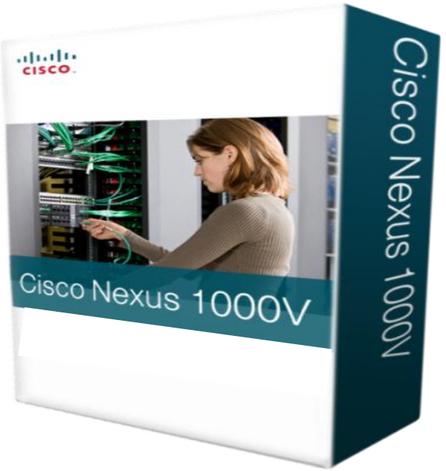
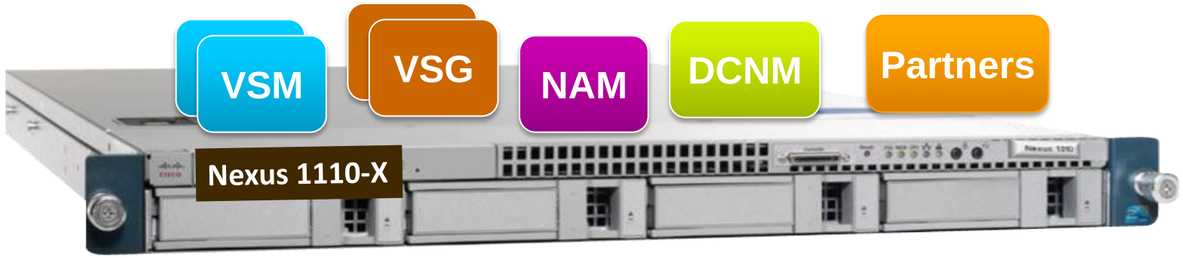
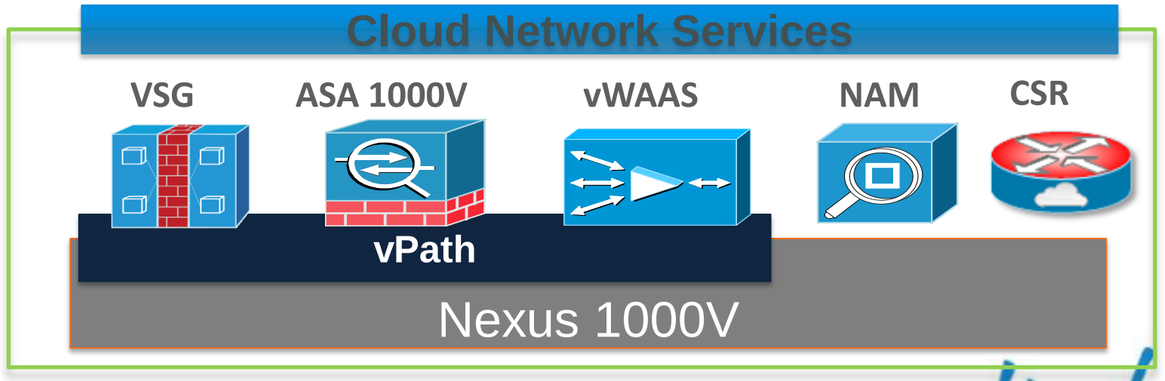
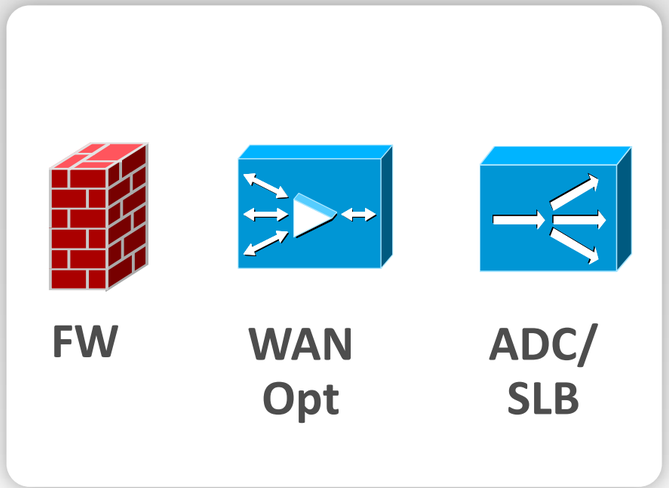






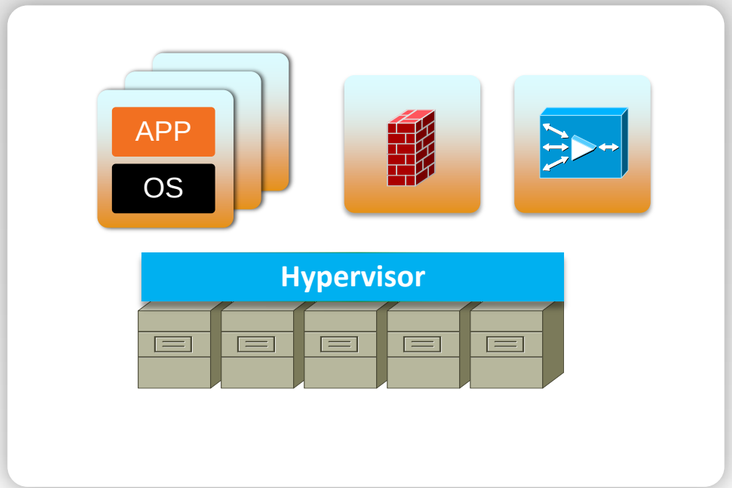
Virtualisation and Cloud Driving New Requirements in Data Centre

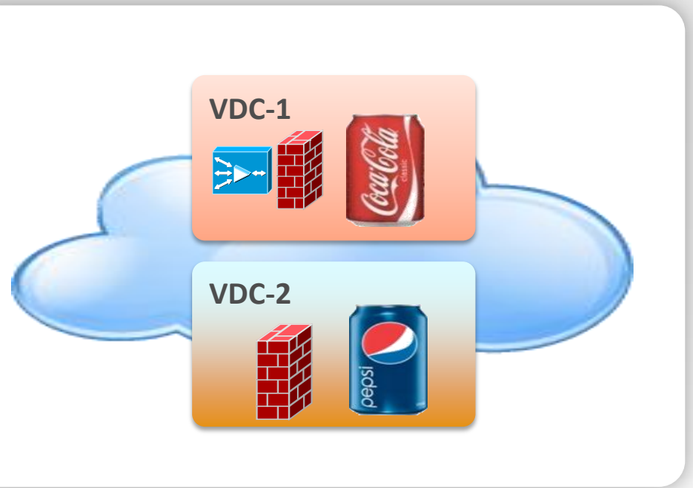
Traditional Data Centre



- Application-specific services
- Form factors:
  - Appliance
  - Switch module

Virtual/Cloud Data Centre

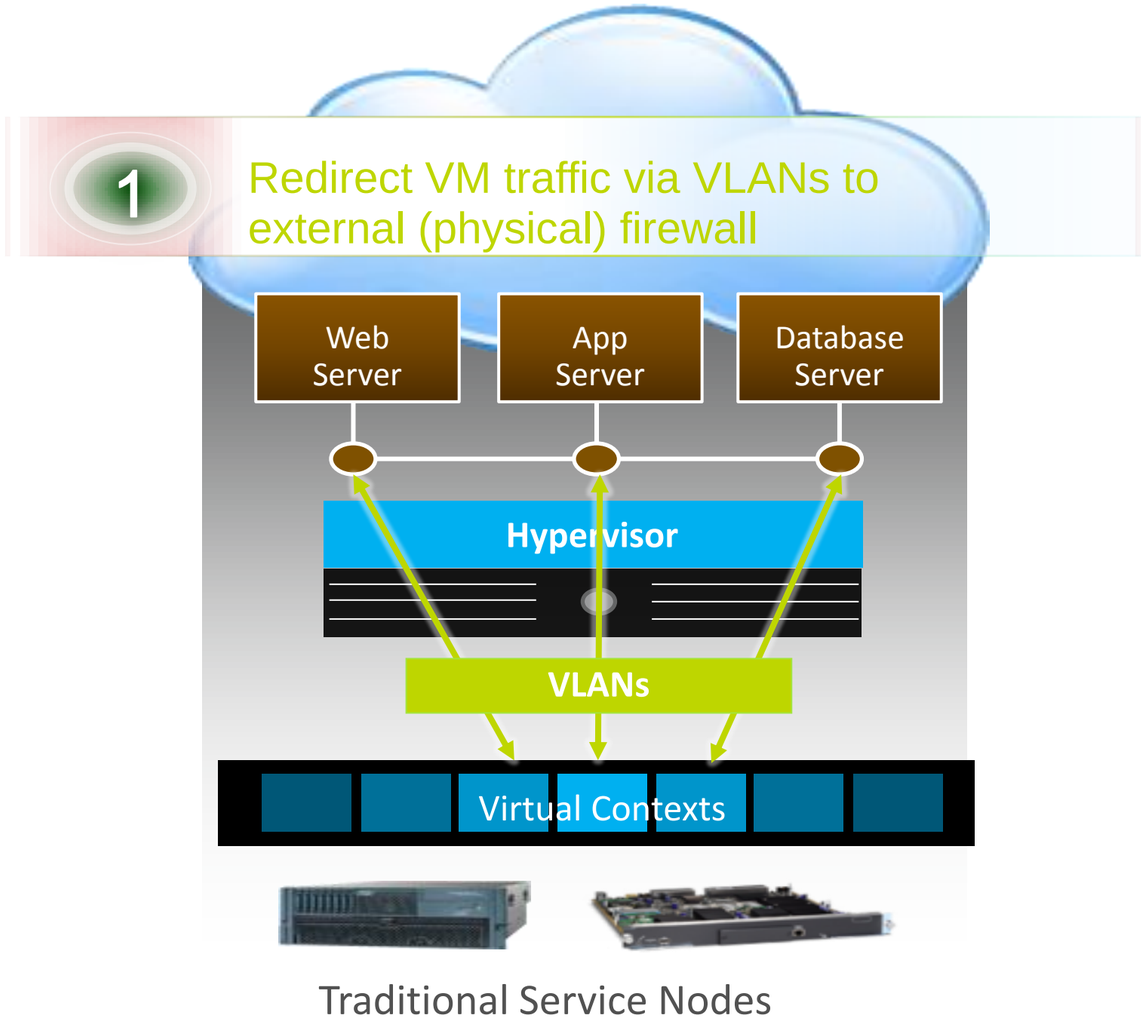




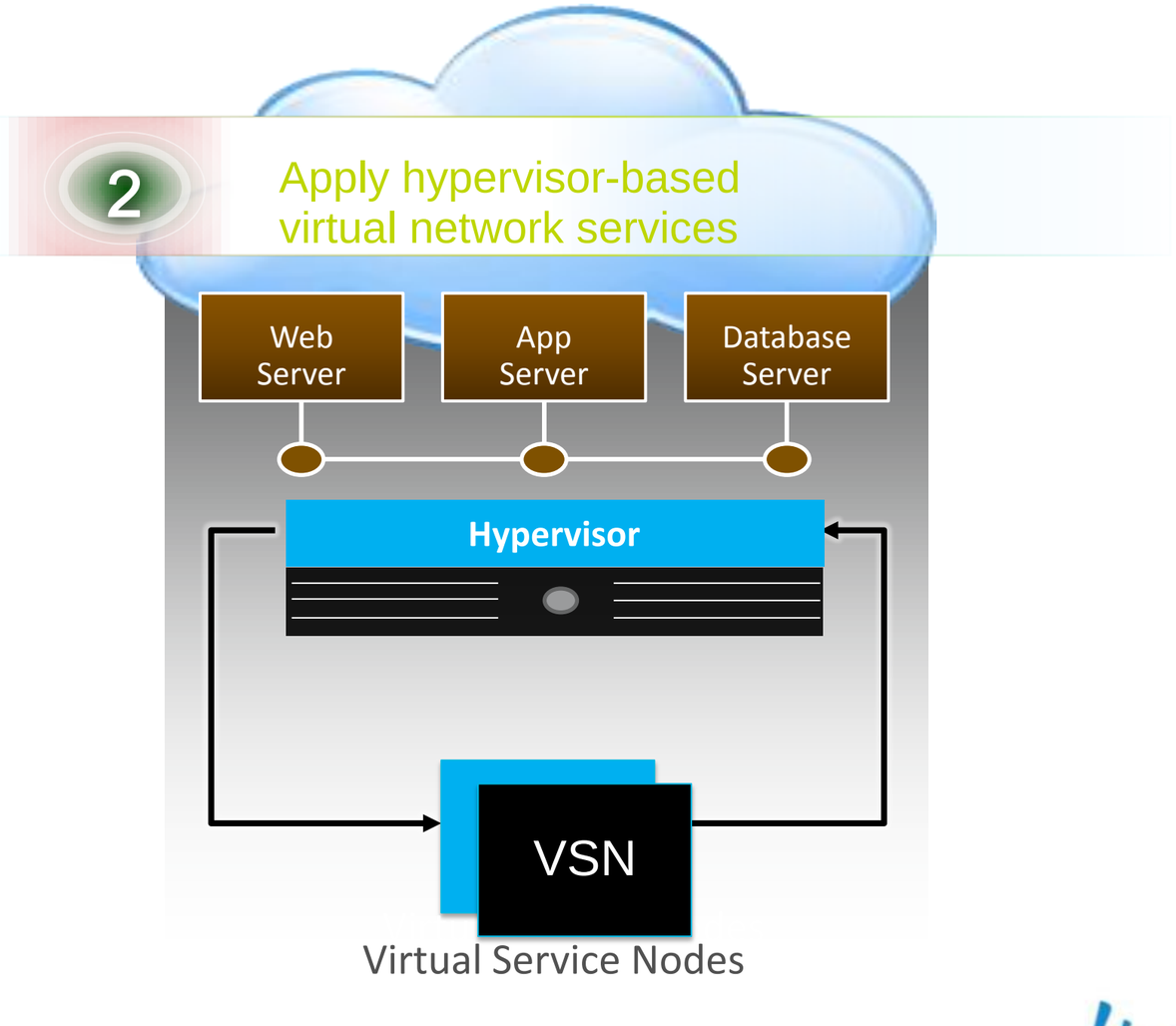
Virtual Service Node (VSN)

- Virtual appliance form factor
- Dynamic instantiation/provisioning
- Service transparent to VM mobility
- Support scale-out
- Large scale multitenant operation

