Cisco Nexus 1000V Update

Uday Gokarn, Product Manager, Nexus 1000V

Balaji Sivasubramanian, Director, Cloud and Virtualization Group

April 21, 2015

Agenda

- **Nexus1000V Support for VMware vSphere 6.0**

- **Nexus1000V Benefits**

- **Nexus1000V for vSphere Major Release Ver 3.1 Update**
  - Highlights of the release
  - Micro-segmentation and Distributed Firewall
  - Simplified installation/upgrade of Nexus1000V
  - Monitoring from within vCenter

- **Nexus1000V Across Multiple Hypervisors**

- **Cisco VACS**

Executive Summary

- Cisco is fully committed to virtual networking across multiple hypervisors and going forward containers

- Cisco Nexus 1000V will be supported in vSphere 6.0 and future versions of vSphere as well as Microsoft Hyper-V and RHAT/Canonical KVM hypervisors

- Cisco is committed to supporting Nexus 1000V for its 10,000+ install base of customers

- Cisco will continue to sell Nexus 1000V across multiple hypervisors for various cloud solutions

Nexus1000V software for vSphere 6.0 shipping now

Nexus 1000V and VMware vSphere Support

- Nexus 1000V has been supported since vSphere 4.0 in 2009

- Cisco and VMware have agreed to extend support of Nexus 1000V in vSphere 6.x and future releases
  - Nexus 1000V releases - 5.2(1)SV3(1.4) supporting VMware vSphere 6.0 started shipping 4/17/2015

- VSUM will support vCenter 6.x and vSphere 6.x

vSphere 4.x	→ EOS 2014
vSphere 5.0 and 5.1	→ EOS 2016
vSphere 5.5	→ EOS 2018
vSphere 6.x	→

Note: End of Technical Guidance is 2 years after End of Support (EOS) date

Cisco Continues to Sell and Support Contracts for Nexus 1000V

- Since June 2009, VMware had resold Nexus 1000V licenses and support (via ELA) as well as supported Nexus 1000V through their support organization

VMware End of Availability Announcement

" VMware is announcing the End of Availability (EOA) for the Cisco Nexus 1000V SKU and its associated support SKUs from VMware effective February 2, 2015.

Customers who want to buy additional licenses and support for the Cisco Nexus 1000V after February 2, 2015 can buy those licenses and support directly from Cisco. "

- Cisco and its reseller partners (including VCE) will continue to sell Nexus 1000V licenses and support contracts

Cisco encourages customers who have expiring VMware support contract to migrate the contract over to Cisco for continued support

Please reach out to your account team for assistance
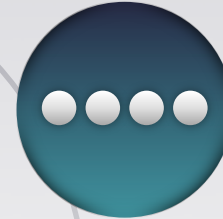
Nexus1000V Benefits

Nexus1000V Value

Choice
- Multi-hypervisor
- Add new network features

Consistency
- Physical to Virtual
- No learning curve

Security
- In-built DFW
- Micro-segmentation
- ACLs, PACLs
- Cisco TrustSec

Visibility
- vTracker
- VSUM Dashboard
- Easy troubleshooting

Choice: Simplified Licensing
Allows Use of Licenses on Any Hypervisor

Multi-Hypervisor License

Choose one and migrate to another hypervisor in future

One License to use/ re-use across multiple hypervisors

Virtual Security Gateway does not need a separate VSG license

Feature rich premium switch
Consistent NX-OS Features Across Physical and Virtual

Switching
- L2 Switching, 802.1Q Tagging, VLAN, VXLAN, Rate Limiting (TX)
- IGMP Snooping, QoS Marking (COS and 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 and fast-path off-load [leveraged by Virtual Security Gateway (VSG)*, vWAAS, vASA]

Provisioning
- Port Profiles, Integration with virtualization and cloud mgmt. tools
- Optimized NIC Teaming with Virtual Port Channel – Host Mode

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

Management
- Integrated Provisioning with VM Mgmt station, Cisco LMS, DCNM
- Cisco CLI, Radius, TACACs, Syslog, SNMP (v.1, 2, 3)
- Hitless upgrade, Integrated SW Installer

* Available only with Advanced Edition

Other benefits of Cisco Nexus 1000V

Scalability

Connect multiple-VSM over a control plane, Perform Datacenter to Datacenter vMotion and interoperate using VXLAN with physical switches

- **Enhanced VXLAN**– goes beyond 4000 L2 domain (VLAN) limitation, no multicast dependency
- **Inter-DC VxLAN** with Mac-Distribution and BGP Control Plane
- **Inter-DC vMotion** – Nexus 1000v dissolves Data center boundaries in vCenter for VM vMotion
- **VxLAN Gateway** – Scale and Migration friendly service which allows stretching of VLAN into a VxLAN and enables Physical to Virtual communication within same L2 domain

Security

In-built distributed firewall with micro-segmentation capable of using both Virtual Machine attributes and Network based attributes

- **VSG -** Multitenant, Stateful, Distributed Firewall, enabling Micro segmentation, Zone based, security policy enforcement
- **CTS -** Cisco TrustSec creates role-aware network with a converged policy framework and pervasive integrity and confidentiality to meet network security requirements

Benefits of Cisco Nexus1000V

Virtualized Services

Virtual networking switching supporting multiple virtualized network services and solutions

- **CSR 1000v** – Delivers comprehensive WAN gateway and network services functions into virtual environments and enables enterprises to transparently extend their WANs into provider-hosted clouds

- **Netscaler 1000v** – Citrix NetScaler is the industry's leading web application delivery solution which utilizes Cisco vPath technology for policy-based service insertion and chaining

- **vPath** – Enables forwarding plane virtualization and provides capability to implement virtualized Layer 2 to Layer 7 services such as Firewall, Load Balancers, WAN optimization etc

- **vNAM** – Offers outstanding deployment versatility, consistent visibility across physical, virtual and cloud

Benefits of Cisco Nexus1000V

Multi-layer redundancy

Control your virtual switch from outside the hypervisor infrastructure

- **Nexus 1110-x** – Offers dedicated hardware appliance for deployment of network services critical to virtualized datacenter infrastructure. Delivers administrative separation provides control of Network entities to Network admins

- **VSM redundancy** – Active-standby VSM support provides another level of redundancy.

