



FlexPod Architecture & VM networking with the Nexus 1000V and 1010

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Public Webcasts Series, Spring 2012

Date	Technical Track Topics	Webinar
2/14/12	Virtual Security Gateway (VSG) v1.3 Technical Deep Dive	Play
2/22/12	Nexus 1000V v1.5 Technical Deep Dive	Play
2/29/12	Nexus 1010-X v1.4 Technical Deep Dive	Play
3/7/12	vWAAS and Nexus 1000V Technical Deep Dive	Play
3/14/12	FlexPod & Nexus 1000V/1010	Register
3/21/12	QoS for multimedia traffic in the Virtualized DC (w/ Nexus 1000V)	Register
3/28/12	Vblock & Nexus 1000V / VSG / vWAAS	Register
4/4/12	vCloud Director, Nexus 1000V, and VXLAN Technical Deep Dive	Register
4/11/12	Cisco's CloudLab Deep Dive: Hands-on labs for N1KV, VSG & VXLAN	Register

Above table and presentations: www.cisco.com/go/1000vcommunity

Reference Solutions

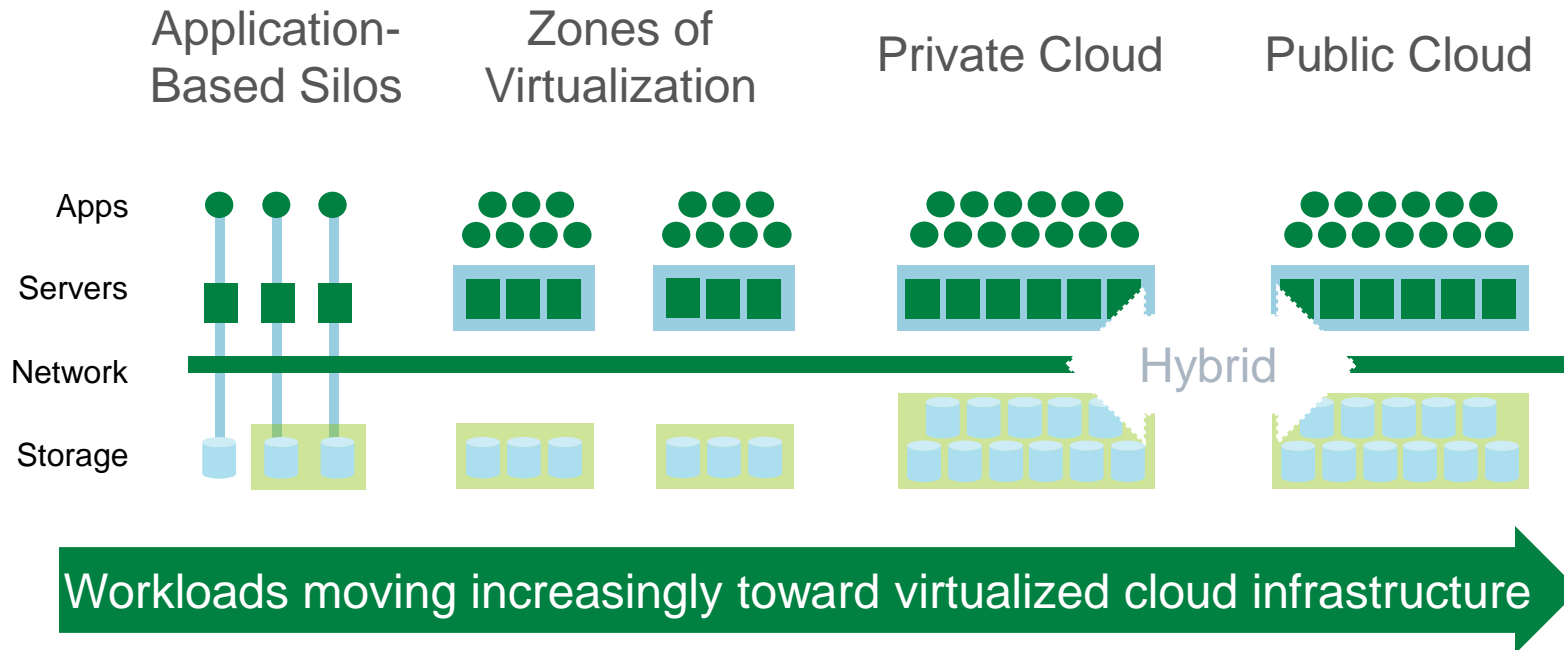
Solution	Nexus 1000V	Nexus 1010	Virtual Security Gateway	Virtual WAAS	NAM (N1010)
FlexPod	✓	✓			
Virtual Desktop	✓	Implicit Support	✓	✓ *	Implicit Support
Virtualized Multi-Tenant DC (VMDC)	✓	Implicit support	✓	In Planning	Implicit support
DC-to-DC vMotion	✓	Implicit support	✓	✓	Implicit support
PCI 2.0	✓	Implicit support	✓		Implicit support
Hosted Collaboration	✓	Implicit support			Implicit support

Agenda

- ✓ FlexPod Architecture
- ✓ Nexus 1000V and 1010
- ✓ VMDC with FlexPod
- ✓ Resources
- ✓ Questions as we go..

FlexPod Architecture

Transitioning from Virtualization to Cloud



- **Private cloud:** Behind the firewall of an enterprise, closed to public
- **Public cloud:** Accessible through service providers for general purchase
- **Hybrid cloud:** Private clouds linked to public clouds

Technical Design Requirements

NetApp Design Principles

Operational continuity/high availability (HA)

Access flexibility such as Fibre Channel (FC), Fibre Channel over Ethernet (FCoE), and network-attached storage (NAS) protocols

NetApp® Data ONTAP® for scalability

Cisco Design Principles

Operational continuity/HA

Transport flexibility such as FC, Ethernet/FCoE, and Overlay Transport Virtualization (OTV)

NX-OS for scalability

FlexPod Data Center Platform

Prevalidated, Flexible Unified Architecture

Cisco UCS™ B-Series
Blade Servers and
Cisco UCS Manager



Cisco Nexus®
Family Switches



NetApp® FAS
OnCommand™
Software Suite
10GE and FCoE



Features

- Standard, prevalidated, best-in-class converged platform:
 - Virtualized and nonvirtualized environments
- **Flexible:** One platform scales up or out to fit many mixed workloads:
 - Add applications and workload

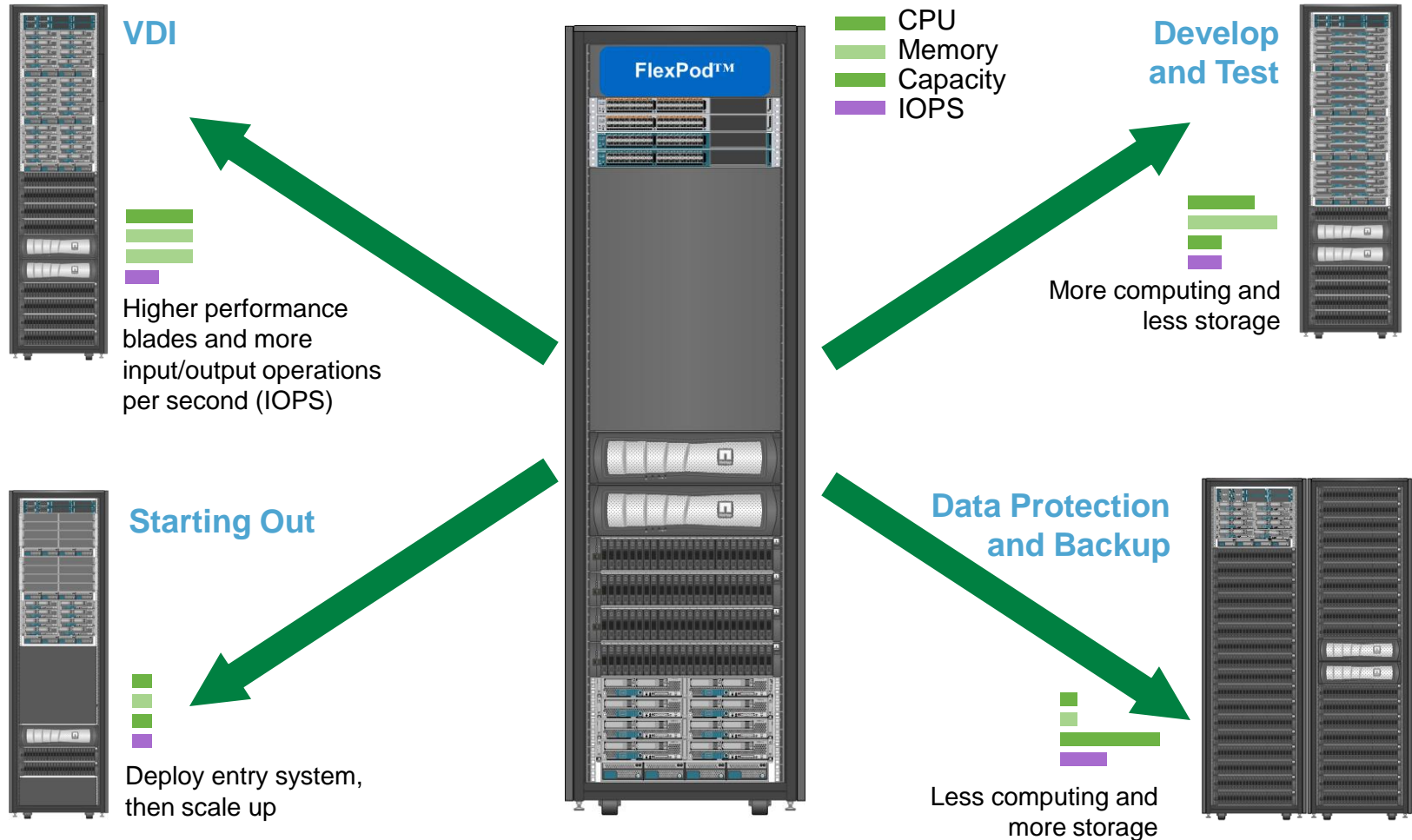
Benefits

- **Flexibility:** Future-proof platform to meet today's challenges and scale for future needs
- **Built-in data center efficiencies:** Lower total cost of ownership (TCO) with simplified deployments and rapid provisioning of resources
- **Reduce risk:** Prevalidated architecture with prescriptive sizing and design guides

Future-Proof, Validated FlexPod

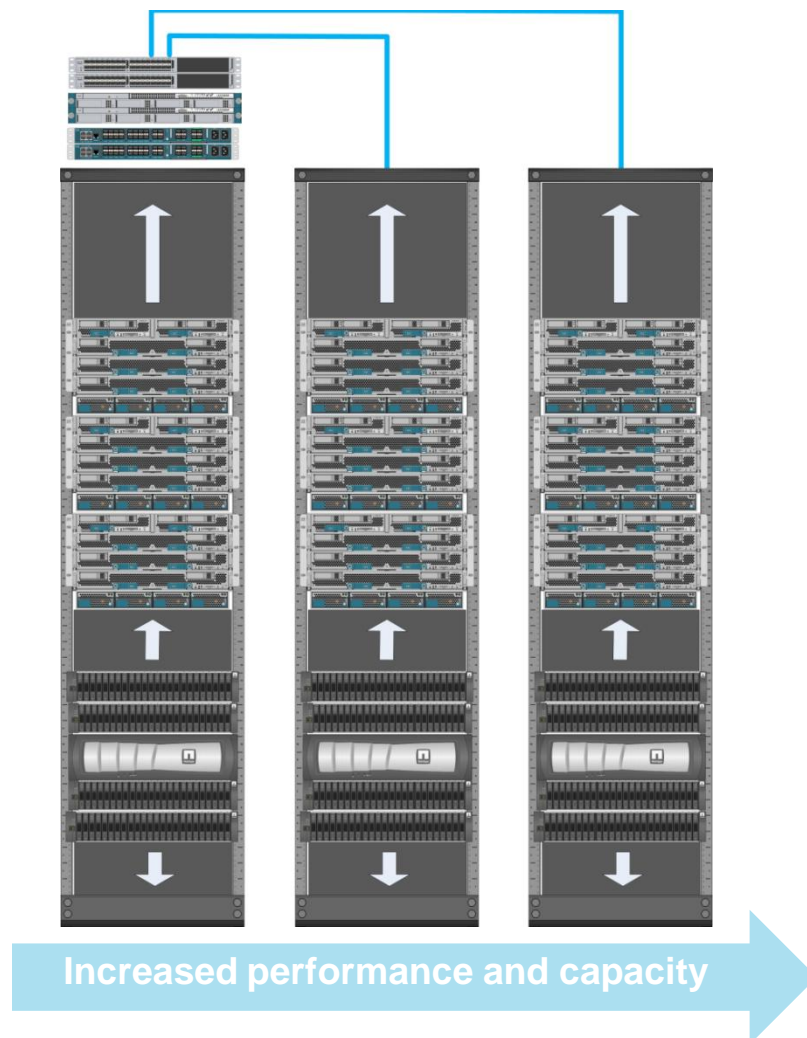
Meeting Needs of Today and Tomorrow in One Platform