Services Deployment in Virtualised DC

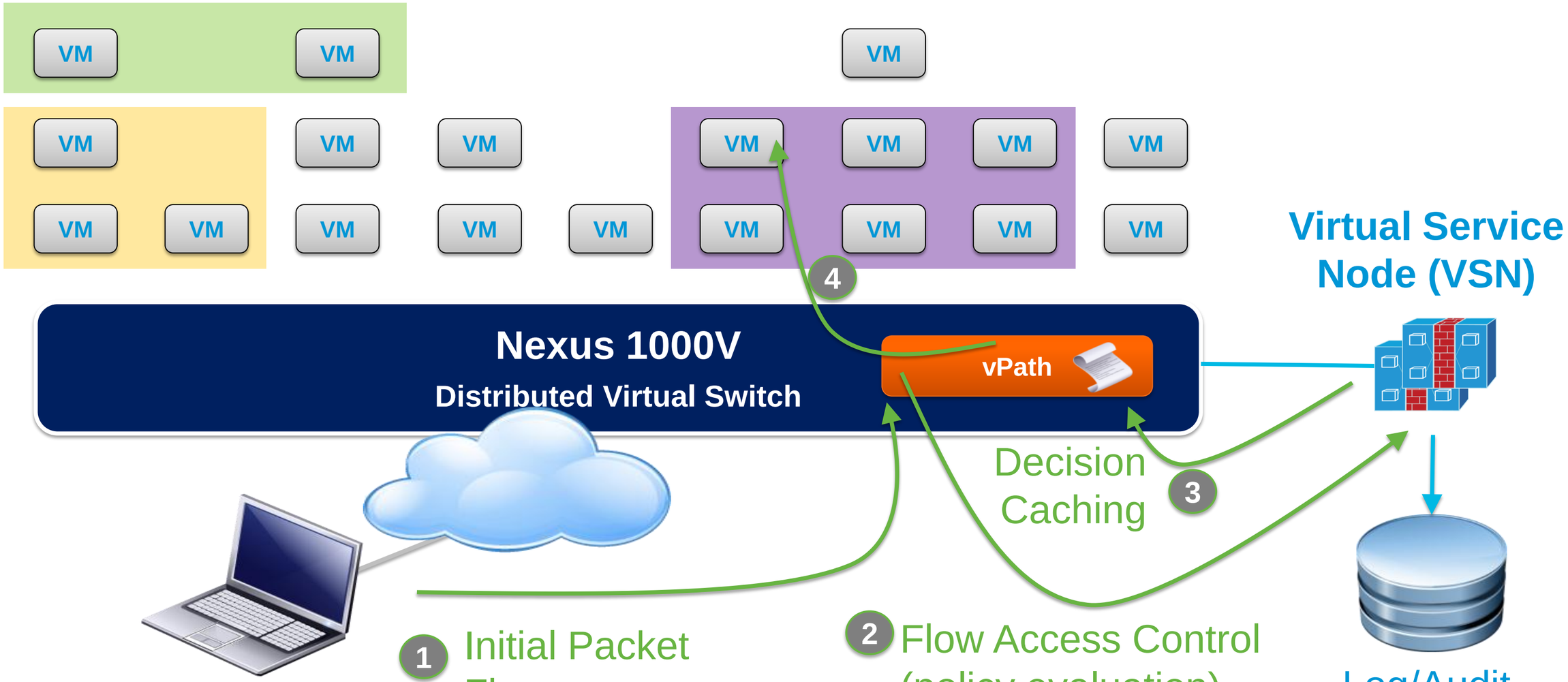


Traditional Service Nodes

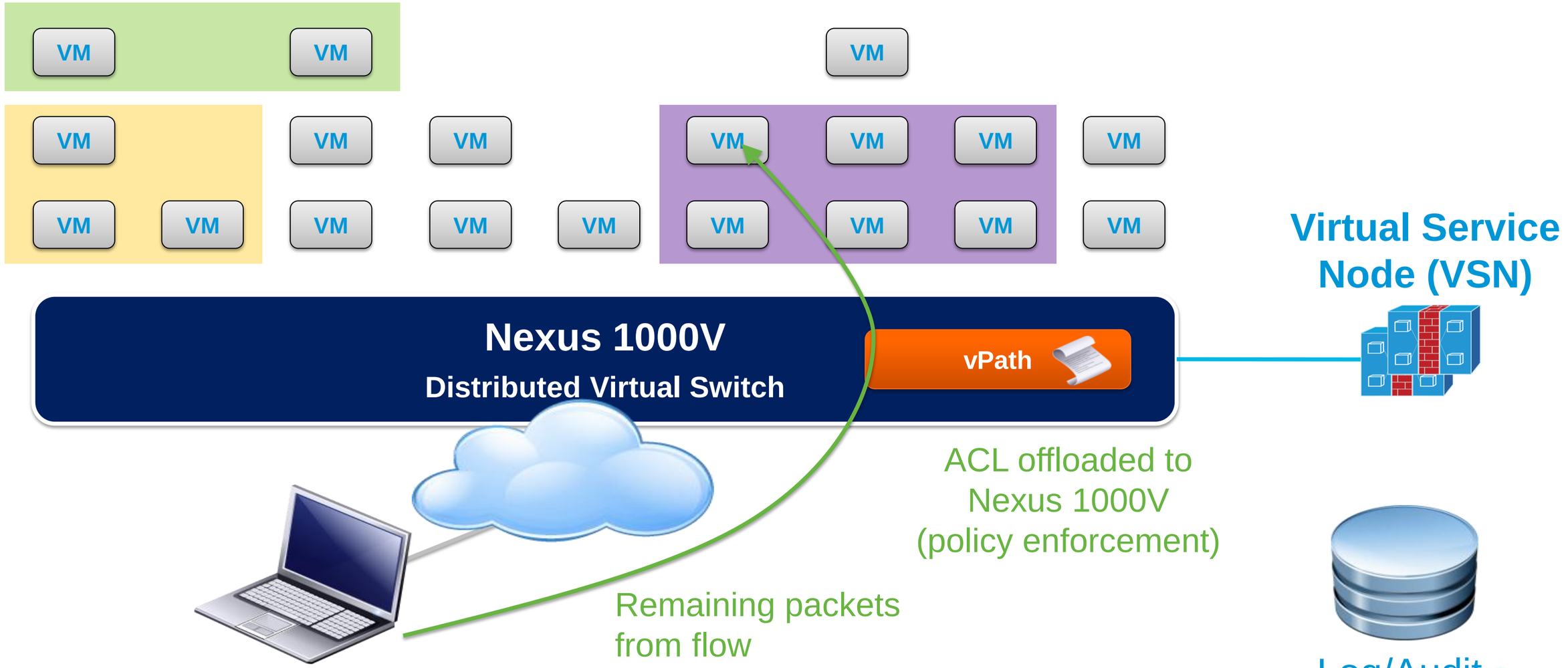


Virtual Service Nodes

Intelligent Traffic Steering with vPath



Performance Acceleration with vPath



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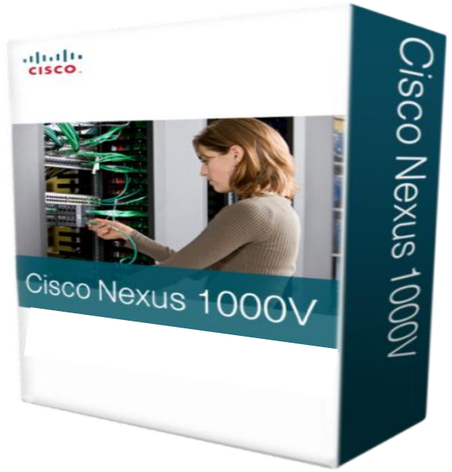
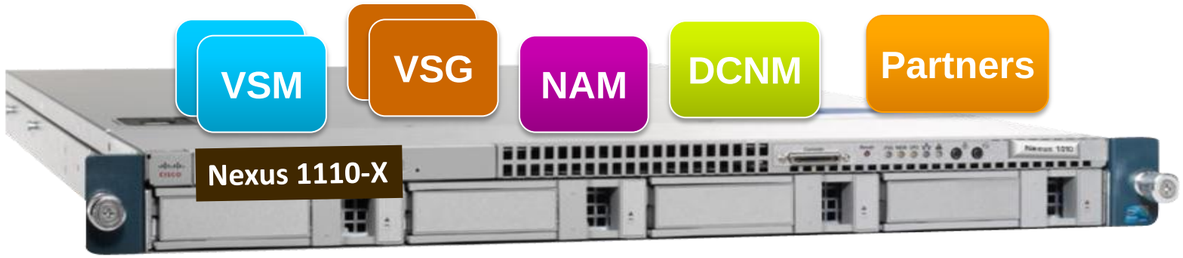
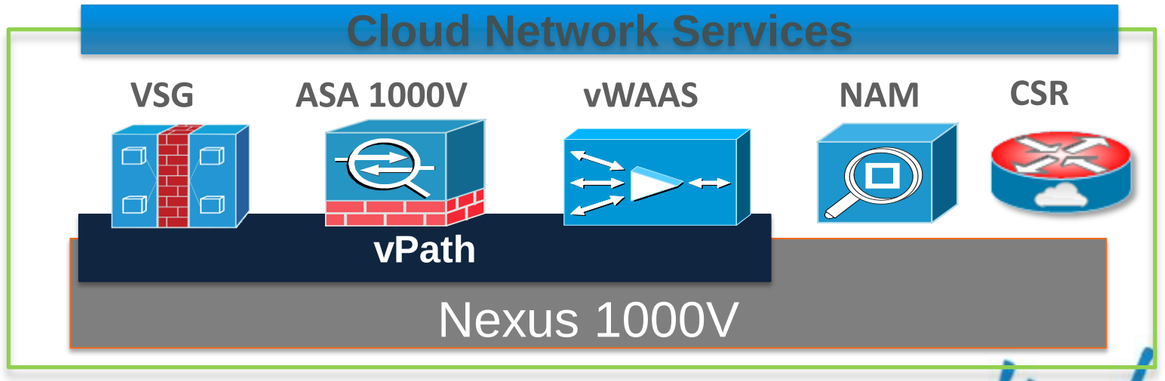
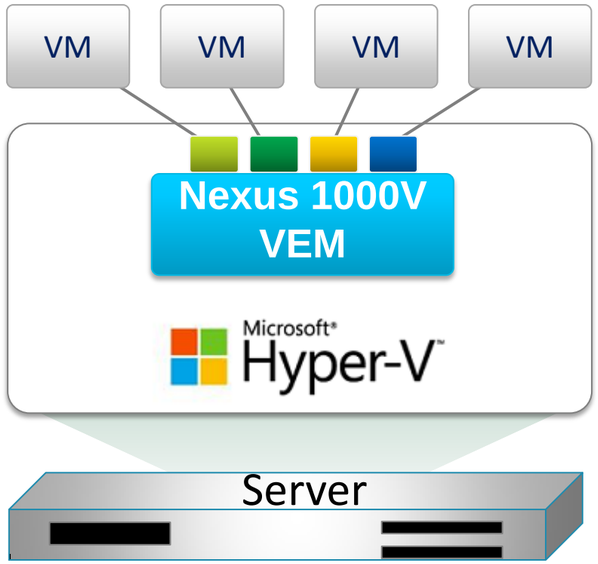


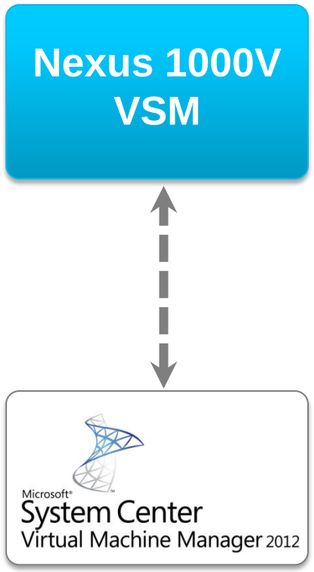




Cisco Nexus 1000V for Microsoft Hyper-V

Consistency for Investment protection & Reduced operational risk





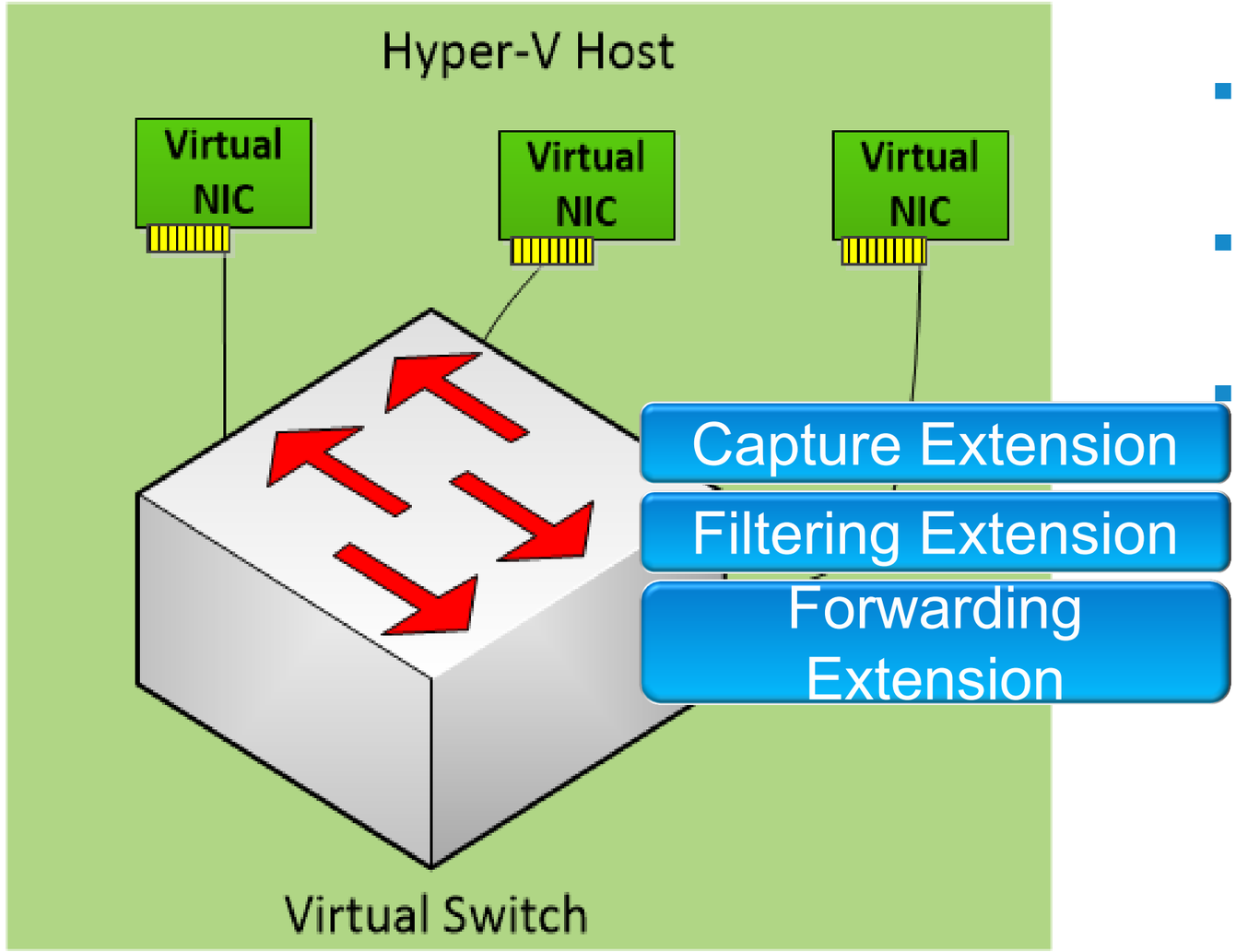
- Advanced NX-OS feature-set
- Tight integration with SCVMM
- Services architecture with vPath
- Consistent operational model

Hyper-V: Comparison with ESX Terminology

VMware ESX	Microsoft Hyper-V
Virtual Distributed Switch (VDS)	Logical Switch
Port Group	Virtual Port Profiles + VM networks
vmknic	Host VNIC
Folder/Data Centre	Host Group
vMotion	Live Migration
Distributed Resource Scheduling (DRS)	Dynamic Optimisation
Distributed Power Mgmt (DPM)	Power Management
vCenter, vCloud Director	SCVMM, SCO
Site Recovery Manager	Hyper-V Replica
Virtual Machine Disk (VMDK)	Virtual Hard Disk (VHDX)

Hyper-V Extensible Switch Architecture

Nexus 1000V is a Forwarding Extension

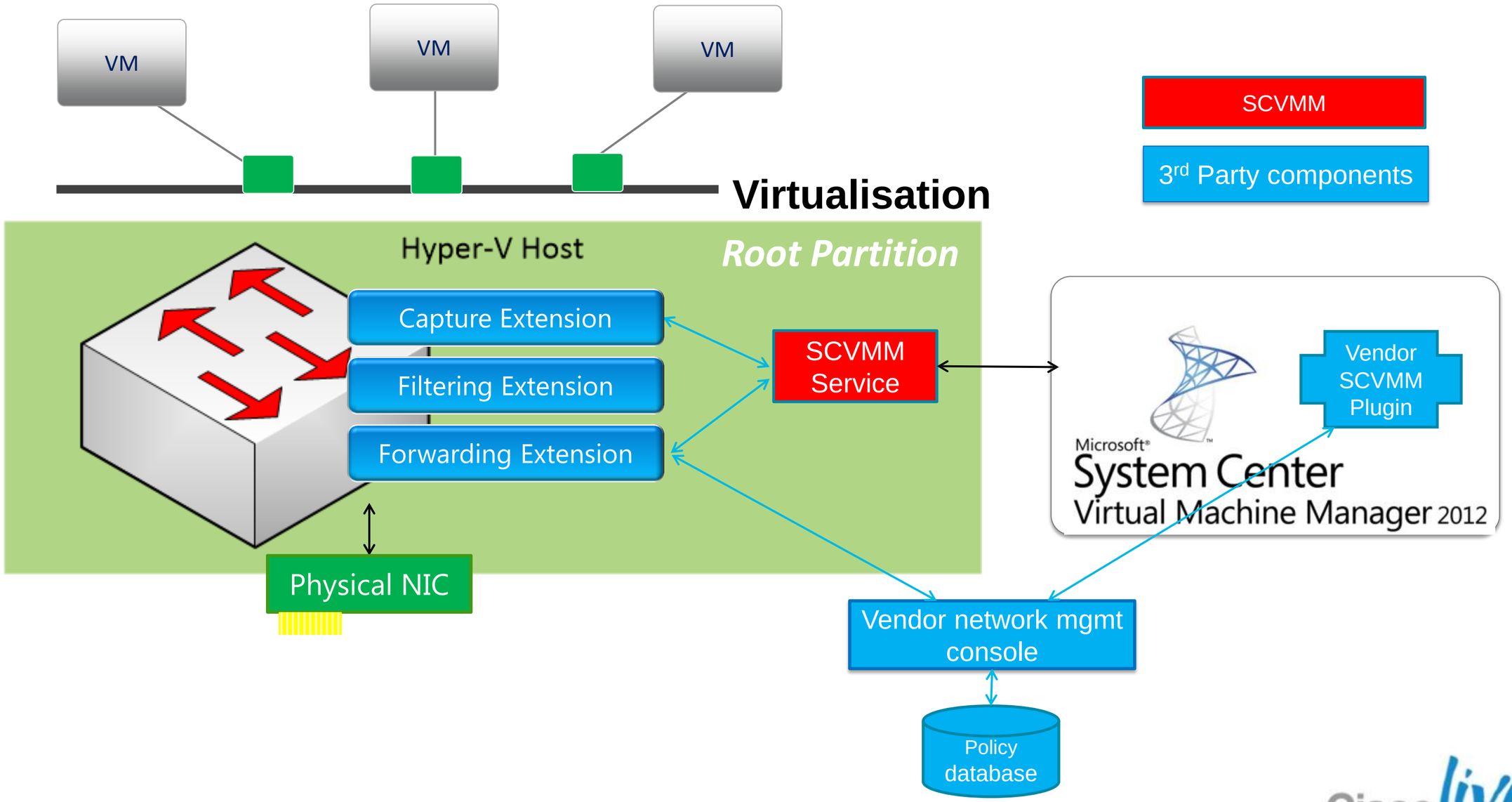


- Extensions process all network traffic including VM-to-VM traffic
- Forwarding Extensions can capture and Filter Traffic as well
- Nexus 1000V will work with other 3rd party Capture and Filtering Extensions as well
- Live Migration and NIC Offloads continue to work even when the extensions are present

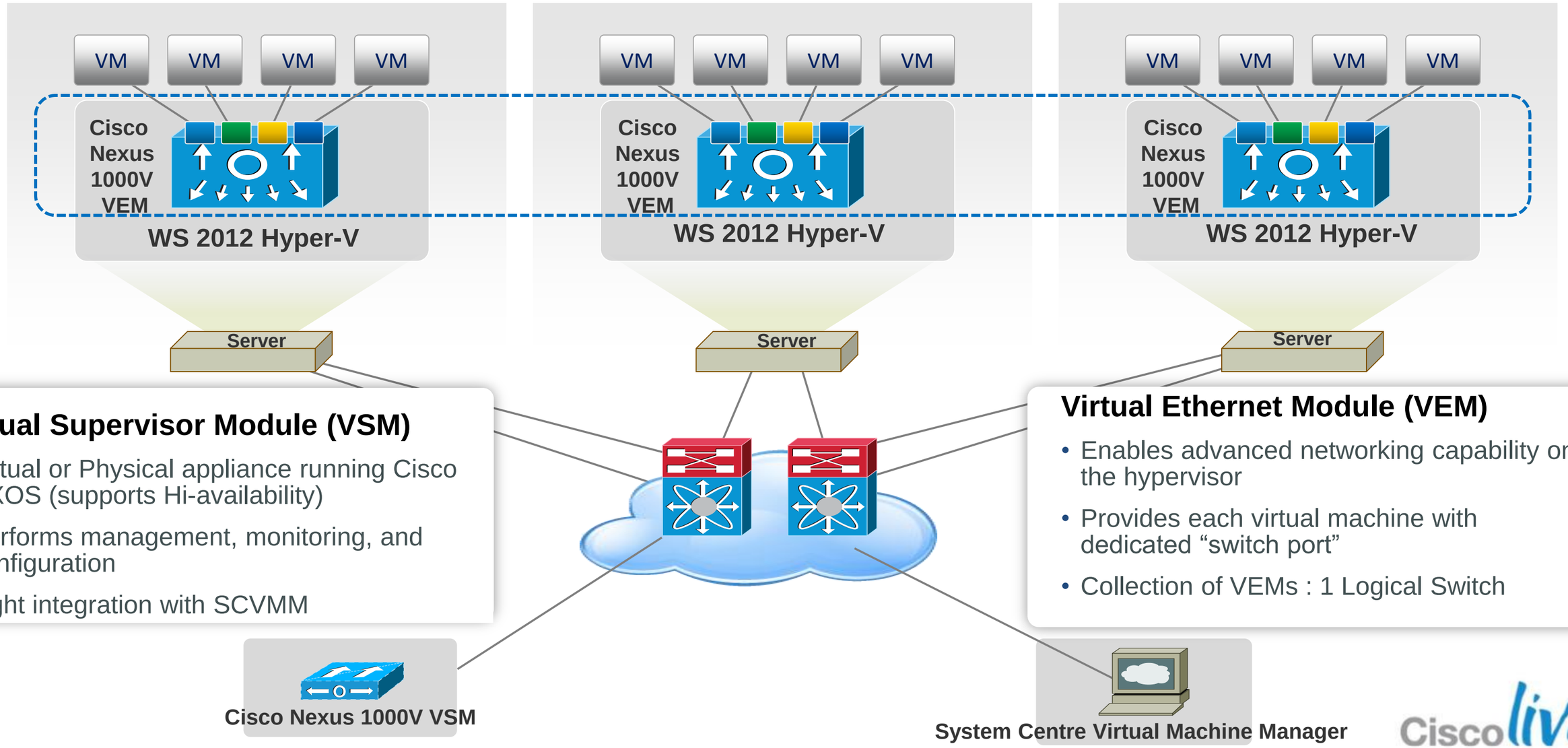
System Centre Virtual Machine Manager

- Manages Hyper-V Virtualisation environment
- Similar in function to VMware vCenter Server
  - But includes some functionality similar to VMware vCloud Director
- What SCVMM Manages
  - Hyper-V hosts
  - Virtual Machines
  - Logical Switches
  - Logical Networks and Network Sites
  - VM Networks and Subnets
  - IP Addressing
  - Port Profiles and Classifications

SCVMM Management of Switch Extensions



Cisco Nexus 1000V Architecture on Hyper-V



Virtual Supervisor Module (VSM)

- Virtual or Physical appliance running Cisco NXOS (supports Hi-availability)
- Performs management, monitoring, and configuration
- Tight integration with SCVMM

Virtual Ethernet Module (VEM)

- Enables advanced networking capability on the hypervisor
- Provides each virtual machine with dedicated “switch port”
- Collection of VEMs : 1 Logical Switch

Cisco Nexus 1000V Overview

Consistent NX-OS Features across physical & virtual environments

Switching	▪ L2 Switching, 802.1Q Tagging, VLAN, Rate Limiting (TX) ▪ IGMP Snooping, QoS Marking (COS & DSCP)
Security	▪ Policy Mobility, Private VLANs w/ local PVLAN Enforcement ▪ Access Control Lists, Port Security, Cisco TrustSec Support* ▪ Dynamic ARP inspection*, IP Source Guard*, DHCP Snooping*
Network Services	▪ Virtual Services Datapath (vPath) support for traffic steering & fast-path off-load [leveraged by Virtual Security Gateway (VSG)* and other services]
Provisioning	▪ Port Profiles, Integration with virtualisation & cloud mgmt. tools ▪ Optimised NIC Teaming with Virtual Port Channel – Host Mode
Visibility	▪ VM Migration Tracking, NetFlow v.9 w/ NDE, CDP v.2 ▪ VM-Level Interface Statistics, SPAN & ERSPAN (policy-based)
Management	▪ Integrated Provisioning with SCVMM, Cisco LMS, Cisco DCNM, Cisco VNMC ▪ Cisco CLI, Radius, TACACs, Syslog, SNMP (v.1, 2, 3) ▪ Hitless upgrade, SW Installer