- **Headless Mode support** – Maintains Business continuity by offering VM bring up and vMotion even during situations when VSM is not available

Consistent Security across Physical and Virtual
Cisco Trust Sec

Tag = "Marketing"

Security Group Tag

Wireless User

SXP

WAN/ Campus Network

SXP

SXP

VM   VM   VM

Security Group Tag

"Marketing VM"

Security Group Tag

Tag = "Marketing"
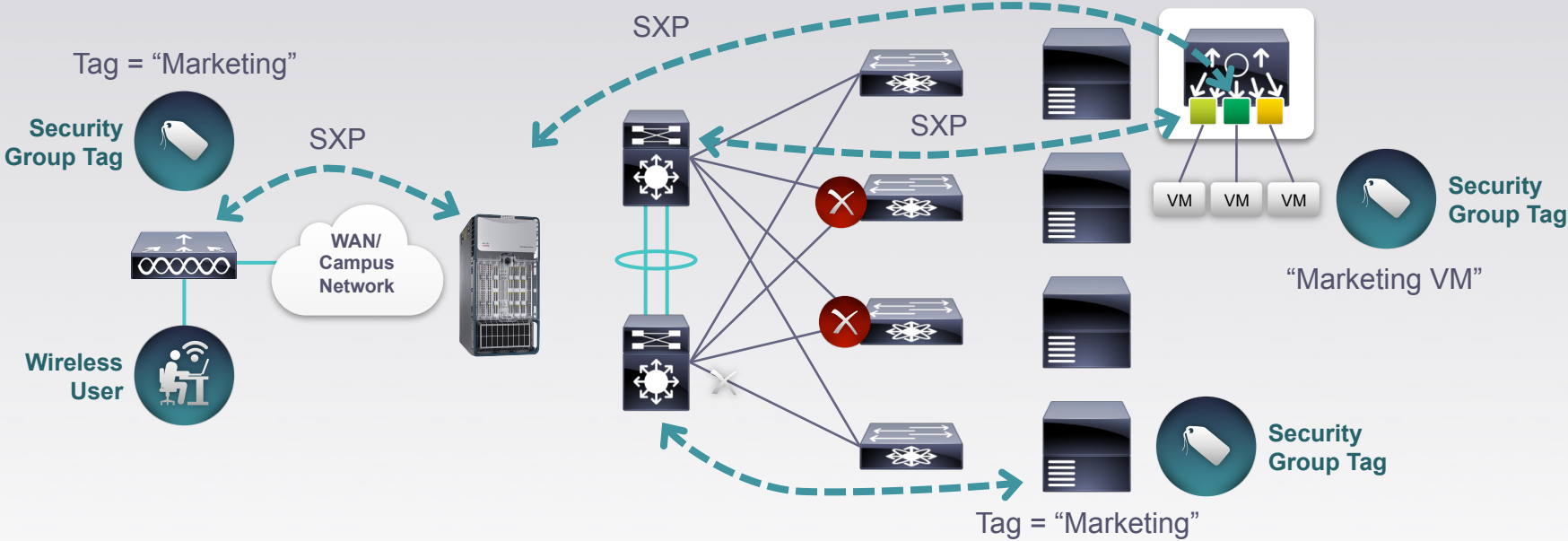
Data Center Segmentation and Consistent Security Policy Enforcement Across Physical and Virtual Workloads

Nexus 1000V for vSphere
Version 3.1 - Scale, Secure and Simplify

Increased Scalability — Host Scale, VxLAN scale, VM scale

Increased Security — Cisco TrustSec 2.0, Virtual Security Gateway (VSG)

Simplify - Cisco VSUM — Simplifies installation, upgrade and monitoring

Increased Scale for Larger Deployment

Nexus 1000V

250 Hosts/servers

10,000 Ports/switch

1,000 Ports per host/server

4094 VLANS

6,000 VXLAN

6,000 Port profiles

New Features in 3.1 Release

Scale

- Connection multiple VSM across a BGP based VXLAN Control plane providing for larger Layer 2 domain footprint in the datacenter

- Distributed Netflow - Netflows are directly transmitted by VEM to Netflow Collector providing for improved scale. 2K flows per host

New Features in 3.1 Release

Usability

- Role based CLI access - Enables privilege of roles for command authorization using TACACS and RADUS server

- Provides ACL supports for IPv6 traffic

New Features in 3.1 Release

Security

- Security Group (SGACL) support (Enforcement)

- In-line native SGT tagging

- Enables N1KV veth ports as edge port and protect the upstream network receiving the unwanted stp bpdu packets sent by a rouge vm

- Protecting server/host CPU by rate limiting broadcast, multicast and unknown unicast(BUM) traffic on both vEth and pNic

- Secure your virtual network using Port Security even if the VSM is unavailable. Securing Mac's, violation action are done in VEM, providing zero-tolerance security for the server/host.

