Data Center of the Future for the Connected Governent

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Connected Government Overview

Government Agency Challenges

- Improve operational efficiencies with proactive strategic planning, policy development, resource allocation, and administrative and financial planning
- Increase reach and responsiveness of citizen services
- Reduce operational costs
- Enhance quality and flow of information across chain of command
- Establish resilient network infrastructure that supports interagency collaboration

Agency Drivers for Change

Intra-agency/Interagency Collaboration

- Enable interoperable communications to support citizen services, agency collaboration, and joint operations

Infrastructure Sharing

- Foster sharing of physical resources and equipment (e.g., incident command vehicles, aircraft, etc.) across agencies to reduce costs

Information Sharing

- Improve operational efficiency by providing equal interagency access to critical information

Shared Services

- Consolidate common government services to enhance operational efficiency

What Is a Connected Government?

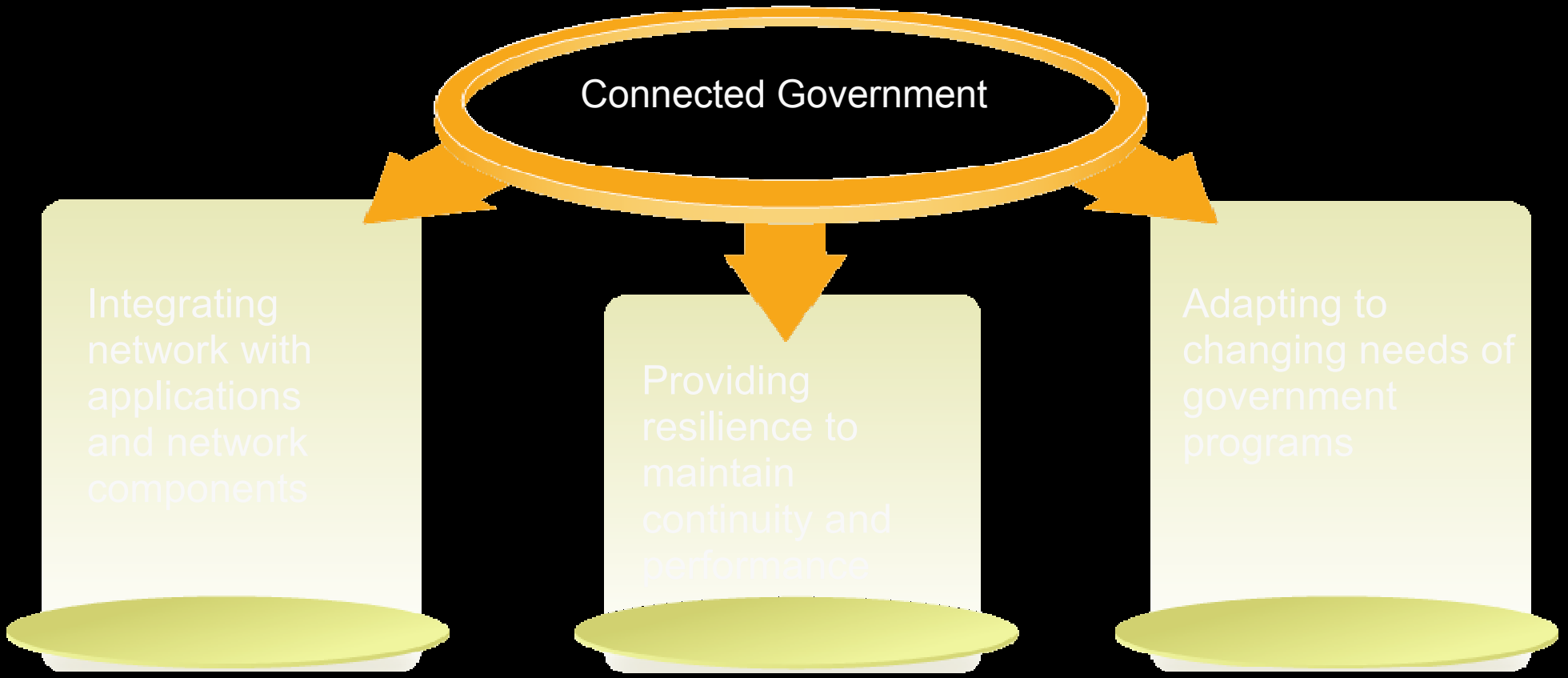
- All branches of government support the controlled flow of information
- Services reach citizens when they need them, where they need them, and in the way they need them
- Services reach more citizens with less cost
- Government is engaged with citizens

Overview of Cisco Connected Government

- Reference network and application architectures with a corresponding roadmap
  - Uses government and private-sector best practices to enable improved information sharing across organizational boundaries
- Roadmap transitions governments through a multiphase approach, synchronized with process change
  - Yields realistic near-term benefits while making progress toward long-term objectives
- Connected Government Assessment Tool
  - Compares department mission with IT capability

Cisco's Approach for Connected Government

Connected government is based on three key tenets of an intelligent information network



Cisco Connected Government Roadmap

- Sections illustrate common application of roadmap, but there are exceptions
  - For some agencies, sharing across groups within one agency is as complex as sharing between agencies
  - For these agencies, all six phases can be applied within the same agency before branching out between agencies

Work from inside out

1

Intra-agency Focus

Enhances agency's ability to serve citizens wherever they are and whenever they need assistance

Phases 1 to 3

2

Interagency Focus

Enables connectivity, communication, and collaboration between agencies

Increases service effectiveness and public safety

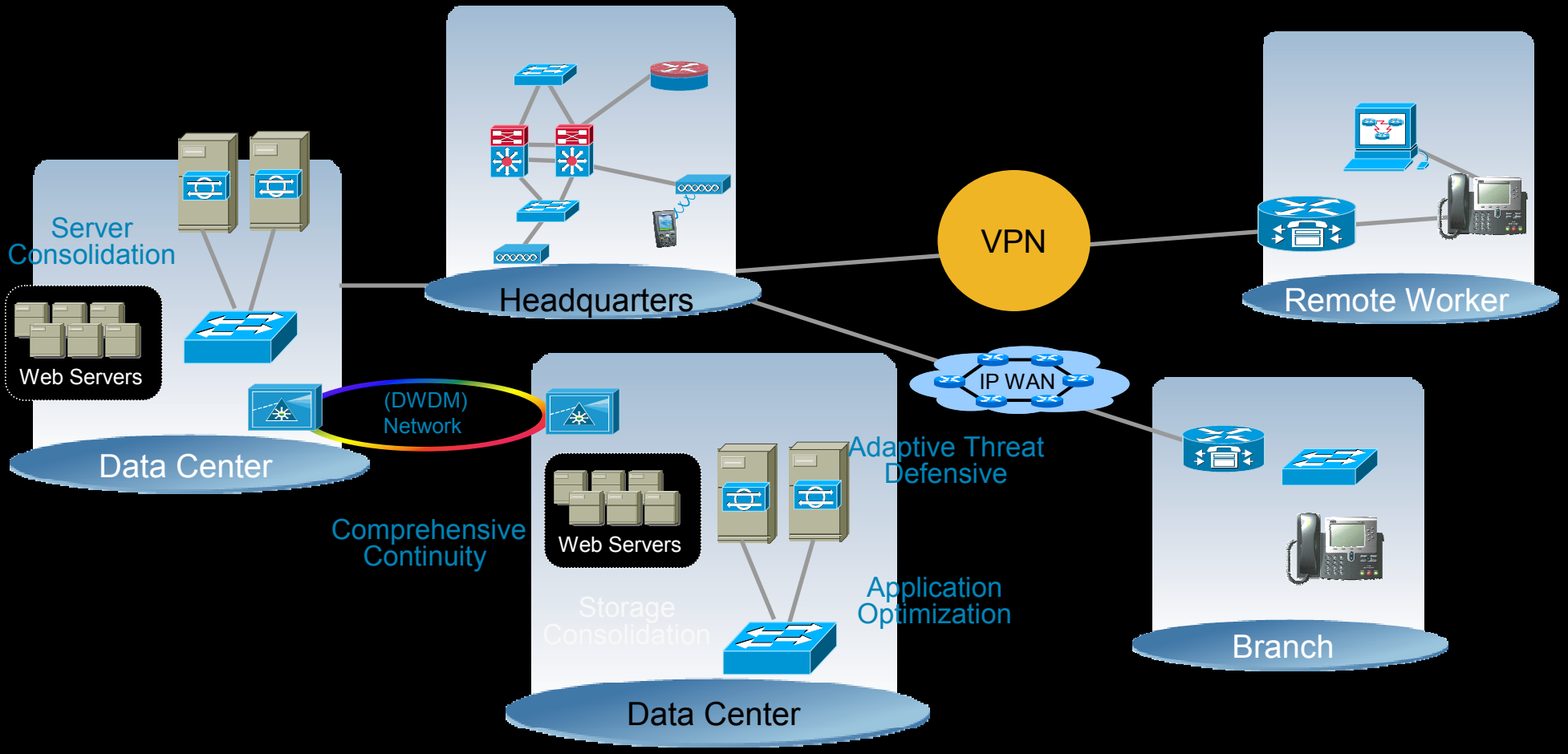
Phases 3 to 6

SONA Roadmap for Achieving a Connected Government

Intra-Agency Phases	
1	"Siloed" Operation
2	Intra-Agency Collaboration
3	Intra-Agency Integrated Remote Resources
Interagency Phases	
4	Interagency Collaboration
5	Interagency Infrastructure Sharing
6	Interagency Information Sharing/Shared Services