* **Available only with Advanced Edition**

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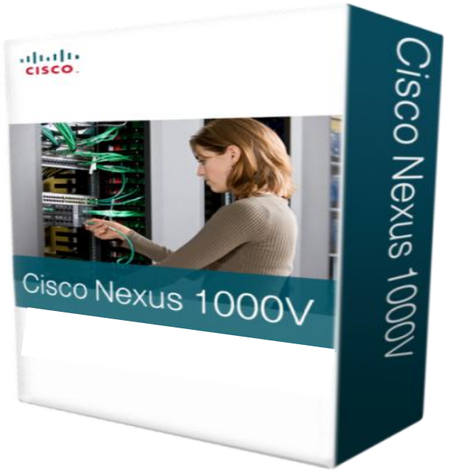
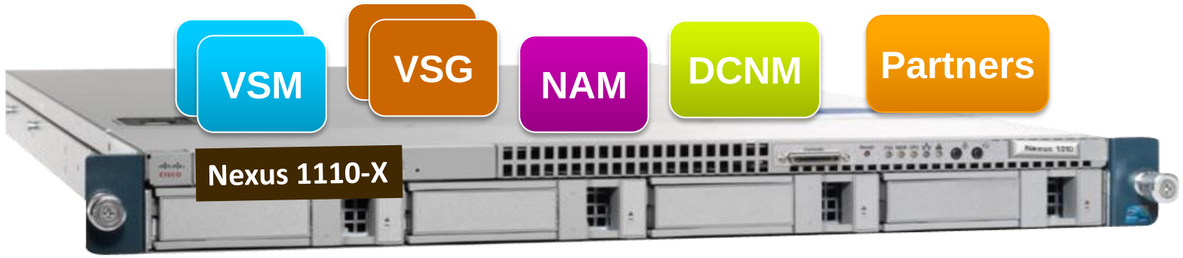
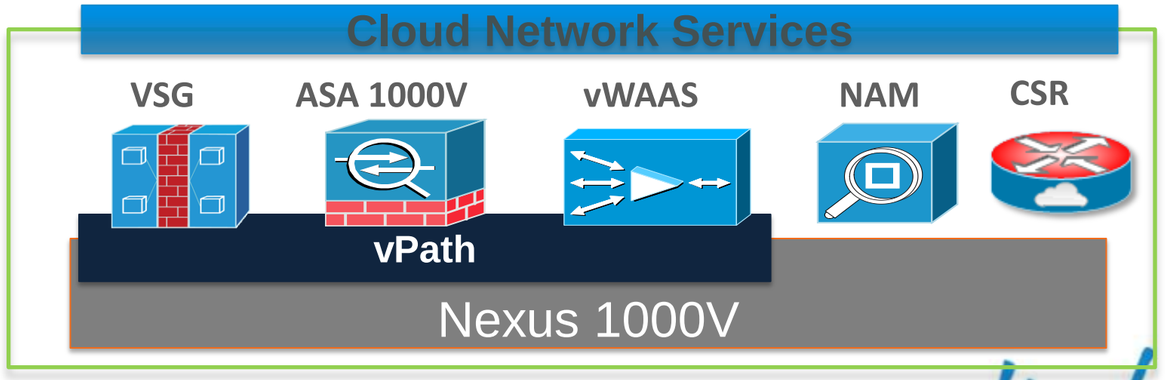






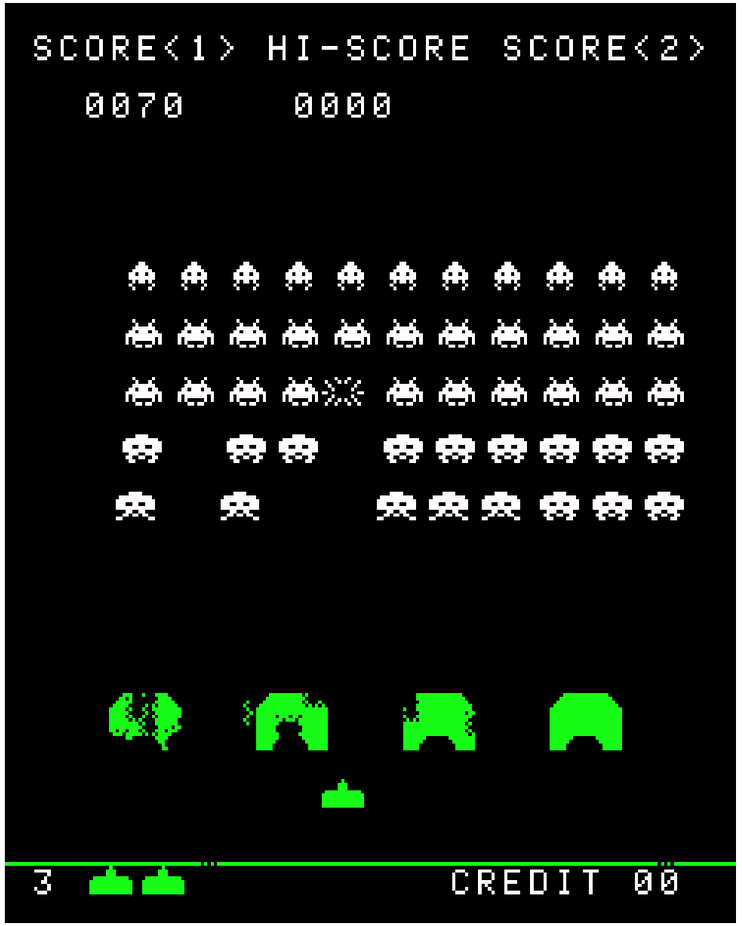
Why Not Configure Virtual Ports?

Too many ports, and they move too fast

Network admin needs **sanity**

Server admin needs **freedom**

- To deploy and move virtual machines
- To deploy and move physical hosts



Source: http://images.webmagic.com/klov.com/screens/S/wSpace_Invaders.png

Port Profiles – Current Nexus 1000V

- Instead of configuring individual Ports, create a Port Profile
- Set up ahead of time:
  - VLANs
  - ACLs
  - NetFlow
  - QoS
  - Private VLANs
  - and all other port config!

```
# port-profile database
switchport mode access
switchport access vlan 10
ip port access-group myacl in
no shut
state enabled
```

Re-use it multiple times!

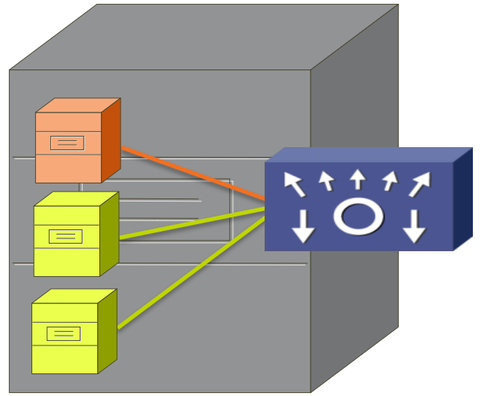
Port Profiles – Current Nexus 1000V

Setting Port Policies Ahead of Time

```
# port-profile database
switchport mode access
switchport access vlan 10
no shut
```

```
# port-profile webserver
switchport mode access
switchport access vlan 243
acc
no
```

```
# port-profile webserver
switchport mode access
switchport access vlan 752
access list, etc. commands
no shut
```

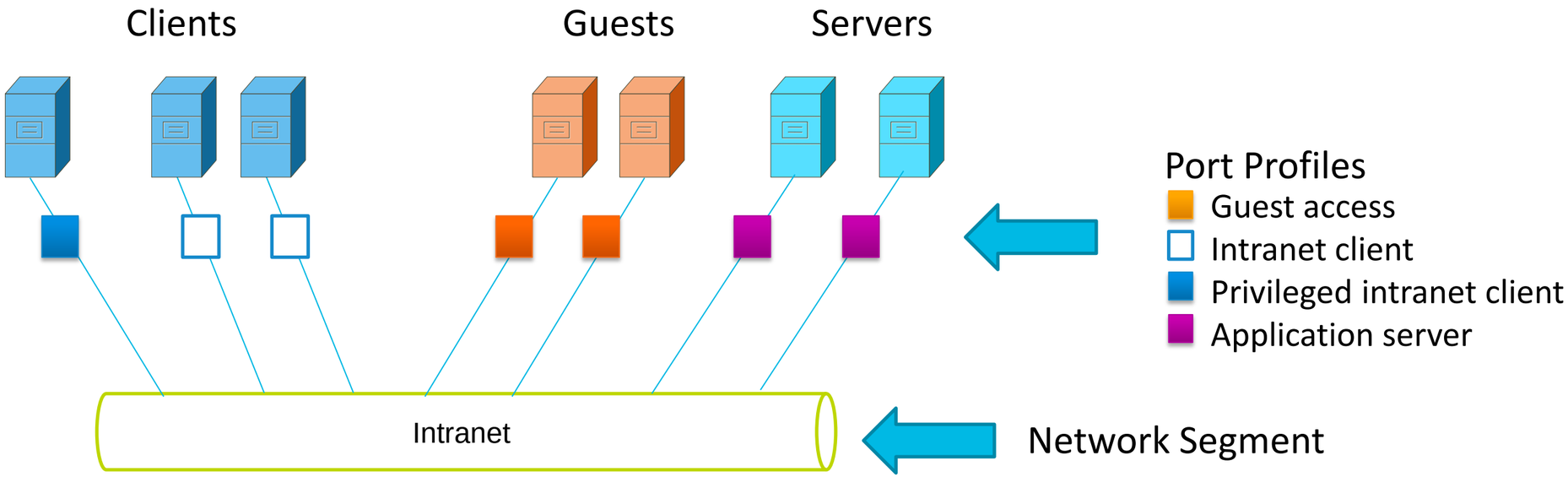


Port Profiles are “Live”:

Network Admin can change them any time!

Network Segments and Port Profiles

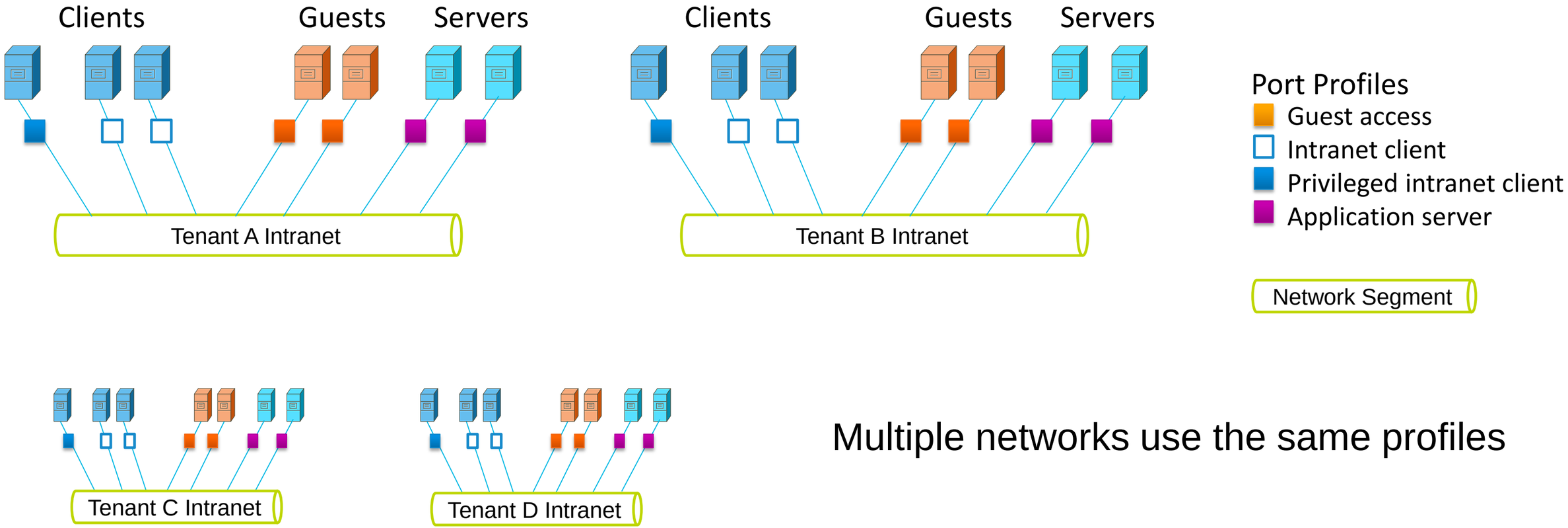
- Networks and Profiles are Two Different Things
- Different ports need different protection on the same network



One network, multiple profiles for access

Network Segments and Port Profiles

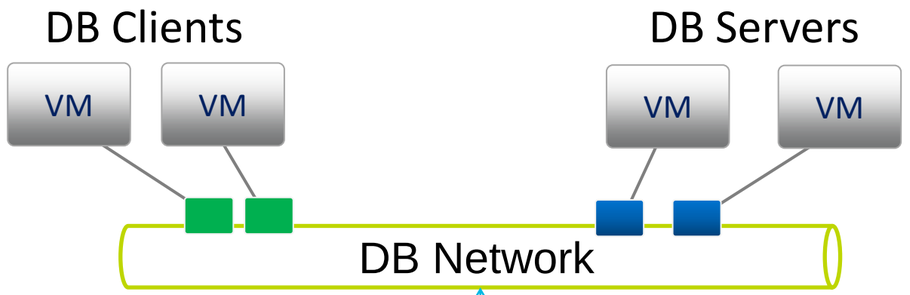
- And many networks can share the same protection requirements



Multiple networks use the same profiles

Network Segments and Port Profiles

Splitting the port-profile into “Network Connectivity” and “Policy”



Current N1KV Version

```
# port-profile db-client
switchport mode access
switchport access vlan 10
ip port access-group dbclient in
no shut
state enabled
```

```
# port-profile db-server
switchport mode access
switchport access vlan 10
ip port access-group dbserver in
no shut
state enabled
```

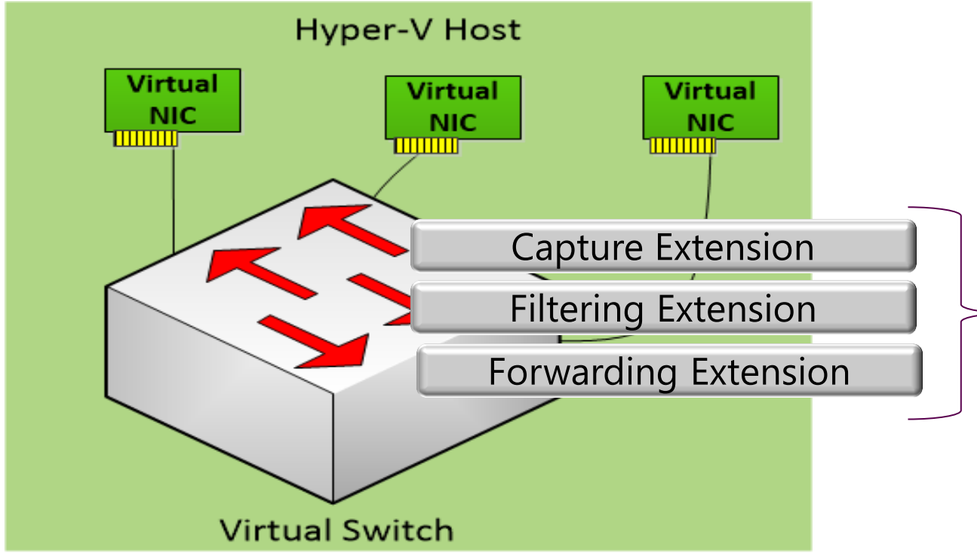
N1KV/Hyper-V Version

```
# network-segment db-network
switchport mode access
switchport access vlan 10
```

```
# port-profile db-client
ip port access-group dbclient in
no shut
state enabled
```

```
# port-profile db-server
ip port access-group dbserver in
no shut
state enabled
```

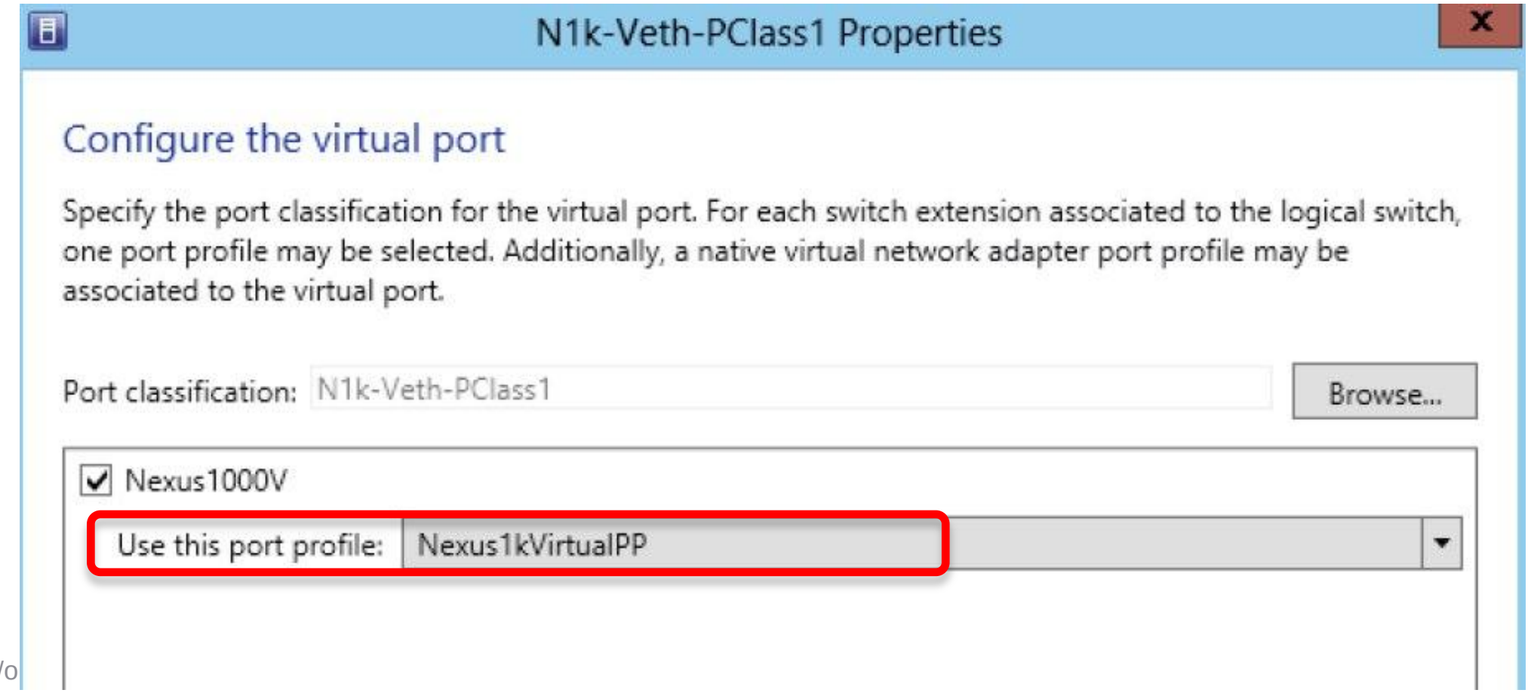
Port-Classifications in SCVMM



Bundling of profiles from each extension is the port-classification

Port-Classifications

- Provide a level of indirection to Virtual Port Profiles
- Provide a way to group Port Profiles from different Hyper-V switch extensions



