



Cisco Nexus 1000V for Hyper-V

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Agenda

- Cisco Virtual Networking Solutions
- Cisco Nexus 1000V Overview
 - Architectural Overview
 - What is new in v1.5.2?
 - What is on the roadmap?
- Cisco Virtual Security Gateway

Data Center Transformation - Requirements



Virtualized Data Center

- Consistent operational model of physical and virtual resources
- Flexibility to select any hypervisor for Applications
- Consistency across physical and virtual service nodes
- Consistent Application Policy Enforcement



Private Cloud

- Automation through Cloud Management Platforms
- Flexibility with Application placement on any hypervisor
- Automated service insertion, policy management and chaining
- Increased Resource Utilization



Hybrid Cloud

- Seamless Secure extension of private cloud to public cloud
- Single pane of management of local/remote resources
- Consistent servers and policies regardless of location of workloads
- Choice in Cloud Providers and Multi-Cloud Models

Cisco's Cloud Networking Services Portfolio

Virtual Application Networking

Nexus 1000V with built-in Distributed Virtual Firewall (VSG)
For
vSphere, Hyper-V and KVM ^{New}

Virtual Network Services

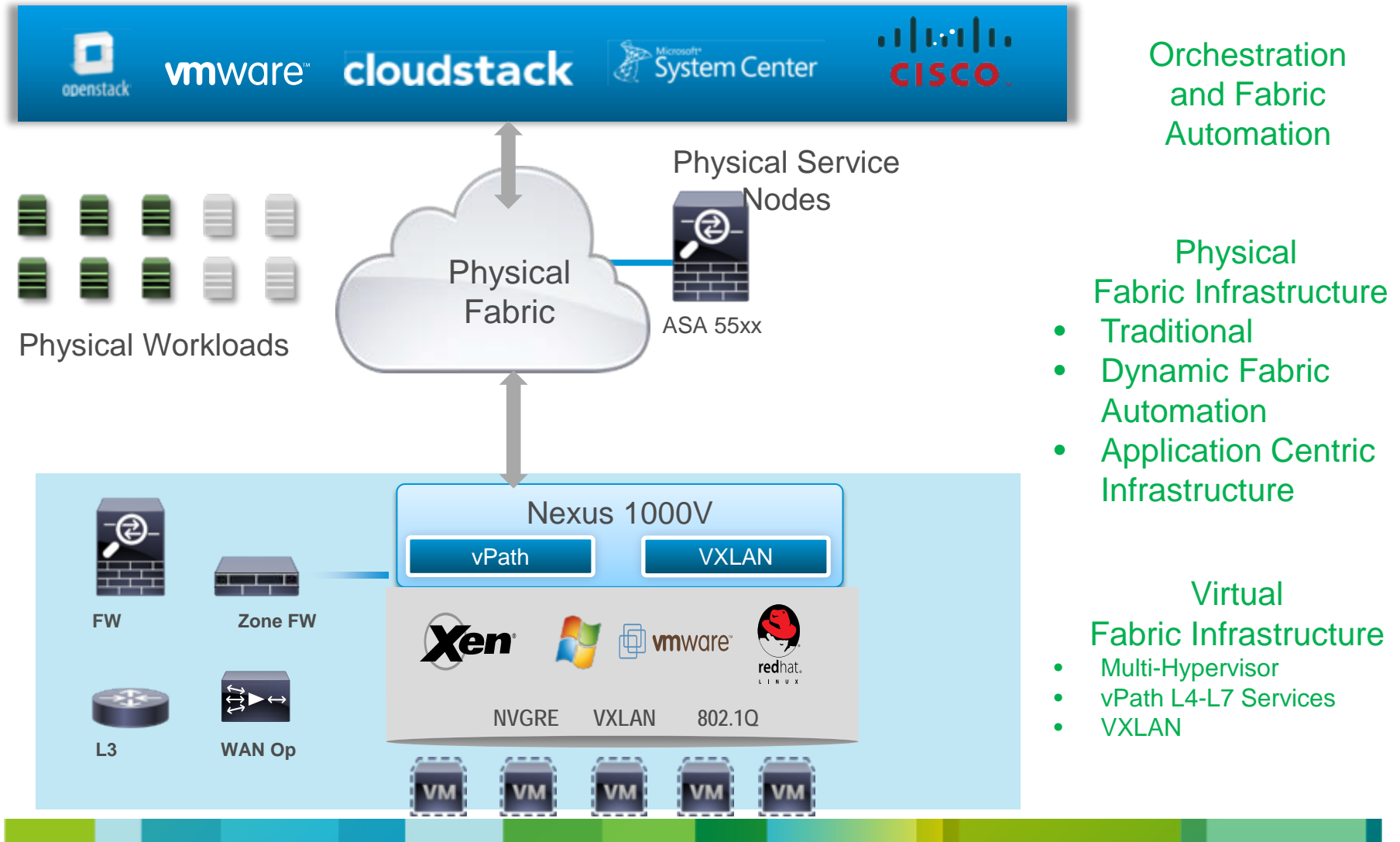
- L4-L7 Services Hosting Platform**
- Virtual Security Gateway
 - Perimeter Firewall - ASA1000V
 - Cloud Services Router – CSR1000V
 - Virtual Network Analysis Modules - vNAM
 - Virtual Wide Area Acceleration - vWaas
 - Load Balancer - Citrix NetScaler 1000V ^{New}

Hybrid Cloud

^{New}
InterCloud

Nexus 1000V for Any Fabric Architecture

Seamless Interaction Across Physical and Virtual Workloads & Services



Cisco's Microsoft Datacenter Portfolio

Microsoft Partner

Gold OEM
Gold Management and Virtualization



Compute



UCS



Network



Nexus 1000V

Storage



EMC²

Partnerships

Management



Windows Server

PowerShell

Virtualization



Windows Server

Microsoft | Hyper-V Cloud



Architectures (CVD)



Microsoft | Hyper-V Cloud



Windows Server



Community Recognition



Tech Ed 2011
Hardware Category
UCS B Series

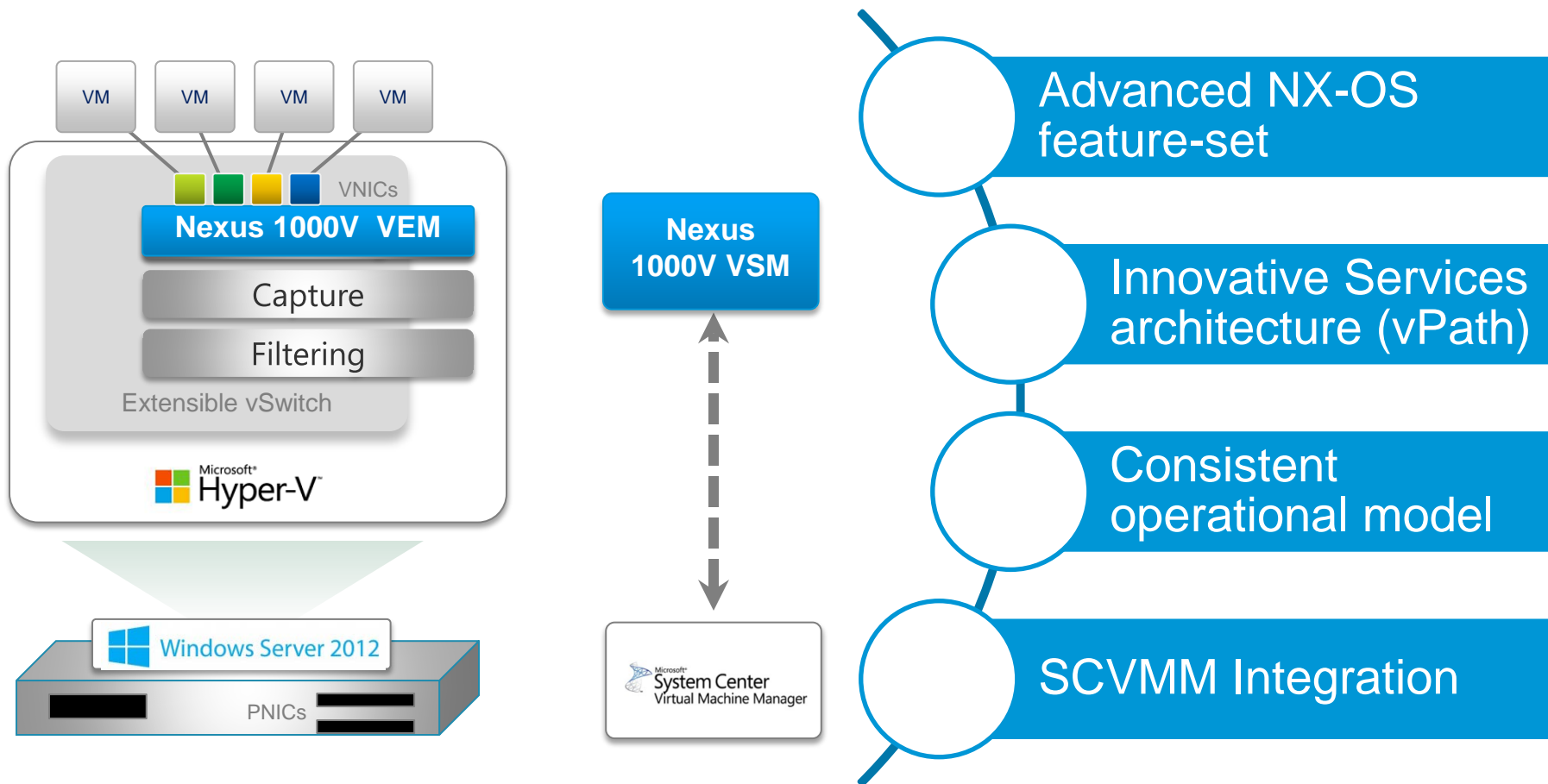
Tech Ed 2012
Breakthrough Product
UCS Manager