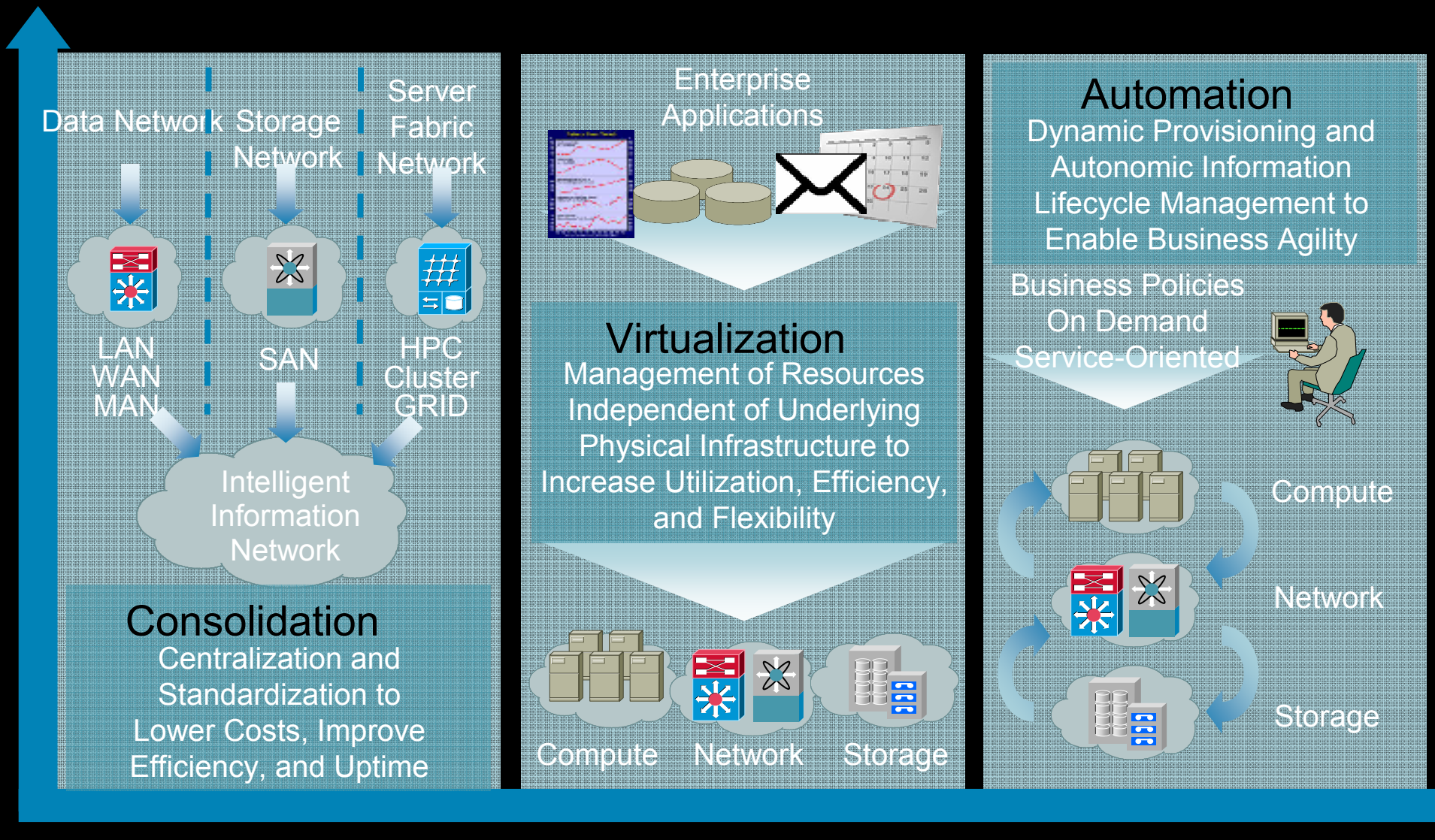
Each phase moves closer to information-sharing goal and delivers near-term operational value