# Upcoming Features on Nexus1000V (Roadmap)

- IP address based forwarding
  - Optimized switching to prevent hairpin routing

- Communicate VXLAN with Physical switches
  - BGP EVPN – Physical switches overlay

- Nexus1000V in IPv6 only environment
  - Communicate VSM to VEM over IPv6 address

- Backup your VSM automatically
  - Automation of VSM backup

Virtual Security Gateway
Stateful Distributed Firewall bundled with Nexus 1000V
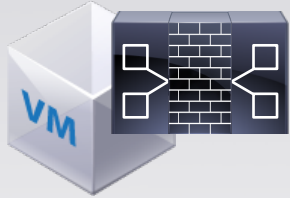
Virtual Security Gateway (VSG)

✓	**Context Aware Security**	VM context aware rules
✓	**Zone Based Controls**	Establish zones of trust
✓	**Dynamic, Agile**	Policies follow vMotion
✓	**Best-in-class Architecture**	**Efficient, Fast, Scale-out SW** (with vPath intelligence)

Prime Network Services Controller (PNSC)

✓	**Non-Disruptive Operations**	Security team manages security
✓	**Policy Based Administration**	Central mgmt, scalable deployment, multi-tenancy
✓	**Designed for Automation**	**XML API, security profiles**

Virtual Security Gateway
Intelligent Traffic Steering with vPath

PNSC

VM VM

VM VM VM VM VM VM VM VM

VM VM VM VM

Nexus 1000V
Distributed Virtual Switch

vPath

VSG

Decision Caching

Flow Access Control (Policy Evaluation)

