Cisco Expo 2008

Datacenter

Rune Kongsrud, PSS Datacenter

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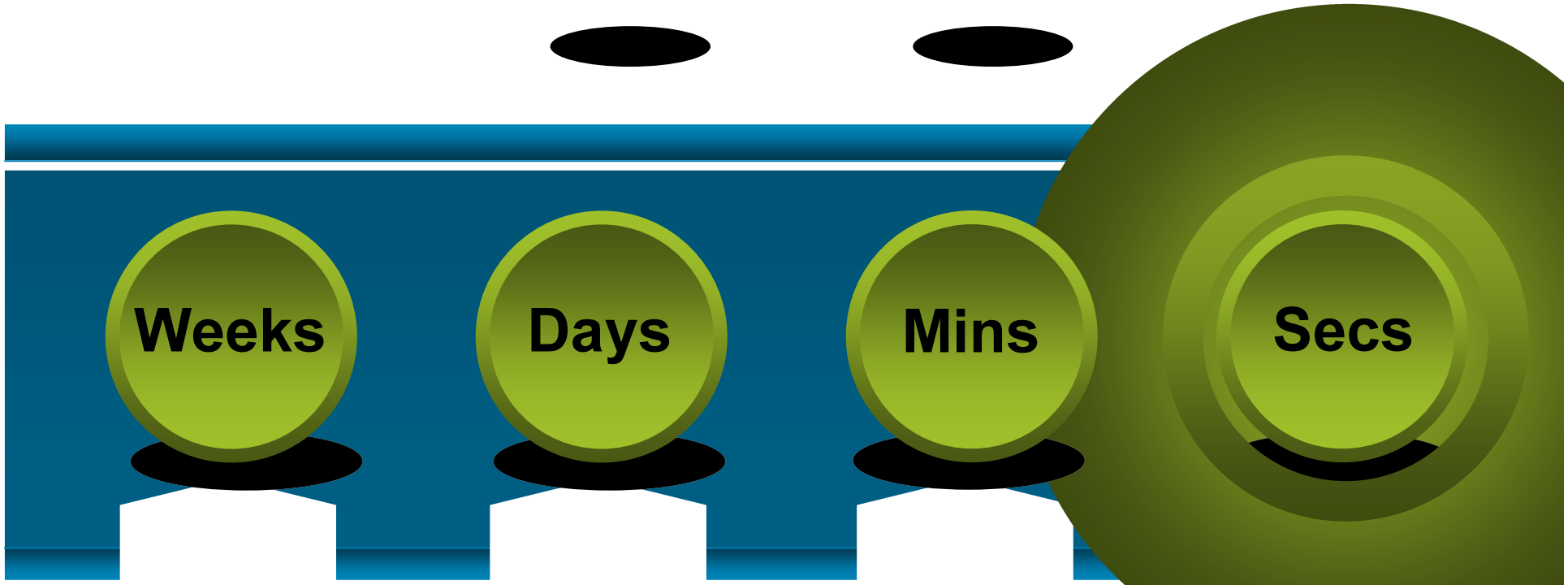
Improving IT Responsiveness



No Virtualization

Data Center Virtualization

Static Service Orchestration

Service Orchestration

Agenda

- Datacenter 3.0 – Cisco's datasenter visjon
- Datacenter Assuranse Program og Datacenter Reference Design
- Erfaringer fra CiscoIT's virtualiserings prosjekt
- VMware og Cisco
- Produktnyheter – Introduksjon

  Nexus 7000,

  ACE 4710 Appliance

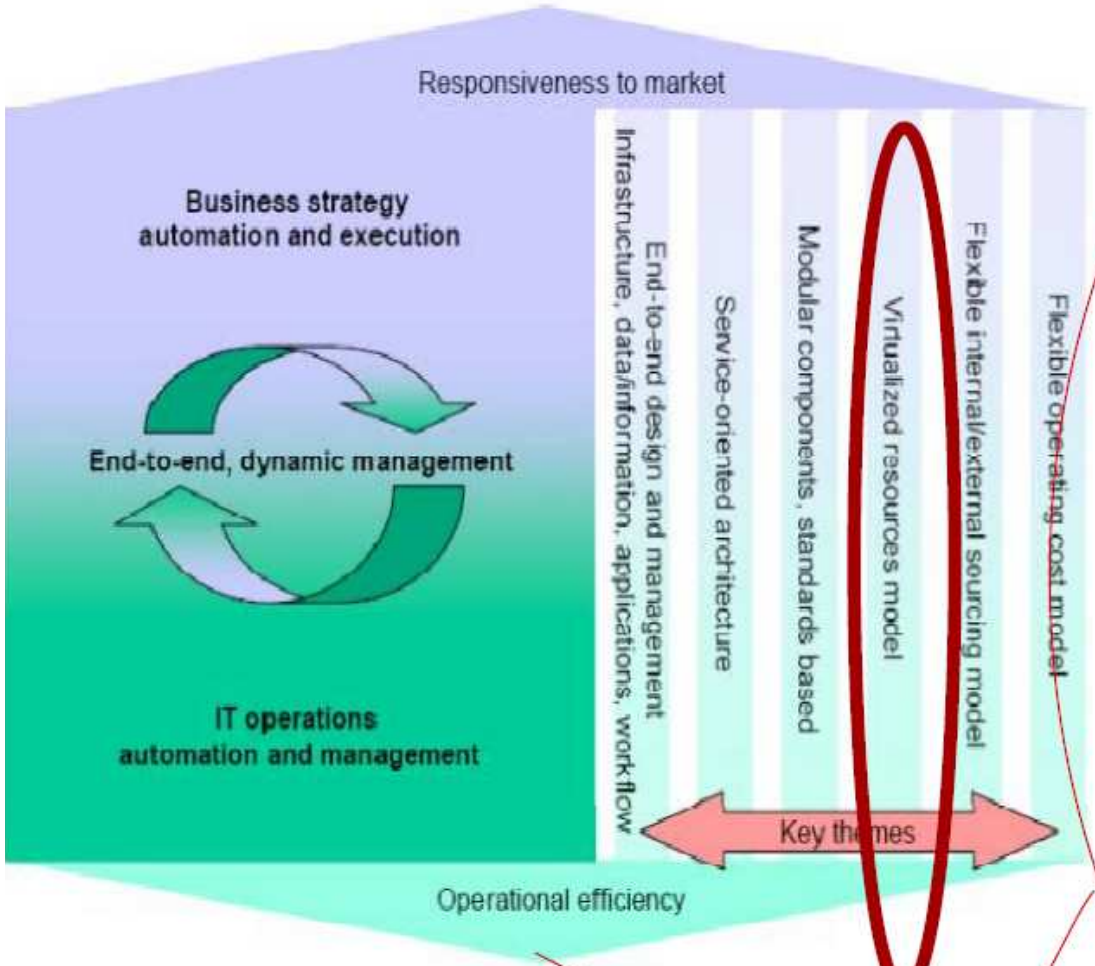
  Microsoft 2008 server på WAAS appliance
- Detaljene tar vi etterpå i møterom Counsil (--> 14.30)

Todays challenge in the datacenter

- Storage growing at 40-70% per year
- Low utilization ~15-25% (Servers/Storage)
- Power & Cooling ~25-30%+ of total DC costs , power availability
- Operations taking another ~30% of total DC costs
- 54% of network downtime is caused by human error
- New Applications can take 60-180 days to deploy