Production Balanced Infrastructure



Scale Out with FlexPod Repeatable, Consistent Deployments

- Scale out with standard and proven configurations:
 - Predictable and highly efficient:
 - Capacity and performance
 - Floor space, power, and cooling
- Benefits:
 - Reduce effort for architecture, design, deployment, and testing
 - Reduce infrastructure deployment cycle time by up to 50%
 - Manage pools consisting of storage, compute, and networking resources, not individual systems



Flexing a FlexPod Configuration

Required Components

- Cisco Unified Computing System™ (Cisco UCS™) chassis
- Cisco UCS blades with VIC adapter
- Redundant Cisco UCS FIs
- Redundant Cisco Nexus® 5k
- Redundant NetApp® FAS
- Certain software and redundancy features

Flexible Components

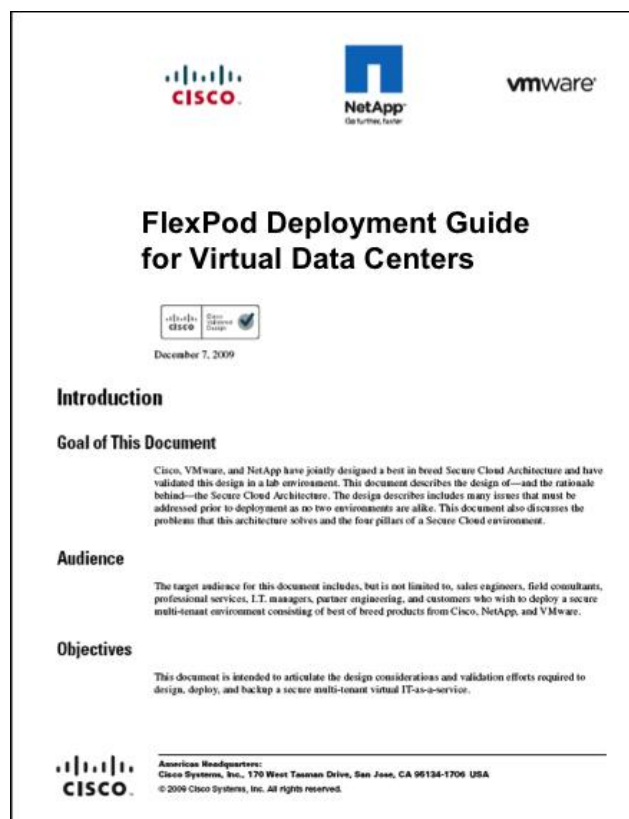
- Cisco UCS blade model and quantity
- Port count of Cisco Nexus 5k
- Fabric-attached storage (FAS) controller size
- FAS disk type, count, and size
- Add-on cards, modules, and interfaces

For more information, visit www.netapp.com/us/technology/flexpod/

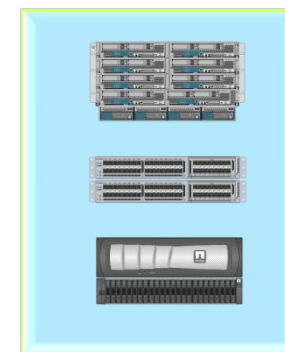
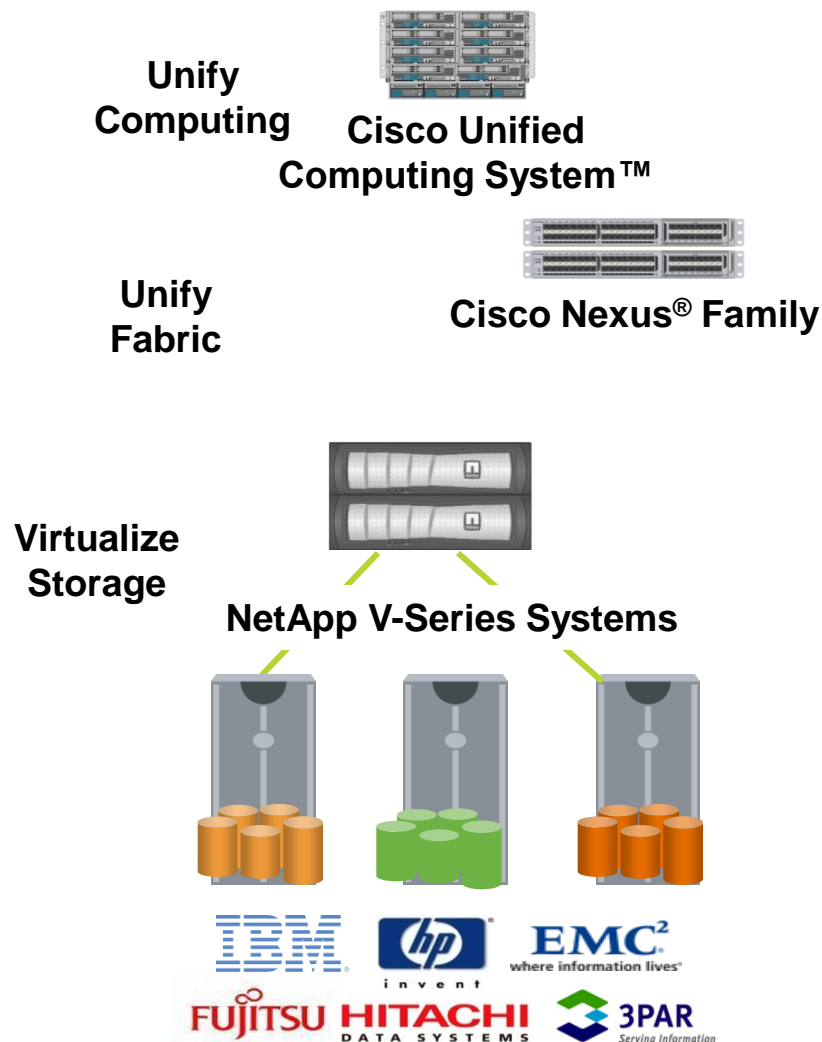
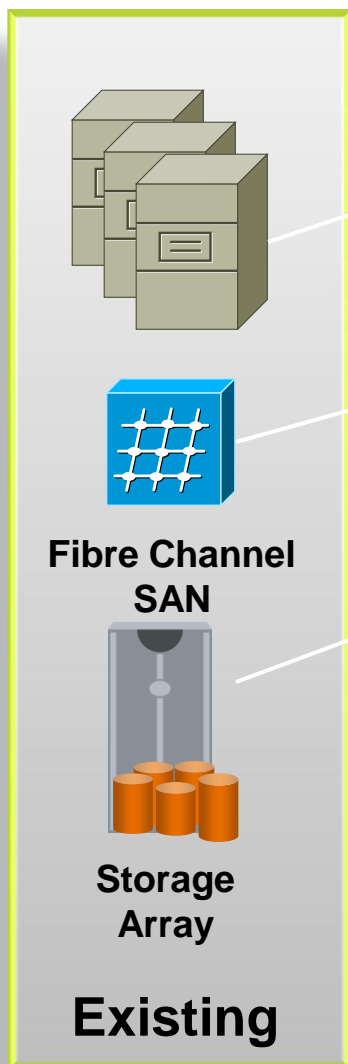
Reduce Risk with FlexPod Prescriptive Deployment Collateral

Wide range of resources available:
validated design, deployment, and
solution guides

- Step-by-step instructions for repeatable high-quality deployments, including these use cases:
 - Secure multi-tenancy and secure separation
 - VMware® vSphere® and View™
 - SAP® applications
 - Microsoft® Exchange applications



