



Delivering
Unprecedented
Innovation to Create
Flexible Virtual
Environments



Maximize IT Productivity while Lowering
Capital and Operating Costs



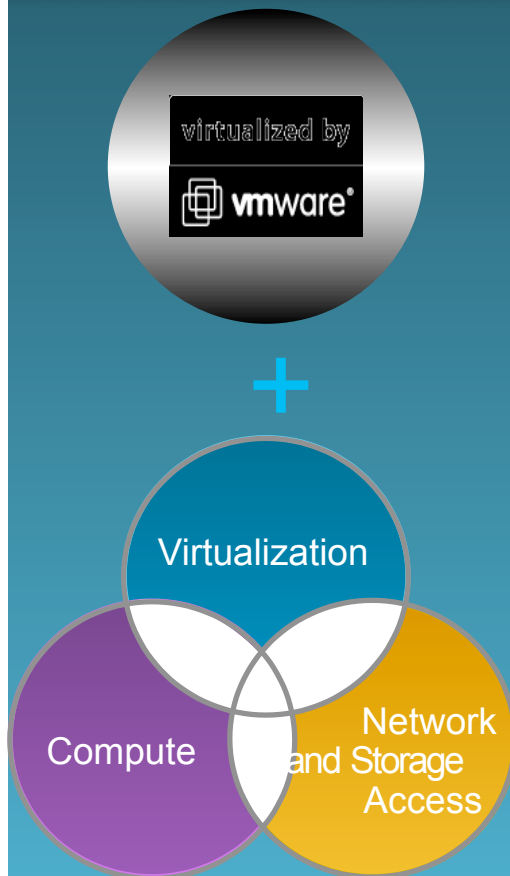
Virtualization has changed the face of today's data centers

- Virtualization has become a requirement for staying competitive
 - Increased utilization brings greater ROI
 - Decoupling application deployment from server purchases increases agility
- Upping the ante: To be competitive with this new *status quo*, business organizations need to squeeze even greater benefits from virtualization
 - Leverage the power of better virtualization platforms
 - Increase virtualization percentage



