



Cloud Networking and Services Update

Nexus 1000V for vSphere Update

Uday Gokarn

Product Manager

Cloud Networking and Services Group

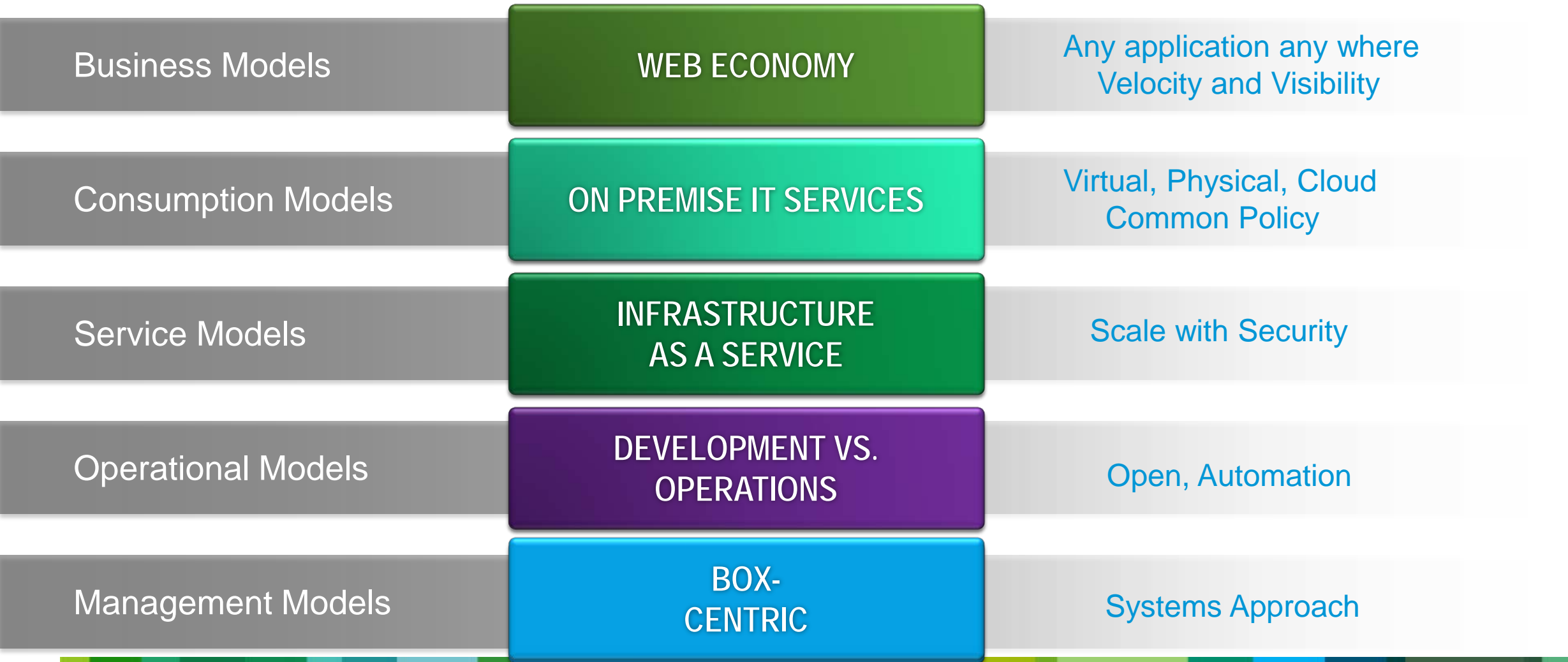
March, 2014

Agenda

- Nexus 1000V Introduction
- Nexus 1000V for vSphere
 - Evolution from Ver 1.0 to 2.0
 - What's new in Ver 2.x
 - Licensing changes
 - What's new in Ver 3.x*
- Nexus 1000V Manager*

* Preview of direction

IT'S ALL ABOUT THE APPLICATION SHIFTS THAT ARE RE-DEFINING IT—AT ALL LEVELS



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 and Services Portfolio

Virtual Application Networking

Nexus 1000V with built-in Distributed Virtual Firewall (VSG)
for vSphere, Hyper-V **New** and KVM

