

What You Make Possible

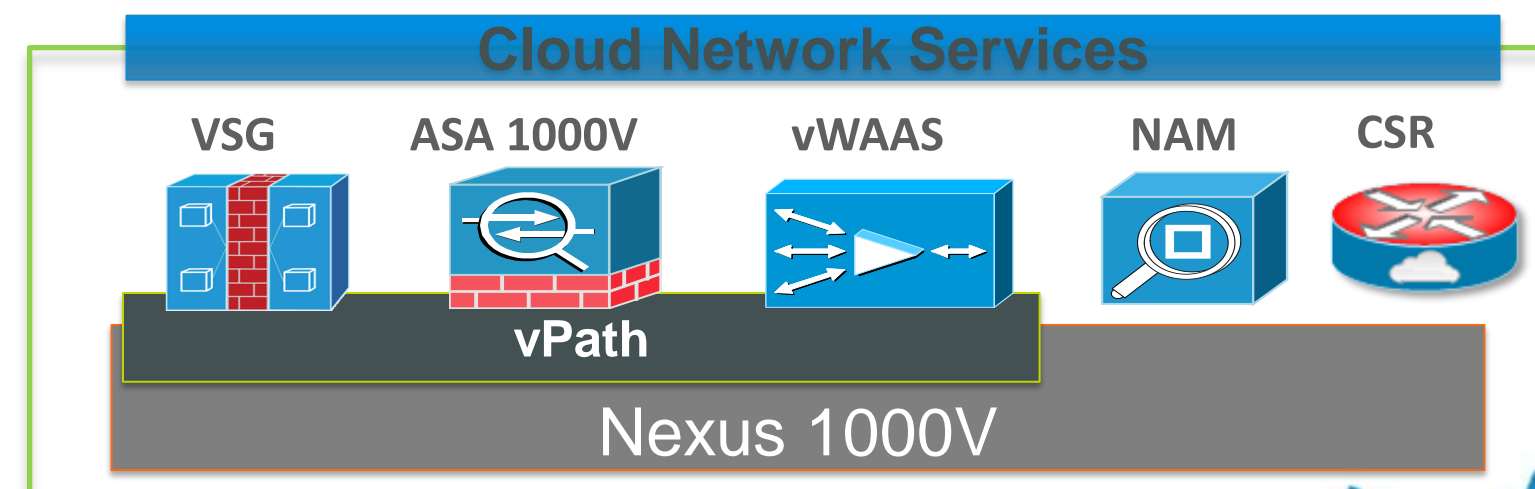
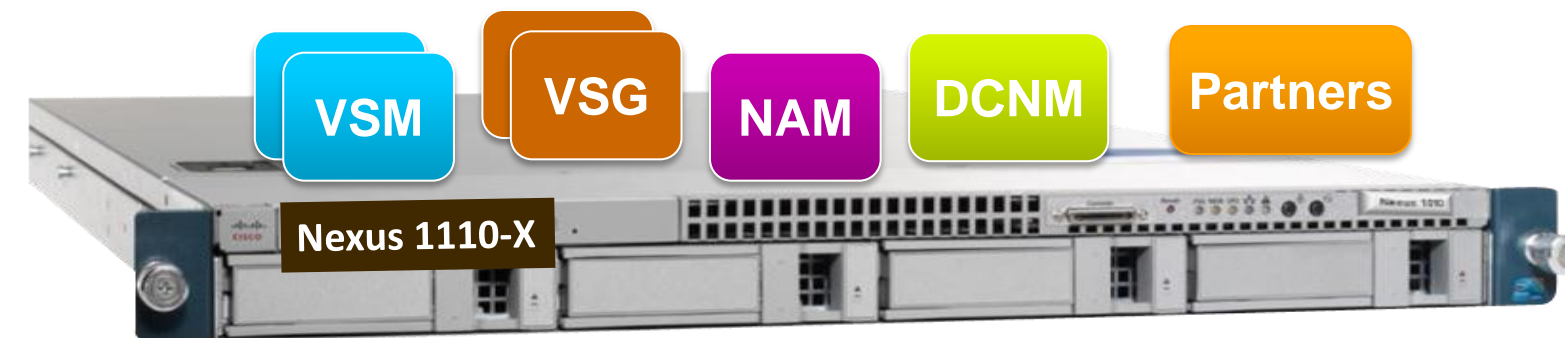
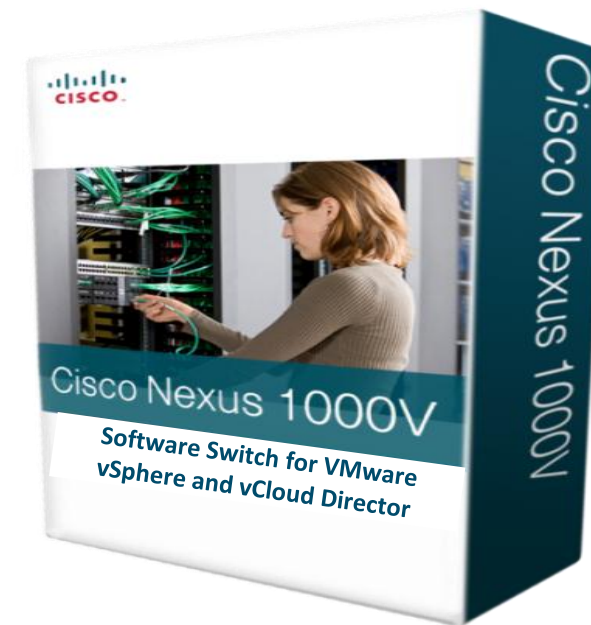


Inside the Nexus 1000V Virtual Switch

BRKVIR-2012

Agenda

- Why Cisco Nexus 1000V
- Cisco's Virtual Networking Vision
- Cisco Nexus 1000V v 2.1+
 - Now It is Free!
 - Deploying N1k
 - Best Practice Updates
 - Upgrading N1k
 - vTracker
 - Resource availability
 - vCenter Plugin
 - VXLAN
 - Virtual Services with vPath
- Nexus 1000V for Microsoft Hyper-V
- Architectural enhancements
- Nexus 1000V for KVM and OpenStack
- Q&A



Cisco live!

What Happened to the Edge?



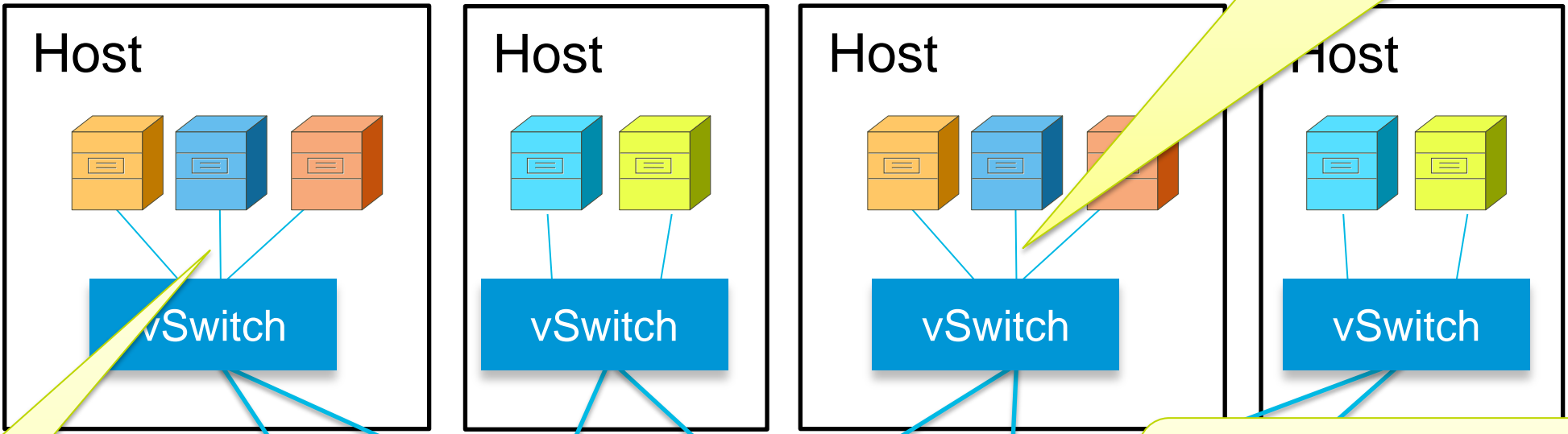
**Unstable Cliffs
Keep Clear**

Losing the Edge...

Server Admin must handle network configuration



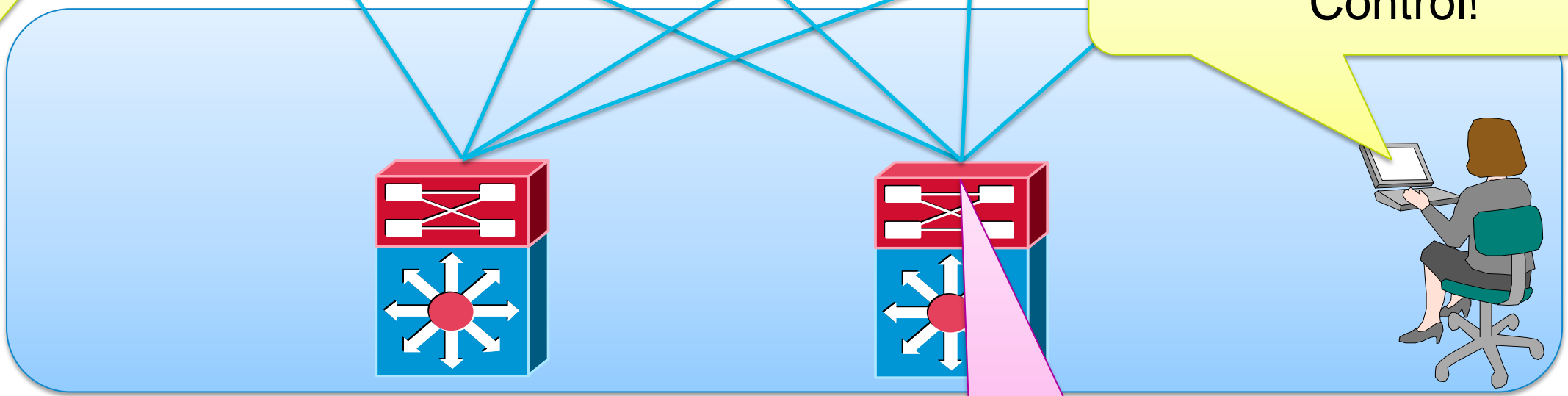
Server Admin



VMs on Wrong VLANs!

No Network Visibility or Control!

Unchaperoned VM-to-VM communication!



The rest of the network...

No Policy and VLAN control!

Network Admin



And Finding it Back!

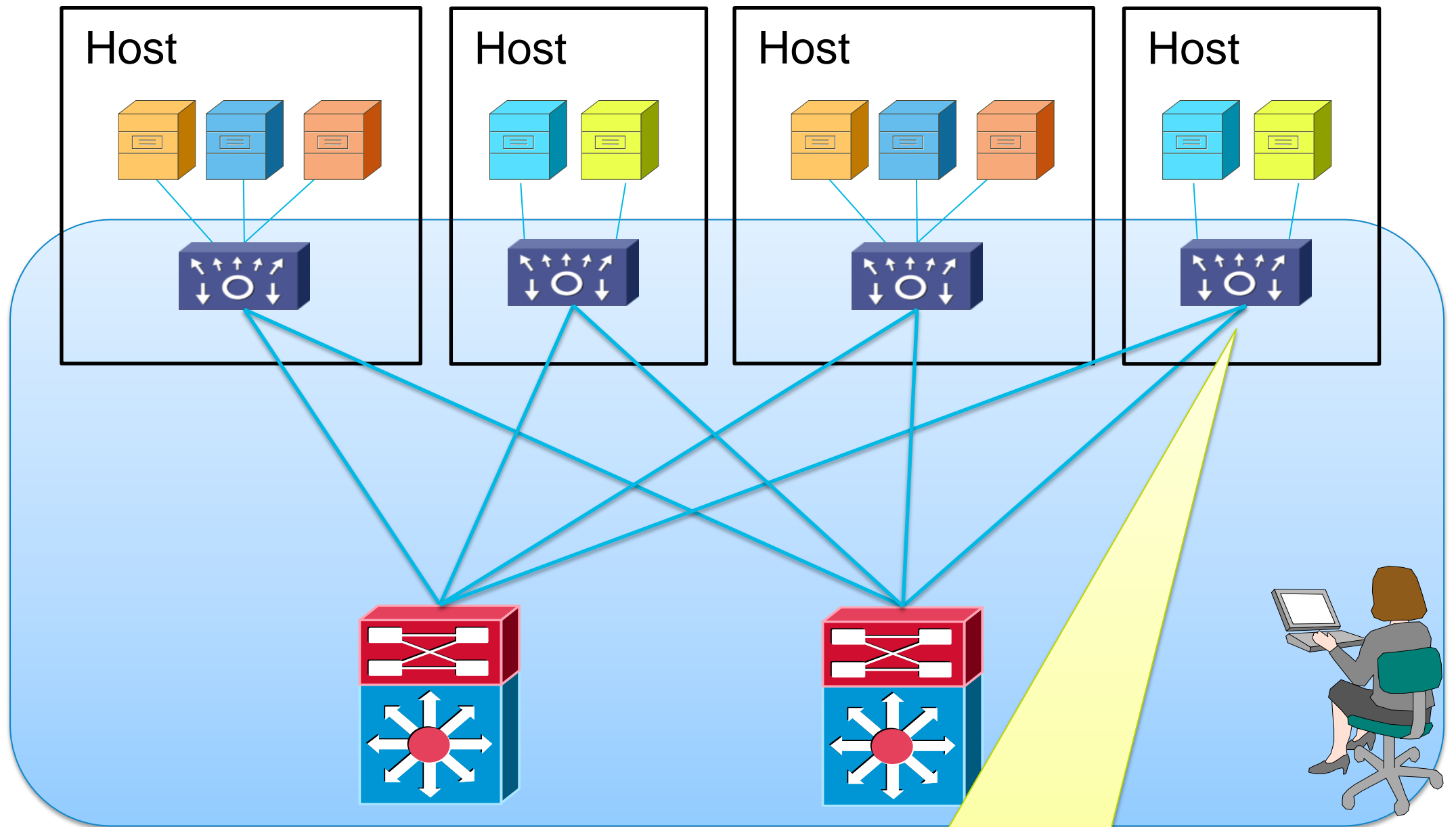
Server Admin
freed from
networking
configuration



Server
Admin

Clear Configuration
Boundaries

Transparent Monitoring
Boundaries



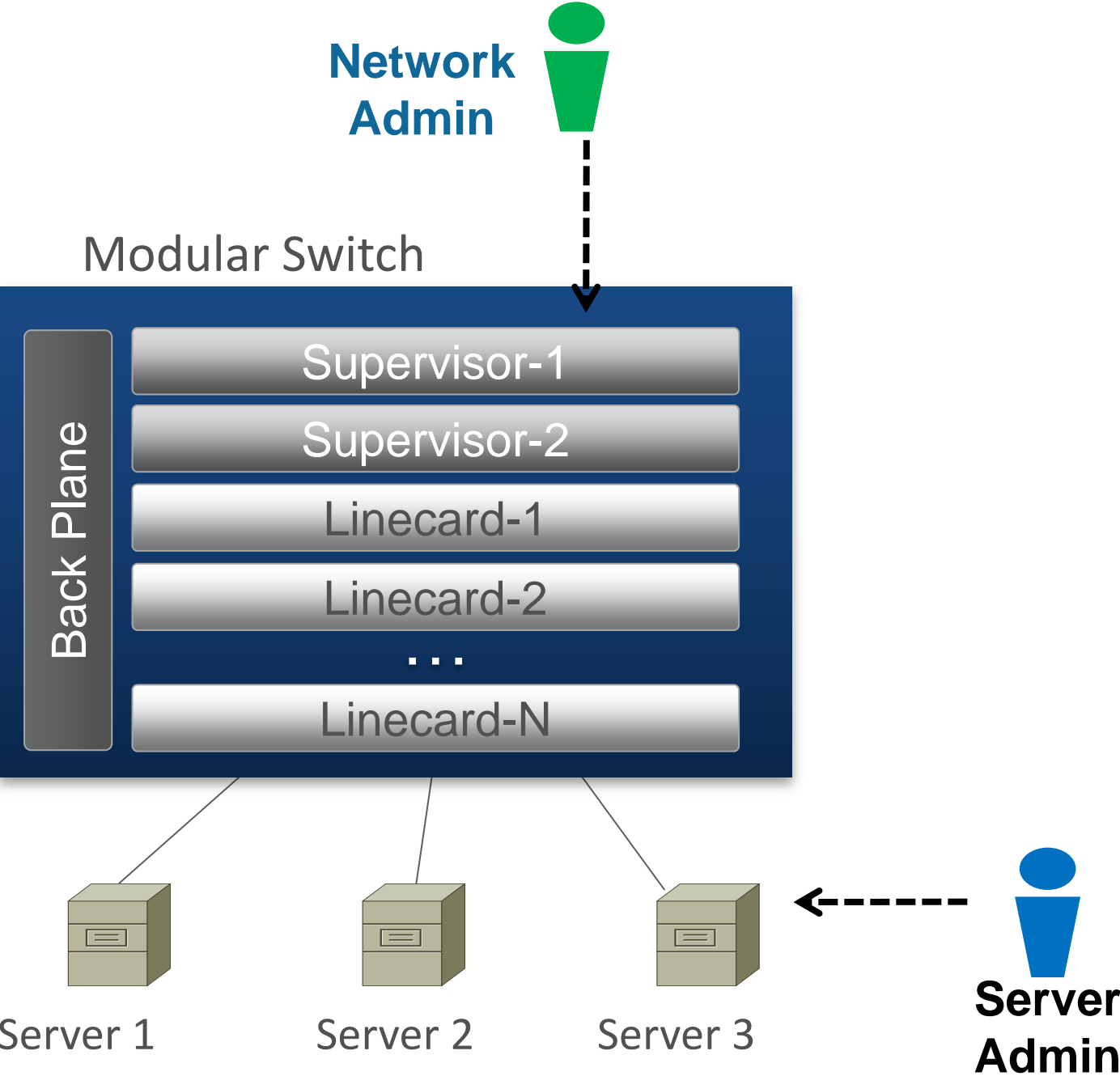
Distributed Switch managed by
Network Admin

Network
Admin

Cisco *live!*

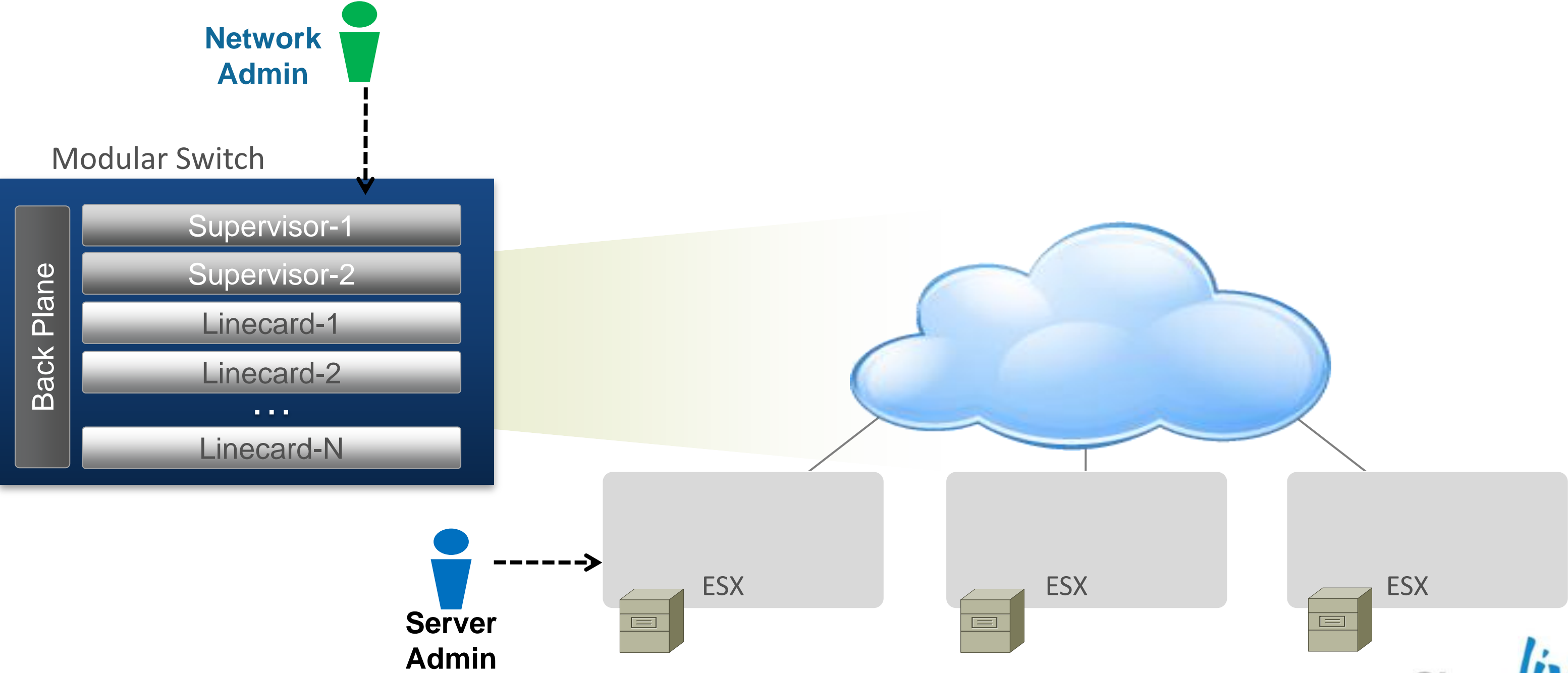
Nexus 1000V Architecture

Comparison to a Physical Switch



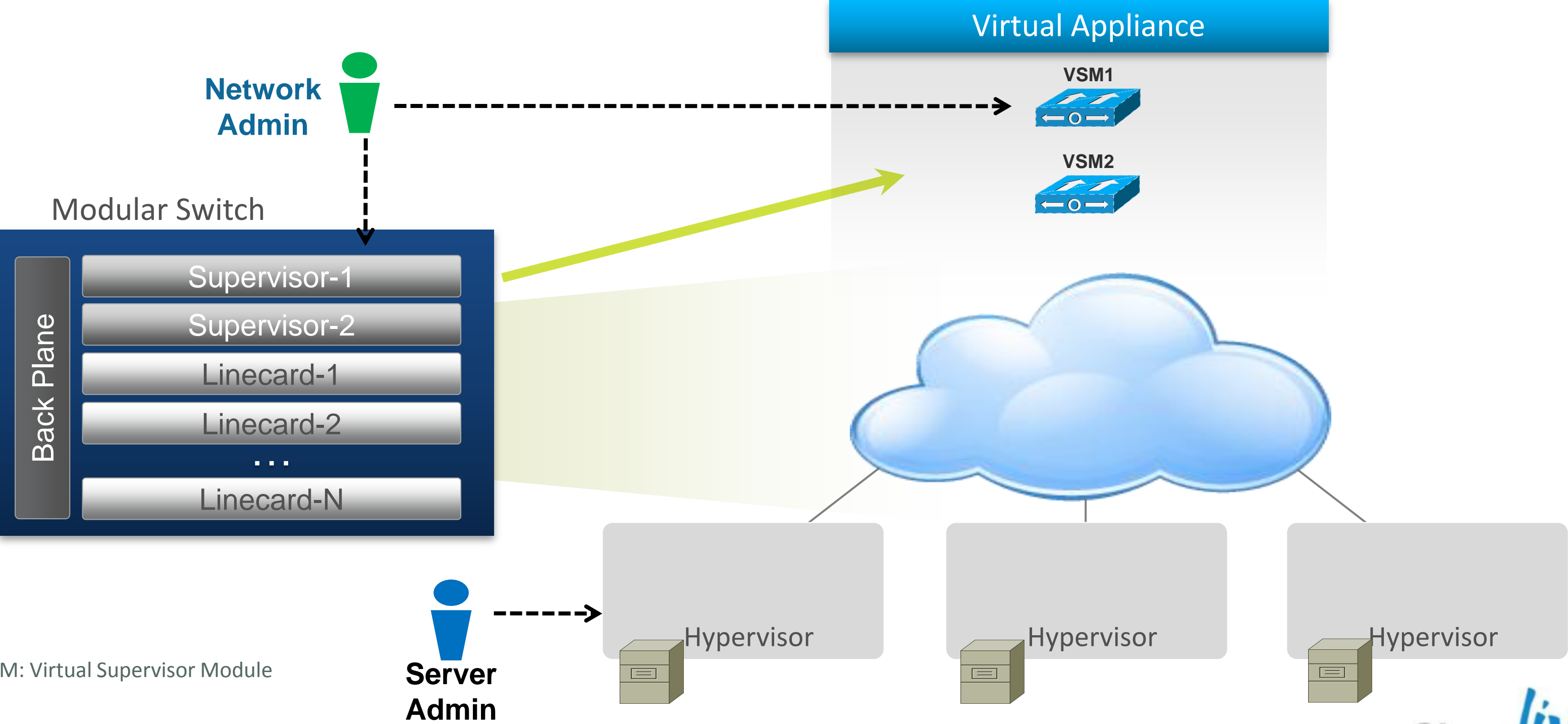
Nexus 1000V Architecture

Moving to a Virtual Environment



Nexus 1000 Architecture

Supervisors → Virtual Supervisor Modules (VSMs)