Tech Ed 2013
Virtualization Category
Nexus 1000V

Best of TechEd winners stand apart from the pack, either offering an edge in product functionality, boasting enhanced feature sets in new versions, or introducing innovative technology. Winners are chosen based on their innovation, strategic importance to the market, competitive advantage, and exceptional value to customers.

Cisco Nexus 1000V

Award Winning Networking Platform for Hyper-V



Cisco Nexus 1000V for Hyper-V Features

Switching

- L2 Switching, 802.1Q Tagging, Rate Limiting (TX)
- IGMP Snooping, QoS Marking (COS & DSCP)

Security

- Policy Mobility, Private VLANs w/ local PVLAN Enforcement
- Access Control Lists (L2–4 w/ Redirect), Port Security
- 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

- Full integration with System Center – VM Manager (SCVMM)
- Faster network policy provisioning through port profiles

Visibility

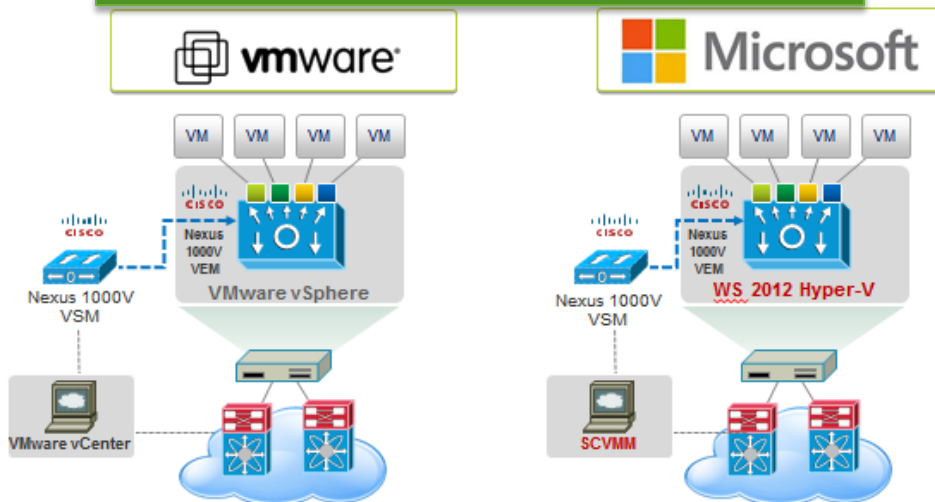
- Live Migration Tracking, NetFlow v.9 w/ NDE, CDP v.2
- VM-Level Interface Statistics
- SPAN & ERSPAN (policy-based)

Management

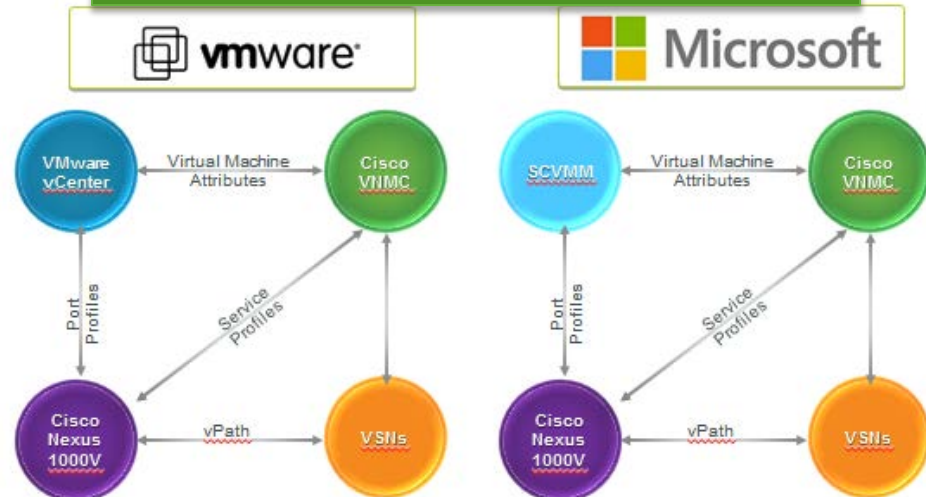
- VM Network Provisioning (port-profiles), CiscoWorks, Cisco DCNM
- Cisco CLI, Radius, TACACs, Syslog, SNMP (v.1, 2, 3)
- Hitless upgrade, SW Installer

Hypervisor-agnostic architecture

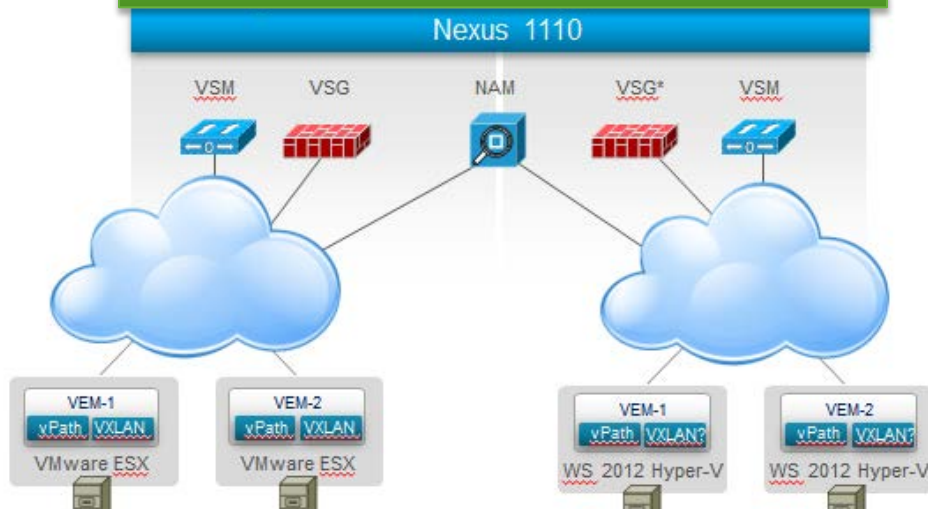
Consistent Switching Architecture



Consistent Services Architecture



Consistent Hosting Platform



Cisco Nexus 1000V Tiered Pricing

	Essential (free)	Advanced (licensed per-cpu)
VLANs, ACL, QoS	✓	✓
vPath	✓	✓
LACP	✓	✓
Multicast	✓	✓
Netflow, SPAN, ERSPAN	✓	✓
Management (SNMP etc.)	✓	✓
SCVMM Integration	✓	✓
DHCP Snooping		✓
IP Source Guard		✓
Dynamic ARP Inspection		✓
Virtual Security Gateway		✓

Cisco Nexus 1000V Terminology

SCVMM Terminology

Cisco Nexus 1000V Terminology

Logical Networks

Logical Networks

Network Sites

Network Segment Pools

VM Networks

Network Segments

IP-Pools

IP-Pools & IP-Pool Templates

Port-Classifications

Port-profiles

Cisco Nexus 1000V for Hyper-V

Defining “Network sites” and “VM Networks”