Virtual Network Services

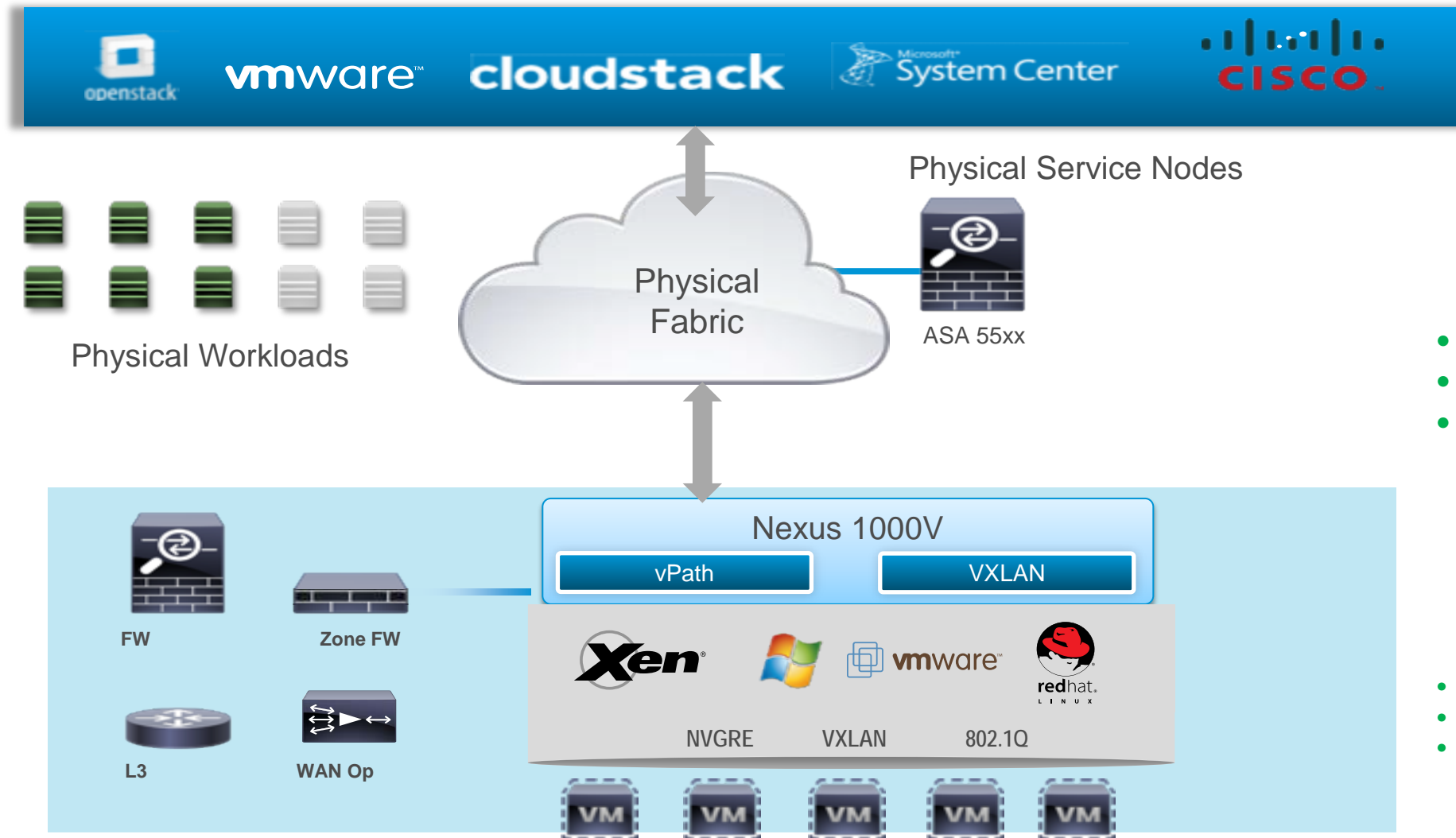
- L4-L7 Services Hosting Platform
- Perimeter Firewall - ASA1000V,
 - Cloud Services Router - CSR
 - Virtual Network Analysis Modules - vNAM,
 - Virtual Wide Area Acceleration - vWaas **New**
 - Load Balancer - Citrix NetScaler 1000V

Hybrid Cloud

InterCloud **New**

Nexus 1000V for Any Fabric Architecture

Seamless Interaction Across Physical and Virtual Workloads & Services



Orchestration
and Fabric
Automation

Physical
Fabric Infrastructure

- Traditional
- Dynamic Fabric Automation
- Application Centric Infrastructure

Virtual
Fabric Infrastructure

- Multi-Hypervisor
- vPath L4-L7 Services
- VXLAN

Use Cases for Nexus 1000V – 9000+ Customers

Virtual Data Center

Managing Policies for VMs



Secure Container - Cloud

Secure Multi-Tenancy



VDI

Secure VDI



OpenStack

Self-Service Cloud



Multi-DC

DC to DC Live Migration



Virtual Services Hosting

Easy of Deployment



Hybrid Cloud/Shadow IT

Secure Extension



Nexus 1000V Editions

Nexus 1000V Essential Edition

The world's most advanced virtual switch available across vSphere and Hyper-V Platforms

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

No-Cost Version

Nexus 1000V Advanced Edition

Increased Scale and Security

- All Feature of Essential Edition
- Virtual Security Gateway - Distributed firewall
- Increased Scale up to 256 servers
- Large Scale VXLAN overlay
- Enhanced Security Features
- VXLAN Gateway

\$695 per CPU MSRP

Nexus 1000V Editions Offers Flexibility for Customers to Deploy Cisco Virtual Data Center

Existing 1.0 Customers (with active SASU Support)

Free Upgrade to Advanced Edition

N1KV Release 1.X

N1KV Licenses
Bought and Deployed

Existing Cisco TAC Support Contract Will
Include Cisco
VSG Support

Free Upgrade to
Release 2.x
Advanced for
active SmartNet
Customers

N1KV Release 2.x

N1KV—Advanced Edition:
No Cost
Use Existing Licenses



VSG License*:
No Cost

*Contact Cisco Representative
for Free VSG licenses for old releases. With 2.2 release
no VSG license required



What's new in Ver 2.1?



Review of features in 4.2(1)SV2(1.1) Release

“Further Simplify and Enrich the End-User Experience”