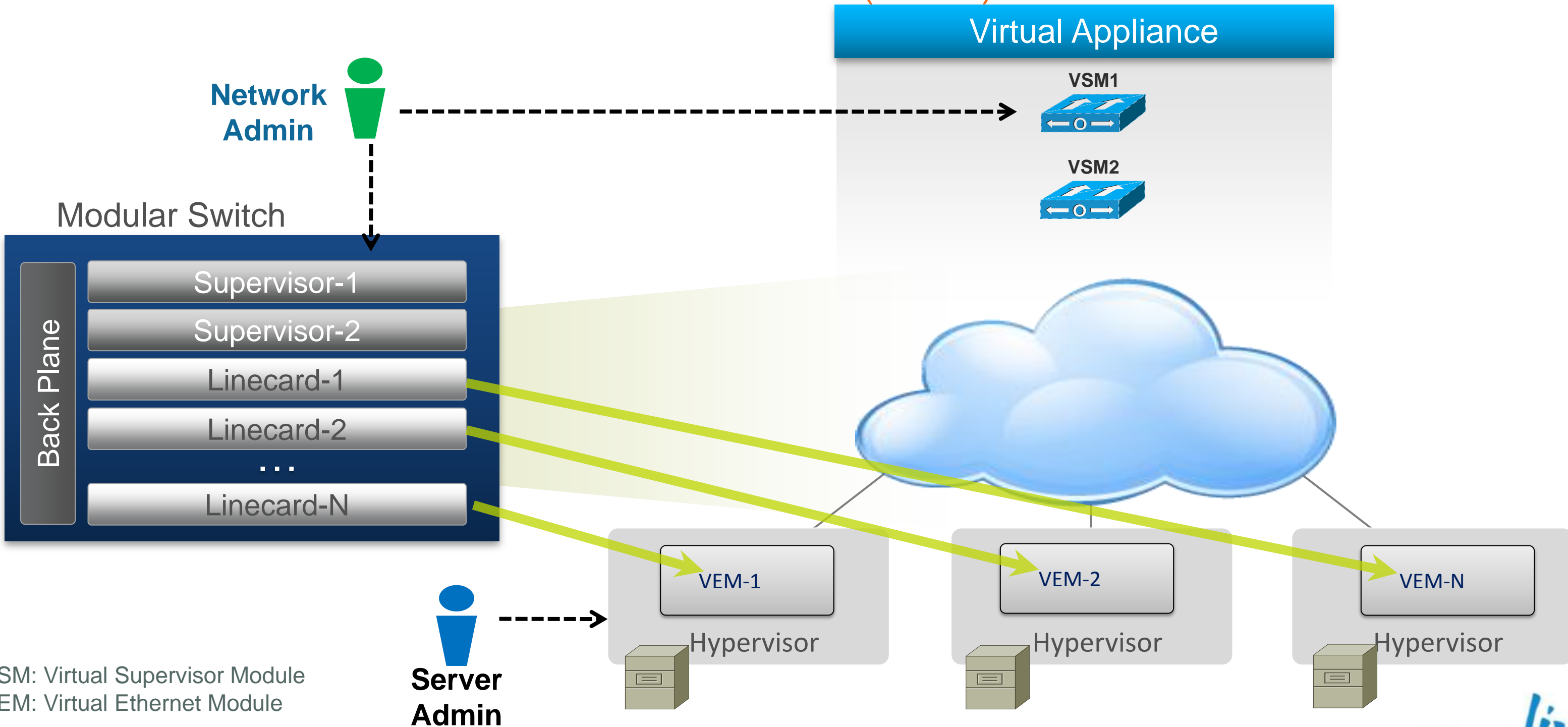


VSM: Virtual Supervisor Module



Nexus 1000 Architecture

Linecards → Virtual Ethernet Modules (VEMs)

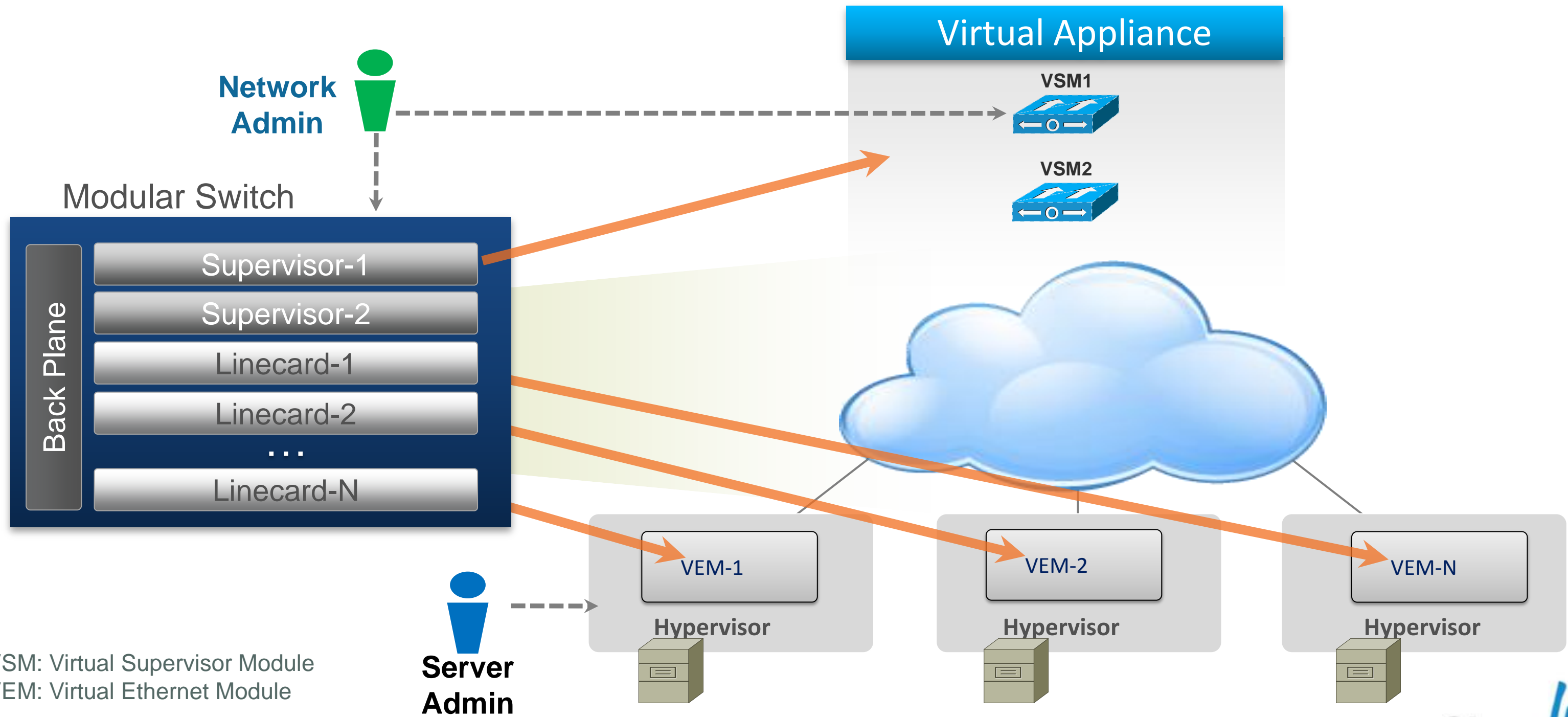


VSM: Virtual Supervisor Module
VEM: Virtual Ethernet Module



Cisco Nexus 1000V Overview

Architecture consistent with other modular switches

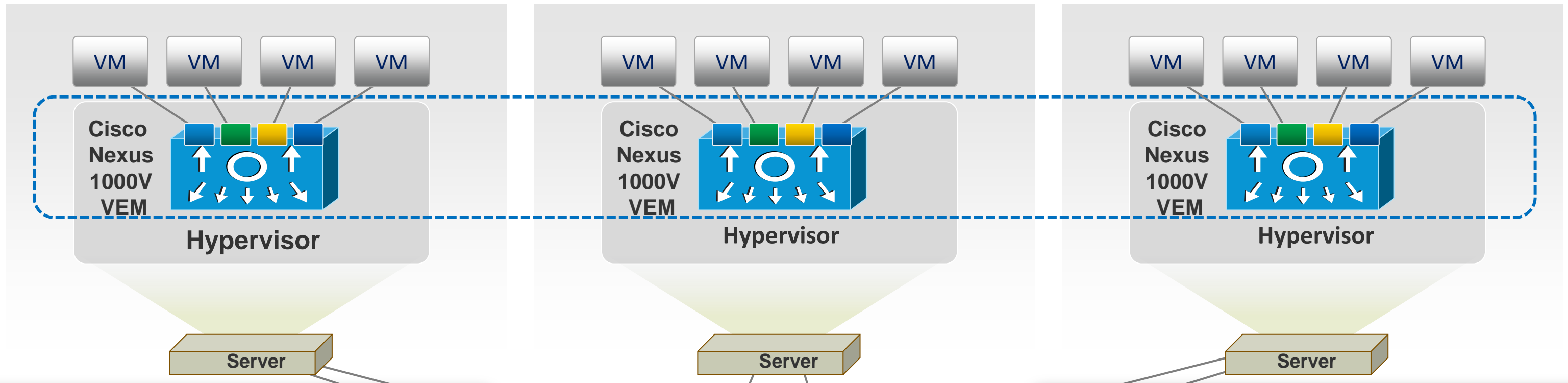


VSM: Virtual Supervisor Module
VEM: Virtual Ethernet Module



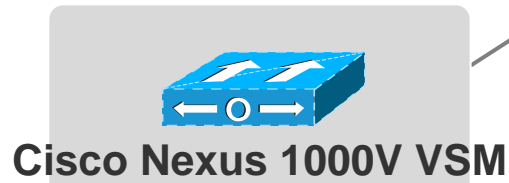
Cisco Nexus 1000V Overview

A Feature-rich Distributed Virtual Software Switch



Virtual Supervisor Module (VSM)

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



Cisco Nexus 1000V VSM

Virtual Ethernet Module (VEM)

- Enables advanced networking capability on the hypervisor
- Provides each virtual machine with dedicated "switch port"
- Collection of VEMs : 1 virtual network Distributed Switch



VM Management Station

Cisco Nexus 1000V Overview

Consistent NX-OS Featureset for Virtual Networks

Switching

- L2 Switching, 802.1Q Tagging, VLAN, Rate Limiting (TX), VXLAN
- IGMP Snooping, QoS Marking (COS & DSCP), Class-based WFQ

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), vWAAS, ASA1000V]

Provisioning

- Port Profiles, Integration with vC, vCD, SCVMM*, BMC CLM
- Optimised NIC Teaming with Virtual Port Channel – Host Mode

Visibility

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

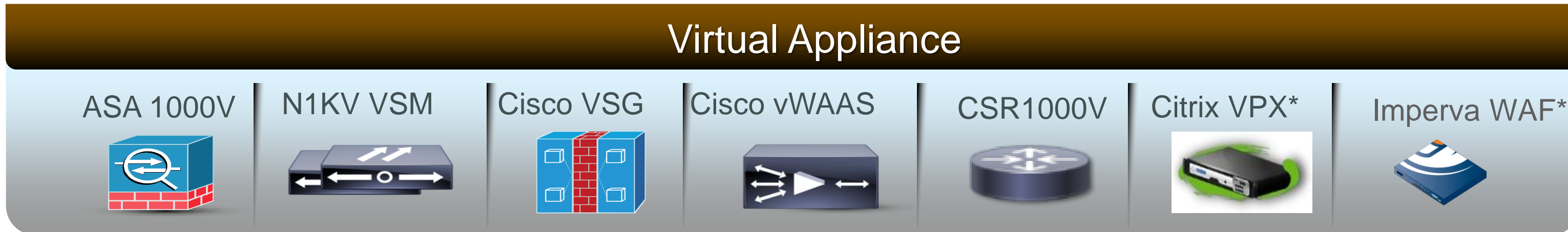
Management

- Virtual Centre VM Provisioning, vCenter Plugin, Cisco LMS, DCNM
- Cisco CLI, Radius, TACACs, Syslog, SNMP (v.1, 2, 3)
- Hitless upgrade, SW Installer

Cisco Nexus 1000V Architecture

vPath and VXLAN

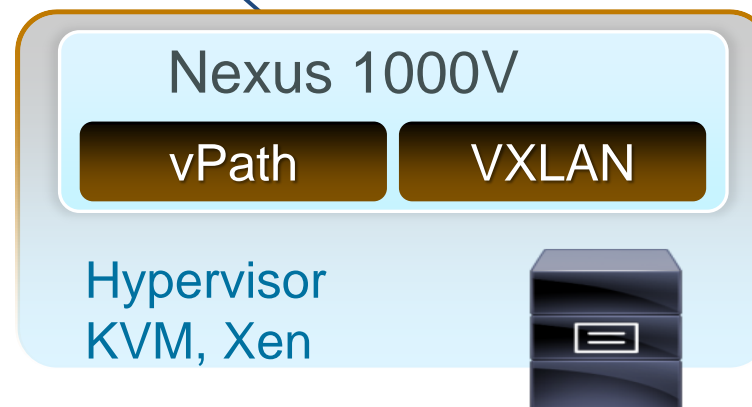
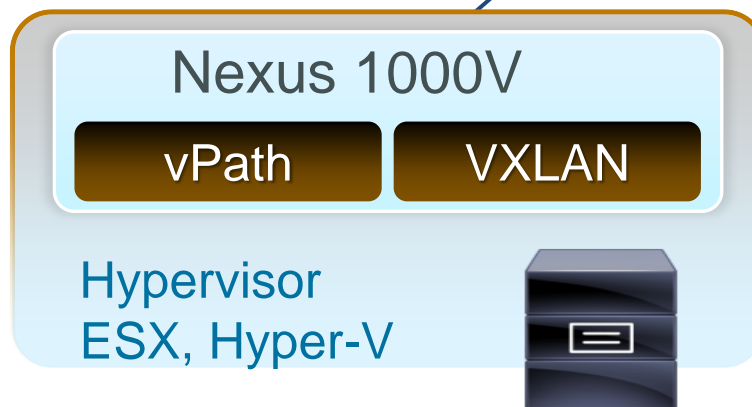
Virtual Appliance



Virtual Service Data Path (vPath)

Embedding intelligence for virtual services

- Service chaining (traffic steering)
- Fast-path offload
- VXLAN aware



Virtual Extensible LAN (VXLAN)

Scaling LAN segments
DC-wide VM Mobility

- LAN segment across Layer 3
- Works with existing network infrastructure
- 16 million segments



Cisco Virtual Networking Vision

Nexus 1000V

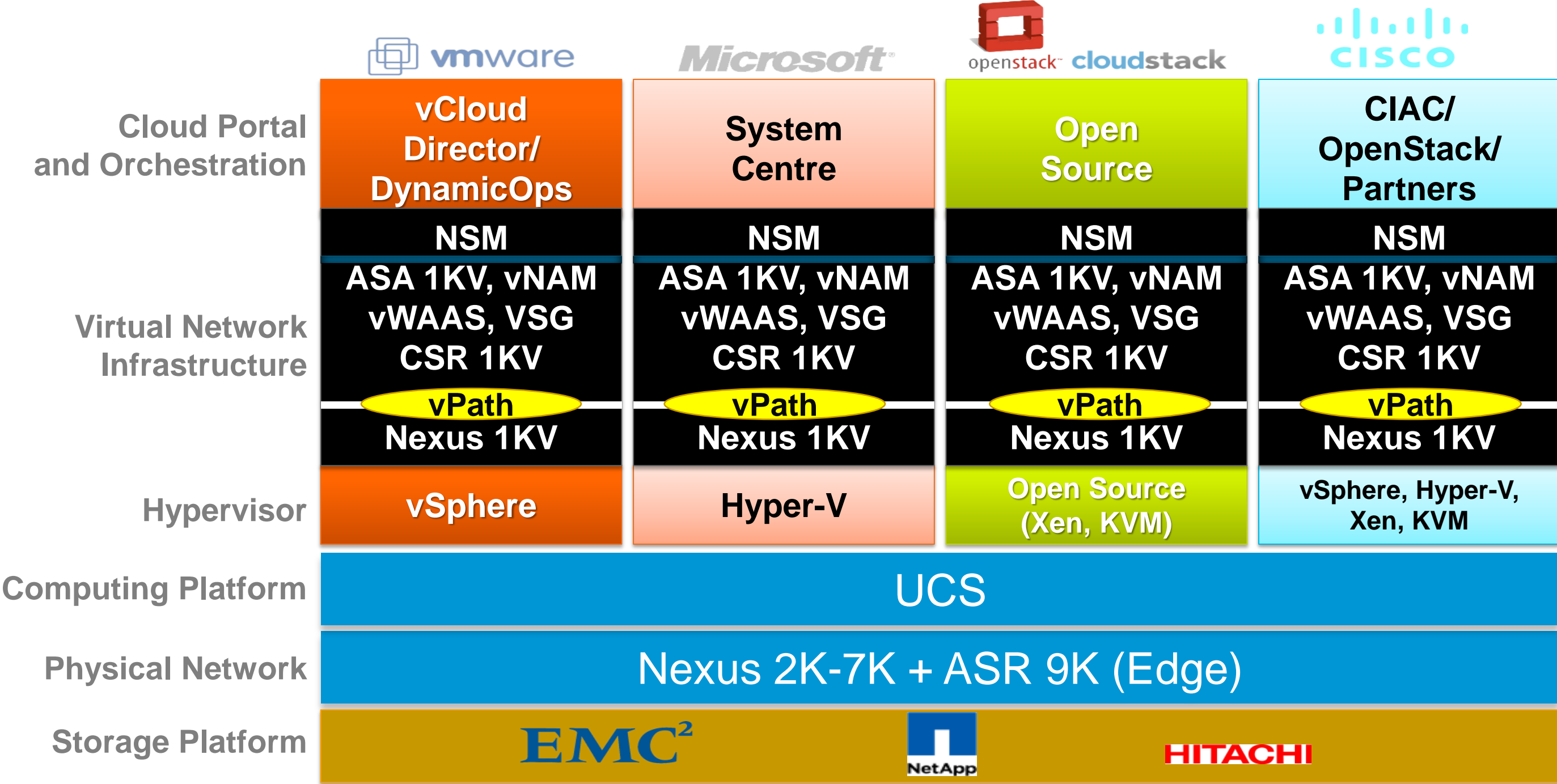
Multi-Cloud

Multi-Services

Multi-Hypervisor

Cloud Technology Stacks

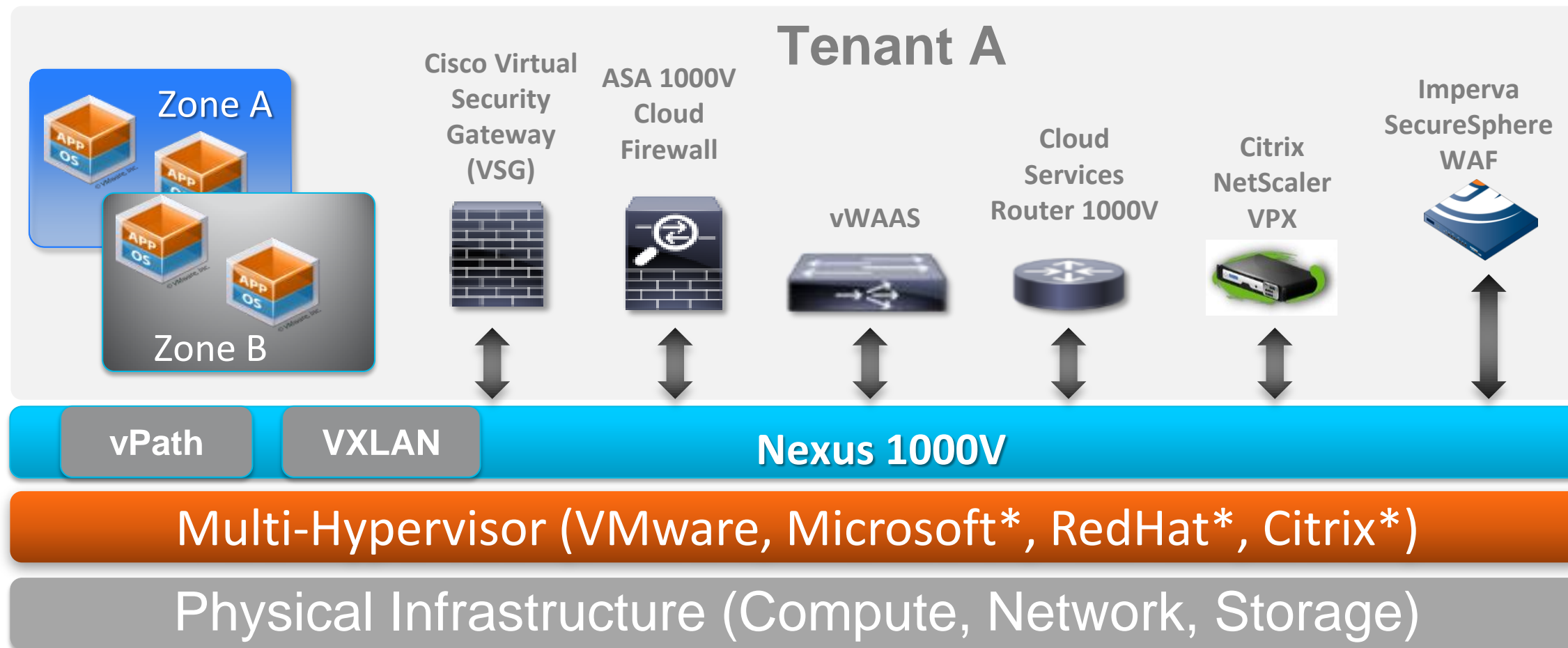
Multi-Hypervisor and Multi-Orchestration Strategy



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

Cisco Cloud Services

Hypervisor agnostic multi-service 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

Limited Availability

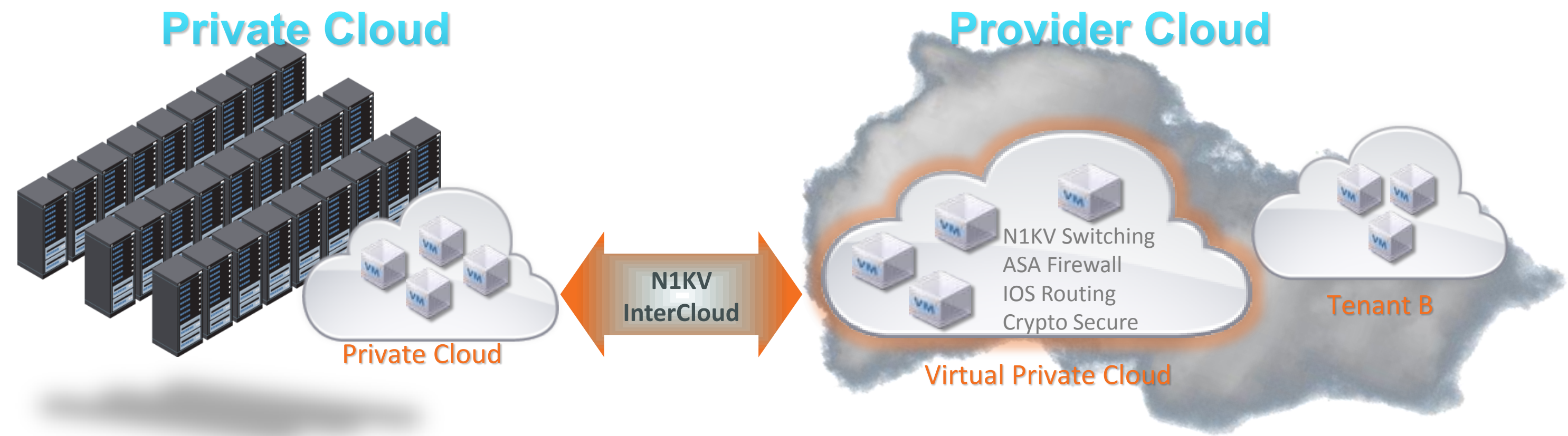
Ecosystem Services

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

CY2013



Cisco's Vision for Hybrid Cloud



Secure Hybrid Cloud = Securely Extend Private Cloud into Provider Cloud

Use Cases

- Bursting
- Disaster recovery/avoidance
- Upgrade/migration

Workloads

- Dev/QA
- Intern/Partner VDI
- Training Apps
- Initially low-value workloads

Requirements

- Network consistency
- Security consistency
- Policy consistency

Nexus 1000V is Free!



Now Cisco Nexus 1000V is Free

Flexible pricing model to meet customer needs

No-Cost Version

Nexus 1000V Essential Edition

The world's most advanced virtual switch

- Full Layer-2 Feature Set
- Security, QoS Policies
- VXLAN virtual overlays
- Full monitoring and management capabilities
- vPath enabled Virtual Services

\$695 per CPU MSRP

Nexus 1000V Advanced Edition

Adds Cisco value-add features for DC and Cloud

- All Features of Essential Edition
- VSG firewall bundled (previously sold separately)
- Support for Cisco TrustSec SGA
- Platform for other Cisco DC Extensions in the Future

Start using the **FREE** Essential Edition today.

Download from <http://cisco.com/go/1000v>



Cisco Nexus 1000V Overview

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		✓

Cisco Nexus 1000V Essential Edition

It is free – start using it today

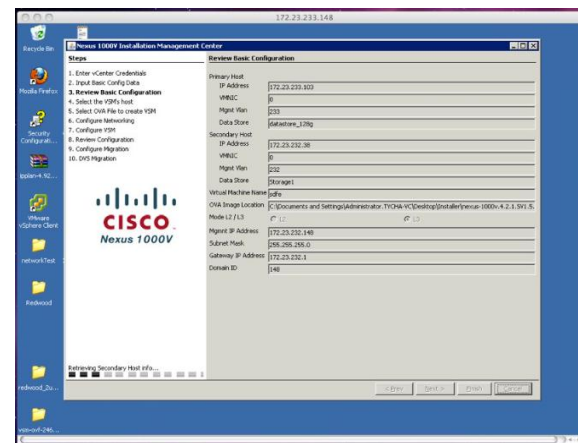
1

Download Software
v2.1 from cisco.com*



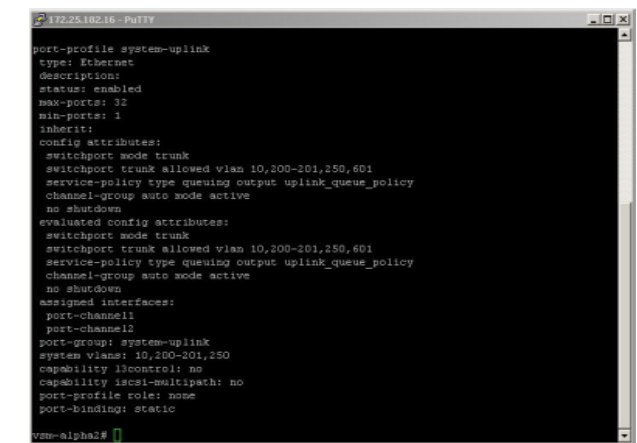
2

Install Nexus 1000V
Using new Installer App**



3

Create Port Profiles
& Start Using N1KV



Note: *CCO login required

** By default, the switch will be in Essential edition after installation

Cisco Nexus 1000V Essential Edition

It is free – start using it today

1

Download Software
v2.1 from cisco.com*

2

Install Nexus 1000V
Using new Installer App**

3

Create Port Profiles
& Start Using N1KV

No License or procurement necessary to use Essential Edition.
Yes, Enabling Nexus 1000V is that easy in the Virtual DC!

