Infrastructure for the Next Generation Virtualized Data Centre

Data Centres are at a Critical Juncture

Perfect Storm of Forces Impacting IT and the Business

Collaboration

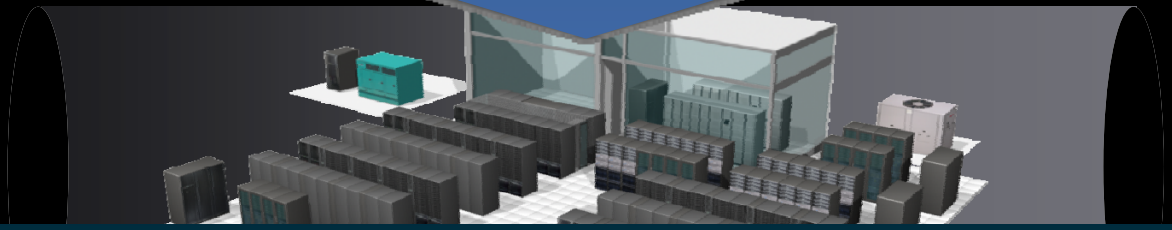
Empowered User

SLA Metrics

Global Availability

Reg. Compliance

New Business Pressures



Operational Limitations

Power & Cooling

Asset Utilization

Provisioning

Security Threats

Bus. Continuance

Status Quo is Not an Option

Current Trends will Overwhelm Traditional Infrastructures

- Storage growing at 40-70% per year [1]
- Utilization ~15-25% (Servers/Storage) [2]
- Power & Cooling ~25-30% of total DC costs [2]
- Operations taking another ~30% of total DC costs [2]
- 54% of Network Downtime is due to Human Error [3]
- New Applications can take 60-180 days to deploy

"50% of Enterprise Class data centres will be technologically obsolete within 24 months" - Gartner Group

1 = Gartner 2006
2 = IDC 2007
3 = Uptime Institute 2007
4 = Morgan Stanley 2006
5 = EBC feedback

Need Infrastructure for Today *and* Tomorrow

Start Tactically, Implement Strategically

Current: 'Accidental Architecture'

- Non-optimized, bandwidth intensive
- Rigid, inflexible
- Branch offices 'mini data centres'