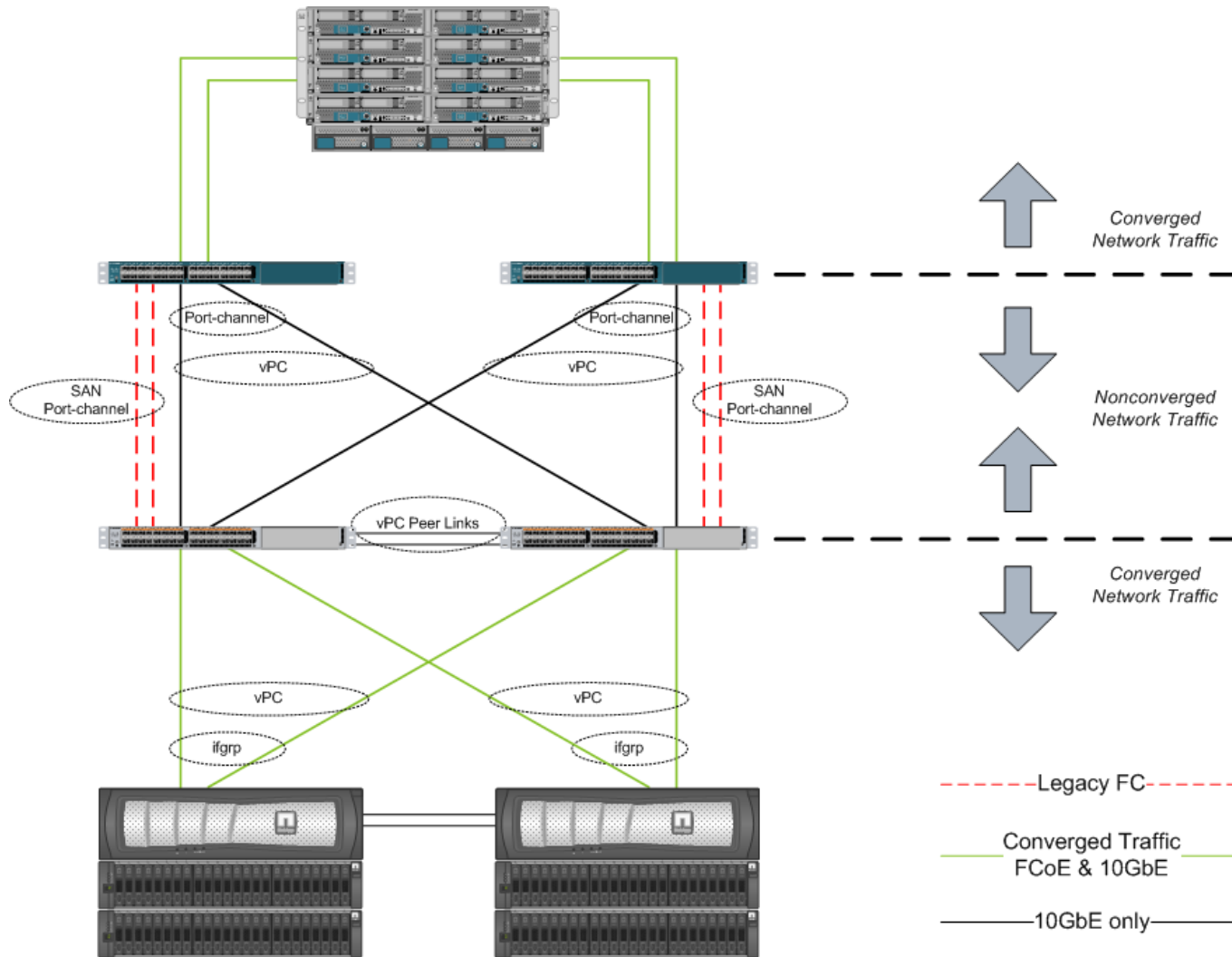
Leverage existing investments



FlexPod

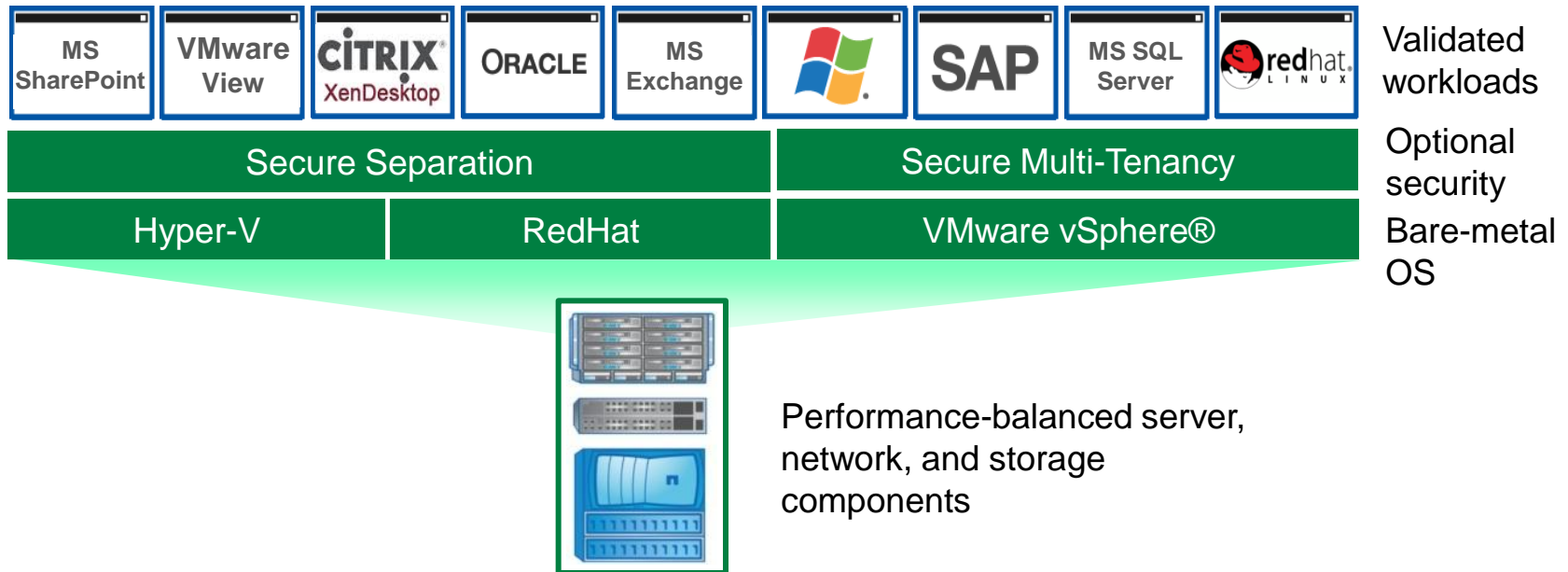
- Protect existing investments
- Achieve benefits in each layer as you go
- Stepwise rather than all at once

FlexPod FCoE Connectivity



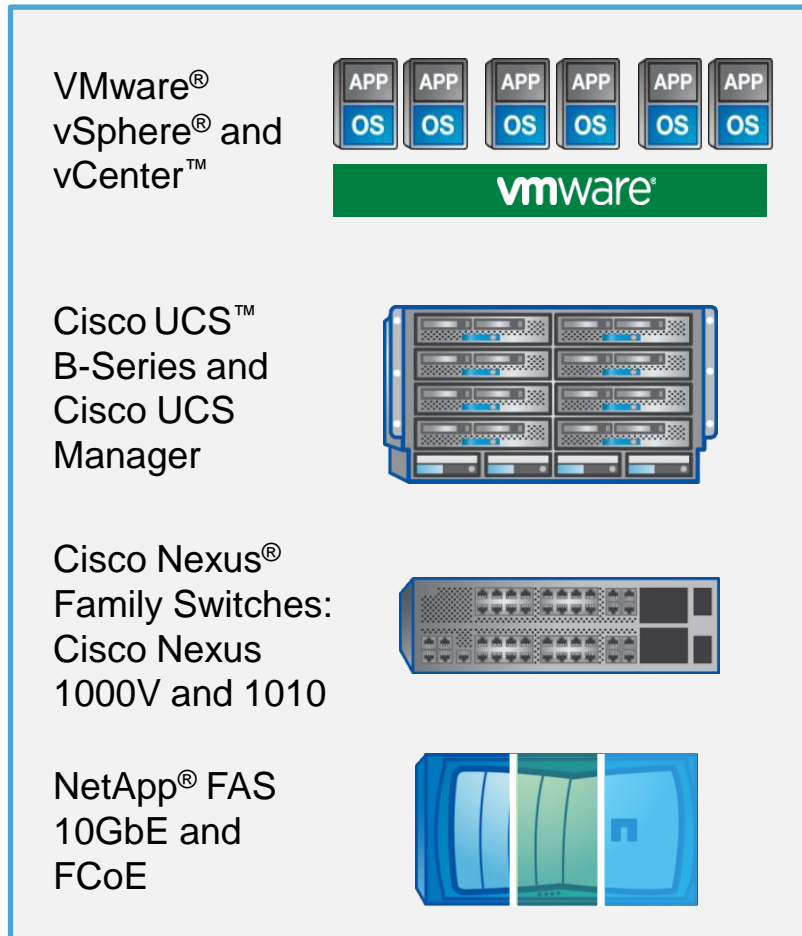
FlexPod Data Center Solutions

- VMware® (Exchange, SQL Server®, SharePoint®, View™)
- Citrix XenDesktop
- SAP® applications
- Microsoft® private cloud/Hyper-V™
- Red Hat Enterprise Linux®



VMware vSphere Built on FlexPod

Complete data center in one rack cabinet



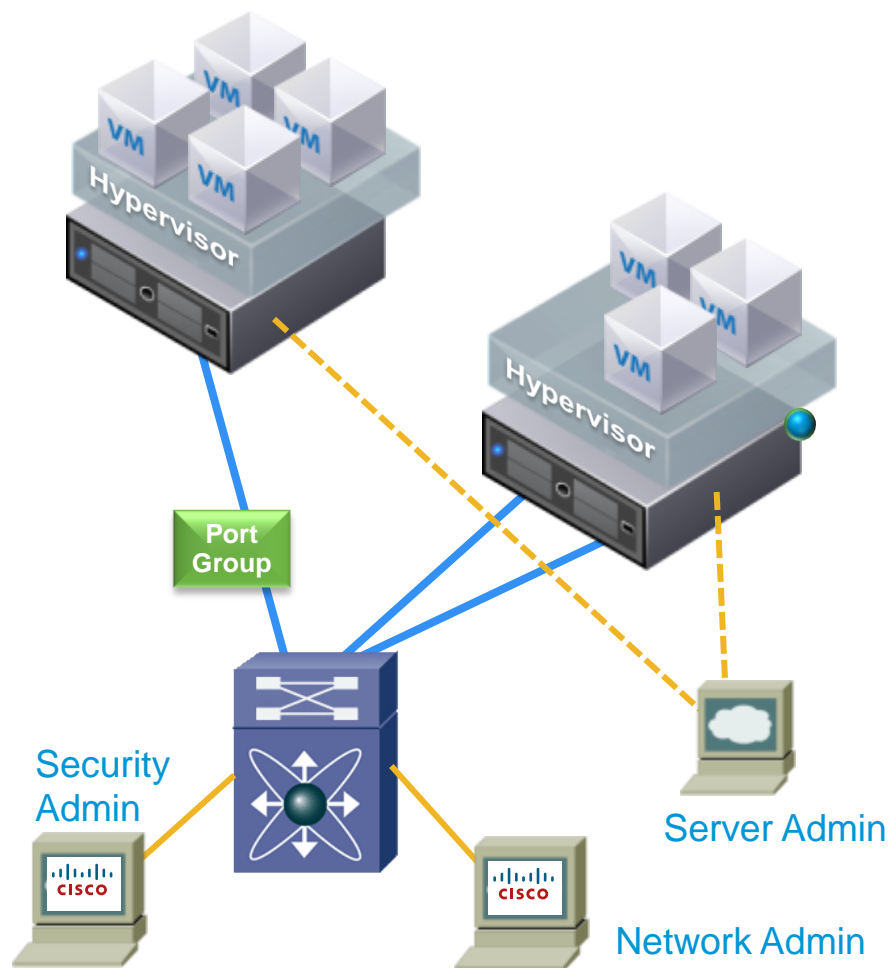
- Base configuration tested and validated for 1,500 users for four workload applications simultaneously:
 - VMware Virtual Desktop Infrastructure (VDI)
 - Microsoft® Exchange
 - Microsoft SharePoint®
 - Microsoft SQL Server®
 - Plus headroom for multiple applications
- Flexibility to support multiple classes of computing and storage in a single FlexPod™ for VMware data center solution