Status Quo is Not an Option

Virtualisation is one of the cornerstones of Dynamic IT



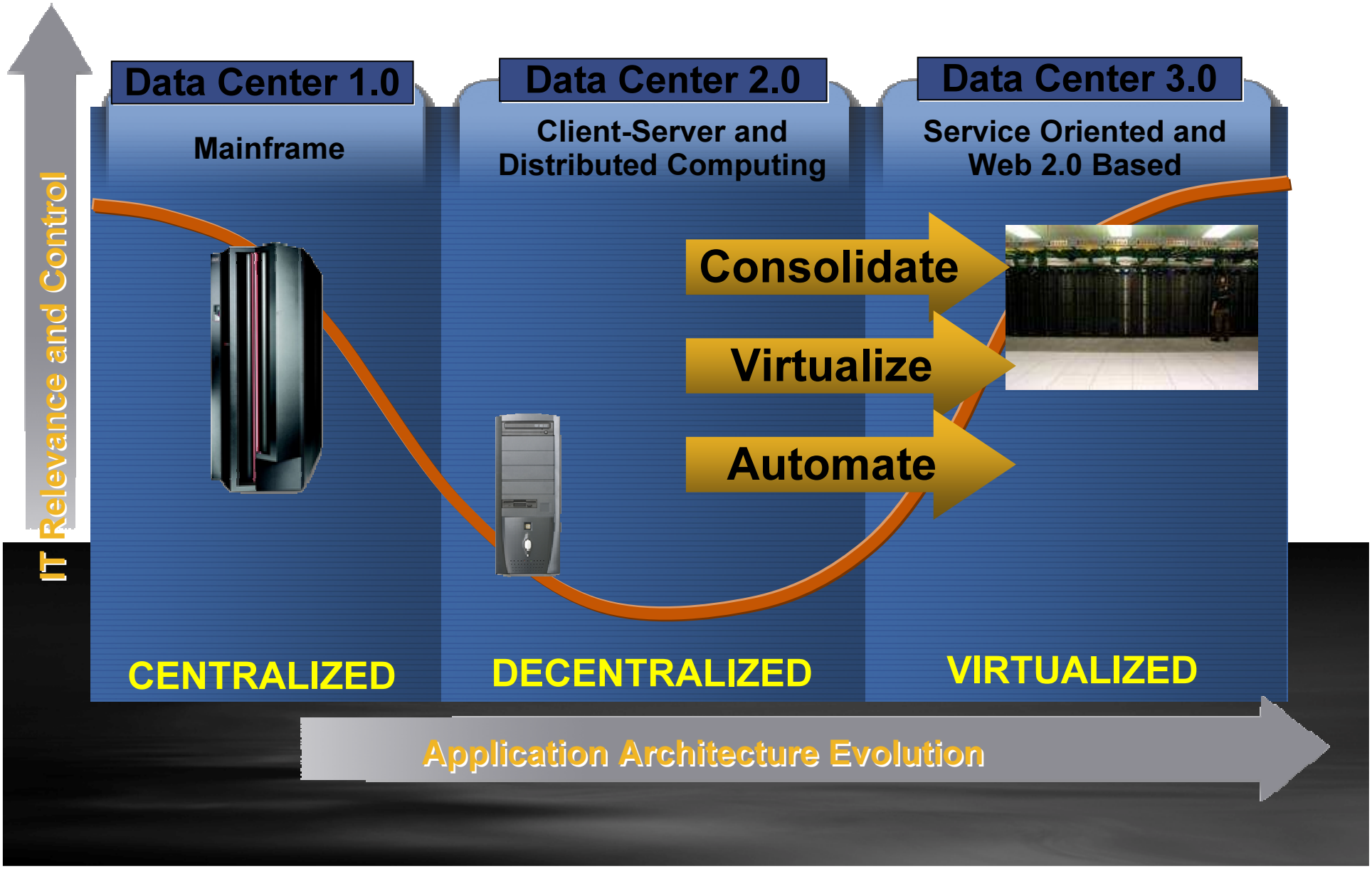
Lower capital expenditure

Lower administration cost

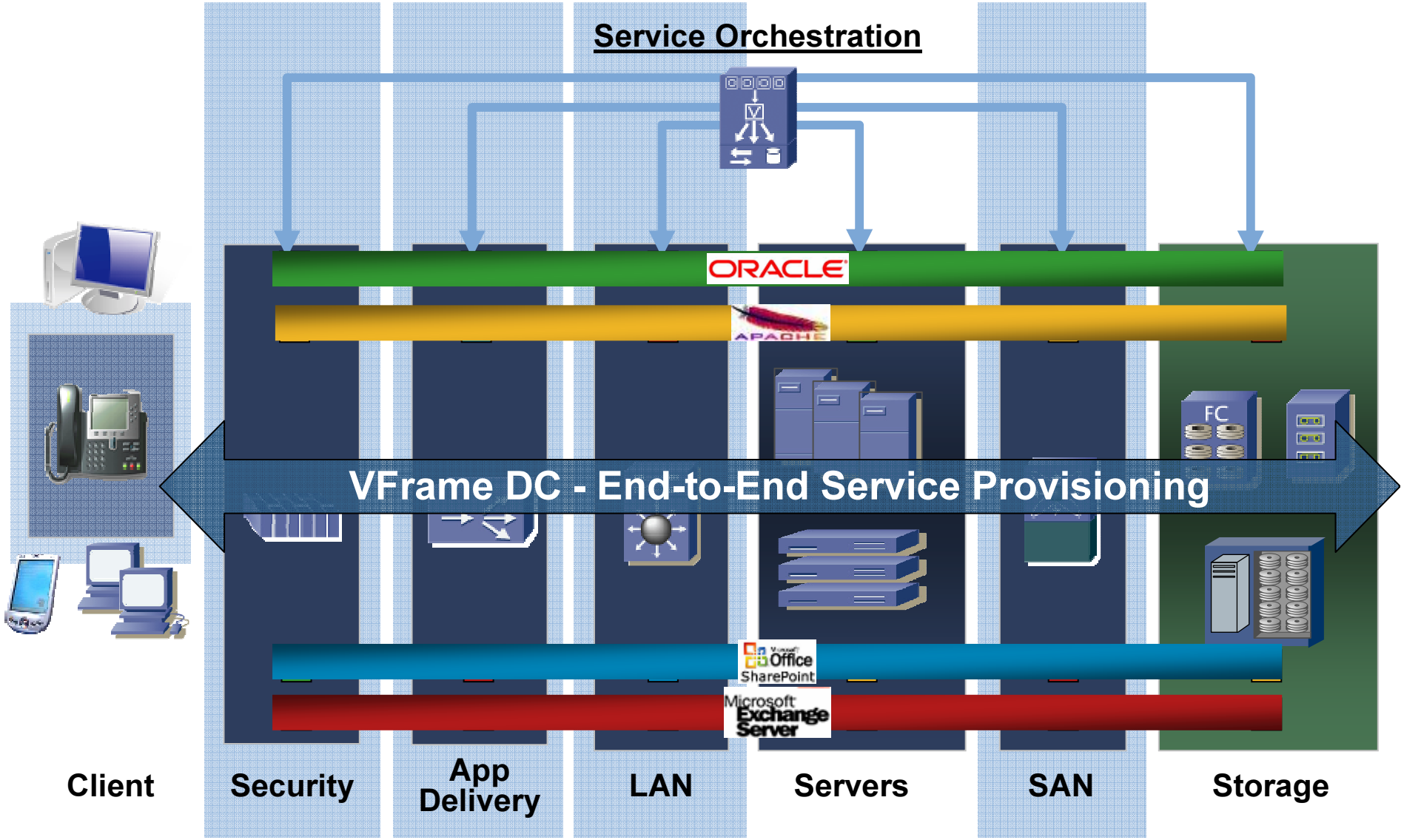
Higher availability

Quicker provisioning

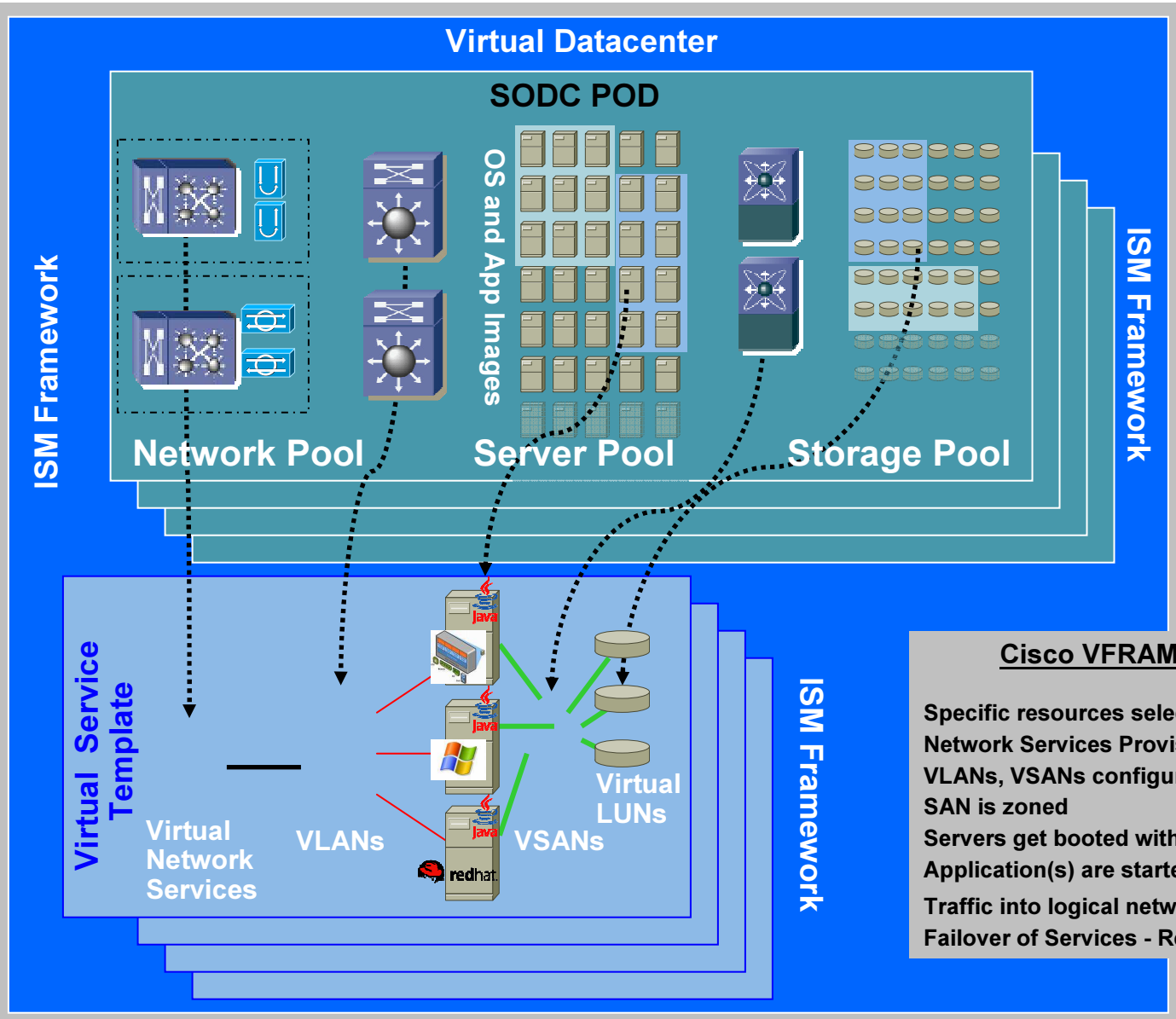
Data Center and Network Evolution



Data Center Virtualization – Virtual DC



Orchestration of pooled resources



Cisco VFRAME Data Center Orchestration

- Specific resources selected
- Network Services Provisioned
- VLANs, VSANs configured
- SAN is zoned
- Servers get booted with assigned image – Remote Images
- Application(s) are started
- Traffic into logical network turned "on"
- Failover of Services - Resiliency

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The “Accidental architecture”

- Silo’d based on traditional growth
- Complex, heterogeneous infrastructure