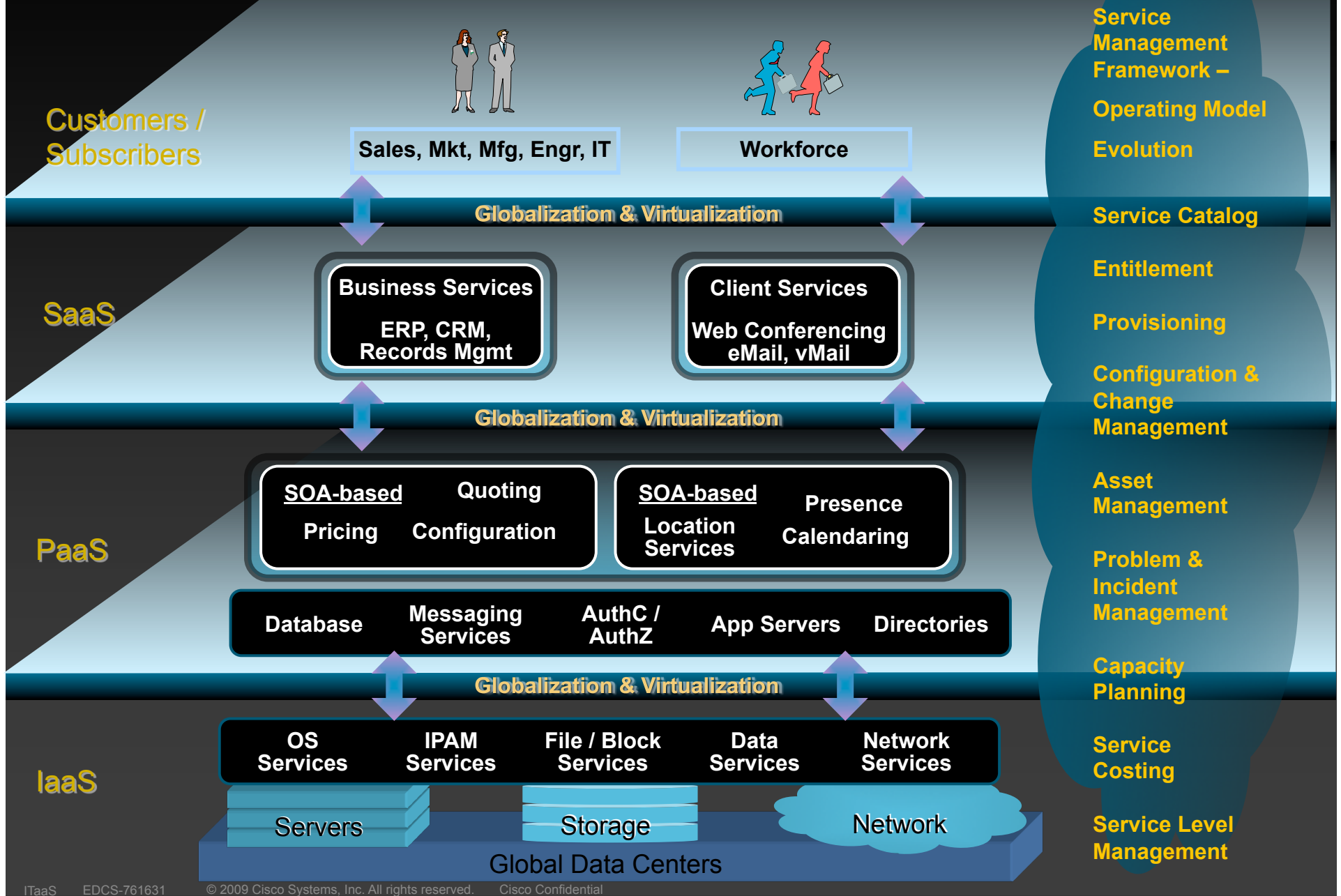
A New Architectural Approach Is Needed

Tomorrow's Data Center Can't Be Built On Yesterday's Technology



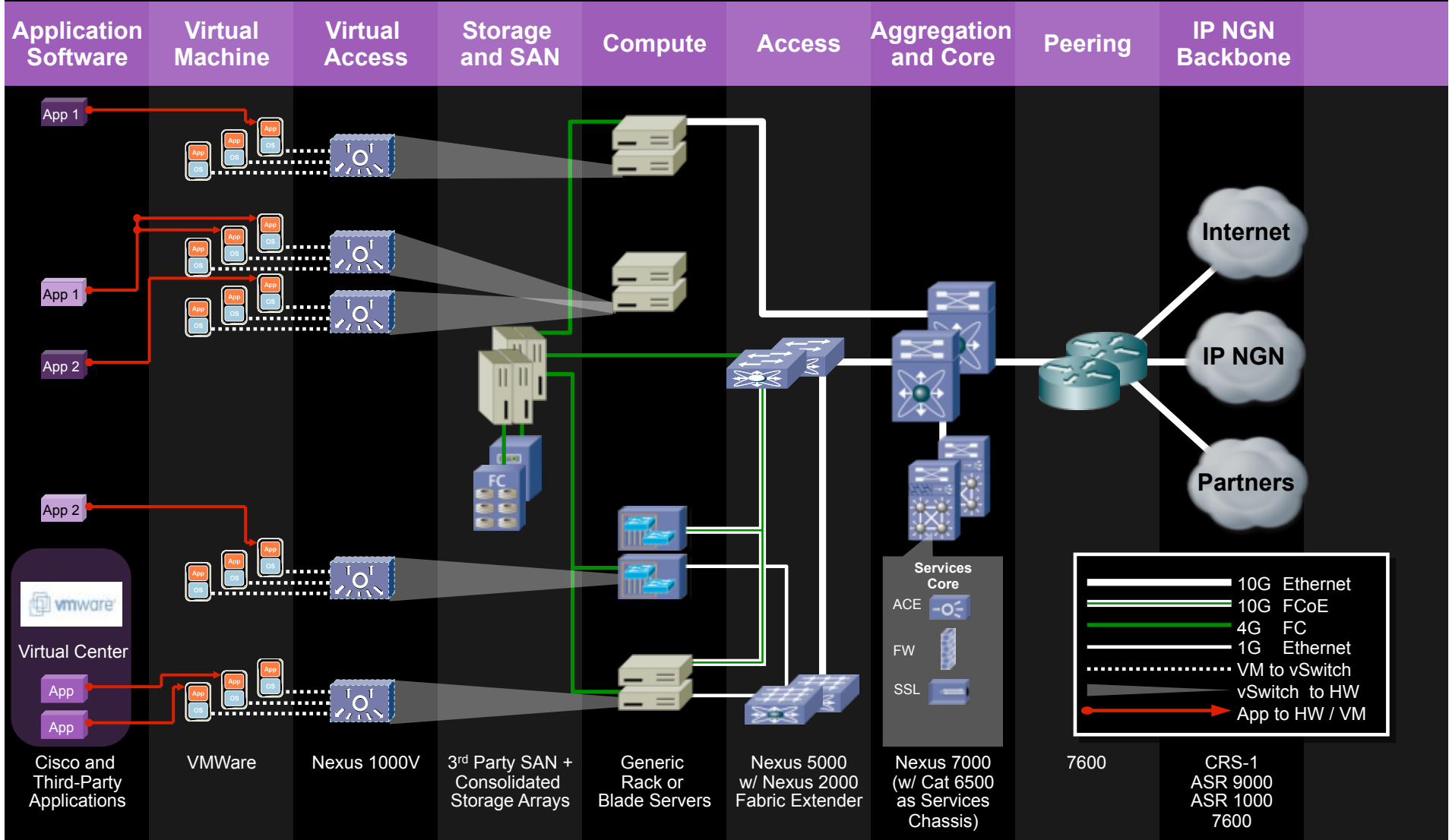
- **The data center needs to evolve**
 - Traditional siloed server, network, storage, and virtualization platforms have limited virtualization efficiency and inhibit rapid deployment
 - Management needs to be native, not an after-thought
- **Cisco and VMware are delivering integrated solutions to accelerate data center transformation**
 - More than independent best-of-breed solutions
 - Integration delivers unprecedented innovation to create flexible, virtual environments
 - Enabling rapid application and infrastructure deployment
 - Greater security, availability, and performance
 - Increasing ROI, reducing TCO

IT as a Service (ITaaS)