Public FlexPod Customers



Nexus 1000V and 1010

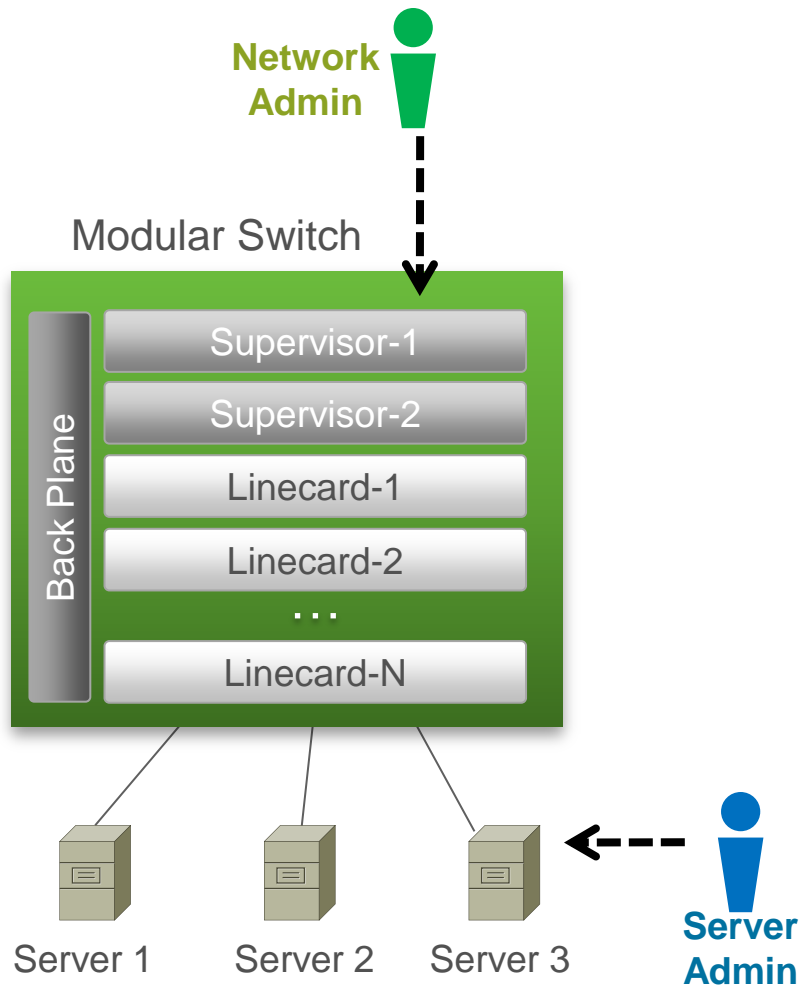
Server Virtualization Issues



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

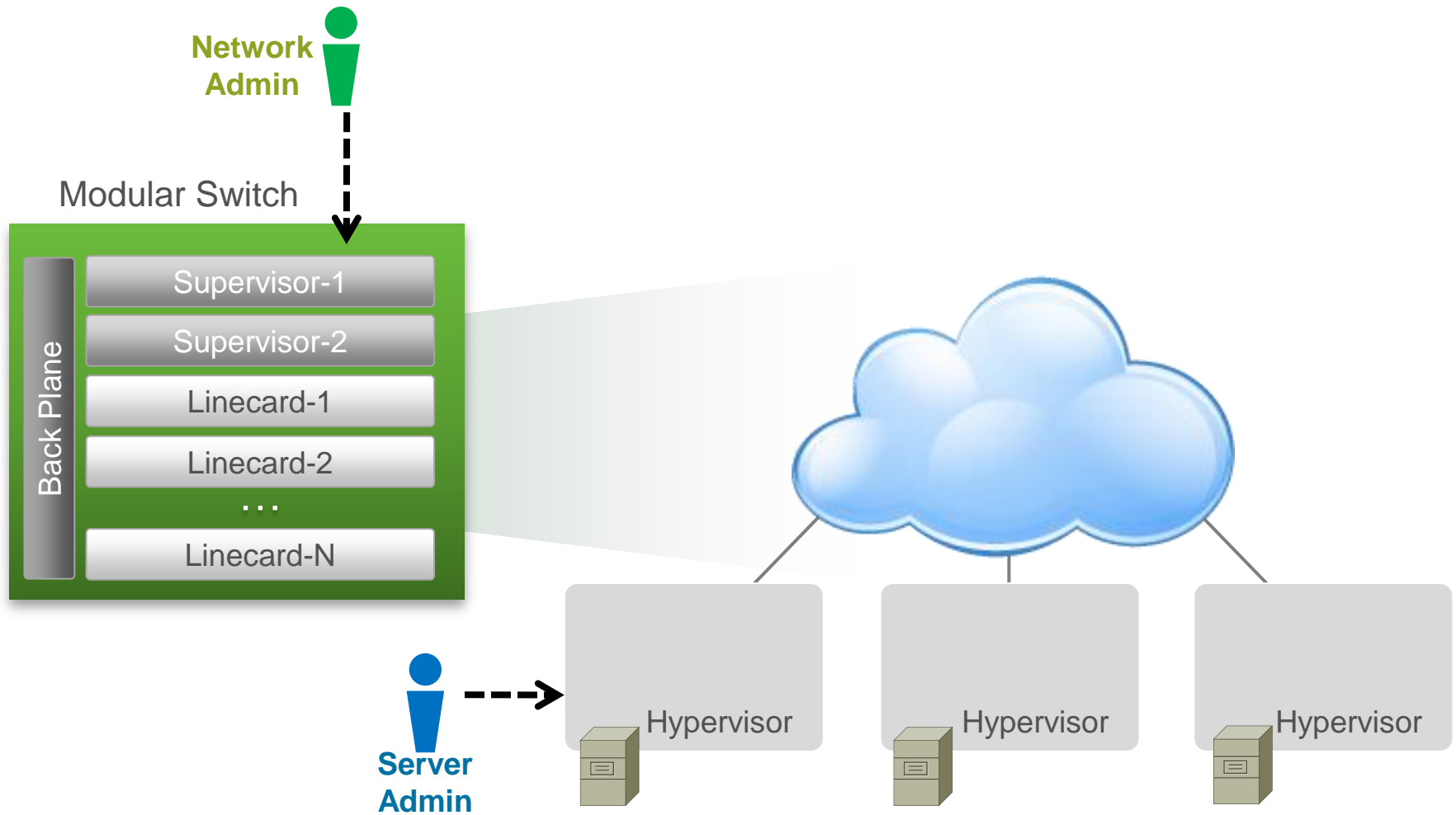
Nexus 1000V Architecture

Comparison to a Physical Switch



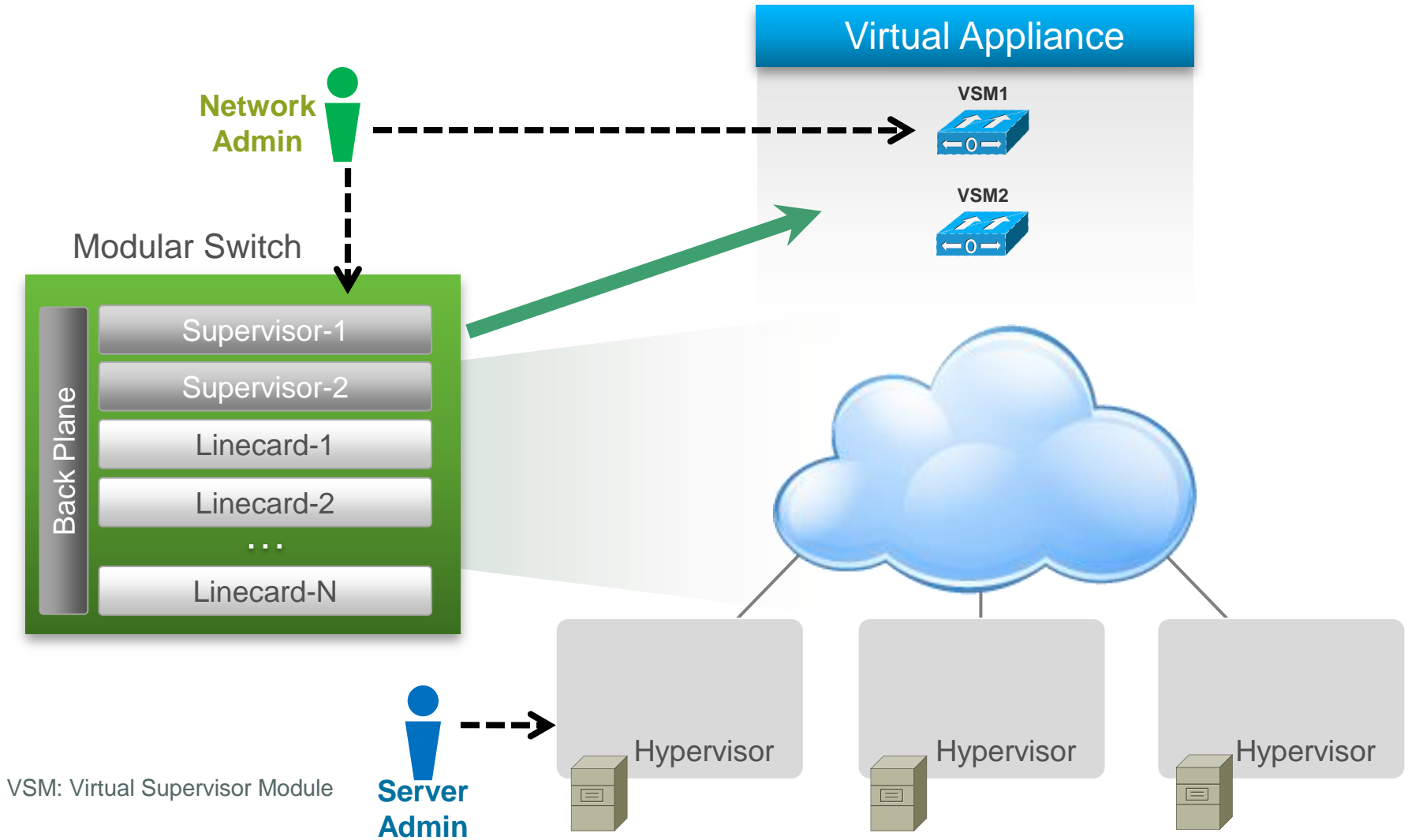
Nexus 1000V Architecture

Moving to a Virtual Environment



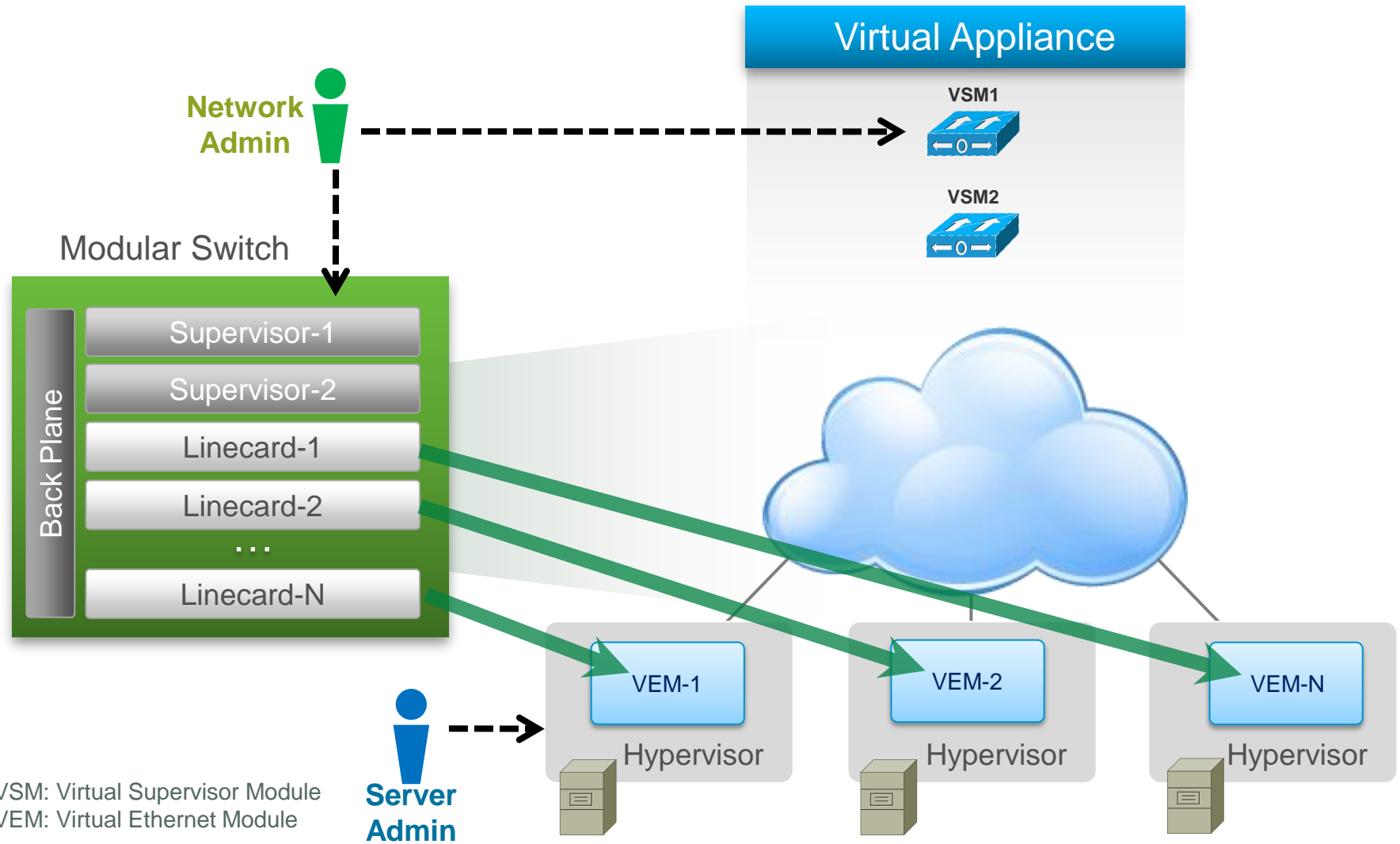
Nexus 1000V Architecture

Supervisors → Virtual Supervisor Modules (VSMs)