Next Generation Datacenter for Government

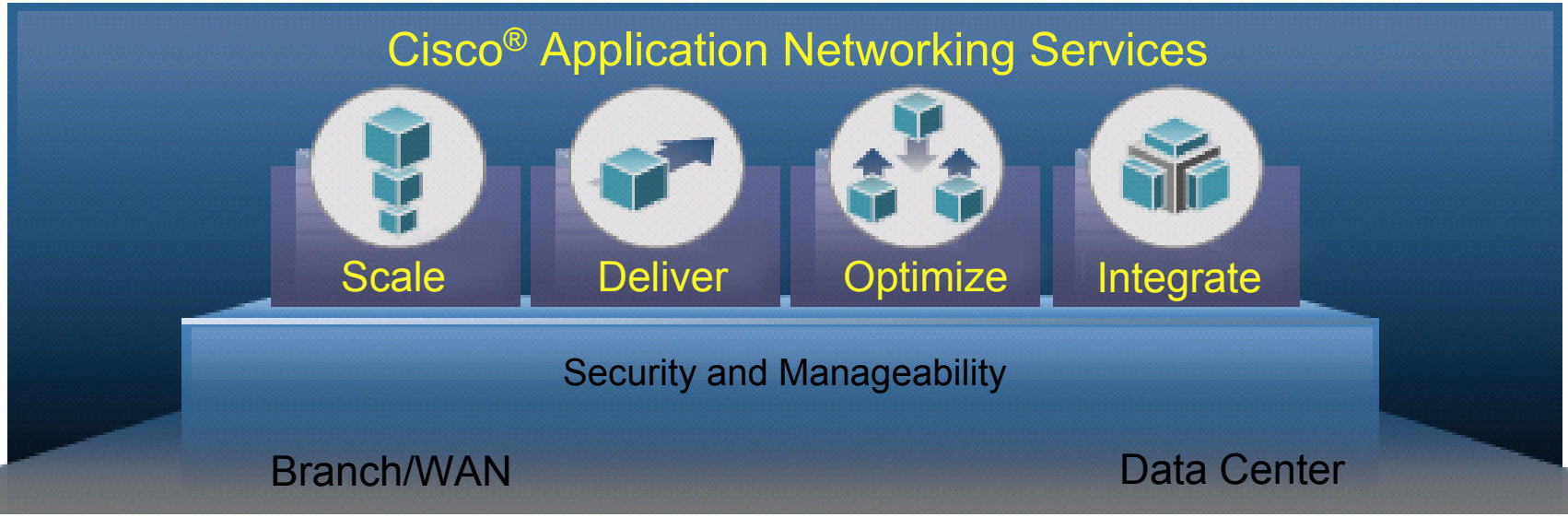


Enabling a Virtualized, Consolidated, and Automated Data Center

Evolution of the Data Center

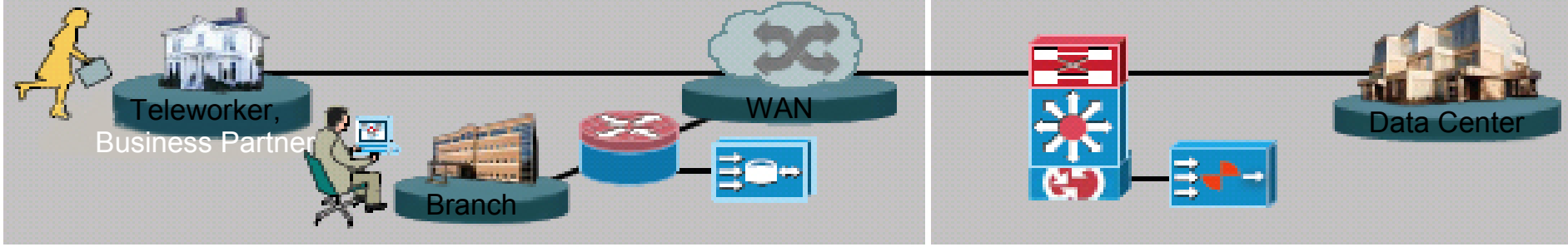


Cisco Application Networking Services
Comprehensive and Best-of-Breed Approach

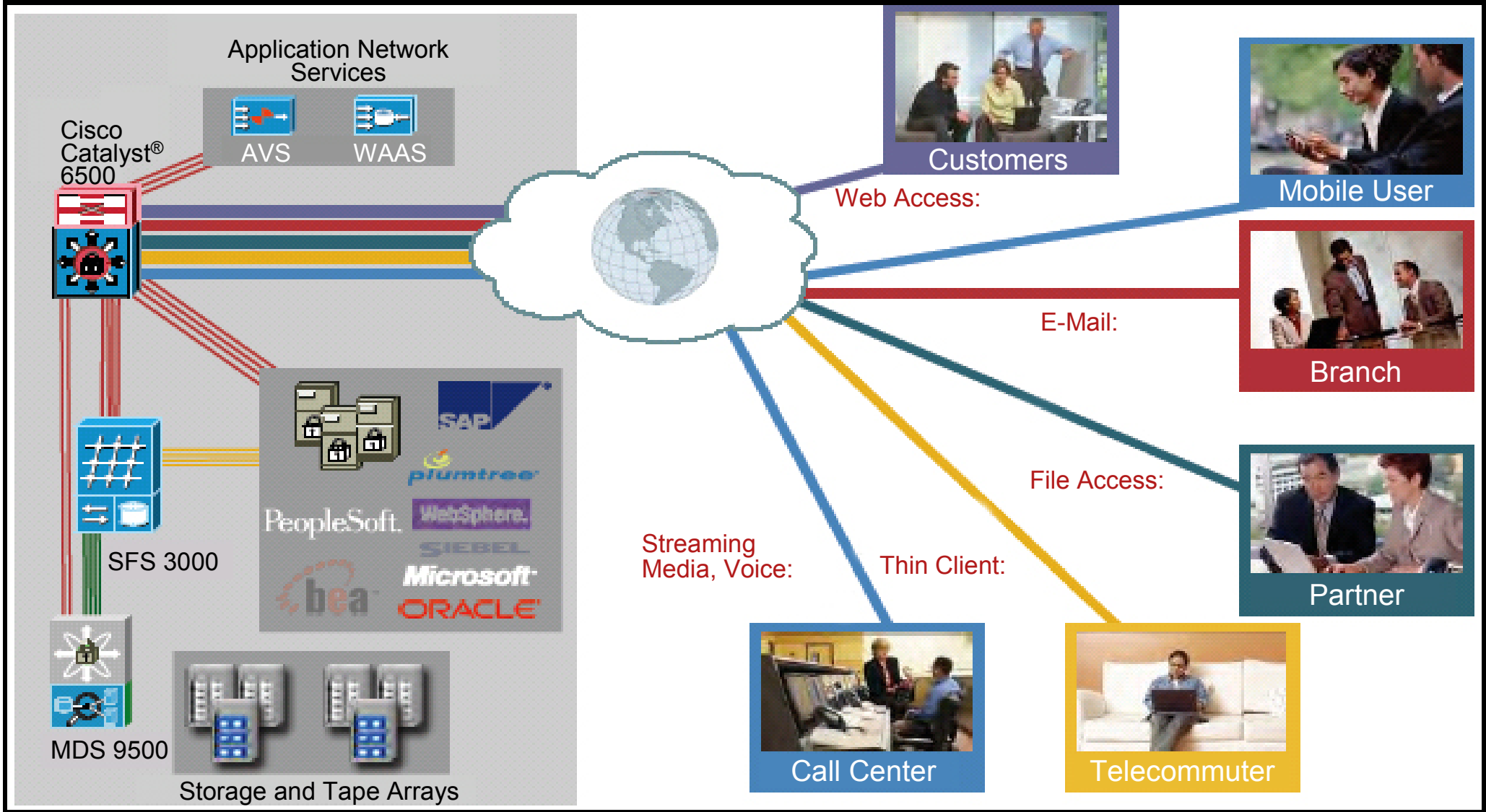


- Wide Area Application Engine (WAE)
- Integrated Services Router (ISR)
- Cisco IOS® NetFlow, NBAR, QoS, IP-SLA
- Application-Oriented Networking (AON)

- Application Velocity System (AVS)
- L4-7 Content Switches (CSS/CSM)
- Cisco Catalyst® 6500 LAN Switch
- Application-Oriented Networking (AON)



Application Delivery Services: Any Application, Any Protocol—Anywhere



Data Center Network Strategy and Evolution

Consolidation

Scale

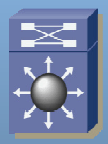
Performance

Density

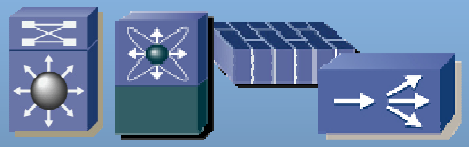
Availability

Operational Manageability

Investment Protection



Virtualization



- Immediate Power Savings
- Service Velocity
- Opex Alignment
- Capital Asset Utilization Improvement

Integration

- Single Unified Network Fabric
- Integrated Provisioning Capabilities
- Data Center Class Platforms
- Integrated Services

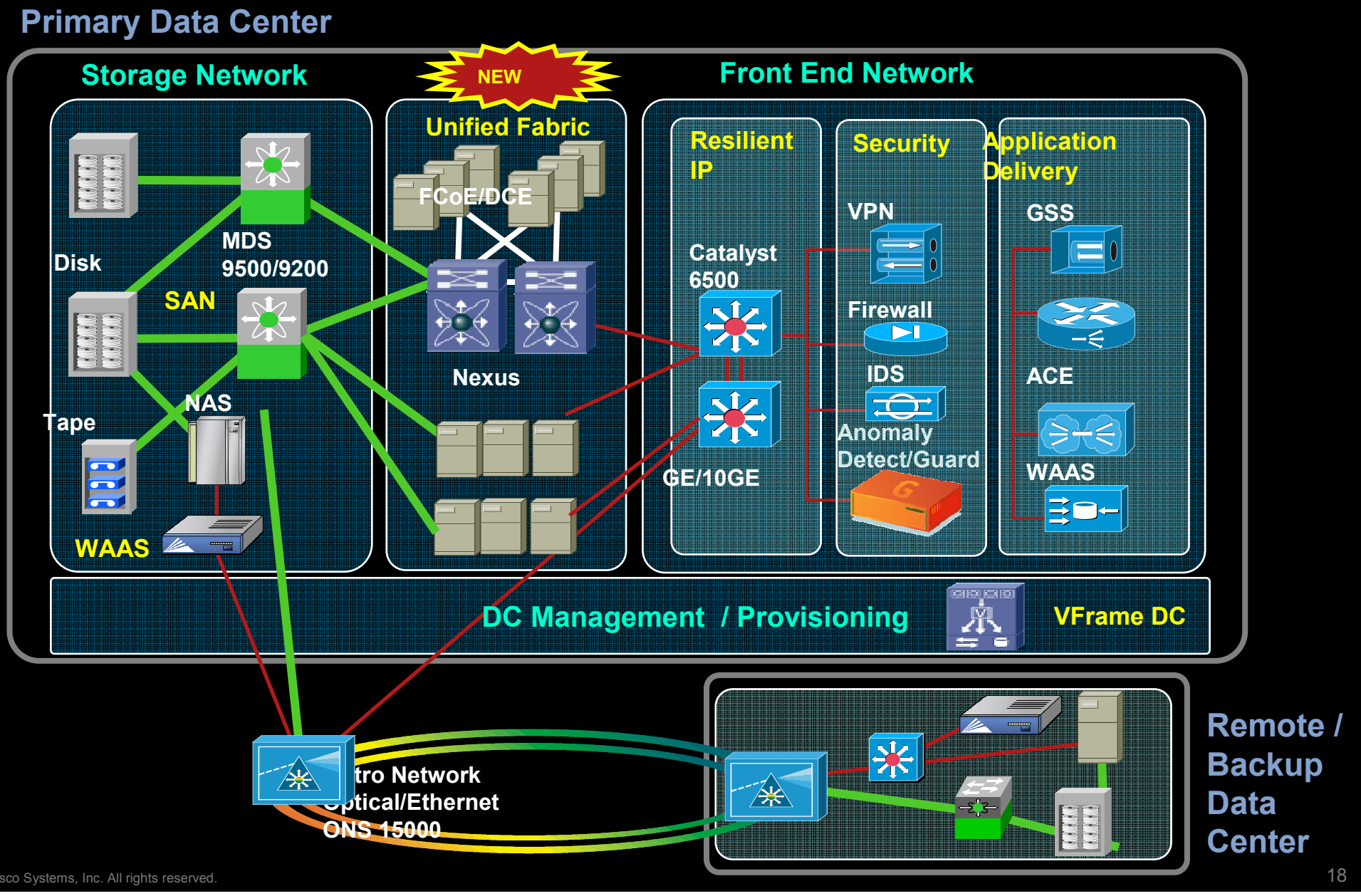
Automation

- Net-Centric Server Evolution
- Virtual Machine Integration
- Inline Data Protection
- Separation of Policy and Forwarding

Getting the Journey Started


The New Atomic Unit for Tomorrow's Data Centres!
2008
Vm
VIRTUAL MACHINE
x86
TANNING
NAIL