Initial Packet Flow

Log/Audit

Virtual Security Gateway
Intelligent Traffic Steering with vPath

PNSC

VM VM

VM VM VM VM VM VM VM VM

VM VM VM VM VM VM VM

Nexus 1000V
Distributed Virtual Switch

vPath

VSG

Subsequent Packet Flow

Log/Audit
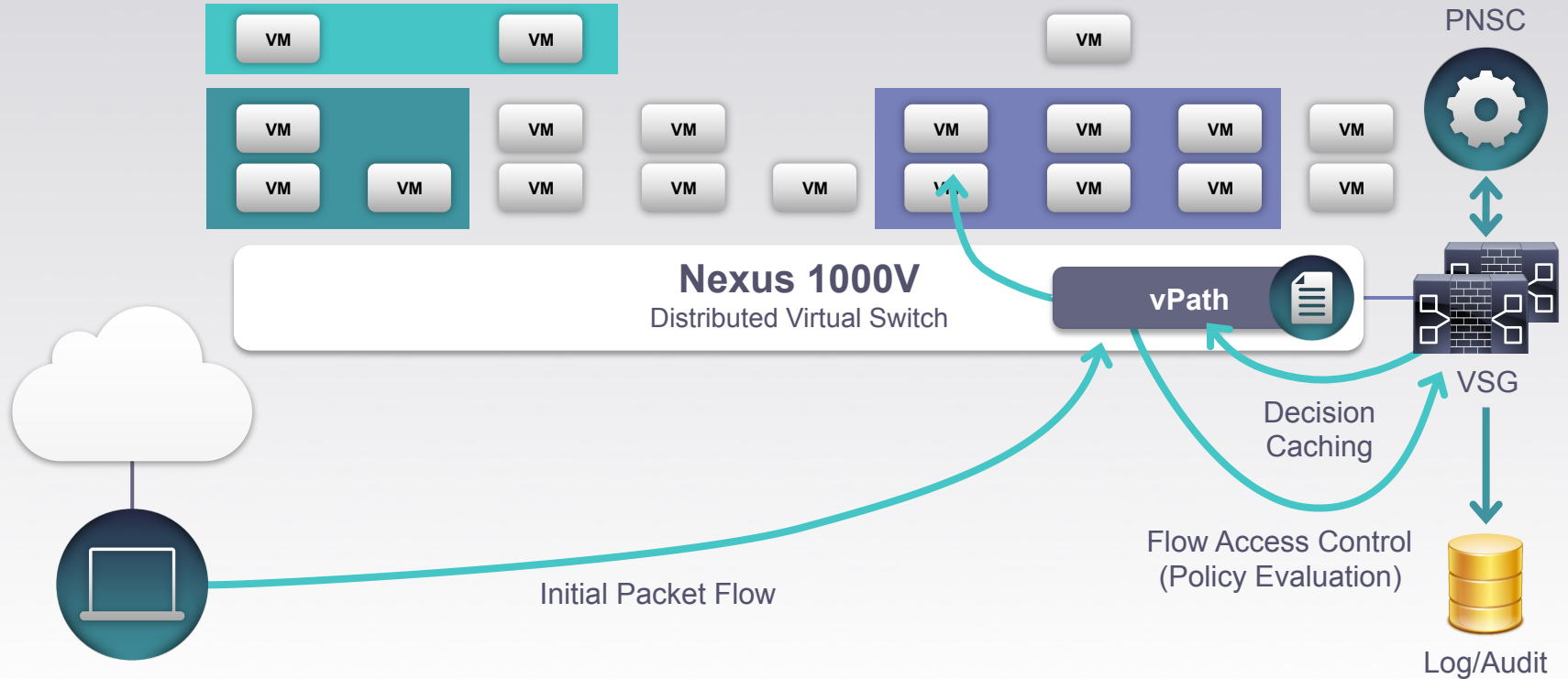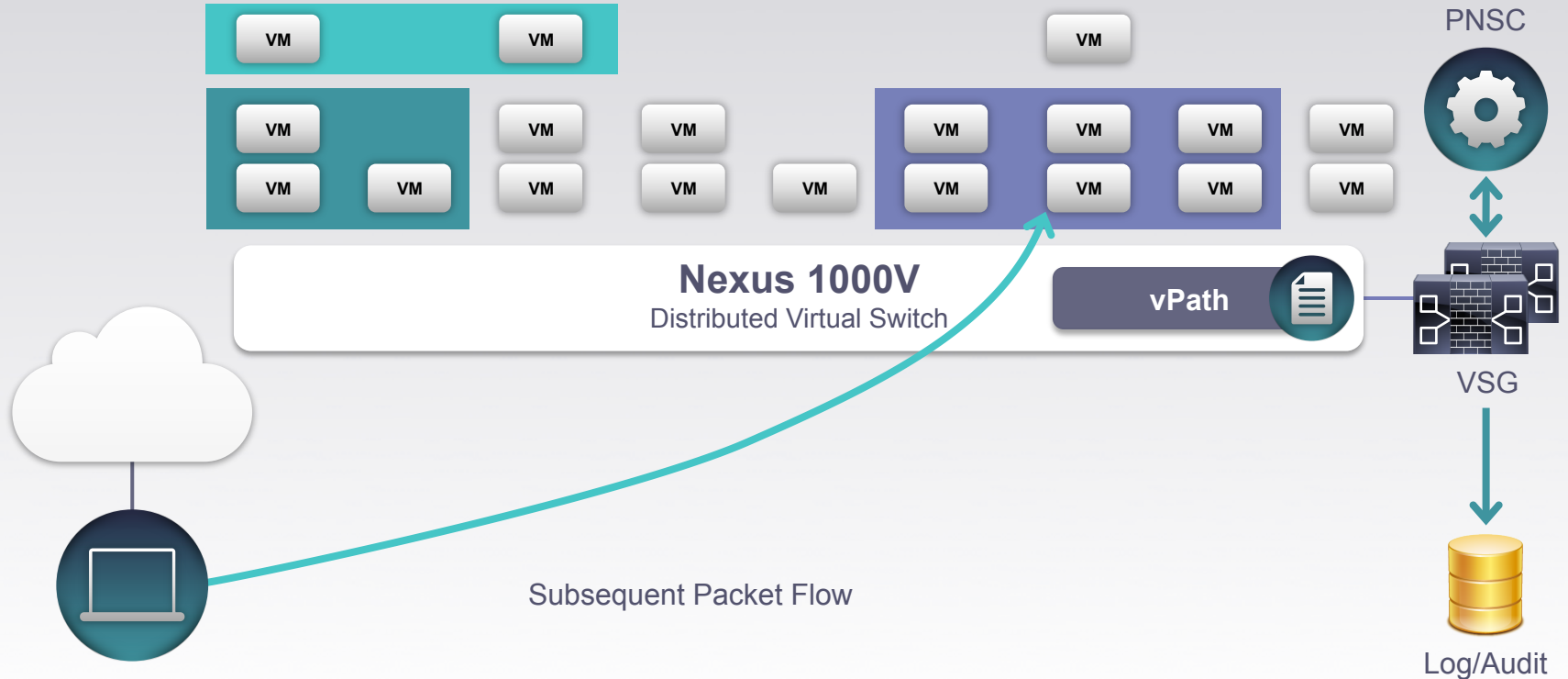
Decoupled Deployment across Applications and Virtual Services

Nexus 100V Virtual Supervisor Module
Network Team: Manage Nexus 100V and Network Policies (Port Profiles)

Data Center Network

VMWare vCenter Server
Server Team: Manage Virtual Machines

Cisco Prime Network Services Controller
Security Team: Manage Cisco VSGs and Security Polices (Security Profiles)
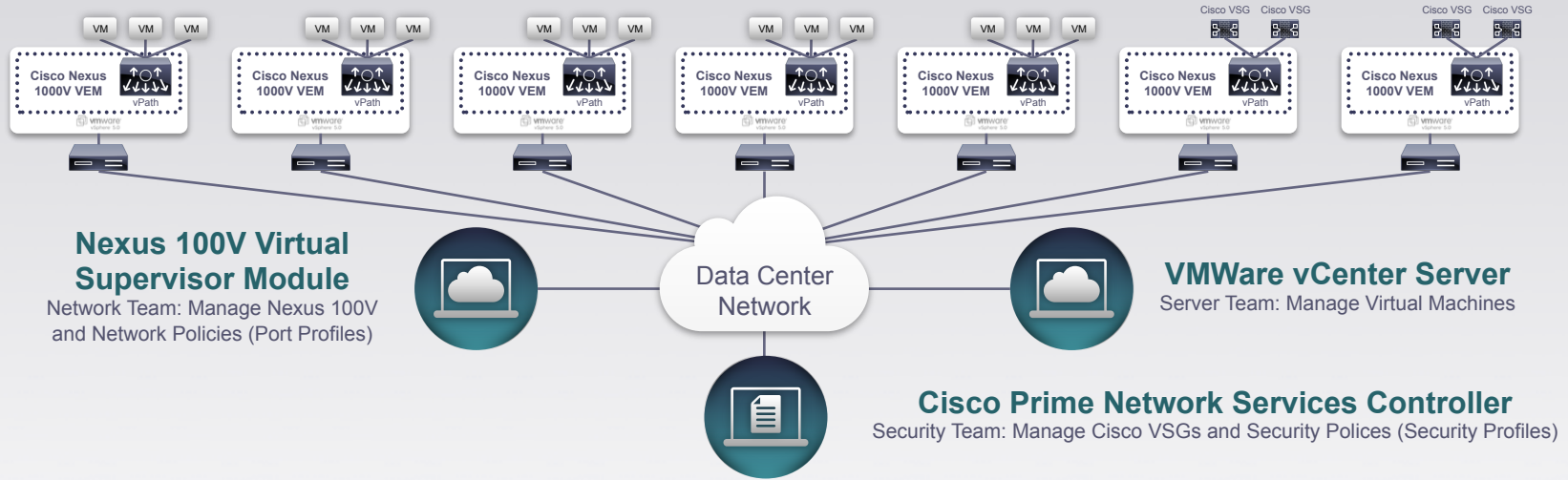
- No need to deploy virtual services on every host
- Plan CPU capacity independently across application workloads and virtual services
- Simpler to deploy with multiple operations teams (server, network, security, etc.)