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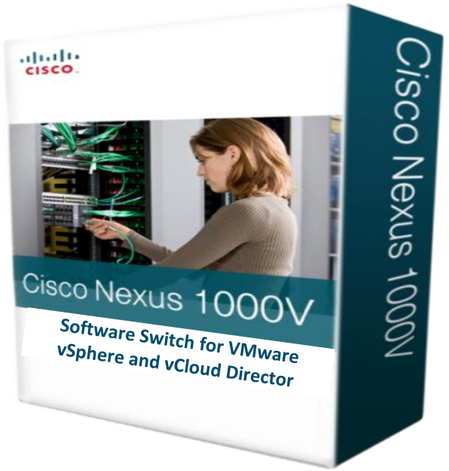
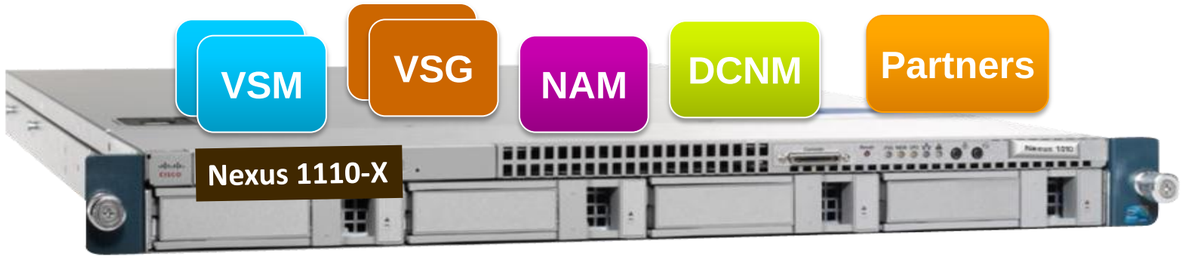
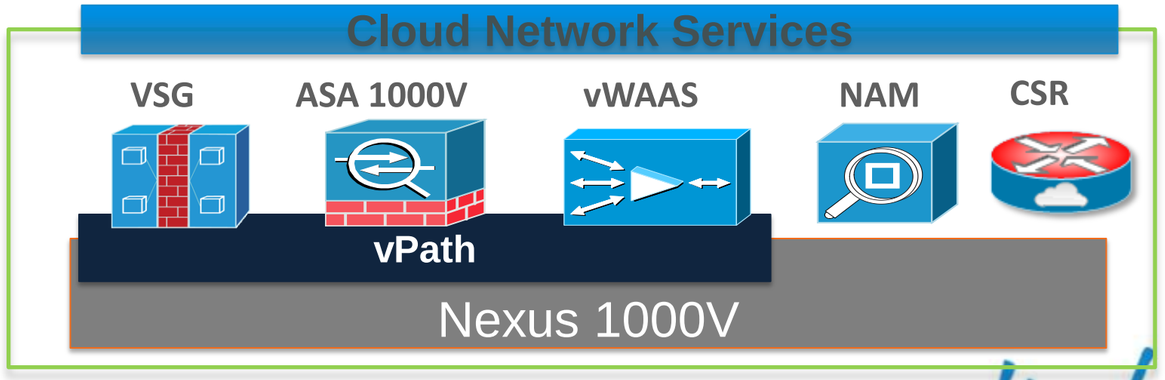






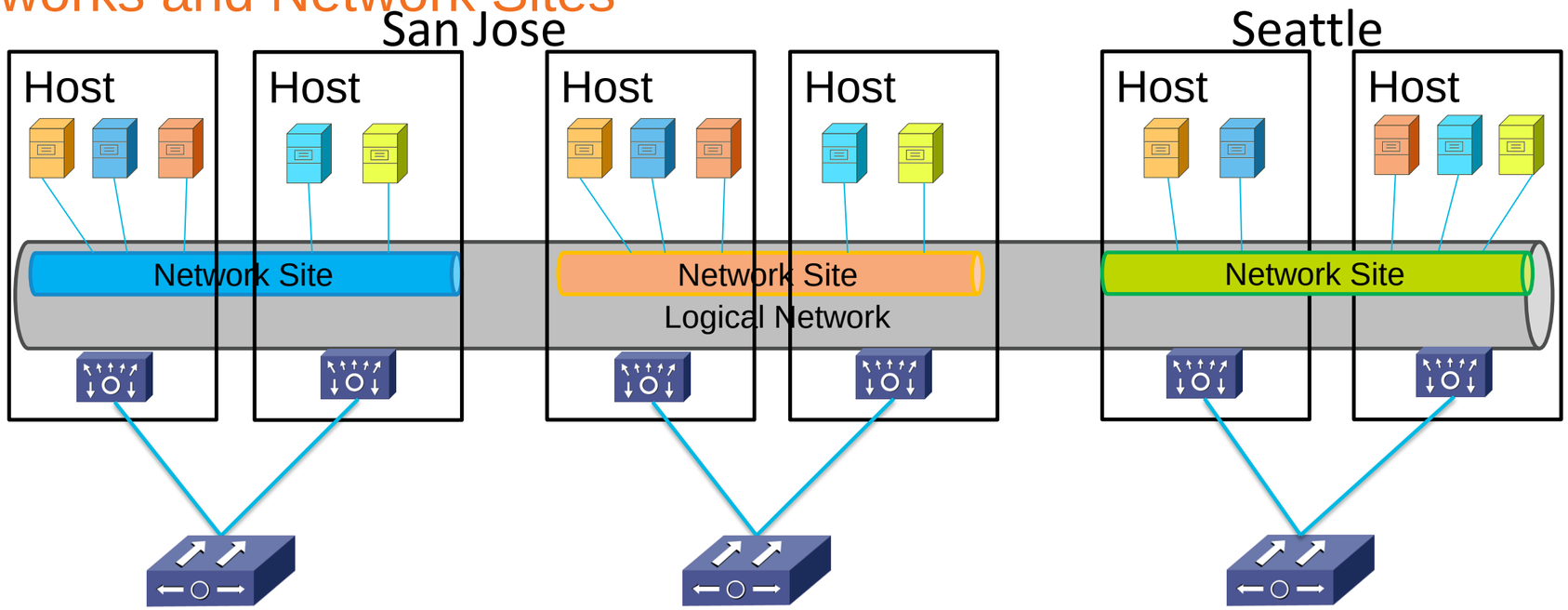
SCVMM Networking Concepts

Types of Networks

- Logical Networks
- Network Sites
- VM Networks
- IP Address Pools

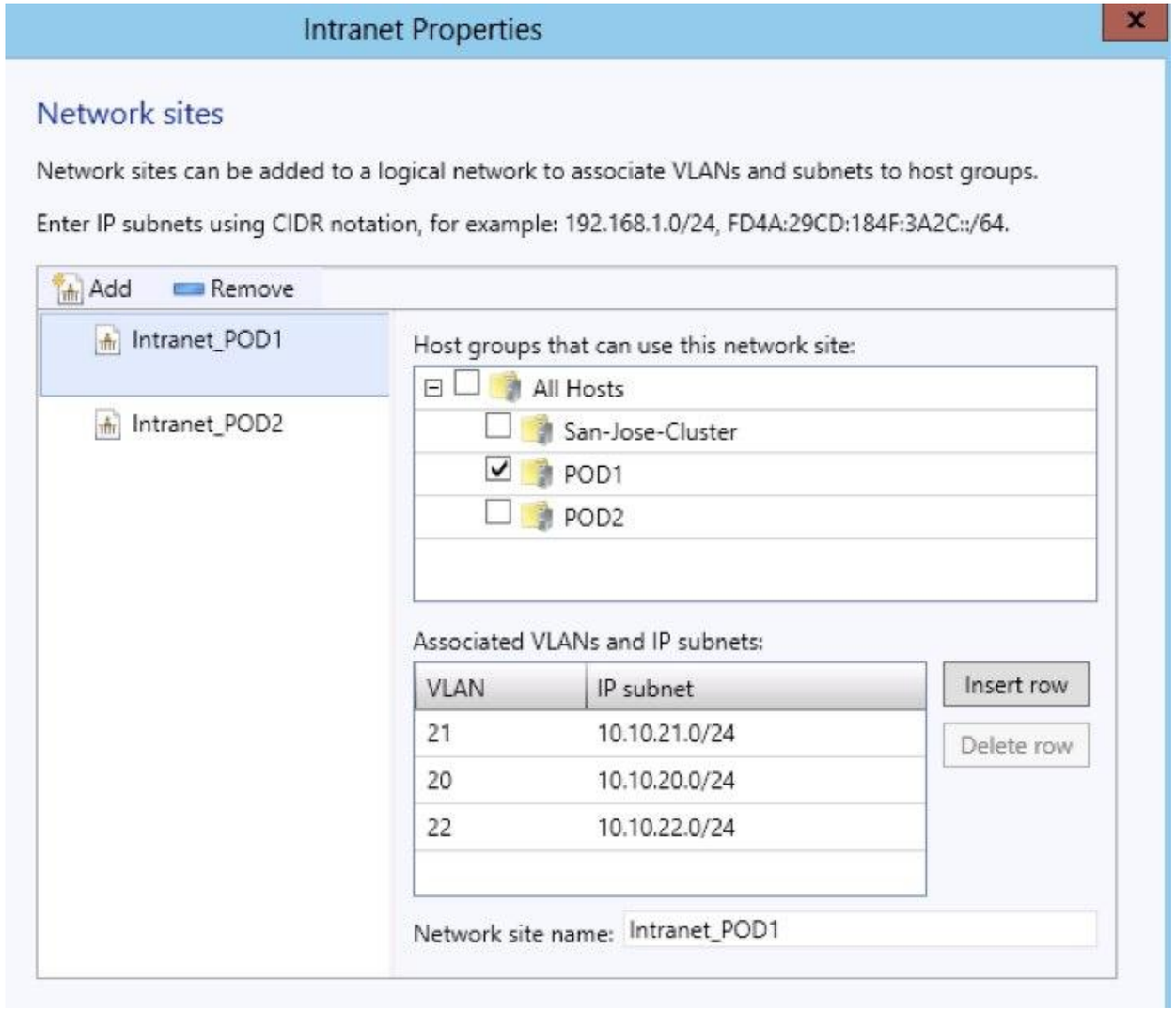
SCVMM Networking Concepts

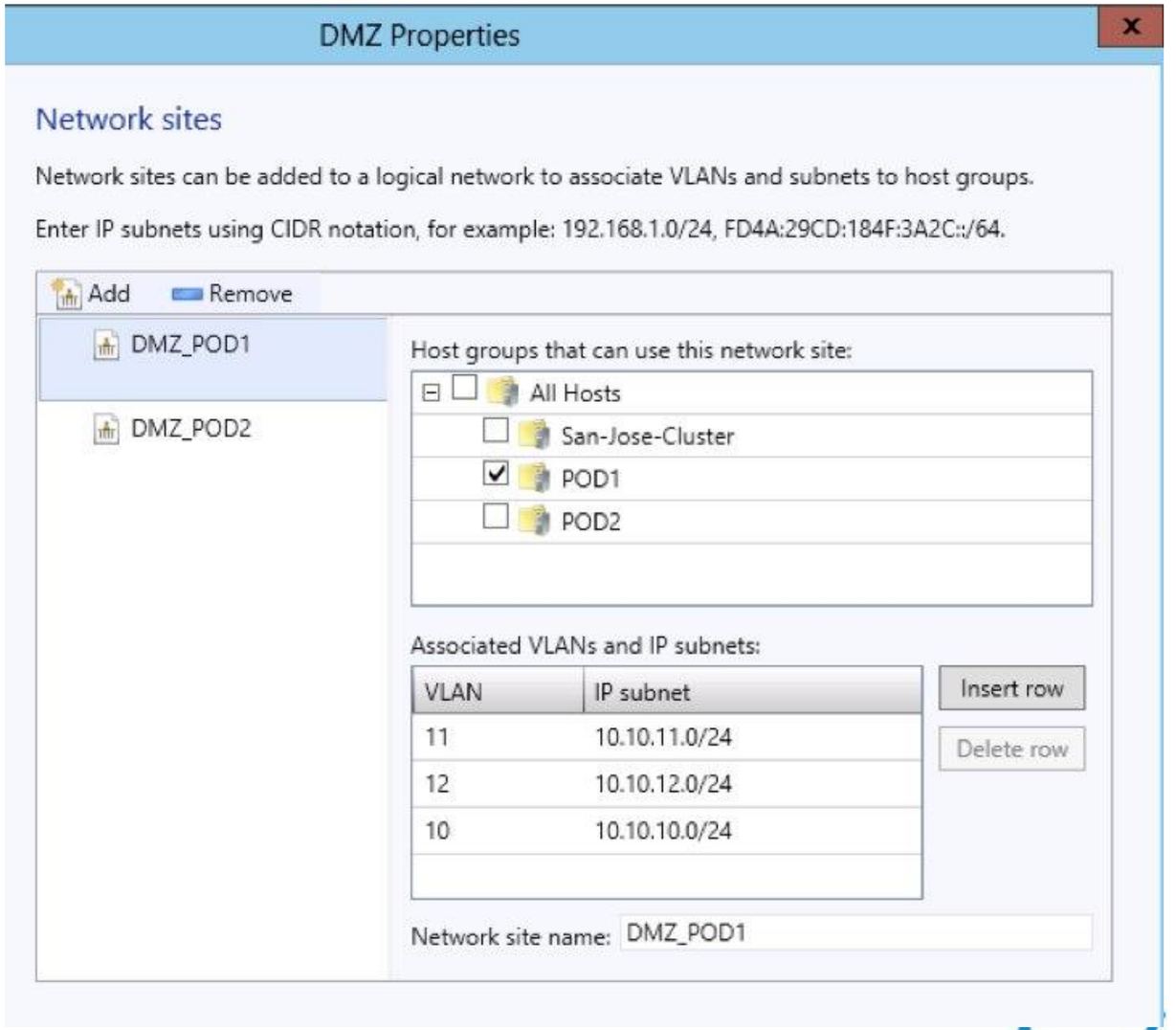
Logical Networks and Network Sites



- Logical Network represents a network with a certain type of connectivity characteristics (for eg. DMZ network, intranet, isolation)
- An instantiation of a Logical network on a set of host-groups (for eg. hosts in a POD) is called a Network Site
- Network sites can be defined based on physical network connectivity or based on isolating traffic to specific host-groups

Logical Networks and Network Sites





VM Networks with Nexus 1000V

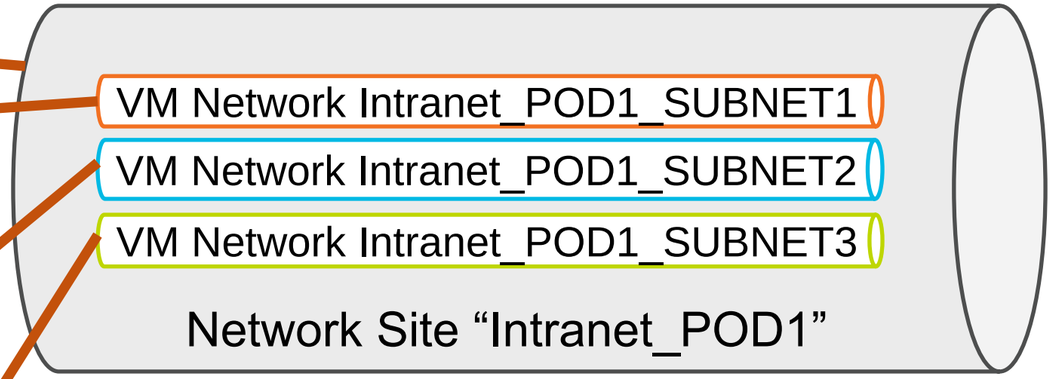
- VM VNICs connect to VM Networks
  - Each VM Network is associated with a single subnet
  - Each VM Network is represented in the N1KV as a “network-segment”
  - Each “network-segment” in the N1KV is backed by some Layer 2 isolation mechanism (e.g. VLAN)

```
# network-segment Intranet_POD1_SUBNET1
switchport mode access
switchport access vlan 20
ip-pool Intranet_POD1_Pool1
```

Network Sites in SCVMM with Nexus 1000V

A Network Site is represented in the N1KV as a “network-definition”

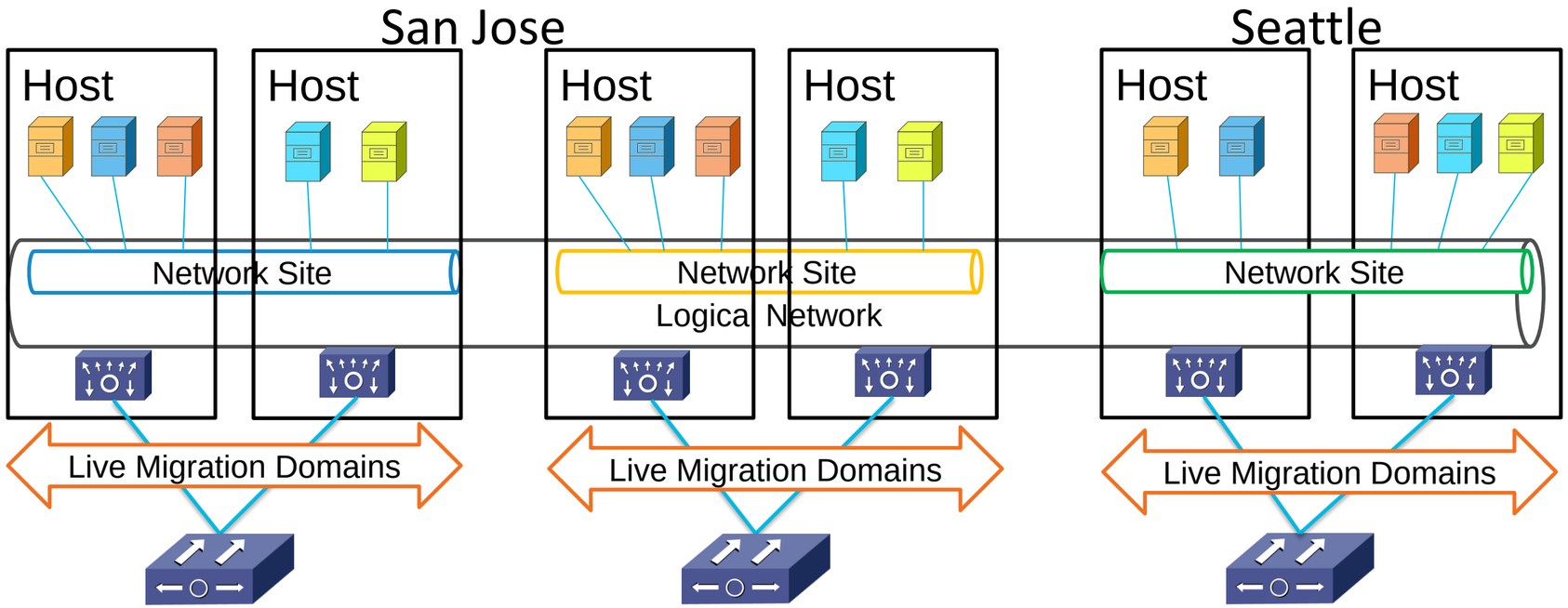
```
# network-segment-pool Intranet_POD1

# network-segment Intranet_POD1_SUBNET1
switchport mode access
switchport access vlan 20
ip-pool Intranet_POD1_Pool1
network-definition Intranet_POD1

# network-segment Intranet_POD1_SUBNET2
switchport mode access
switchport access vlan 21
ip-pool Intranet_POD1_Pool2
network-definition Intranet_POD1

# network-segment Intranet_POD1_SUBNET3
switchport mode access
switchport access vlan 22
ip-pool Intranet_POD1_Pool2
network-definition Intranet_POD1
```



- A Network Site is a grouping of VM Networks that are always available together on the same host simultaneously
- A host uplink can be configured to carry one or more Network Sites

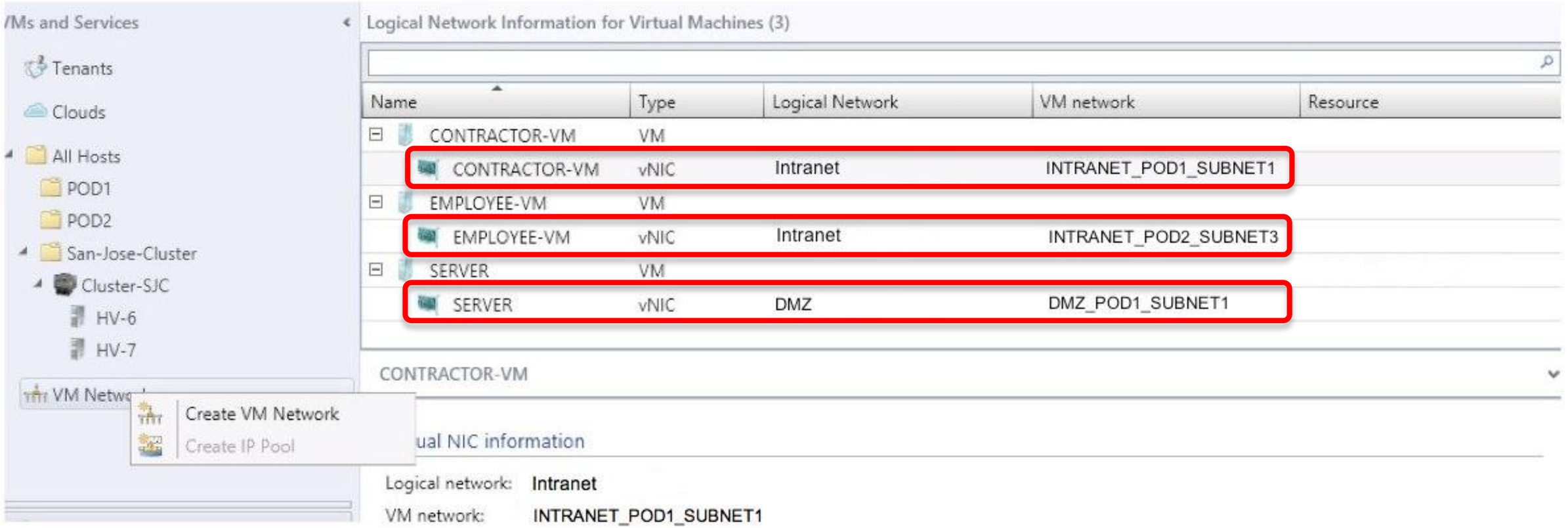
Placement and Live Migration Domains

And Network Site Binding



- SCVMM uses the list of network sites available on a host to make placement decisions
- Live-Migration domain is constrained to a network-site that the VM network is bound to