Ease

- Enhanced installer app
- Enhanced upgrade process



Redundancy

- Split VSMs across data centers
- VEMs in remote branch offices



Visibility and Troubleshooting

- vCenter plug-in
- vTracker



Integrated Security

- Cisco TrustSec SXP support

Two Editions

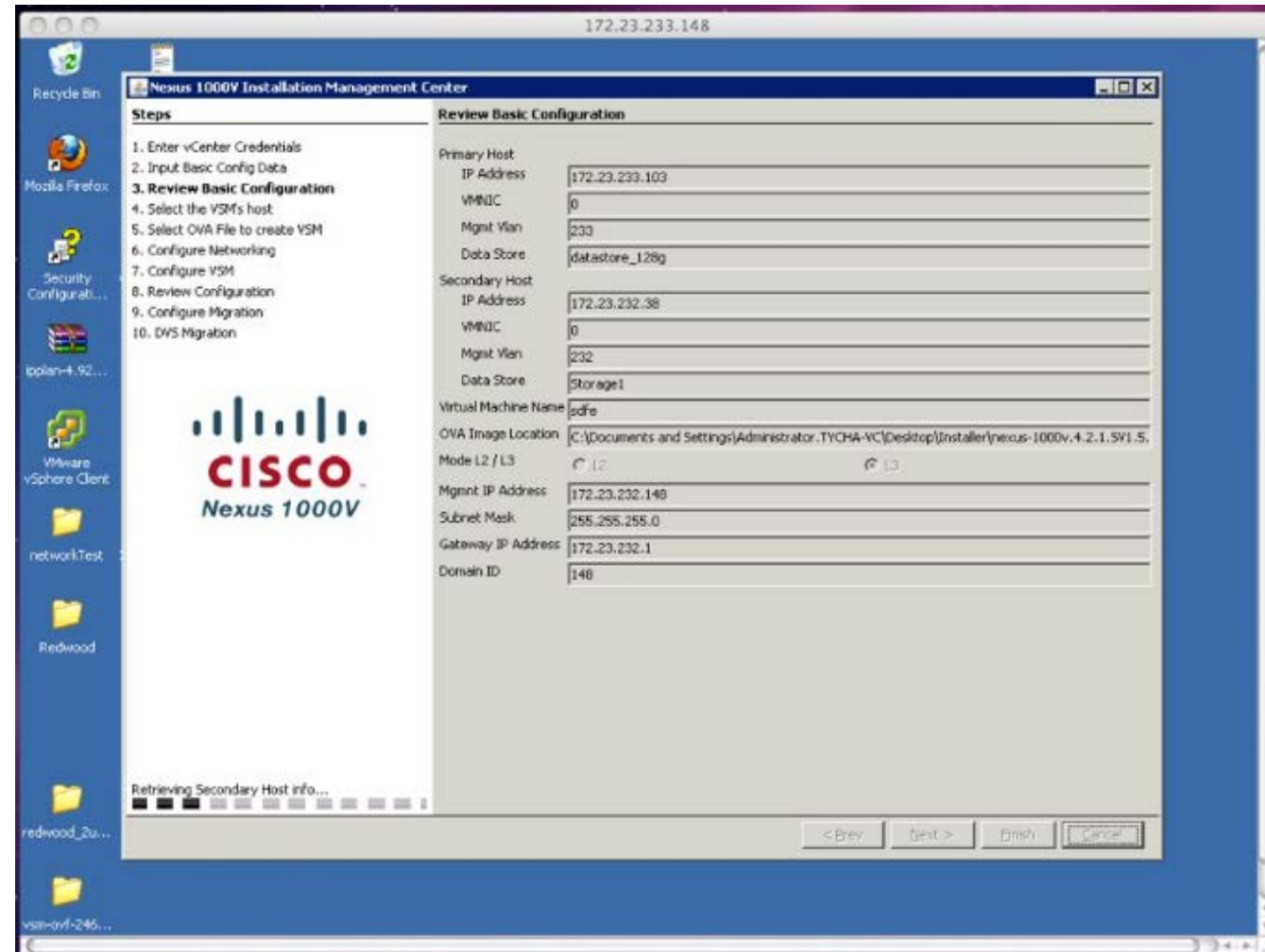
ADVANCED
EDITION
\$695

ESSENTIAL
EDITION
\$0

Enhanced Installer App

Simplifying the installation process

- Single pane of glass – simplified installation process
 - VSMs, VEMs,
 - VSM HA
 - VSM – VEM communication mode
- Options: Standard or Custom Installation
- The app supports:
 - L3 (default) & L2 mode
 - HA mode (default)
 - Can load inputs from a config file
- Recommended for clean installation only