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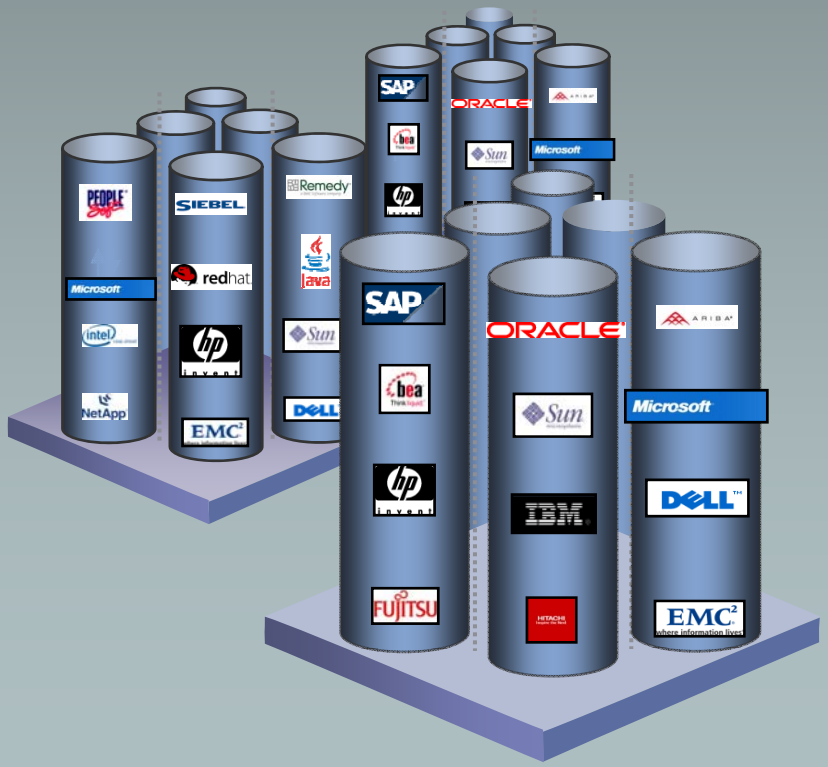
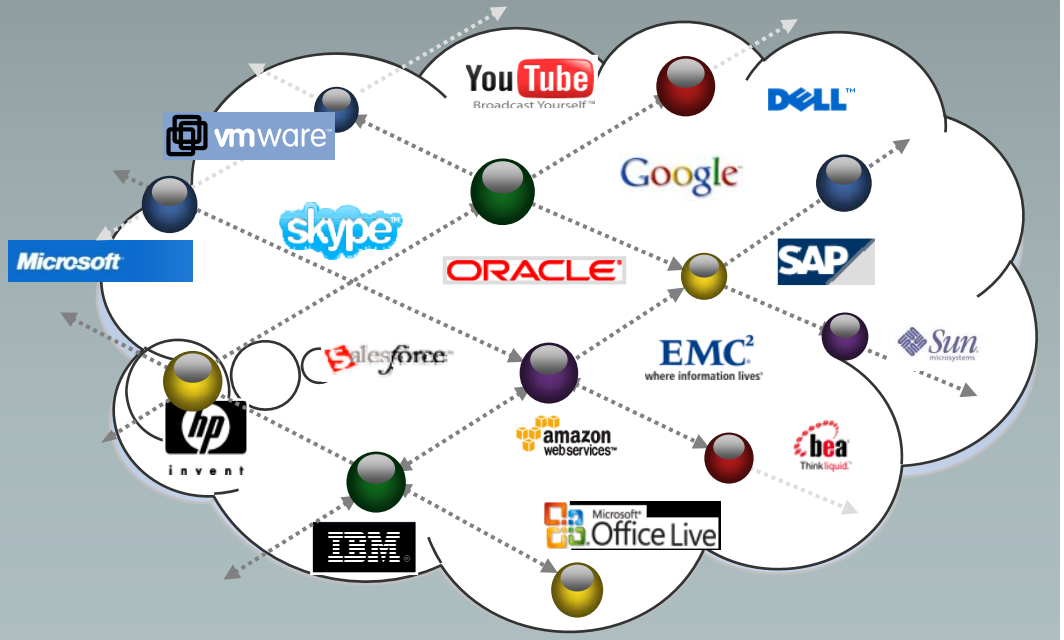
Emerging: Web 2.0 Model

- Clouds of virtualized services & resources
- Significant new resource demands
- Challenges with visibility, control, security