Duration: Forever (no expiration)
License Activation: No

Cisco Nexus 1000V Advanced Edition

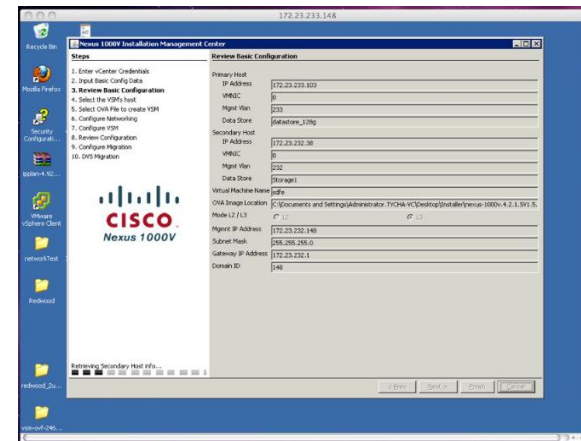
1

Download Software
v2.1 from cisco.com



2

Install Nexus 1000V
Using new Installer App



3

Change Switch mode to
Advanced*
& Start Using N1KV

Command:
“svs switch edition advanced”

Note: * Ensure Nexus 1000V licenses are installed prior to enabling Advanced edition

Cisco Nexus 1000V Advanced Edition

1

Download Software
v2.1 from cisco.com

2

Install Nexus 1000V
Using new Installer App

3

Change Switch mode to
Advanced*
& Start Using N1KV

Enabling Advanced Edition is as simple as running a command!

Duration: 60 days trial license
License Activation: Yes

Existing customers

Free upgrade to Advanced Edition

N1KV Release 1.X

N1KV Release 2.1

N1KV licenses bought and deployed



Free upgrade to Release 2.1 Advanced

N1KV – Advanced Edition:
No Cost use existing licenses

Seamless upgrade for Existing Customers to the Nexus 1000V Advanced Edition

Deploying Nexus 1000V



Installer Application



Config file feature (Screenshots)

Nexus 1000V Installation Management Center

Steps

1. Prerequisites
2. vCenter Server Credentials
- 3. Basic Configuration Data**
4. Basic Configuration Review
5. Confirmation
6. Hosts Selection
7. Host Review

Basic Configuration Data

Import Configuration

Host 1

IP Address / Name Browse

Data Store Browse

Host 2

IP Address / Name Browse

Data Store Browse

Virtual Machine Name

OVA Image Location Browse

Layer 2 / Layer 3 Connectivity Layer L2 Layer L3

VSM IP Address

Subnet Mask

Gateway IP Address

Domain ID

Management VLAN

Migrate Host(s) to DVS Yes No

Save Configuration

Enter a valid primary host IP address.

< Prev Next > Finish Cancel

Installation Steps (Screenshots)

The screenshot displays the 'Nexus 1000V Installation Management Center' window. On the left, a 'Steps' list shows the current step as '4. Basic Configuration Review'. Below the list is the Cisco Nexus 1000V logo. At the bottom left, there is a progress bar for 'Install VEMs using VEM installer...' which is currently empty. The main area shows a 'Basic Configuration Review' section with a list of tasks, each preceded by a green checkmark, indicating they are completed. The tasks include: Configuring Properties, Configuring Network (with sub-tasks for Control VLAN and Management VLAN), Setting Properties, Checking VSM Status (with sub-tasks for Configuring Virtual Device Specification, Configuring Property Specification, and Powering On VSM), Establishing SSH Connection (with sub-tasks for Registering Extension with vCenter and Creating SVS Connection), Cleaning Up the Installation (with sub-tasks for Removing OVF Properties and Deleting Temporary Files), Validating Install, and Installation Completed. Below the completed tasks, there are several uncompleted tasks: 'Add Host to Nexus 1000V DVS', 'Creating Port Profiles', 'Migrate Eligible Adapters', and 'Migration Completed'. At the bottom right, there are navigation buttons: '< Prev', 'Next >', 'Finish', and 'Cancel'.

Steps

1. Prerequisites
2. vCenter Server Credentials
3. Basic Configuration Data
- 4. Basic Configuration Review**
5. Confirmation
6. Hosts Selection
7. Host Review

CISCO
Nexus 1000V

Install VEMs using VEM installer...

Basic Configuration Review

Installation Progress:

- ✓ Configuring Properties
- ✓ Configuring Network
 - ✓ Control VLAN
 - ✓ Management VLAN
- ✓ Setting Properties
- ✓ Checking VSM Status
 - ✓ Configuring Virtual Device Specification
 - ✓ Configuring Property Specification
 - ✓ Powering On VSM
- ✓ Establishing SSH Connection (this might take a few minutes)
 - ✓ Registering Extension with vCenter
 - ✓ Creating SVS Connection
- ✓ Cleaning Up the Installation
 - ✓ Removing OVF Properties
 - ✓ Deleting Temporary Files
- ✓ Validating Install
- ✓ Installation Completed

Add Host to Nexus 1000V DVS
Creating Port Profiles
Migrate Eligible Adapters
Migration Completed

< Prev Next > Finish Cancel

Add Sdditional Host (Screenshots)

The screenshot shows the 'Confirmation' step of the Nexus 1000V installation process. On the left, a 'Steps' sidebar lists seven steps, with '5. Confirmation' highlighted. The main area contains a 'Confirmation' section with the question 'Do you want to add more modules?'. There are two radio button options: 'Yes' (selected) and 'No'. Below this, there are two more radio button options: 'Install VIB' and 'Install VIB and add module to Nexus 1000V' (selected). A 'Management VLAN:' label is followed by an empty text input field. At the bottom of the main area, there is a blue error message: 'Enter a valid management VLAN.'. The bottom of the window features four navigation buttons: '< Prev', 'Next >', 'Finish', and 'Cancel'. The Cisco logo and 'Nexus 1000V' text are visible in the lower-left corner of the window.

Nexus 1000V Installation Management Center

Steps

1. Prerequisites
2. vCenter Server Credentials
3. Basic Configuration Data
4. Basic Configuration Review
- 5. Confirmation**
6. Hosts Selection
7. Host Review

Confirmation

Do you want to add more modules?

Yes No

Install VIB Install VIB and add module to Nexus 1000V

Management VLAN:

Enter a valid management VLAN.

< Prev Next > Finish Cancel

CISCO
Nexus 1000V

Sources for VEM Images

- Terminology :
 - Online VIBs – used by VMware Update Manager (VUM)
 - Offline VIBs – used by N1k installer and for manual installs
- Cisco.com – N1k download page – All offline VEMs for a VSM, posted on release date
- VSM portal – Both offline and online VIBs for compatible vSphere versions released before N1k
- VMware online portal – used by VUM – All online VIBs

vSphere and N1k Compability

- N1k will support 2 to 3 vSphere versions
- N1k is binary compatible with vSphere – will automatically support all patches and updates on a vSphere version !
- Refer to compatibility information in the release notes

VEM Installation

- Installer Application – uses vCenter API to install VEM on the host
 - Caveats :
- VUM – Automatically installs VEM when host is added to N1k DVS
 - Caveats :
- Manual install – more control over installs, needs scripting to scale

Deploying Large Numbers of Hosts

No Network Admin Actions Required!

- VUM for VEM installation
- Set up a host
 - Complete with port profiles!
- Create a host profile
- Add hosts using host profile
- Nexus 1000V is Added!

Profile Name: UCS Profile

Profile/Policy

- UCS Profile
 - Memory reservation configuration
 - Storage configuration
 - Networking configuration
 - vSwitch
 - Virtual machine port group
 - Host port group
 - Service console port group
 - DNS configuration
 - IP route configuration
 - Service Console IP route configuration
 - Physical NIC configuration
 - vNetwork Distributed Switch
 - Service console virtual NIC (vNetwork Distributed...)
 - Host virtual NIC
 - Date and time co
 - Firewall configu
 - Security configu
 - Service configur
 - Advanced config
 - User configurati
 - User group conf

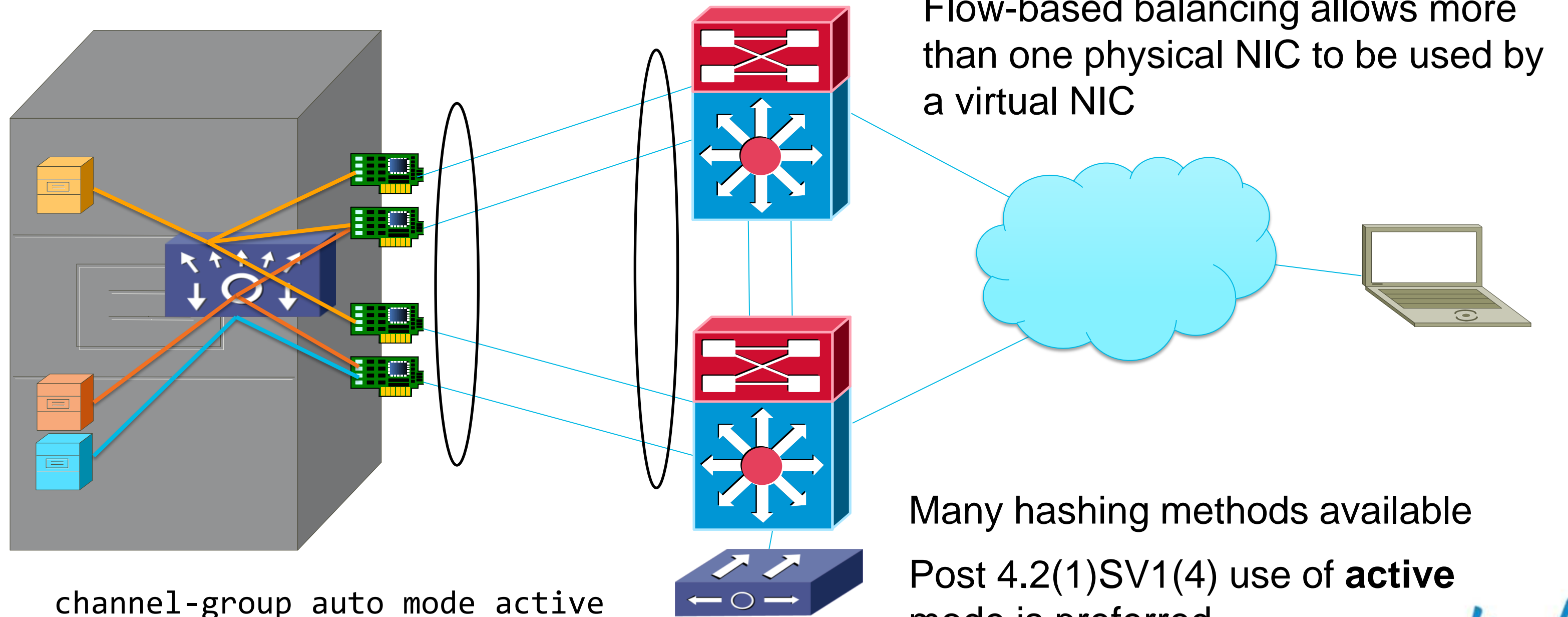
- Images from VMware vSphere

Best Practice Updates



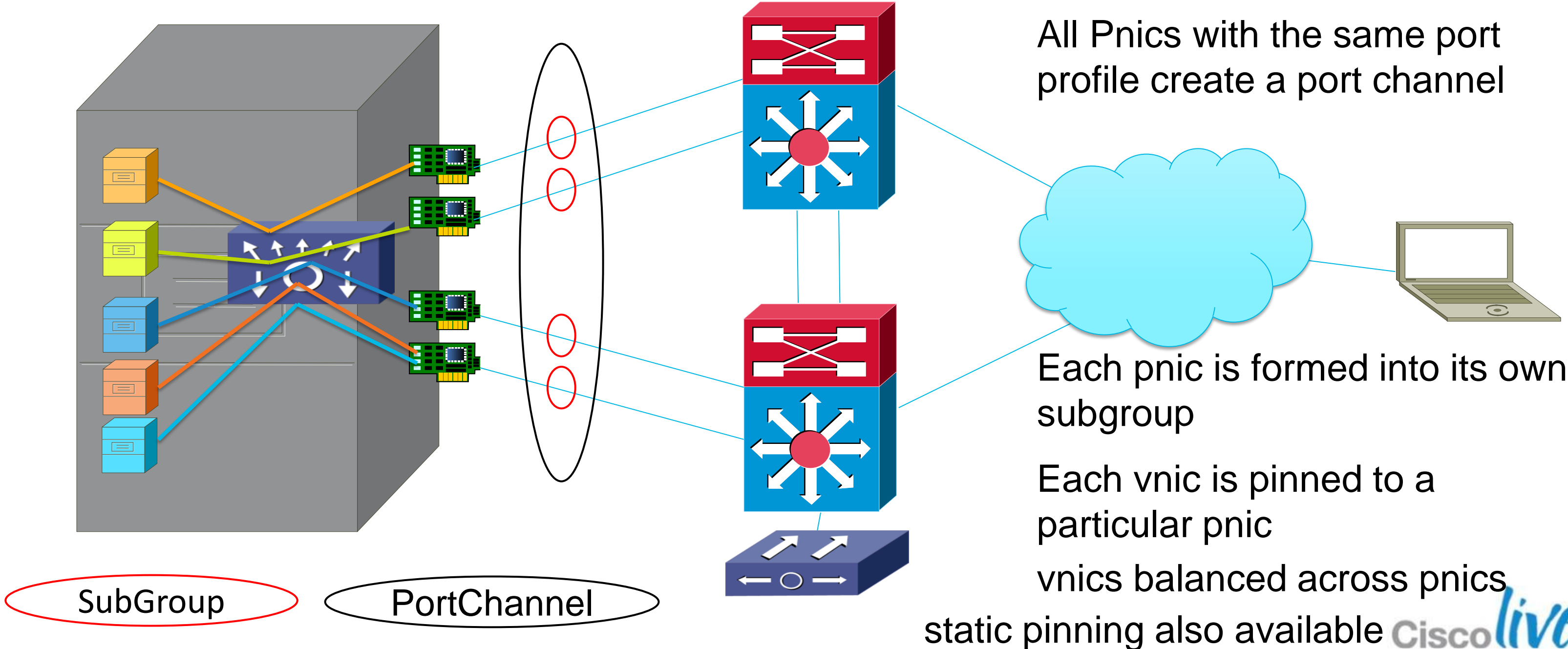
LACP for “Clustered” Switches

Cisco vPC, VSS, VBS Stack



MAC Pinning – Keeping it Simple

Simplest configuration; no upstream features required



VSM Best Practices



For Your
Reference

- L3 control is recommended for new installations
 - No need to change a working L2 control setup
- Management, Control, and Packet can use same VLAN
- Do not use VLAN 1 for Control and Packet
- Primary and Standby VSM must be in the same L2 domain
- VSM VM can be backed up for recovery
 - Configuration backup must be done separately
 - “Configuring VSM Backup and Recovery” in System Management configuration guide
- If deploying VSM on remote storage, know the caveat
 - Storage failure will make N1k VSM non functional (NXOS mount partitions will go into read-only mode)

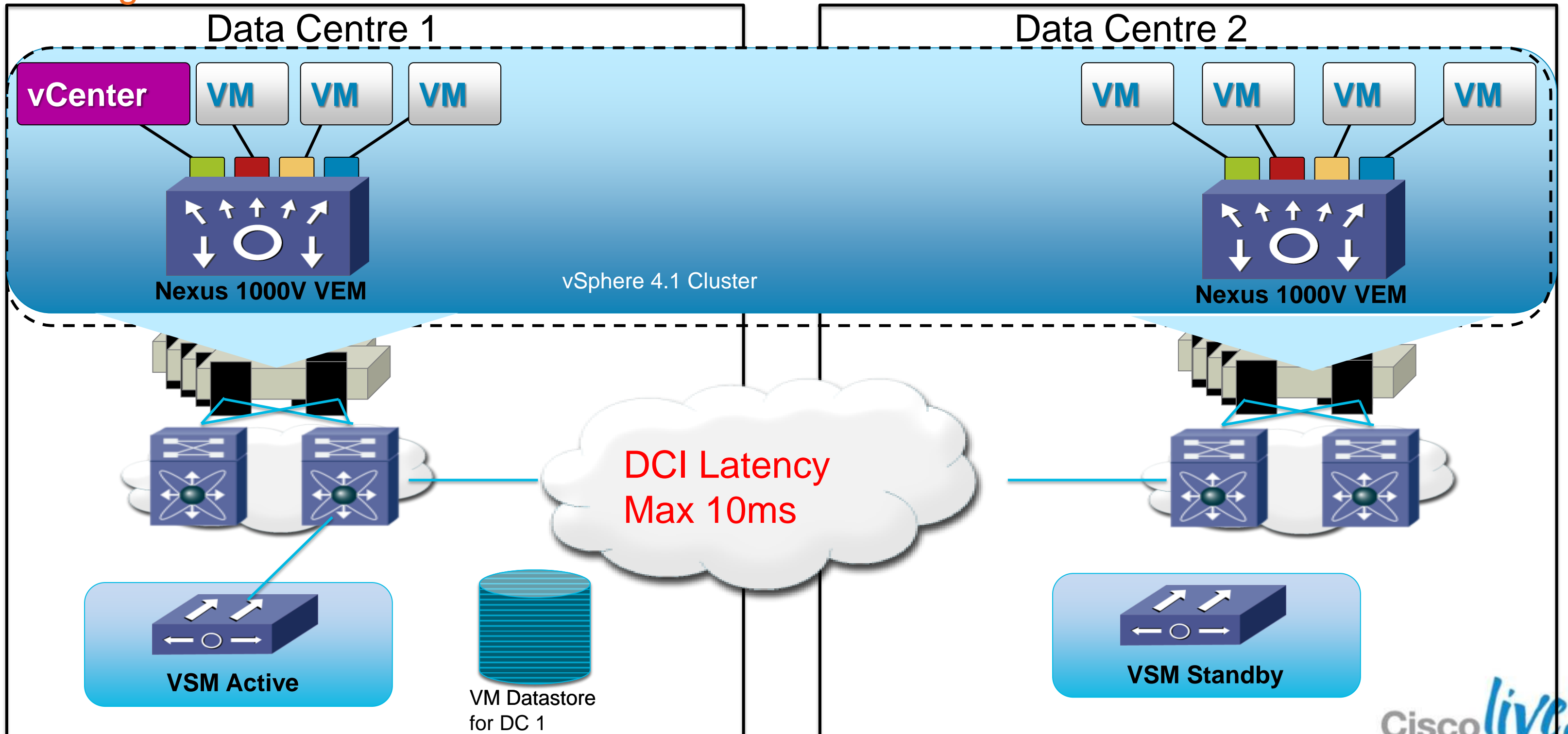
VSM and vMotion

- vMotion, DRS of VSM is supported
 - Define anti affinity rules for Primary and Secondary VSMs
- Aggressive DRS vMotion setting can cause VSM to drop packets. Can result in lose connectivity to VEM or switchover
- Using the **Nexus 1010** is a popular option that will avoid :
 - VSM storage concern
 - VSM DRS concern



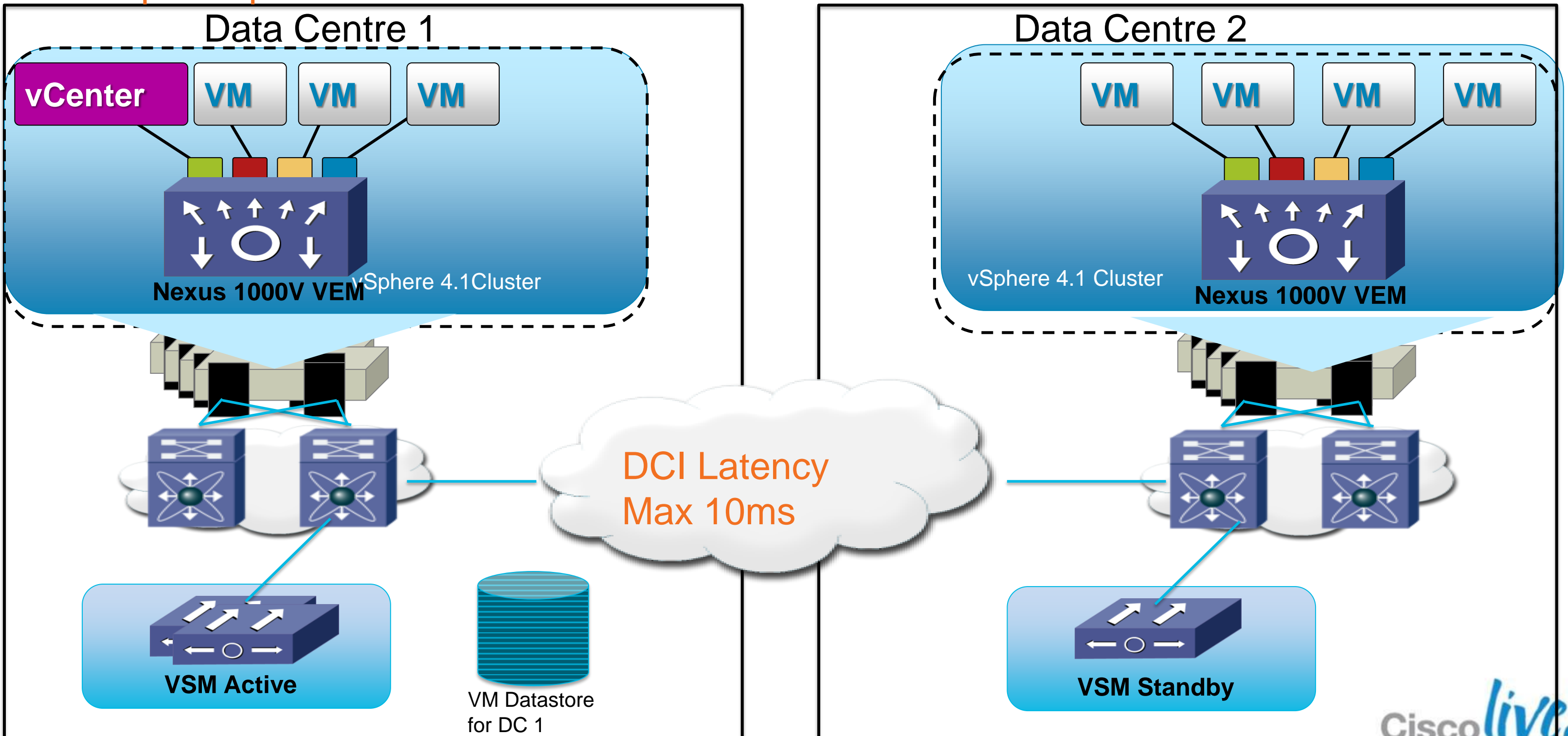
Inter DataCentre N1k Deployments

Single VMW cluster



Inter DataCentre N1k Deployments

Multiple vSphere Clusters



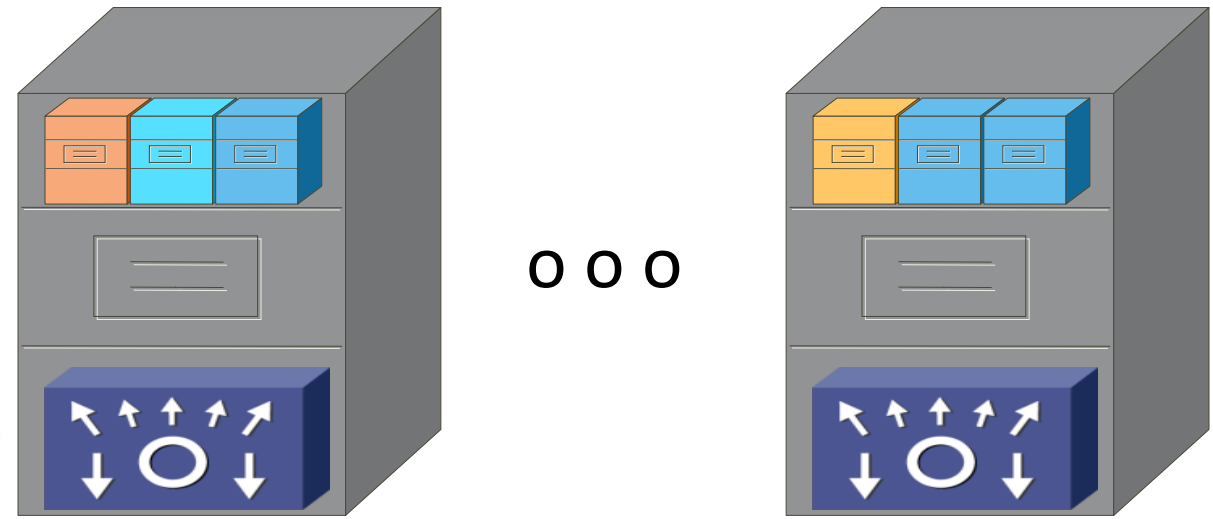
Upgrading the Nexus 1000V



Upgrading the Nexus 1000V Software

Keeping the Boundaries

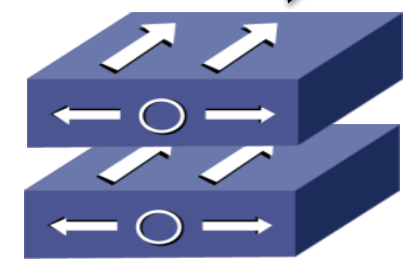
3. Server admin upgrades VEMs



Server admin still owns the "hardware"

1. Network admin upgrades VSMs

2. VSM makes new VEM version available



Upgrading the Nexus 1000V Software

- VSM upgrade – Identical to other Nexus Products
- Upgraded VSM can work with previous version of VEM – So Server Admin schedule the upgrade as per is convenience (note Caveats later)
- VEM upgrade – should be handled (process and tools) as any other host upgrade (patches, updates)
- VEM upgrade options
 - VUM – caveat : currently automated but inflexible
 - Manual – flexible
- N1k upgrade utility for N1k upgrades with enhanced prechecks and error reporting coming – Stay tuned !

Running Older VEMs with Upgrade VSM

Operations allowed

- Add or remove ports (ETH and VETH).
 - Shut or no-shut a port.
 - Migrate ports to or from a vswitch.
 - Change port modes (trunk or access) on ports.
 - Add or remove port profiles.
 - Modify port profiles to add or remove specific features such as VLANs, ACLs, QoS, or PortSec.
 - Change port channel modes in uplink port profiles.
 - Add or delete VLANs and VLAN ranges.
 - Add or delete static MACs in VEMs.
- Note: Queuing configuration changes not supported on QoS.