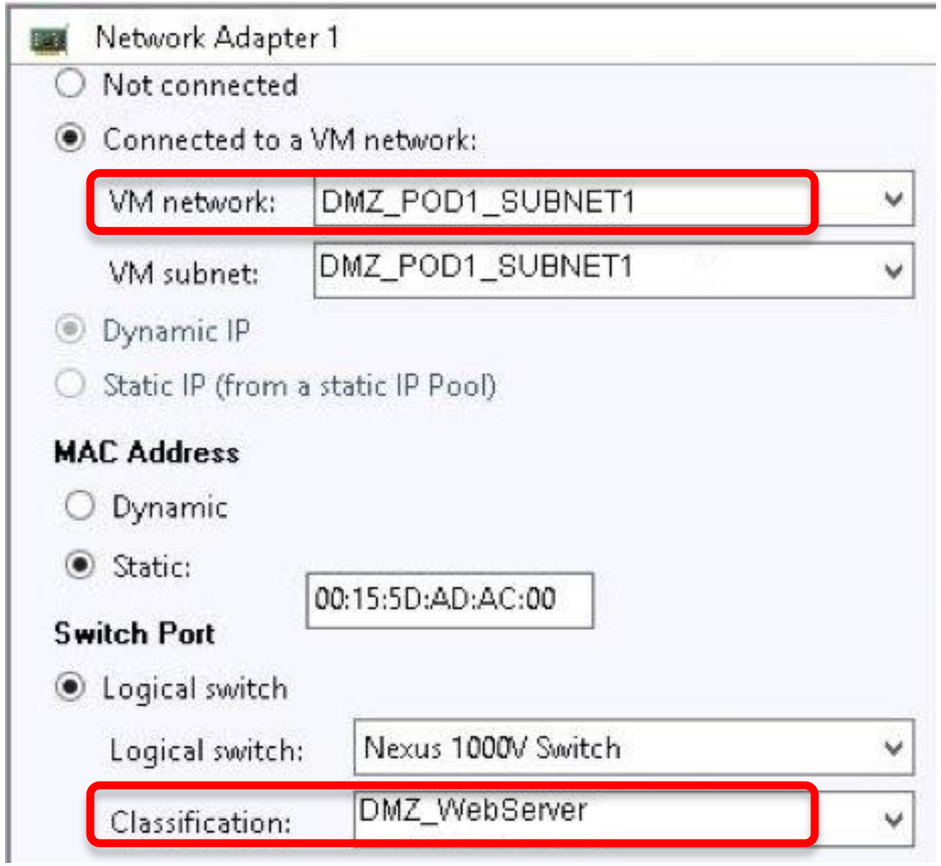
VM Connectivity to VM Networks



Connecting a VM to the Network

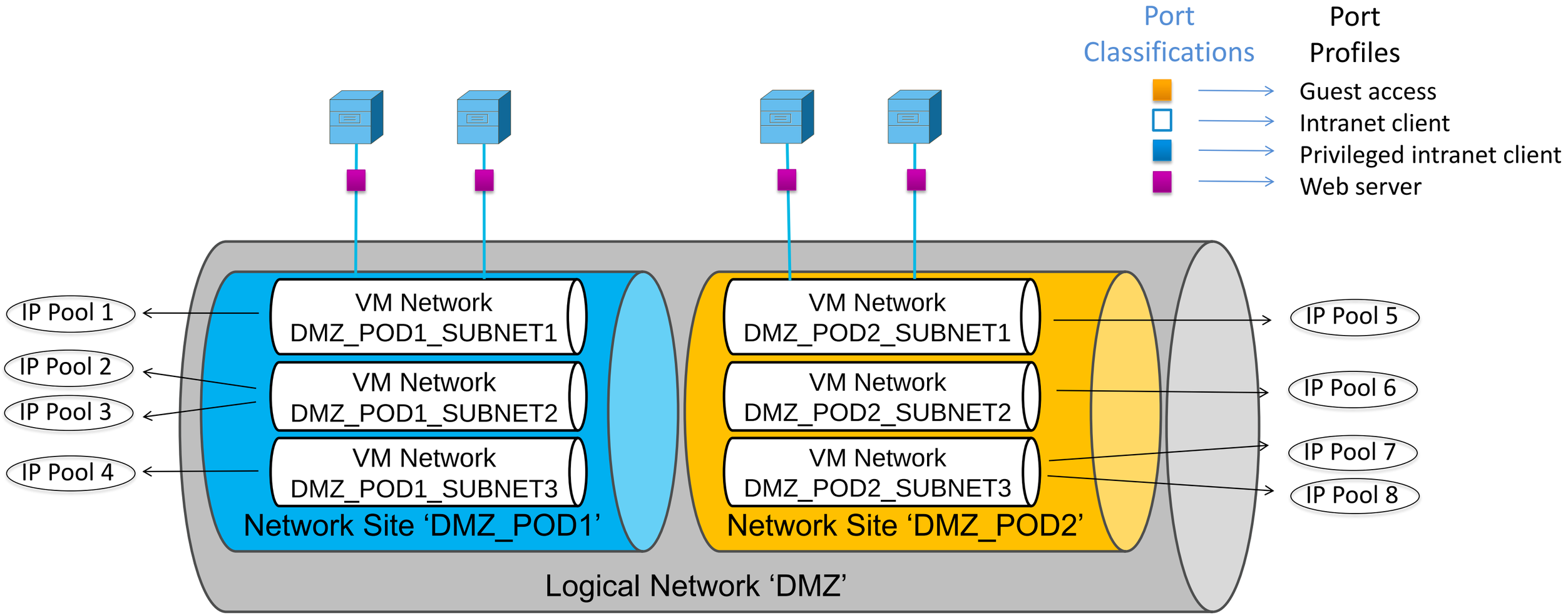
Using VM Networks and Port Classification

- Choose a VM network
- Choose IP address type (DHCP or statically assigned)
  - Choose IP pool for static IPs
- Choose Port Profile Classification
  - Policy (QoS, Security, Monitoring)
  - A Classification refers to a Port Profile



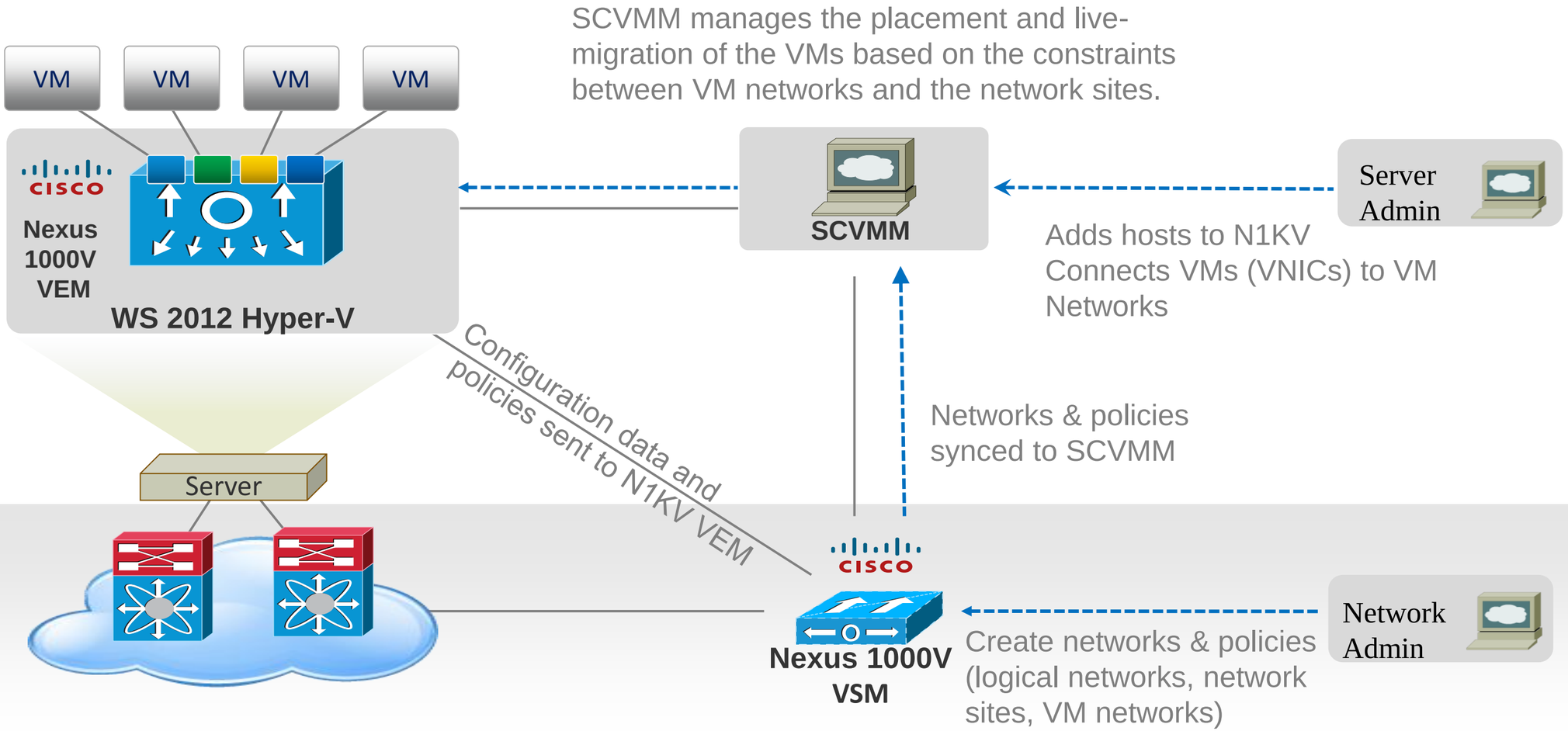
SCVMM Networking

Putting it all together !



SCVMM Networking with Nexus 1000V

Separation of duties between Network Admin and Server Admin



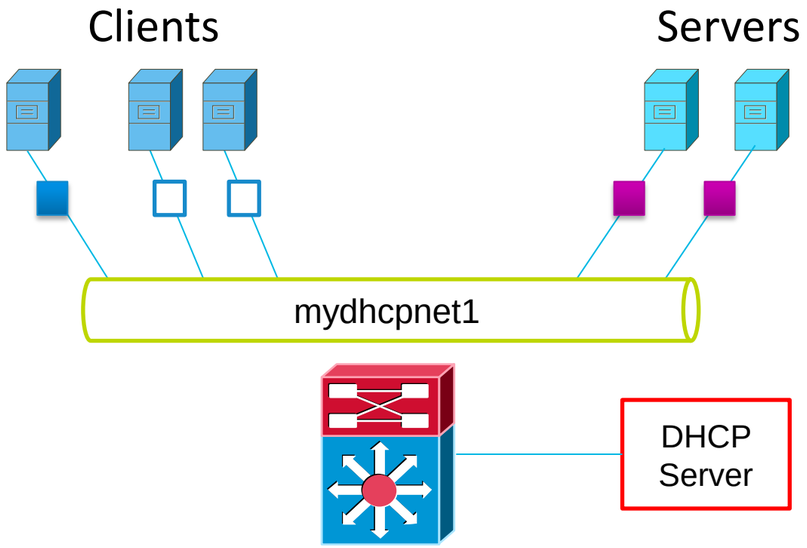
Who Does IP Address Administration?

That depends on the customer environment

- Who decides on IP address ranges?
  - Network admin
  - SCVMM admin
- Who allocates IP Addresses?
  - DHCP Server as part of network infrastructure
  - SCVMM as part of VM creation and replication

IP Pools for DHCP Servers

IP Address Ranges Chosen and Allocated by an external DHCP Server




```
# ip-pool my-dhcp-pool
description “Pool for DHCP segments”
dhcp-support
# network-segment mydhcpnet1
ip-pool my-dhcp-pool
# network-segment mydhcpnet2
ip-pool my-dhcp-pool
```

IP Pools Created for SCVMM by Nexus 1000V

IP Address Ranges Chosen by Network Admin, Individual IP Addresses allocated by SCVMM

Logical Networks and IP Pools (3)

Name	Subnet	Begin Address	End Address	Available Addr...		
DMZ						
DMZ_POD1_Pool1	10.10.11.0/24	10.10.11.2	10.10.11.254	253		
DMZ_POD1_Pool2	10.10.12.0/24	10.10.12.2	10.10.12.254	253		
DMZ_POD1_Pool3	10.10.10.0/24	10.10.10.2	10.10.10.254	253		
DMZ_POD2_Pool1	10.20.11.0/24	10.20.11.2	10.20.11.254	253		
DMZ_POD2_Pool2	10.20.10.0/24	10.20.10.2	10.20.10.254	253		
DMZ_POD2_Pool3	10.20.12.0/24	10.20.12.2	10.20.12.254	253	253	0
Fabric_Network_Cisco						
Intranet						
Intranet_POD1_Pool1	10.10.21.0/24	10.10.21.2	10.10.21.254	253	253	0
Intranet_POD1_Pool2	10.10.20.0/24	10.10.20.2	10.10.20.254	253	253	0
Intranet_POD1_Pool3	10.10.22.0/24	10.10.22.2	10.10.22.254	253	253	0
Intranet_POD2_Pool1	10.20.20.0/24	10.20.20.2	10.20.20.254	253	253	0
Intranet_POD2_Pool2	10.20.22.0/24	10.20.22.2	10.20.22.254	253	253	0
Intranet_POD2_Pool3	10.20.21.0/24	10.20.21.2	10.20.21.254	253	253	0

```
# ip-pool DMZ_POD1_Pool1
ip-address 10.10.11.2 10.10.11.254
subnet-mask 255.255.255.0
gateway 10.10.11.1
dns-servers 192.168.1.2
# network-segment DMZ_POD1_SUBNET1
ip-pool DMZ_POD1_Pool1
```

IP Pools Created and Allocated by SCVMM

IP Address Ranges Chosen and Allocated by Server Admin

```
# network-segment mysubnet1
# <no reference to ip-pool>
```

Logical Networks and IP Pools (3)

Name	Subnet	Begin Address	End Address	Available Addr...	Available Addr...	Available Addr...
DMZ						
DMZ_POD1_Pool1	10.10.11.0/24	10.10.11.2	10.10.11.254	253	253	0
DMZ_POD1_Pool2	10.10.12.0/24	10.10.12.2	10.10.12.254	253	253	0
DMZ_POD1_Pool3	10.10.10.0/24	10.10.10.2	10.10.10.254	253	253	0
DMZ_POD2_Pool1	10.20.11.0/24	10.20.11.2	10.20.11.254	253	253	0
DMZ_POD2_Pool2	10.20.10.0/24	10.20.10.2	10.20.10.254	253	253	0
DMZ_POD2_Pool3	10.20.12.0/24	10.20.12.2	10.20.12.254	253	253	0
Fabric_Network_Cisco						
Intranet						
Intranet_POD1_Pool1	10.10.21.0/24	10.10.21.2	10.10.21.254	253	253	0
Intranet_POD1_Pool2	10.10.20.0/24	10.10.20.2	10.10.20.254	253	253	0
Intranet_POD1_Pool3	10.10.22.0/24	10.10.22.2	10.10.22.254	253	253	0
Intranet_POD2_Pool1	10.20.20.0/24	10.20.20.2	10.20.20.254	253	253	0
Intranet_POD2_Pool2	10.20.22.0/24	10.20.22.2	10.20.22.254	253	253	0
Intranet_POD2_Pool3	10.20.21.0/24	10.20.21.2	10.20.21.254	253	253	0

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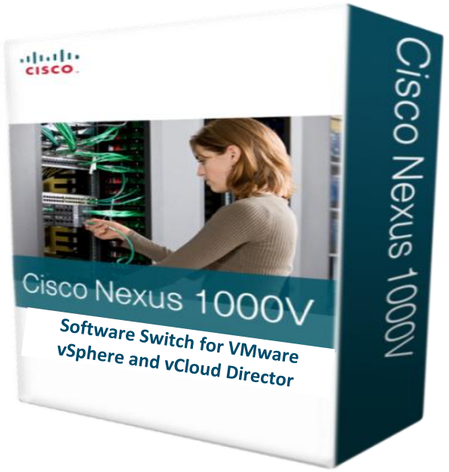
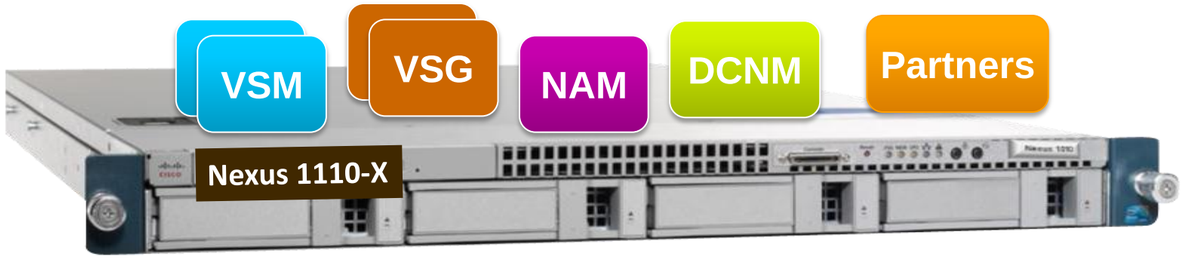
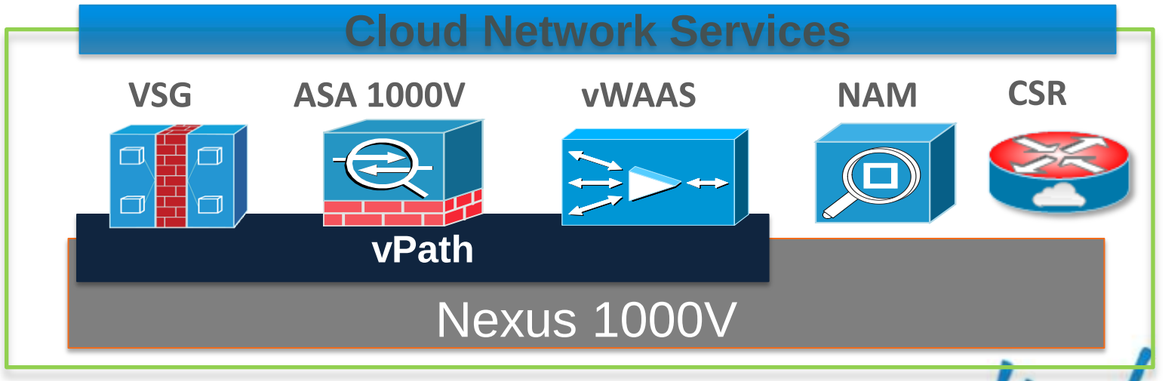






Powershell Interface for Nexus 1000V

- **#cmdlet PSSET.ps1**
- param([string]$ip, [string]$api, [string]$obj)
-
- $name = read-host "vsm user id:"
- $pw = read-host "vsm password:" –AsSecureString

- $url = “http://{0}/api/{1}” -f $ip, $api
- $req = [System.Net.WebRequest]::Create($url)
- $req.Method ="POST"
- [String]$pw= [Runtime.InteropServices.Marshal]::PtrToStringAuto([Runtime.InteropServices.Marshal]::SecureStringToBSTR($pw))
- $req.Credentials = New-Object System.Net.NetworkCredential -ArgumentList $name, $pw
- $req.PreAuthenticate = $true