- New developments difficult to integrate

The “Accidental architecture” – Example

Blade Servers

Network

vmware

Nortel

HP VC

CISCO

SAN

vmware

Brocade

McData

How many hands are required?

How does the physical & virtual map?

How does provisioning work?

- Network – VM’s, 802.1q tags, uplinks, team & load balancing
- SAN – Different core/edge, NPIV support, Domain issues
- Questions??

The “Accidental architecture” – Answers!!

Blade Servers

Network

vmware

CISCO

SAN

vmware

CISCO

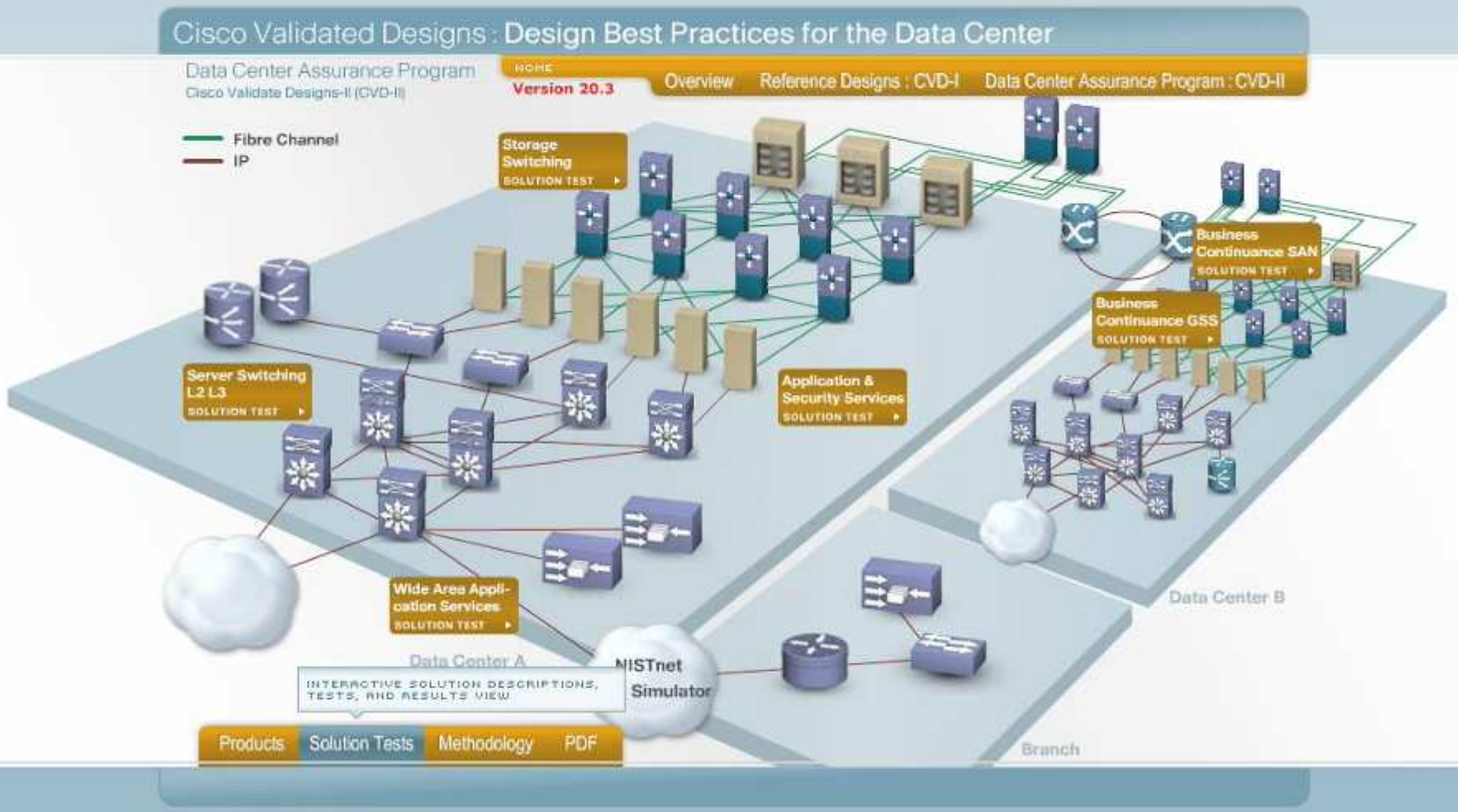
Far fewer hands and coordination

Alignment between the virtual machines and data center fabrics

Optimized provisioning with Virtual Center and VF Data Center

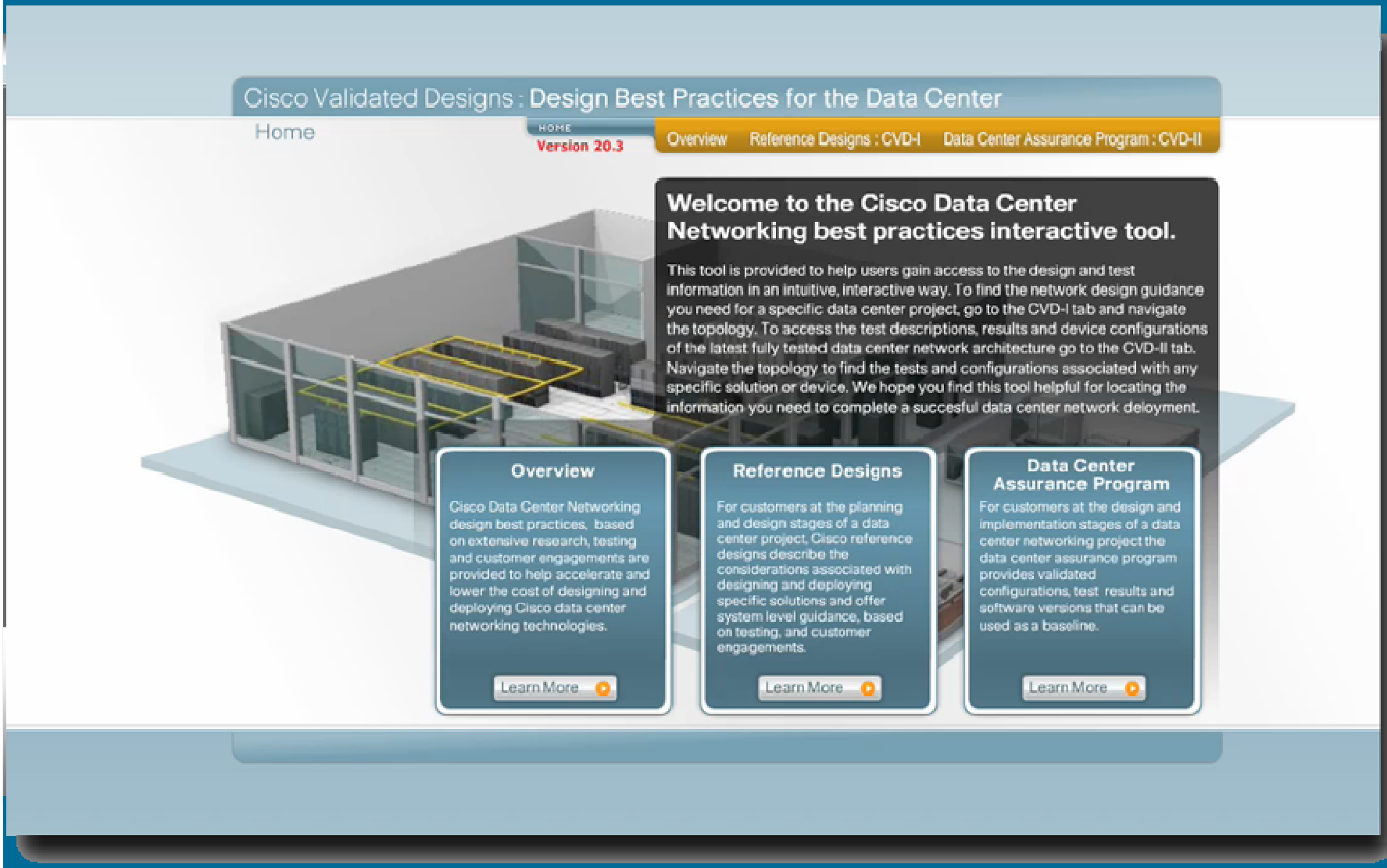
- Network – VM’s, 802.1q tags, uplinks, team & load balancing
- SAN – Different core/edge, NPIV support, Domain issues
- Answers – Significantly reduced OPEX and number of hands