Simplified Upgrade Process

- **Combined Upgrade:** You can simultaneously upgrade the VEM and ESX versions
 - Requires vSphere version 5.0 Update 1 and above
 - Supported in Nexus 1000V version 4.2(1)SV1(5.2) and above
 - Can be done with VMware Update Manager or manually
- **Upgrade few hosts or clusters incrementally when you upgrade Manually**
 - Upgrade during normal working hours (no maintenance mode required) or short maintenance windows
 - Supported with combined upgrades of VEM and ESX, and also with manual upgrades of VEM alone

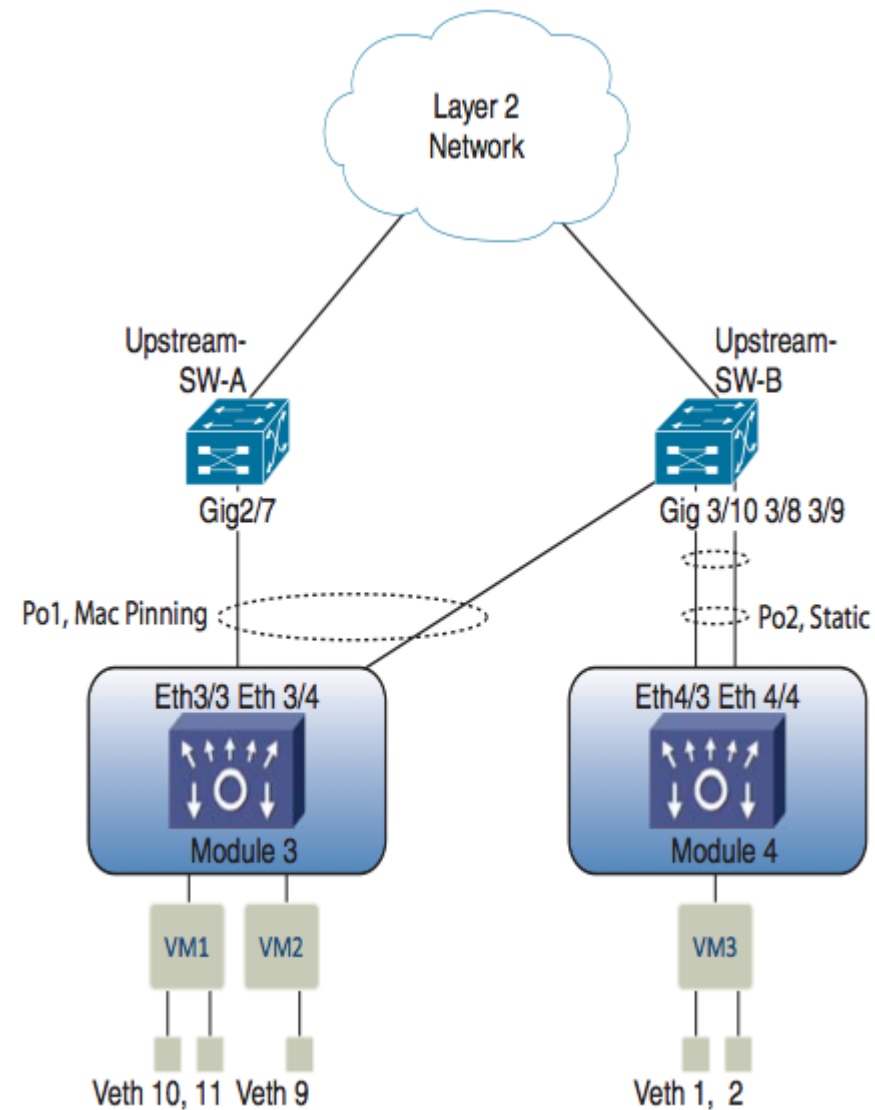
vTracker : VM Visibility



What is vTracker

- vTracker provides VM information through VSM
 - Works by pulling information from vCenter
- Following different views are available
 - Upstream
 - Vlan
 - Module Pnic
 - VM
 - VMotion

Upstream View



- Provides end-to-end network information from the physical switch to VM Veth ports
- Cisco Discovery Protocol (CDP) neighbour information must be enabled on network

Contd Upstream View...

```
VSM-N1k# show vtracker upstream-view
```

Device-Name Device-IP	Device-Port Local-Port	Server-Name Adapter Status	PC-Type PO-Intf	Veth-interfaces
Upstream-SW-A 172.23.231.27	Gig2/7 Eth3/3	172.23.232.117 vmnic2 up	MacPinn Po1	10-11
Upstream-SW-B 172.23.231.15	Gig3/10 Eth3/4	172.23.232.117 vmnic3 up	MacPinn Po1	9
	Gig3/8 Eth4/3	172.23.232.118 vmnic2 up	Default Po2	1-2
	Gig3/9 Eth4/4	172.23.232.118 vmnic3 up	Default Po2	1-2

```
VSM-N1k#
```

Module PNic View

Provides hardware/firmware information on pnic

show vtracker module-view pnic [module *number*]

```
VSM-N1k# show vtracker module-view pnic
```

```
-----  
Mod  EthIf      Adapter  Mac-Address  Driver  DriverVer  FwVer  
-----  
          Description  
-----  
3    Eth3/8     vmnic7   0050.5652.f935  igb     2.1.11.1   1.4-3  
          Intel Corporation 82576 Gigabit Network Connection  
  
4    Eth4/3     vmnic2   0050.565e.df74  e1000   8.0.3.2-1vmw-NAPI  N/A  
          Intel Corporation 82546GB Gigabit Ethernet Controller  
  
4    Eth4/4     vmnic3   0050.565e.df75  e1000   8.0.3.2-1vmw-NAPI  N/A  
          Intel Corporation 82546GB Gigabit Ethernet Controller  
-----
```

```
VSM-N1k#
```

Vlan View

Provides information on all the VMs that are connected to a specific VLAN or a range of VLANs

show vtracker vlan-view [vlan number/range]

```
VSM-N1k# show vtracker vlan-view
```

```
* R = Regular Vlan, P = Primary Vlan, C = Community Vlan  
I = Isolated Vlan, U = Invalid
```

VLAN	Type	VethPort	VM Name	Adapter Name	Mod
1	R	-	-	-	-
233	R	-	-	-	-
335	R	-	-	-	-
336	R	-	-	-	-
337	R	-	-	-	-
338	R	-	-	-	-
339	R	Veth3	gentoo-2	Net Adapter 3	3
		Veth4	gentoo-2	Net Adapter 4	3
		Veth5	gentoo-2	Net Adapter 2	3
340	R	-	-	-	-
341	R	-	-	-	-
400	R	Veth1	Fedora-VM2	Net Adapter 1	5
401	R	Veth1	Fedora-VM2	Net Adapter 1	5
402	R	Veth1	Fedora-VM2	Net Adapter 1	5
403	R	-	-	-	-
404	P	Veth6	Fedora-VM1	Net Adapter 1	4
405	C	Veth2	Fedora-VM2	Net Adapter 3	5
406	I	Veth7	Fedora-VM1	Net Adapter 2	4

VM vNic View

Provides information on vNICs

```
VSM-N1k# show vtracker vm-view vnic
* Network: For Access interface - Access vlan, Trunk interface - Native vlan,
            VXLAN interface - Segment Id.
```

Mod	VM-Name HypvPort	VethPort Adapter	Drv Type Mode	Mac-Addr IP-Addr	State	Network	Pinning
3	gentoo-2 1025	Veth3 Adapter 3	Vmxnet3 access	0050.56b5.37de n/a	up	339	Eth3/8
3	gentoo-2 1026	Veth4 Adapter 4	E1000 access	0050.56b5.37df n/a	up	339	Eth3/8
3	gentoo-2 1024	Veth5 Adapter 2	Vmxnet2 access	0050.56b5.37dd n/a	up	339	Eth3/8
4	Fedora-VM1 4258	Veth7 Adapter 2	E1000 pvlan	0050.56bb.4fc1 10.104.249.49	up	406	Eth4/3
5	Fedora-VM2 100	Veth1 Adapter 1	E1000 trunk	0050.56b5.098b n/a	up	1	Po9
5	Fedora-VM2 3232	Veth2 Adapter 3	E1000 pvlan	0050.56b5.098d 10.104.249.60	up	405	Po9

```
VSM-N1k#
```

VM Info View

Provides information on all the VMs that run on each server

```
VSM-N1k# show vtracker vm-view info module 4

Module 4:
  VM Name:          Fedora-VM1
  Guest Os:         Other Linux (32-bit)
  Power State:      Powered On
  VM Uuid:          421871bd-425e-c484-d868-1f65f4f1bc50
  Virtual CPU Allocated: 1
  CPU Usage:        1 %
  Memory Allocated: 256 MB
  Memory Usage:     1 %
  VM FT State:      Unknown
  Tools Running status: Not Running
  Tools Version status: not installed
  Data Store:       NFS1_4
  VM Uptime:        1 day 29 minutes 46 seconds

  VM Name:          Fedora-VM2
  Guest Os:         Other Linux (32-bit)
  Power State:      Powered On
  VM Uuid:          4218ab37-d56d-63e4-3b00-77849401071e
  Virtual CPU Allocated: 1
  CPU Usage:        1 %
  Memory Allocated: 256 MB
  Memory Usage:     1 %
  VM FT State:      Unknown
  Tools Running status: Not Running
  Tools Version status: not installed
  Data Store:       NFS1_4
  VM Uptime:        58 minutes 30 seconds
```

VMotion View

```
show vtracker vmotion-view [now | last <1-100>]
```

```
VSM-N1k# show vtracker vmotion-view count 20
```

```
Note: Command execution is in progress..
```

```
Note: VM Migration events are shown only for VMs currently  
managed by Nexus 1000v.
```

```
* '-' = Module is offline or no longer attached to Nexus1000v DVS
```

VM-Name	Src Mod	Dst Mod	Start-Time	Completion-Time
rk-ubt-1-0046	6	4	Mon Sep 3 10:42:27 2012	OnGoing
rk-ubt-1-0045	6	4	Mon Sep 3 10:42:27 2012	OnGoing
rk-ubt-1-0031	6	4	Mon Sep 3 10:42:27 2012	Mon Sep 3 10:44:10 2012
rk-ubt-1-0021	6	4	Mon Sep 3 10:42:27 2012	Mon Sep 3 10:43:42 2012
rk-ubt-1-0029	6	3	Thu Aug 16 14:25:26 2012	Thu Aug 16 14:27:55 2012
rk-ubt-1-0023	6	3	Thu Aug 16 14:25:26 2012	Thu Aug 16 14:27:50 2012
rk-ubt-1-0025	6	3	Thu Aug 16 14:25:26 2012	Thu Aug 16 14:26:13 2012
rk-ubt-1-0024	6	3	Thu Aug 16 14:25:26 2012	Thu Aug 16 14:26:12 2012
rk-ubt-1-0026	6	3	Thu Aug 16 14:25:26 2012	Thu Aug 16 14:26:09 2012
RHEL-Tool-VmServer	-	3	Wed Aug 8 12:57:48 2012	Wed Aug 8 12:58:37 2012

```
VSM-N1k#
```

Resource Availability



Resource Availability Overview

- Provides easy visibility for
 - Configuration limits on various “resources” on Nexus 1000V.
 - Resources could be vethernet ports, port channels, VLANs, etc.
 - Current usage of these resources
- Can be used to determine resource availability for whole DVS, per module or per resource.
- For whole DVS and module – similar to ‘show tech’ i.e. series of show commands executed one by one.
- For a specific resource – first prints DVS-wide limit and usage followed by per-module stats (if applicable)

Supported Resources

```
switch#
switch# show resource-availability ?
<CR>
>      Redirect it to a file
>>    Redirect it to a file in append mode
acl    Show resource information for Acl
all    Show resource information for all resources
bridge-domain Show resource information for bridge-domains
ethports Show resource information for ethernet ports
hosts  Show resource information for hosts
ip     Show resource information for IP
mac-address-table Show resource information for mac address table
module Show resource information for a specific VEM
monitor Show resource information for ethernet span
netflow Show resource information for Netflow
port-channel Show resource information for port channels
port-profile Show resource information for port-profiles
port-security Show resource information for port security
private-vlan Show resource information for private vlan
qos-queuing Show resource information for QoS and Queuing
vethports Show resource information for vethernet ports
vlan   Show resource information for vlan
|      Pipe command output to filter

switch# show resource-availability █
```


Resource Availability – Example 1

```
switch# show resource-availability
`show resource-availability hosts`

Maximum number of hosts that can be added to DVS: 64
Number of hosts currently powered up: 1
Number of hosts currently absent: 0
Number of hosts that can be added further: 63

`show resource-availability port-channel dvs-only`

Maximum number of port channels per DVS: 256
Number of port channels currently created: 2
Number of port channels available: 254

`show resource-availability port-profile`

Maximum number of port-profiles per DVS           : 2048
Number of port-profiles in use                     : 15
Number of port-profiles available                 : 2033

Maximum number of system port-profiles per DVS   : 32
Number of system port-profiles in use             : 5
Number of system port-profiles available         : 27

`show resource-availability vethports dvs-only`

Maximum number of Veth ports per DVS: 2048
Number of Veth ports used: 0
Number of Veth ports available : 2048

`show resource-availability vlan`
```

Resource Availability – Example 2

```
switch# show resource-availability module 3
`show resource-availability acl module 3`
Maximum number of ACL instances per host is      256
Instances created is                             0
Instances available is                           256

`show resource-availability ethports module 3`

Maximum number of Eth ports per module: 32
Number of Eth ports in module: 3
Number of Eth ports available for module: 29

`show resource-availability mac-address-table module 3`

Maximum MAC Addresses per module: 32000
-----
Module  Used  Available
-----
      3    22    31978
-----

`show resource-availability port-channel module 3`

Maximum number of port channels per module: 8
Number of port channels in module: 2
Number of port channels available for module: 6

`show resource-availability qos-queuing module 3`
Maximum number of instances per host is      256
Instances created is                             0
Instances available is                           256

`show resource-availability vethports module 3`
```

Resource Availability – Example 3

```
switch# show resource-availability ip igmp snooping ?
<CR>
>      Redirect it to a file
>>    Redirect it to a file in append mode
|      Pipe command output to filter

switch# show resource-availability ip igmp snooping
Max number of IGMP groups supported: 512
Number of IGMP groups in use: 0
Number of IGMP groups available: 512

switch#
switch# show resource-availability port-channel ?
<CR>
>      Redirect it to a file
>>    Redirect it to a file in append mode
module Show VEM specific information
|      Pipe command output to filter

switch# show resource-availability port-channel

Maximum number of port channels per DVS: 256
Number of port channels currently created: 2
Number of port channels available: 254

Maximum number of port channels per module: 8
-----
Module  Used  Available
-----
      3    2      6

Note: Modules not seen in above table are either not added to DVS or have all 8 port channels available

switch#
```

vCenter Plugin



vCenter Plugin

- Provide visibility to Server Admin on networking
- VC Plugin UI uses REST API to get info from VSM
- Requirements :
 - N1k 4.2(1)SV1(2)
 - VMware vSphere web client 5.1 only
 - vCenter version can be 5.0 or 5.1

Dashboard View

Issues | Tasks | Events | Health | Cisco Nexus 1000V

Getting Started | **Dashboard** | Switch | Hosts/VEM | About

Cisco Nexus 1000V Summary

System

Switch Name	NX-OS Version	VSM IP	DC Name	Connectivity Mod	VC Connectivity	VSM HA
Cx-VSM-51-MNN-1	4.2(1)SV2(1.1) [build 4.2(1)SV2(1.0.194)]	10.78.0.121	DC-123	L2	Connected	true

Network Statistics

VNICs vs Max	Hosts vs Max	Port-Groups vs Max	Veths/Host Max	VLAN / VXLAN vs Max	
				Vlan	VxLan
1(2048)	1(64)	2049(2048)	1(216)	2023(2048)	N/A(N/A)

Licenses

Cisco Nexus 1000V Edition: Essential

License Type	Licenses Available	Licenses Used	Earliest Expiration	Status
NEXUS_VSG_SERVICES_PKG	512	0	24 Nov 2012	Unused
NEXUS_ASA1000V_SERVICES_PKG	16	0	24 Nov 2012	Unused
NEXUS1000V_LAN_SERVICES_PKG	512	0	24 Nov 2012	Unused

Switch View

Issues | Tasks | Events | Health | Cisco Nexus 1000V

Getting Started | Dashboard | **Switch** | Hosts/VEM | About

Cisco Nexus 1000V Switch Level Details

Host/VEM | VM Info | Port Groups | vNICs | Uplinks

Host Name	NX-OS Version	Host IP	License	Host / Module	VMs / Host	VNICs / Host
10.78.0.125	4.2(1)SV2(1.1)	10.78.0.125	licensed	3	1	1

Logout

Hosts/Vem View

Issues | Tasks | Events | Health | Cisco Nexus 1000V

Getting Started | Dashboard | Switch | **Hosts/VEM** | About

System

Host Name	NX-OS Version	Host IP	License	Host / Module	VMs / Host	VNICs / Host
10.78.0.125	4.2(1)SV2(1.1)	10.78.0.125	licensed	3	1	1

VM Info | Port Groups | vNICs | Uplinks

VMs	VNICs	Adapter	Status	Port Group	VLANs	Host ID
ESX-Host-124	Vethernet1	Net Adapter 1	✓	1812	1812	3

Logout



VXLAN

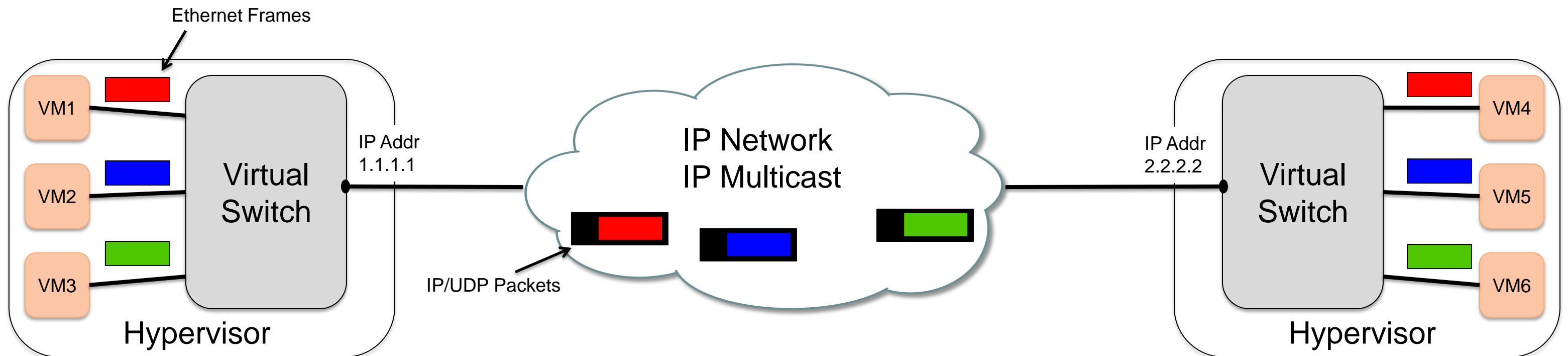
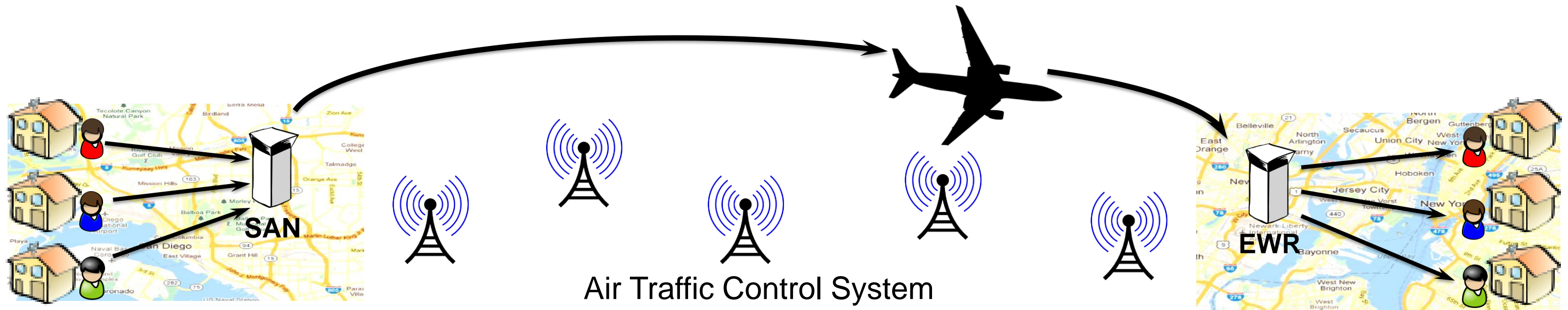


Why VXLANs?

Pain Points in Scaling Cloud Networking

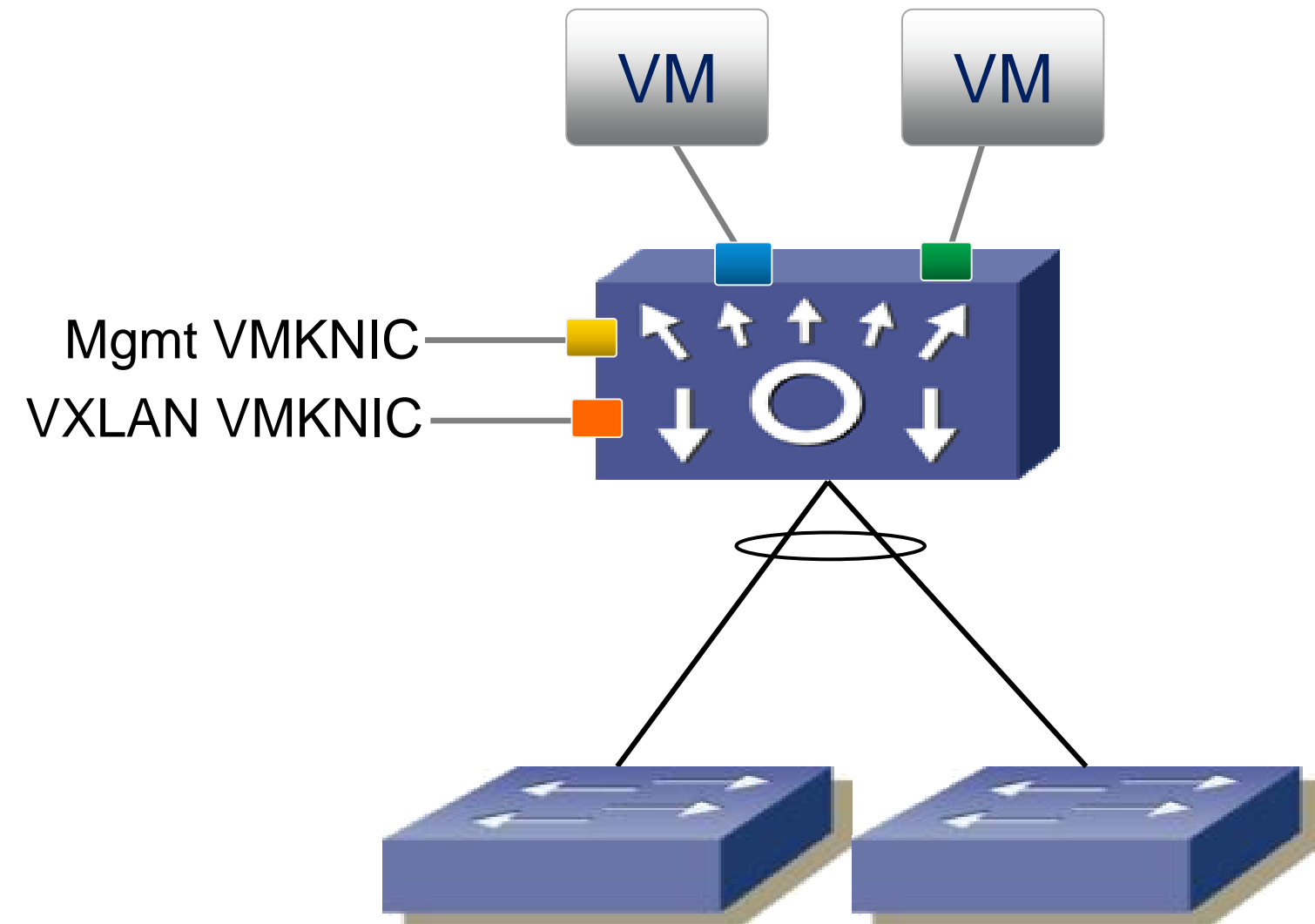
- Use of server virtualisation and cloud computing is stressing the network infrastructure in several ways:
 - Server Virtualisation increases demands on switch MAC address tables
 - Multi-tenancy and vApps driving the need for more than 4K VLANs
 - Static VLAN trunk provisioning doesn't work well for Cloud Computing and VM mobility
 - Limited reach of VLANs using STP constrains use of compute resources
- Solution : VXLANs - an Overlay Network technology
 - MAC Over IP/UDP
 - VXLAN uses IP multicast to deliver bcast/mcast/unknown unicast