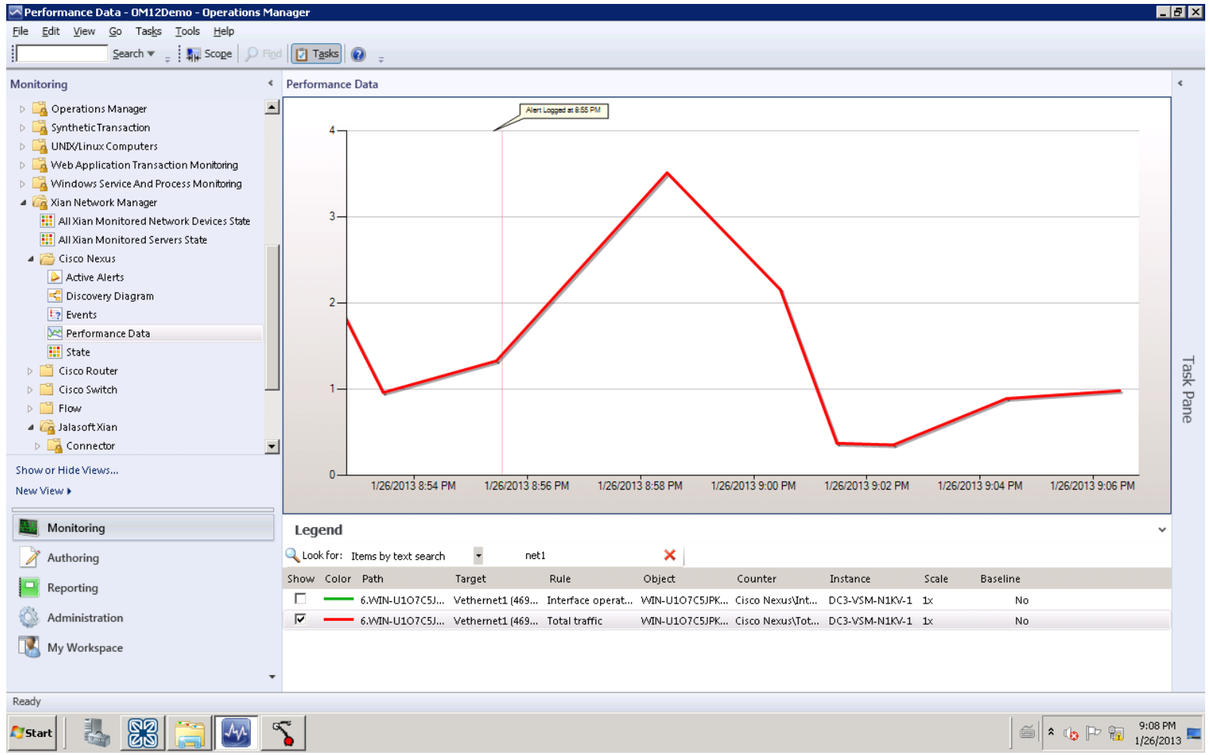
- $encodedContent = [System.Text.Encoding]::UTF8.GetBytes($obj)
-
- if($encodedContent.length -gt 0) {
- $req.ContentLength = $encodedContent.length
- $requestStream = $req.GetRequestStream()
- $requestStream.Write($encodedContent, 0, $encodedContent.length)
- $requestStream.Close()
- }
-
- [System.Net.WebResponse] $resp = $req.GetResponse();
- if($resp -ne $null) {
- $rs = $resp.GetResponseStream();
- [System.IO.StreamReader] $sr = New-Object System.IO.StreamReader -argumentList $rs;
- [string] $results = $sr.ReadToEnd();
- return $results;
- }

```
C:\Users\user1>>> ./PSSET 10.193.196.201 vc/port-profile '{"name":
"pp-new", "description": "desc pp-new"}`

Successfully created "port-profile pp-new"
```

Jalasoft SCOM Plugin for Nexus 1000V

- Xian SCOM Plugin for Nexus 1000V
- Monitors
  - Availability (ICMP and SNMP)
  - TCP Connections
  - Uptime
  - Traffic, total, error etc.
  - Bandwidth



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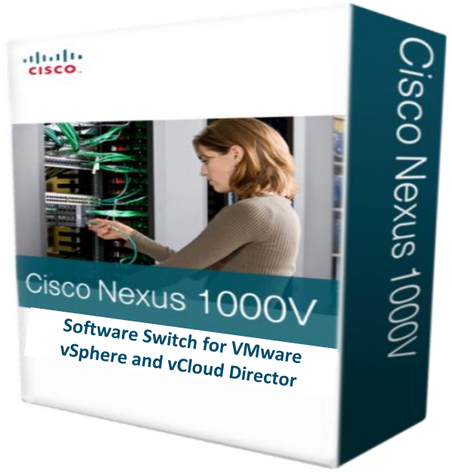
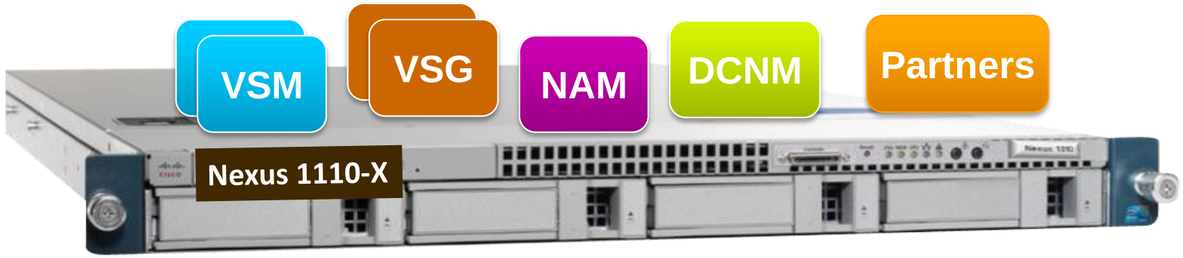
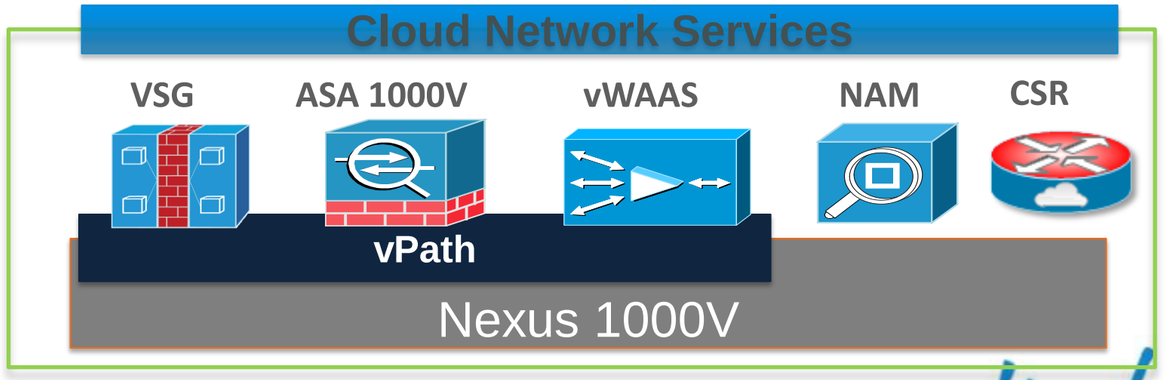




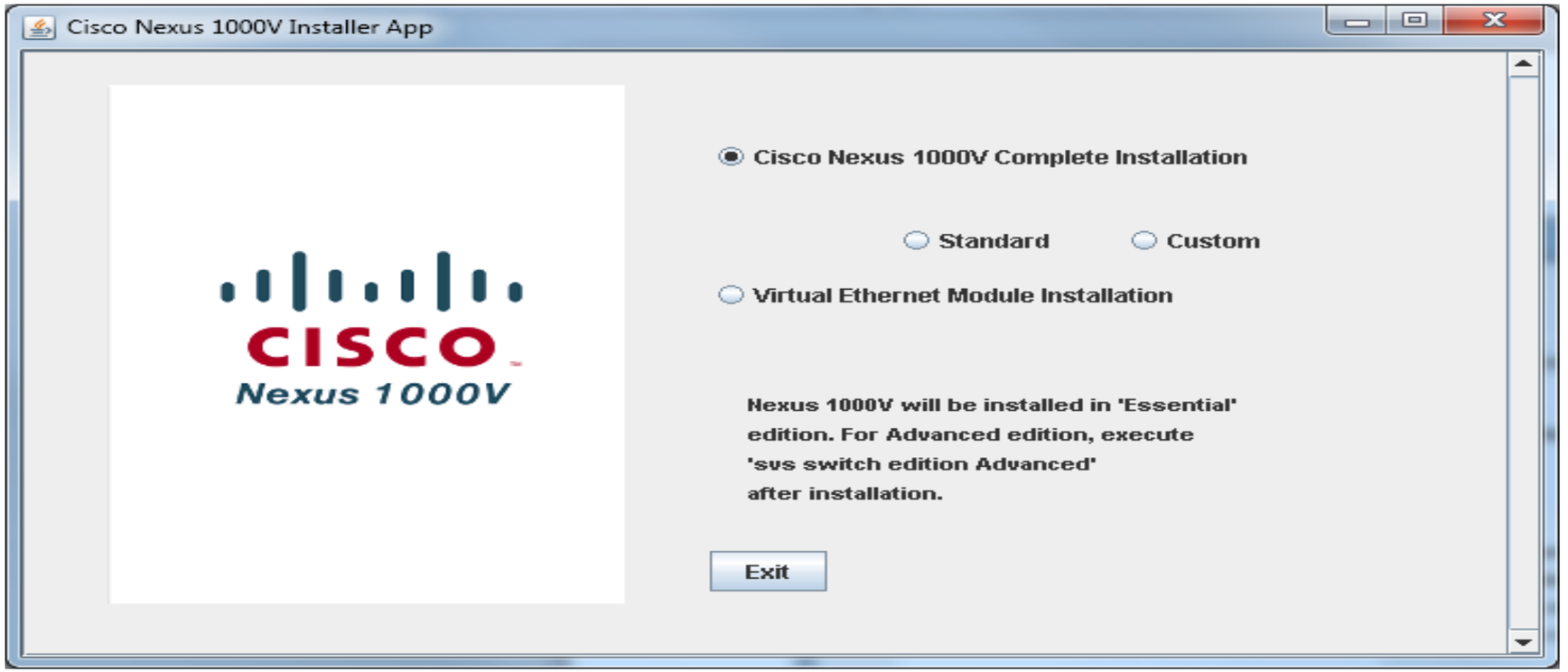


Deploying Nexus 1000V on Hyper-V Hosts

- Deploying Nexus 1000V on Hyper-V
  - Install Nexus 1000V VMM Provider on SCVMM
  - Create & Configure N1KV VSM Virtual machine
  - Register N1KV with SCVMM as a switch extenstion
  - Create a logical switch associated with N1KV
  - Identify the scope of the logical switch
- Adding host(s) to Nexus 1000V
  - Select host(s) in SCVMM
  - Add logical switch (select physical adapters to be used as uplinks)
- Attaching VMs to Nexus 1000V