Virtualizing the Data Centre Infrastructure

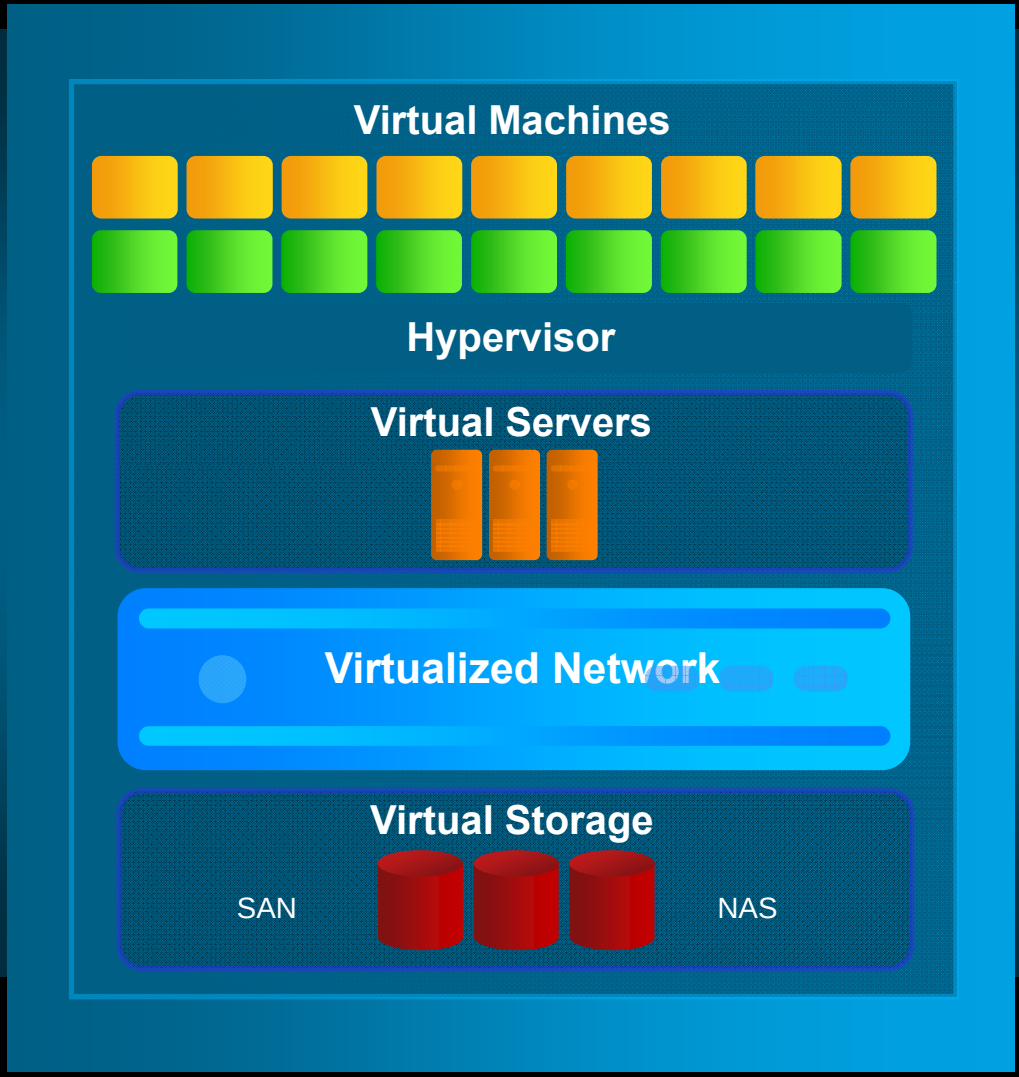
Virtualization – definition (well, one of them)

Virtualization

is the pooling and abstraction of resources and services in a way that masks the physical nature and boundaries of those resources and services from their users