Overlay Networks



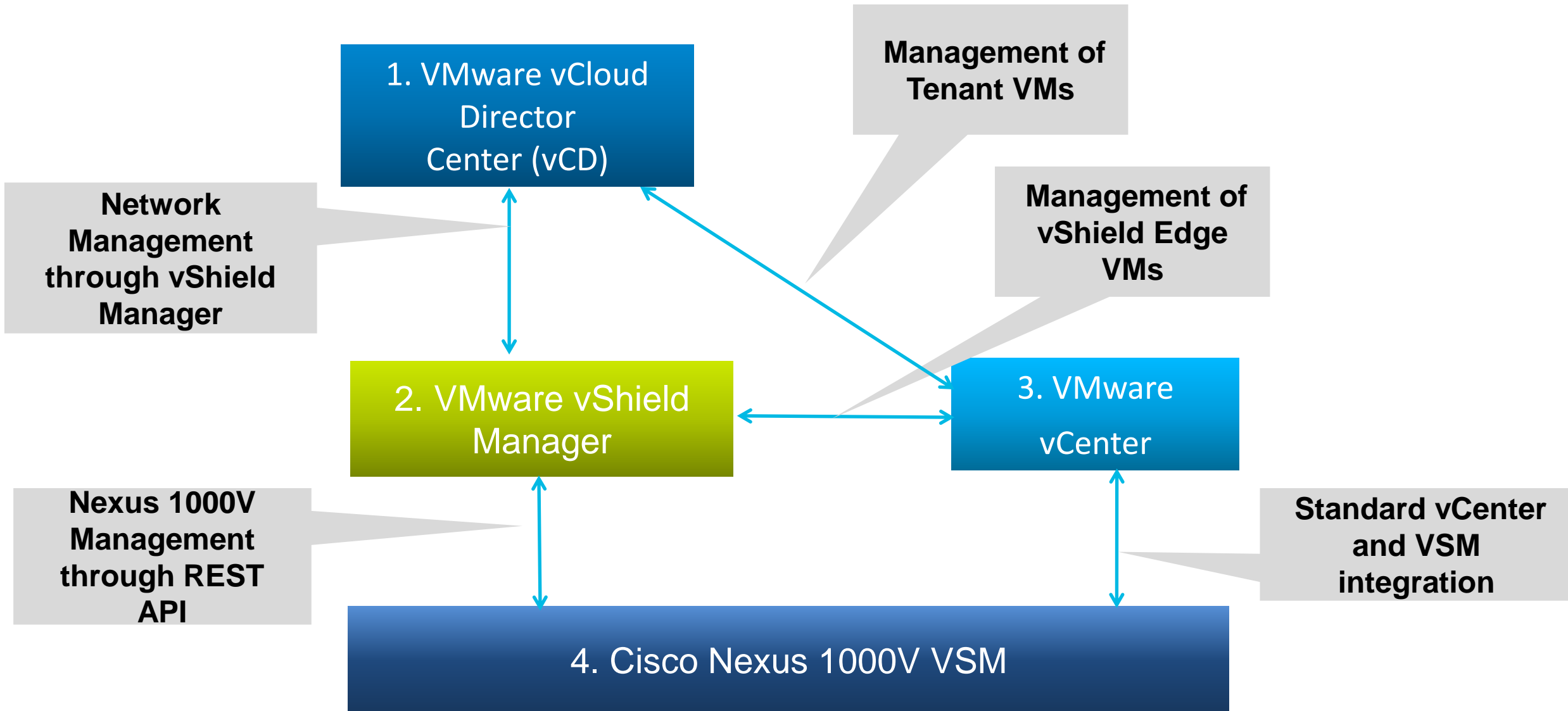
Nexus 1000V VEM VMKNICs = VTEPs

- Management VMKNIC
 - For VSM to VEM communication
- VXLAN VMKNIC(s)
 - For terminating VXLAN encapsulated traffic
 - VTEPs – VXLAN Tunnel endpoints
 - Connected to a “Transport VLAN” to carry VXLAN traffic



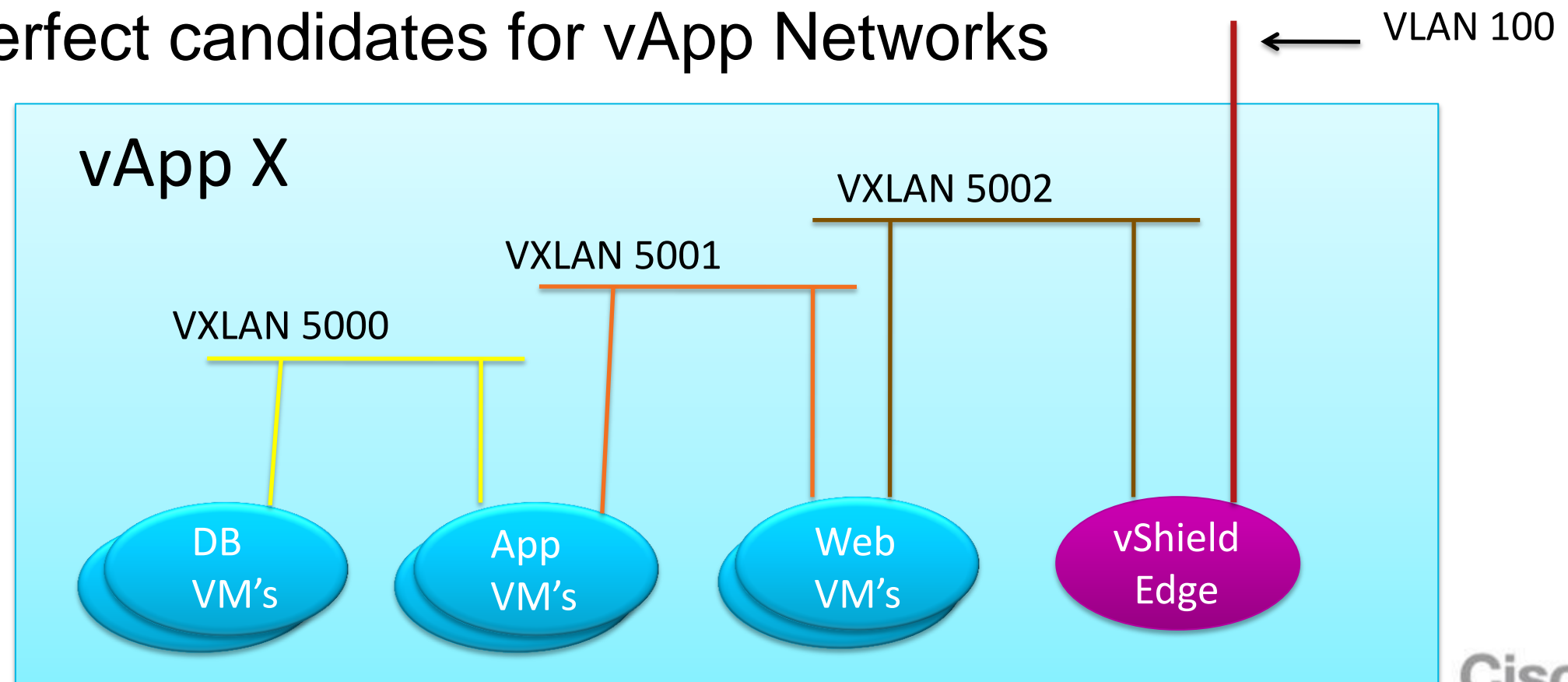
Nexus 1000V vCloud Director Integration

Four Main Components



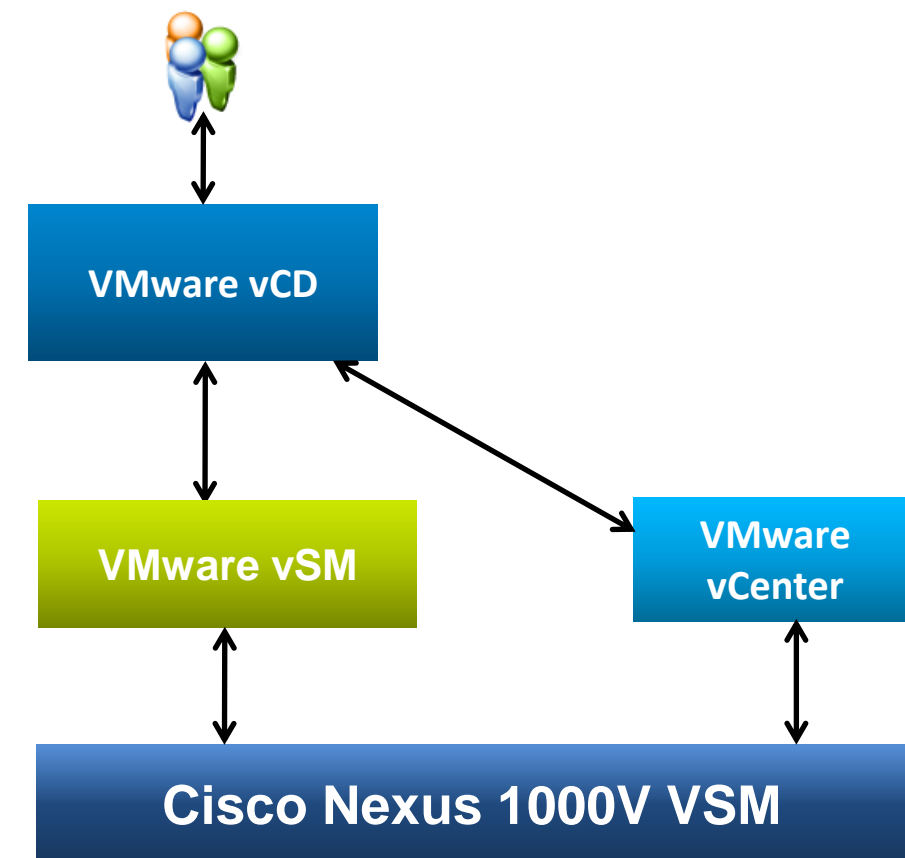
Possible vApp Instantiation

- Edge Gateway options:
 - vShield Edge (now)
 - ASA 1000V (future)
- Edge Gateway performs NAT or VPN to remote location
- VXLANs are perfect candidates for vApp Networks



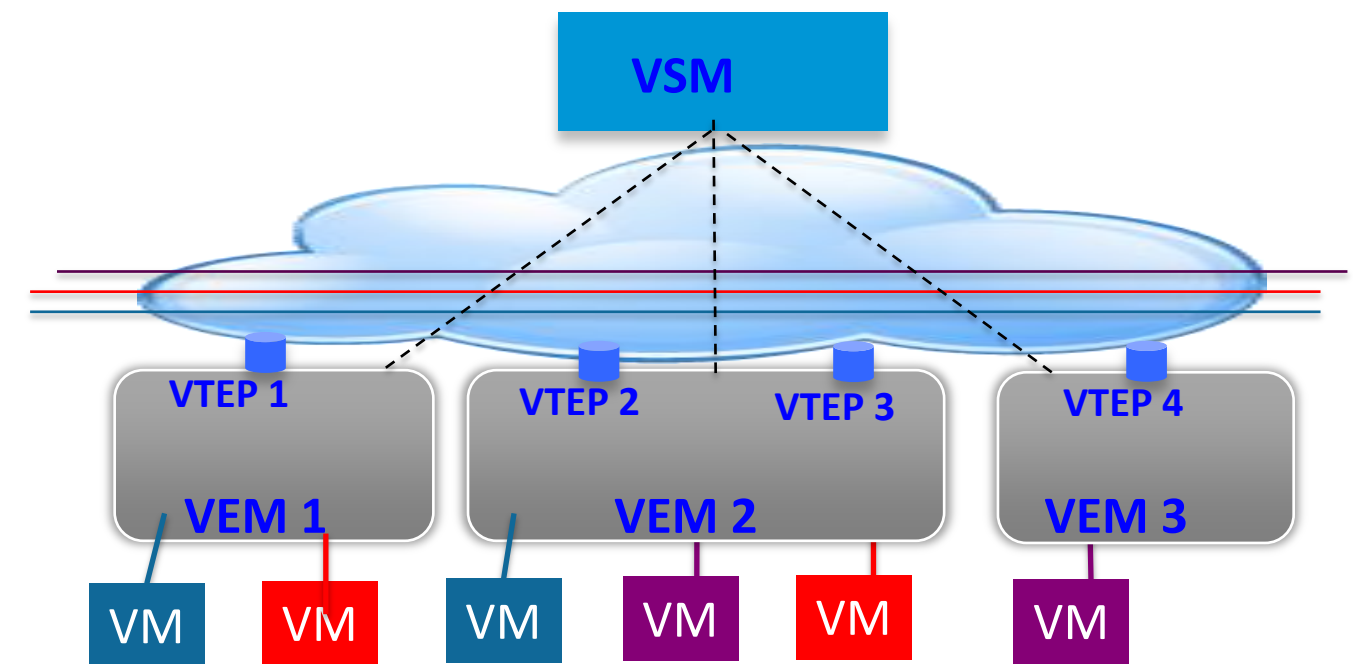
VXLAN Creation Using vCloud Director

- vCloud Director user creates a Network
- vCloud Director invokes vShield Manager to create a VXLAN Network
- vShield Manager allocates a VXLAN ID and Multicast Group and invokes the “CreateNetwork” API to the Nexus 1000V
 - vCD provides the VXLAN ID and Multicast IP, Plus the Tenant ID
- Nexus 1000V creates a VXLAN Bridge-Domain and a Port Profile referring to that Bridge-Domain and pushes the Port Group into vCenter
- vCloud Director connects VMs to the Port Group



VXLAN 1.5 – Q2CY13 – 4.2(1)SV2(2.1)

- Unicast only transport mode
 - No multicast Requirement
- Flood-less mac Learning
 - Mac addresses are learnt over control plane
 - No floods for unknown unicast pkts
- Local ARP Responder
 - VSM based Mac-IP association distribution
 - Responses to ARP requests are generated locally on the VEM

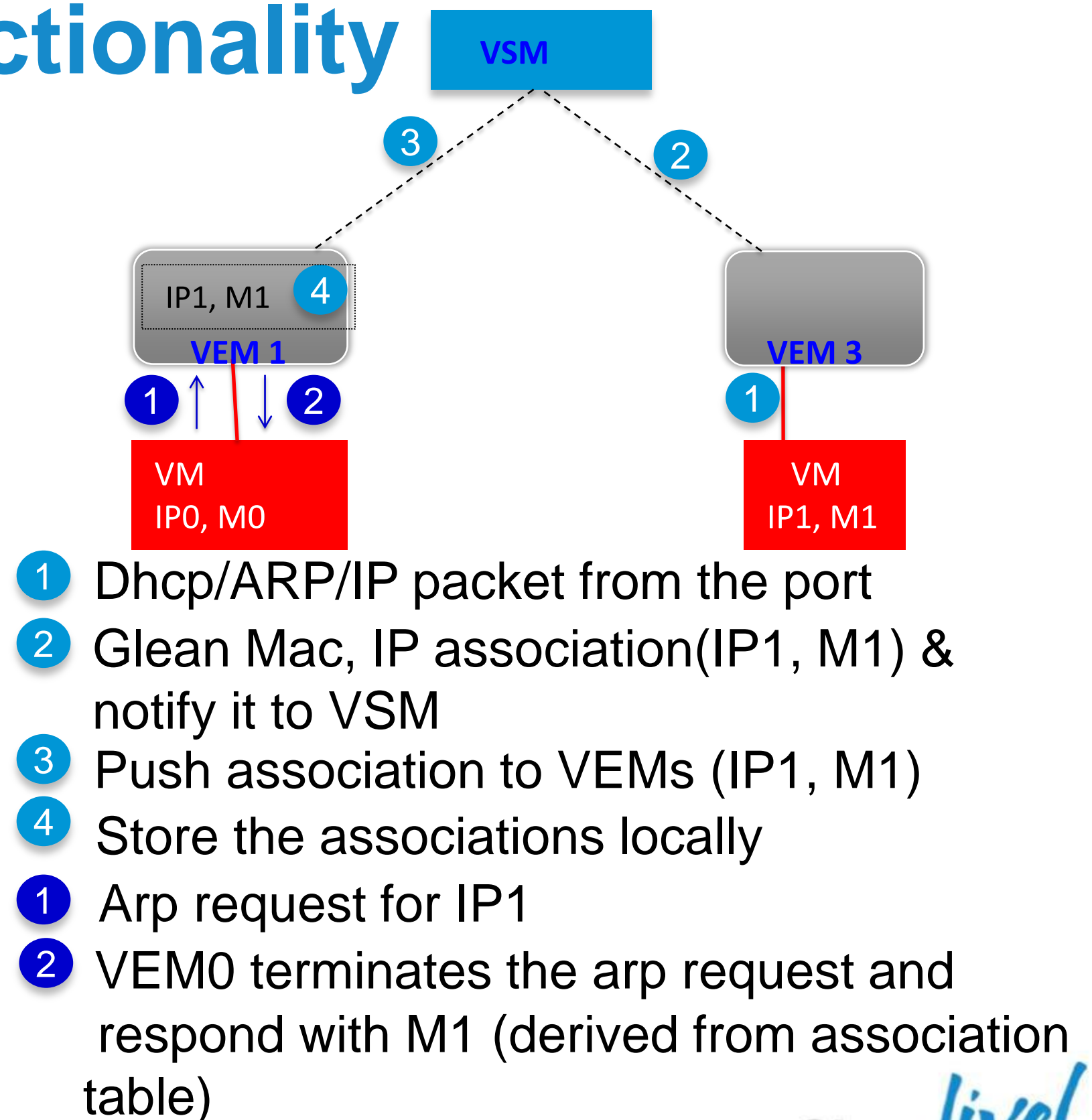


Mac Learning/Distribution

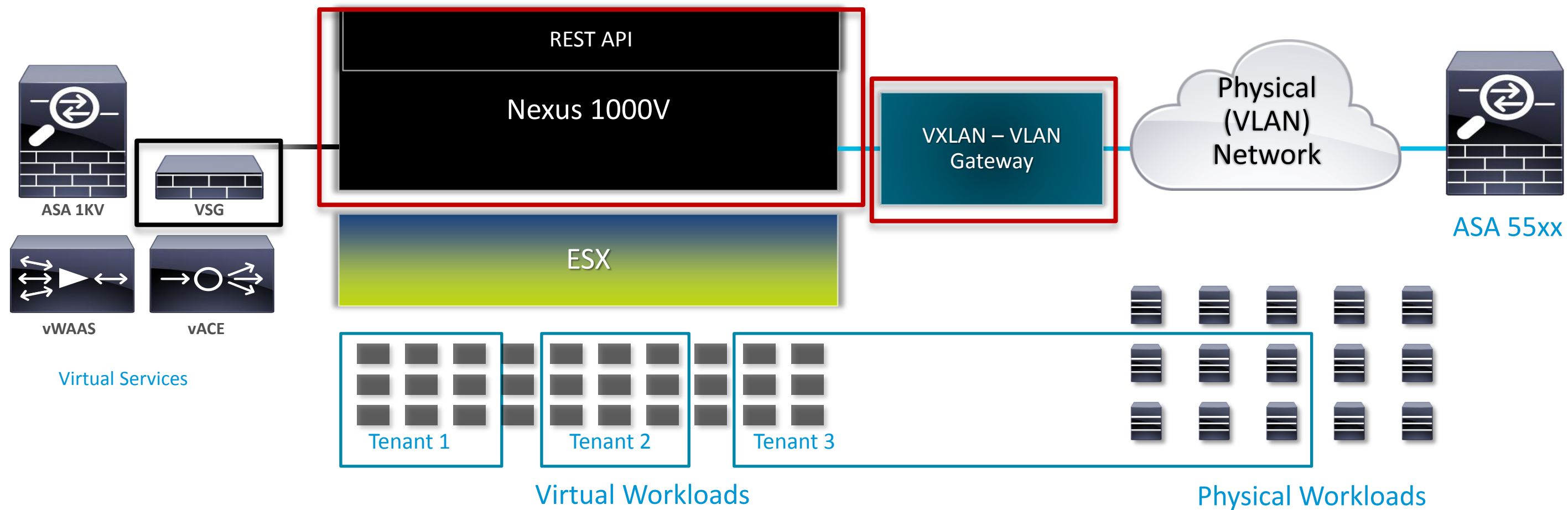
- VEMs glean Mac address of the local VM interfaces
 - Source of information
 - VMM/VC assigned mac from Port Opaque Data (assigned Mac)
 - Source mac of the data traffic (Learnt Mac)
- VEMs associates Mac to one of the local VTEPs and publish the mac to VTEP bindings to VSM
- VSM distribute the associations to all VEMs
- VEMs program the bindings in their local L2 tables and use this information for forwarding frames

ARP Responder Functionality

- VEM gleans (dhcp, arp, etc) IP to Mac associations from the VM data traffic
- VEMs publish locally learnt MAC IP associations to VSM
- VSM distribute the associations to all VEMs
- Any ARP request is locally responded using the MAC-IP bindings

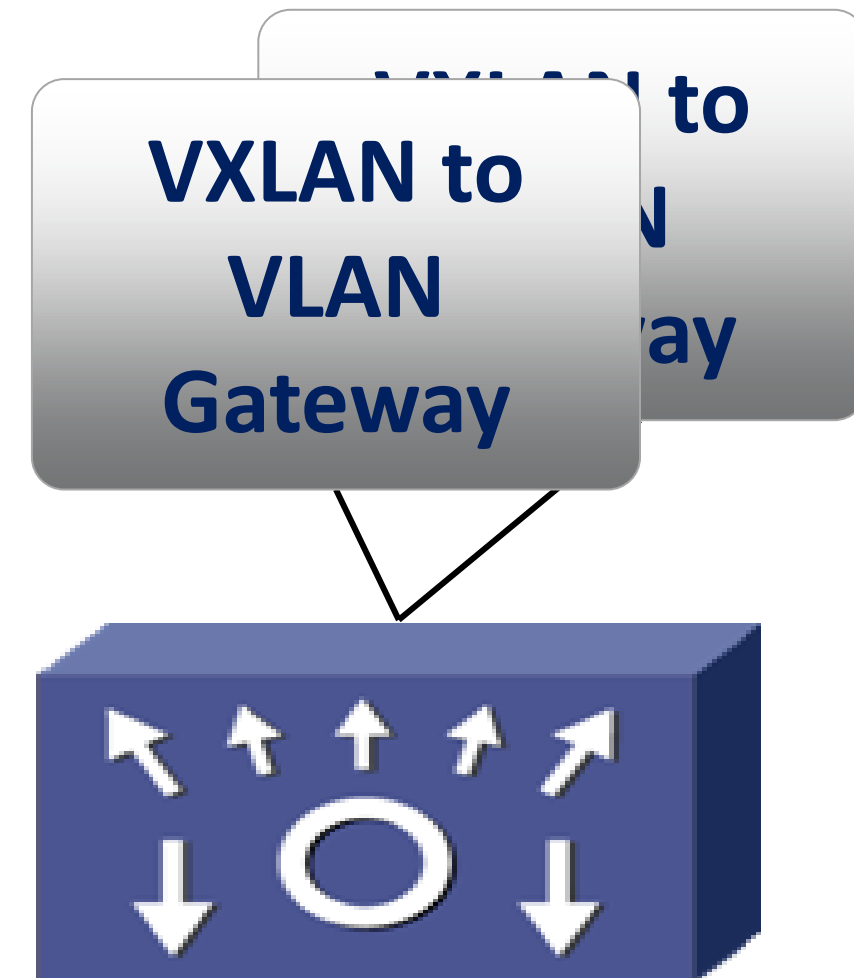


VXLAN Gateway Architecture

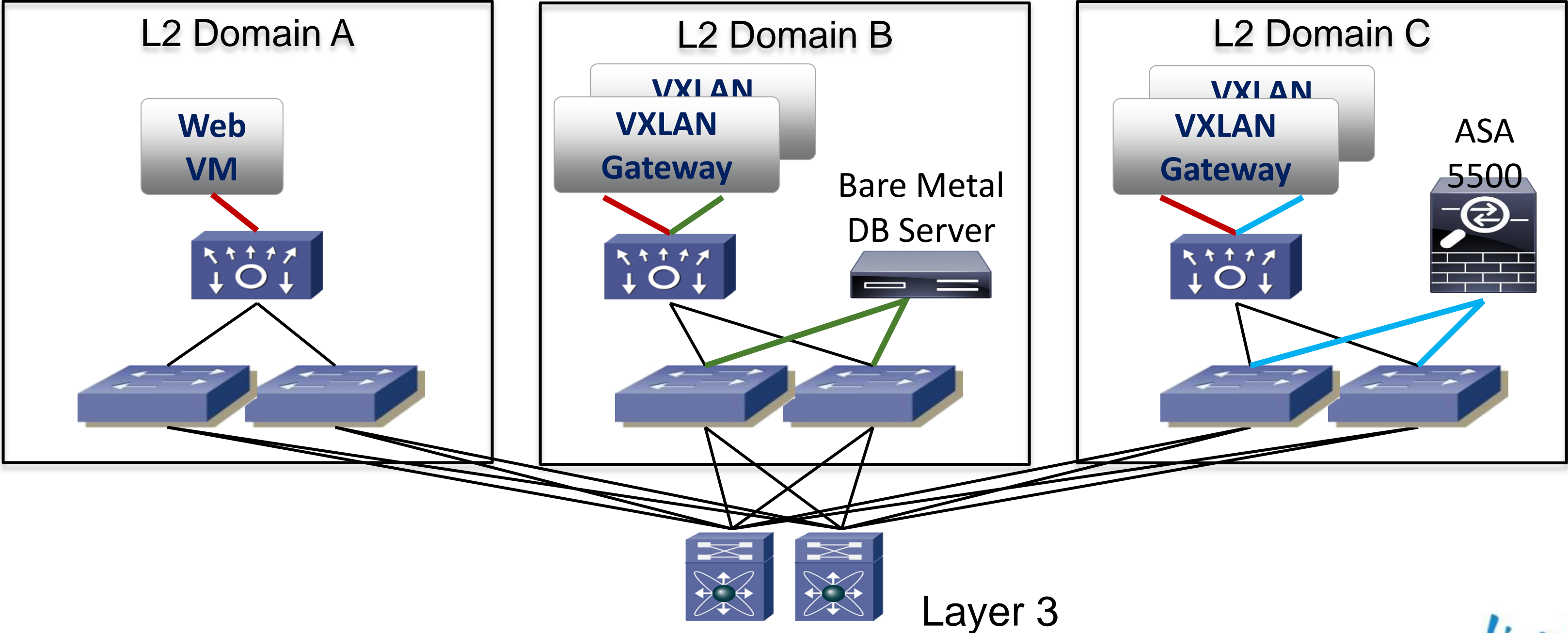


VXLAN to VLAN Gateway

- Form-factor: VM or Hosted on N1110
- Managed as a module from VSM
- Active/Standby VXLAN Gateway