VSG Policy: Rule (ACE) Construct

Rule	Source Condition	Destination Condition	Action

Condition

Attribute Type : VM

Expression ⓘ

Attribute Name : VM Name   Operator : contains (Contains string)   Attribute Value : Web

VM Attributes		Network Attributes	
Instance Name	Hypervisor Name	IP Address	
Guest OS full name	Resource-pool	Network Port	
Guest OS Host name	Port Profile Name		
Parent App Name	Zone Name		
Cluster Name			

Attribute Type
Network
VM
User Defined
vZone

Operator	
eq	Prefix
neq	Member
gt	Not-member
lt	Contains
Note-in-range	

⦿ drop ○ permit ○ reset
☐ log

ACE: Access Control Entry

VSUM Video

- VSUM Animation Video
- https://www.youtube.com/watch?v=BGkZBVM1bgw
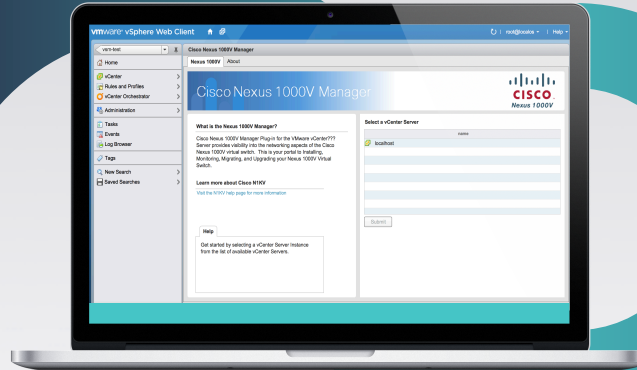
Enhanced Out of Box Experience
Cisco Virtual Switch Update Manager

Install and Migrate

- Easily install the Nexus1000V and Cisco AVS using vSphere web client
- Smoothly migrate vSwitch/VDS to N1KV

Upgrade and Monitor

- Upgrade the Nexus1000V and AVS(multiple hosts allowed).
- Easily monitor your virtual network.

Configure*

- Configure and Manage Nexus1000V features and port-profiles
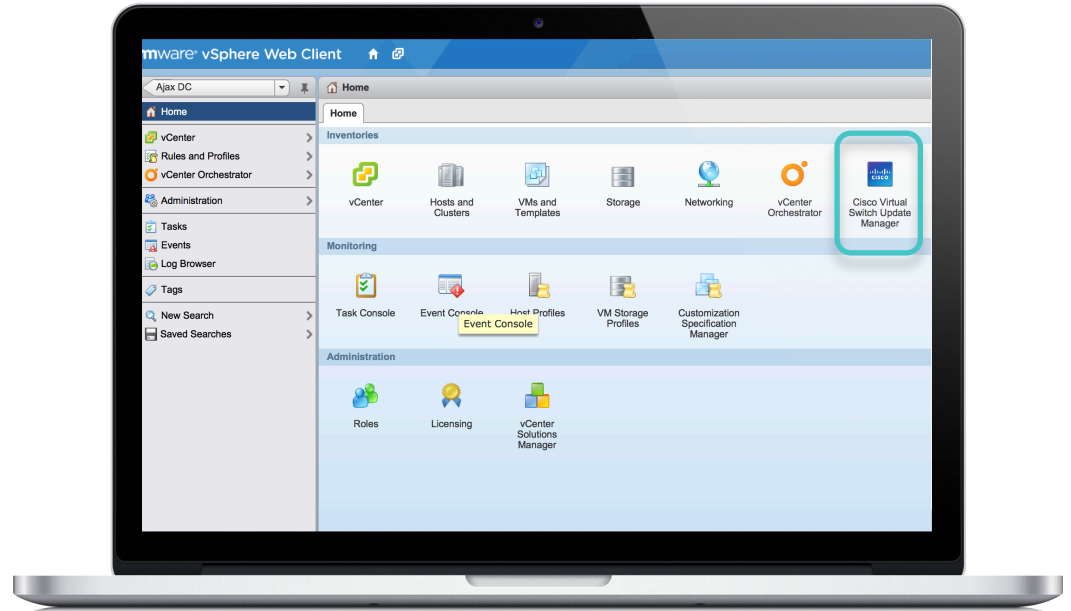
*Future