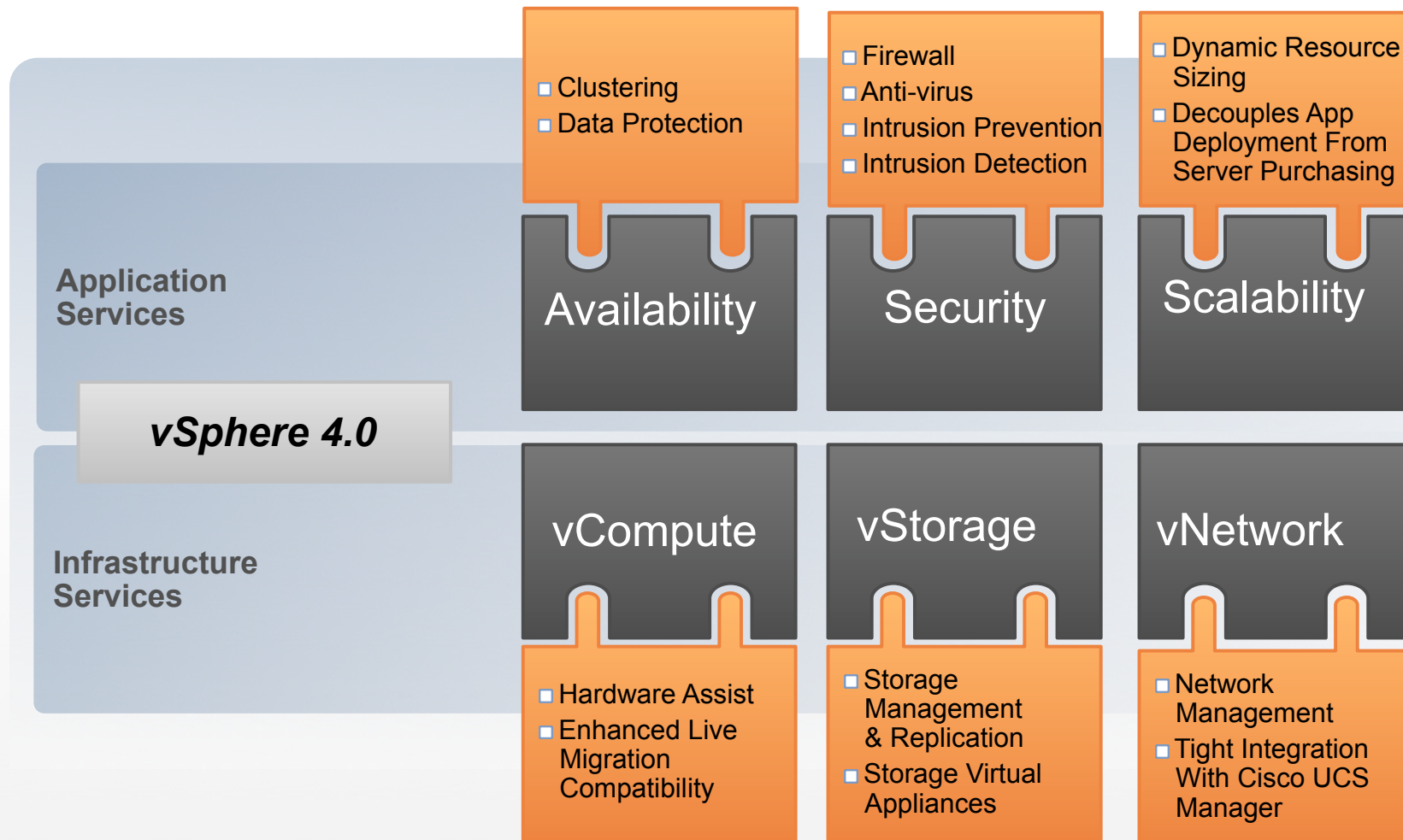


Infrastructure as a Service System

Adding the Capability to an Existing Data Center

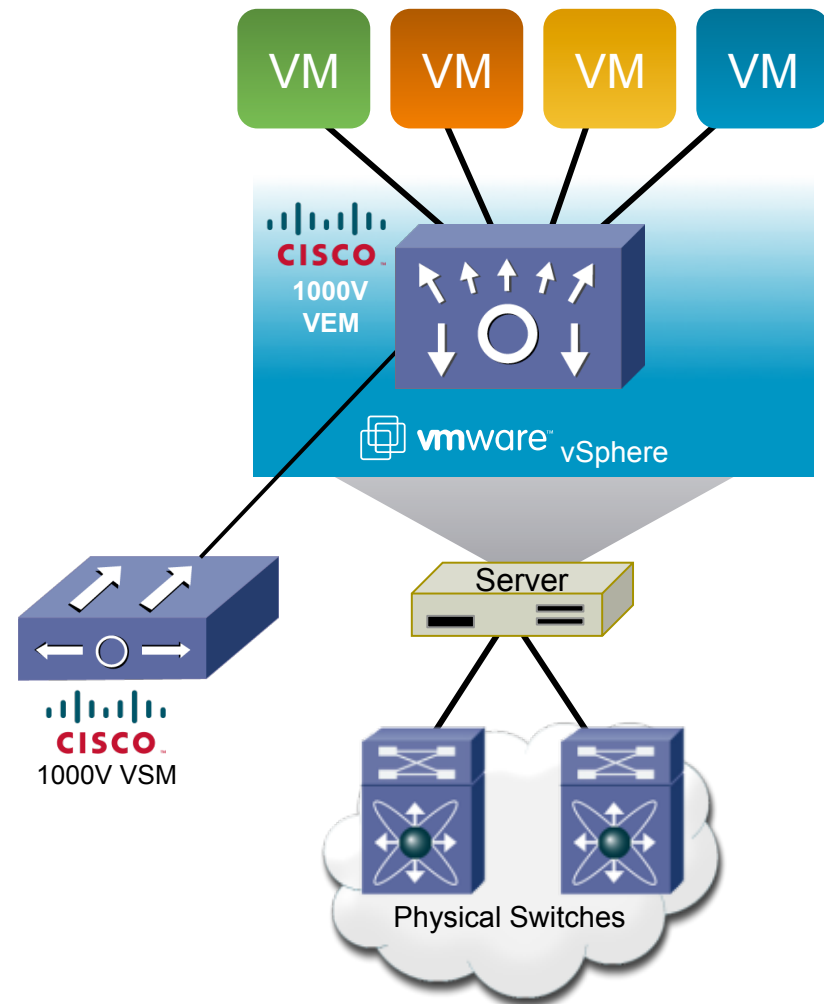


VMware vSphere™ –Most Widely Used and Trusted Virtualization Software on the Market



Integrated Solution: Cisco Nexus 1000V +VMware Vsphere

- Industry's most advanced software switch for VMware vSphere
- Built on Cisco NX-OS
- Compatible with all switches
- Compatible with all servers on the VMware Hardware Compatibility List
- Winner of VMWorld Best in Show 2008 and Cisco Most Innovative Product of 2009