Nexus 1000 Architecture

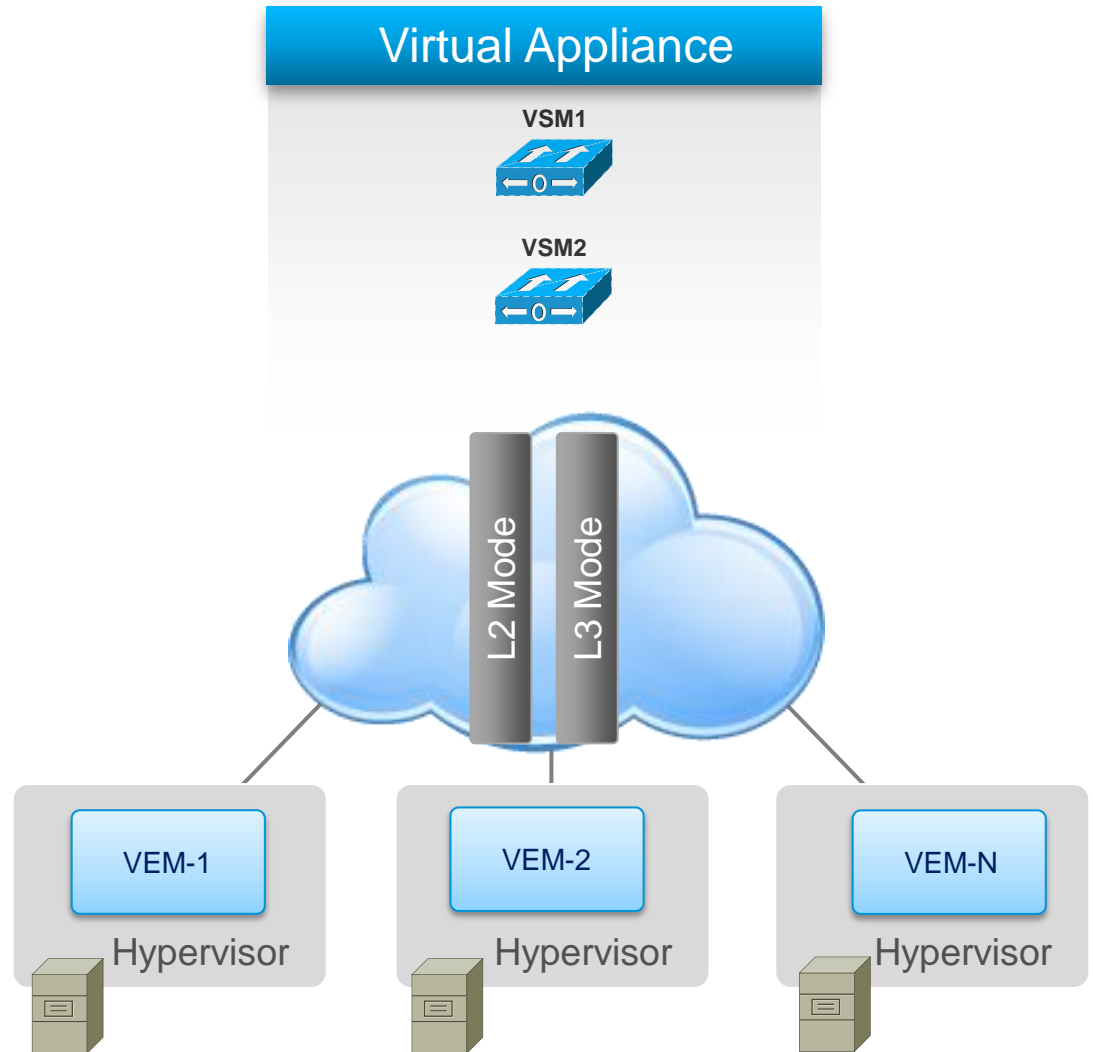
Linecards → Virtual Ethernet Modules (VEMs)



Nexus 1000V Architecture

VSM + VEMs = Nexus 1000 Virtual Chassis

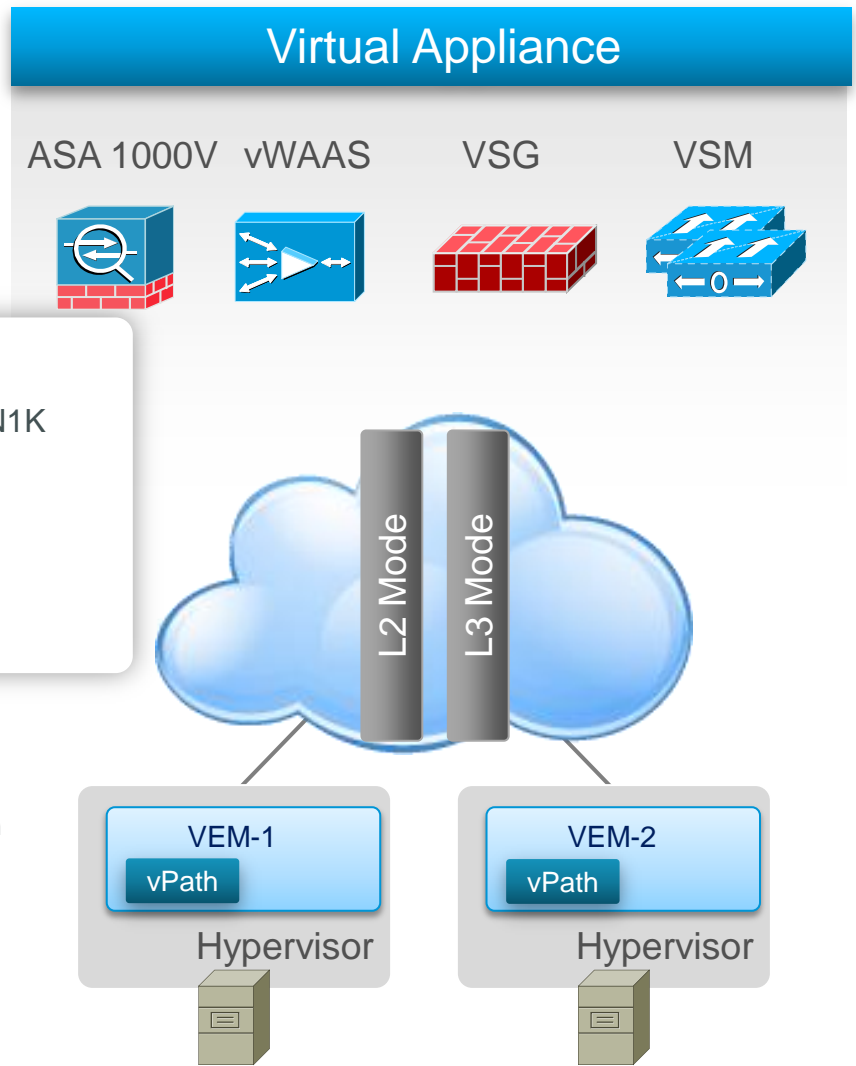
- 200+ vEth ports per VEM
- 2K vEths per N1K
- 64 VEMs per N1K (connected by L2 or L3)
- Multiple N1Ks can be created (under single VM management center)



VSM: Virtual Supervisor Module
VEM: Virtual Ethernet Module
vEth: Virtual Ethernet port

Embedding Intelligence for Virtual Services

vPath – Virtual Service Datapath



- VSG**
 - Virtual Security Gateway for N1K
- vWAAS**
 - Virtual WAAS
- ASA 1000V**
 - Virtual ASA

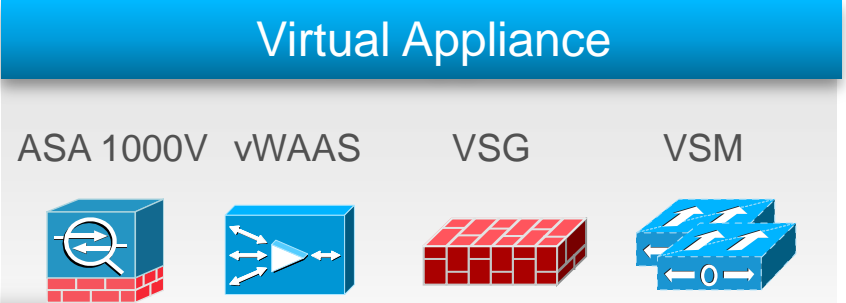
vPath

Virtual Service Datapath

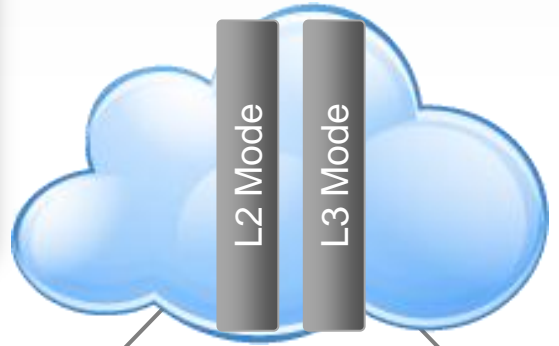
- **Service Binding (Traffic Steering)**
- **Fast-Path Offload**
- **VXLAN aware**

Scaling LAN Segments

VXLAN – Virtual Extensible LAN



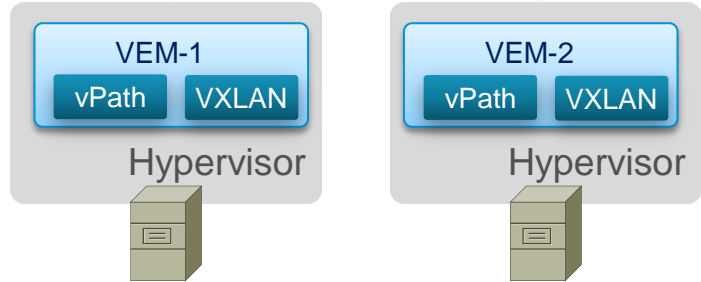
- VSG**
 - Virtual Security Gateway for N1K
- vWAAS**
 - Virtual WAAS
- ASA 1000V**
 - Virtual ASA



vPath

Virtual Service Datapath

- Service Binding (Traffic Steering)
- Fast-Path Offload
- VXLAN aware

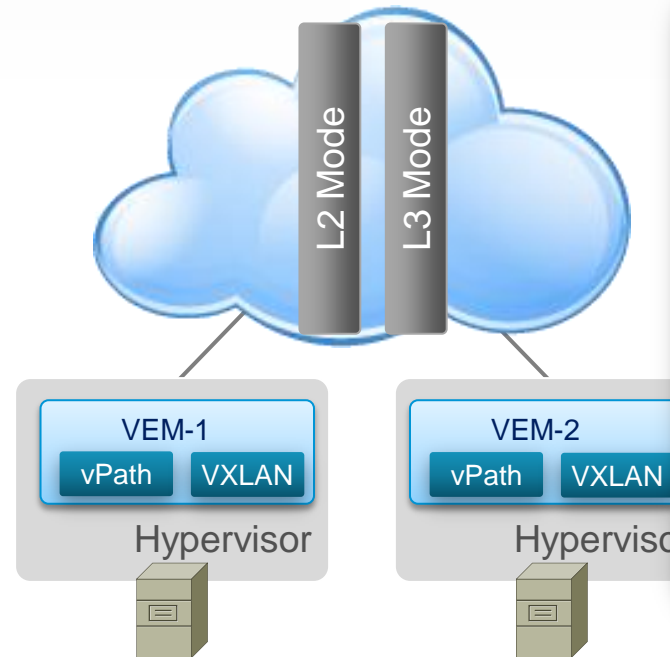
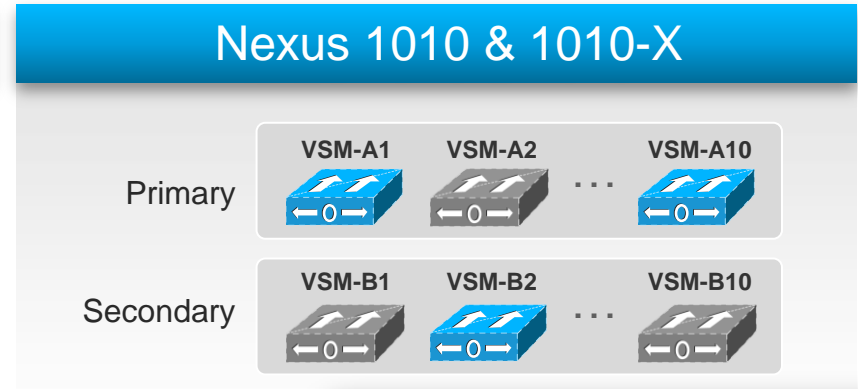
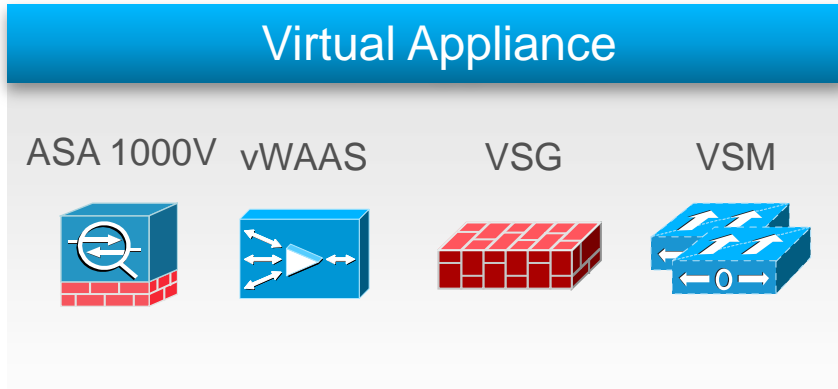