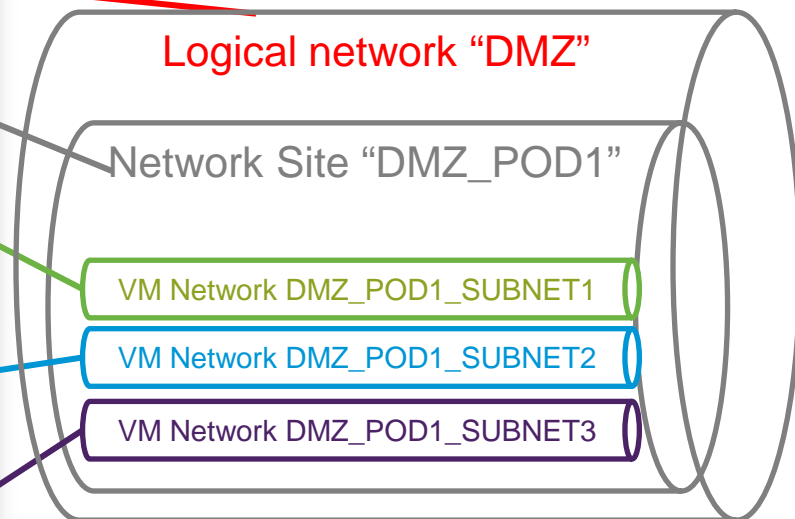
```
nsm logical network DMZ
```

```
# nsm network segment pool DMZ_POD1  
# member-of logical network DMZ
```

```
# nsm network segment DMZ_POD1_SUBNET1  
member-of network segment pool DMZ_POD1  
switchport mode access  
switchport access vlan 20  
ip-pool import template DMZ_POD1_Pool1
```

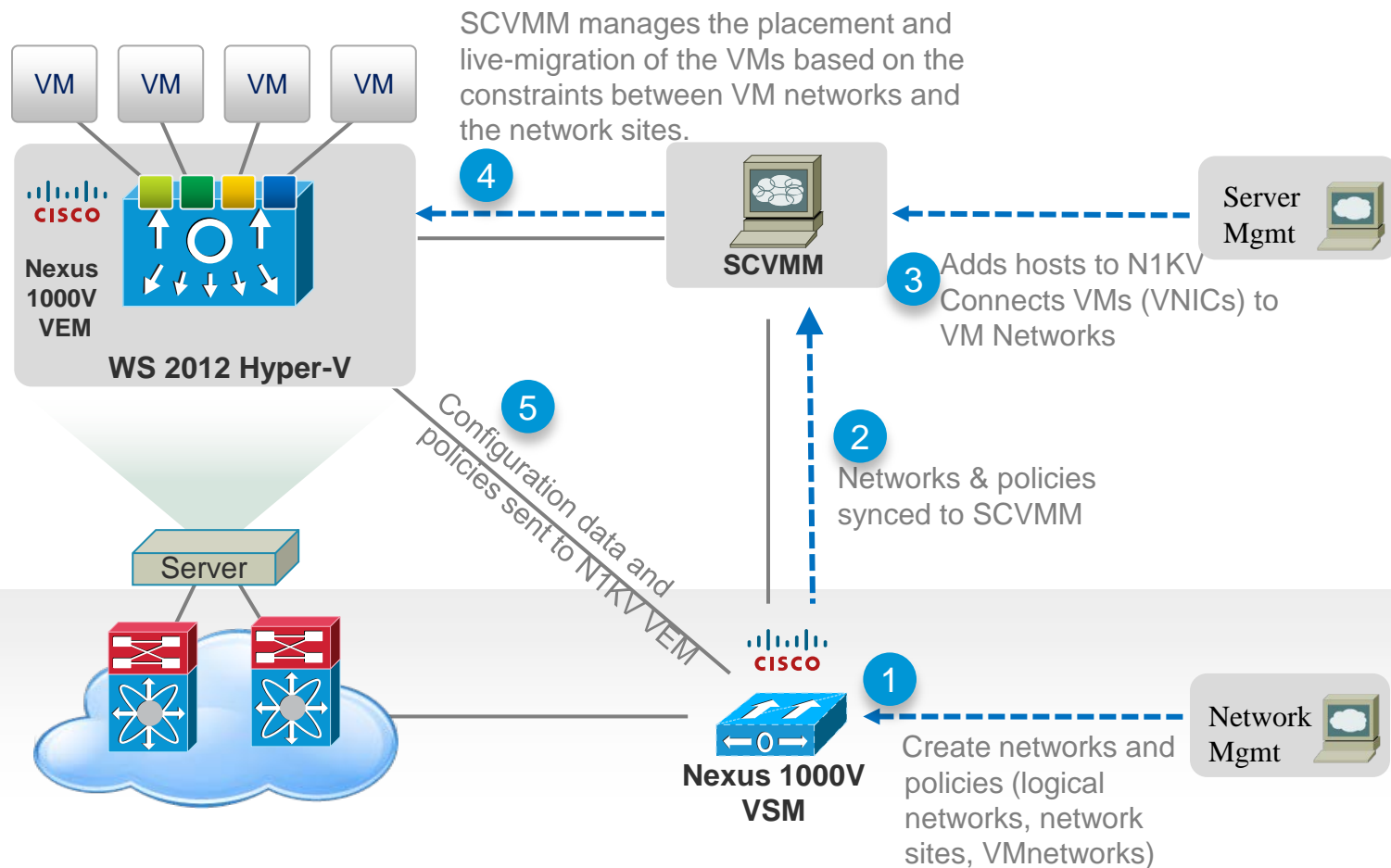
```
# nsm network segment DMZ_POD1_SUBNET2  
member-of network segment pool DMZ_POD1  
switchport mode access  
switchport access vlan 21  
ip-pool import template DMZ_POD1_Pool2
```

```
# nsm network segment DMZ_POD1_SUBNET3  
member-of network segment pool DMZ_POD1  
switchport mode access  
switchport access vlan 22  
ip-pool import template DMZ_POD1_Pool2
```



Cisco Nexus 1000V for Hyper-V

Operational Model with SCVMM



Cisco Nexus 1000V PowerShell Cmdlets

Available from <http://developer.cisco.com/web/n1k/hyperv>

PowerShell CmdLet: *<Action>-N1k<Object>*

Action Verbs

Create an object*	New
Read an object	Get
Update an object	Set
Delete an object	Remove

Examples

Create a Logical Network*	New-N1kLogicalNetwork()
Read port-profile info	Get-N1kPortProfile()
Update an IP-Pool	Set-N1kPoolTemplate()
Remove network segment	Remove-N1kNetworkSegment()

*Objects can be Logical Networks, VM networks, Port-profiles, IP-Pools, Port-profiles etc.
Write/Update Operations are only supported on limited set of objects

Open a connection to
VSM from PowerShell
using the credentials

Identify the
required
PowerShell
CmdLets

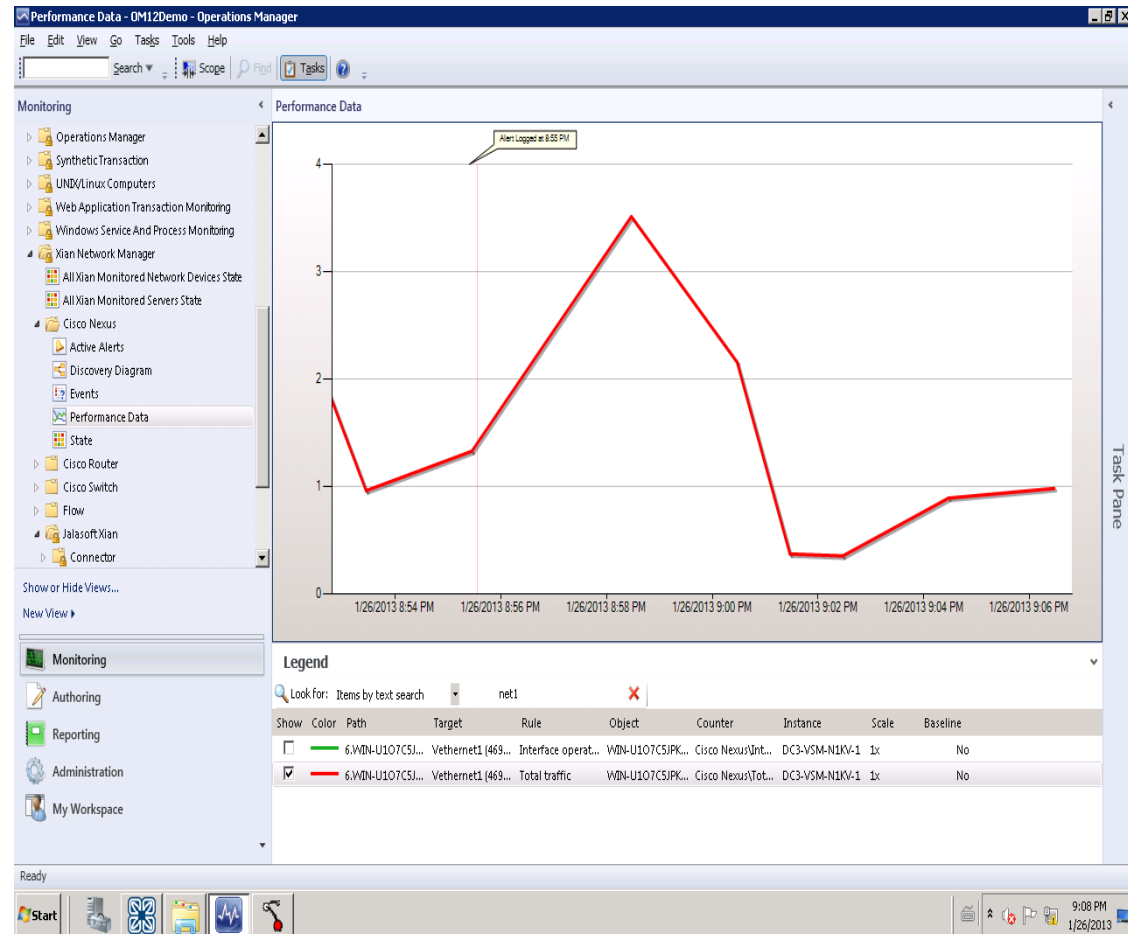
Run the Cmdlet
directly from
the PowerShell
Prompt