Nexus 1000v: Policy-Based VM Connectivity

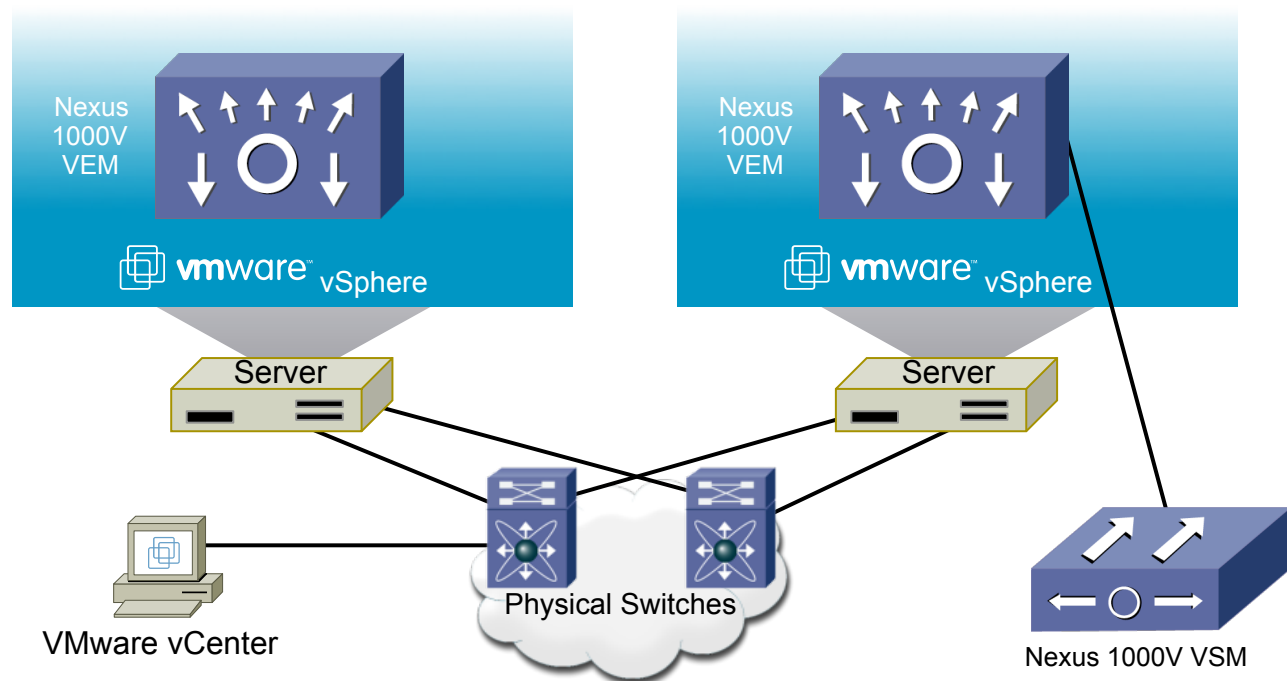
Policy-Based VM Connectivity

Mobility of Network and Security Properties

Non-Disruptive Operational Model

Port Profiles

- WEB Apps ■
- HR ■
- DB ■
- DMZ ■



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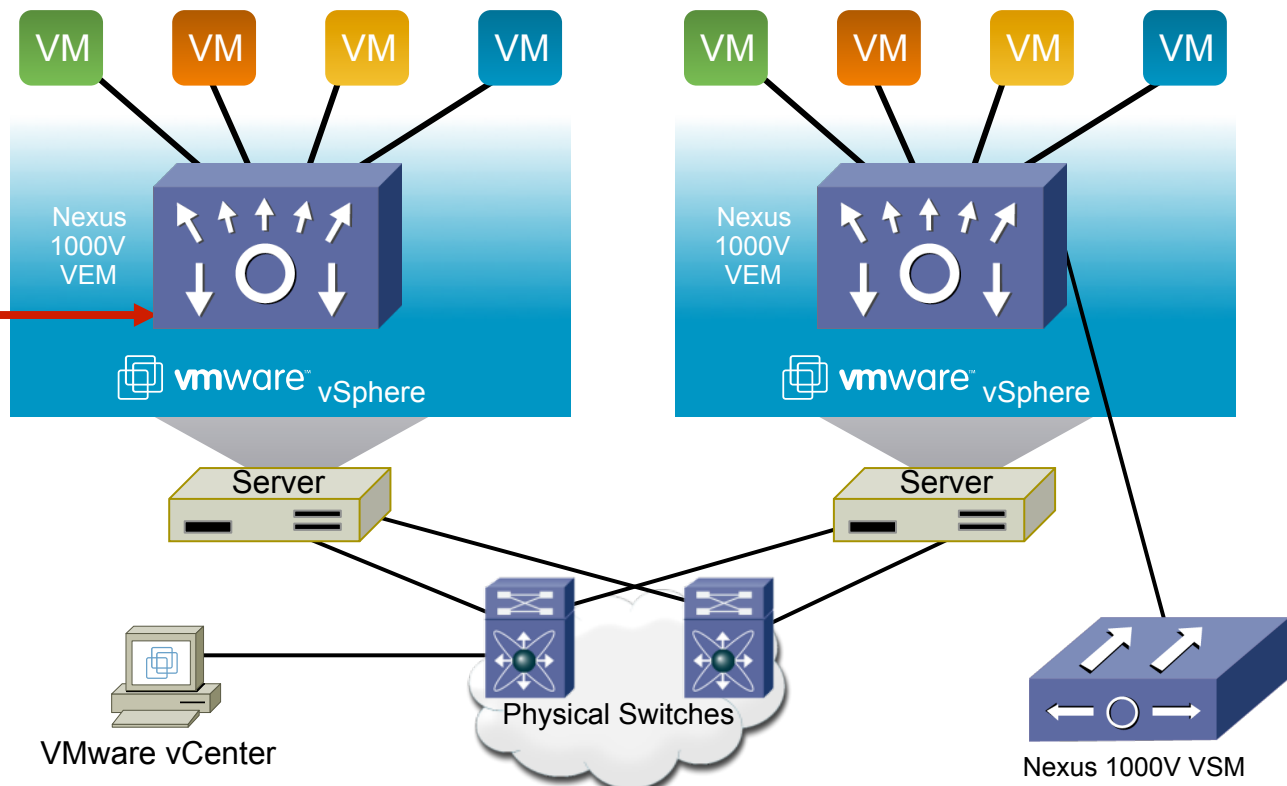


DMZ



VM Connection Policy

- Defined in the network
- Applied in Virtual Center
- Linked to VM UUID



Nexus 1000v: Mobility of Network and Security Properties

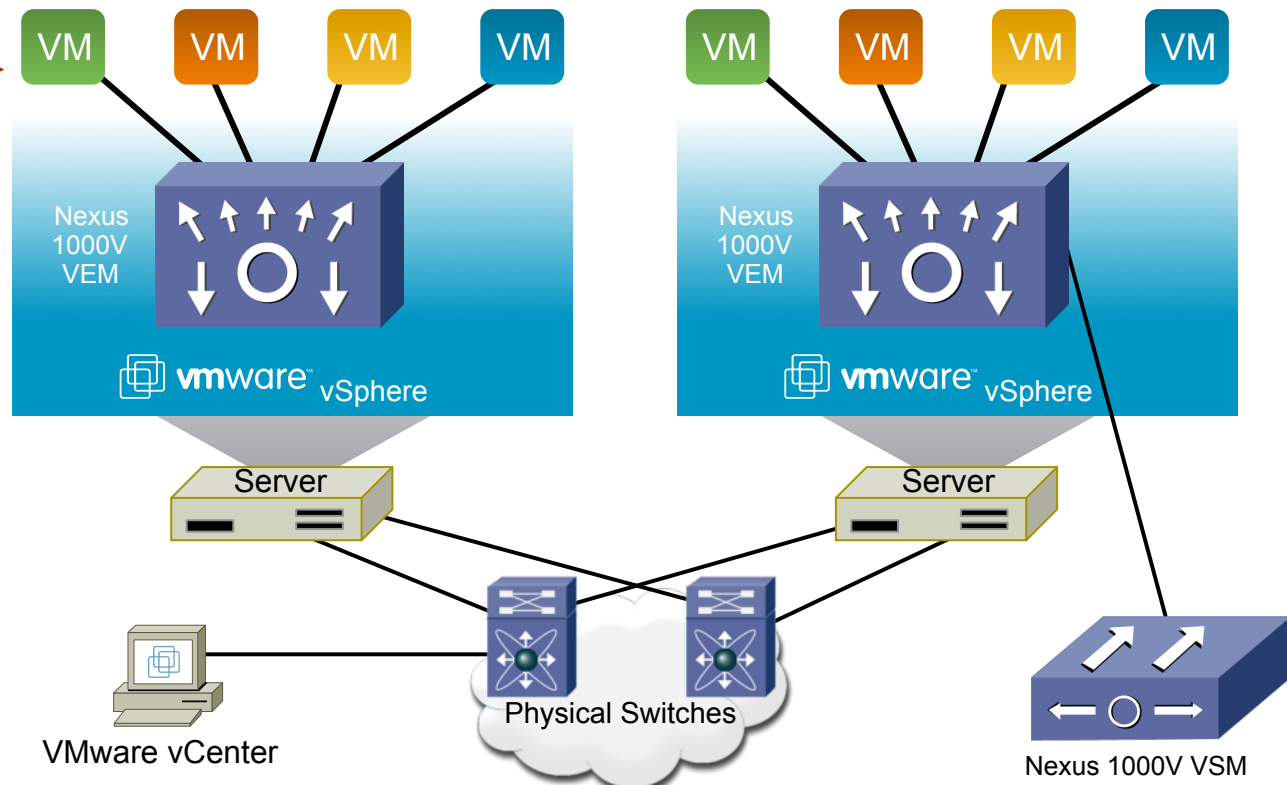
Policy-Based
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Mobility of Network and
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Operational Model