DC reference architecture



Basis for all utvikling av våre datasenter produkter

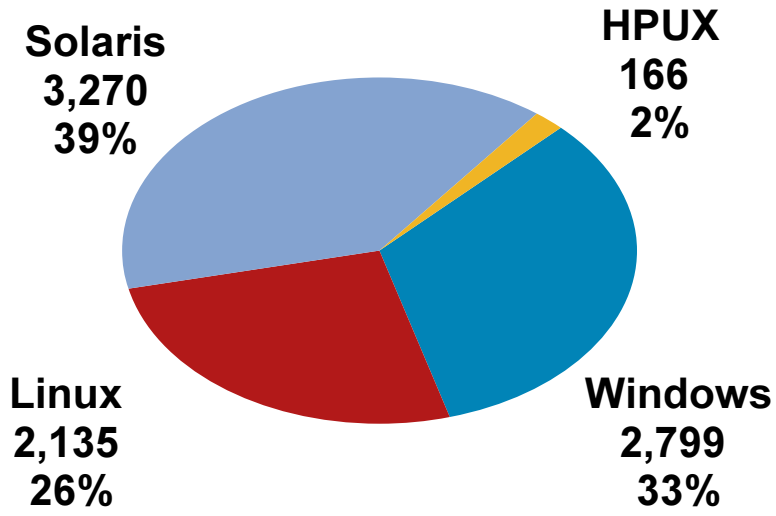
Data Center Assurance Program



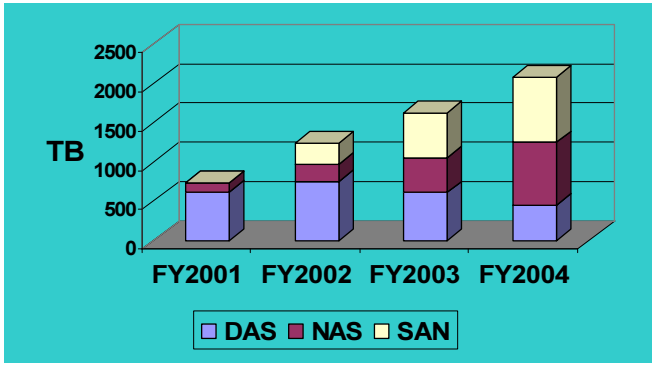
CASE STUDY: Cisco IT

Data Center Landscape

✓Servers 8-12 weeks deployment



✓Storage > 50% of data center budget



Cisco IT

Roadmap to Service Orientation

	Legacy Data Center	Consolidated Data Center	Virtual Data Center	Service Oriented Data Center
Compute	• 4 Tier Silos • Heterogeneous OS	• Standardization • Virtual Machines	• Server Repurposing • VM Mobility	• Service Oriented Infrastructure
Storage	• Storage Silos • Low Utilization	• Tiered Storage	• Virtualized Storage	• Service Orchestration & Automation
Network	• IP Connectivity	• Consolidated Network Services	• Virtualized Network	
Security	• Perimeter Security	• Secure Each Application Tier	• Virtualized Firewalls	• Usage and SLA-based Funding Model
Application	• Application Silos	• Consolidate	• SOA Pockets	

2004 2005 2006 2007 2008 2010

Consolidation and Standardize Phase

Virtualization Phase

Integration Phase

Automation Phase

Quantified Benefits

Server

- 50/75% virtualized
- $10 Million savings*
- 1 week deployment

Storage

- .21/MB to .032/MB
- Utilization 20% to 66%
- $50 Million savings*

* CapEx Cost Avoidance

Next Steps in Data Center Transformation

Consolidate

Teams, IT Assets, and Facilities

- Assign Data Center Architecture Leads
- Build Integrated Critical Teams
- Integrate Transport Operations
- Centralize Branch Servers
- Use Cisco Data Center Assurance Program

Virtualize the DC

- SLB and FW Network Services
- IT Assets – Servers, Storage, Networks, Services = Data Centers

Automate

- Service Provisioning
- Deployments and Changes

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Cisco Expo 2008

Cisco & VMware

Cisco and EMC / VMWare Press Release

VMWare and Cisco Announce Investment

PALO ALTO, Calif. and SAN JOSE, Calif., July 27, 2007 - VMware, Inc. today announced that Cisco Systems will acquire an equity stake in the company.

Cisco will purchase $150 million of VMware Class A common shares currently held by EMC Corporation, VMware's parent company, subject to customary regulatory and other closing conditions including Hart-Scott-Rodino (HSR) review. Upon closing of the investment, Cisco will own approximately 1.6 percent of VMware's total outstanding common stock (less than one percent of the combined voting power of VMware's outstanding common stock). VMware has agreed to consider the appointment of a Cisco executive to VMware's board of directors at a future date.

Cisco's purchase is intended to strengthen inter-company collaboration towards accelerating customer adoption of VMware virtualization products with Cisco networking infrastructure and the development of customer solutions that address the intersection of virtualization and networking technologies.

In addition, VMware and Cisco have entered into a routine and customary collaboration agreement that expresses their intent to expand cooperative efforts around joint development, marketing, customer and industry initiatives. Through improved coordination and integration of networking and virtualized infrastructure, the companies intend to foster solutions for enhanced datacenter optimization and extend the benefits of virtualization beyond the datacenter to remote offices and end-user desktops.

About VMware, Inc.

VMware, an EMC company (NYSE: EMC), is the global leader in virtual infrastructure software for industry-standard systems. Organizations of all sizes use VMware solutions to simplify their IT, fully leverage their existing computing investments and respond faster to changing business demands. VMware is based in Palo Alto, California. For more information, visit www.VMware.com.