Parse the
response for
the required
information

Cisco Nexus 1000V for Hyper-V

SCOM Management Plugin from Jalasoft

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

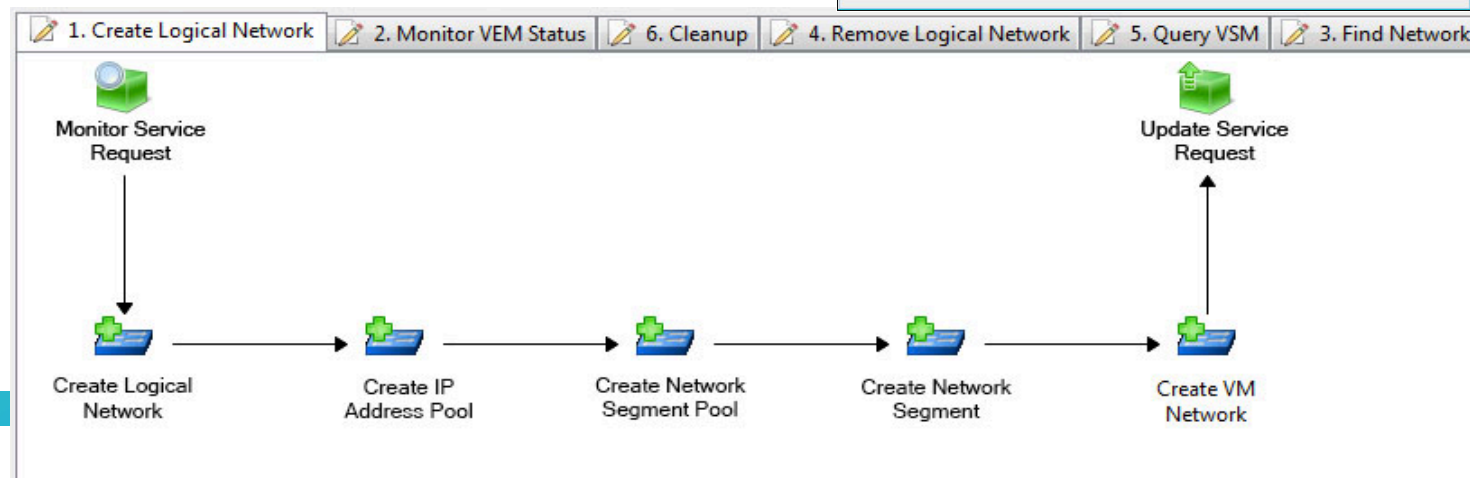
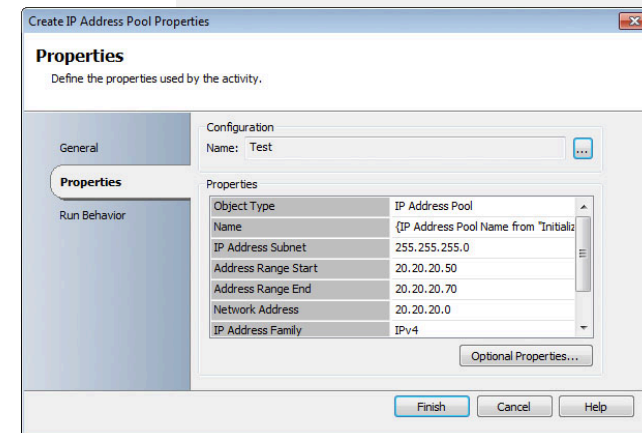
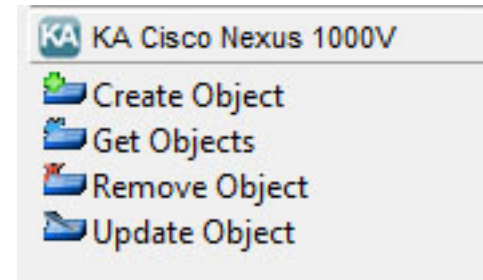


Cisco Nexus 1000V for Hyper-V SCO Integration Pack from Kelverion

- Nexus 1000V Integration Pack for Microsoft System Center 2012 Orchestrator

Run-books to automate network provisioning including network-segments, ip-address-pools,

- For enquiries: info@kelverion.com



What is new in v1.5.2? (Feb 2014)



What is new with v1.5.2?

R2 support, VSG with VM-attributes, multi-hypervisor licensing

- Support for Windows Server 2012 R2
- Additional PowerShell Commands
- Multi-hypervisor Licensing
- VSG/PNSC support for VM-attributes and Custom-attributes

Product Compatibility Matrix

Cisco Nexus 1000V for Hyper-V
Release 5.2 SM1 (5.2)

Cisco Virtual Security Gateway
Release 5.2(VSG2(1.1a))

Cisco Prime NSC
Release 3.2.1

What is new with v1.5.2?

New REST-APIs & PowerShell Commands

- CRUD Operations for User-creation
 - To Create/Read/Update/Delete VSM user account information
 - Get-User, New-User, Set-User, Remove-User
- Managing SPAN & ERSPAN sessions
 - To Create/Read/Update/Delete SPAN/ERSPAN session information
 - Get-Session, New-Session, Set-Session, Remove-Session
- CRUD operations for port-profiles
 - To Create/Update/Delete port-profiles
 - New-PortProfile, Set-PortProfile, Remove-PortProfile

What is new with v1.5.2?

Multi-hypervisor Licensing

Before v1.5.2

- Separate Advanced Licenses for each hypervisor version
- Licenses for one hypervisor won't work on other hypervisors

After v1.5.2

- Existing N1KV Licenses can be used for N1KV/Hyper-V
- If you already bought N1KV/Hyper-V, we will issue new universal licenses

What is new with v1.5.2?

Multi-hypervisor Licensing

Deprecatcd PIDs	New multi-hypervisor PIDs	PID Description
N1K-MLCPU-01 L-N1K-MLCPU-01	N1K-VLCPU-01 L-N1K-VLCPU-01	Nexus 1000V Advanced Edition Multi-hypervisor Paper/eDelivery CPU License Qty. 1-Pack
N1K-MLCPU-04 L-N1K-MLCPU-04	N1K-VLCPU-04 L-N1K-VLCPU-04	Nexus 1000V Advanced Edition Multi-hypervisor Paper/eDelivery CPU License Qty. 4-Pack
N1K-MLCPU-16 L-N1K-MLCPU-16	N1K-VLCPU-16 L-N1K-VLCPU-16	Nexus 1000V Advanced Edition Multi-hypervisor Paper/eDelivery CPU License Qty. 16-Pack
N1K-MLCPU-32 L-N1K-MLCPU-32	N1K-VLCPU-32 L-N1K-VLCPU-32	Nexus 1000V Advanced Edition Multi-hypervisor Paper/eDelivery CPU License Qty. 32-Pack

What is new with v1.5.2?