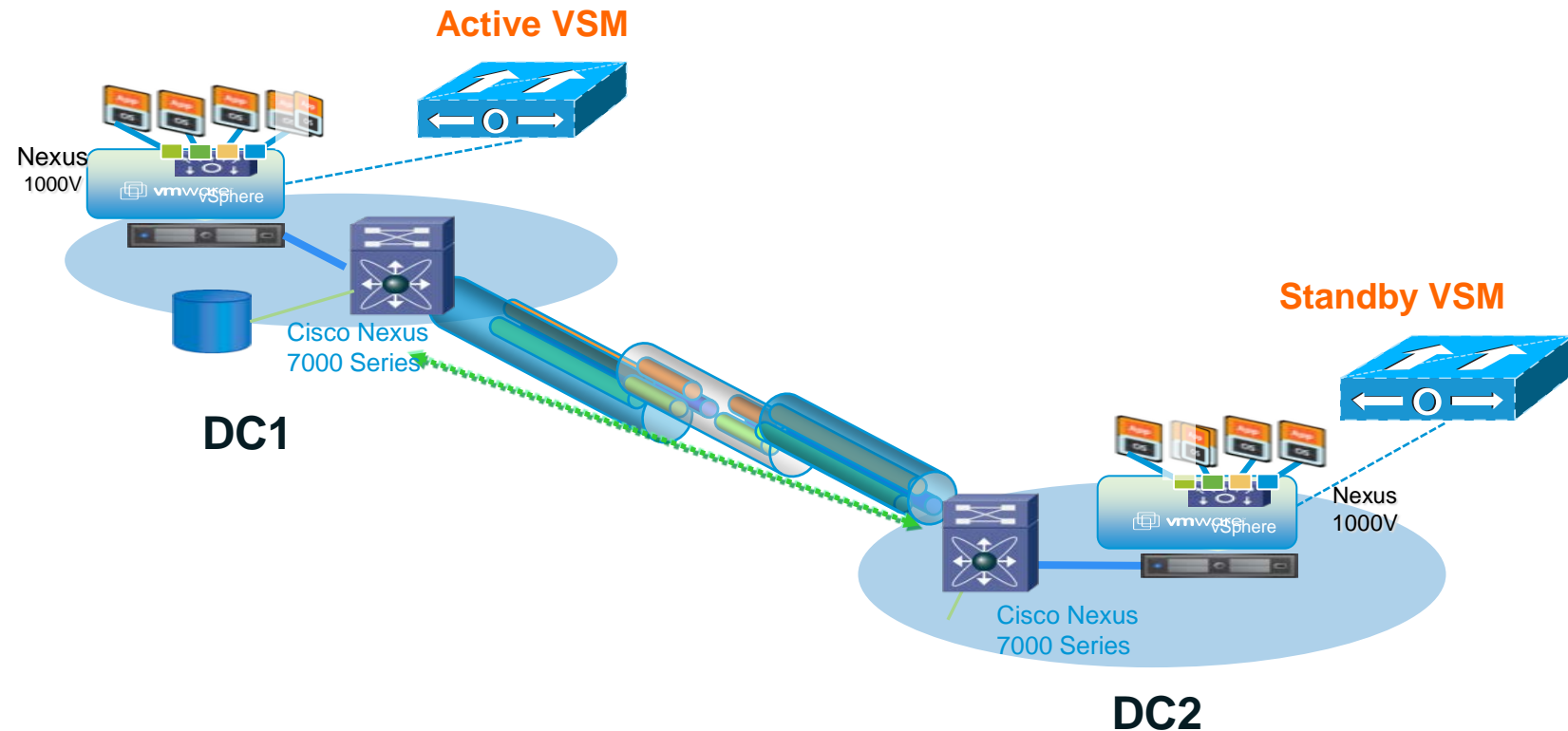
Simplifying Upgrade Process

1. Flexibility to schedule N1KV upgrades on a per-host basis
 - ✓ Enabling incremental upgrades even during short maintenance windows
2. Simultaneously upgrade N1KV along with vSphere Hypervisor
 - ✓ Requires vSphere version 5.0 U1 & above
 - ✓ Supported in N1KV version – 1.5.2 and above
3. Modify VSM configurations between the upgrade maintenance windows
 - ✓ VSM configuration changes allowed: Add/remove modules, port config, vlans, and other commands

Redundancy across DataCenters

Active and Standby VSMs across DCs

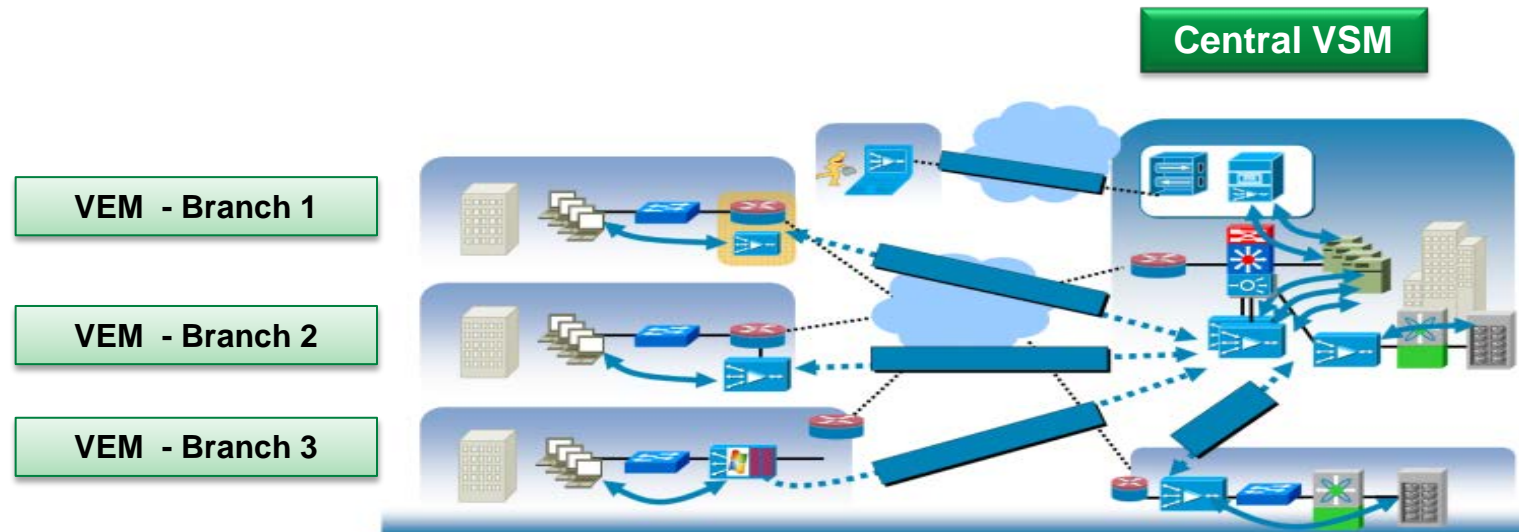
- ✓ VSM can be split across two Datacenters
- ✓ Max Latency of 10ms recommended



Enabling Centralized Management of N1KV

Extending VEMs to branch offices

- ✓ VSM can be in a central location in the Head Quarter Datacenter
- ✓ VEMs can be spread across in different branches
- ✓ Max Latency of 100ms recommended
- ✓ Use case: Centralized management for both DC and branch



VMware vCenter Plug-in

Providing a holistic view of the virtual network from VMware vCenter

- N1KV Dashboard in vCenter presenting the VSM level and VEM level information
- VSM level information:
 - VSM health status
 - License information
 - Limits information
- VEM level information
 - Summary
 - PNIC information
 - Connected VM's
 - Limits

The screenshot displays the 'Cisco Nexus 1000V' VSM level information. It includes a 'System' table with details like Switch Name, NX-OS Version, VSM IP, DC Name, Connectivity Mode, VC Connectivity, and VSM HA. Below this is a 'Network Statistics' table showing VNICs vs Max, Hosts vs Max, Port-Groups vs Max, Veths/Host Max, and *VlanVxLan vs Max. A 'Licenses' table at the bottom lists license types, available and used counts, and expiration dates.