VMs Need to Move

- VMotion
- DRS
- SW Upgrade/Patch
- Hardware Failure



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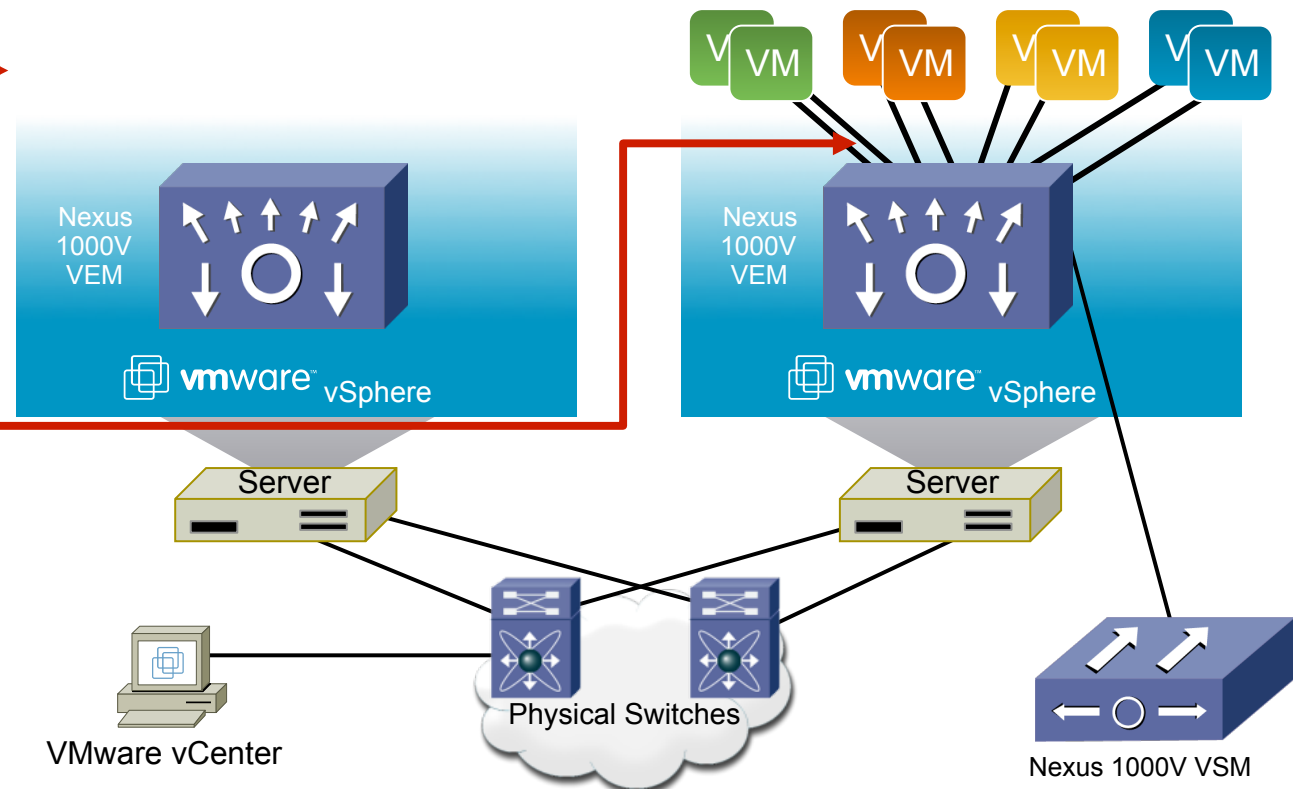
Non-Disruptive
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VMs Need to Move

- VMotion
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Property Mobility

- VMotion for the network
- Ensures VM security
- Maintains connection state



1000s of Companies Use Nexus 1000V



1000s of Companies Use Nexus 1000V

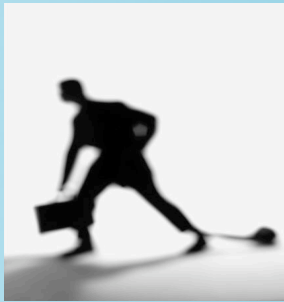


Over 100,000
CPU Licenses
Sold



Addressing Challenges Created By Traditional Architectures

**Inflexible infrastructure
inhibits rapid
deployment**



**High Cost of
implementing network
storage**



**Increased management
complexity**



**Overlap of administrative
domains**



**Obstacles to
Virtualization
Reduce Agility
Increase Costs**

**The Solution: integration of two leading platforms
specifically designed for virtualization**

Cisco Unified Computing System: Next Generation Hardware Platform

Unites compute, network, storage access, and virtualization into a cohesive system designed to reduce total cost of ownership, increase business agility.

Embedded – Unified Management

Extended Memory Technology

Dynamic Provisioning - Service Profiles

Unified Fabric

VN Link – Virtual Interface Card

InfoWorld

NOVEMBER 10, 2009

How Cisco UCS reinvents the datacenter

If you could design a blade server system entirely from scratch, it might look a whole lot like Cisco's Unified Computing System

Network Computing

For IT By IT

News and Analysis

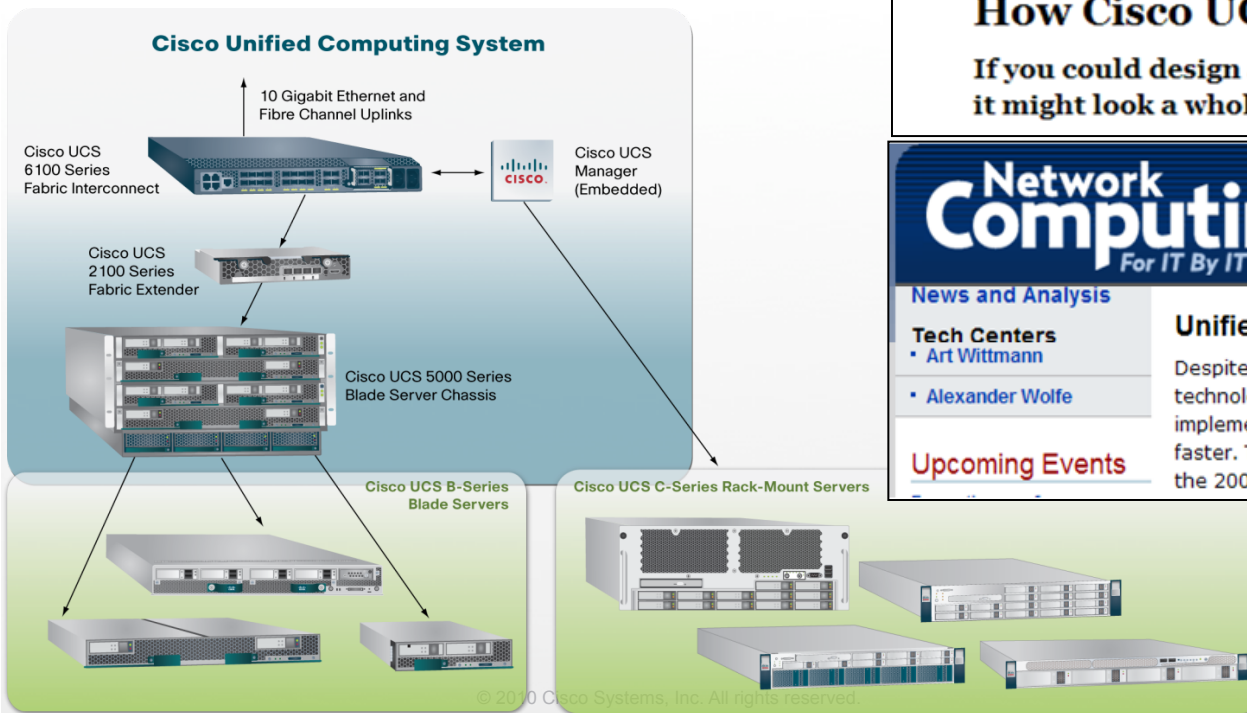
Tech Centers

- Art Wittmann
- Alexander Wolfe

Upcoming Events

Unified Computing: A New Game Plan For IT?