Cisco Virtual Security Gateway support for VM-attributes

- Policies based on VM attributes and custom-attributes
- Policy AND & OR model
- Jumbo frame support with VSG on Nexus 1110X
- vPath/VSG in Layer-3 mode

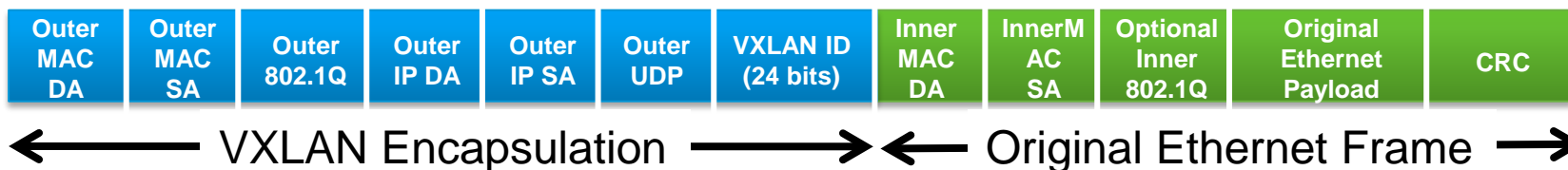
What is on the roadmap?

- Overlay Support
 - VXLAN Support
 - NVGRE Support
- IPv6 Support
 - IPv6 addressing for VMs
 - IPv6 address Pools

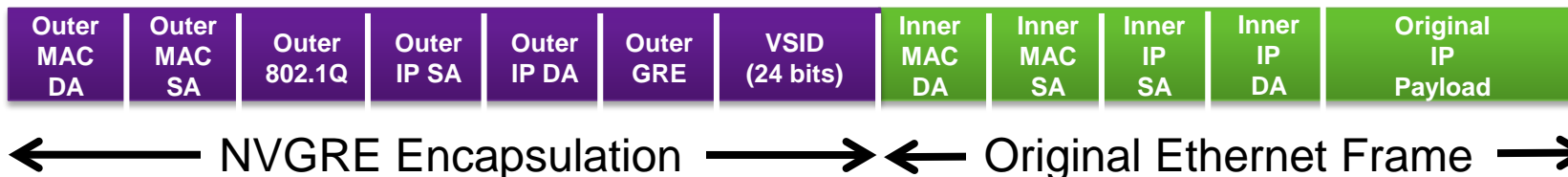
VXLAN & NVGRE

VXLAN: MAC-over-UDP overlay

Entire L2 frame encapsulated in UDP, 50 bytes of overhead



24-bit Segment ID
16 million logical L2 segments
Tunnel between the VEMs



NVGRE: MAC-over-GRE Tunnel
Entire L2 frame encapsulated in GRE

Installation & Upgrade



Cisco Nexus 1000V Installation

N1KV/Hyper-V Installation Package Contents

Description	Filename
VSM iso	Nexus-1000V.5.2.1.SM1.5.2.iso
VEM MSI package	Nexus1000V-VEM-5.2.1.SM1.5.2.0.msi
VSEM Provider MSI package	Nexus1000V-VSEMPProvider-5.2.1.SM1.5.2.0.msi
Upgrade Files	Nexus-1000V-kickstart.5.2.1.SM1.5.2.bin Nexus-1000V.5.2.1.SM1.5.2.bin
WSUS Scripts	Publish-CiscoUpdate.ps1 Remove-CiscoUpdates.ps1 Get-CiscoUpdates.ps1 Get-MSIDetails.ps1
Other Scripts	Register-Nexus1000VVSMTemplate.ps1 Install-Nexus1000V-VSMCertificate.ps1 Deploy-Nexus1000V-VSEM.ps1 Refresh-Nexus1000V-VSEM.ps1 Cleanup-Nexus1000V-VSEM.ps1

Cisco Nexus 1000V Installation

Simple 4-step deployment process



Upgrading Cisco Nexus 1000V

Simple 4-step upgrade process

Download the new
Nexus 1000V
image

- Go to <http://www.cisco.com/go/1000v/hyper-v>
- Click on the Download link

Upgrade VSM to
current release

- Important files: kickstart and system images
- VSM HA for non-disruptive upgrade
- Upgrade secondary VSM, then make it primary
- Upgrade the other VSM, and it becomes secondary

Upgrade VSEM to
current release

- Install the new VSEM Provider MSI into SCVMM
- This automatically uninstalls the old VSEM Provider
- Refresh to make sure N1KV extension uses this MSI

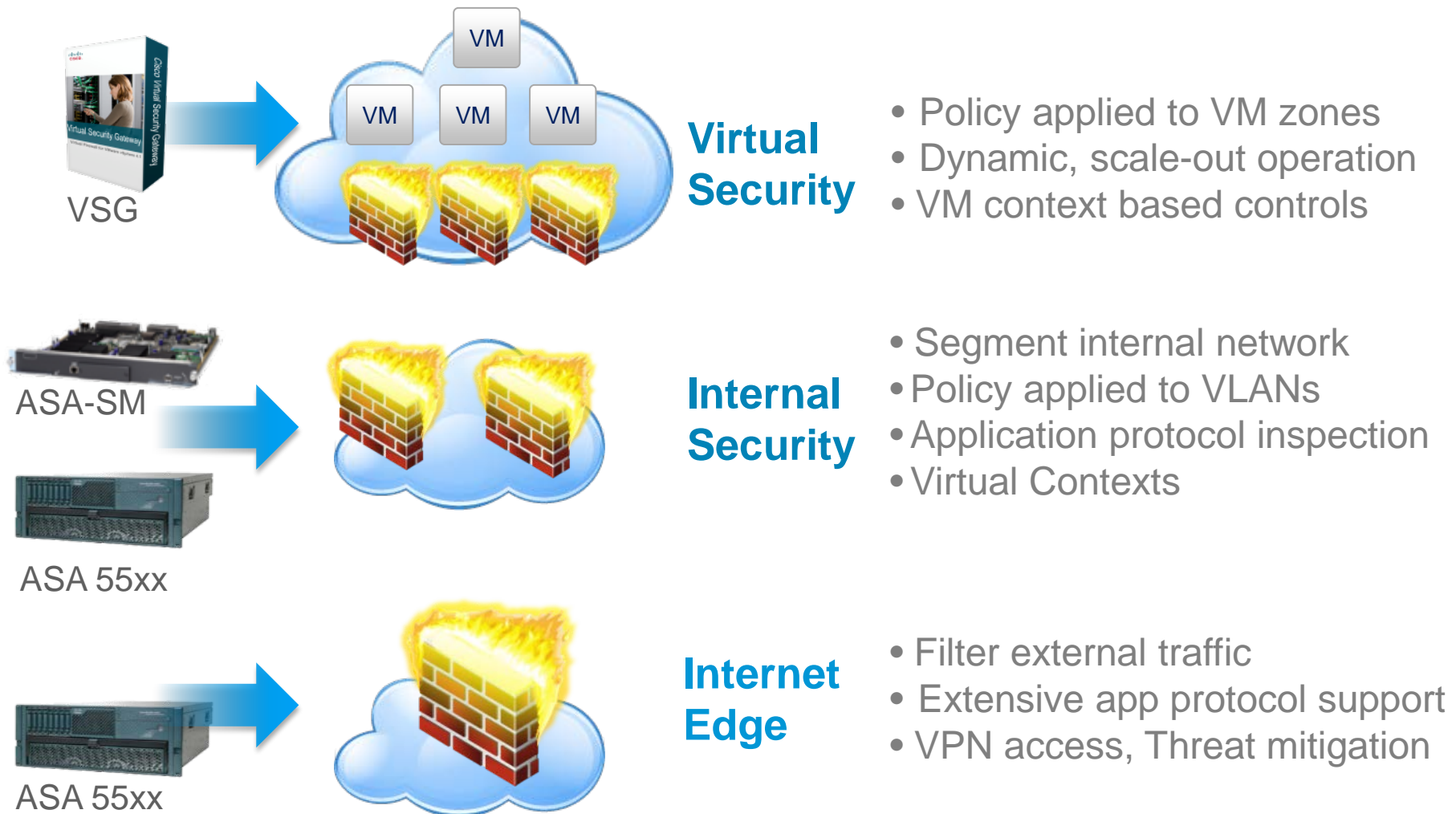
Upgrade VEM to
current release

- Prepare Windows Server Update Server (WSUS)
- Prepare Active Directory
- Configure SCVMM
- Check Compliance and perform VEM upgrade

Cisco Virtual Security Gateway (VSG)