VXLAN to VLAN Gateway

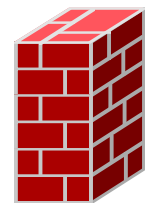


Virtual Services on N1k Using vPath

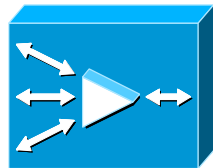


New Requirements in Virtual/Cloud Data Centre

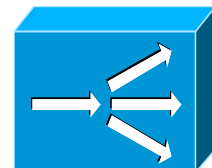
Traditional Data Centre



FW



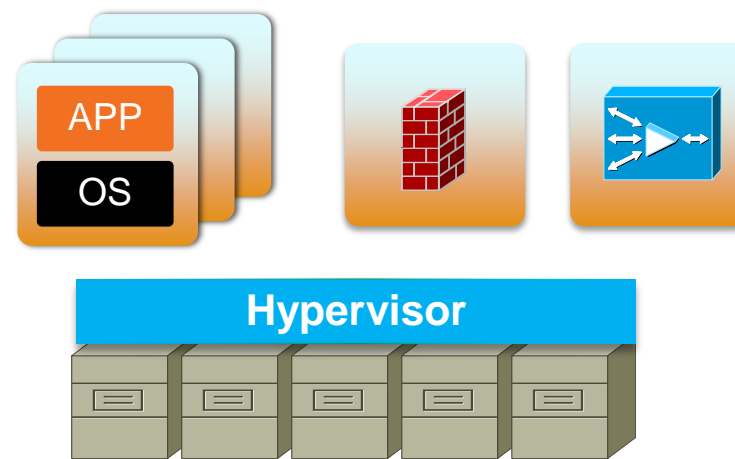
WAN
Opt



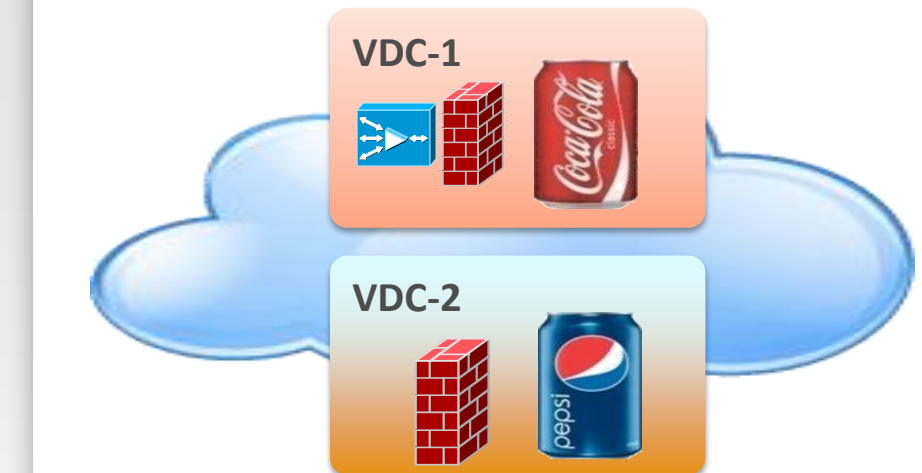
ADC/
SLB

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

Virtual/Cloud Data Centre



Virtual
Service
Node
(VSN)

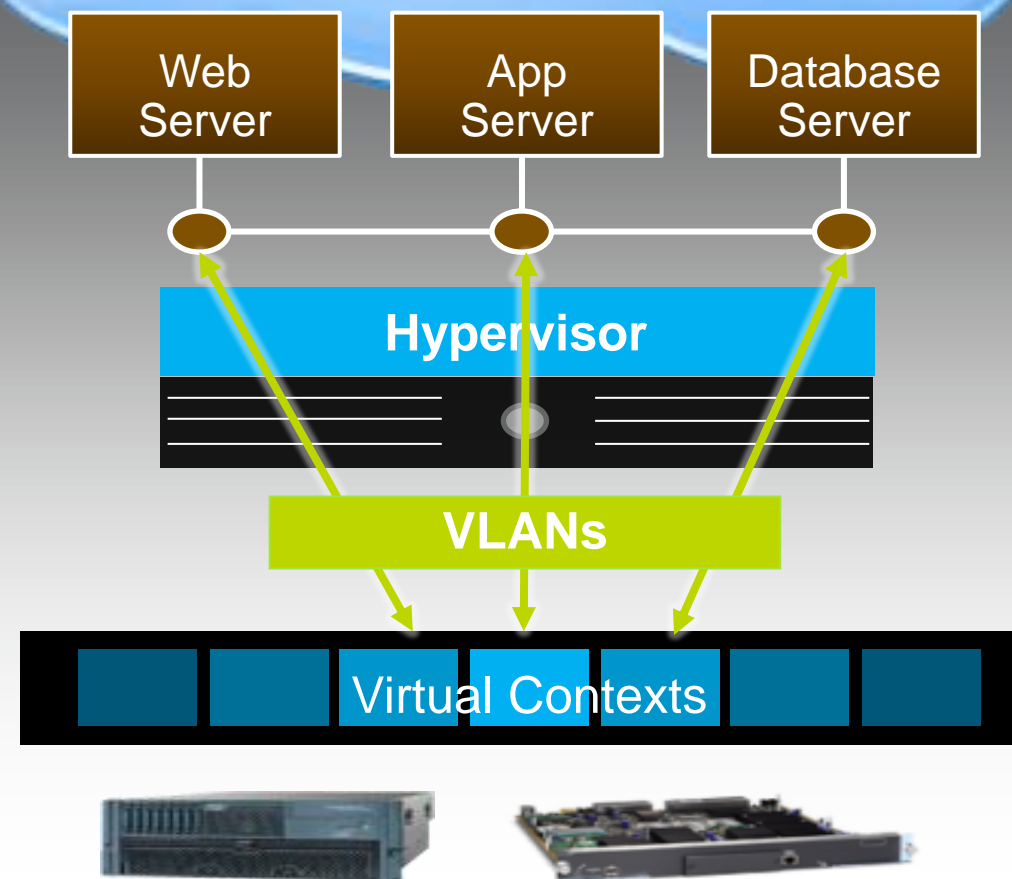


- Virtual appliance form factor
- Dynamic instantiation/provisioning
- Service transparent to VM mobility
- Support scale-out
- Large scale multitenant operation

Deployment Options in Virtual/Cloud DC

1

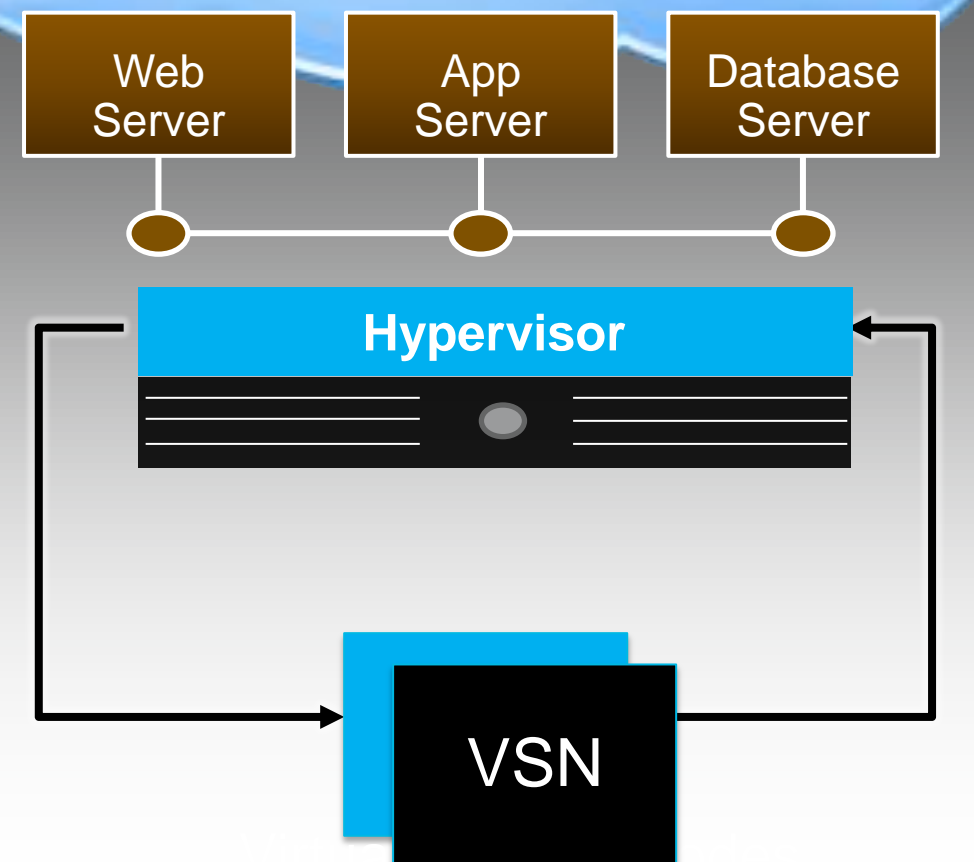
Redirect VM traffic via VLANs to external (physical) firewall



Traditional Service Nodes

2

Apply hypervisor-based virtual network services

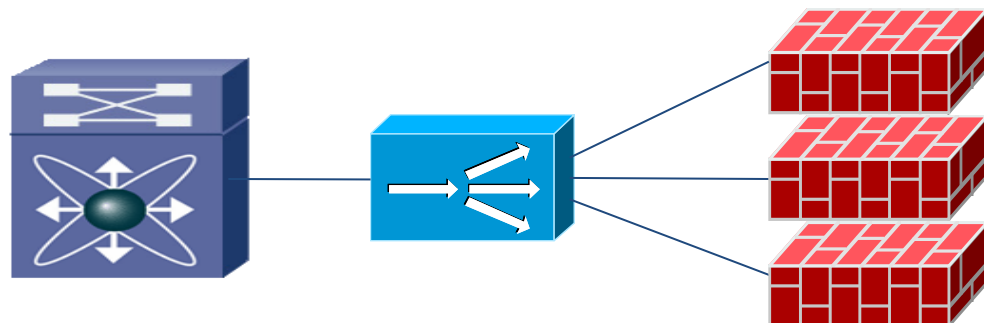


Virtual Service Nodes

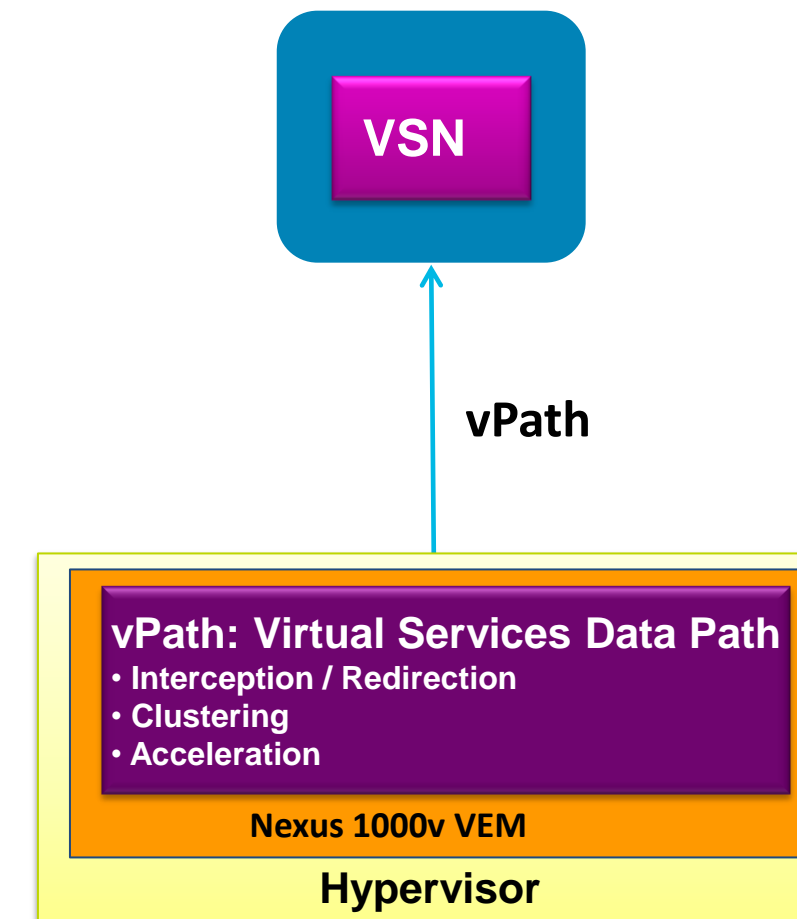
Architecting a Distributed VSN

Centralised

Function	Approach
Interception/Redirection	VLAN, PBR..
Clustering (scaling)	Load balancer
Acceleration	Fast-path off-load

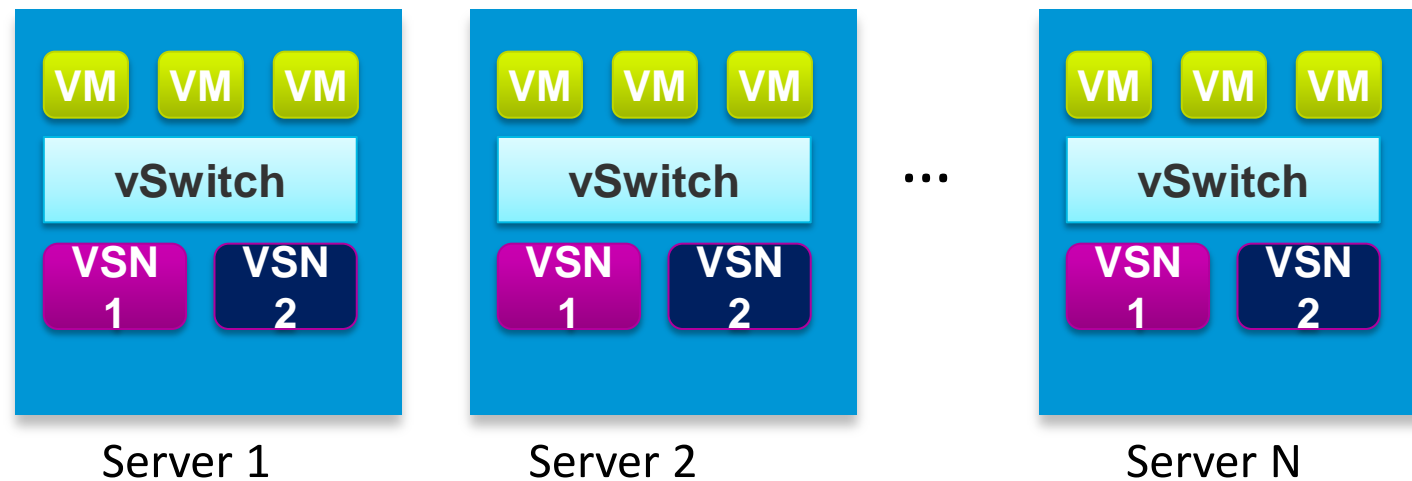


Distributed

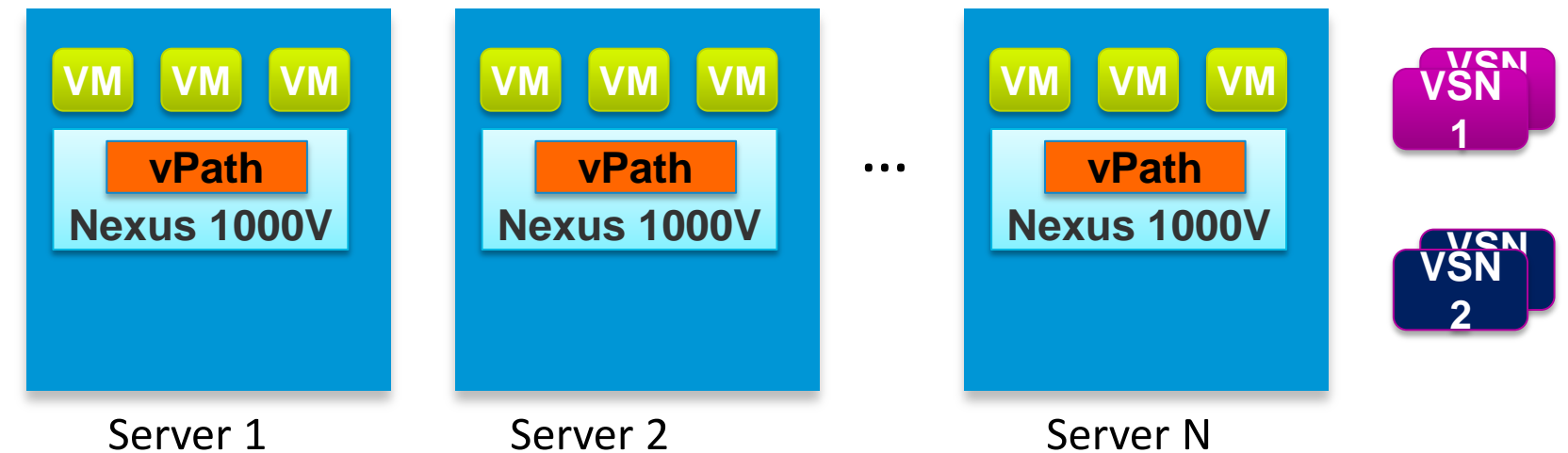


Why vPath?

Without vPath



With vPath



Deployment

Complex

Virtual Services Scope is Host-Local. One per Host.

Simpler

Virtual services scope is network-wide. VSN shared among one or many Hosts.

Capacity Planning

Difficult

App workloads share CPU resources with virtual services

Easier

Virtual services can reside on dedicated servers. Can be hosted on Nexus 1010 appliance

Separation of Duties

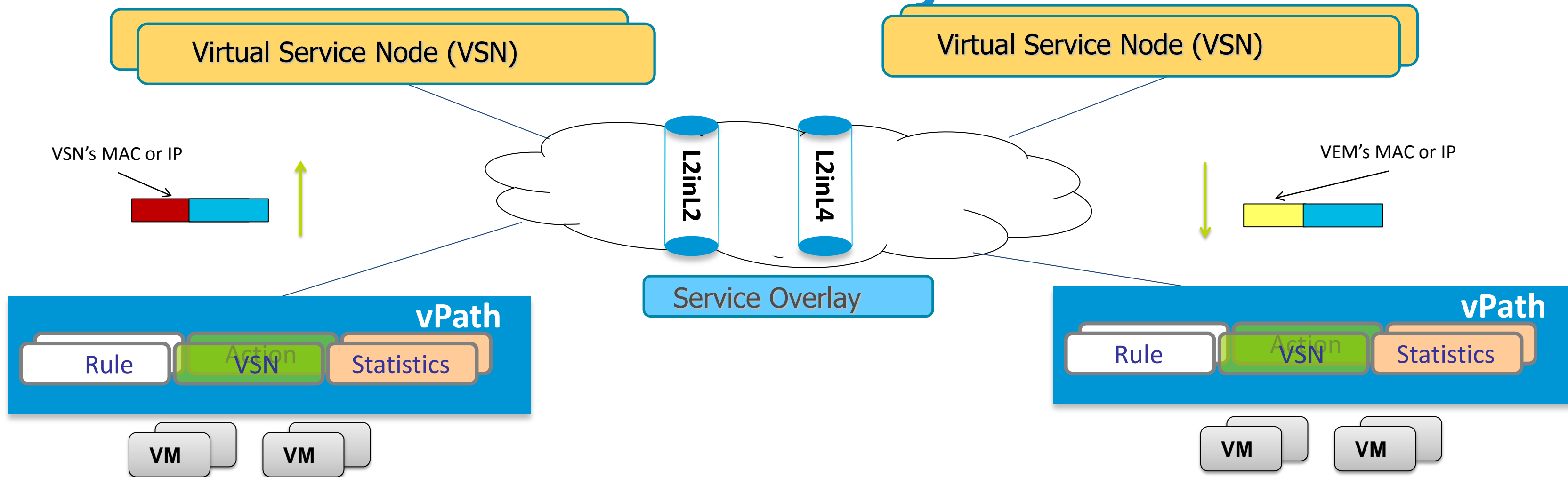
Server Admin is owner

Server/hypervisor maintenance need to be co-ordinated

Network/Security Admin is owner

Virtual services can reside on dedicated servers.. Little co-ordination is needed

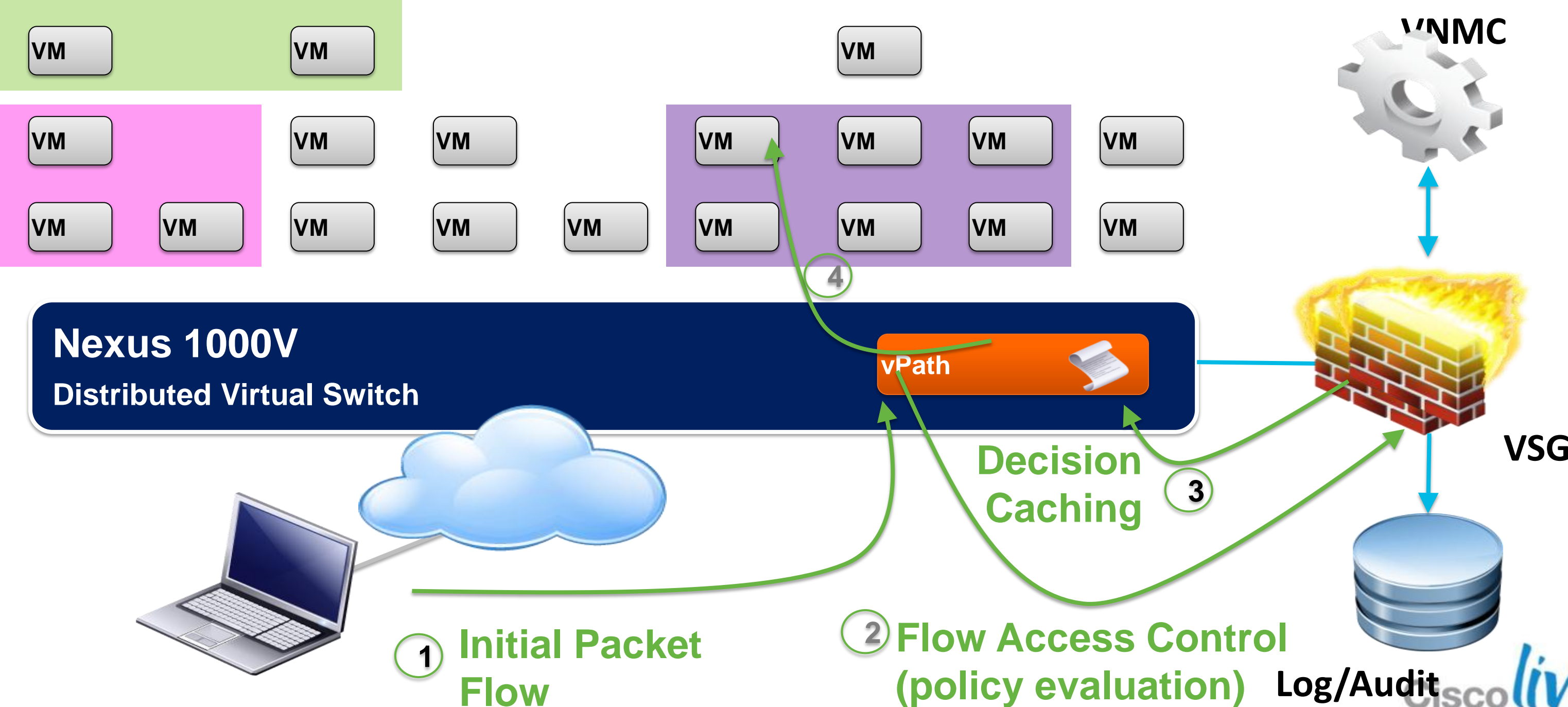
vPath – Service Overlay Model



- L2 Mode – VSN is L2-adjacent to switch, uses Mac-in-Mac Encapsulation
- L3 Mode – VSN is L3 hop away from switch, uses Mac-in-UDP Encapsulation
- Overlay provides topology agnostic model – enables mobility of VSNs