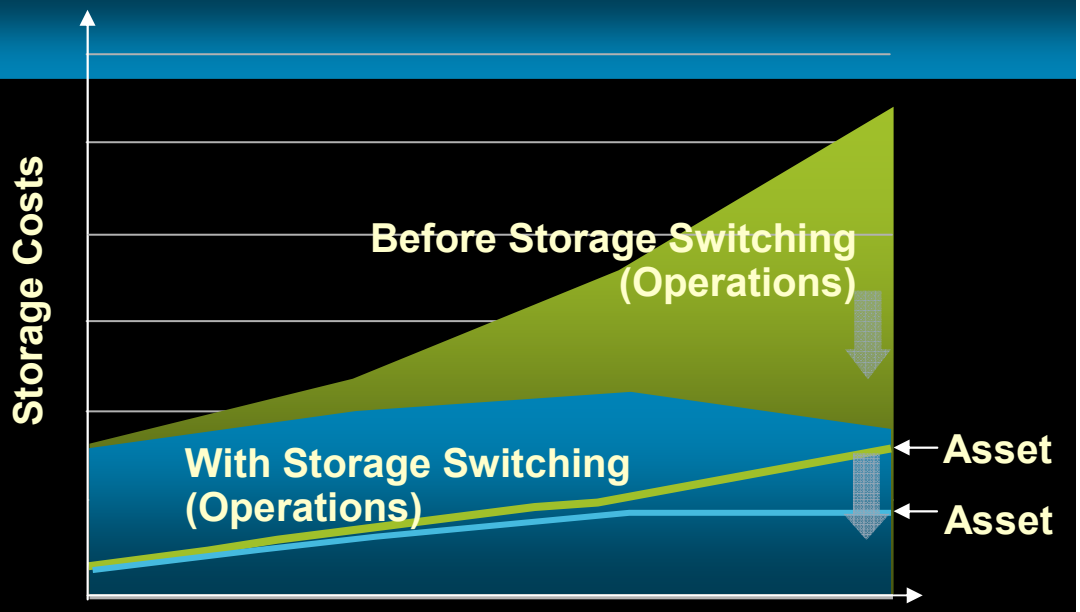
The Cisco Data Center Network



Improved TCO, Operations, Responsiveness

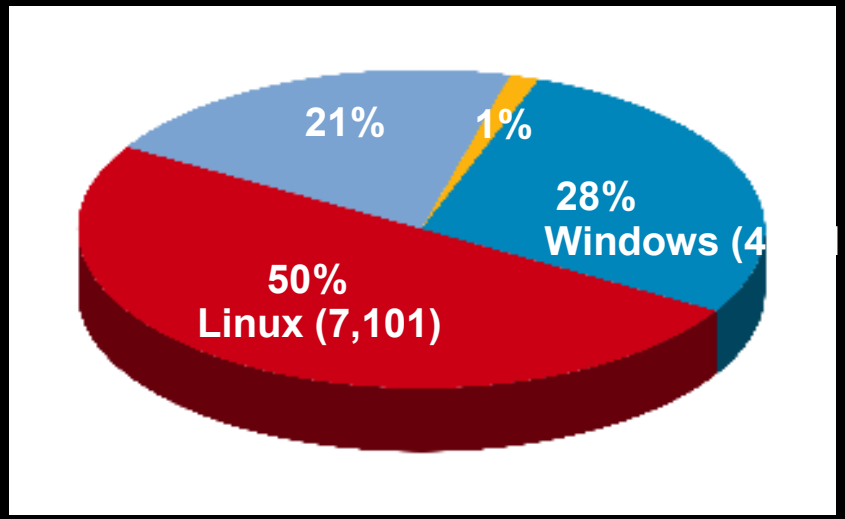
Storage

- 10+PB of storage, growing at ~50% per year
- TCO reduced from $0.21/MB to $0.01/MB over 6 years
- Managed storage per FTE increased from 25 TB to 600 TB
- Overall utilization increased from 20% to 68%
- $71 Million in cost avoidance over last 4 years



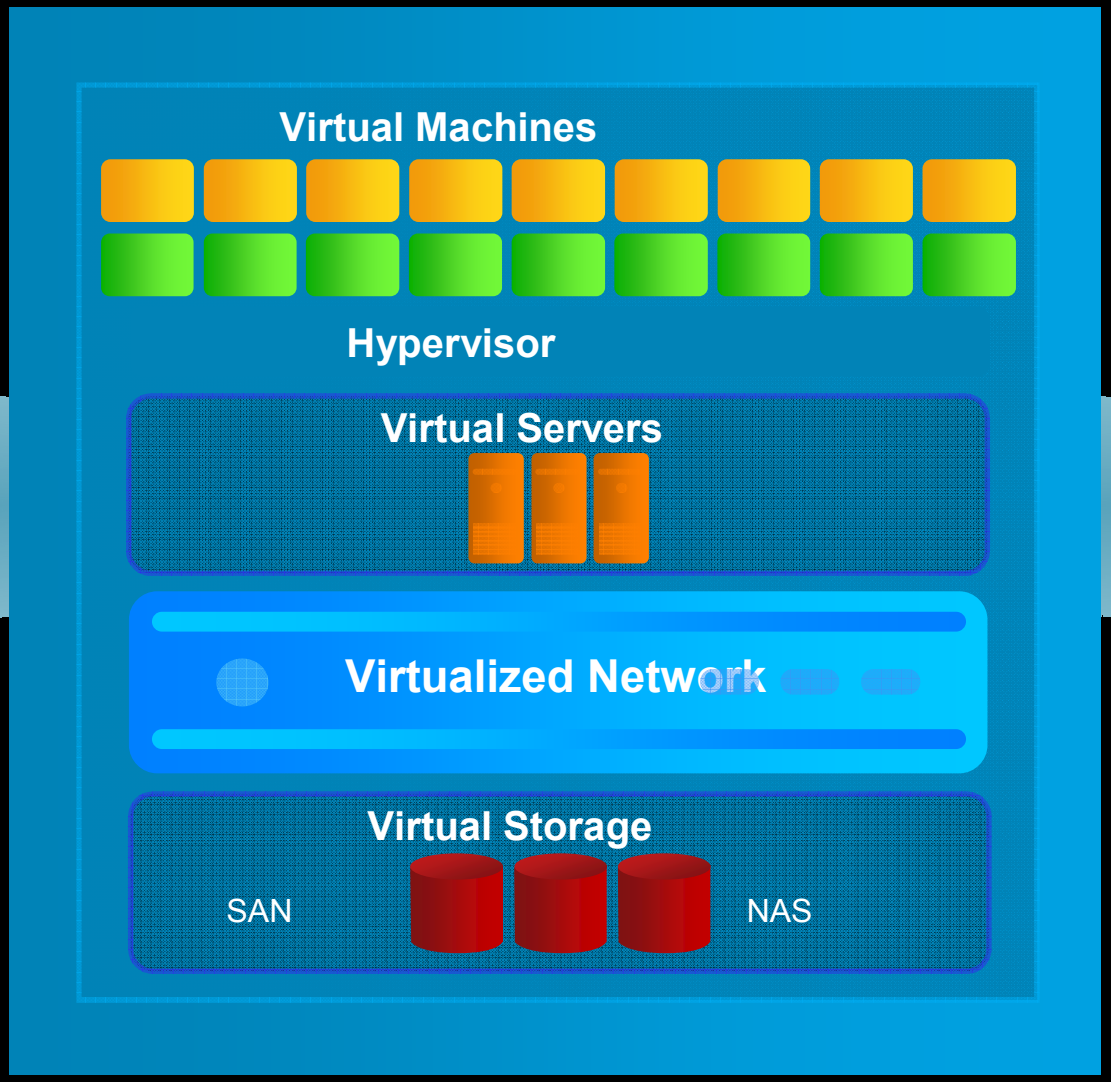
Servers

- 14,250 servers, 3,780 applications
- 50% of existing, 75% of all new server environments virtualized
- 2,720 VM's installed
- $19+ Million in cost avoidance and reductions to date
- Deployment time reduced from 8-12 weeks to 3 days

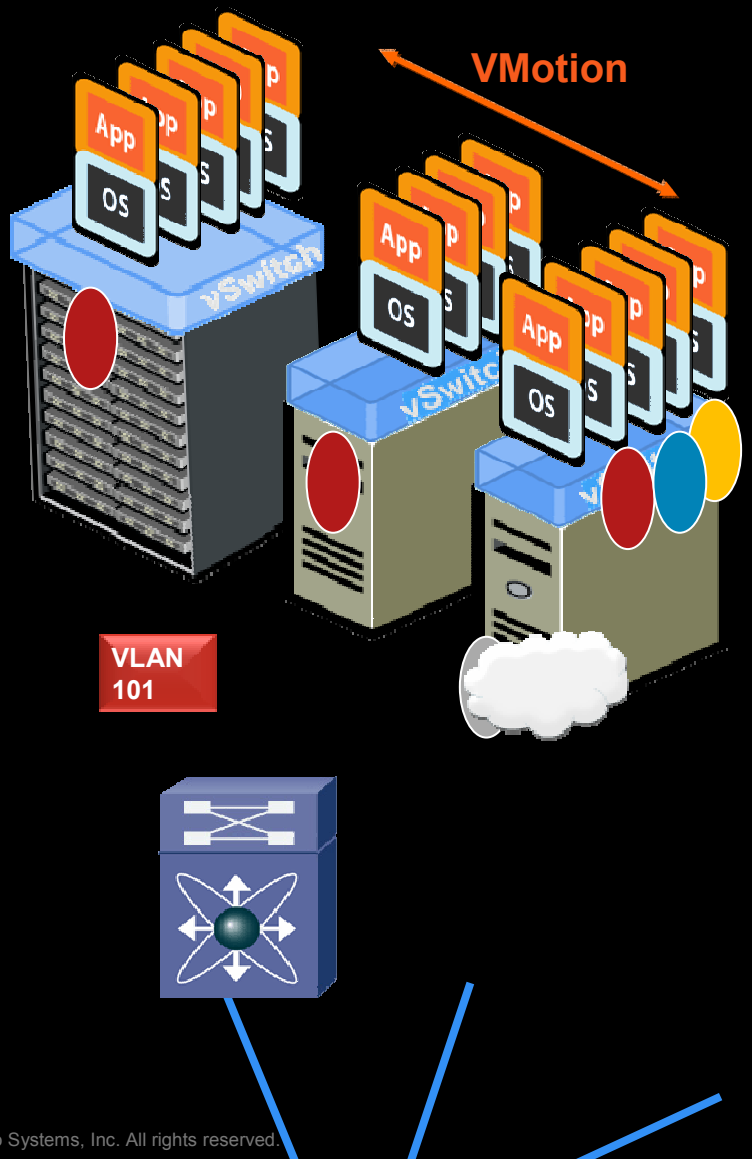


Virtualisation Crosses the Platform

Key to Responsive, Resilient, Efficient IT



VN-Link Brings VM Level Granularity



Problems:

- VMotion may move VMs across physical ports—policy must follow
- Impossible to view or apply policy to locally switched traffic
- Cannot correlate traffic on physical links—from multiple VMs

VN-Link:

- Extends network to the VM
- Consistent services
- Coordinated, coherent management

Introducing Cisco Virtual Network Link

Virtualizing the Network Domain

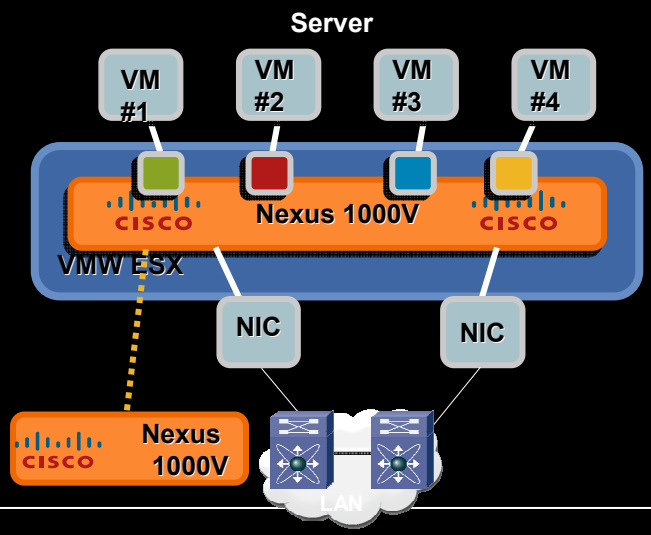
Policy Based VM Connectivity

Mobility of Network & Security Properties

Non-Disruptive Operational Model

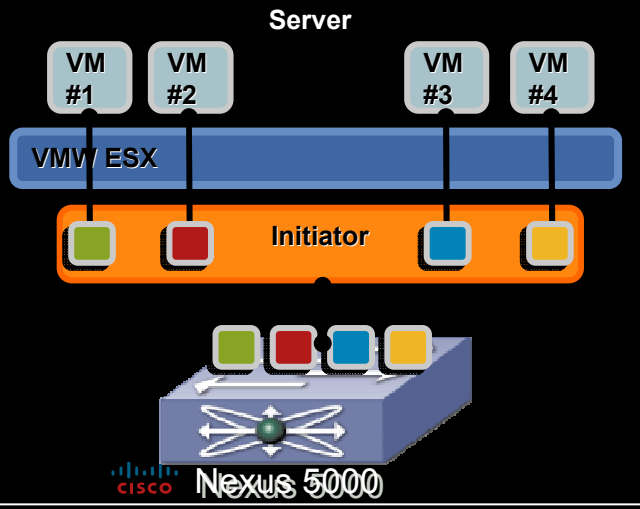
Cisco Nexus 1000V

(Software Based)



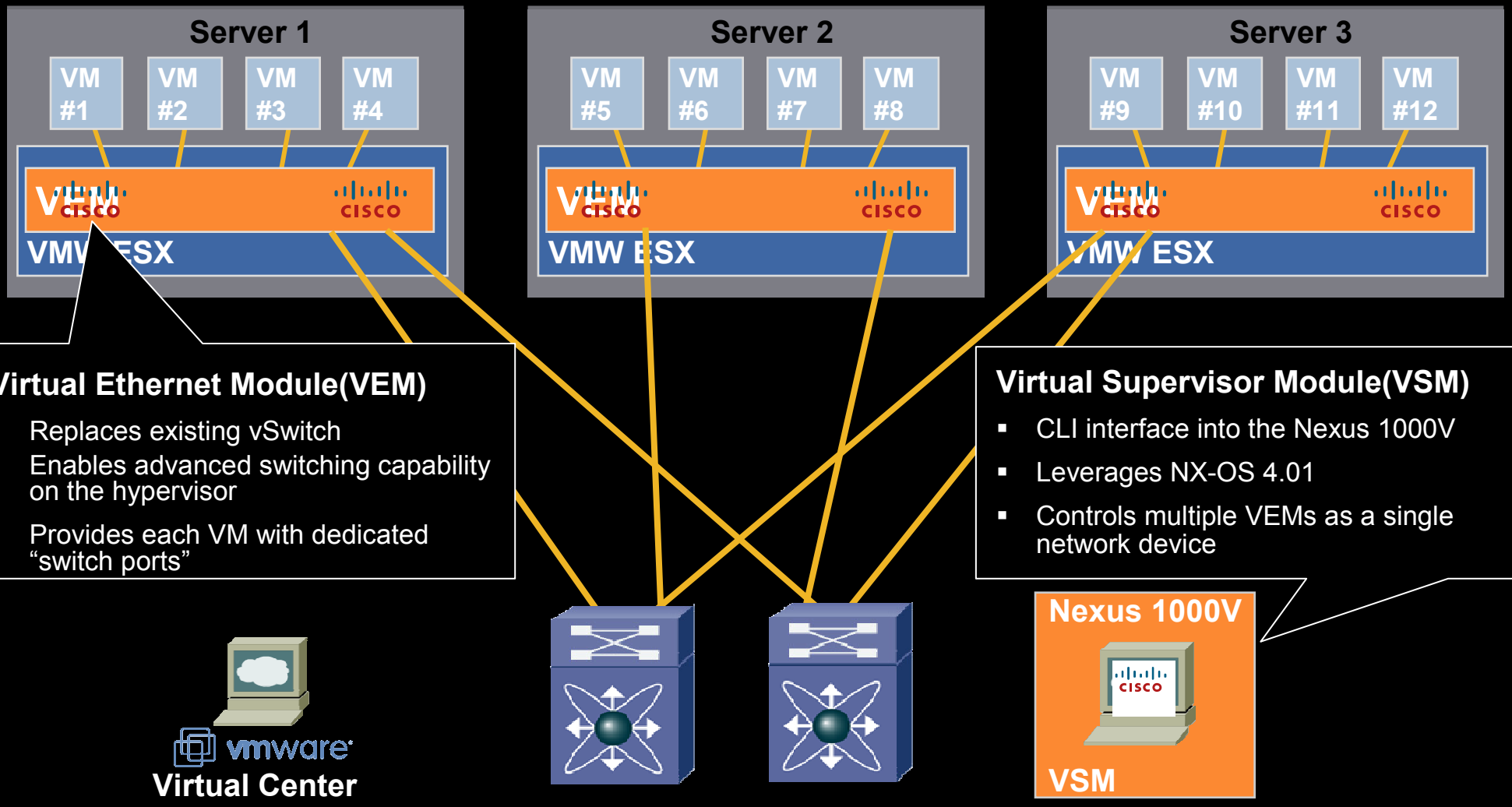
Nexus 5000 with VN-Link

(Hardware Based)



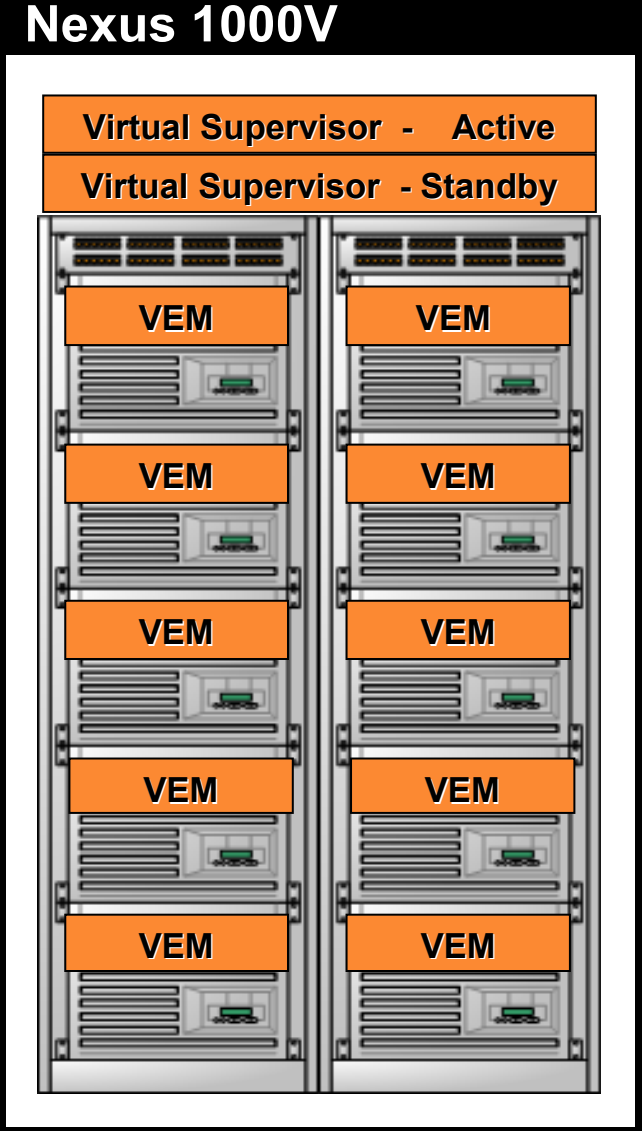
Two Complimentary Models to Address Evolving Customer Requirements