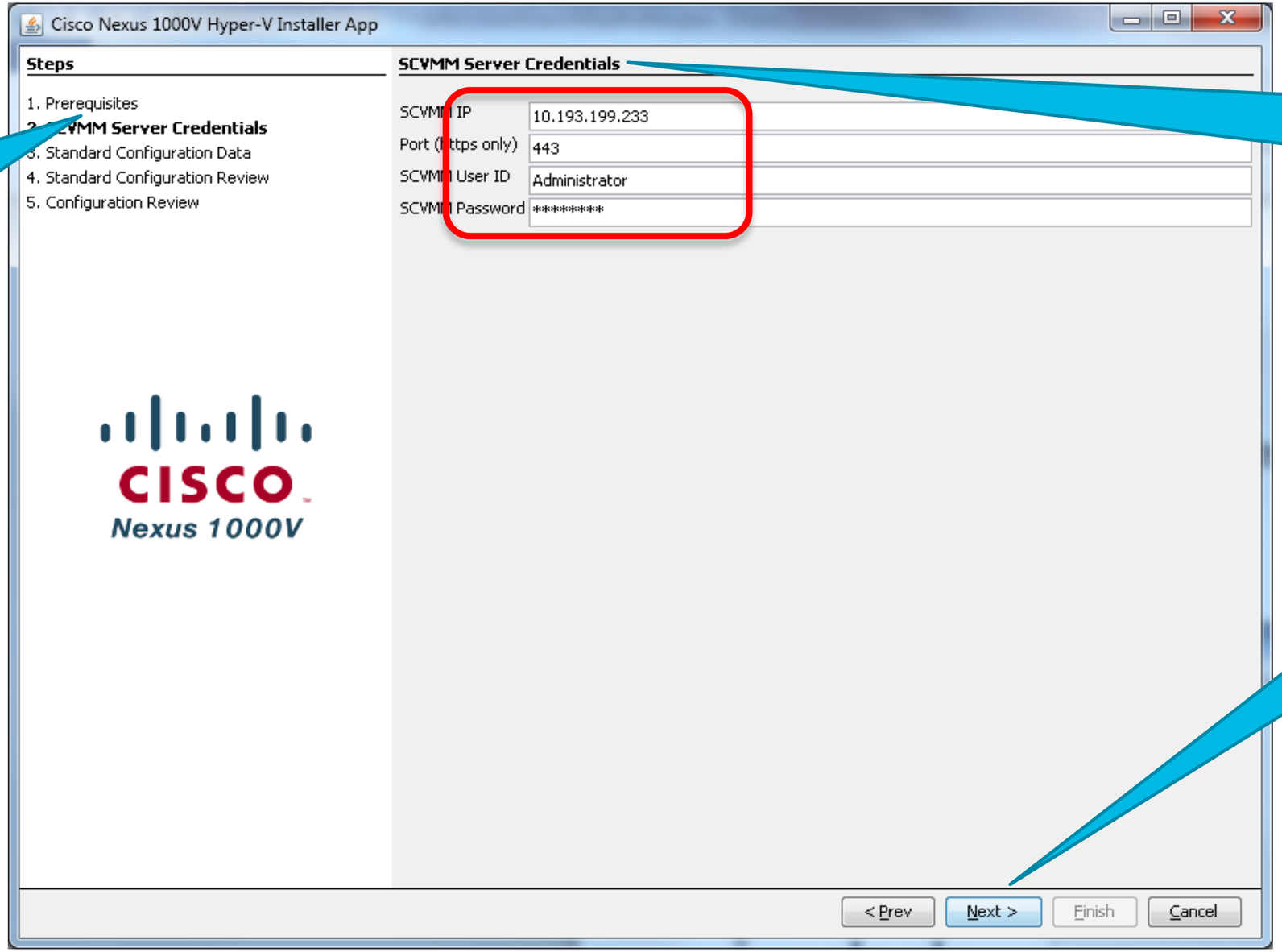
Deploying Nexus 1000V Using Installer

Standard or Custom Installation options



Deploying Nexus 1000V Using Installer

Enter SCVMM Credentials



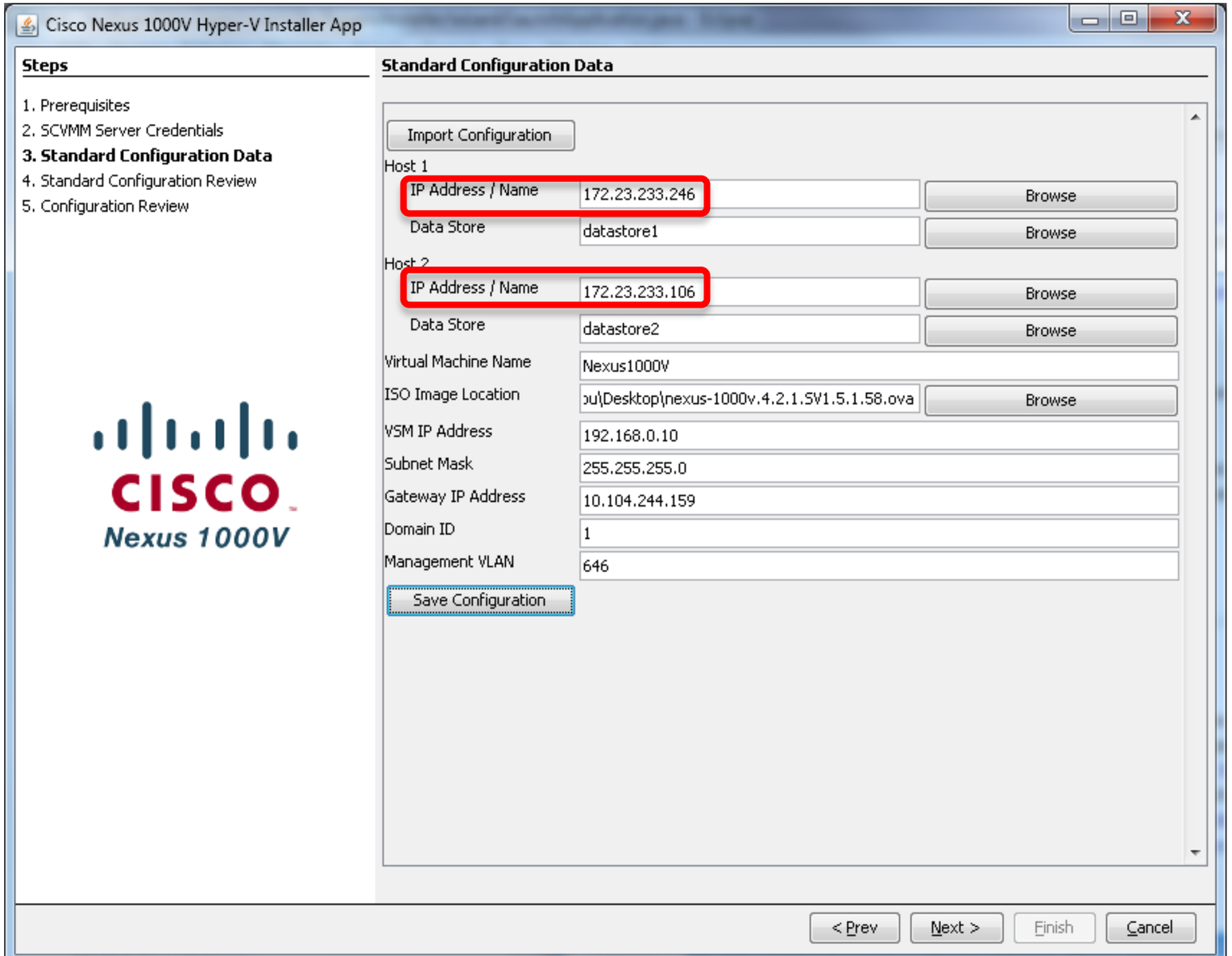
Frame outlining the installation stpes

Current Active frame

Navigation pane at the bottom

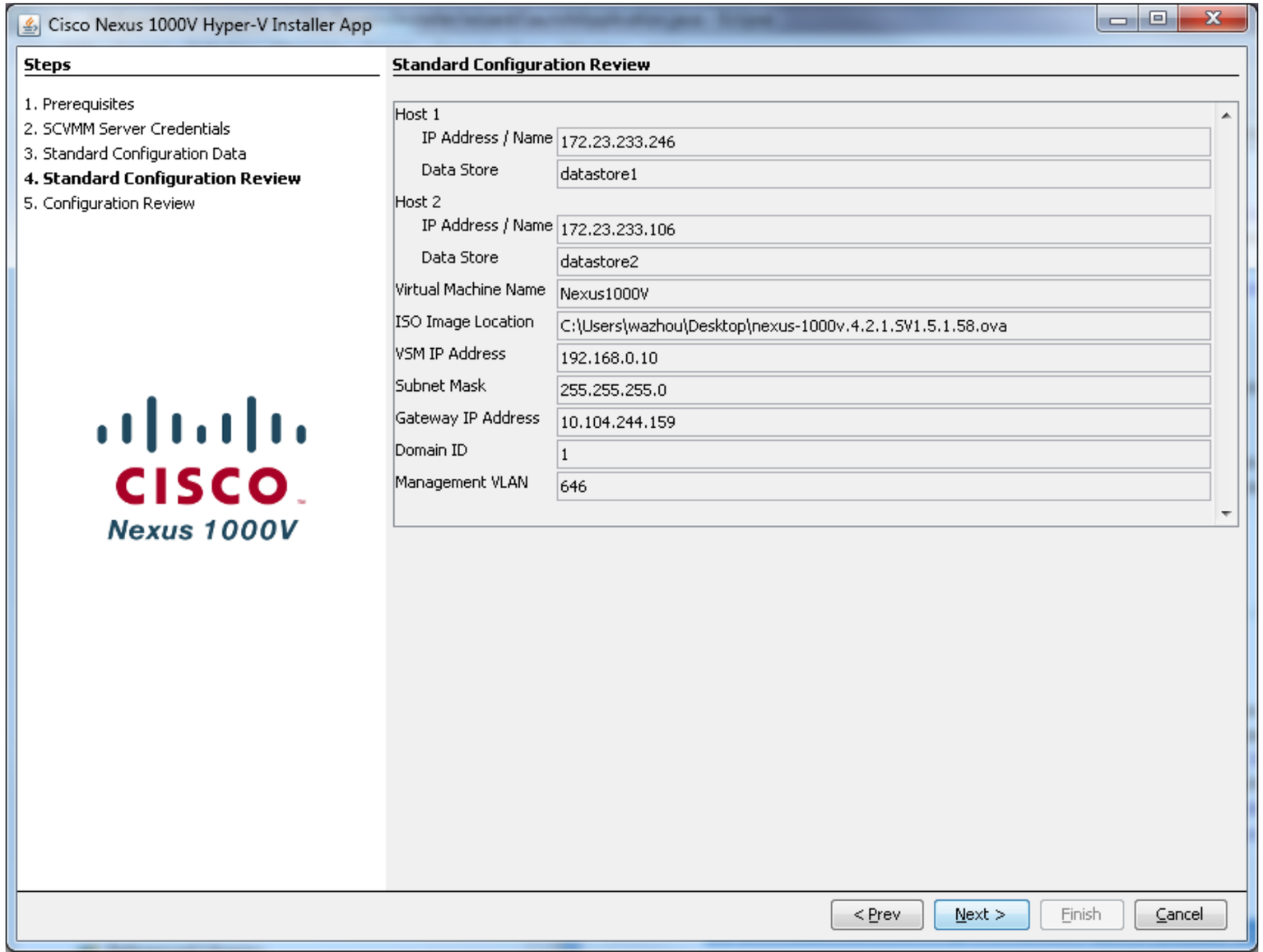
Deploying Nexus 1000V Using Installer

Choose Host for Active and Standby VSM VM



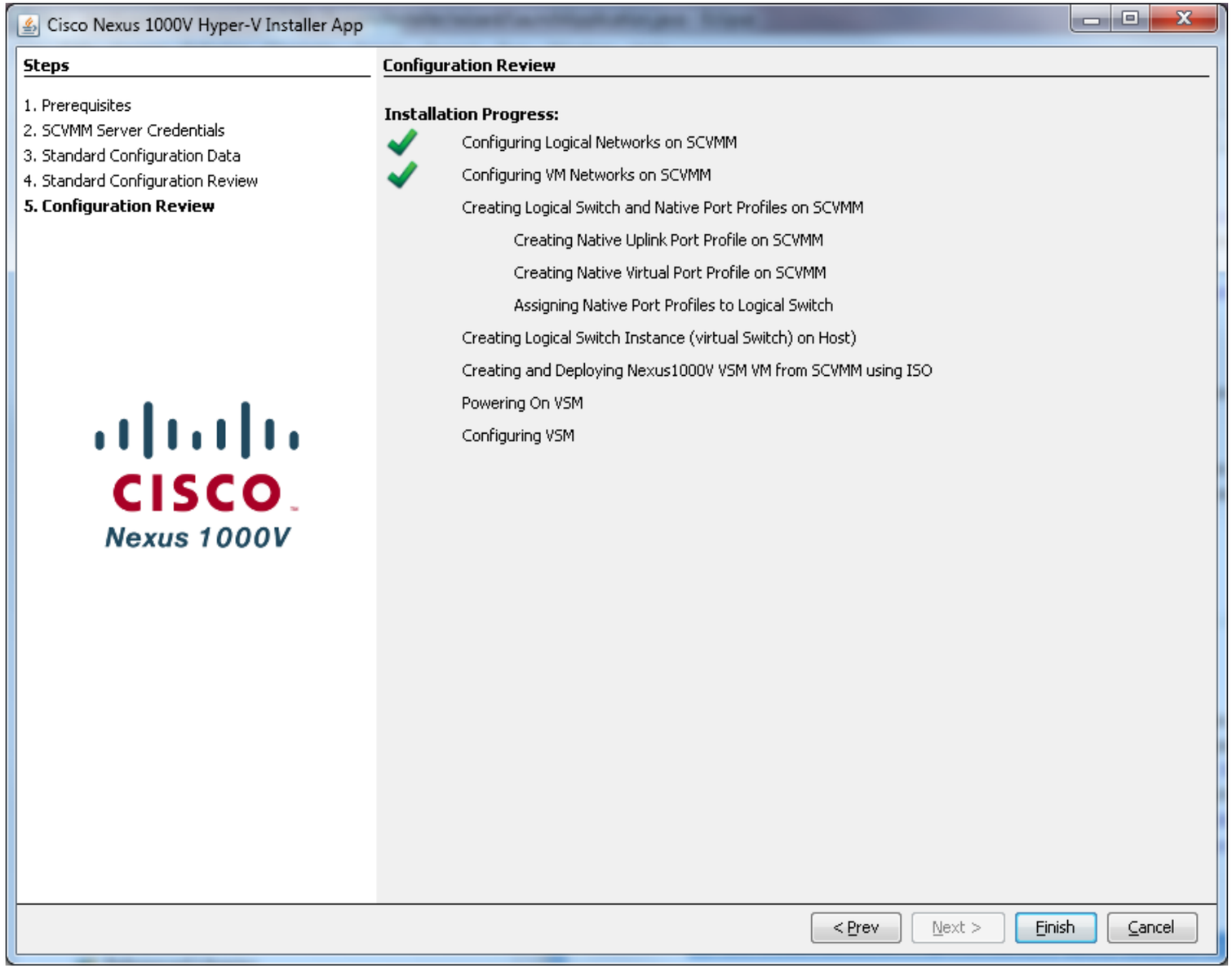
Deploying Nexus 1000V Using Installer

Summary Configuration Screen



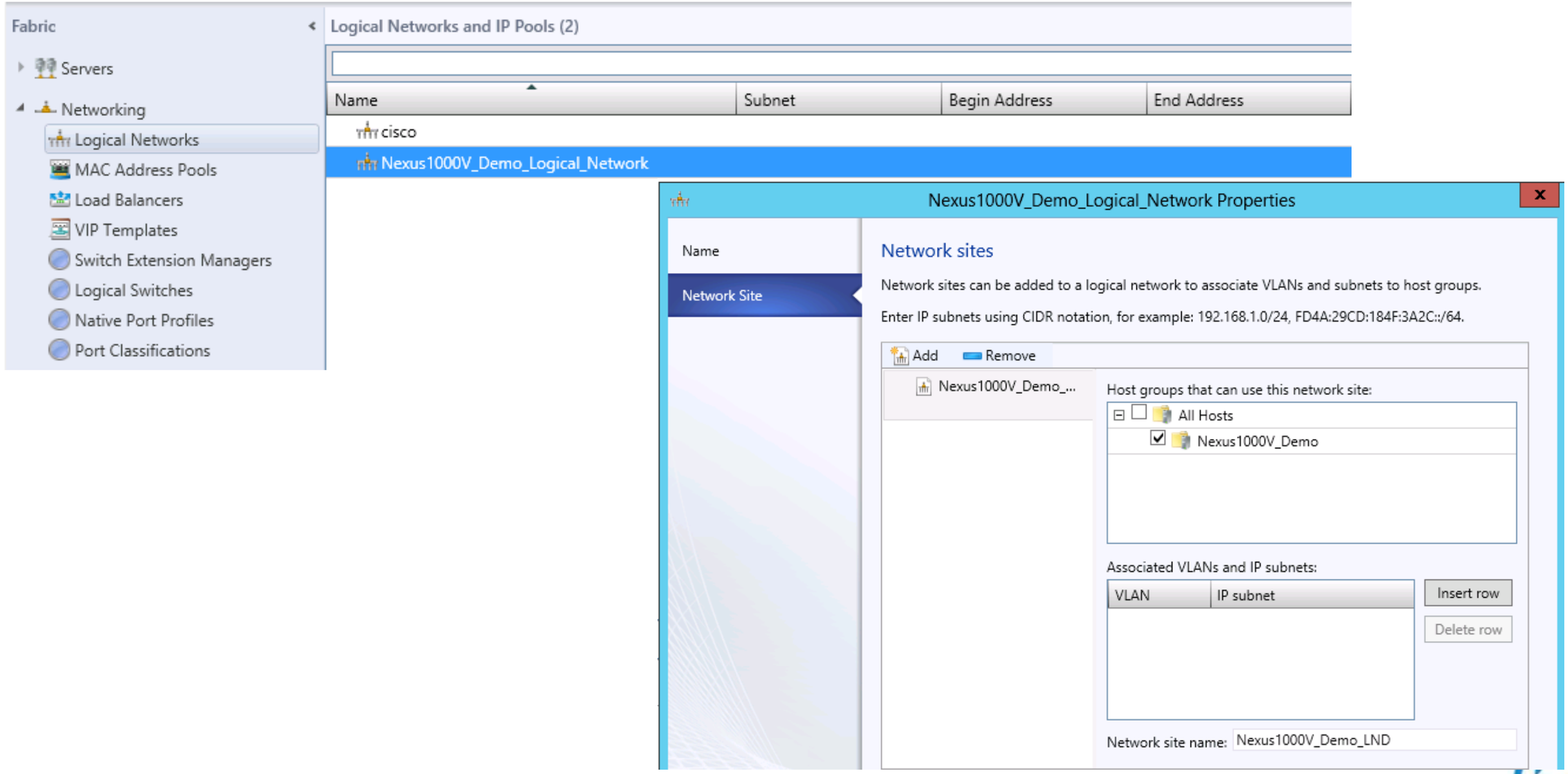
Deploying Nexus 1000V Using Installer

Deployment status



Publishing Logical Networks

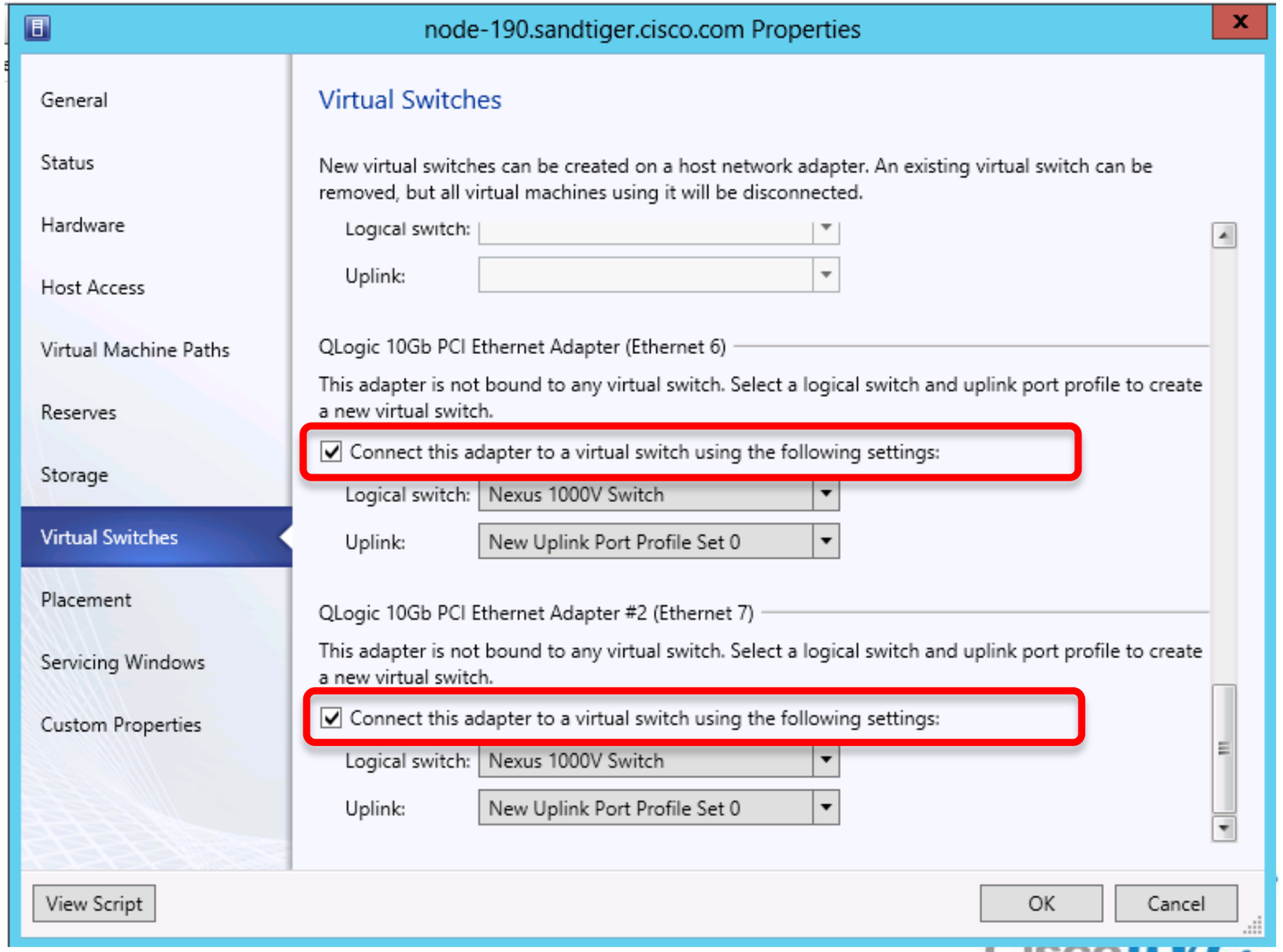
Nexus 1000V VSM publishes Logical Networks to SCVMM



Add a Host (VEM) to Nexus 1000V

Configure Logical switch & Uplink on one or more Physical adapters

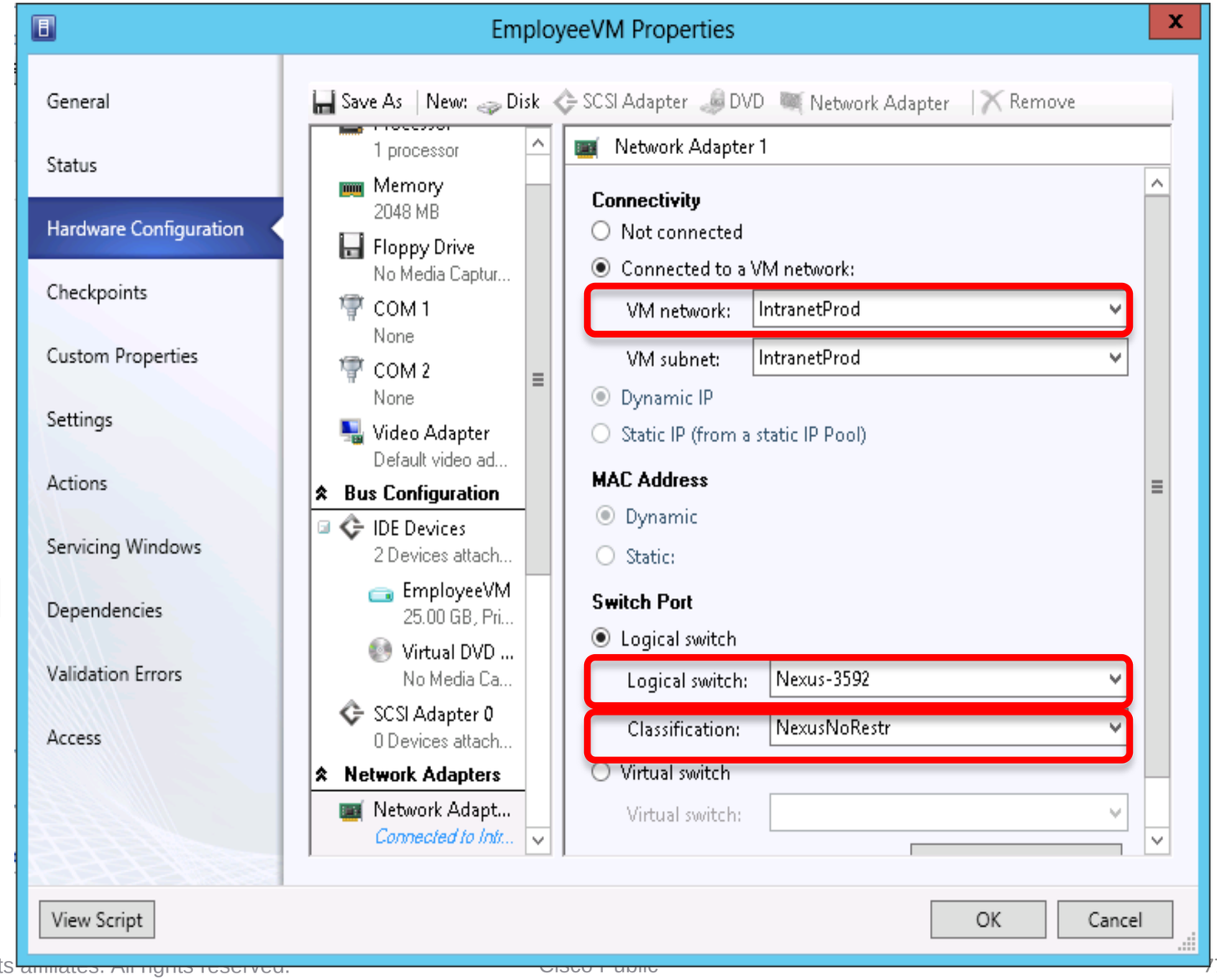
- Select Fabric tab
- Select the host
- Right-Click for Properties
- Select Virtual Switches
- For each uplink, select N1KV as the logical switch & the uplink port-profile



Add a Veth to a Host (N1KV VEM)

Configure Logical switch & Uplink on one or more Physical adapters

- Select “VM & Services” tab
- Select the host
- Select the VM
- Right-Click for Properties
- Select Hardware Configuration
- Select Network Adapters
- Select VM Network and Logical Switch