Defense in Depth Security Model



Cisco Virtual Security Gateway

Context-based, Multi-tenant, Workload Segmentation

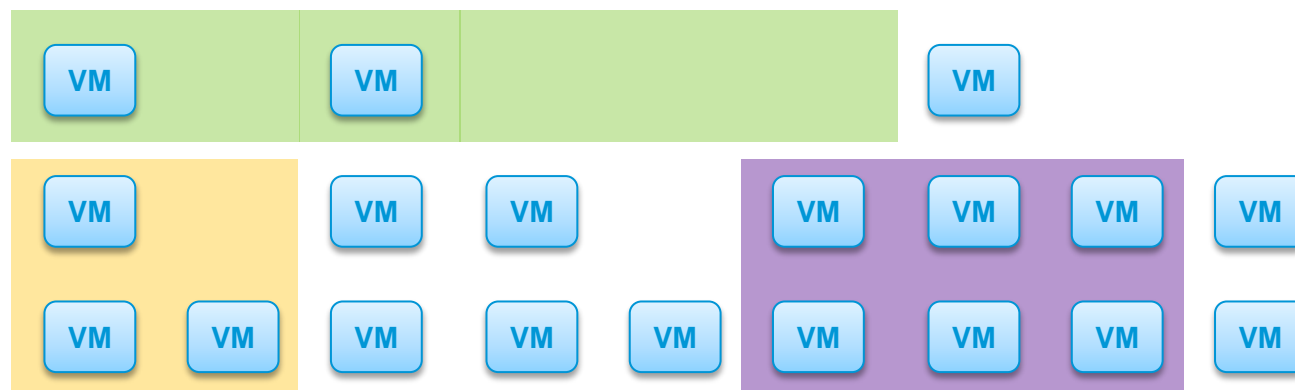
Cisco PNSC



VSG
(active)



Log/Audit



Secure Segmentation
(VLAN agnostic)

Efficient Deployment
(secure multiple hosts)

Dynamic policy-based
provisioning

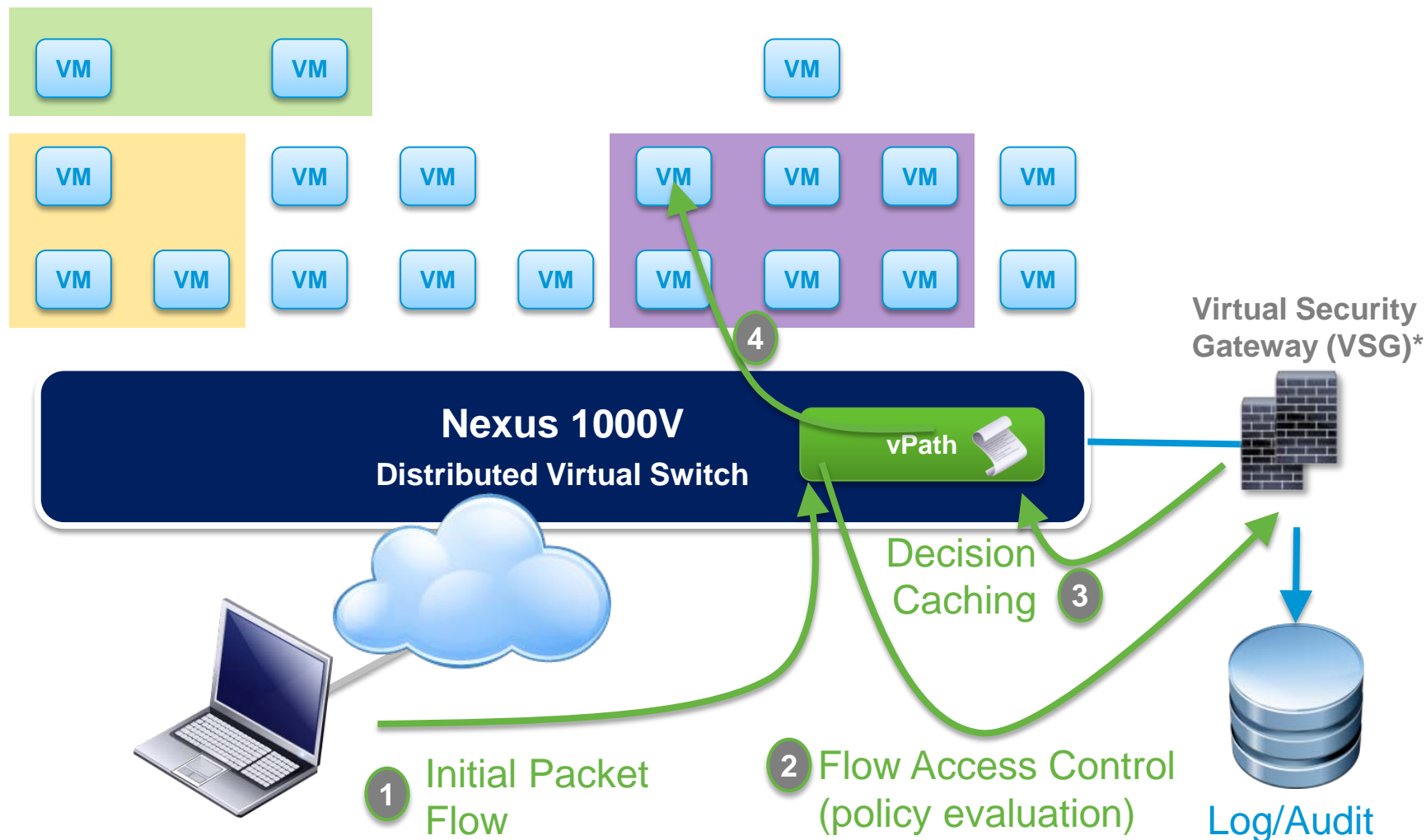
Transparent Insertion
(topology agnostic)

High Availability

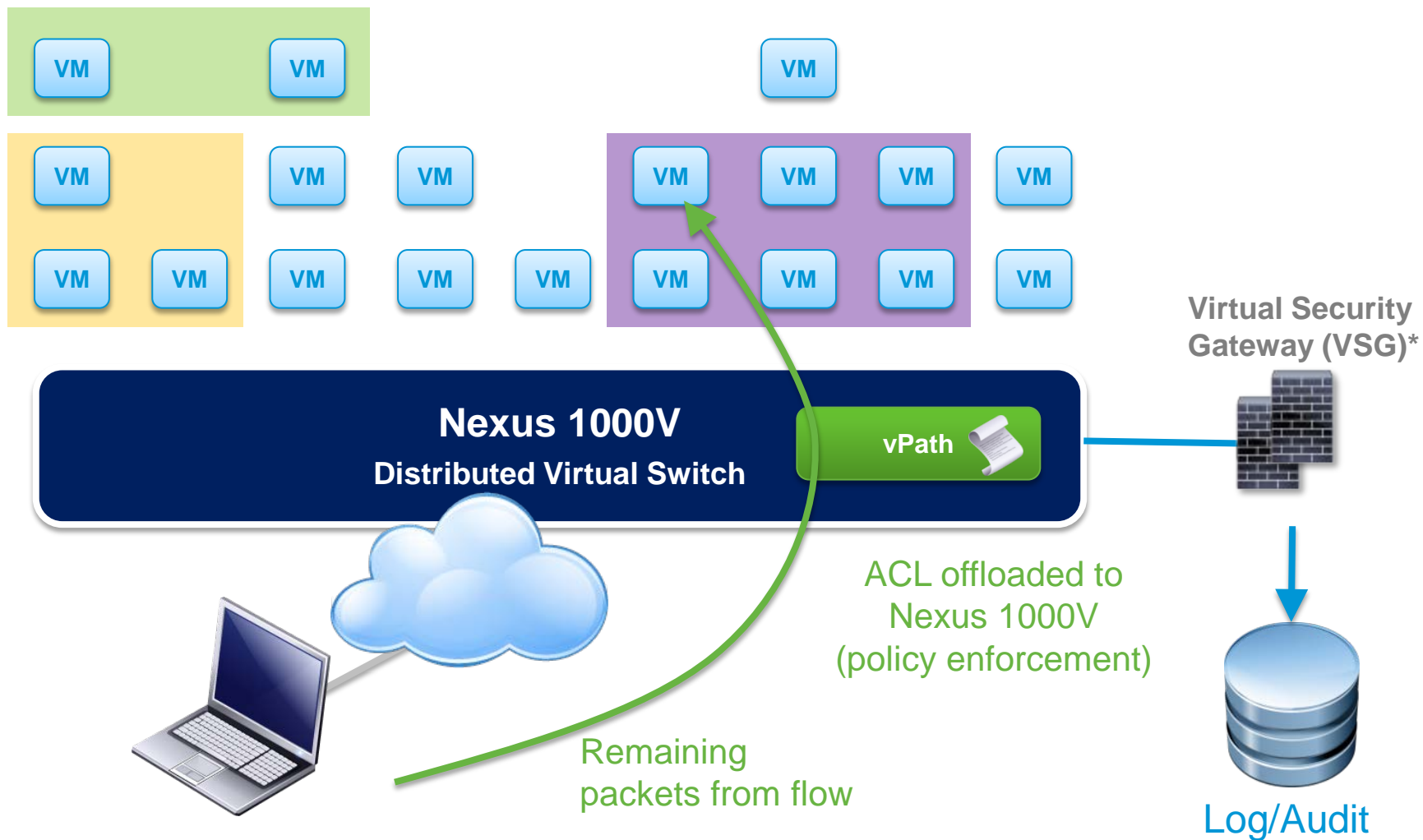
Mobility aware
(policies follow Migration)