VXLAN*

Virtual Service Datapath

- 16M segments
- LAN segment across L3 (Mac-over-UDP encap)
- Friendly to existing network devices

Nexus 1010 – Hosting Platform for VSM



- ### Nexus 1010 & 1010-X
- NX-OS based physical appliance
 - Network team can deploy & manage like an NX-OS switch
 - Admin access to VM mgmt tool (e.g. vCenter) is NOT required
 - Deploy/manage VSMs via SSH/CLI
 - Can be deployed in pair for HA
 - Leverage vPC/LACP to connect to network
 - Common hosting platform for multiple virtual appliances
 - Up to 10 VSMs (or virtual blades)

VSM: Virtual Supervisor Module
VEM: Virtual Ethernet Module

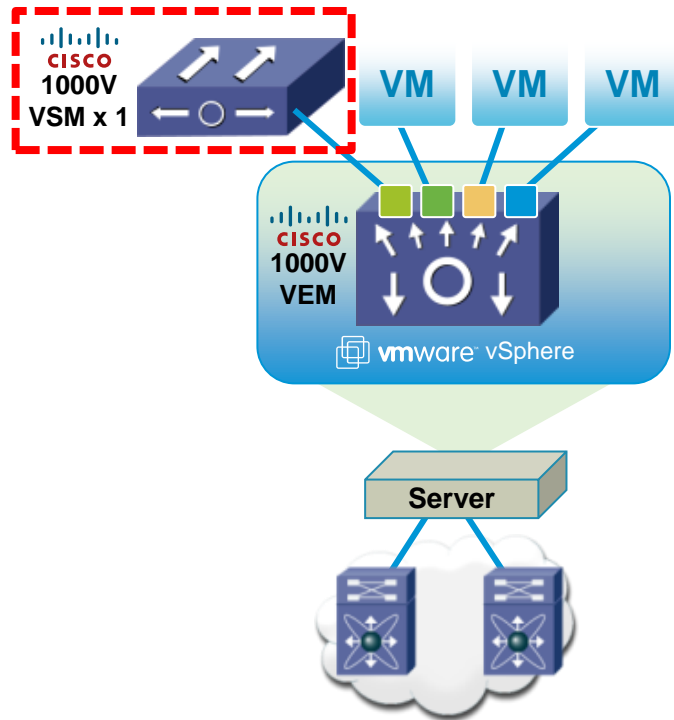
Nexus 1010 and 1010-X

- Dedicated NX-OS server appliances to run multiple Nexus 1000V Virtual Supervisor Modules (VSMs) as well as other Virtual Blades such as the VSG, NAM, and DCNM.
- 1010 available since April 2010
 - Supports up to 6 virtual blades
- 1010-X available since December 2011
 - Supports up to 10 virtual blades

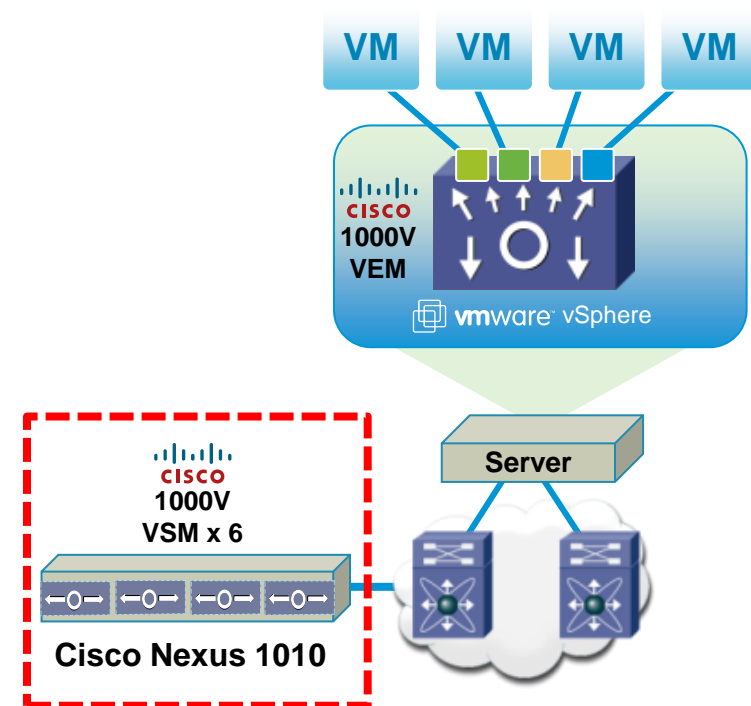


Architecture Comparison

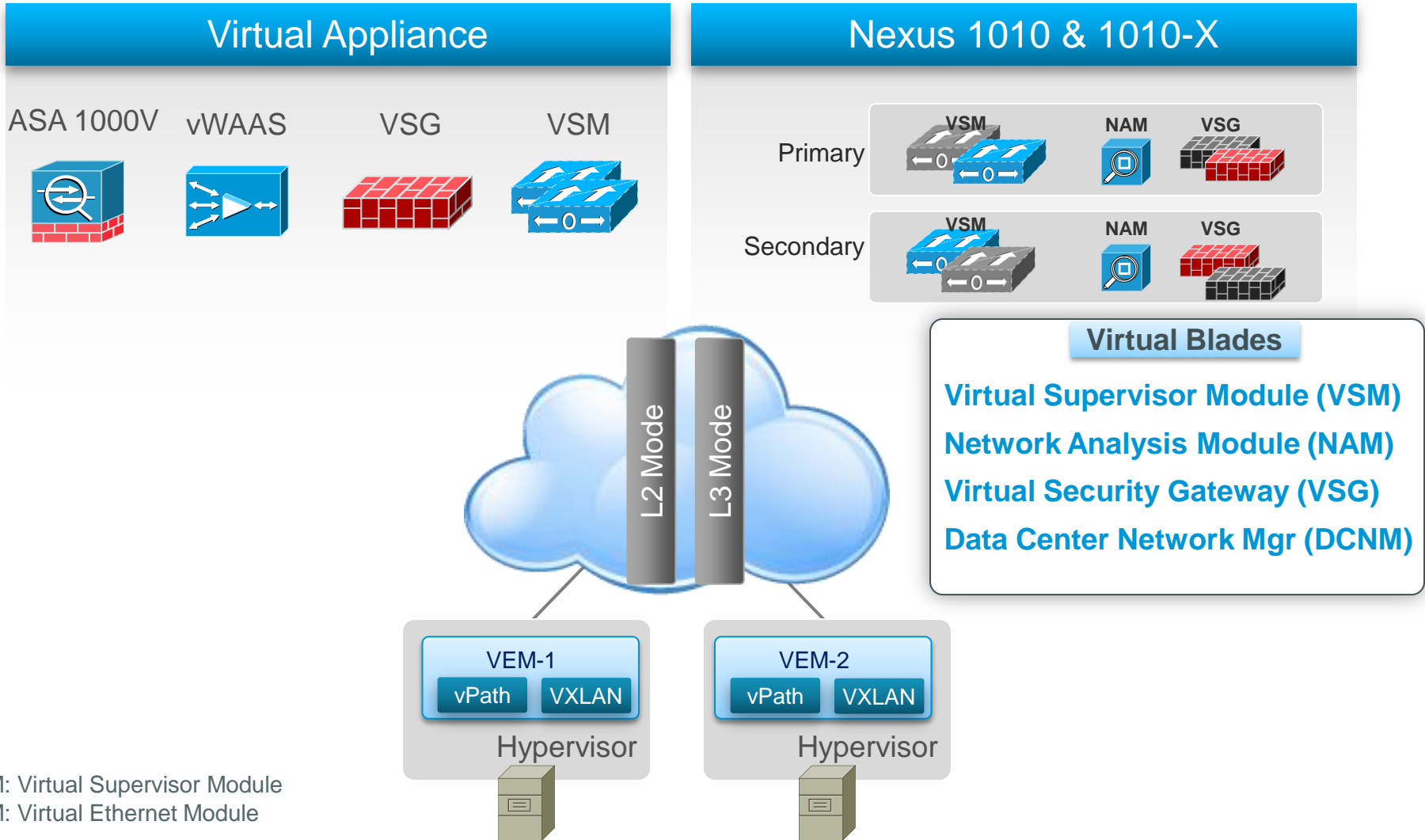
Virtual Machine



Physical Appliance (Nexus 1010)

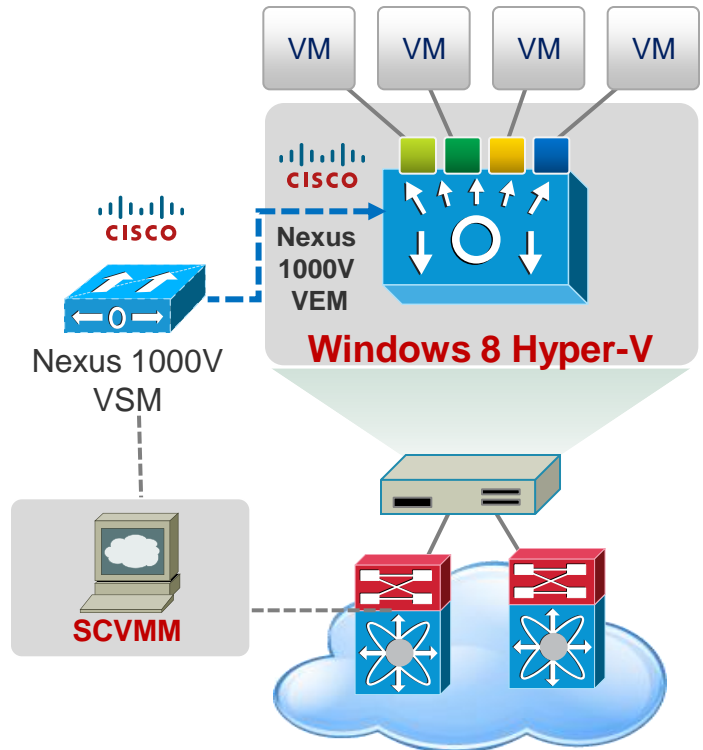
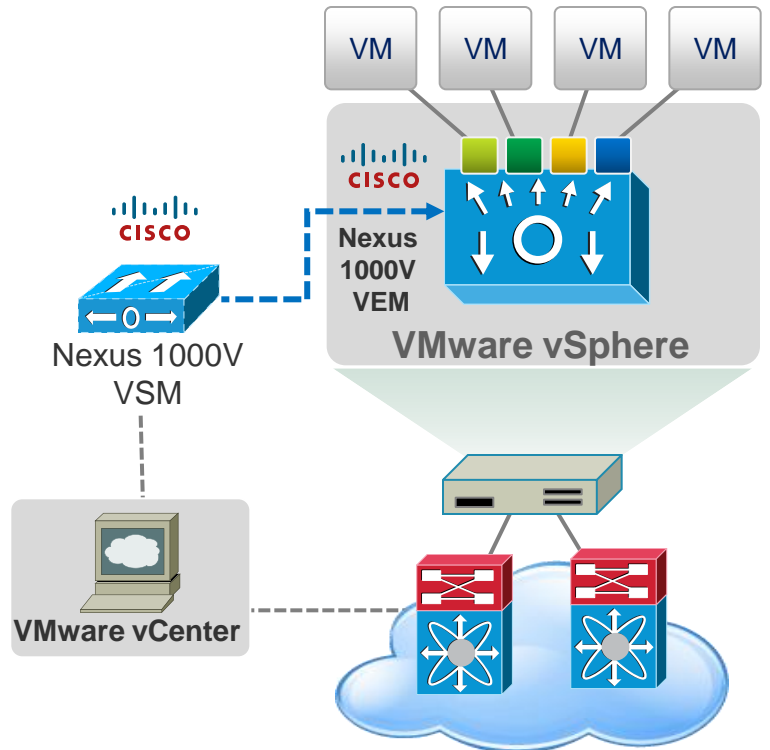