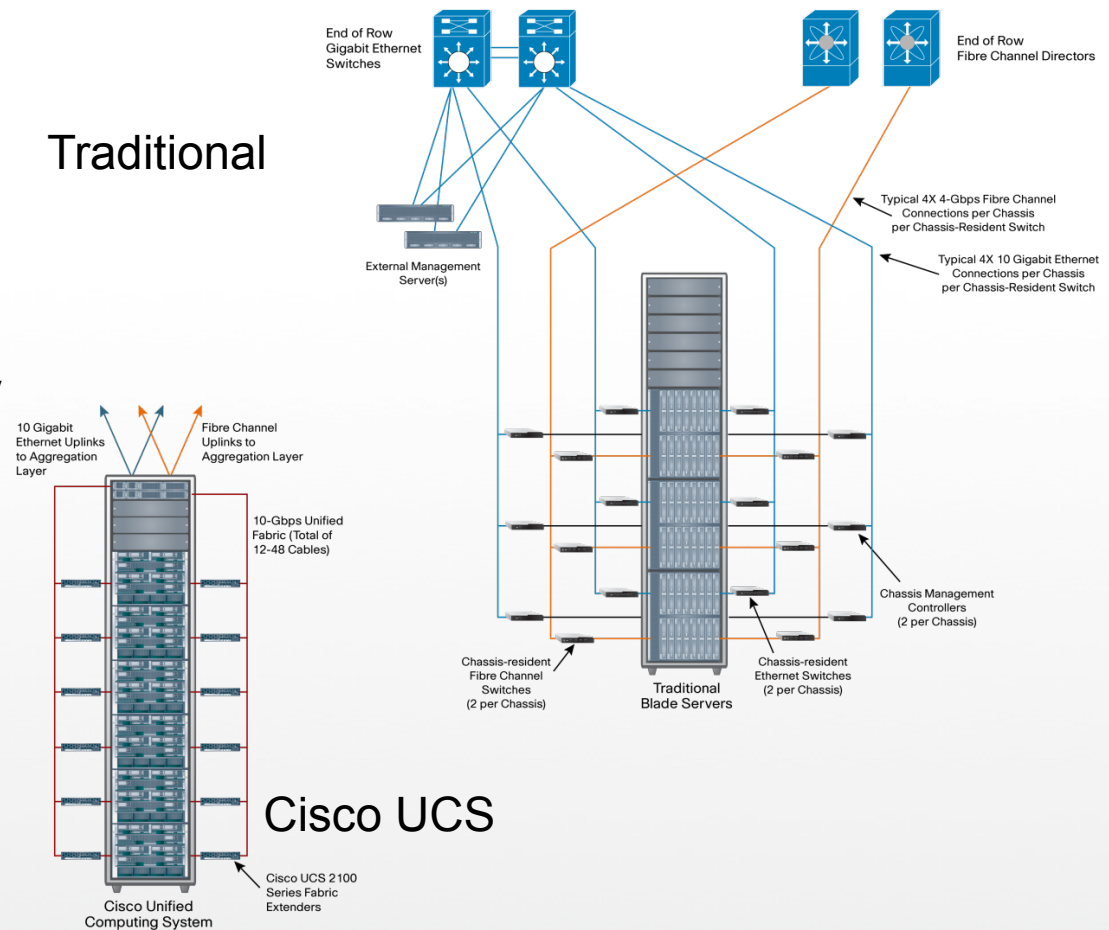
Despite the challenges, IT departments are penciling UCS into their technology roadmaps because it offers solutions that can help them implement strategies like cloud computing and resource deployment faster. They are doing this at the same time that recent surveys like the 2009-2013 IDC Forecast and Analysis for Worldwide Network



Better Virtualization through Simplified Architecture

Radically simplified architecture increases ROI, TCO, while increasing speed of virtual machine and virtual infrastructure deployment

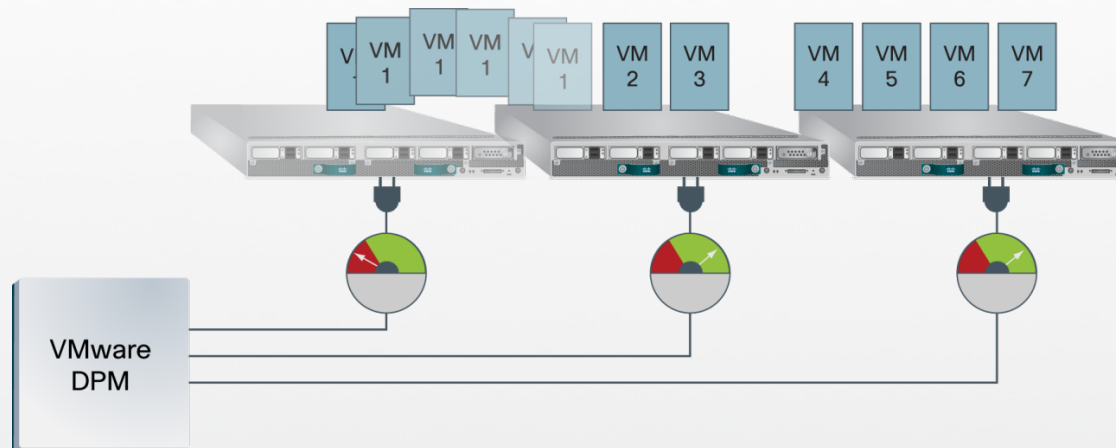
- **Dramatic reduction in components and cables** to purchase, configure, maintain, power, and cool
- **Single point of control for all network traffic** to increase QoS management and security
- **Rapid application deployment** at lower cost
- **Form factor neutral** for greater choice and investment protection
- **More efficient support** for VMware vSphere



Integration of UCS Manager and VMware vCenter

Cisco UCS Manager provides integrated, embedded management for entire hardware stack, while VMware vCenter manages virtual environment and virtualization pool.

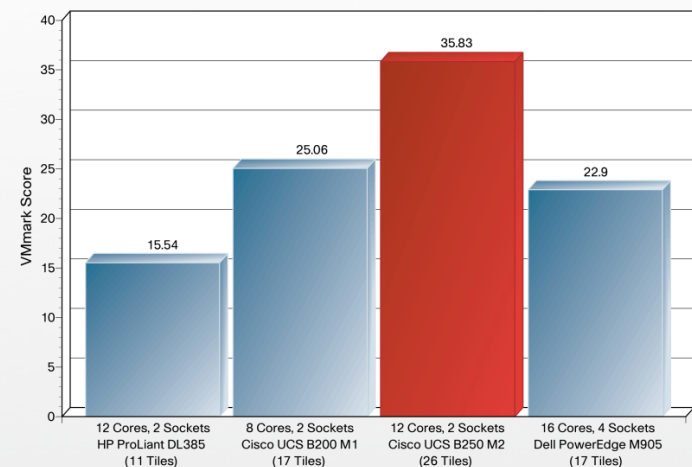
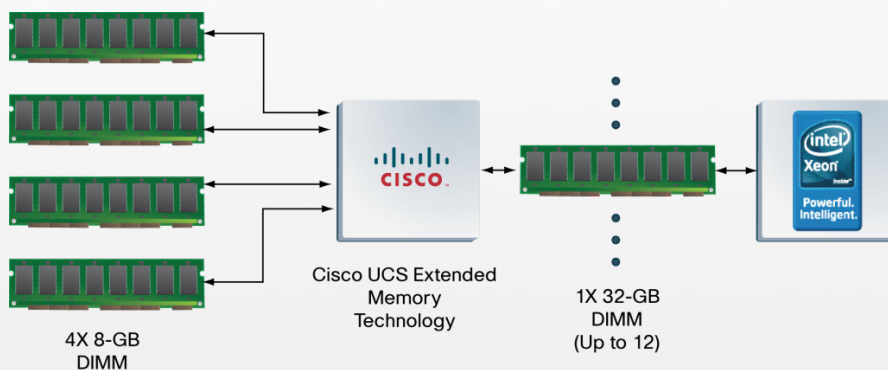
- **Automates** virtual machine and virtual infrastructure **deployment**
- Integrated port profiles and port groups **reduce chance of error, increases security, reduces down time**
- **No other joint solution** moves network QoS and security settings with virtual machines, automatically, simultaneously
- **Programmable infrastructure**: standards-based integration with VMware Dynamic Power Management