Cisco Virtual Switch Update Manager

Front end – Web interface in vCenter


Back end VM Appliance

Cisco VSUM Plug-in integrated into the vSphere web client

Solution Components

- Front End Client component
  - vSphere Web client

- Back End component
  - VM Appliance
  - Runs CentOS
  - Maintains own database
  - Acts as a web-server
  - Repository of Nexus1000V VSM and VEM

- vCenter Version Supported:
  vCenter 5.1 and 5.5
- ESXi version on the host:
  ESXi Ver 4.1 and above
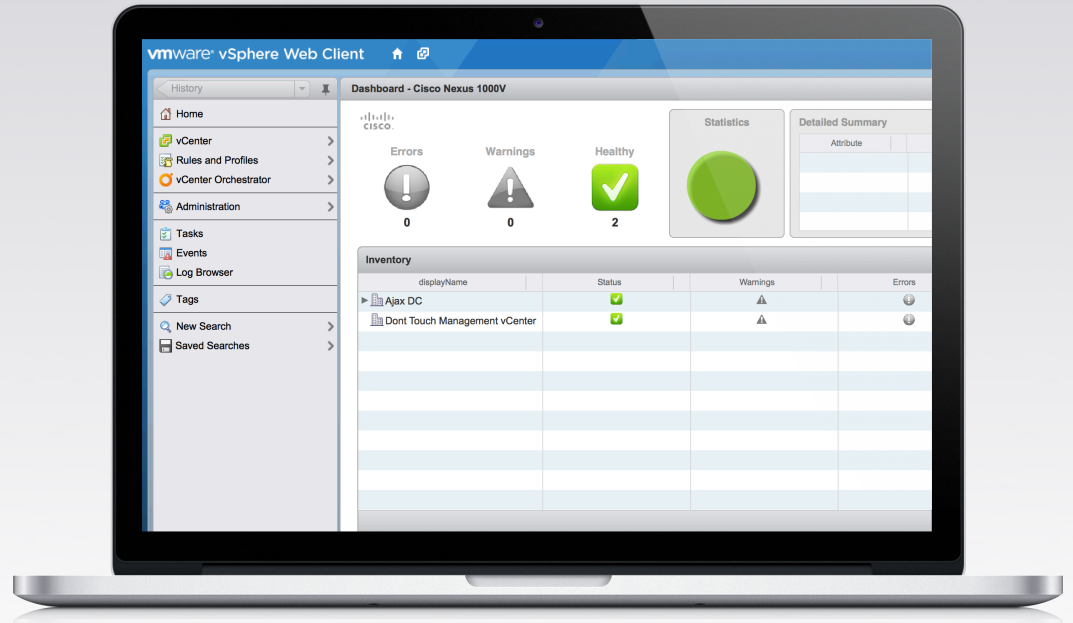
Benefits of Cisco VSUM

Cisco VSUM

Virtual Network visibility from vCenter

Install Nexus1000V via GUI

Simplified upgrade of Nexus1000V

Easily migrate an existing vSwitch or VDS to Nexus1000V

Enhanced visibility to the Server administrator

Simple user interface integrated into the vCenter web client

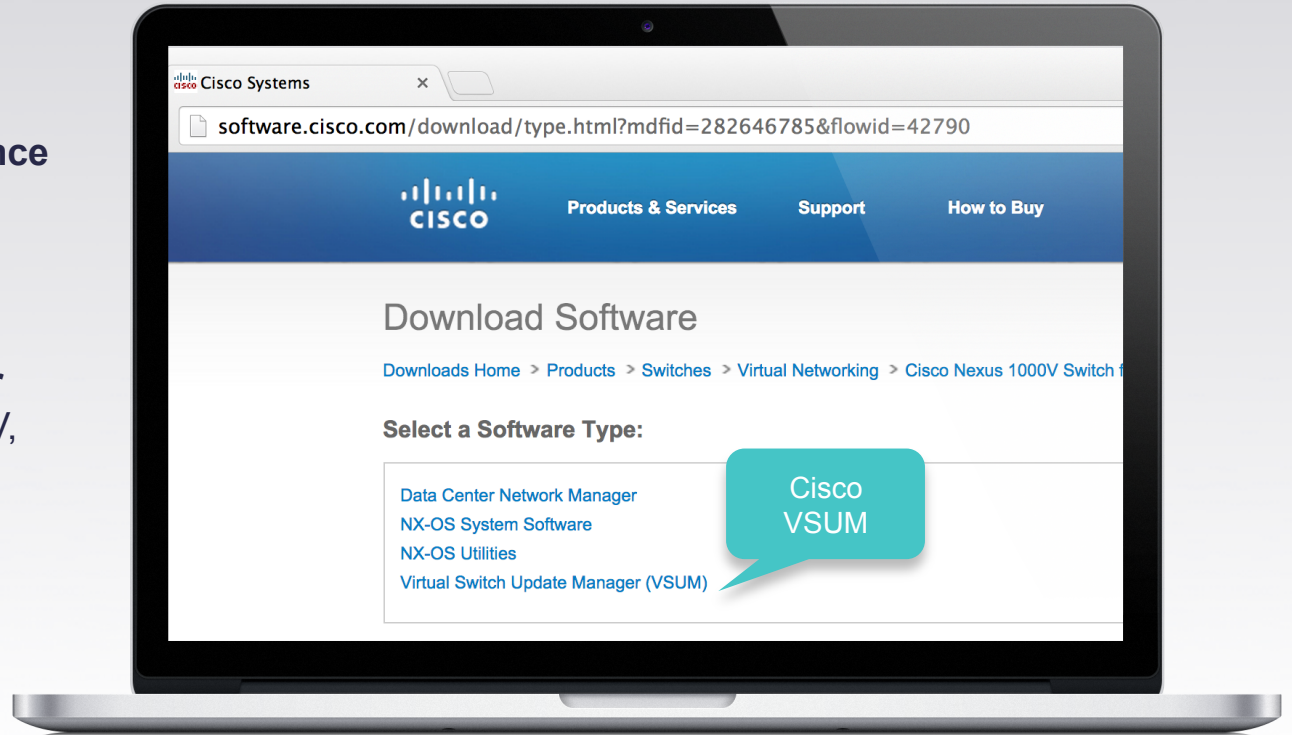Best practices incorporated into the workflow