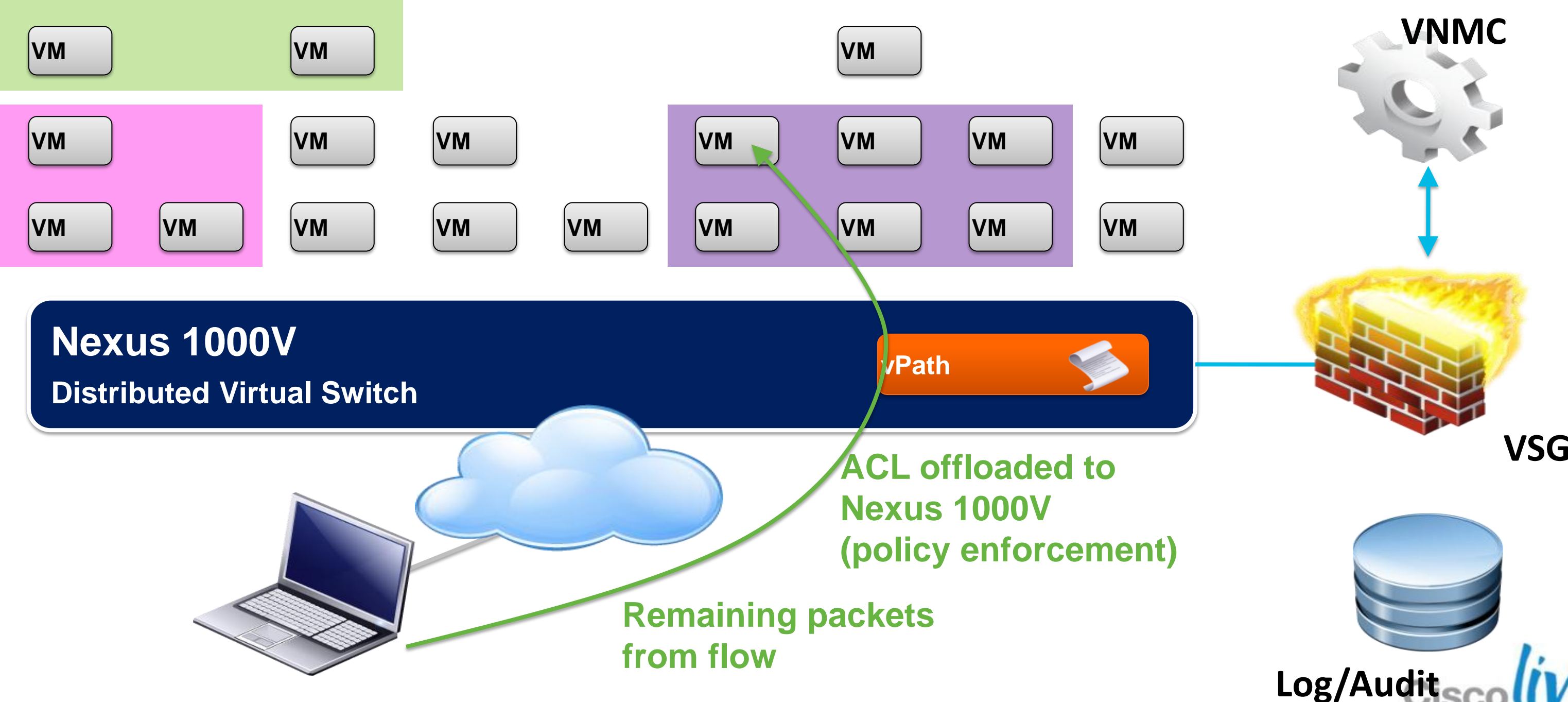
VSG Packet Flow

Intelligent Traffic Steering with vPath



VSG Packet Flow

Performance Acceleration with vPath

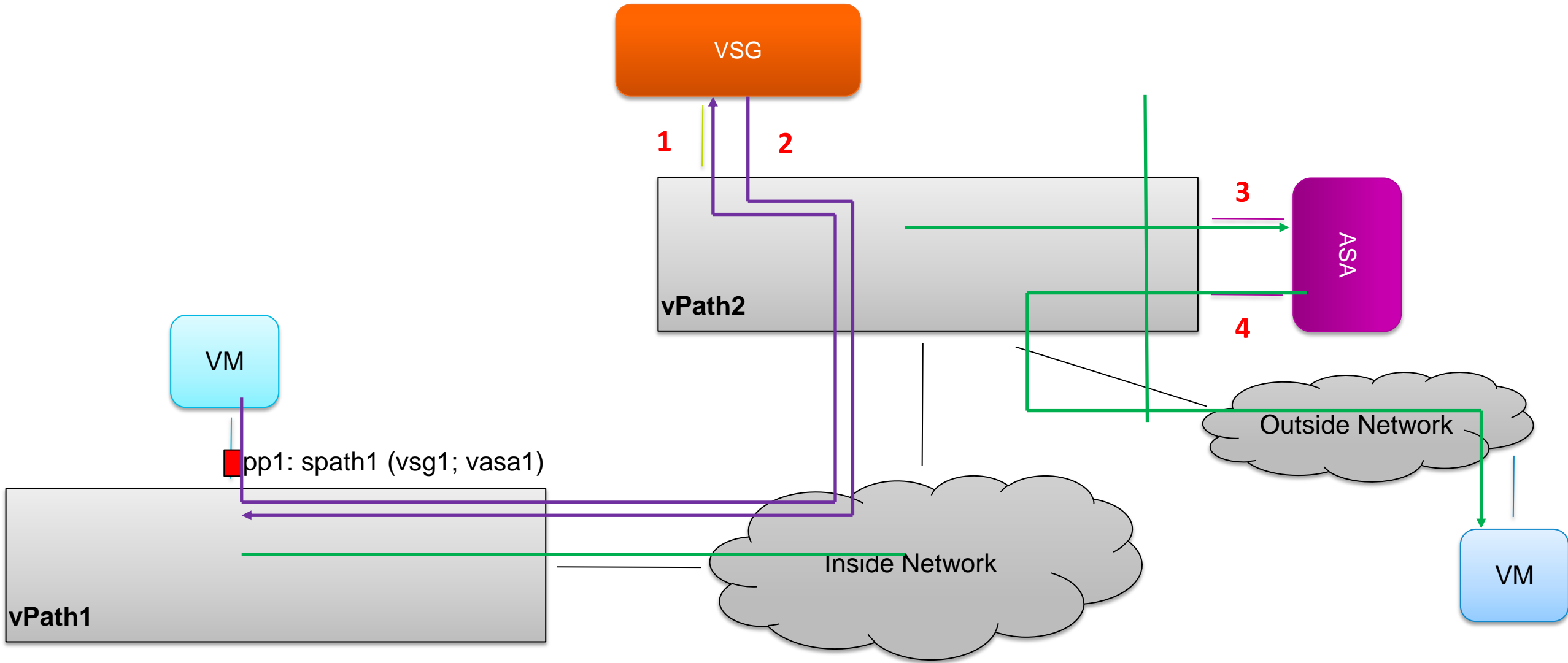


vPath – Service Chaining



- Service Path defines the service chain – an ordered list of service profiles (e.g. security profile, edge profile, slb profile etc.)
- Traffic Selector rules are used to configure Service Table in vPath
- An endpoint VM is associated with Service Path via Port-Profile Binding

VSG + ASA 1000V Service Chaining



Cisco Nexus 1000V for Win8/Hyper-V

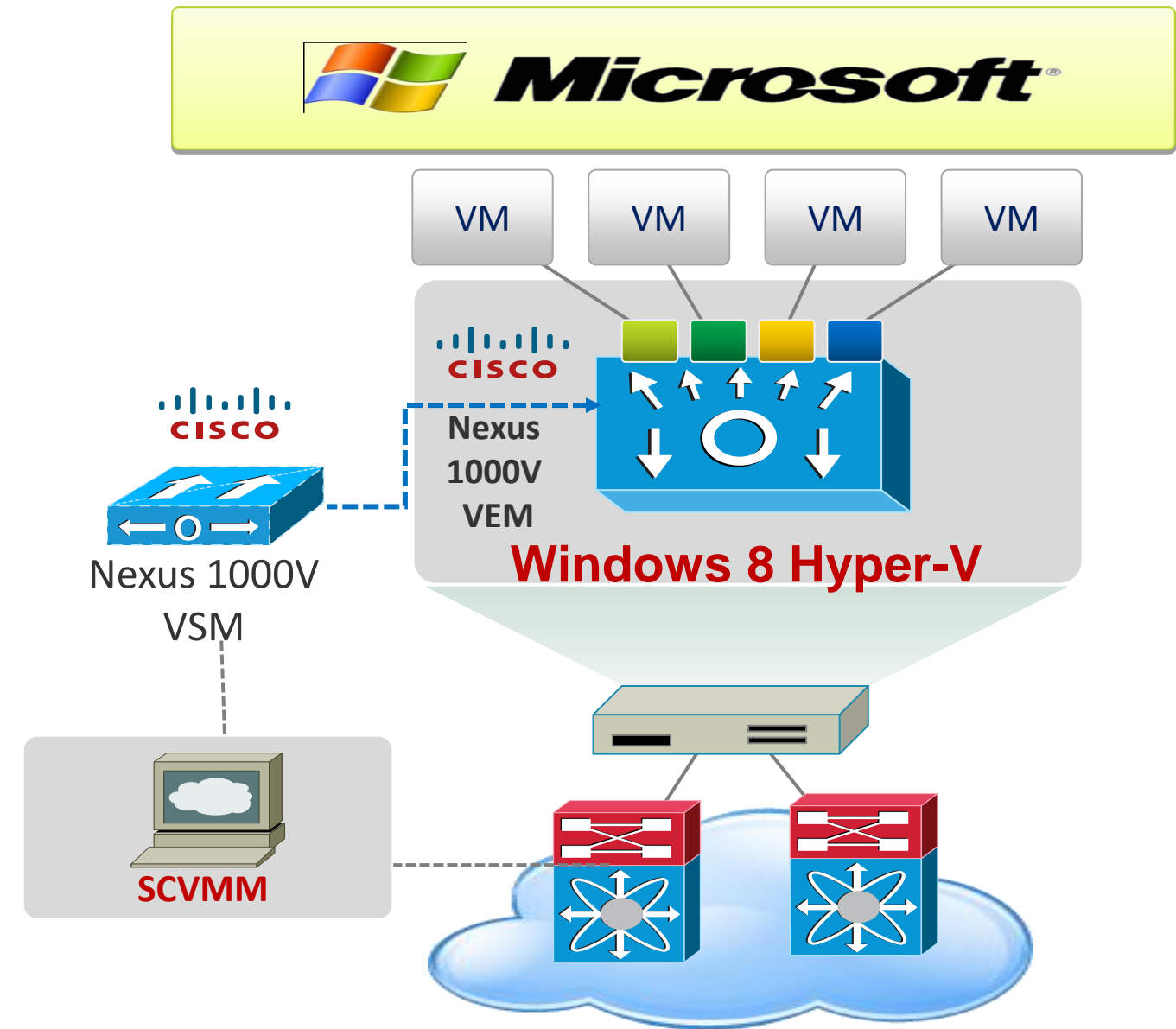
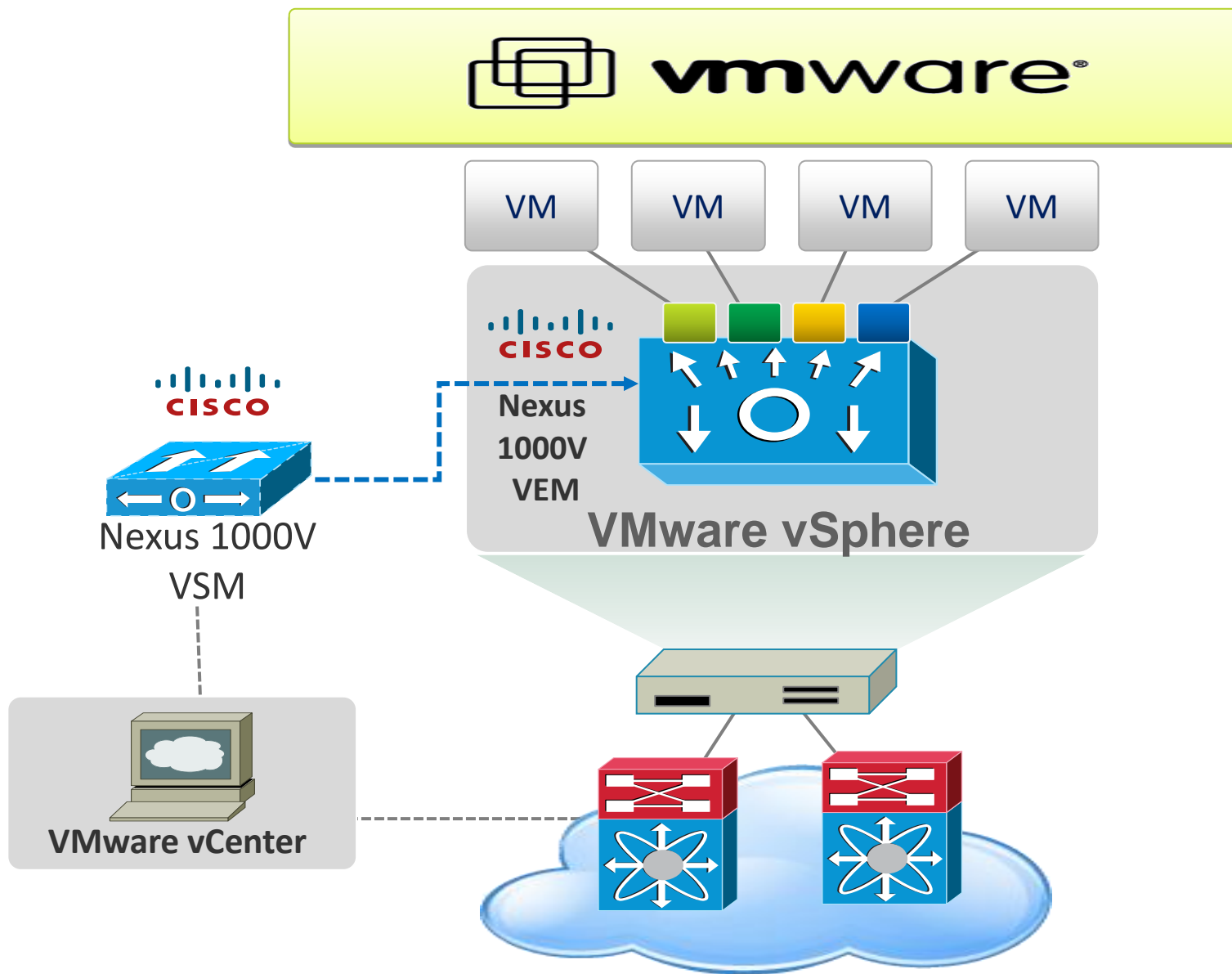


Forward-Looking Information

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.

Cisco Nexus 1000V for Win8/Hyper-V

Beta-2*: Q1 CY13
FCS: Q2 CY13



Consistent architecture, feature-set & network services ensures operational transparency across multiple hypervisors.

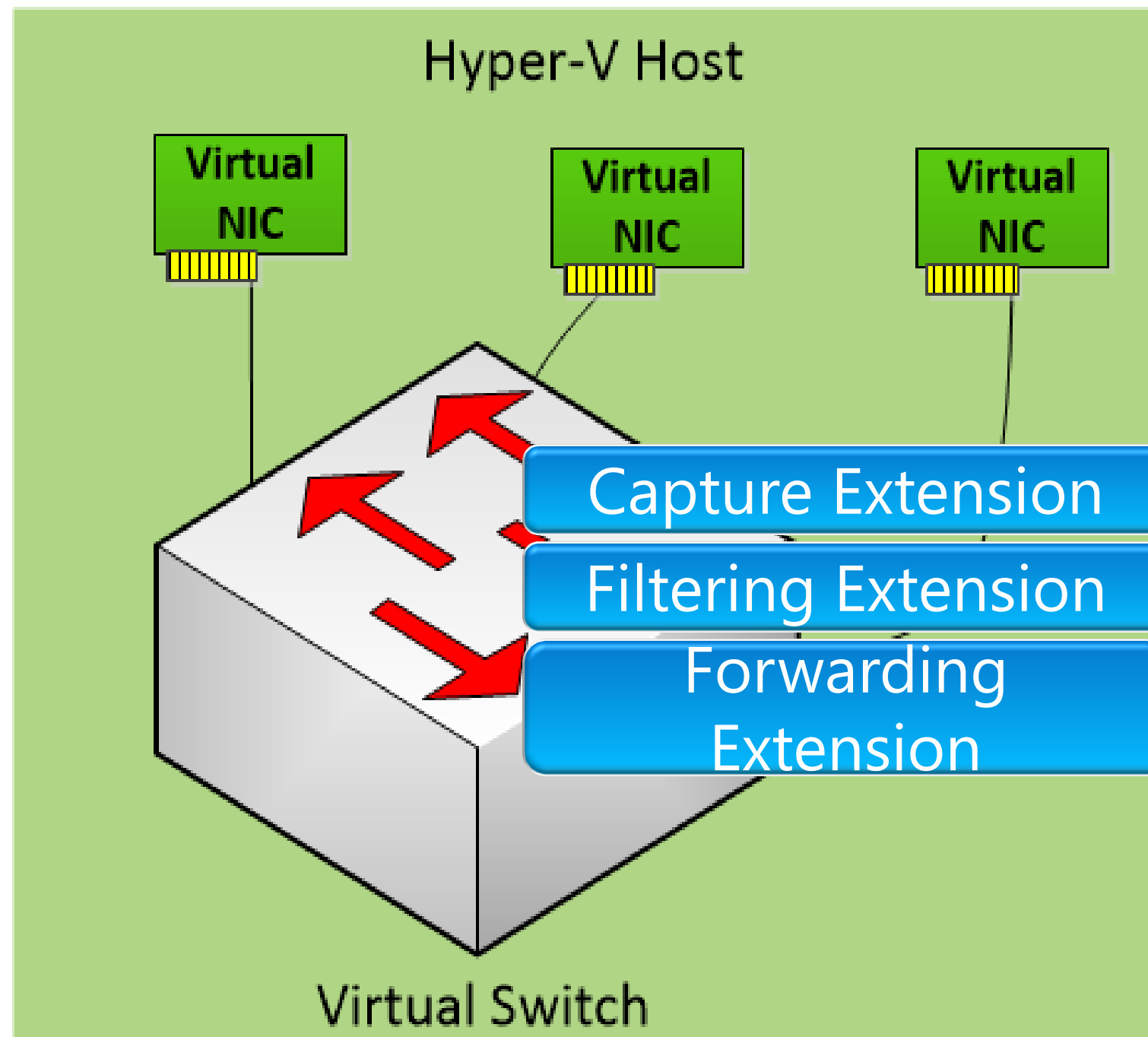
Hyper-V: Comparison with ESX

Terminology

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

Hyper-V Extensible Switch Architecture

Nexus 1000V is a Forwarding Extension



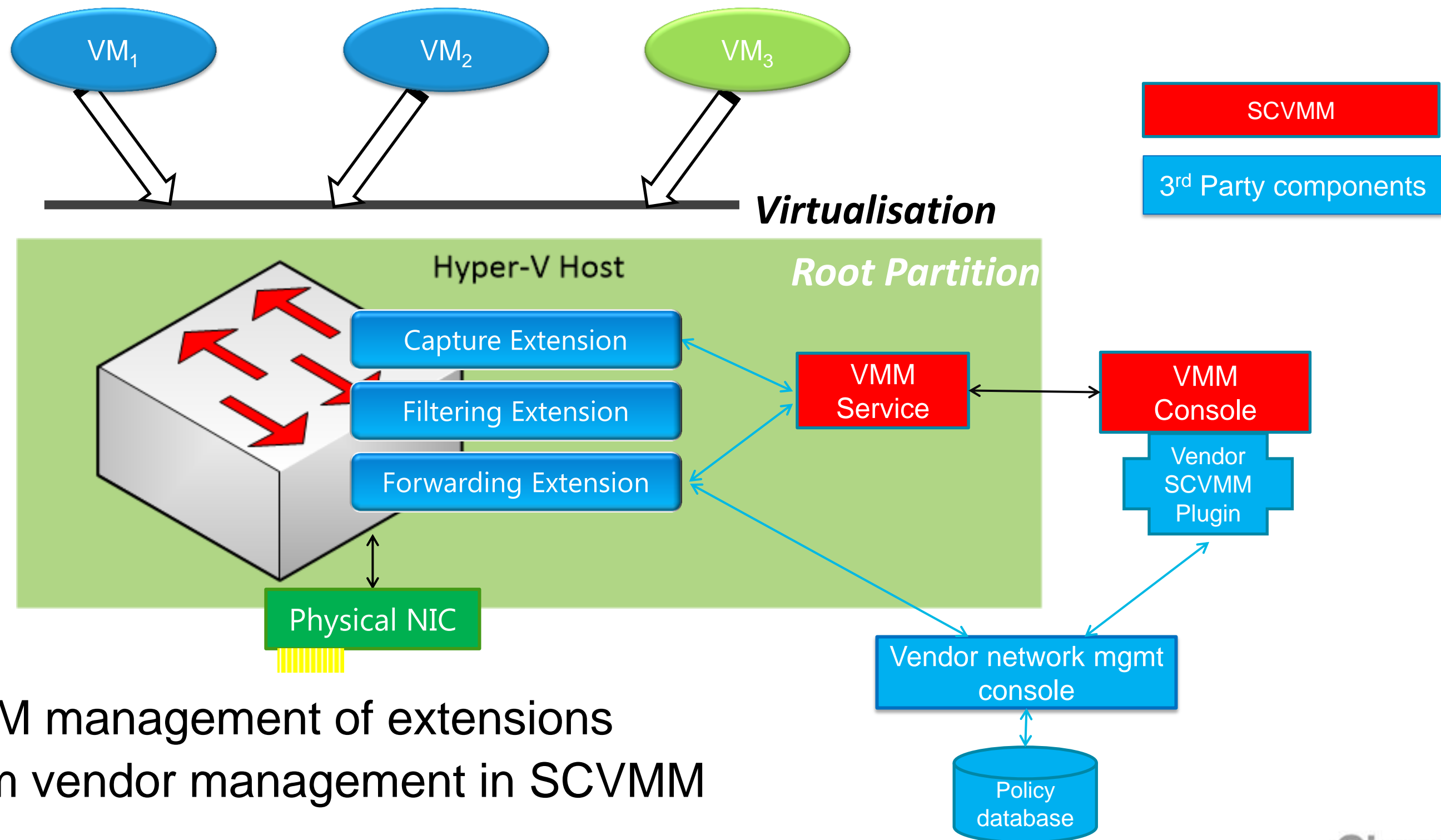
- Extensions process all network traffic, including VM-to-VM
- Forwarding Extensions can Capture and Filter Traffic as well
- Nexus 1000V will work with other 3rd party Capture and Filtering Extensions as well
- Live Migration and NIC Offloads continue to work even when the extensions are present

What is SCVMM?

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

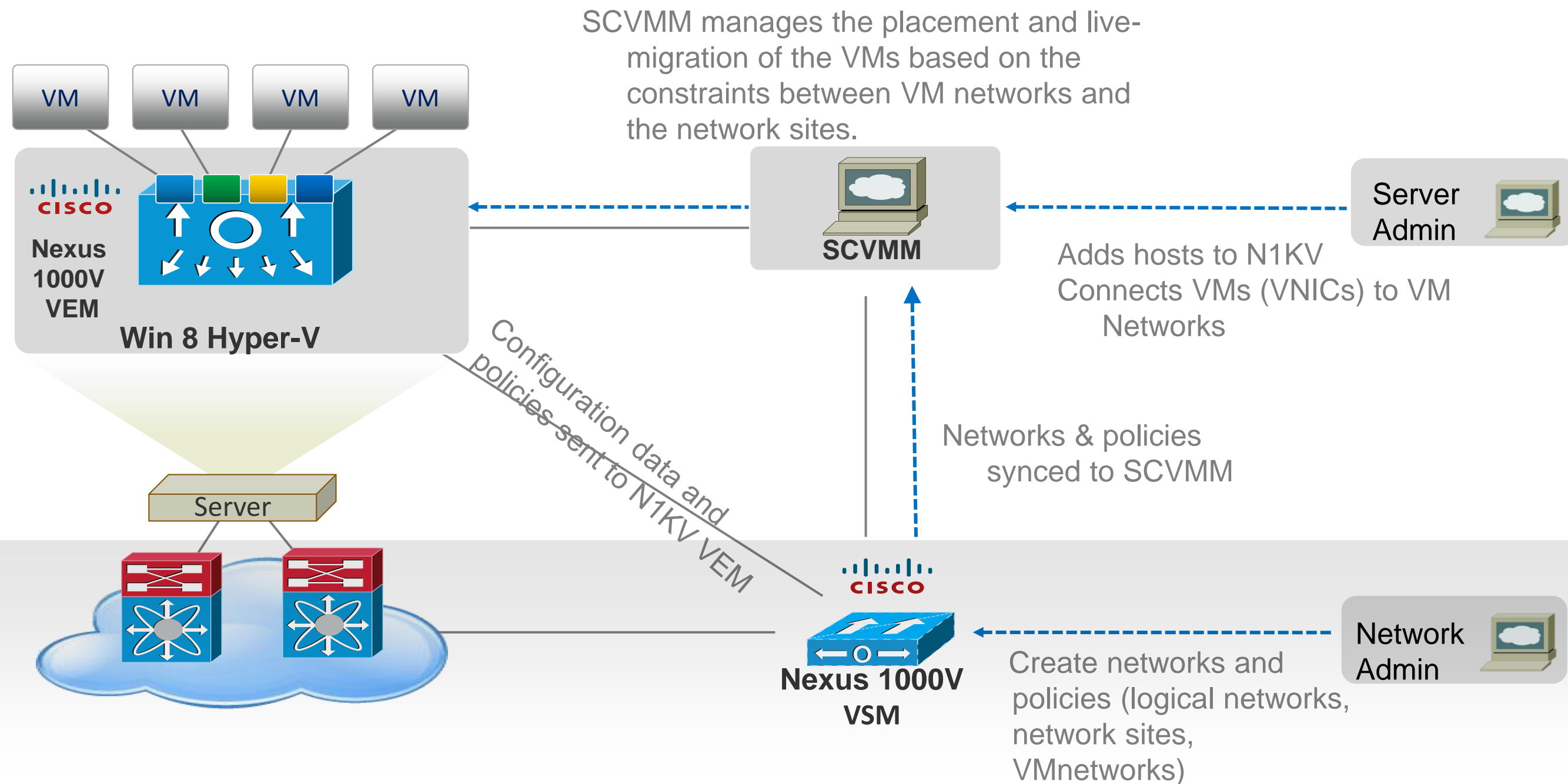
SCVMM Management of Switch Extensions



- SCVMM management of extensions
- Custom vendor management in SCVMM

Cisco Nexus 1000V for Hyper-V

Operational Model with SCVMM



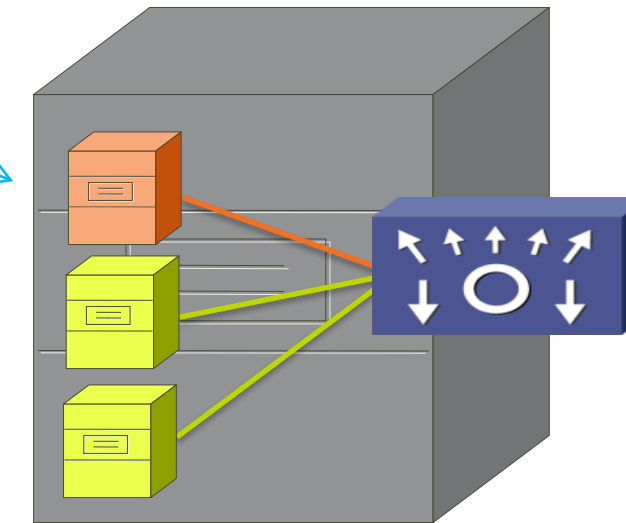
Port Profiles – Current Nexus 1000V

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
```

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



Port Profiles are “Live”:

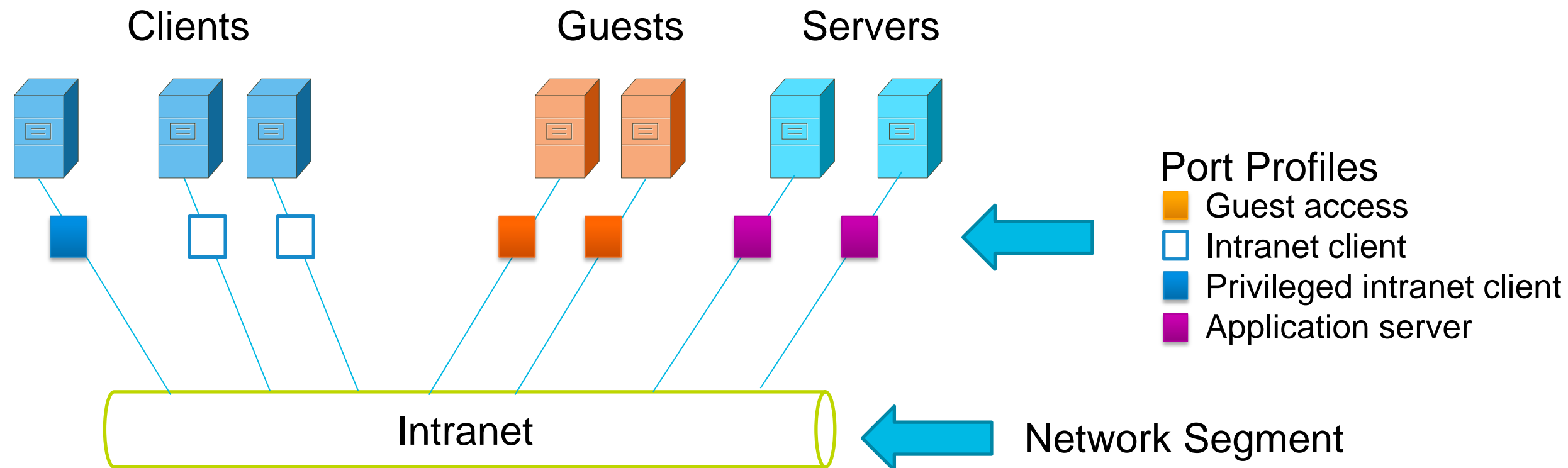
Network Admin can change them any time!



Cisco *live!*

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

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

Current Product – Port profiles only