Increased VM Density Through Extended Memory

Cisco's Extended Memory Technology increases virtual machine density while eliminating need to upgrade to four-socket servers when a larger memory footprint is what is needed

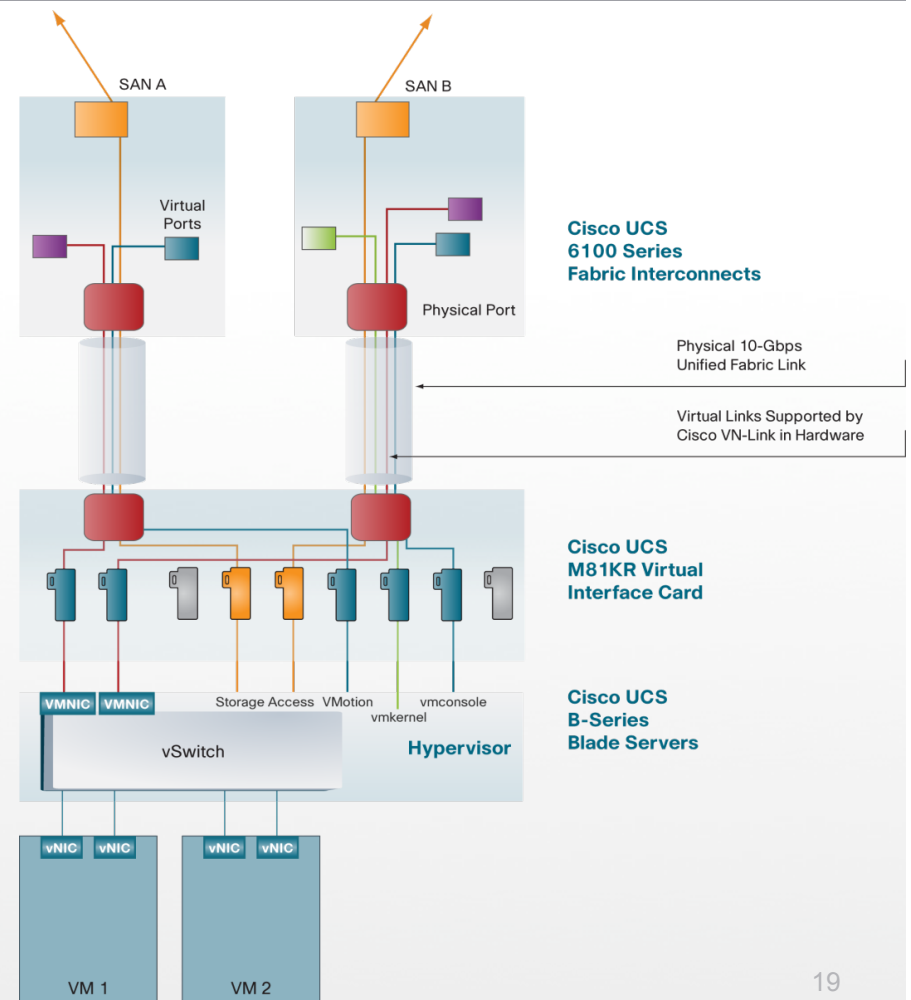
- Greater VM density means **greater data center efficiency**
- VMware **efficiently leverages larger memory space**
- Cisco Extended Memory Technology
 - **Largest memory footprint of any two-socket server: 384 GB with 8-GB DIMMS**
 - **Economical 192-GB memory footprint using 4-GB DIMMs**
- **Result: best VMmark result of any blade server, anywhere**



Virtualized I/O for Physical Servers and VMs

Cisco Virtual Interface Cards virtualize server I/O infrastructure, providing just-in-time provisioning for both VMware vSphere hypervisor and individual virtual machines

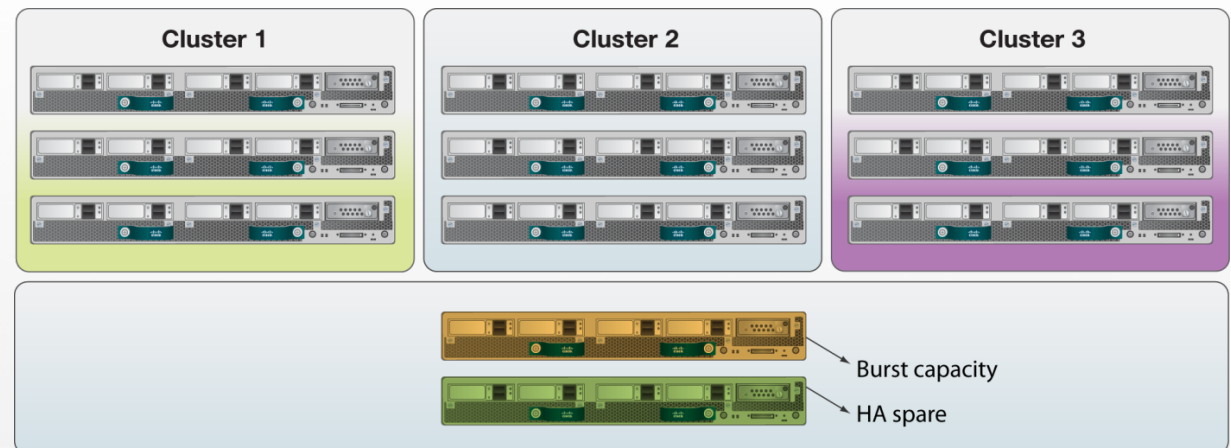
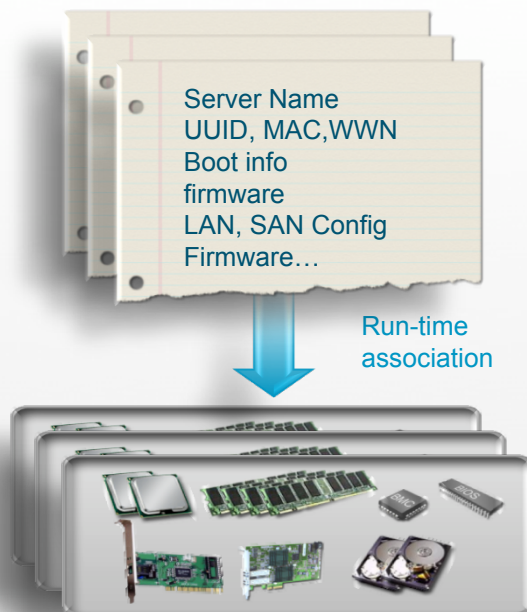
- **All I/O connectivity** for vSphere hypervisor and virtual machines in **single PCIe interface**
 - VMware: vmkernel, vmconsole, vMotion, shared storage
 - Virtual machines: **via virtual switch**, Cisco VN-Link in hardware, VN-Link **in hardware with hypervisor bypass**
 - Up to **30% better network throughput** with VMware VMDirectPath
- **Up to 128 virtual devices**: NICs and HBAs; each logically connects to one of two unified fabrics
- Traffic isolation, **security**, and **QoS**



Rapid Infrastructure Deployment

Cisco Service Profiles make virtual infrastructure deployment fast and error free. They make implementing hot spares or failover infrastructure more cost effective by speeding server configuration in the event of a failure.