Switch Name	NX-OS Version	VSM IP	DC Name	Connectivity Mode	VC Connectivity	VSM HA
Cx-VSM-VCP-Test	4.2(1)SV2(1.1) [build 4.2(1)SV2(1.0.134)] [gdb]	10.78.0.126	DC-1	L2	Connected	true

VNICs vs Max	Hosts vs Max	Port-Groups vs Max	Veths/Host Max	*VlanVxLan vs Max	
				Vlan	VxLan
76(2048)	4(64)	1942(2048)	76(216)	1944(2048)	N/A(N/A)

License Type	Licenses Available	Licenses Used	Earliest Expiration	Status
NEXUS_VSG_SERVICES_PKG	16	0	16 Oct 2012	Unused
NEXUS_ASA1000V_SERVICES_PKG	48	0	Never	Unused
NEXUS1000V_LAN_SERVICES_PKG	2075	5	03 Sep 2012	In use

The screenshot displays the 'Cisco Nexus 1000V Switch Level Details' for the VEM level. It features a table with columns for Host Name, NX-OS Version, Host IP, License, Host / Module, VMs / Host, and VNICs / Host.

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	5	2	0
10.78.0.119	4.2(1)SV2(1.1)	10.78.0.119	licensed	4	1	0
10.78.0.117	4.2(1)SV2(1.1)	10.78.0.117	licensed	3	7	0
10.78.0.118	4.2(1)SV2(1.1)	10.78.0.118	licensed	6	3	0

vTracker

Added visibility into the virtual and physical network

Providing added network information at the fingertips:

1. vMotion View
2. VLAN View
3. VM-Info View
4. VM vNIC View
5. Module PNIC View
6. Upstream network view

vMotion View

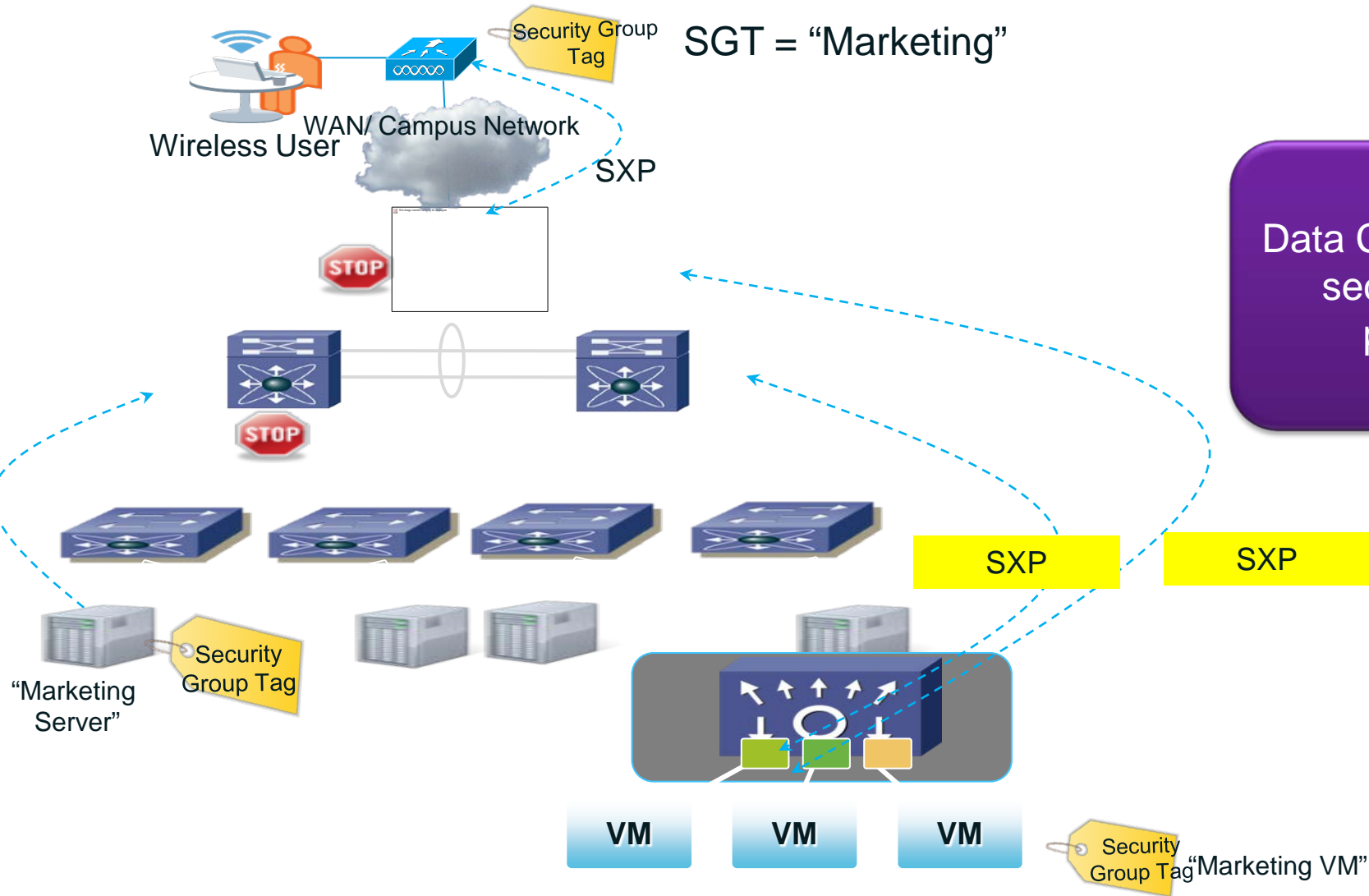
```
VSM-Cinq-x# show vtracker vmotion-view count 5
Note: VM Migration events are shown only for VMs currently
      managed by Nexus 1000v.
-----
VM-Name          Src-  Dst-  Start-Time          Completion-Time
                  Mod   Mod
-----
Fedora-skk       5     5     Wed Jul 25 01:41:58 2012 Wed Jul 25 01:41:59 2012
Fedora-skk       4     5     Tue Jul 24 22:55:50 2012 Tue Jul 24 22:56:02 2012
Fedora-skk       5     4     Tue Jul 24 22:55:12 2012 Tue Jul 24 22:55:23 2012
Fedora-skk       4     5     Tue Jul 24 22:52:10 2012 Tue Jul 24 22:52:30 2012
Fedora-VM2       5     4     Tue Jul 24 22:38:25 2012 Tue Jul 24 22:38:36 2012
-----
VSM-Cinq-x#
```