Add hosts to existing installations
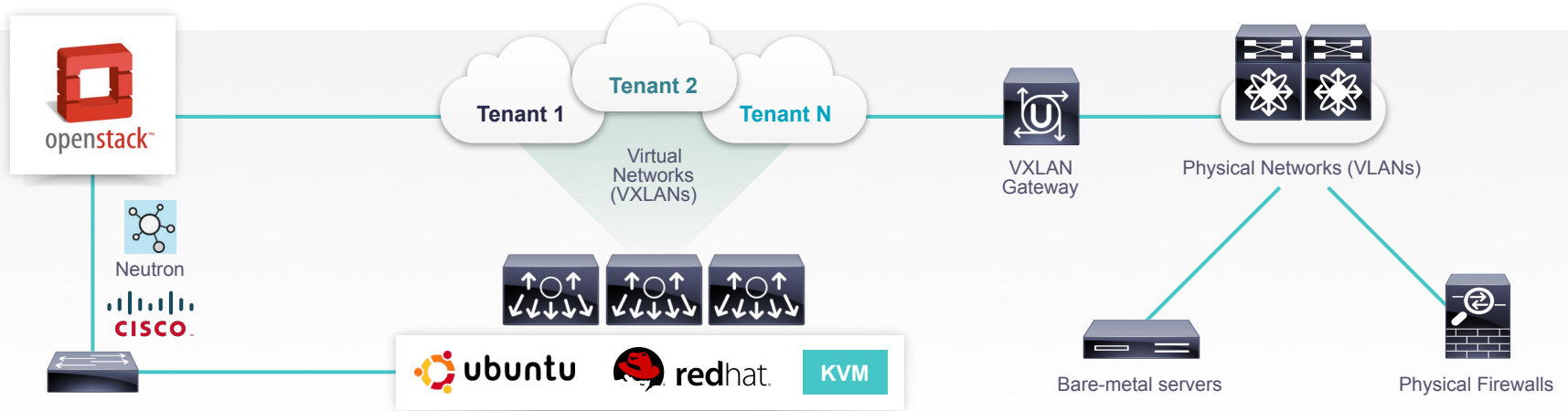
Downloading Cisco VSUM
FREE Download

- **No license needed** to run Cisco VSUM

- **Ships as a virtual appliance** (OVA file)

- **Download from CCO and use**

- **Contains all the manager software** and Nexus1000V, AVS VEM binaries

---

Cisco Systems   ✕

software.cisco.com/download/type.html?mdfid=282646785&flowid=42790

CISCO

Products & Services   **Support**   **How to Buy**

Download Software

Downloads Home > Products > Switches > Virtual Networking > Cisco Nexus 1000V Switch

Select a Software Type:

Data Center Network Manager
NX-OS System Software
NX-OS Utilities
Virtual Switch Update Manager (VSUM)

Cisco VSUM

Nexus1000V Across Multiple-Hypervisors

Nexus 1000V for KVM
Cisco Virtual Networking Solution for OpenStack

Tenant 1 **Tenant 2** **Tenant N**

Virtual Networks (VXLANs)

VXLAN Gateway

Physical Networks (VLANs)

Neutron

ubuntu redhat **KVM**

Bare-metal servers
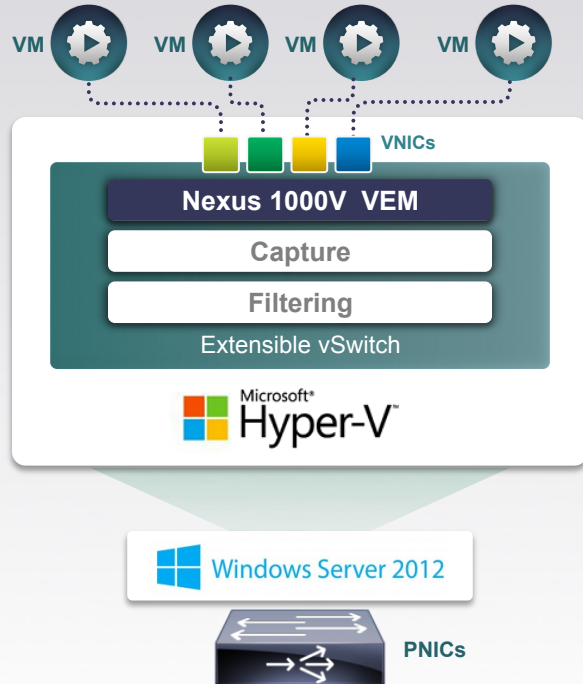
Physical Firewalls

Solution Highlights

- Enterprise grade network virtualization solution (using VxLAN multicast/unicast)
- Enhanced security , visibility and troubleshooting for networking
- OpenStack Extensions – Network Profile (incl Trunk) and Policy Profile Extension (PVLAN)
- Consistent networking between physical and virtual workloads
- Integrated in OpenStack Icehouse release - Ubuntu 14.0.4 and RHEL 7.0/RHOS 5.0
- Automated Installation via Juju/Charm on Canonical and StayPuft on RHAT