Cisco Virtual Security Gateway

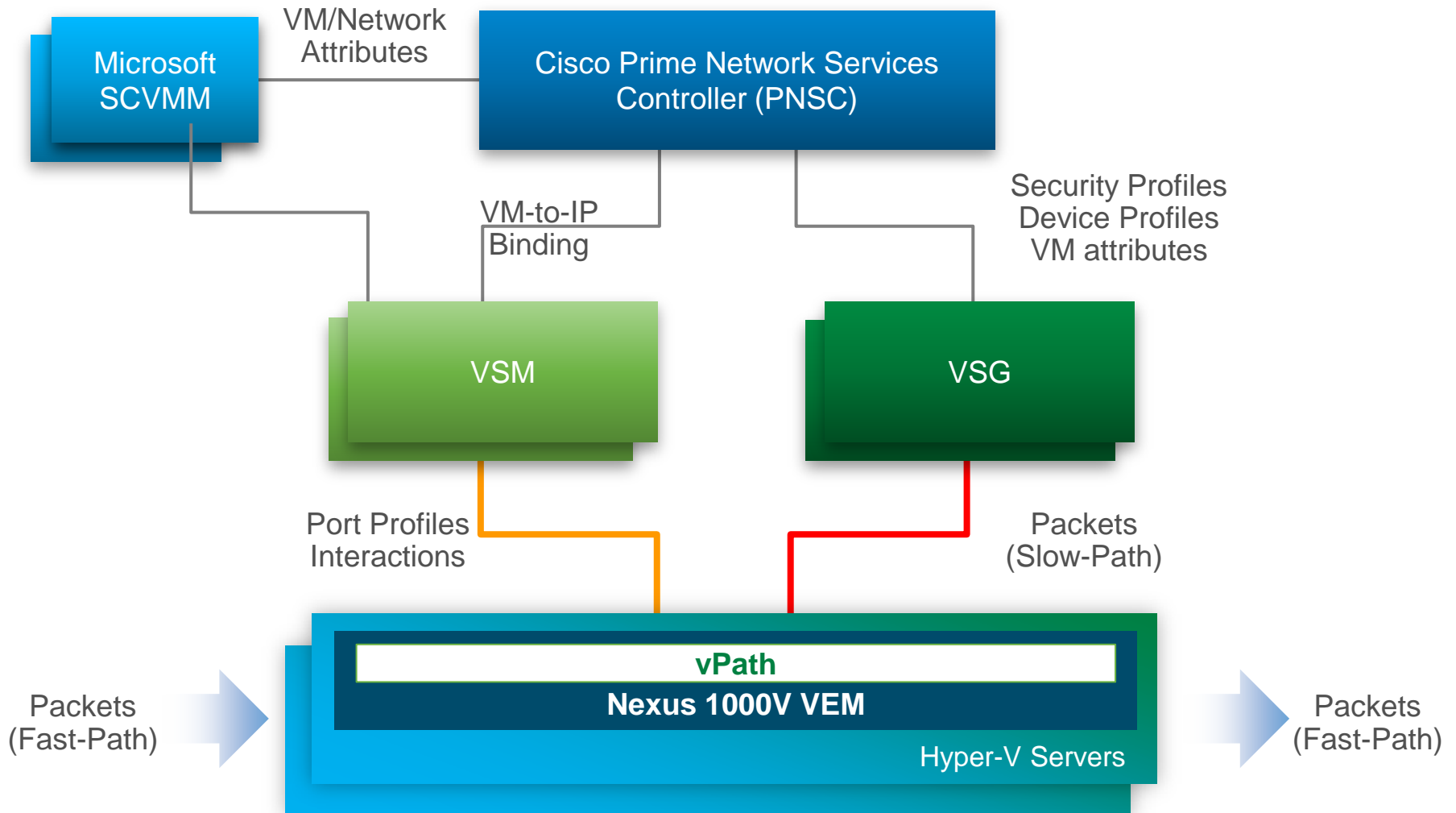
Intelligent Traffic Steering with vPath



Cisco Virtual Security Gateway Performance Acceleration with vPath

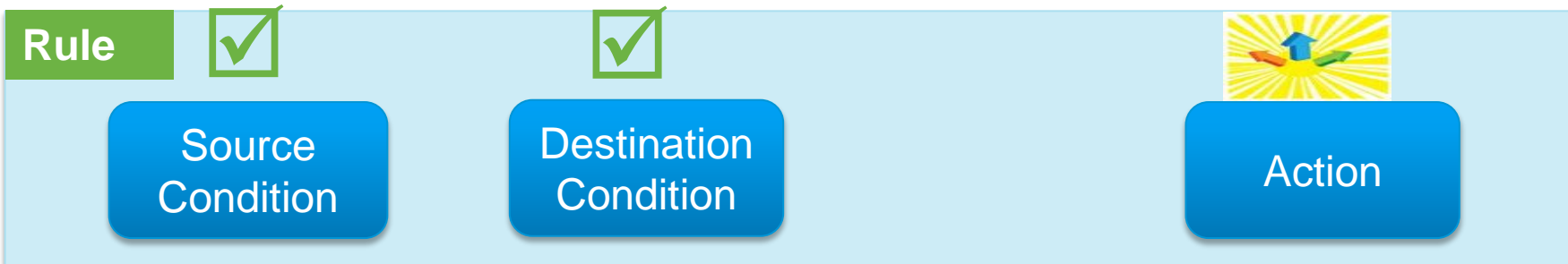


Cisco Virtual Security Gateway System Architecture



Cisco Virtual Security Gateway

Defining Security Rules



Condition

Attribute Type :

Network ▼

Expression

Attribute Name :

IP Address ▼

Operator :

eq ▼

Attribute Value : 192 . 168 . 1 . 2

Attribute Type

Network

VM

User Defined

vZone

Condition Match Criteria

Match All (And)

Match Any (Or)