```
# port-profile database-client1
switchport mode access
switchport access vlan 10
ip port access-group dbclient in
no shut
state enabled
```

```
# port-profile database-server1
switchport mode access
switchport access vlan 10
ip port access-group dbserver in
no shut
state enabled
```

Microsoft Hyper-V – Port Profile + Network

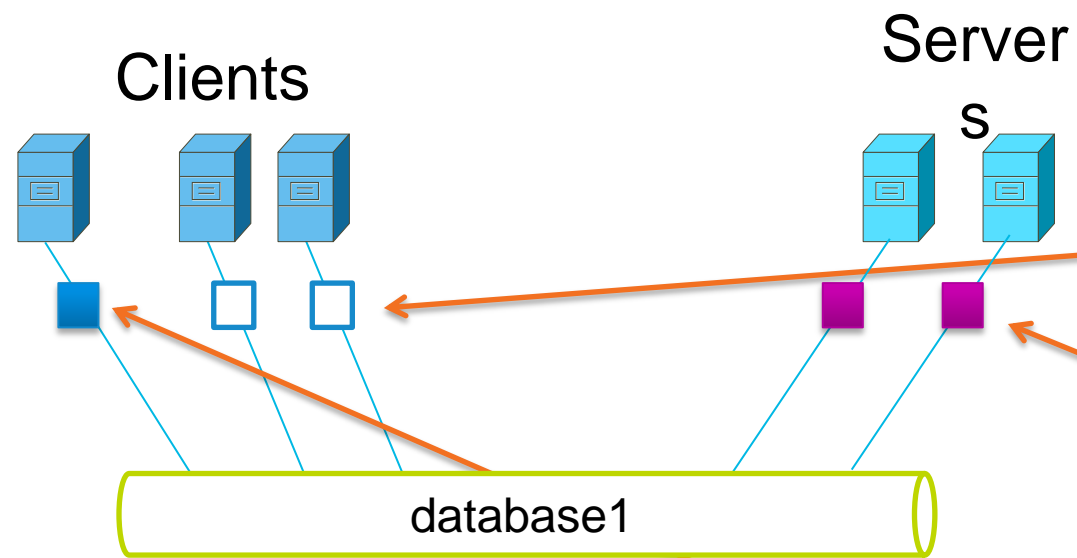
```
# port-profile database-client
ip port access-group dbclient in
no shut
state enabled
```

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

Network is separate:

```
# network-segment database1
switchport mode access
switchport access vlan 10
```

Port Profiles, Network Segments and VMs



Microsoft Hyper-V – Port Profile + Network

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

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

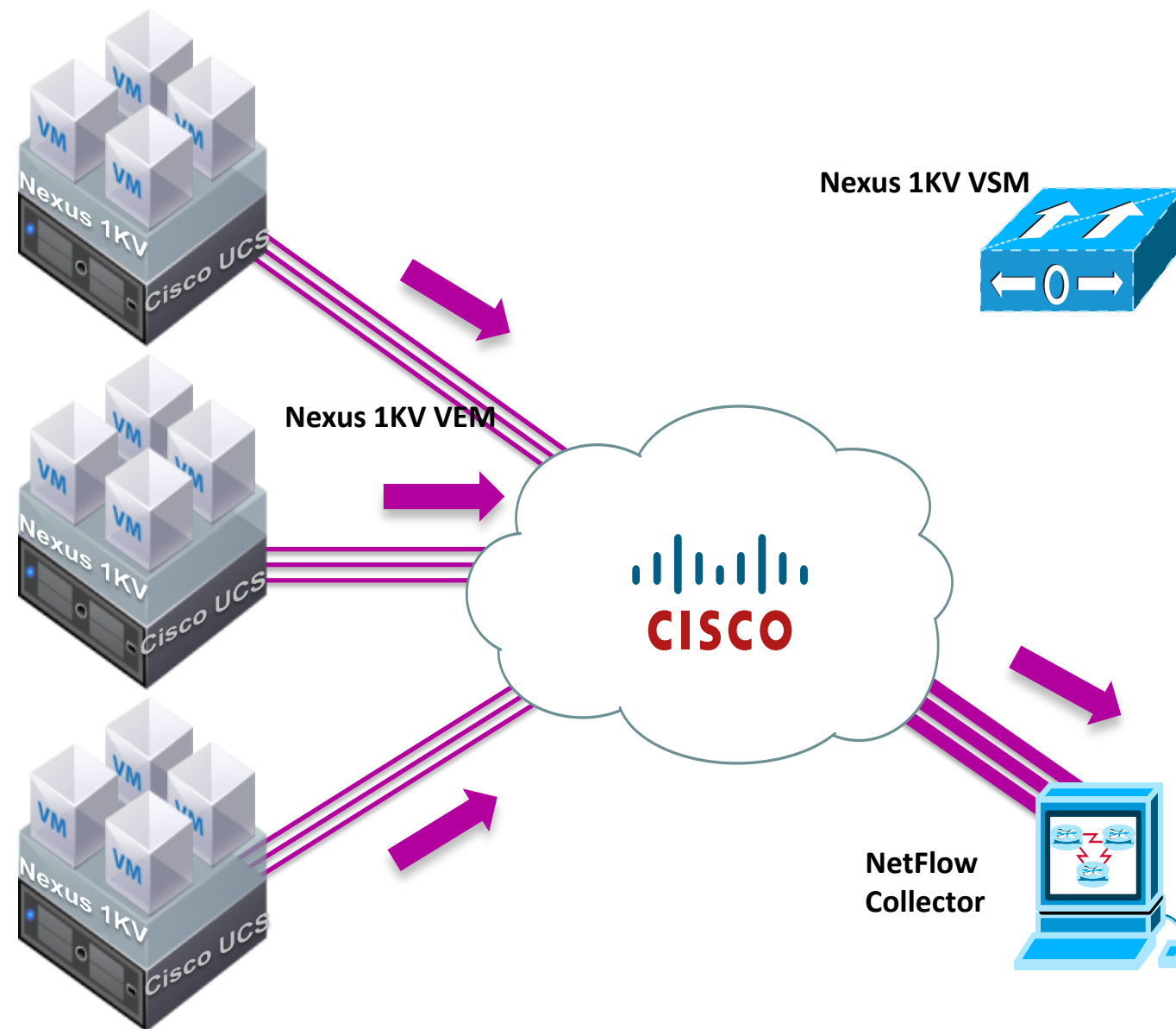
```
# network-segment database1  
switchport mode access  
switchport access vlan 10
```

```
# port-profile database-admin  
ip port access-group dbadmin in  
no shut  
state enabled
```

N1k Features

Distributed NetFlow Export on N1KV

First on Hyper-V platform



- VEMs directly export to Collectors
- Option 1: Spoofing VSM's address
 - Reverse forwarding checks need to be disabled on network
- Option 2: Use VEM mgmt address (not yet supported)
 - VEM exports "DVS ID" to enable collectors to identify all the data exported from a single switch

Using VM Networks and Port Profiles

How networks and port profiles are used

- Choose network
 - VM Network
 - VM Subnet is tied to the Network (1:1)
- 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

The screenshot shows the configuration for 'Network Adapter 1'. It is currently connected to a VM network. The 'VM network' and 'VM subnet' are both set to 'DMZ_POD1_SUBNET1'. The IP address type is set to 'Dynamic IP'. The MAC address is set to 'Static' with the value '00:15:5D:AD:AC:00'. The 'Switch Port' is set to 'Logical switch', with the 'Logical switch' set to 'Nexus 1000V Switch' and the 'Classification' set to 'DMZ_WebServer'.

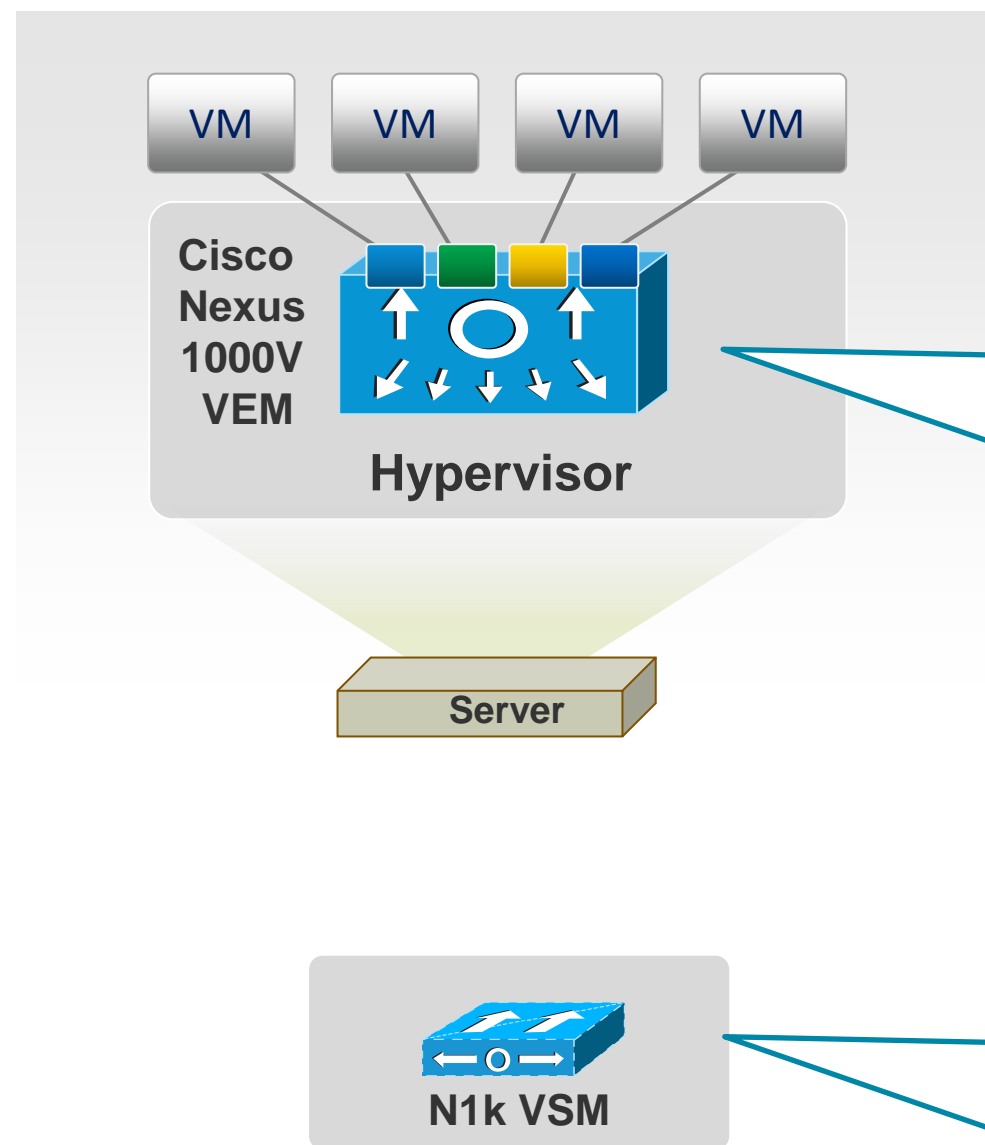
N1k Architectural Enhancements



Architectural Issues

- VSM – VEM and VSM internal communication very chatty
 - Makes it sensitive to latency. Example : inter DC deployments
- VEM over dependency on VSM reduces resiliency
- VSM is required for vSphere HA, FT, vmotion to work
- Message handling overload on VSM at higher scale
 - Reduces response time of VSM
- VSM – VEM, VSM (active) – VSM (standby) heartbeat time of 6 seconds makes it sensitive to network failures, congestion

Current Architecture

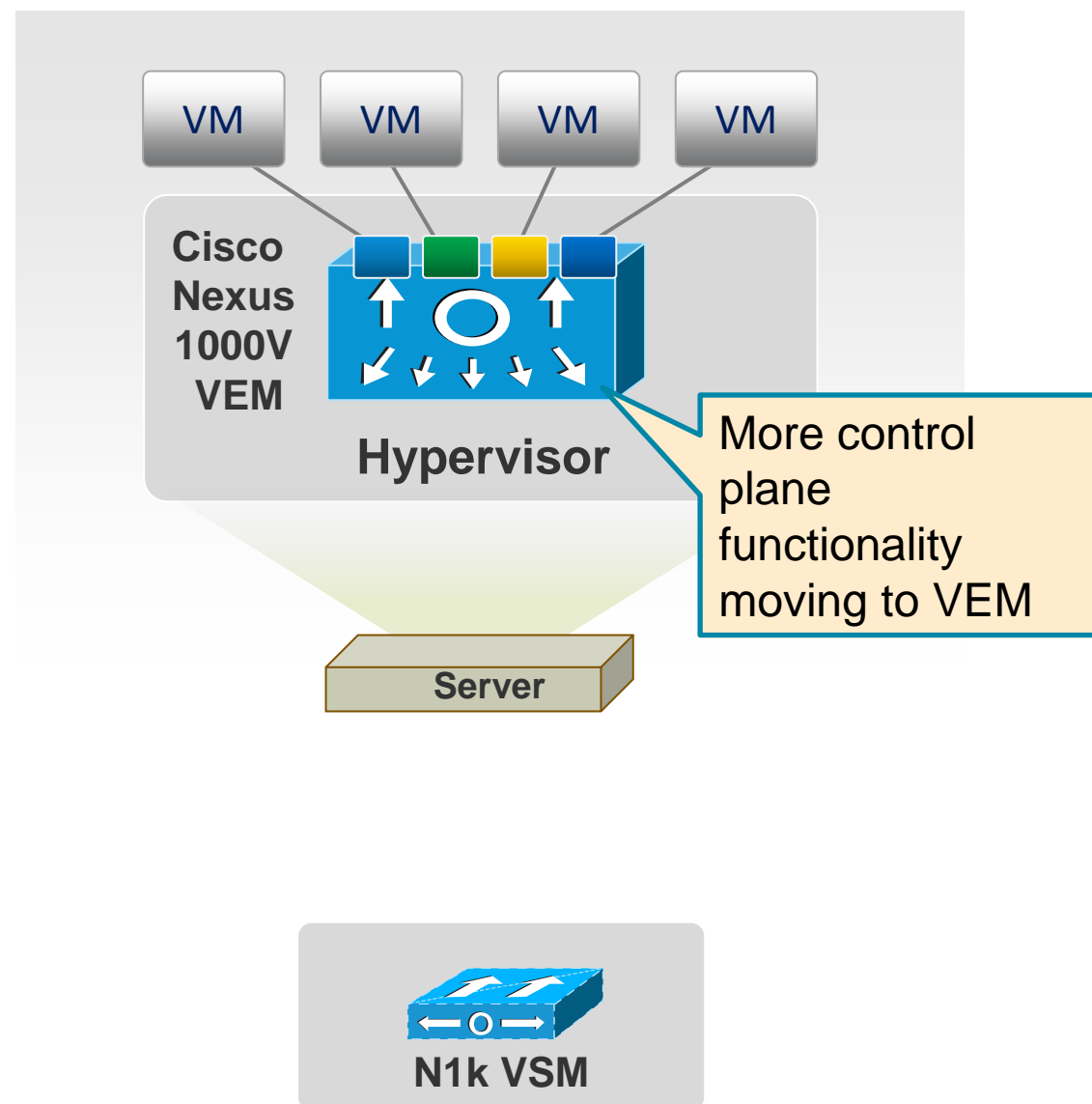


- VEM needs to talk to VSM to provision ports
- VSM has to orchestrate port bringup
- VSM has to download port profiles and network policies to VEM if the VEM does not have it

- VSM has to handle requests (port mgmt, etc) from all VEMs
- VSM has to remove the module/VEM on HeartBeat failure and reprogram when connectivity is established

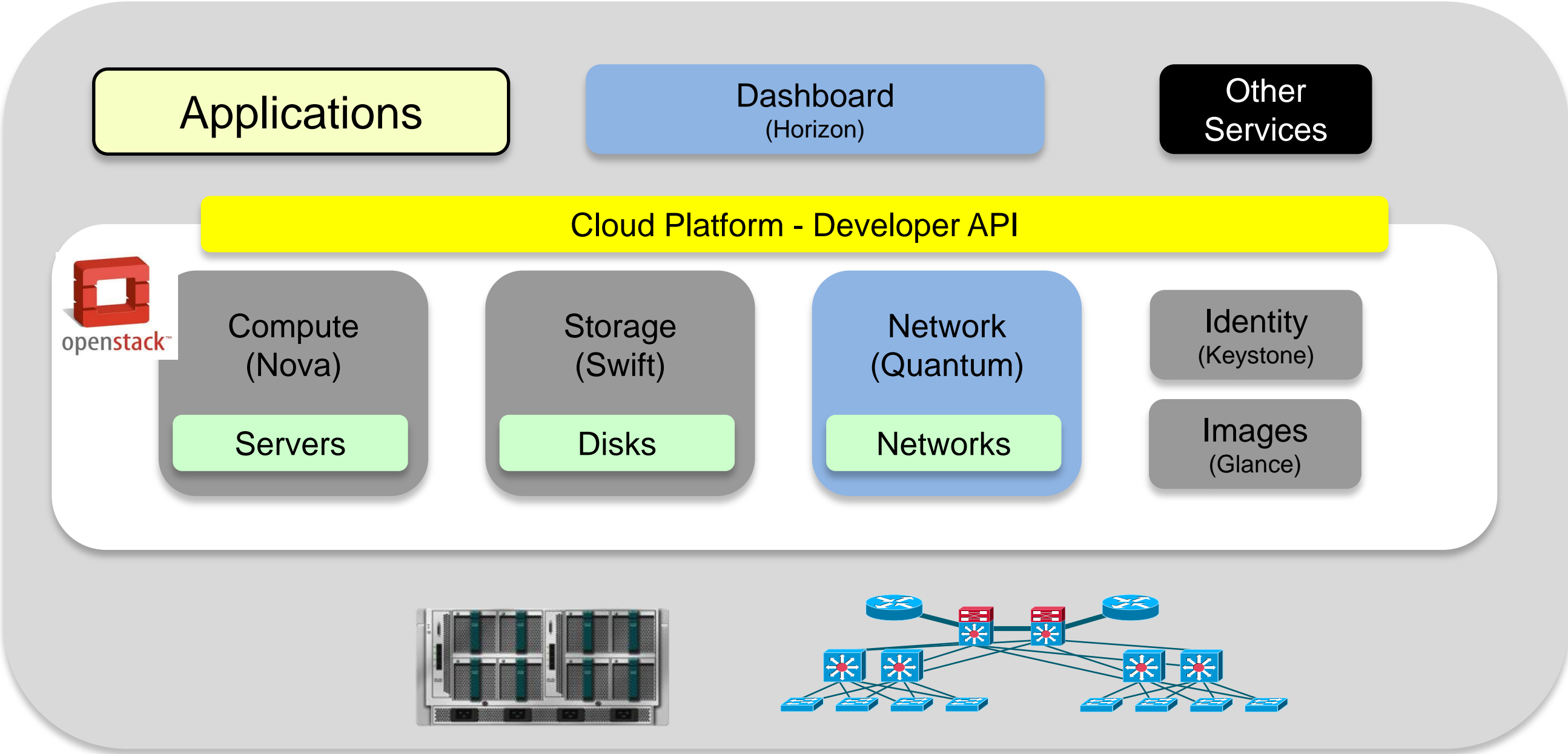
Architecture for Scale and Resiliency

Planned to ship first on KVM hypervisor 2H CY13!

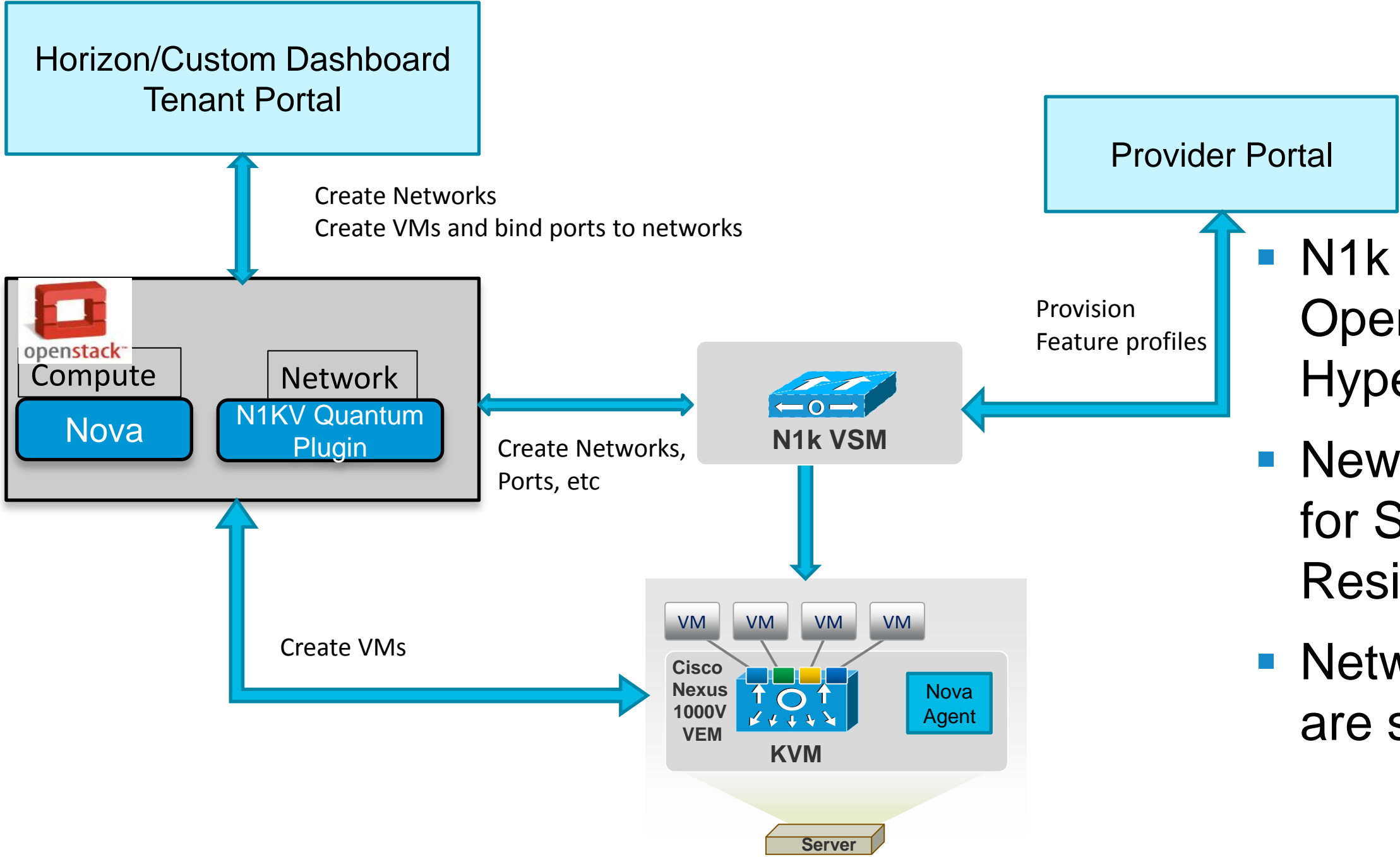


- Control plane functionality in VEM
- Reduces messages and allows significantly higher scale
 - VSM load, response time is reduced
- VSM distributes policies to VEM ahead of time
- VSM-VEM heartbeat loss will not cause VEM to go offline on VSM
- VSM-VSM HA heartbeat timeout will be increased

OpenStack Overview



OpenStack Integration with N1k



- N1k integration with OpenStack and KVM Hypervisor
- New N1k architecture for Scale and Resilience
- Network and policies are separated

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, 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	Virtualised 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	Date	Technical Track Topics	Webinar	Preso	Q&A
3/22	Nexus 1000V/1010 Overview and Update	Play	PDF	PDF	3/29	Nexus 1000V v1.4 Features & Install Overview (Installation Screencasts Link)	Play	PDF	PDF
4/05	Virtual Network Services: Virtual Service Datapath (vPath), Network Analysis Module (NAM), Virtual Application Acceleration (vWAAS)	Play	PDF	PDF	4/12	Nexus 1010 Overview & Best Practices	Play	PDF	PDF
4/19	Virtual Security Gateway (VSG) Overview (Installation Videos: Link)	Play	PDF	PDF	4/26	Virtual Security Gateway (VSG) Technical Overview	Play	PDF	PDF
5/03	Journey to the Cloud w/ N1KV: vCloud Director & Long Distance vMotion	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](#)

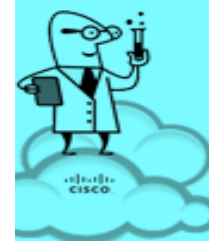
- My Cisco Community:

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



Welcome to Cisco CloudLab

Please select one of the available labs, by clicking on its name. Hover over the lab name content.

Available labs:

- Cisco Nexus 1000V - Basic Introduction (N1K-000111)
- Cisco Nexus 1000V - Installation (N1K-000211)
- Cisco Nexus 1000V - Upgrade to 1.4 (N1K-000310)
- Cisco Virtual Security Gateway (VSG) - Introduction (VSG-000110)
- Cisco Nexus 7000 - Introduction to NX-OS (N7K-000110)
- Cisco Overlay Transport Virtualization (OTV) (N7K-000210)
- Demo: Cisco Nexus 1000V (Pre-Configured) (N1K-100111)
- Demo: Cisco Virtual Security Gateway (VSG)(Pre-Configured) (VSG-100110)

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

Combined Upgrade References

- [Cisco Nexus 1000V / VMware vSphere Combined Upgrade \[Part 1 of 3\]](#)
- [Cisco Nexus 1000V / VMware vSphere Combined Upgrade \[Part 2 of 3\]](#)
- [Cisco Nexus 1000V / VMware vSphere Combined Upgrade \[Part 3 of 3\]](#)

The Nexus 1000V



Q & A



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