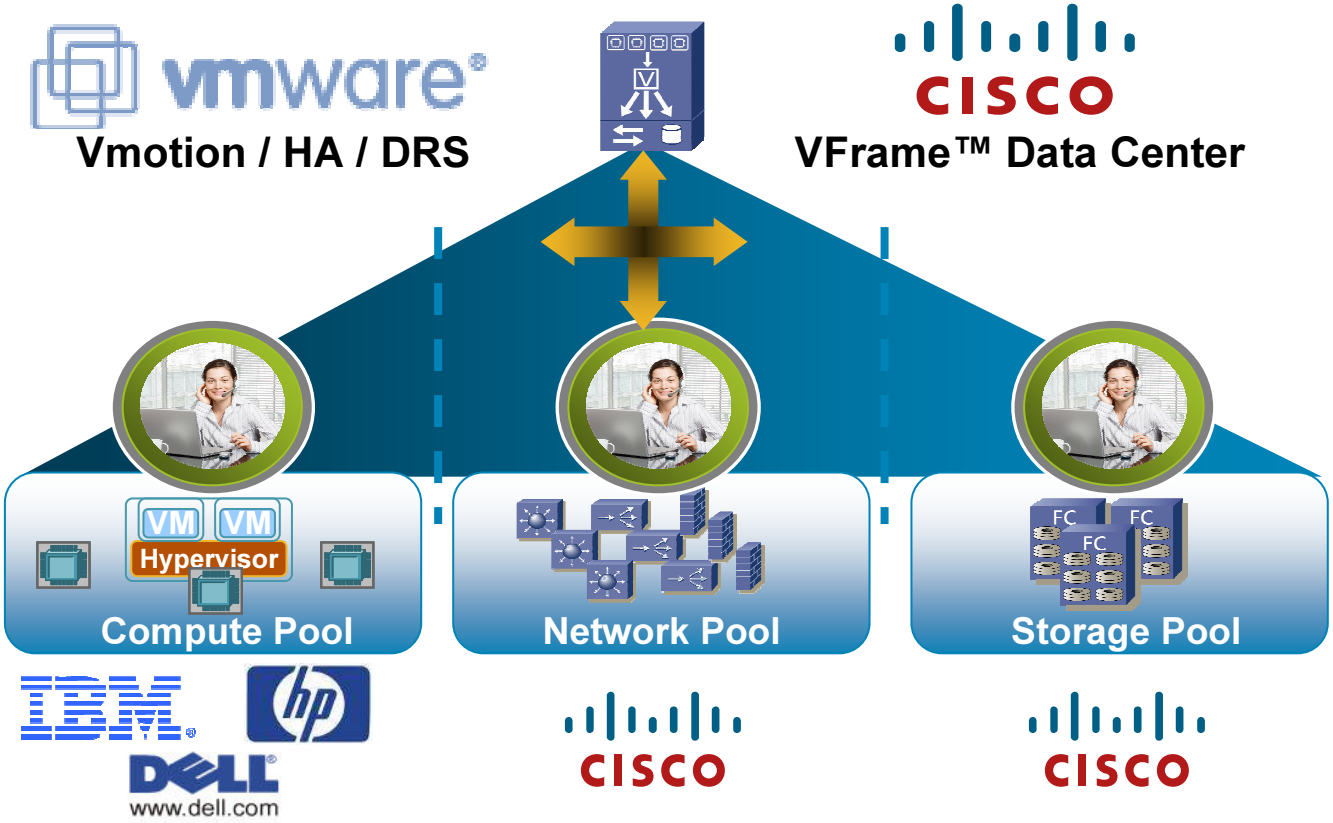
About Cisco Systems

Cisco, (NASDAQ: CSCO), is the worldwide leader in networking that transforms how people connect, communicate and collaborate. Information about Cisco can be found at http://www.cisco.com. For ongoing news, please go to http://newsroom.cisco.com.

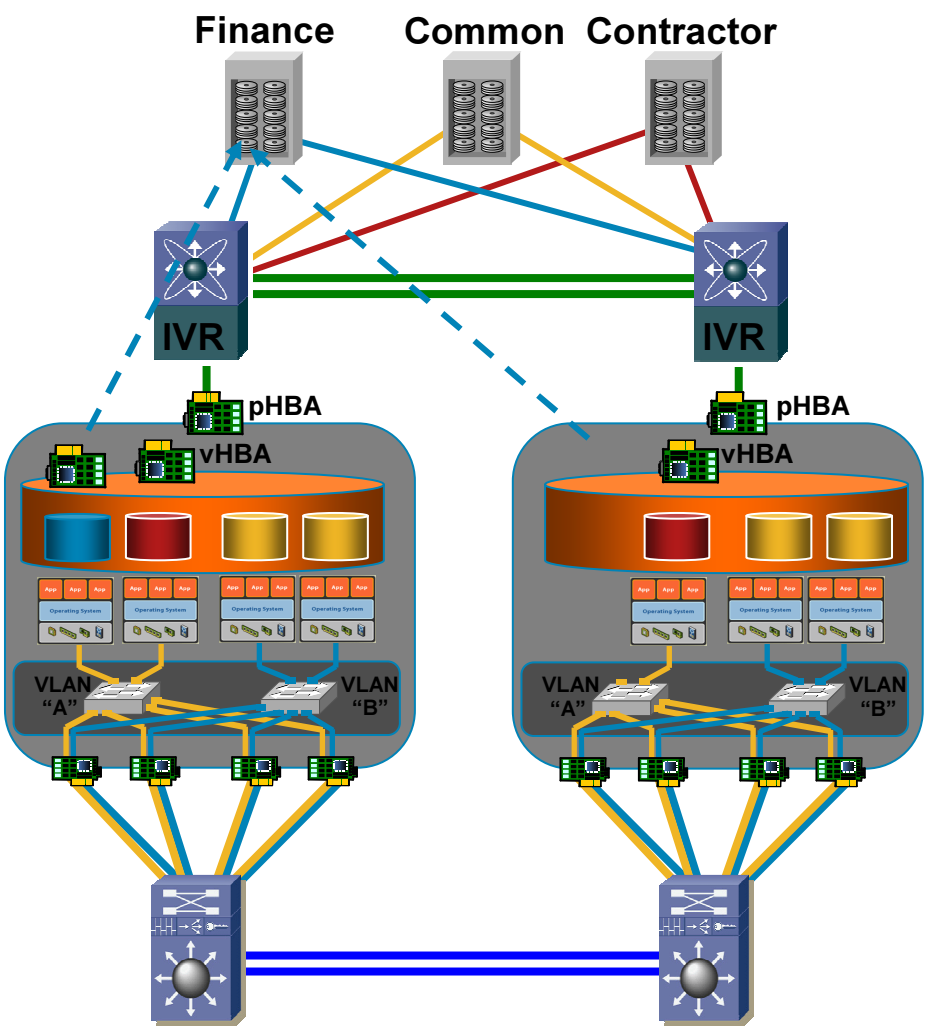
Cisco VFrame™ Data Center

Network-Driven Service Orchestration

Coordinated provisioning and dynamic reuse of physical and virtualized compute, storage, and network resources



New innovative services with VMware / VFrame DC



- Cisco VFrame DC will integrate with VMware Virtual Infrastructure 3
- Based upon predefined policies, these platforms can perform such services as:
- Add "on-demand" capacity by booting an additional server from a preallocated pool
- Configure network and storage services for both the ESX Server and its guest virtual machines
- Reconfigure these dependencies as VMotion migrations occur
- Monitor and adjust network services to assure conformance to defined SLAs
- VFrame DC powers up only those servers needed for a given application workload and returns servers that are no longer being used to server pools, powering them down until required byanother application.
- Automate maintenance updates as organizations undertake software upgrades

New innovation from VMware and Cisco

To be launced during CY2008

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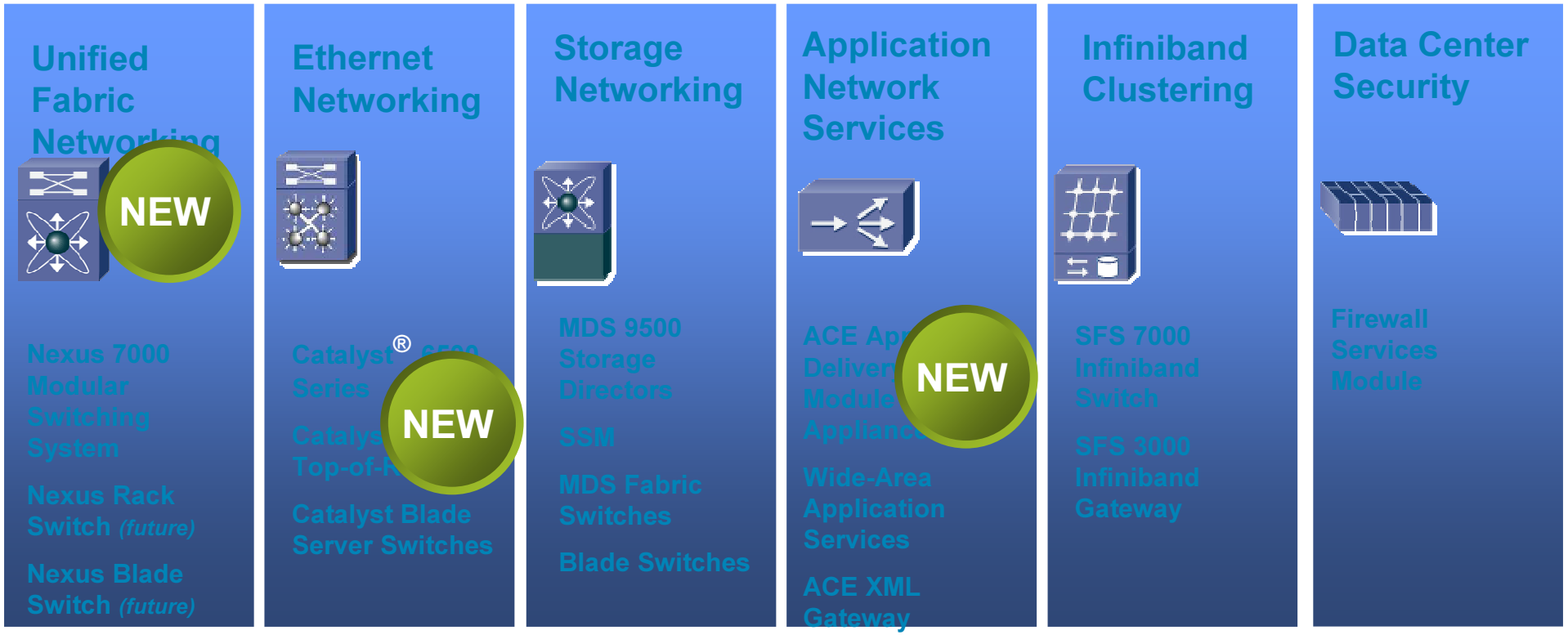
A Comprehensive Portfolio for Data Center 3.0