VLAN View

```
VSM-Cinq-x# show vtracker vlan-view vlan 400-402
* R = Regular Vlan, P = Primary Vlan, C = Community Vlan
  I = Isolated Vlan, U = Invalid
-----
VLAN  Type  VethPort  VM Name          Adapter Name  Mod
-----
400   R     Veth2     Fedora-VM2       Net Adapter 3  4
      Veth6     gentoo-cluster2-1  Net Adapter 2  5
      Veth7     gentoo-cluster2-1  Net Adapter 3  5
      Veth9     Fedora-VM2       Net Adapter 1  4
401   R     Veth2     Fedora-VM2       Net Adapter 3  4
      Veth6     gentoo-cluster2-1  Net Adapter 2  5
      Veth7     gentoo-cluster2-1  Net Adapter 3  5
      Veth9     Fedora-VM2       Net Adapter 1  4
402   R     Veth2     Fedora-VM2       Net Adapter 3  4
      Veth6     gentoo-cluster2-1  Net Adapter 2  5
      Veth7     gentoo-cluster2-1  Net Adapter 3  5
      Veth9     Fedora-VM2       Net Adapter 1  4
-----
VSM-Cinq-x#
```

Cisco TrustSec Support

Enables DC segmentation for virtual workloads





What's new in Ver 2.2?



New in Version 2.2

"Evolve the virtual network"

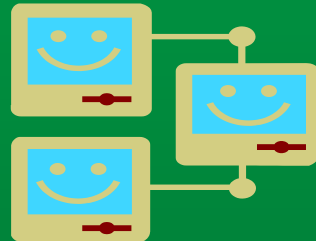
SCALE



Increased Scale

- 128 hosts
- 300 ports per host
- 4000+ ports per VSM

Evolution of VXLAN



Enhanced VXLAN

- Multicast-less mode
- No flood and learn
- Mac-address distribution

VXLAN Gateway



VXLAN to VLAN

- Seamless integration with Physical network
- Scale the Datacenter

Enhanced VXLAN

- Multicast-less mode
 - Simplifies VXLAN deployment
 - Provides better performance
 - Reduces network dependency
 - Easier troubleshooting
- No flood and learn
 - Improved switching performance
 - Reduced latency
 - Lesser lookup cycles
 - Increased security – Unknown broadcast suppressed
- Mac-address distribution
 - Faster response time
 - Efficient switching

VXLAN Gateway

What?

- A Layer 2 Gateway that extends the VXLAN Layer 2 domain to physical servers and services deployed on a VLAN

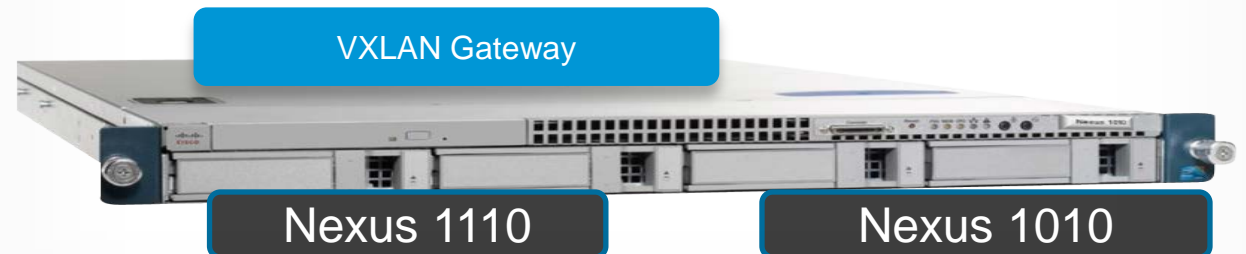
When?

- Created when a Layer 2 adjacency is required between VMs on a VXLAN and physical servers / services on a VLAN

How?