Nexus 1010 – Hosting Platform for Services



VSM: Virtual Supervisor Module
VEM: Virtual Ethernet Module

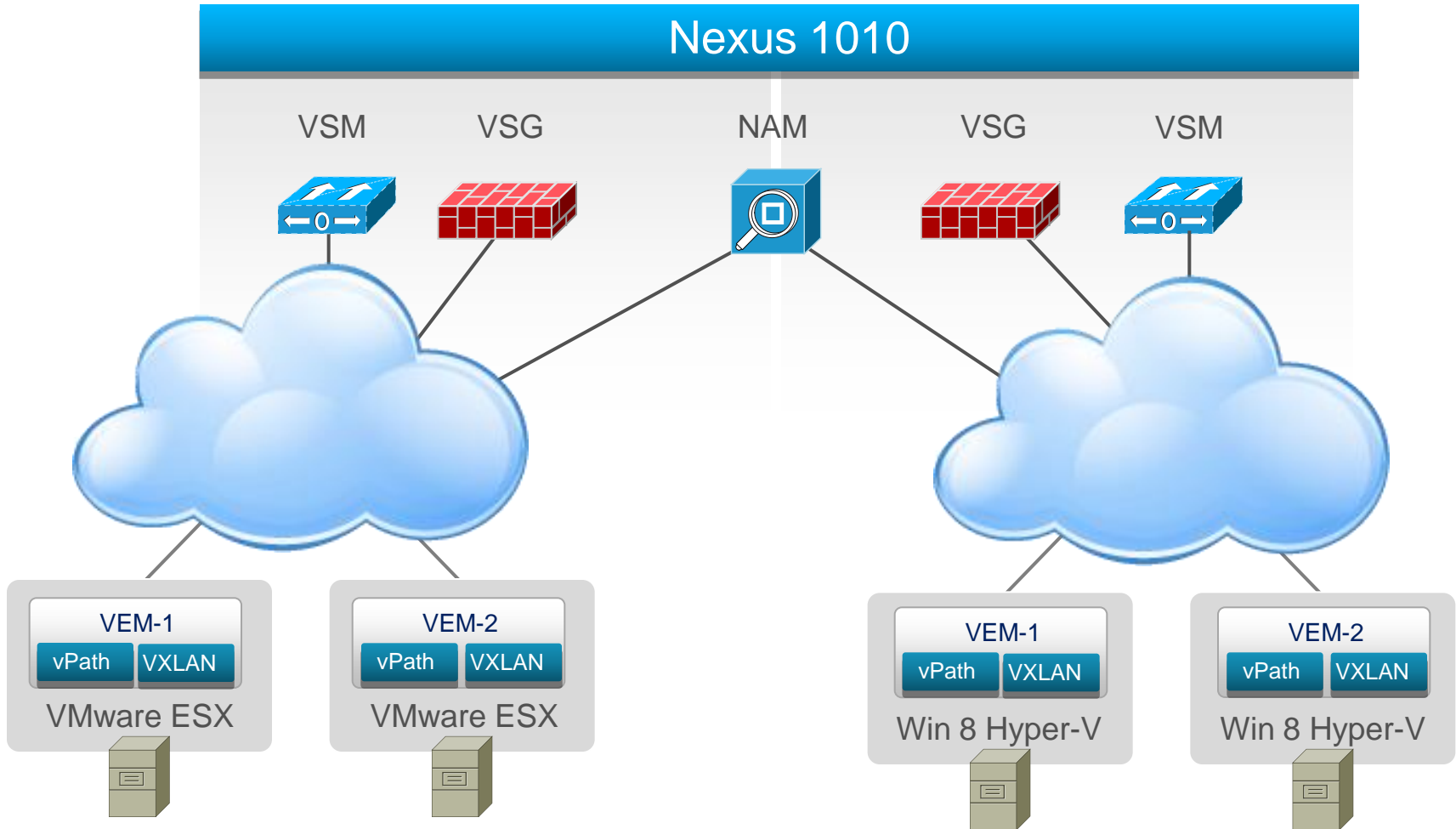
Cisco Nexus 1000V for Win8/Hyper-V



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

Cisco Nexus 1010

Consistent Architecture across Hypervisors



Existing Nexus 1010 will support multi-hypervisor environment

Feature Comparison

VSM as VM



VSM on Nexus 1010



Nexus 1000V features and scalability



VEM running on Hypervisor



NX-OS high availability of VSM



Software-only deployment (Hypervisor specific)



Installation like a standard Cisco switch



Network Team owns/manages the VSM



Support multi-hypervisor VM traffic



Virtualized Multi-Tenant Data Center (VMDC) with FlexPod

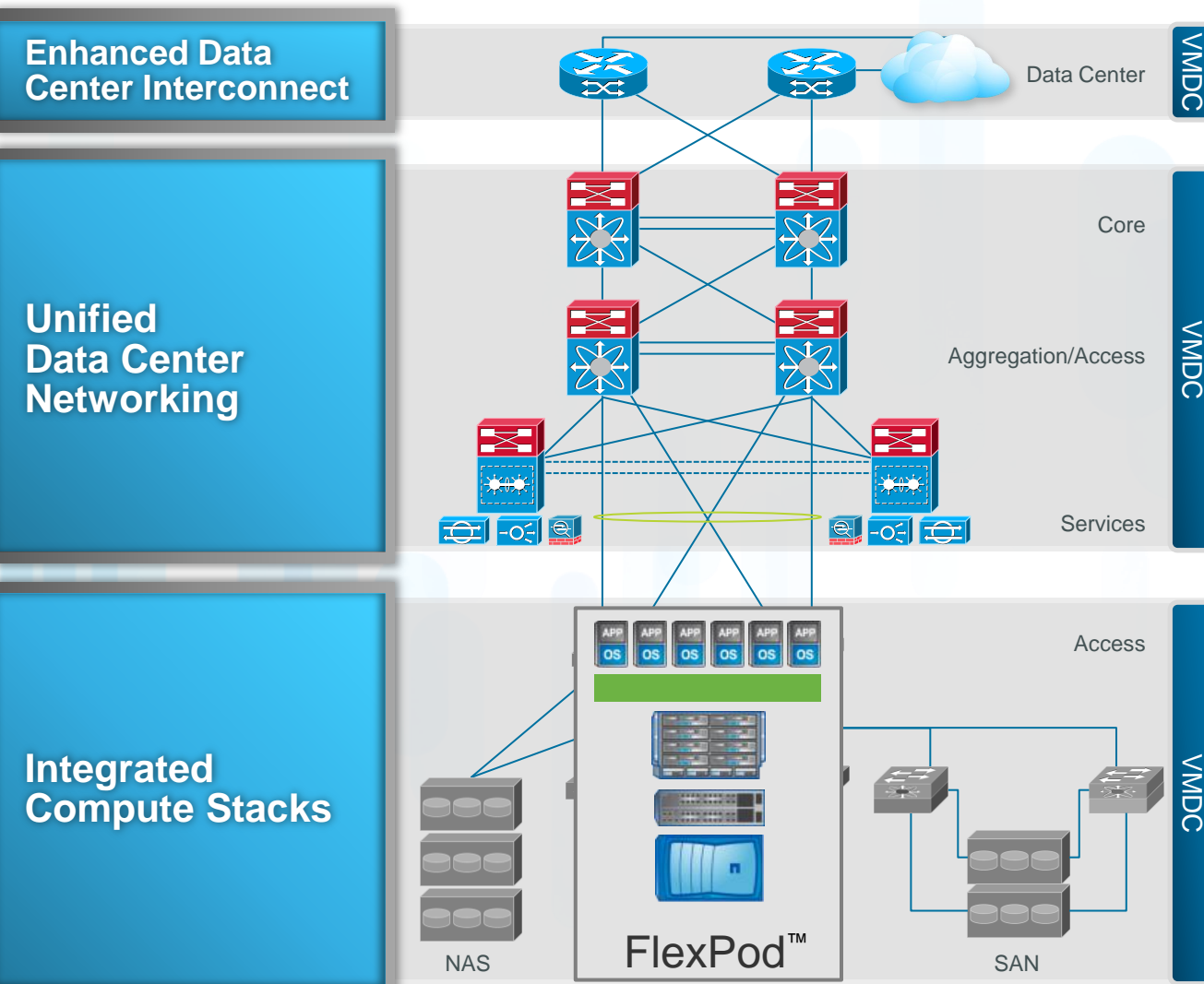
What Is VMDC?

- Virtualized, Multi-Tenant Data Center (VMDC) is a cloud blueprint that enables customer to readily deploy services or applications
- A validated, full-system architecture for customers deploying virtualized services (application workloads) in a “cloud-style” environment, sharing common infrastructure for multiple cloud consumers or “tenants”
- A flexible, modular design that can be used as a blueprint for cloud deployments
- A prescriptive packaged available to customers as a whole offer
- An architecture built to scale
- An architecture that aggregates integrated compute stacks, unified data center, and data center interconnect into an end-to-end architecture

Validated Designs, Modular Approach, Flexible Deployment Options

Cisco Virtualized Multi-Tenant Data Center

Comprehensive, Modular, and Flexible Approach



Cloud Service Management

Business Support

Provisioning Configuration

Portability/ Interoperability

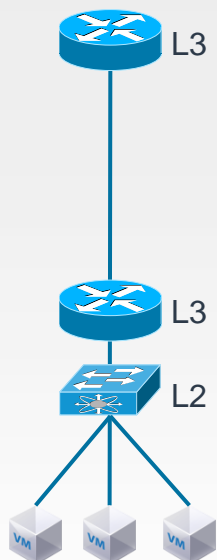
VMDC

VMDC

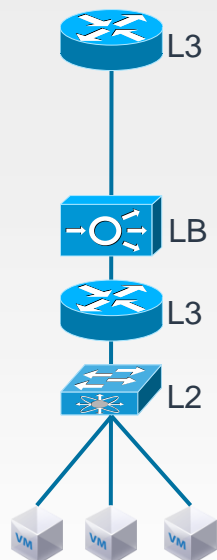
VMDC Validated Infrastructure Flexible Containers