Cisco Nexus 1000V for Hyper-V
Consistent Multi-Hypervisor Platform

VM VM VM VM

VNICs

Nexus 1000V VEM

Capture

Filtering

Extensible vSwitch

Microsoft® **Hyper-V**™

Nexus 1000V VSM

Microsoft® **System Center** Virtual Machine Manager

Windows Server 2012

PNICs

✓ **SCVMM Integration**

✓ **Advance NX-OS feature-set**

✓ **VSG based distributed Security**

✓ **Consistent operational model**

✓ **VXLAN based Network Virtualization**

Nexus 1000V Summary
Last 6 Month Summary

VMware vSphere

VMware vSphere 6.0 support 3.1.4
3.1: increased scale, IPv6, security and ease of deployment with VSUM,

Microsoft Hyper-V

3.1 – VXLAN and HVN support for WS2012 R2

OpenSource KVM

3.1: Canonical IceHouse Ubuntu 14.04 Support, Juju/Charm VXLAN
3.2: Redhat OSP 5.0/RHEL7.0 with Staypuft, VSG

Cisco Virtual Application Container Service (VACS) with UCS Director Update

VACS: Virtual Application Segmentation in Shared Infra
Simple "Out of the Box" Experience for Server/Virtual Admins

Included in Cisco ONE Enterprise Cloud Suite

Cisco UCS Director

Container A
Container B
VACS
VACS

VMware vSphere
Microsoft HyperV *
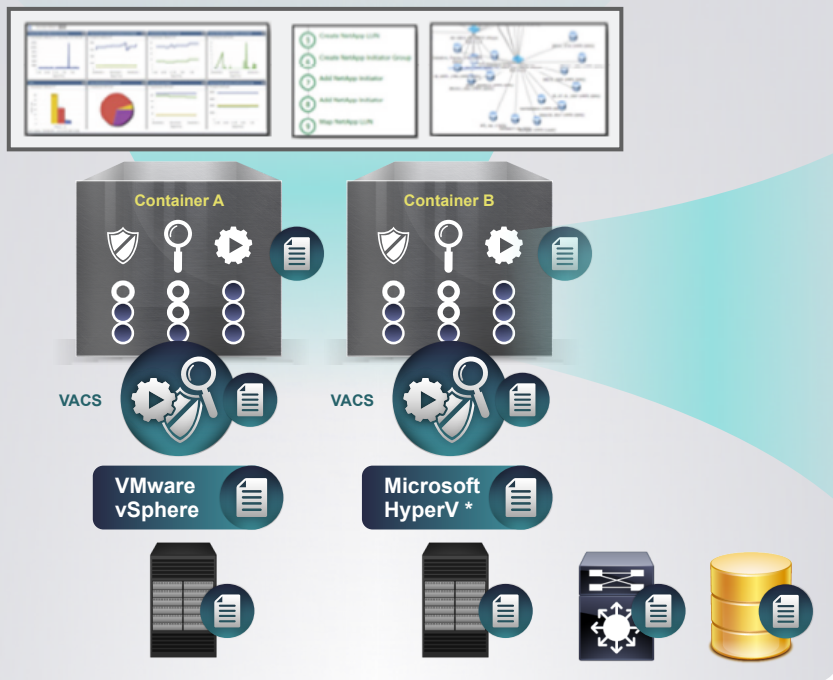
VACS - Unified Licensing
Per Server based

- Automated Provisioning and Orchestration – UCS Director
- Routing – CSR 1000V
- Edge FW – CSR 1000V
- Zone Based FW – Virtual Security Gateway
- Virtual Fabric – Nexus 1000V Platform for Distribute FW

* VACS on Hyper-V available CY15

Executive Summary

✓ Cisco is fully committed to virtual networking across multiple hypervisors

✓ Cisco is continuing to make significant investment in virtual networking R & D

✓ Cisco Nexus 1000V is supported in vSphere 6.0 and future versions of vSphere as well as Microsoft Hyper-V and RHAT/Canonical KVM hypervisors

✓ Cisco is committed to support Nexus 1000V for its 10,000+ install base of customers

✓ Cisco will continue to sell Nexus 1000V across multiple hypervisors for various cloud solutions

For More Information

- Blog announcing Nexus 1000V for vSphere 6
  http://blogs.cisco.com/datacenter/cisco-nexus-1000v-now-supports-vmware-vsphere-6-0

- Cisco Nexus1000V with VMware vSphere 6.0 support Software Download 5.2(1)SV3(1.4)
  https://software.cisco.com/download/release.html?mdfid=282646785&softwareid=282088129&release=5.2(1)SV3(1.3)&relind=AVAILABLE&rellifecycle=&reltype=latest

- Cisco Nexus 1000V Product Information
  http://www.cisco.com/go/nexus1000v

- Cisco Nexus1000V Product documentation
  http://www.cisco.com/go/nexus1000v/docs

- Virtual Switch Update Manager
  http://www.cisco.com/c/en/us/products/collateral/switches/nexus-1000v-switch-vmware-vsphere/datasheet-c78-734070.html

- Cisco Nexus 1000V Community
  https://communities.cisco.com/community/technology/datacenter/nexus1000v

Thank you.