Introducing Cisco Nexus Family:
The Network Platform for Data Center 3.0

Over 1513 Patents Pending/Issued on Data Center Technologies

Over $1B in Overall Data Center Research and Development

Cisco® Nexus Delivers a Unified Fabric and I/O for the DC

Cisco Nexus Consists of Multiple Products with a Data Center Class OS

Cisco Nexus

Transport Flexibility

Operational Continuity

Infrastructure Scalability

Cisco Nexus 7000 Series

Data Center Class Switches

Operational Continuity

Zero Service Disruption design
Graceful systems operations
Integrated lights-out management

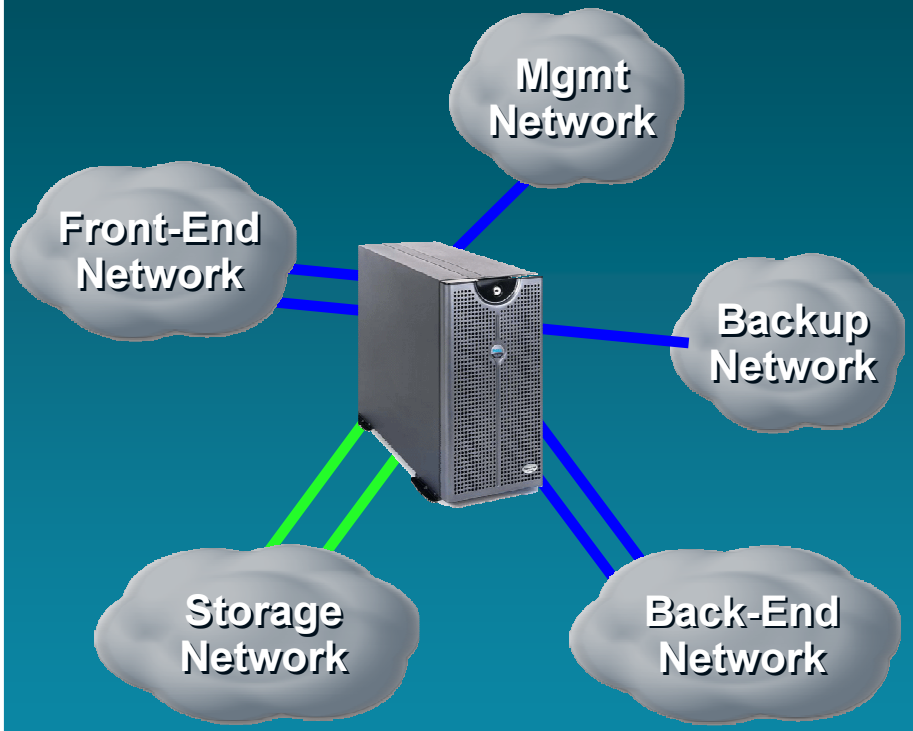
Transport Flexibility

Lossless fabric architecture
Dense 40GbE/100GbE ready
Unified fabric

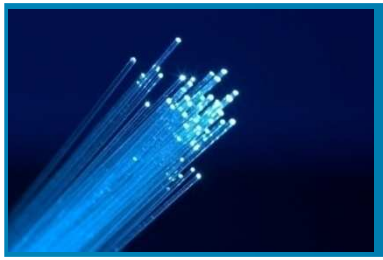
Infrastructure Scalability

Virtualized control and data plane
15Tb+ switching capacity
Efficient physical and power design

Increased Efficiency, Simpler Operations

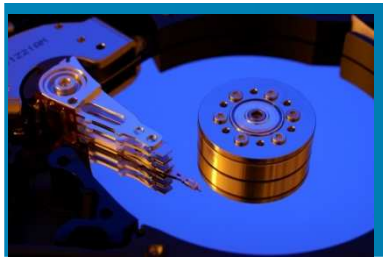


Key Benefits of Unified Fabric

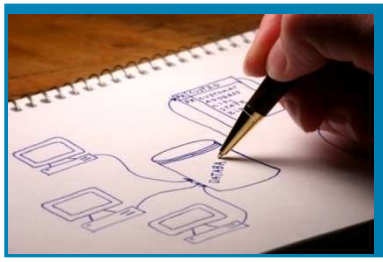


Reduce overall DC power consumption by up to 8%.
Extend the lifecycle of current data center.

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.

NX-OS: Purpose Built for the Data Center

Catalyst and Nexus:
Complementary Focus for Broad Deployments

Cisco Nexus 7000

15 Terabit Scalability
Unified Fabric

100GbE

40GbE

Transport Flexibility

Operational Continuity

10GbE

1GbE

Cisco Catalyst 6500

2 Terabit Scalability
Unified Network Access

Windows on WAAS

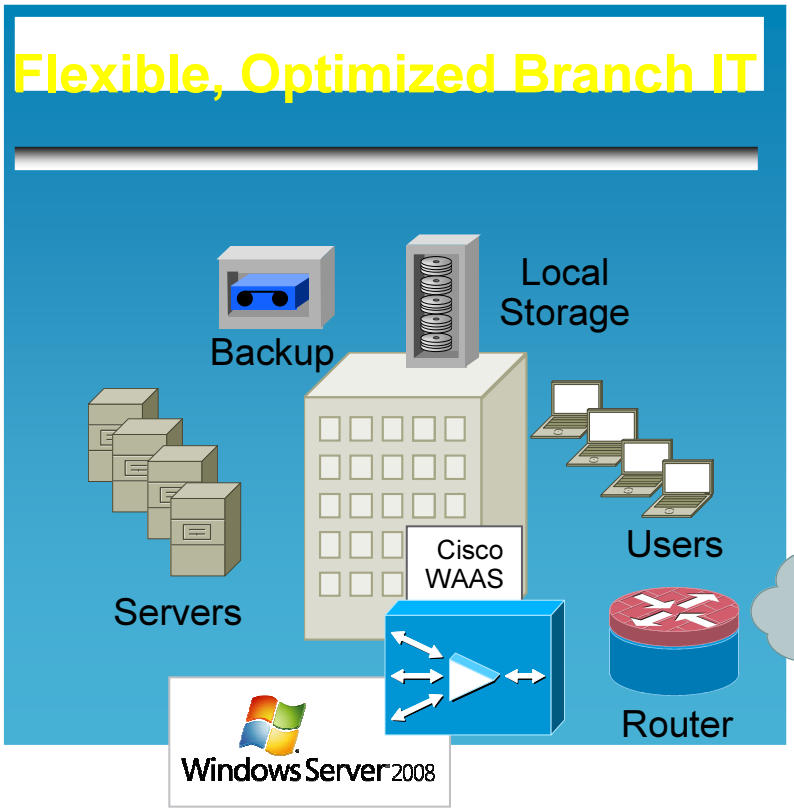
Optimizing Branch IT Services

Microsoft and Cisco Vision for Optimizing IT Services in the Branch

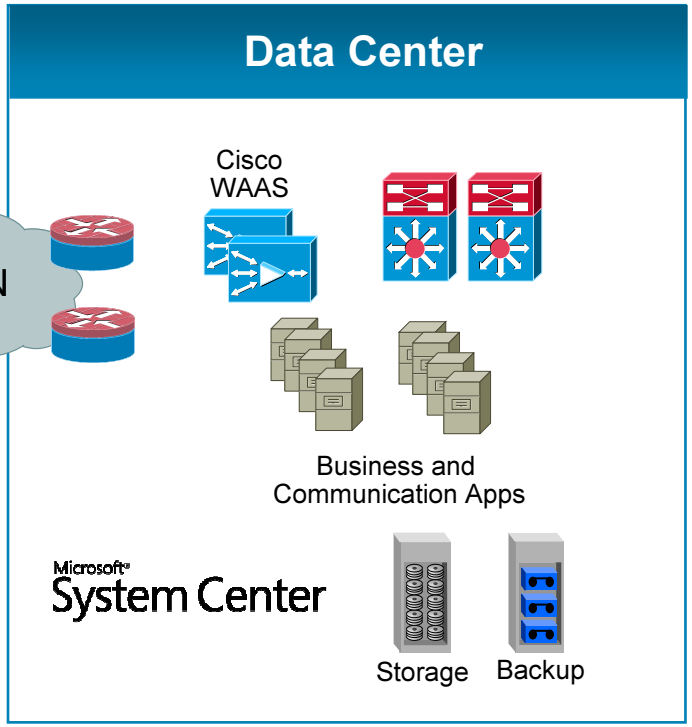
Announcement Summary

- Microsoft and Cisco Enhance Branch Offices through Integration of Windows Server 2008 and Cisco WAAS
- Integrated Solution: Windows Server 2008 pre-installed on Virtualization-ready WAAS Appliances
  - Leverages new Linux kernel technology and designed to meet different requirements from general 'Server Virtualization'
- Joint GTM: Co-marketing, channel partner engagement
- Collaborative Customer Support
- Launch Event: @ Windows Server 2008 Launch in LA
- Solution availability: Summer 2008