- Cisco Service Profiles
- **Consistent and simplified** virtual infrastructure deployment
- **Pay as you grow**
- **Simplified** server upgrades
- **Enhanced availability with fewer servers** and licenses required for HA



Per-system spares, not per-cluster spares

UCS + vSphere: Impact on Applications

■ Secure Virtual Applications

- Unique capabilities establish per-virtual machine network security, QoS policies—and keep them associated with VMs

■ Increased Application Performance

- Industry-leading performance stems from combination of UCS and vSphere's vCompute, vStorage, vNetwork

■ Improved Application Availability

- Planned downtime: Vmotion + VN-Link
- Unplanned downtime: VMware HA and FT

■ Improved Business Continuity

- vCenter Site Recover Manager + Cisco Service Profiles



Only Integration of Cisco and VMware Solutions Delivers:

Unified Fabric

- VMware VMotion, HA, FT, storage, and production traffic over a single cable
- Reduce Support Infrastructure up to 50%

Integrated Management

- Single management points for virtual infrastructure and virtualization clusters
- Port group/port profile coordination

Extended Memory Technology

- VMware DRS manages more VMs per server
- Higher consolidation ratios with less cost.

VN Link + VMware VMDirectPath

- Network security and policy control at the VM level.
- Up to 30% greater network throughput with VMware VMDirectPath technology.

Cisco Service Profiles VMware Templates

- Rapid and consistent physical and virtual infrastructure deployment
- Higher availability through lower chance of error

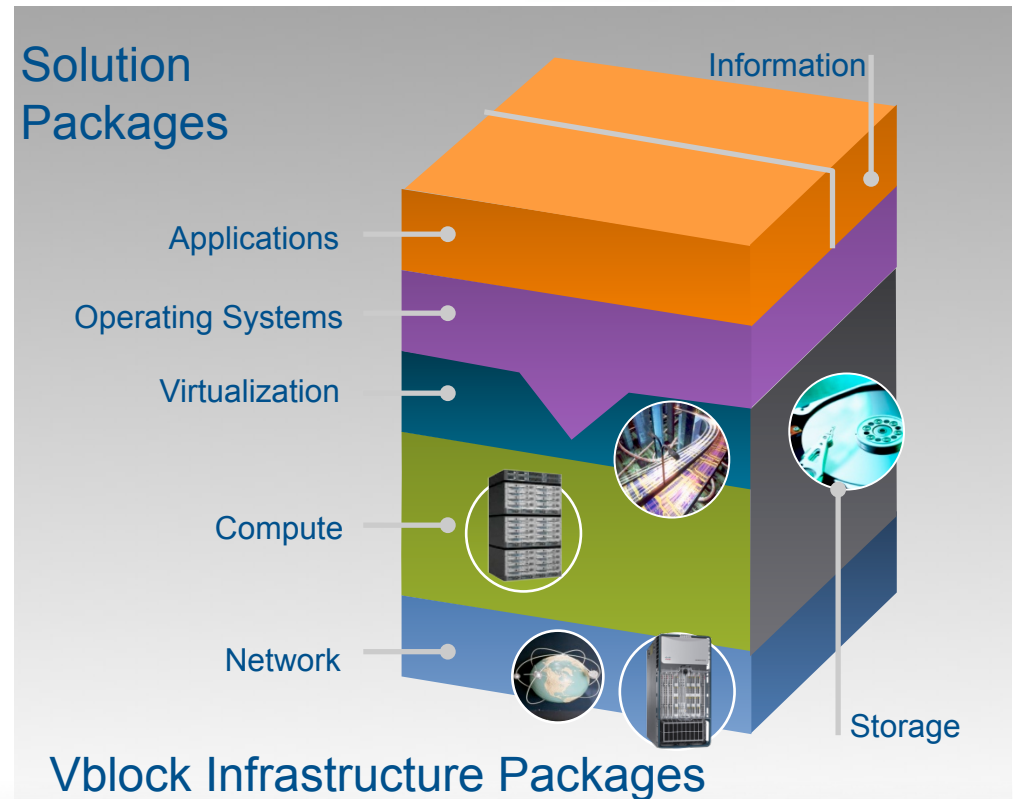
Unprecedented Innovation to Create Flexible Virtual Environments

Pre-Engineered Vblock Infrastructure

A New Way of Delivering IT



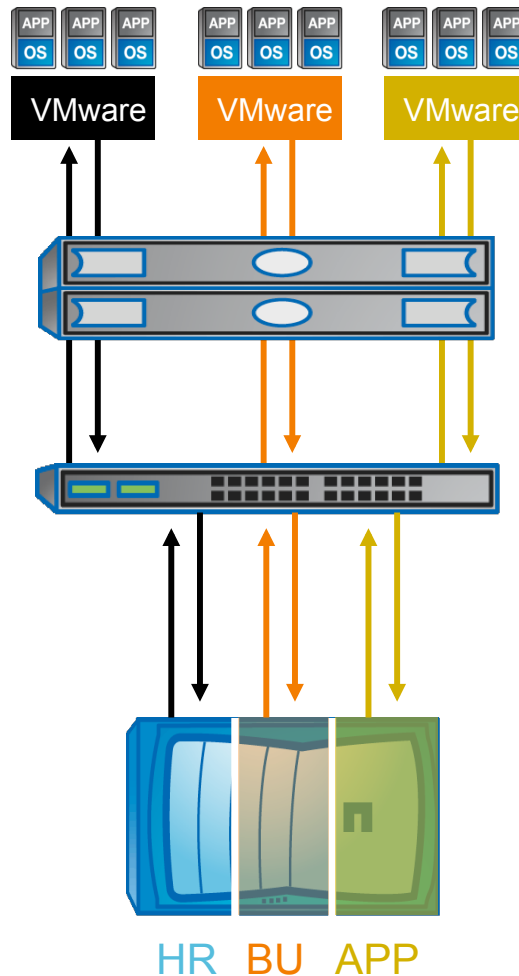
- Rapid deployment model of virtualized infrastructure
- Pre-integrated and validated solutions reduce total cost of ownership
- Service-level driven through predictable performance and operational characteristics
- Improved compliance/ security and reduced risk



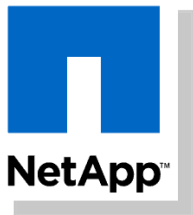
Accelerate time to results, Reduce TCO

Secure Cloud Architecture

VMware Netapp Cisco Secure MultiTenancy Architecture



Nexus 1000V,
Nexus 2000/5000/7000,
UCS,
10GbE



Project Overview:

- NetApp, Cisco, VMware jointly testing an end-to-end secure multi-tenancy solution
- Data is securely partitioned from vFiler, UCS, to vShield Zones

Customer Benefits

- The only solution in the industry to support end to end multi-tenancy across application and data
- To result in significant economies of scale, higher utilization, better SLAs

Delivering Unprecedented Innovation to Create Flexible Virtual Environments

Thank You !!!