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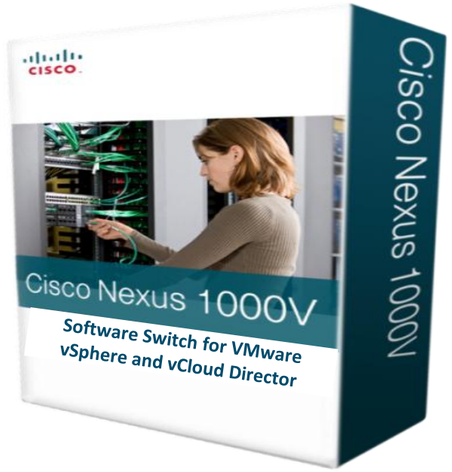
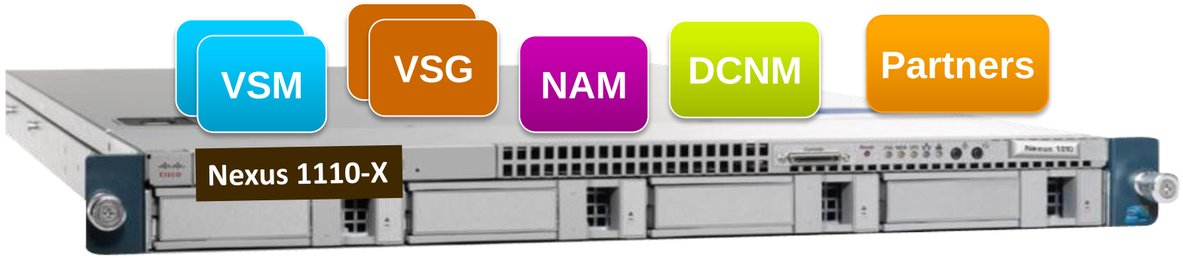
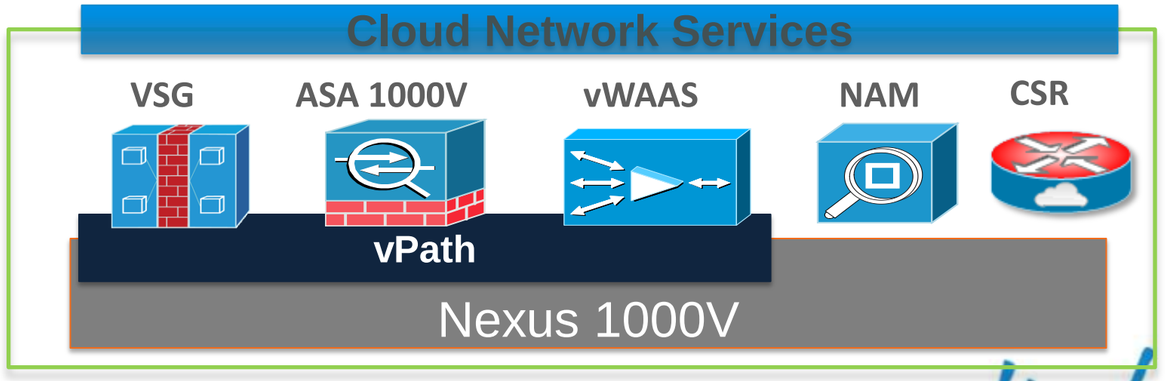
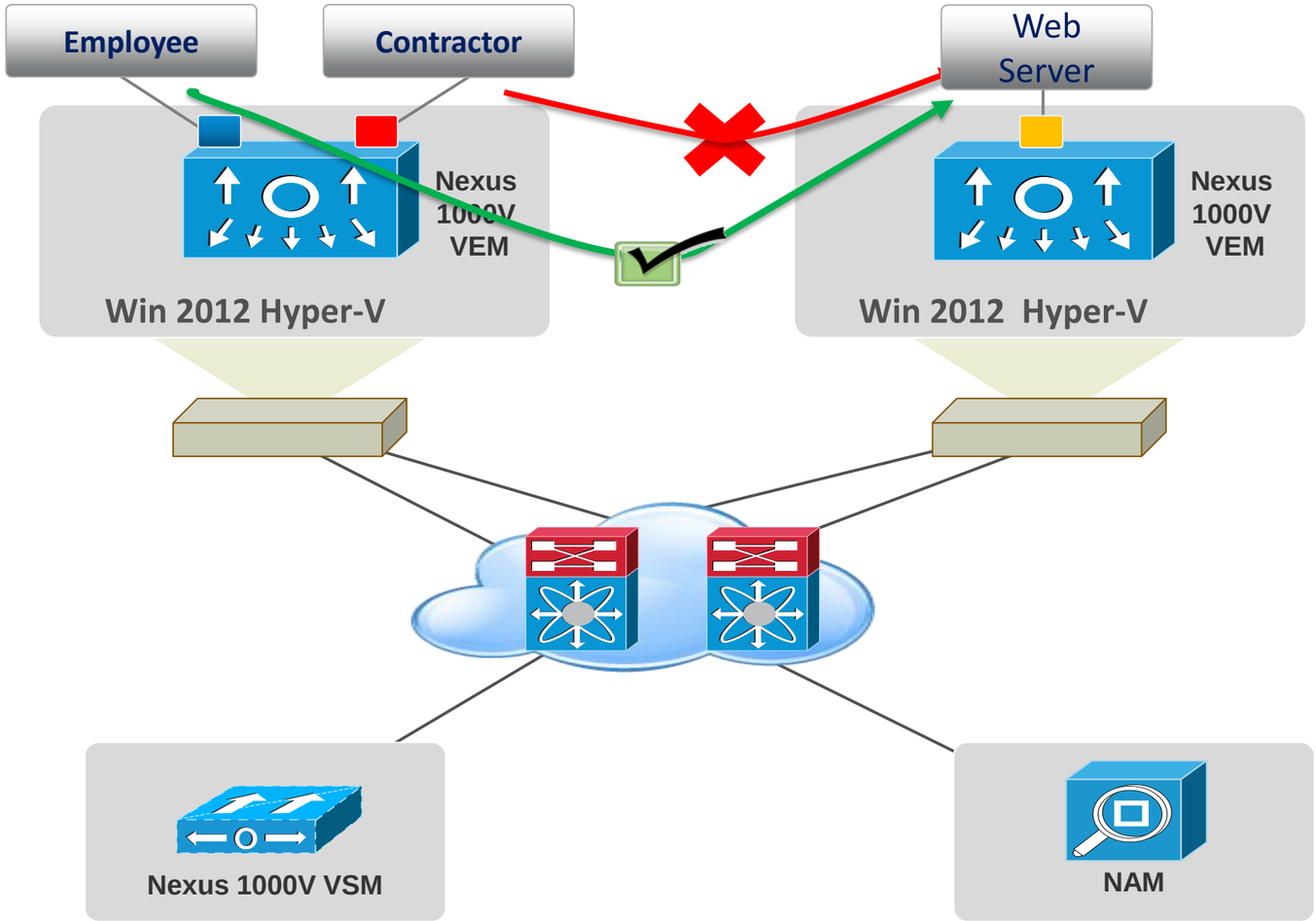






Demo Topology



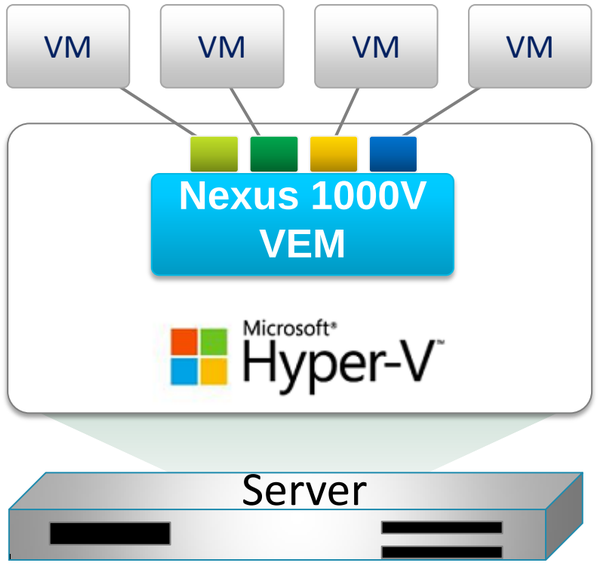
Configure the port-profiles so that web-server access is restricted:

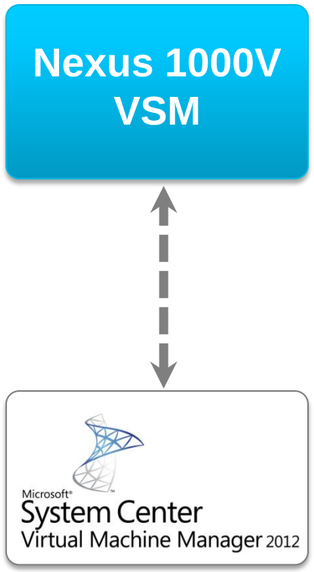
- Employee can access
- Contractor is restricted

NAM (or any other monitoring tool) can be configured to analyse the VM-to-VM traffic using ERSPAN on N1KV.

Cisco Nexus 1000V for Hyper-V Summary

Consistency for Investment protection & Reduced operational risk





- Advanced NX-OS feature-set
- Tight integration with SCVMM
- Services architecture with vPath
- Consistent operational model

Cisco Virtual Networking Solution Summary

Powered by Nexus 1000V

Multi Hypervisor	VMware vSphere WS 2012 Hyper-V Xen Server, KVM
Multi-Service	VSG, ASA1000V vWAAS, CSR Ecosystem Partners
Multi-Cloud	vCloud Director SCVMM Openstack, CIAC,…

Validated Designs

Converged Infrastructure
Virtual Desktop
DC to DC VM Migration
DC-wide Mobility
Secure Multi-tenancy
Private & Public Clouds

Consistent Feature-set
Consistent Network Services
Consistent Operational Model

Reduced time to deploy
Reduced Risk
Investment Protection

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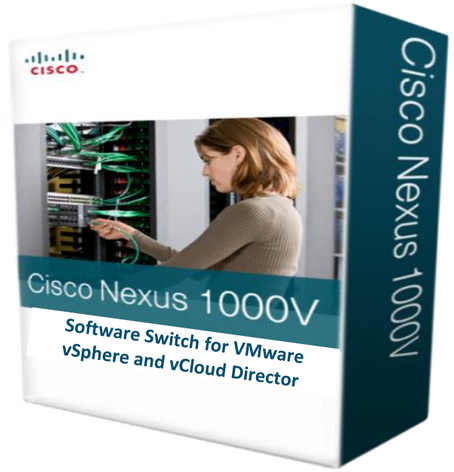
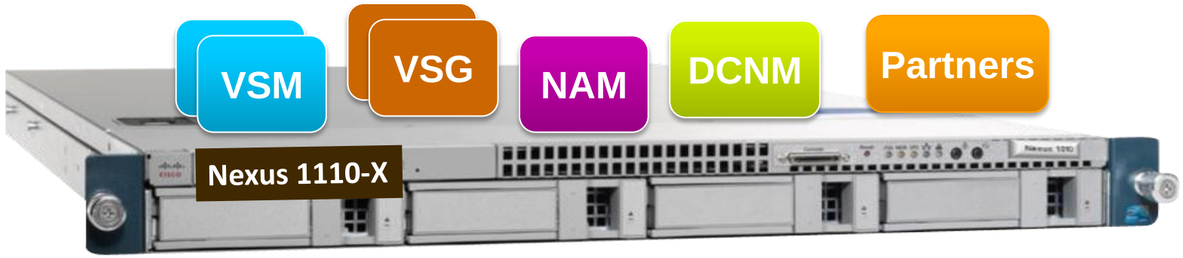
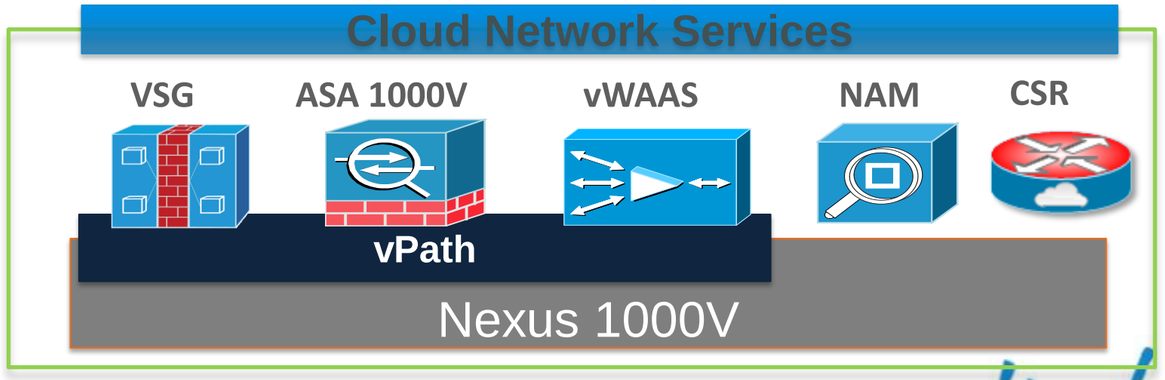






Resources

- Reference Solutions
- Webinars
- Deployment Guides, White Papers, Cheat Sheets
- CloudLab – On-line lab for N1KV & VSG

Reference Solutions

With Nexus 1000V, Nexus 1010, VSG & vWAAS

- vBlock with Nexus 1000V; Vblock with VSG and vWAAS
- FlexPOD with Nexus 1000V and Nexus 1010
- Virtual Multi-tenant Data Center with Nexus 1000V
- Virtual Desktop
  - 1000V and VMware View
  - 1000V and Citrix XenDesktop
  - 1000V and VSG in VXI Reference Architecture
- Virtual Workload Mobility (aka DC-to-DC vMotion)
  - Cisco, VMware and EMC (with 1000V and VSG)
  - Cisco, VMware and NetApp (with 1000V and VSG)
- PCI 2.0 with Nexus 1000V and VSG

N1K Public Webcasts, Fall 2012

Webinar Link: www.cisco.com/go/1000vcommunity

Date	Technical Track Topics	Webinar	Preso
9/26/2012	Nexus 1000V on Hyper-V with Windows Server 2012 (Blog)	Play	PDF
9/27/2012	Nexus 1000V 2.1: Latest Innovations in Virtual Machine Networking (w/ demo)	Play	PDF
10/3/2012	Best Practices for Deploying VXLAN w/ N1KV	Play	PDF
10/10/2012	Cisco's Open Network Environment (ONE) update – includes network programmability, controller & OF, virtual overlays & open clouds	Play	PDF
10/24/2012	Securing Clouds with ASA 1000V and VSG w/ vPath 2.0	Play	PDF
10/31/2012	Cloud Services Router (CSR) 1000V: Connect to provider-hosted clouds	Play	PDF
11/7/2012	Openstack @ Cisco & Quantum support for Nexus 1000V on KVM	Play	PDF
11/14/2012	Nexus 1000V for Hyper-V: Enable Multi-hypervisor & Multi-service Clouds (w/ demo)	Play	PDF

N1K Public Webcasts, Spring 2012

Webinar Link: www.cisco.com/go/1000vcommunity

Date	Technical Track Topics	Webinar	Preso
2/14/12	Virtual Security Gateway (VSG) v1.3	Play	PDF
2/22/12	Nexus 1000V v1.5 Technical Deep Dive	Play	PDF
2/29/12	Nexus 1010-X v1.4 Technical Deep Dive	Play	PDF
3/7/12	vWAAS and Nexus 1000V Technical Deep Dive	Play	PDF
3/14/12	FlexPod & Nexus 1000V/1010	Play	PDF
3/21/12	VMDC QoS for Hybrid Cloud-based Multimedia Services with the Nexus 1000V	Play	PDF
3/28/12	Vblock & Nexus 1000V / VSG / vWAAS	Play	PDF
4/4/12	vCloud Director, Nexus 1000V, and VXLAN Technical Deep Dive	Play	PDF
4/11/12	Cisco's CloudLab Deep Dive: Hands-on labs for N1KV, VSG & VXLAN	Play	PDF
4/18/12	NAM and DCNM on the Nexus 1010 and 1010-X	Play	PDF

N1K Public Webcasts, Fall 2011

Webinar Link: www.cisco.com/go/1000vcommunity

Date	Technical Track Topics	Webinar	Preso
7/27	Long Distance vMotion with Nexus 1000V and VSG	Play	PDF
8/10	PCI Reference Architecture with Nexus 1000V and Virtual Security Gateway	Play	PDF
10/05	Nexus 1000V, VXLAN, and vCloud Director	Play	PDF
10/12	Virtualized Multi-Tenant Data Center (VMDC)	Play	PDF
10/19	Nexus 1010 v1.3 - What's New?	Play	PDF
10/26	Virtualised Workload Mobility - Latest Design Guidance	Play	PDF
11/02	UCS and Nexus 1000V - Best Practices	Play	PDF
11/09	Virtual Security Gateway (VSG) What's new? What's coming?	Play	PDF

N1K Public Webcasts – Spring 2011

Webinar Link: www.cisco.com/go/1000vcommunity

Date	Business Track Topics	Webinar	Preso	Q&A
3/22	Nexus 1000V/1010 Overview and Update	Play	PDF	PDF
4/05	Virtual Network Services: Virtual Service Datapath (vPath), Network Analysis Module (NAM), Virtual Application Acceleration (vWAAS)	Play	PDF	PDF
4/19	Virtual Security Gateway (VSG) Overview (Installation Videos: Link)	Play	PDF	PDF
5/03	Journey to the Cloud w/ N1KV: vCloud Director & Long Distance vMotion	Play	PDF	PDF
5/17	Secure Virtual Desktop with Nexus 1000V & VSG	Play	PDF	PDF

Date	Technical Track Topics	Webinar	Preso	Q&A
3/29	Nexus 1000V v1.4 Features & Install Overview (Installation Screencasts Link)	Play	PDF	PDF
4/12	Nexus 1010 Overview & Best Practices	Play	PDF	PDF
4/26	Virtual Security Gateway (VSG) Technical Overview	Play	PDF	PDF
5/10	Nexus 1000V Key Features Overview	Play	PDF	PDF
5/24	Nexus 1000V Troubleshooting	Play	PDF	PDF

N1K Public Resources

- CCO Links
  - 1000V: www.cisco.com/go/1000v
  - 1010: www.cisco.com/go/1010
  - VSG: www.cisco.com/go/vsg
  - VNMC: www.cisco.com/go/vnmc
  - vWAAS: www.cisco.com/go/waas
  - NAM on 1010: www.cisco.com/go/nam
- White papers:
  - Nexus 1000V and vCloud Director
  - N1K on UCS Best Practices
  - Nexus 1000V QoS White paper (draft)
  - VSG and vCloud Director (draft)
  - vWAAS Technical Overview, vWAAS for Cloud-ready WAN Optimization
- Cheat Sheets
  - Nexus 1010 Configuration Cheat Sheet v.2.0
  - https://communities.cisco.com/docs/DOC-28188
  - Nexus 1000V with UCS Configuration Cheat Sheet v.1.1
  - https://communities.cisco.com/docs/DOC-28187
  - More on the way
- Deployment Guides
  - Nexus 1000V Deployment Guide
  - Nexus 1000V on UCS – Best Practices
  - Nexus 1010 Deployment Guide
  - VSG Deployment Guide
- My Cisco Community: www.cisco.com/go/1000vcommunity

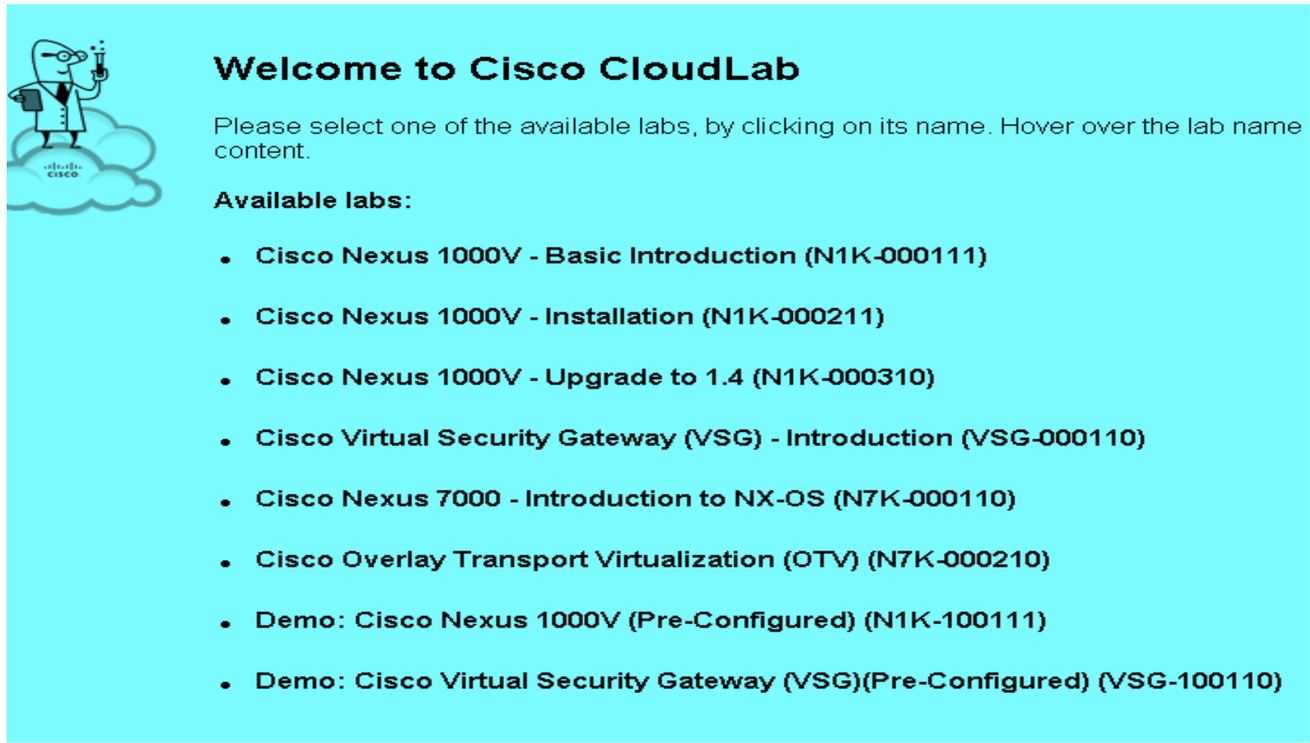
Cisco Cloud Lab

Hands On Training & Demos

- Hands on labs available for Nexus 1000V and VSG in Cloud Lab

  https://cloudlab.cisco.com

- Open to all Cisco employees
- Customers/Partners require sponsorship from account team for access via CCO LoginID
- Extended duration lab licenses for 1000V and VSG are available upon request



Additional N1K Public Links

- N1K Download and 60-day Eval: www.cisco.com/go/1000vdownload
- N1K Product Page: www.cisco.com/go/1000v
- N1K Community: www.cisco.com/go/1000vcommunity
- N1K Twitter www.twitter.com/official_1000V
- N1K Webinars: www.cisco.com/go/1000vcommunity
- N1K Case Studies: www.tinyurl.com/n1k-casestudy
- N1K Whitepapers www.tinyurl.com/n1k-whitepaper
- N1K Deployment Guide: www.tinyurl.com/N1k-Deploy-Guide
- VXI Reference Implementation: www.tinyurl.com/vxiconfigguide
- N1K on UCS Best Practices: www.tinyurl.com/N1k-On-UCS-Deploy-Guide

Q & A

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- Visit any Cisco Live Internet Station located throughout the venue

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