Branch IT Infrastructure:
Microsoft and Cisco Approach



- ✓ Centralize what you can with Cisco WAAS
- ✓ Locally host Window services on same WAAS device



WAAS and Windows Server:
Providing Best Mix of Distributed and Centralized IT Services

Microsoft and Cisco Solution

- Branch optimized IT services
  - Read-only Domain Controller
  - Print services
  - DNS/DHCP services

- Complete WAN optimization + application acceleration
- Ability to host Windows services locally

Cisco WAAS with pre-packaged Windows Server 2008 services

Windows Server 2008

✓ **Jointly developed architecture**

✓ **Joint customer support**

Microsoft/Cisco Solution
Benefits

Low Cost/ Complexity

- Minimized remote office hardware footprint
- Centralized Microsoft and Cisco mgmt
- Reduced downtime with joint support

IT Agility

- More dynamic IT planning
- Rapid software-based deployment of services w/o truck rolls

App Performance

- LAN-like performance for centralized apps
- Local access to services hosted on WAAS

Providing Best Mix of Distributed and Centralized IT Services

Cisco Expo 2008

Cisco Application Control Engine (ACE) 4710 Appliance

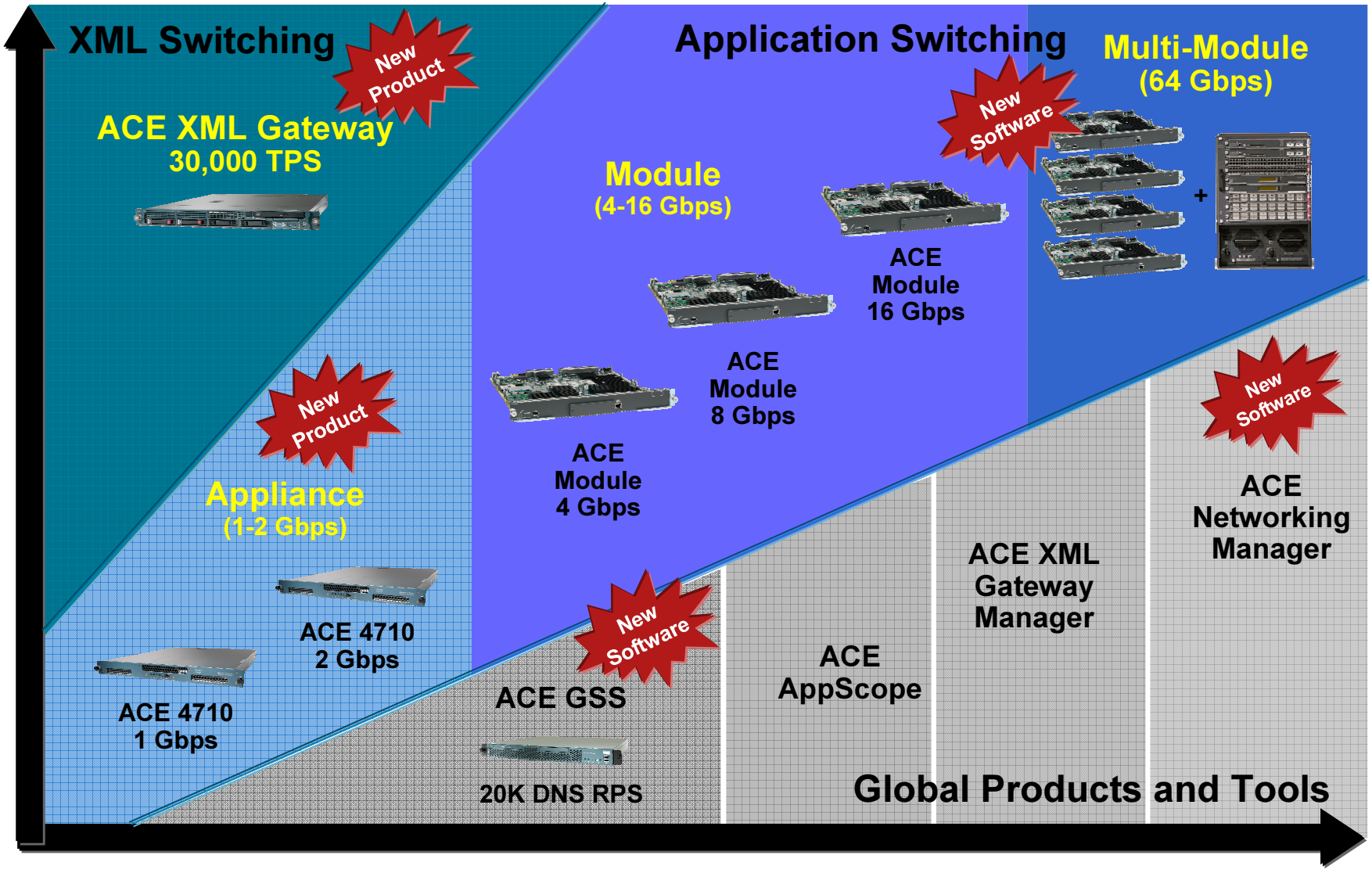
Product Overview Presentation

Introducing Cisco ACE 4710 Appliance

Application Response Times Most Advanced Application Acceleration	500% Improved Response Times
Application Roll-Out Fastest Application Roll-out via Virtual Devices	75% Improved Roll-out Time
Application Protection Highest Performance Application and Data Center Security	64K NAT and 40K ACLs
Investment Preservation Unmatched License-based Scalability	100% Scalability in Capacity
Green Ultimate Energy Efficiency	400% Lower Power and Cooling over Competition

Performance and Availability on the most "Green" Application Delivery Product in Its Class

ACE 4710 Appliance Extends ACE Portfolio



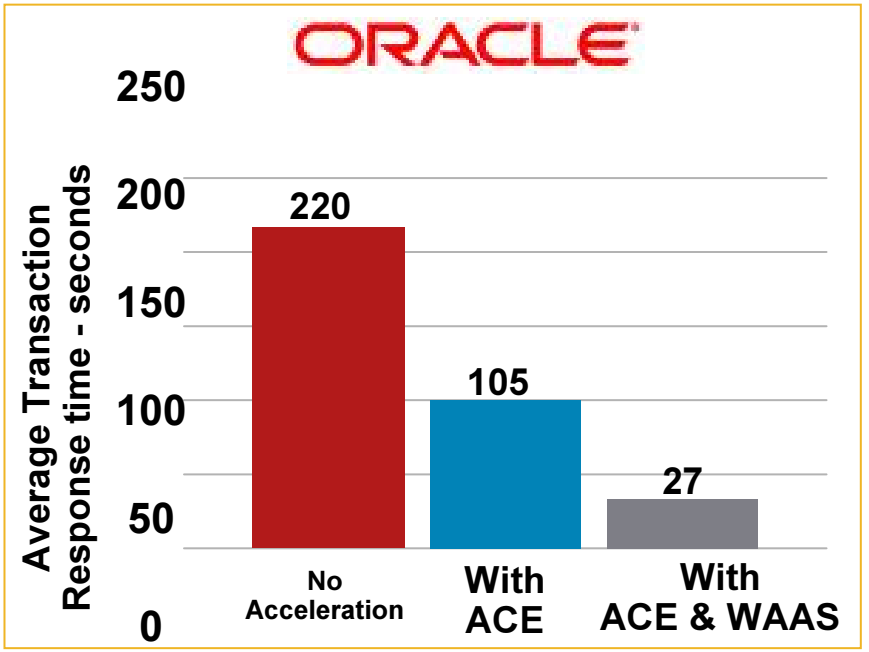
ACE 4710 Appliance and WAAS: The Power of Two