Cisco Nexus 1000V Components

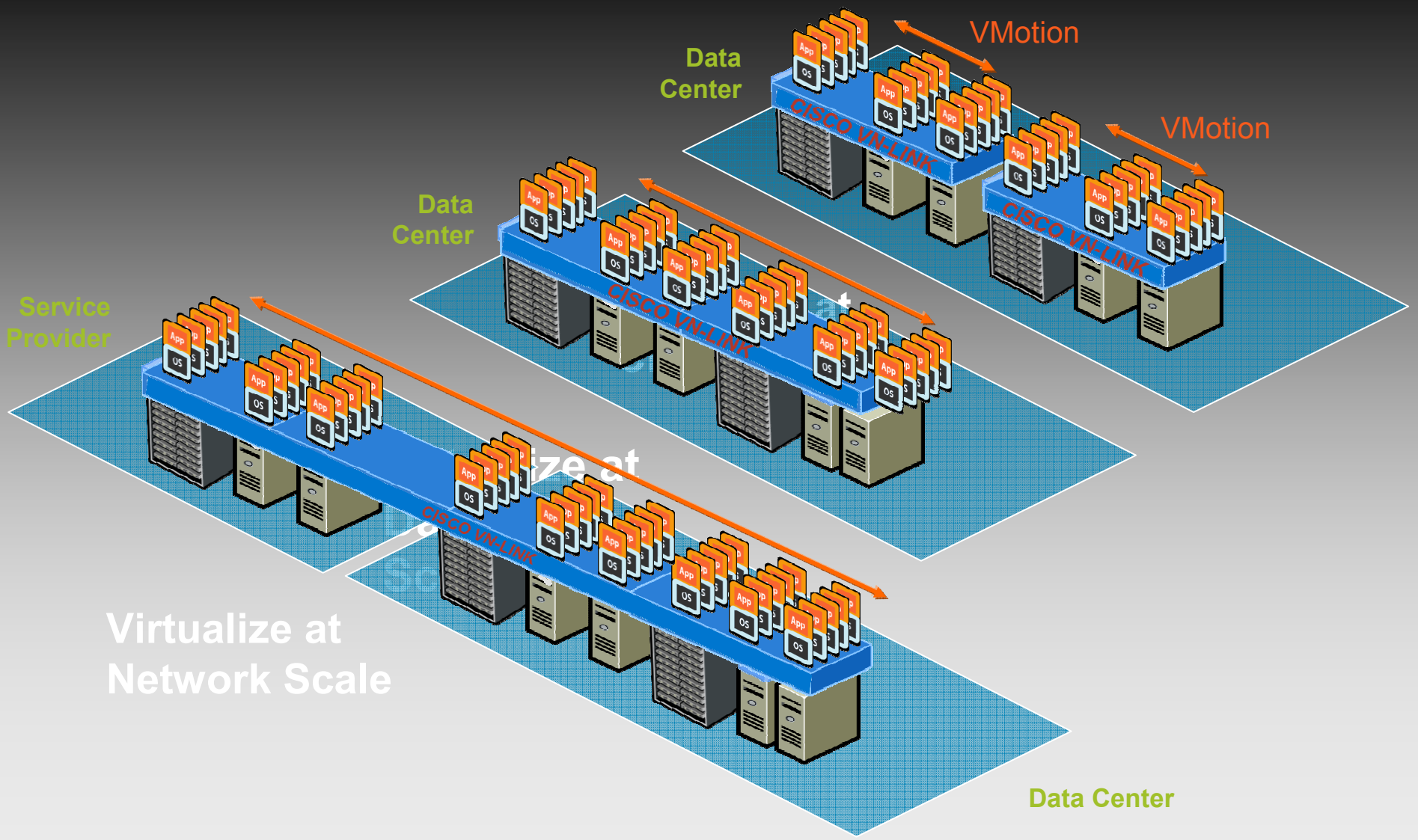


Cisco Nexus 1000V Scalability @ FCS

- A single Nexus 1000V
  - 66 modules (2x Supervisors and 64x Ethernet Modules)
- Virtual Ethernet Module:
  - 32 physical NICs
  - 256 virtual NICs
- Limit Per Nexus 1000V
  - 512 Port Profiles
  - 2048 physical ports
  - 8,192 virtual ports (vmknic, vswif, vnic)



Scaling Virtualization Across & Between Data Centres, Public/Private Environments



Network Implications

Fabric Convergence
One network for storage, Ethernet, IP, and HPC traffic

Virtualization
Server, Switch, Network

Catalyst 6500

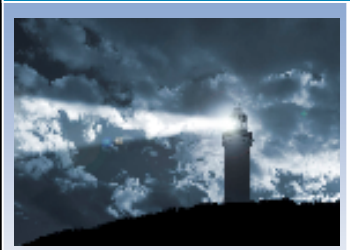
Nexus 7000

Move the Decimal Point
1G->10G->40G/100G
Multi-terabit switch fabrics

Operational Continuity
Modular OS; In Service Software Upgrade, Integrated Diagnostics

Cisco Data Center Technology Strategy

Next Generation Data Center



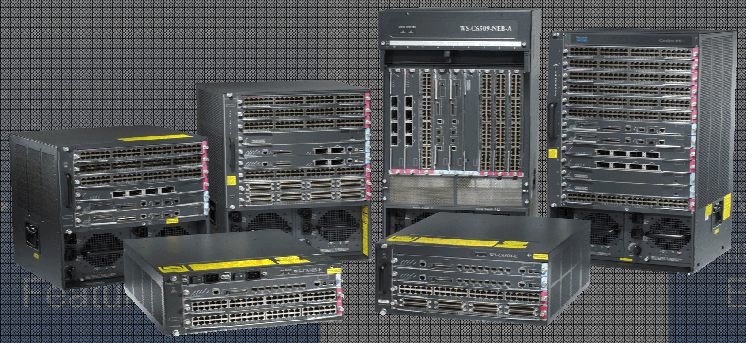



Data Center Class OS

System Scalability

Unified Mgmt Architecture

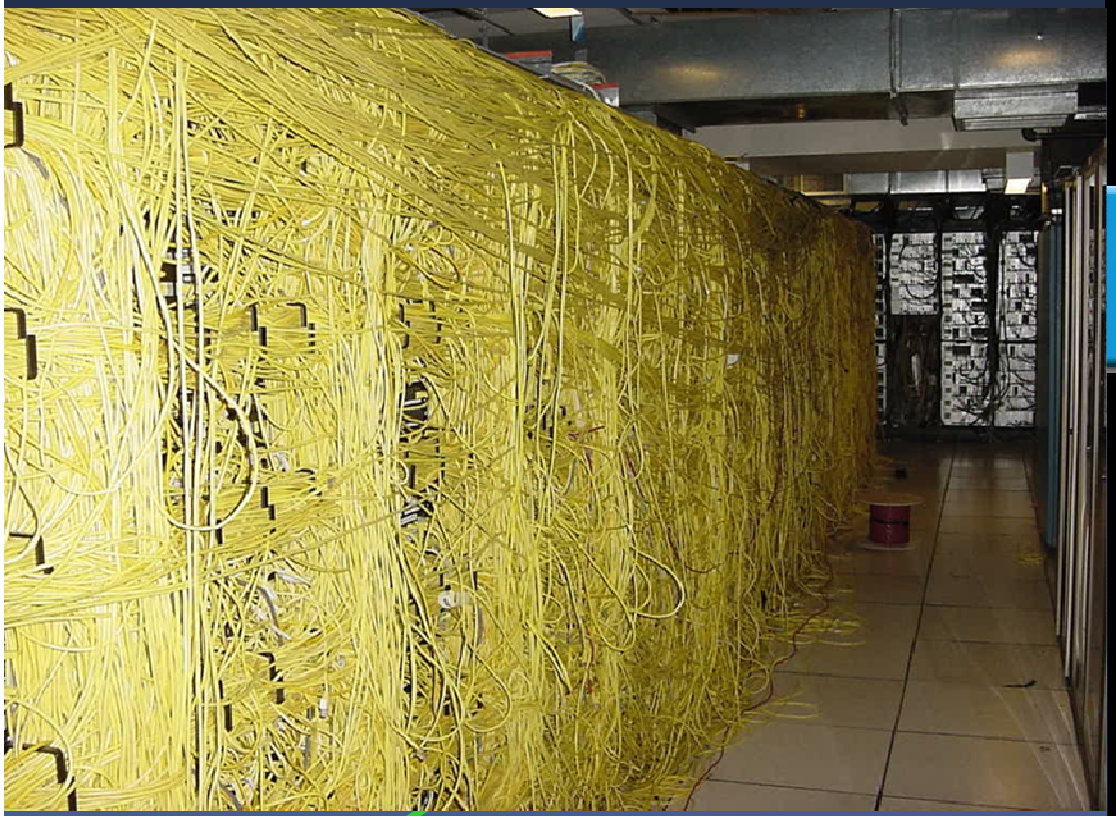
Modular Switching




ToR Switching

Blade Switching

Example: Unifying the Data Center Fabric
Many networks, One Infrastructure



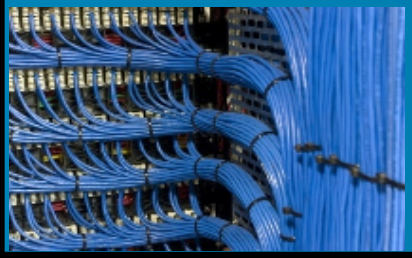
Complexity,
Cost, Power

Increased Efficiency,
Simpler Operations

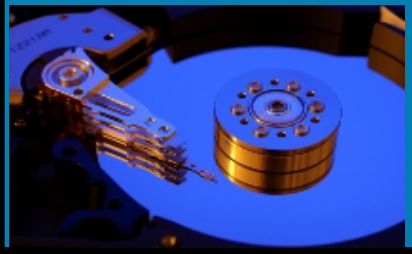
Key Benefits of Unified Fabric

Reducing complexity, Foundation for VM Mobility

Reduce overall DC power consumption by up to 8%. Extend the lifecycle of current data center.