☒ drop ☐ permit ☐ reset

☐ log

VM Attributes

VM Name

Guest OS name

Port Profile Name

VM DNS Name

Network Attributes

IP Address

Network Port

Operator

eq

neq

gt

lt

range

Not-in-range

Prefix

Operator

member

Not-member

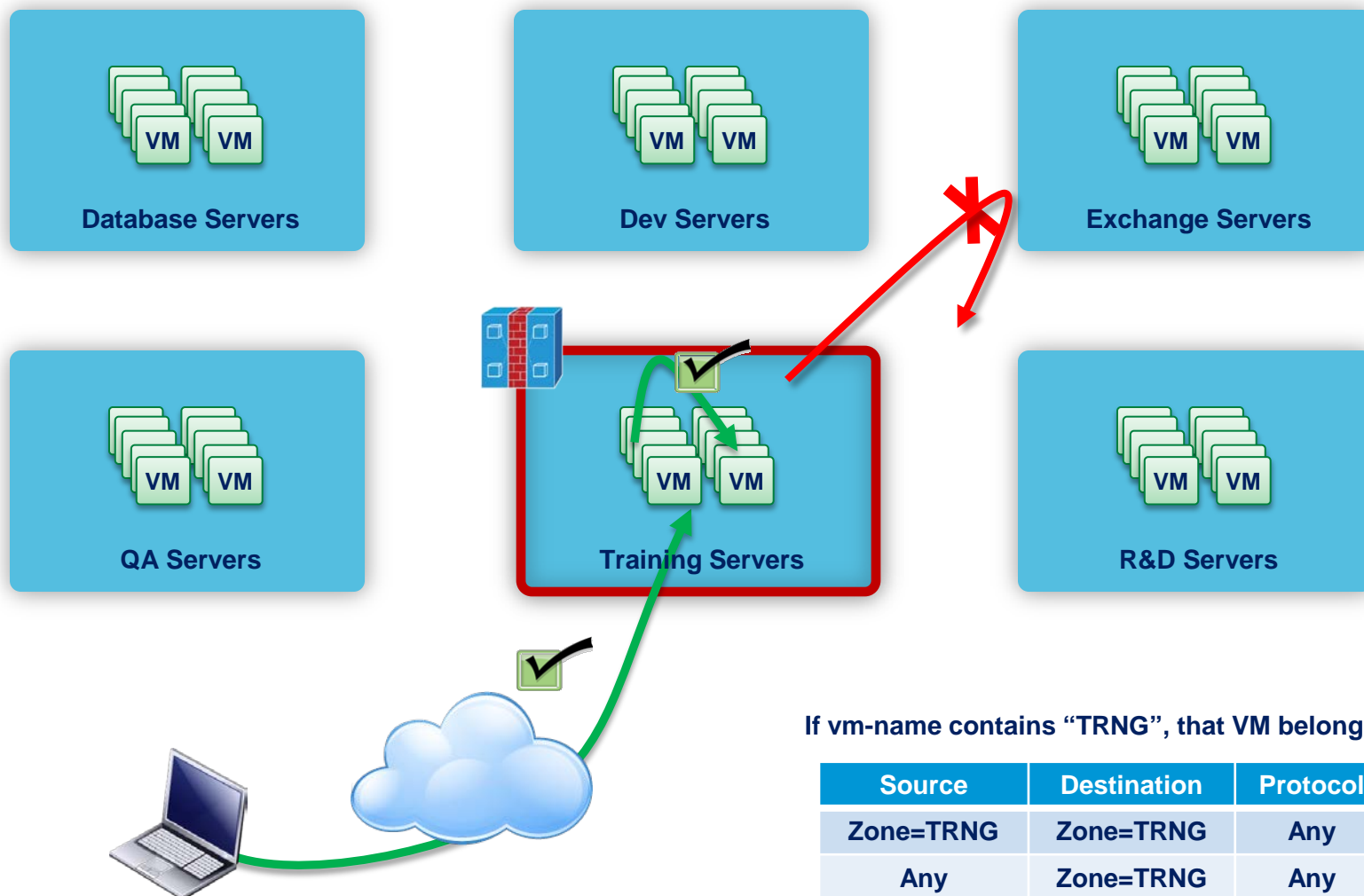
Contains

And (Global Level)

Or (Global Level)

Carecore National

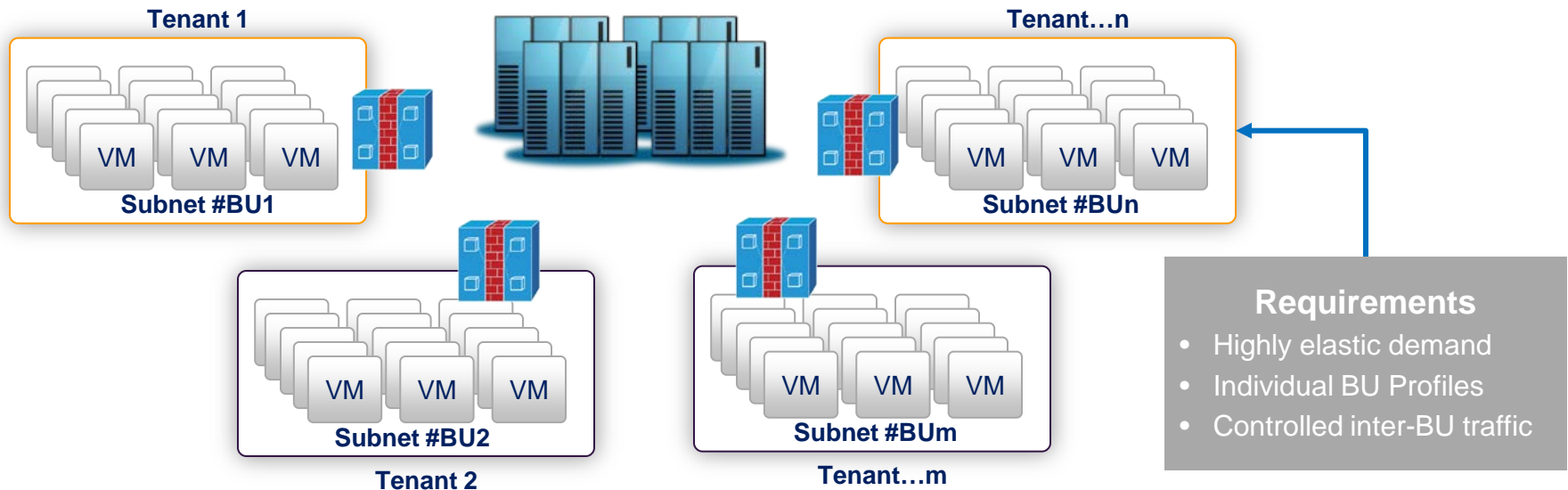
Secure zoning using VM attribute



If vm-name contains "TRNG", that VM belongs to TRNG zone

Source	Destination	Protocol	Action
Zone=TRNG	Zone=TRNG	Any	Permit
Any	Zone=TRNG	Any	Permit
Zone=TRNG	Any	Any	Drop

VSG Deployment in Private Cloud Secure Multi-tenant environment



Prior to VSG

- Under-utilization of IP-subnets
- Thousands of ACL entries
- Tenants don't have admin. control
- Centralized chg mgmt with lot of administrative over-head

With VSG

- No need for ip-subnetting/VLANs
- Simple rules with zone attributes
- Each tenant defines their policies
- Simplified change management process with reduced over-head

Cisco Nexus 1000V: Customer Benefits

Consistent Networking Features

- NX-OS feature across multiple hypervisors & across physical
- Advanced NX-OS switching features, including security, visibility, QoS, segmentation, port channel, ...

Consistent Operational Model

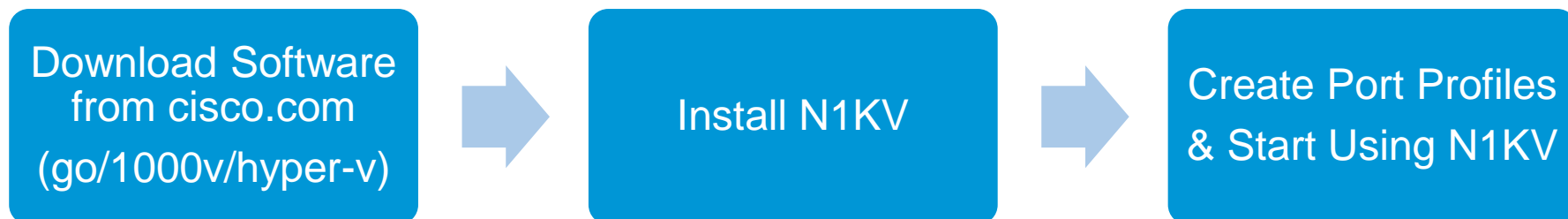
- NX-OS CLI across multiple hypervisors & across physical
- Separation of duties between network & server admins
- Dynamic provisioning and VM mobility awareness
- Leverage existing monitoring and management tools

Consistent Network Services

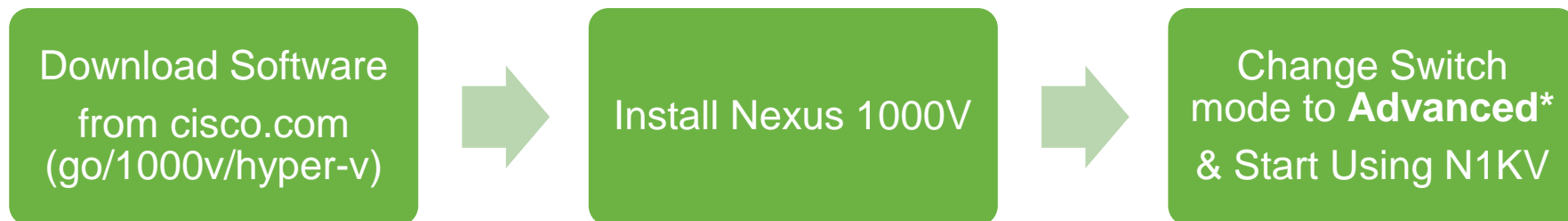
- Leverage existing virtual services
Virtual Security Gateway, Virtual WAAS, Virtual ASA, NAM on Nexus 1010
- Services can be hosted on Nexus 1010

Start using Cisco Nexus 1000V today

Essential Edition – No licensing or procurement needed



Advanced Edition – you can get a free trial for 60 days with essential download



Additional Resources

- Cisco Nexus 1000V for Microsoft Hyper-V: <http://www.cisco.com/go/1000v/hyper-v>
- Cisco Virtual Security Gateway: <http://www.cisco.com/go/vsg>
- Cisco Nexus 1000V Portfolio: <http://www.cisco.com/go/1000v>
- N1KV PowerShell: <http://developer.cisco.com/web/n1k/hyperv>
- N1KV Community Site: <http://www.cisco.com/go/1000vcommunity>
- Cisco-Microsoft Partnership: <http://www.cisco.com/go/microsoft>

Thank you.