VMDC 2.0

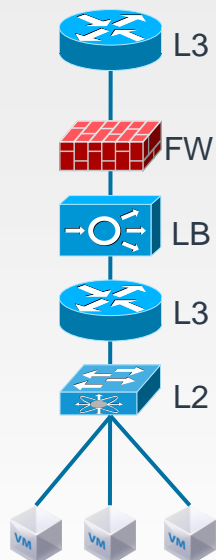
Bronze



Silver

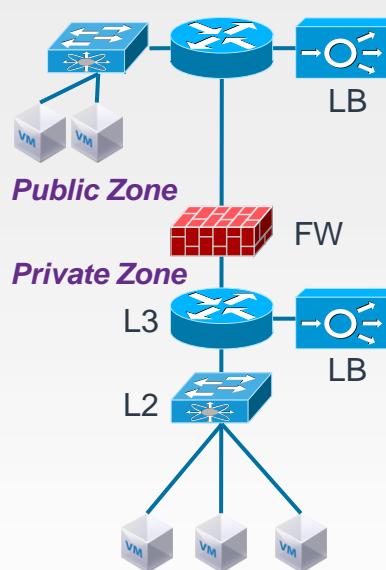


Gold



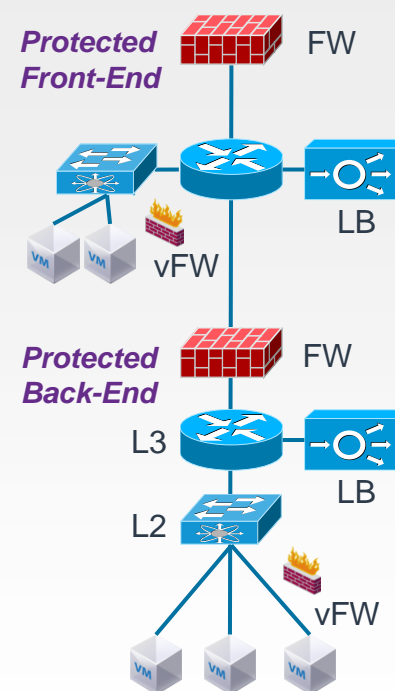
VMDC 2.1

Palladium

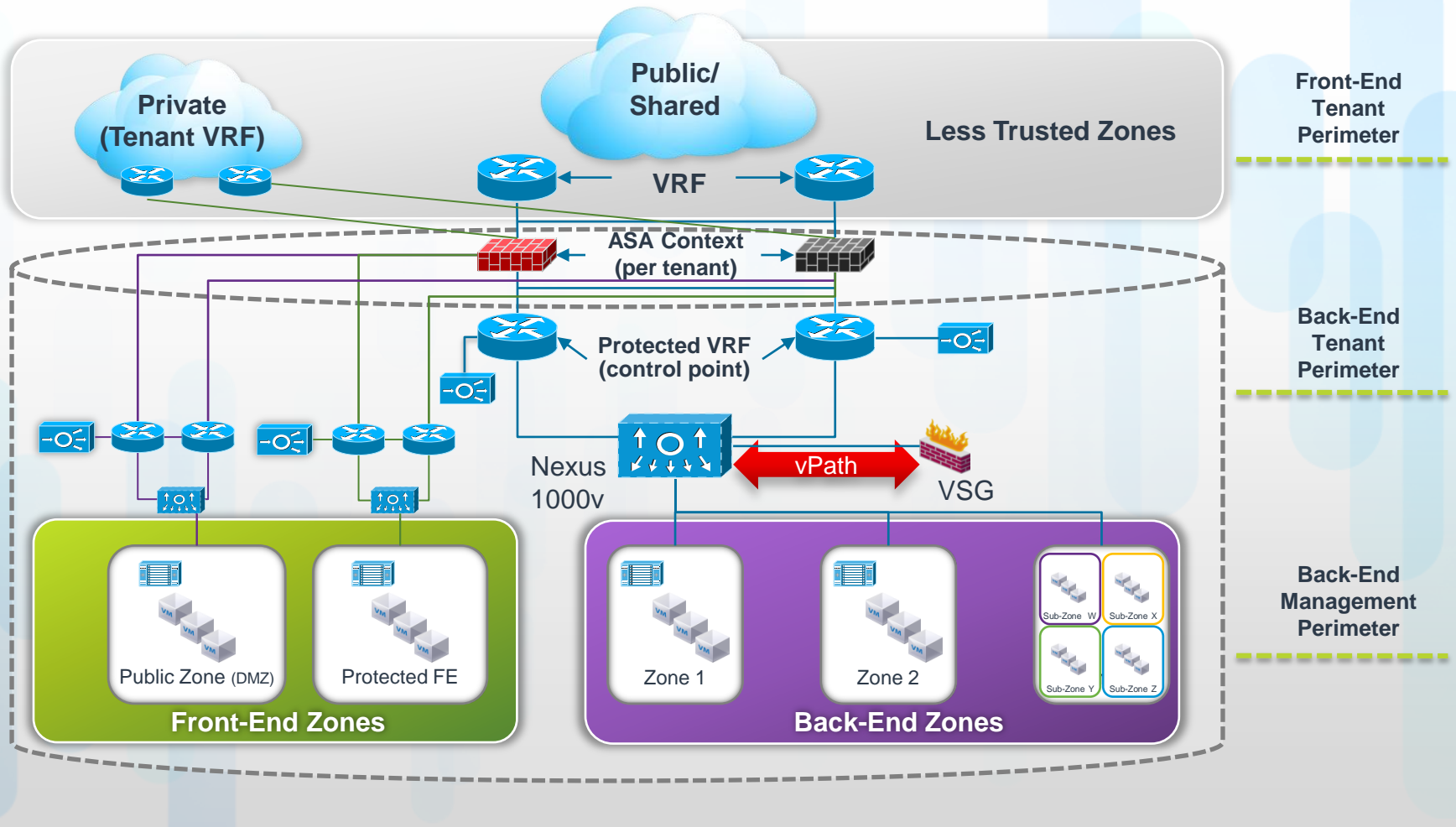


VMDC 2.2

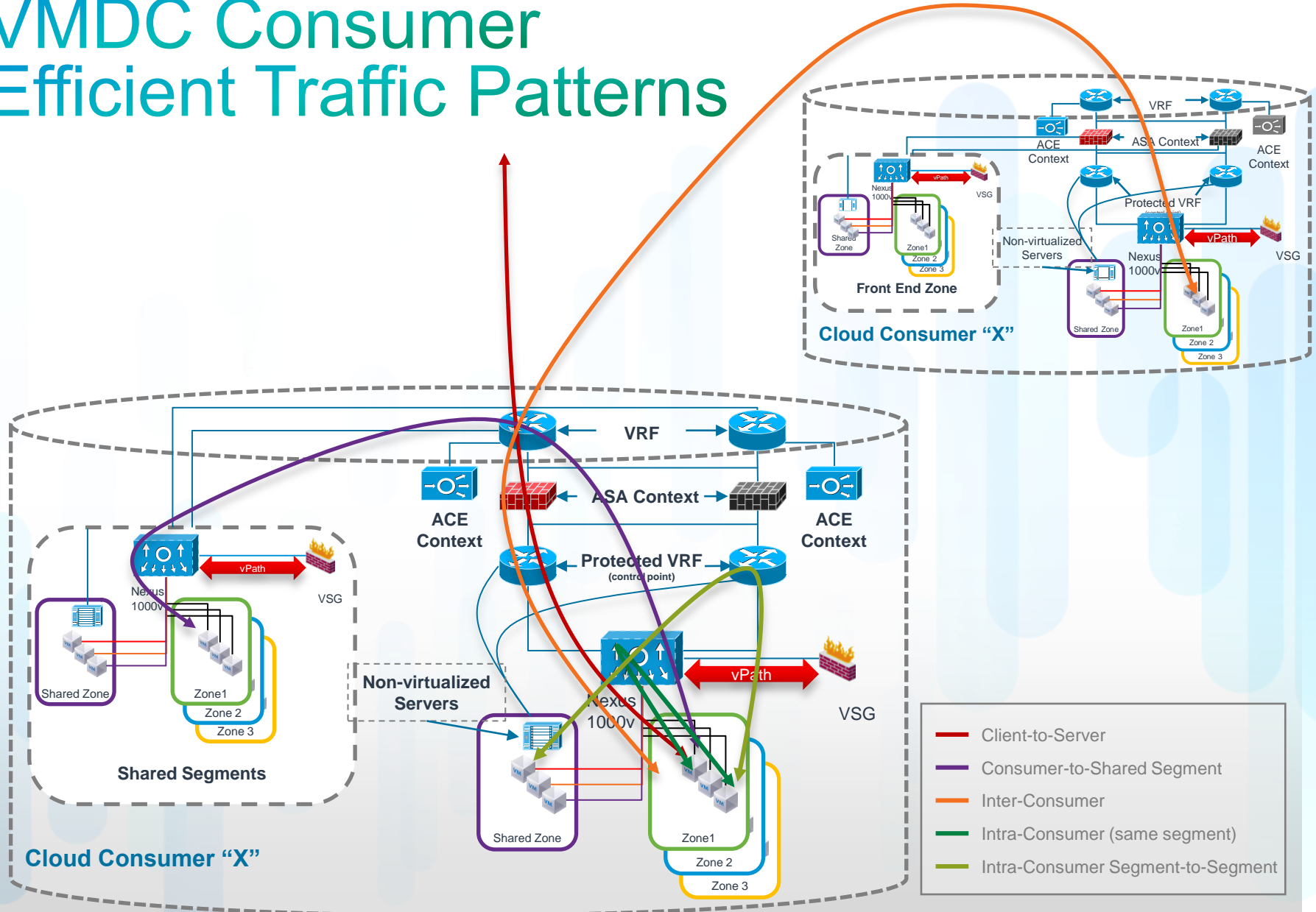
Expanded



VMDC Consumer Model Logical Structure



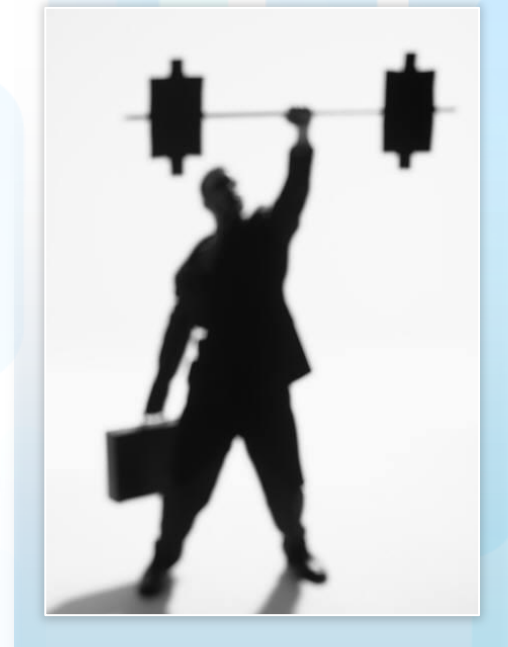
VMDC Consumer Efficient Traffic Patterns



VMDC Strengths

Uniformity and Homogeneity

- Defined System for today, evolving for tomorrow
 - Reduced complexity as system is characterized via validation efforts with supporting collateral
- Facilitates automation, well known and understood resource pools encompassing network, compute and storage
- Facilitates onboarding of services (HCS, HVD, DR, DP for example)
- Facilitates Expertise
 - Staff becomes specialized in defined environment
- Facilitates platform hardening and automation of security operations such as
 - Configuration
 - Auditing
 - Patching
 - Response
- Facilitates operational compliance and certifications
- Availability
 - Resilient architecture that scales



Resources



Cisco Links

Software, Documentation & Screencasts

Product	CCO Links
FlexPod www.cisco.com/go/flexpod	VMware build on FlexPod Deployment Guide
Nexus 1000V (v1.5.1) www.cisco.com/go/1000v	SW Download Documentation Screencasts
Nexus 1010 & 1010-X (v1.4) www.cisco.com/go/1010	SW Download Documentation
Virtual Security Gateway (v 1.3.1) www.cisco.com/go/vsg	SW Download Documentation Screencasts
Virtual Network Management Center (v1.3.1a) www.cisco.com/go/vnmc	SW Download Documentation Screencasts
Data Center Network Manager [v5.2(2a)] www.cisco.com/go/dcnm	SW Download Documentation
Cisco Virtualized Multi-Tenant Data Center	www.cisco.com/go/vmdc

Reference Solutions

- [FlexPOD with Nexus 1000V and Nexus 1010](#)
- [VMDC 2.2 with Nexus 1000V and VSG](#)
- Virtual Desktop
 - [1000V and VMware View](#)
 - [1000V and Citrix XenDesktop](#)
 - [1000V and VSG in VXI Reference Architecture](#)
- Virtual Workload Mobility (aka DC-to-DC vMotion)
 - [Cisco, VMware and EMC \(with 1000V and VSG\)](#)
 - [Cisco, VMware and NetApp \(with 1000V and VSG\)](#)
- [PCI 2.0 with Nexus 1000V and VSG](#)

N1K Public Webcasts, Fall 2011

Date	Technical Track Topics	Webinar	Prezo
7/27	Long Distance vMotion with Nexus 1000V and VSG	Play	PDF
8/10	PCI Reference Architecture with Nexus 1000V and Virtual Security Gateway	Play	PDF
10/05	Nexus 1000V, VXLAN, and vCloud Director	Play	PDF
10/12	Virtualized Multi-Tenant Data Center (VMDC)	Play	PDF
10/19	Nexus 1010 v1.3 - What's New?	Play	PDF
10/26	Virtualized Workload Mobility - Latest Design Guidance	Play	PDF
11/02	UCS and Nexus 1000V - Best Practices	Play	PDF
11/09	Virtual Security Gateway (VSG) v1.2 - what's new? v1.3 - what's coming?	Play	PDF

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

N1K Public Webcasts – Spring 2011

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

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

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

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: <http://www.cisco.com/en/US/products/ps10846/index.html> (or www.cisco.com/go/nam)

- Deployment Guides

[Nexus 1000V Deployment Guide](#)

[Nexus 1000V on UCS – Best Practices](#)

[Nexus 1010 Deployment Guide](#)

[VSG Deployment Guide](#)

- 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 w/ UCS Configuration Cheat Sheet v.1.1

<https://communities.cisco.com/docs/DOC-28187>

More on the way....

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)

Just added: VXLAN Basic Introduction

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

Thank you.