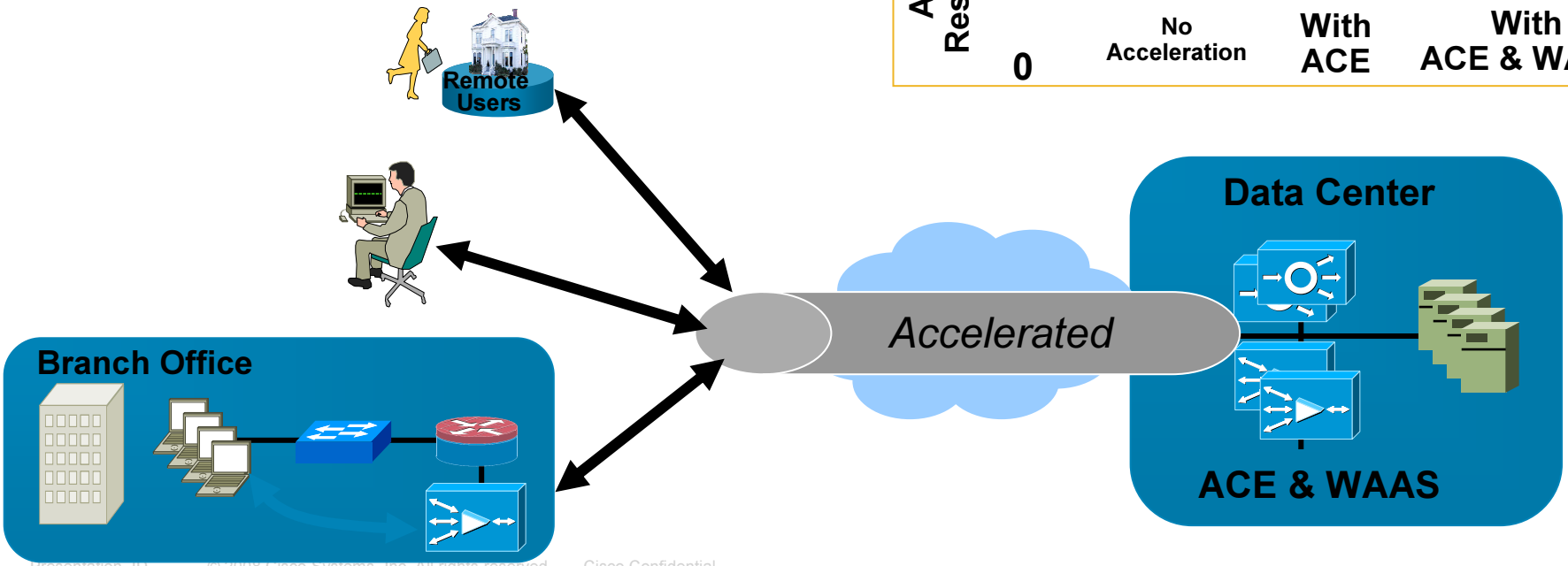
800% Application Acceleration

Acceleration Is Cumulative
- Asymmetric with ACE
- Symmetric with WAAS

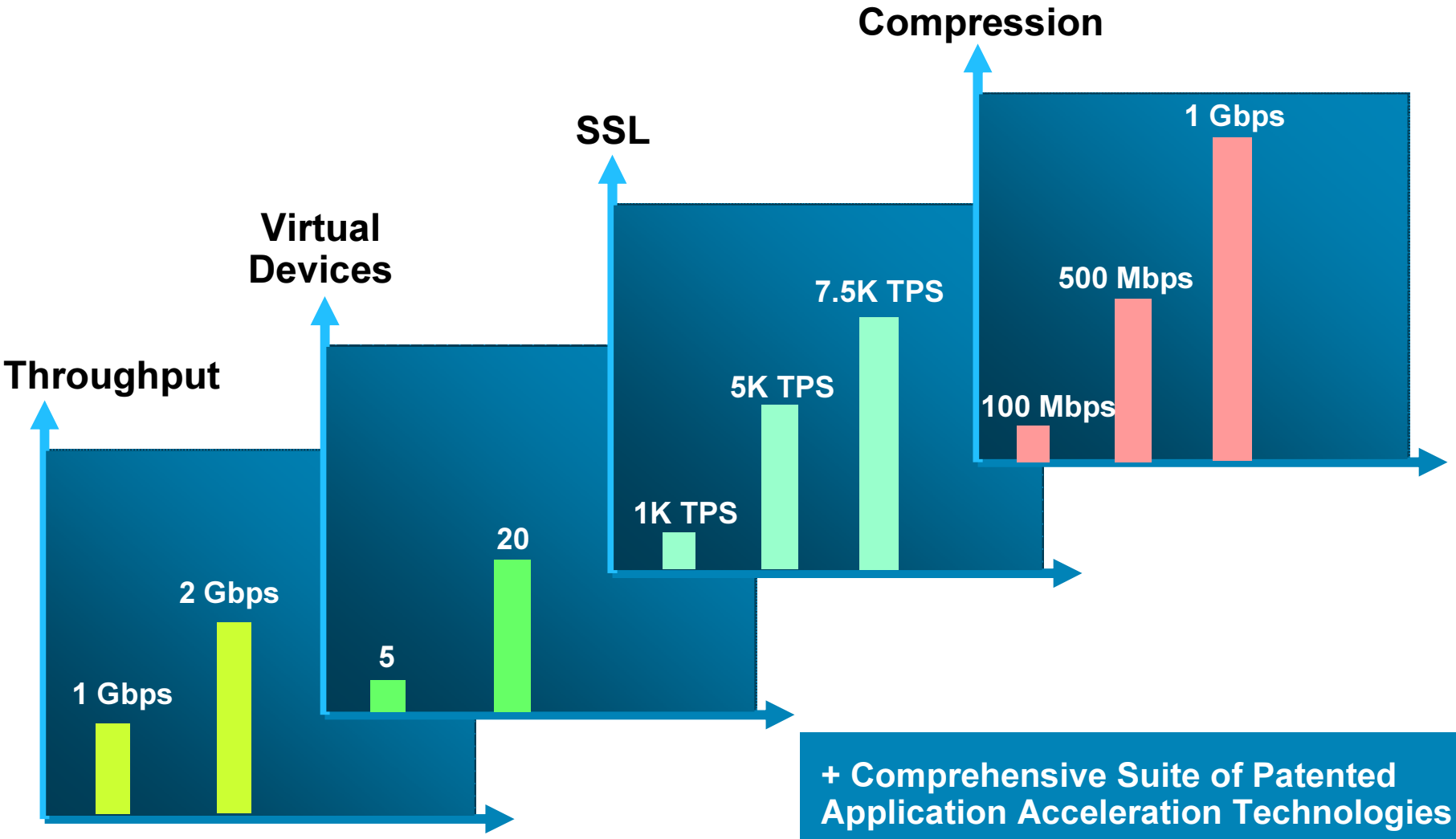
} End-to-End

Branch Office or Mobile Worker





Unmatched License-Based Scalability



+ Comprehensive Suite of Patented Application Acceleration Technologies

Investment Protection and Pay-As-You-Grow

3 Things to Remember About ACE 4710 Appliance

Available

Applications
- Virtual devices guarantee application resources & performance
- Built-in security for well known protocols
- Per-application sub-second failure recovery

Fast

Applications
- Up to 4X faster than competitor in real-world tests
- 6 patents on HTTP acceleration
- Asymmetric application acceleration up to 500%

Green

Infrastructure
- Virtual instead of physical devices minimizes device sprawl
- Up to 400% lower power and cooling over leading competitor
- Forklift-Free upgrades via software licenses
- 75% faster application roll outs

Power with Application Partners

ACE 4710 Appliance + ACE Module + WAAS
Tested, Validated, Documented

ACE 4710 Appliance Promotional Starter Kits

Products	Starter Kit Core - **$15,995** (1Gbps, 1K SSL, 100 Mbps Compression, 5VC) Starter Kit Adv App Acceleration - **$25,995** (1Gbps, 5K SSL, 500 Mbps Compression, 5 VC, App Acceleration)
Training	Europe, London - One Seat for 2-Day ACE Appliance Training - Limit of 2 seats per customer Other Theaters - Contact theater / ANS lead
Services	Optional Advanced Services 2-Day Turn-up Service for $6,000.

How does DC3.0 Solve Business Challenges

Data Center Infrastructure will Last Longer with lower OPEX

Stable and Reliable Infrastructure, less service calls

Deploy Capacity and Applications Quicker

More information

Cisco VFrame Datacenter http://www.cisco.com/go/vframe/

Cisco Validated Datacenter design http://www.cisco.com/go/dcap/

CiscoIT best practice

http://www.cisco.com/web/about/ciscoitatwork/case_studies.html

Cisco Datacenter solutions

www.cisco.com/go/datacenter