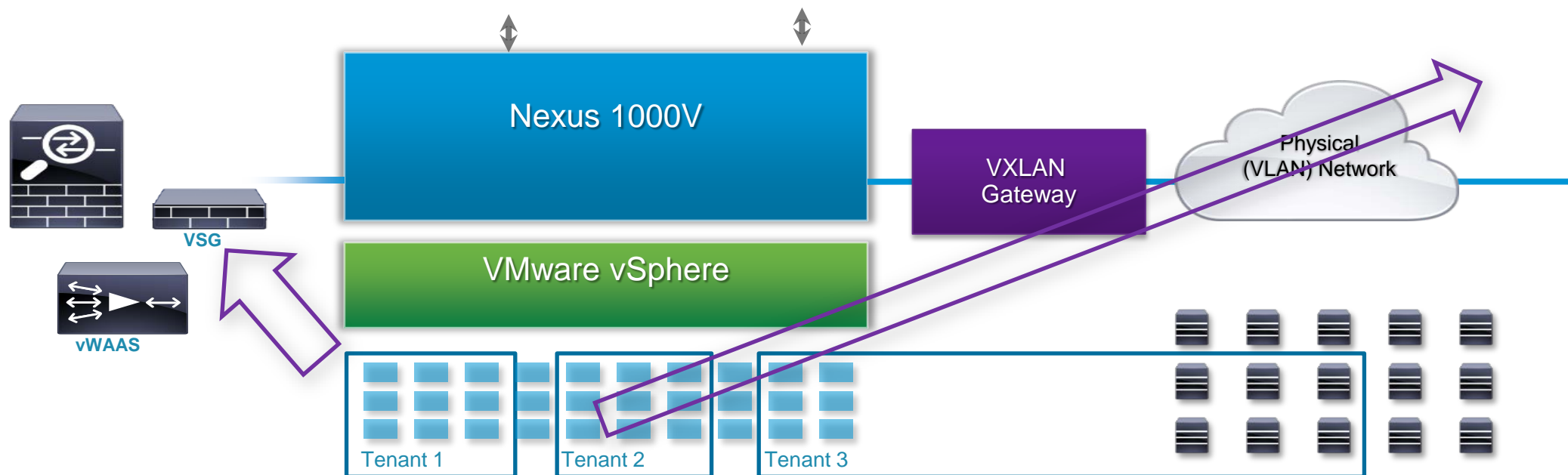
- The VXLAN gateway is managed as a VEM from the Nexus 1000V VSM
- VXLAN Gateway is a feature of the **Advanced Edition**, no additional cost
- Define a mapping between a VXLAN and VLAN on VSM

Where?



VXLAN Gateway is created as Virtual Service Blade on the Nexus 1110/1010

VXLAN Gateway



Tenant 1: virtual workloads protected by virtual firewall

Tenant 2: virtual workloads protected by physical firewall (via VXLAN GW)

Tenant 3: virtual & physical workloads in same L2 domain (via VXLAN GW)

Nexus 1000V 2.0 for vSphere

2H
CY12

v2.1 (Oct 12)

- VXLAN
- vCloud Director Integration
- vCenter Plug-in
- vTracker
- Enhanced Installer
- Simpler upgrade
- Split VSMs across DCs
- VEMs in remote locations
- Essential (free) & Advanced Edition
- TrustSec – SGT, SXP

1H
CY13

v2.2.1 (June 13)

- Scale:
 - 4K ports
 - 128 hosts
 - 300 vEths/VEM
- VXLAN Enhancements
 - no multicast
 - no flood/learn (single VSM)
- VXLAN GW on 1010/1110 (Advanced)
- VMW 5.5 support

2H
CY13

v2.2.1a
Oct 13

Citrix
NetScaler1000V

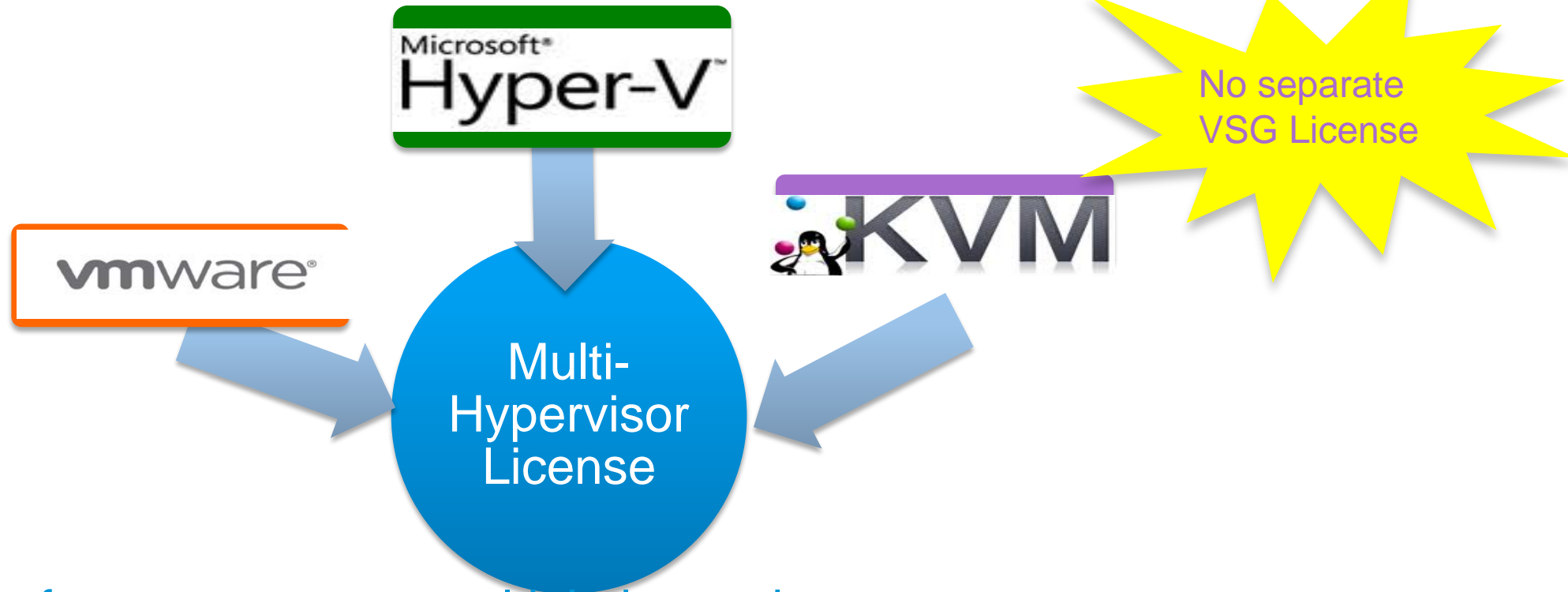
1H
CY14

v2.2.2
Jan 14

- Support for DFA
- Bundled VSG Licensing
- Multi-hypervisor licensing

vSphere 5.5
supported

Simplify Ordering/Deployment – Multi-hypervisor license



- One License file for re-use across multiple hypervisors
- All existing vSphere Licenses are multi-hypervisor licenses
- Hyper-V Release 5.2(1)SM1(5.2) supports multi-hypervisor licensing
- VSG Release VSG 2(2.2) onwards do not need a separate VSG license