Wire hosts once to connect to any network - SAN, LAN, HPC. Faster rollout of new apps and services.



Every host will be able to mount any storage target. Drive storage consolidation and improve utilization.

Rack, Row, and X-Data Center VM portability become possible.

Catalyst and Nexus: Complementary Focus

Cisco® Nexus 7000

15 Terabit Scalability
Unified Fabric

100GbE

40GbE

Transport Flexibility

Operational Continuity

10GbE

1GbE

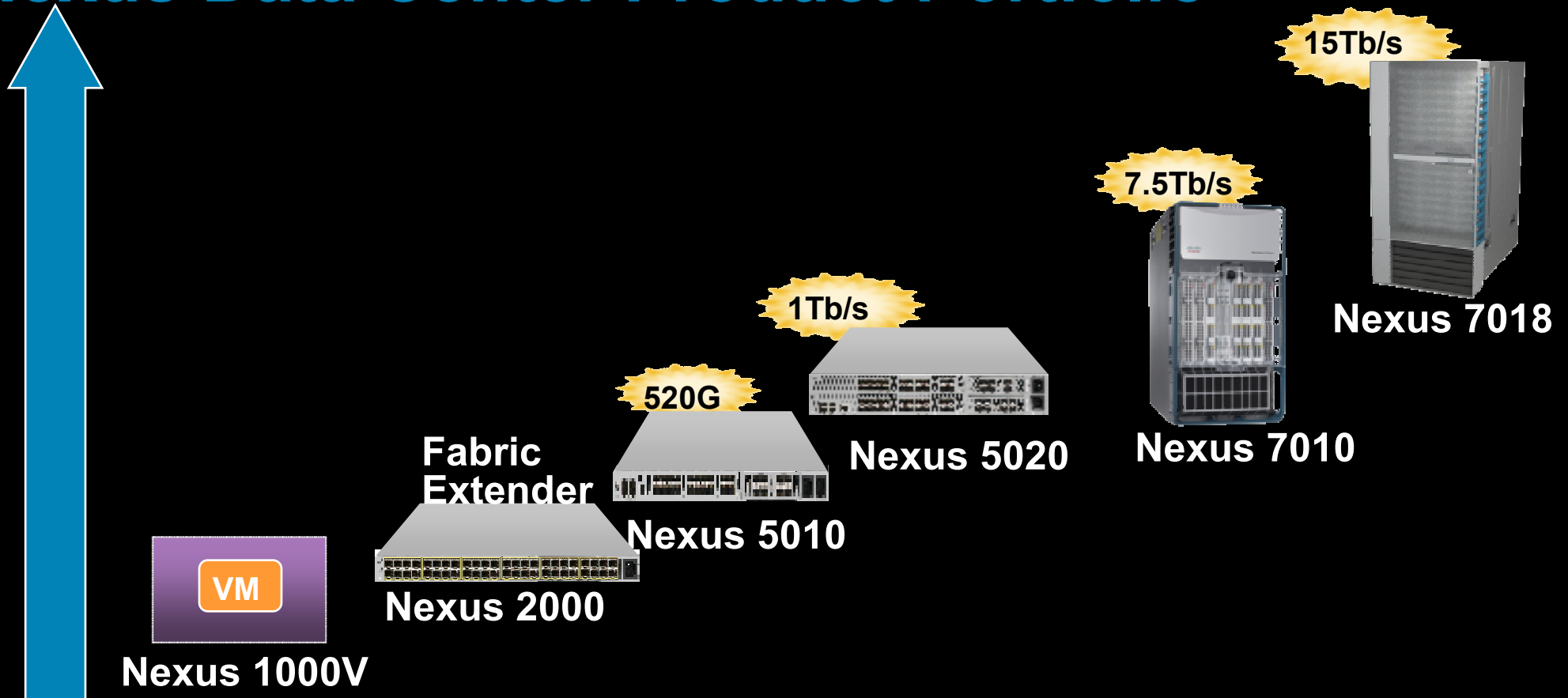
3.7T

720G

Cisco Catalyst® 6500

2 Terabit Scalability
Integrated Services

Nexus Data Center Product Portfolio

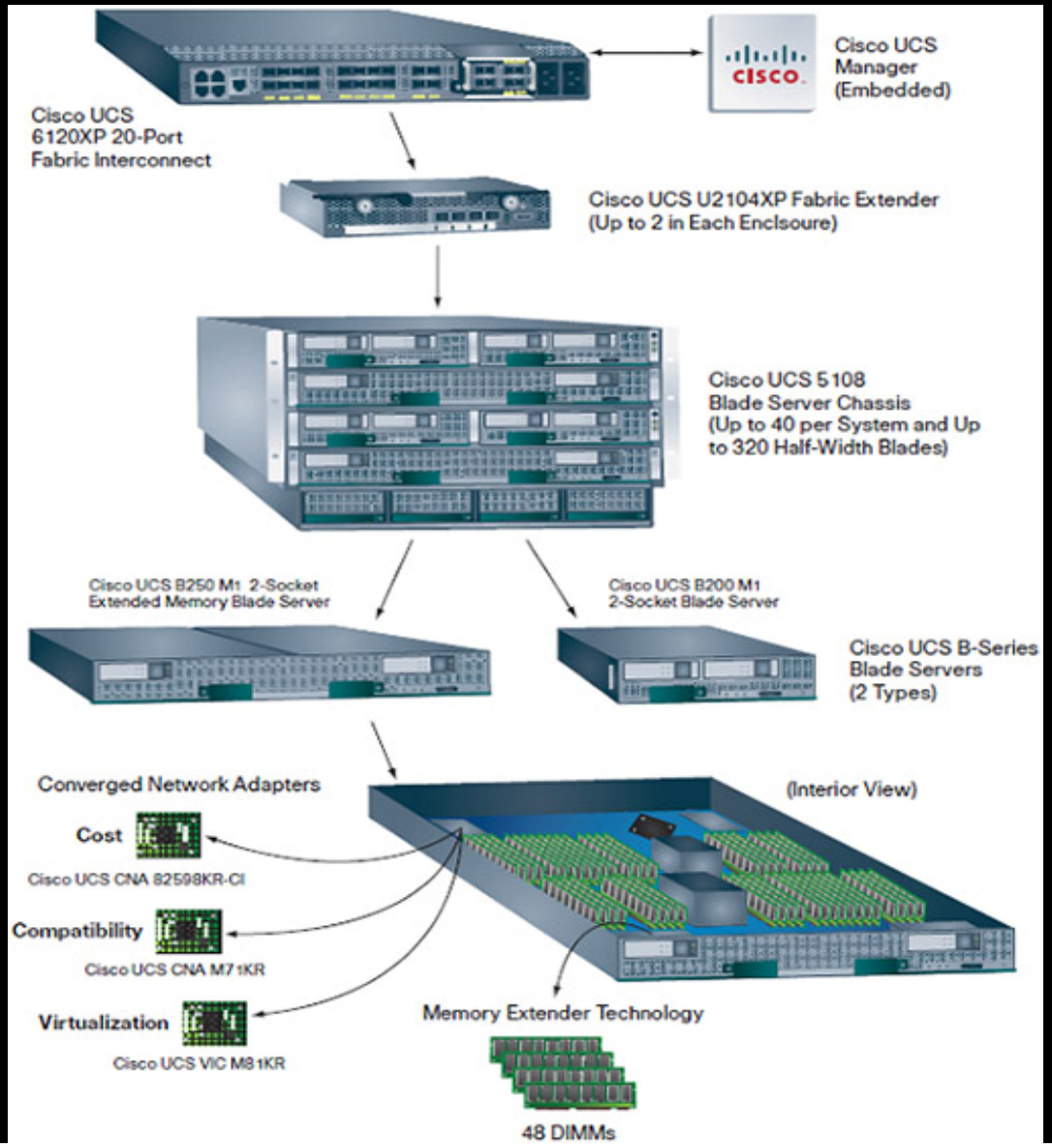


Unified Fabric Savings
Healthcare Customer Case Study

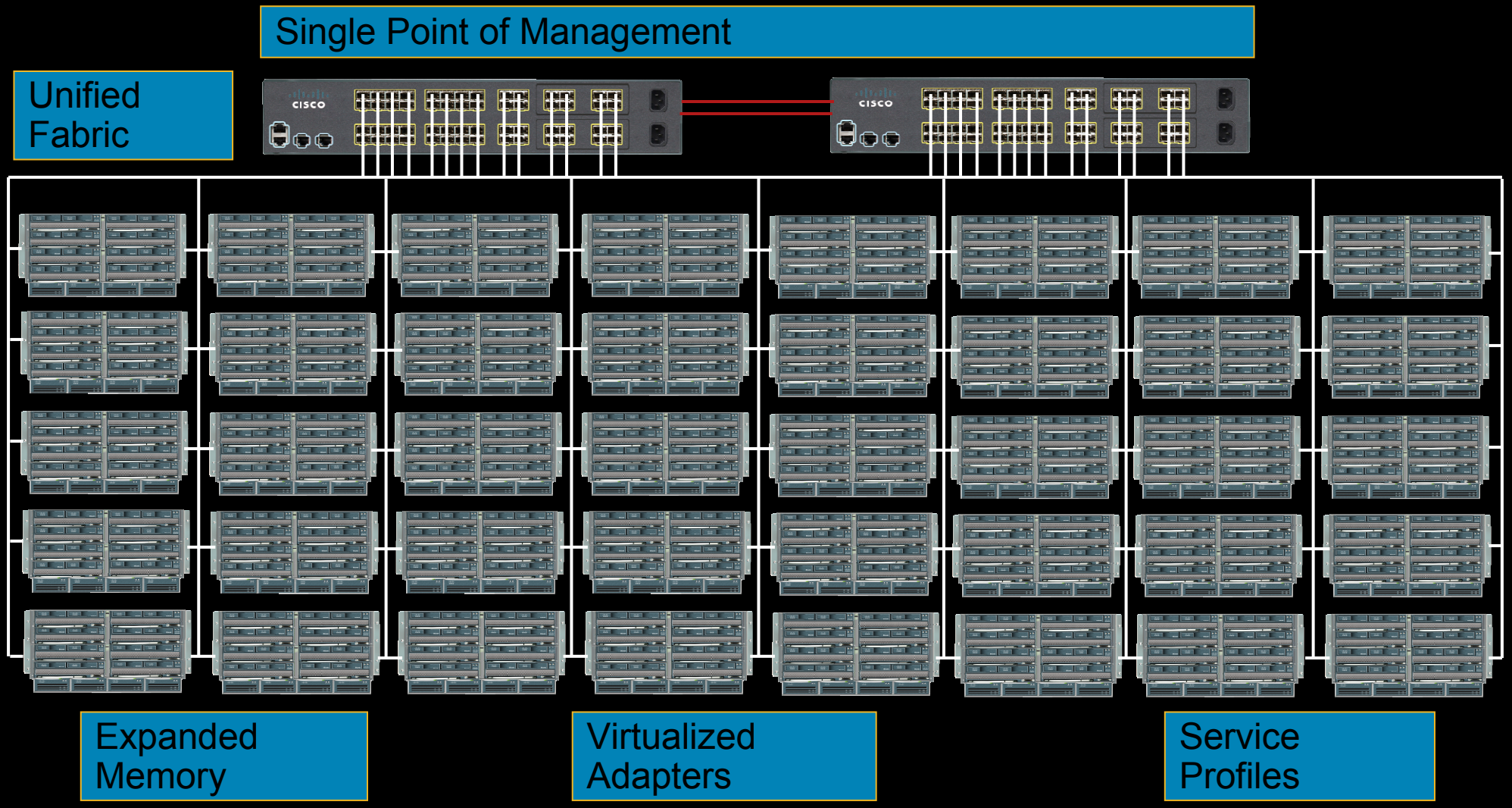
	Cisco LAN & WAN	Cisco Unified Fabric
Power Consumption	147 KW	63KW 57% Savings
Power & Cooling Costs	$909,000	$390,000 57% Savings
Qty of host Adapters (not including LOMs)	8,000	4,000 50% Savings
Qty of Cables	10,484	5,200 50.4% Savings
Qty of access ports	10,000	4,000 60% Savings

http://www.cisco.com/go/unifiedcomputing

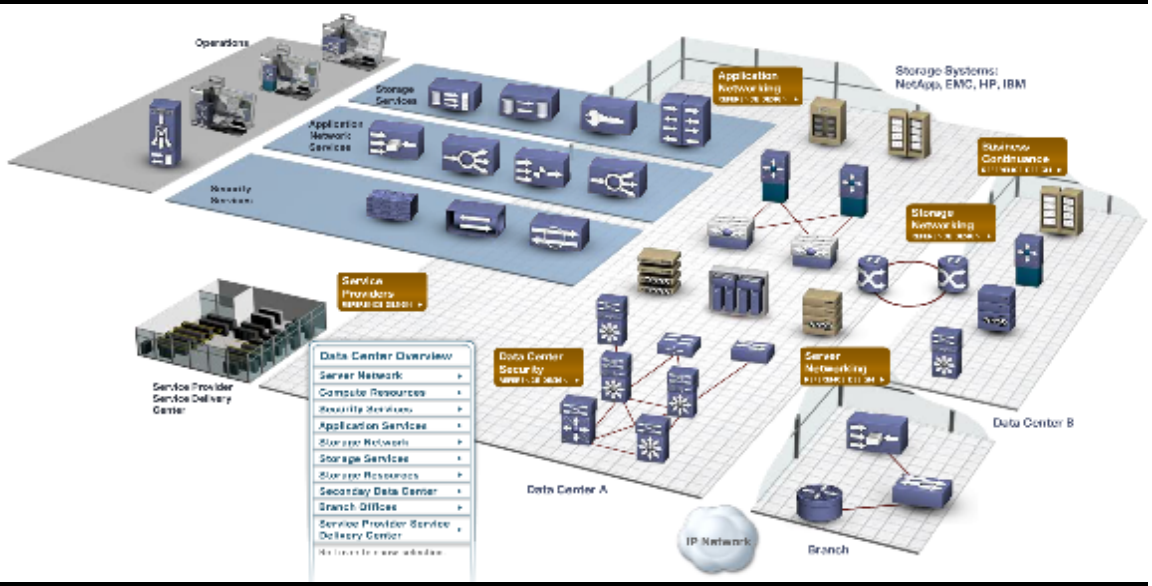
Unified Computing System



Unified Computing System Key Differentiation



Making the Journey – Pragmatic Adoption



Pragmatic Path to Next-Gen Infrastructure

Incremental, Low Risk Evolution via Best Practices

Consolidation
Improved Utilization, Efficiency