VSG Licensing – New Installation

- For N1KV version 1.5.2(b) or earlier – VSG license required
- For N1KV version 2(1.1) and 2(2.1) - \$0 VSG license. License file is still required to be installed. Can request for free VSG license from Cisco account team.
- For N1KV version 2(2.2) - No separate VSG license file is required

VSG is available only with the Nexus1000V Advanced Edition

VSG Licensing – Customers upgrading

- Upgrading from 1.5.2(b) or earlier to 2(1.1) and 2(2.1) - License file is still required to be installed. Can request for free VSG license from Cisco account team.
- Upgrading from 1.5.2(b) or earlier to 2(2.2) - No separate VSG license file is required.

VSG is available only with the Nexus1000V Advanced Edition

Nexus 1000V 3.0 for vSphere*

Summer
2014

- ACI Fabric Support
- Increased Scale:
 - 12K ports
 - 256 hosts
 - 1000 ports/VEM
- VXLAN Enhancements
 - BGP control plane (multi-VSM)
 - VTEP distribution
- VXLAN GW as VM
- Cisco TrustSec 2.0
 - SGACL
 - Native SGT Tagging
- IPv6 with ACL
- Virtual Security Gateway with increased scale

* Preview of direction

Existing Customers (with active SmartNet Support)

Free Upgrade to 3.0 Edition

N1KV Release 1.X and 2.X

N1KV Licenses (1.0) and Advanced Licenses (2.0)
Bought and Deployed

Free Upgrade to
Release 3.x
Advanced for
Active SmartNet
Customers

N1KV Release 3.x

N1KV—Advanced Edition:
No Cost
Use “New” Licenses*

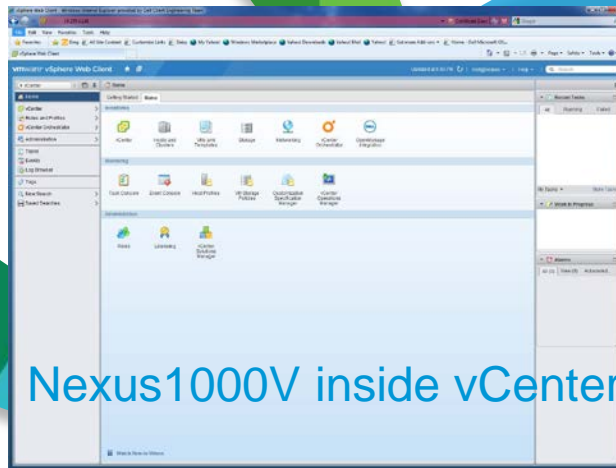
*Contact Cisco TAC. New Licenses will be used after entitlement check

Enhanced out of box experience of Nexus 1000V

Introducing Nexus 1000V Manager – Free tool available in Summer 2014*

Install & Migrate

Ease Install of VEM/VSM and migration to VMs to N1KV



Upgrade & Monitor

Upgrade multiple VSM and VEM and monitor on-going performance

Configure

Configure and Manage N1KV features and port-profiles

* Preview of direction

Calling for beta

- Are you interested in participating in the Beta program for:
 - Nexus1000V Ver 3.0 for vSphere (Beta starting in April 2014)
 - Nexus 1000V Manager (Beta starting in May 2014)

Please send an e-mail from your Company's official e-mail address to Uday Gokarn – ugokarn@cisco.com

Be sure to include:

- Company Name
- Your Title
- CCO user id
- Features of interest and your use case for the same

Nexus1000V Demo

(<https://cloudlab.cisco.com>)



Region:  US-West-01




Welcome to Cisco CloudLab



Instructions: Choose a virtual lab from the list below by clicking its **Select** button.

Lab: Cisco Nexus 1000V (2.1) - General Overview (N1K-000114)

 **Content:** Cisco Nexus 1000V with layer 3 deployment. Attaching Virtual Machines to the Cisco Nexus 1000V, VMotion with Visibility and Policy-based Virtual Machine connectivity.


Demo: Cisco Virtual Security Gateway (VSG)(Pre-Configured) (VSG-101110)

Pre-configured intro/demo - Content: Zones, Security Policies and Security Profiles, Binding Security Profiles to Port-Profiles, Validate Virtual Machine Security, VMotion and Validation of VM Security.

Lab: Cisco Nexus 7000 - Introduction to NX-OS (N7K-000110)

Content System Configuration, Management VRF Concept and Basic Connectivity, CLI Familiarization, Role-based access control (RBAC), Configuration Rollback, Configuration Session, OSPF Configuration, Process Restartability, Licensing, Hot Standby Routing Protocol (HSRP).

Nexus 1000V Install Lab (N1K-000115)

 **Content:** Nexus 1000V Installer Lab hands-on lab.

Summary

- Improved Scale on Nexus1000V
- Simplified installation and monitoring
- Simplified licensing
- Easier physical virtual integration with VXLAN Gateway
- Tighter integration with VMware

For More Information

- Cisco Nexus 1000V Community

<https://communities.cisco.com/community/technology/datacenter/nexus1000v>

- Cisco Nexus 1000V Product Information

<http://www.cisco.com/c/en/us/products/switches/virtual-networking/index.html>

- Upcoming Seminars

3/26 – Cisco Nexus 1000V for Microsoft Hyper-V update

4/2 - Citrix Netscaler 1000V Update

Future – Cisco Nexus 1000V KVM/OpenStack Solution

Cisco Nexus 1000V for ACI deployments

Cisco Nexus 1000V Distributed Firewall – VSG Deployment