Virtualisation
Improved Flexibility, Responsiveness

Automation
Policy-based Adaptive Infrastructure

Agility

Storage Consolidation

Server Consolidation

Branch Infrastructure Consolidation

Data centre Consolidation

Network Virtualisation

Storage virtualisation

Server Virtualisation

Application Virtualisation

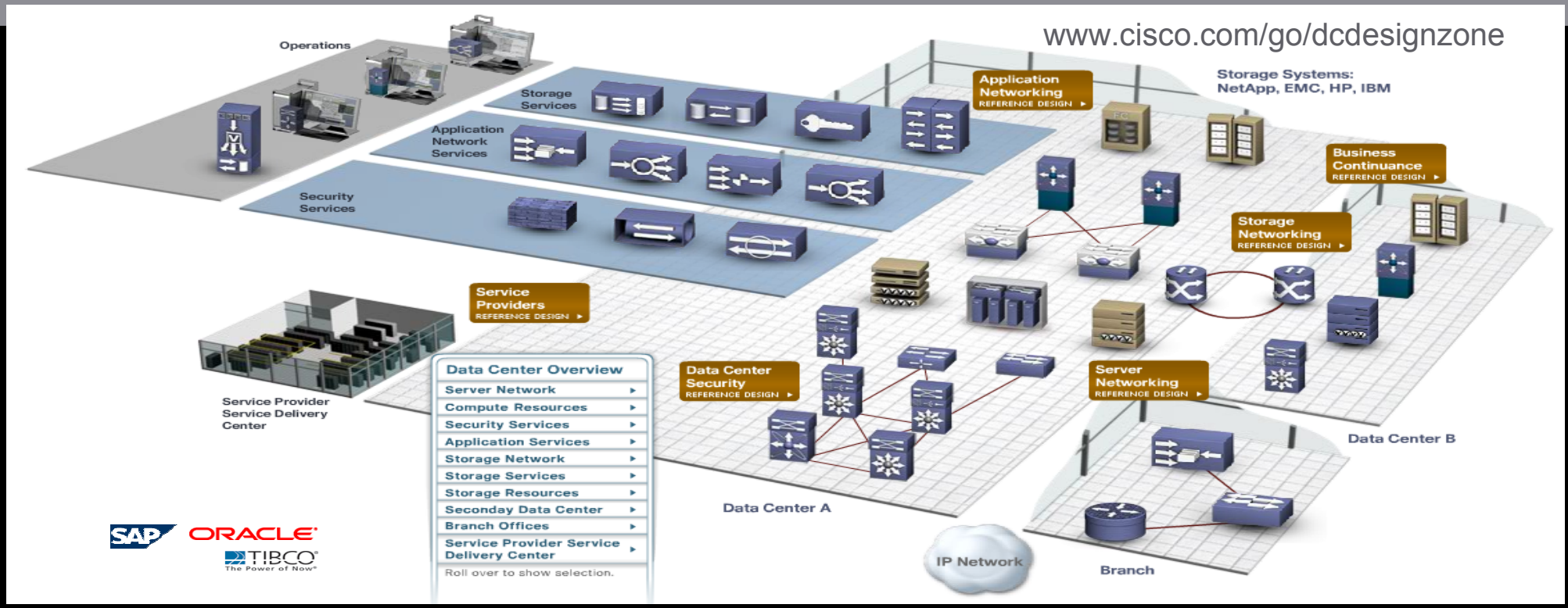
Static Provisioning

Semi-Automated Provisioning

Dynamic Service Automation

Time

Design Best Practices for Virtualized DC
Data Center Assurance Program 4.0



- End-to-end baseline implementations (System Assurance Guides)
- Optimized for ISV Appl'ns (Deployment Guides)
- Tested and Documented Designs (Cisco Validated Design Guides)

- App Networking, Blade Fabric Switches, Active-Active Configurations
- Oracle™ EBS®, Microsoft™ OCS®, SAP™, Tibco™ Rendezvous®
- Service Provider, Video and Mobility overlays

Summary

- The Next Generation Data centre will be virtualised across *all infrastructure*
- Cisco together with our partners provide:
  - A *Pragmatic Solution* to today's DC challenges
  - An *Architectural Foundation* based on best practices and proven designs
  - A *Roadmap of Innovations* to allow customers to tal advantage of future Cloud models
- The approach allows a *proven, incremental, l risk adoption path* that leverages your existi IT investments