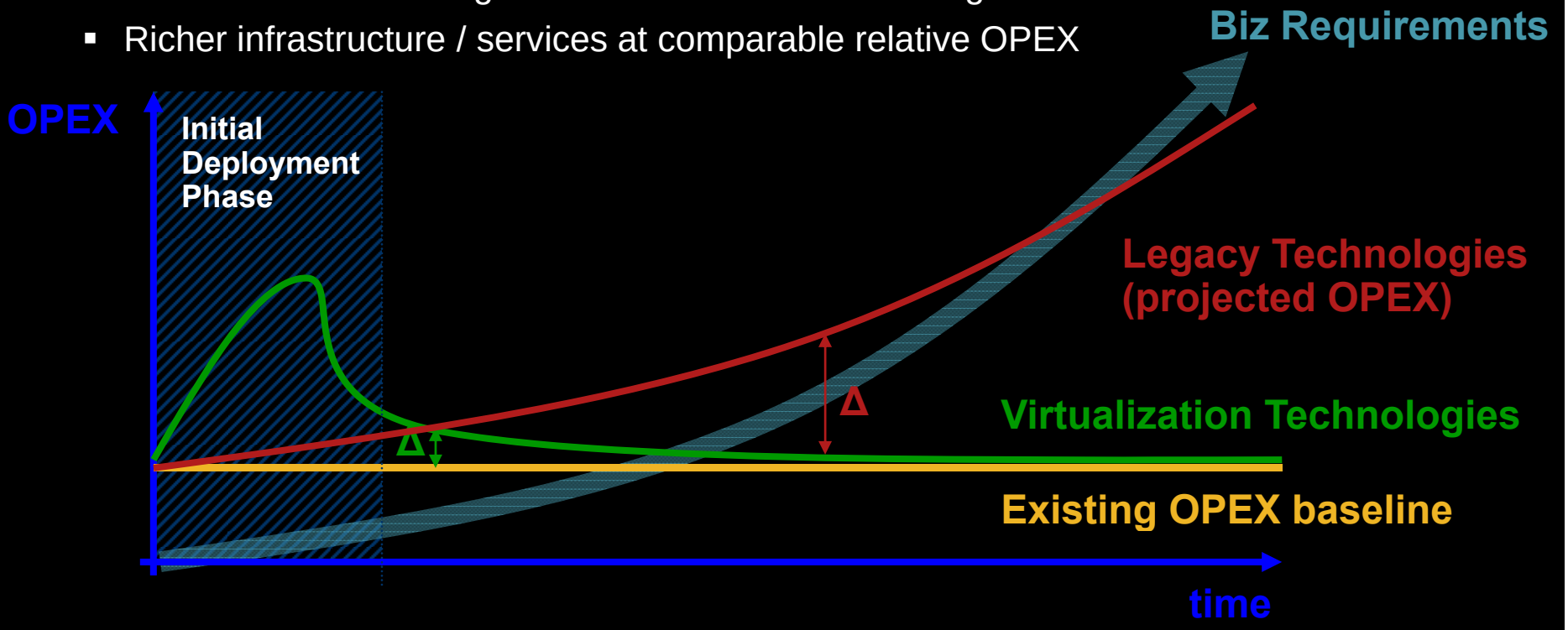
Virtualisation Crosses the Platform

Key to Responsive, Resilient, Efficient IT



Virtualization
Business Need - minimal OPEX

- Ever increasing business requirements
  - Fulfillment with legacy technologies is too expensive (OPEX and CAPEX)
  - Next Generation technologies required as enablers
  - Technology enables Innovative Biz Processes and fosters Business creativity
- Virtualization technologies become baseline technologies over time
- Richer infrastructure / services at comparable relative OPEX



But… Virtualisation is not a “Magic Wand”

Great Benefits but also New Challenges

New Paradigm

- Virtual Machine is the New “Atomic Unit”
- Dynamic Movement of VMs / Applications
- New Options: VDI, Clouds, Workload Portability

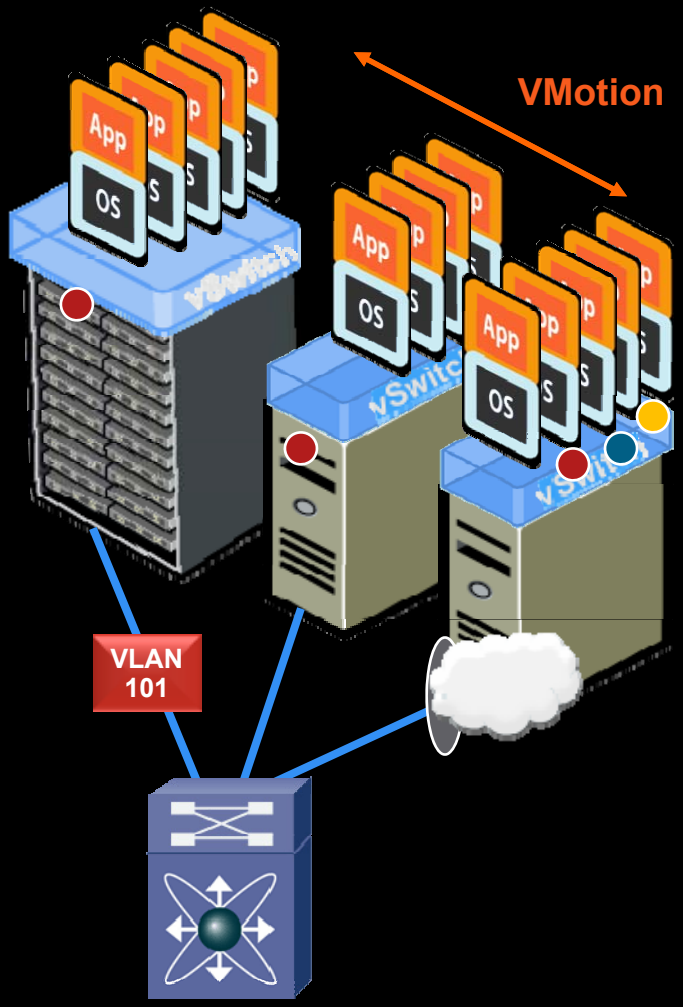
Infrastructure

- Per-Virtual Machine services required
- Multi-Core CPU’s, More I/O Bandwidth
- New emphasis on Security, Trust, QoS

Organization

- Breaks Current Organizational Model
- Reduces Visibility into ‘Hidden’ Resources
- Requires Continuous Availability/Provisioning

VN-Link Brings VM Level Granularity



Problems:

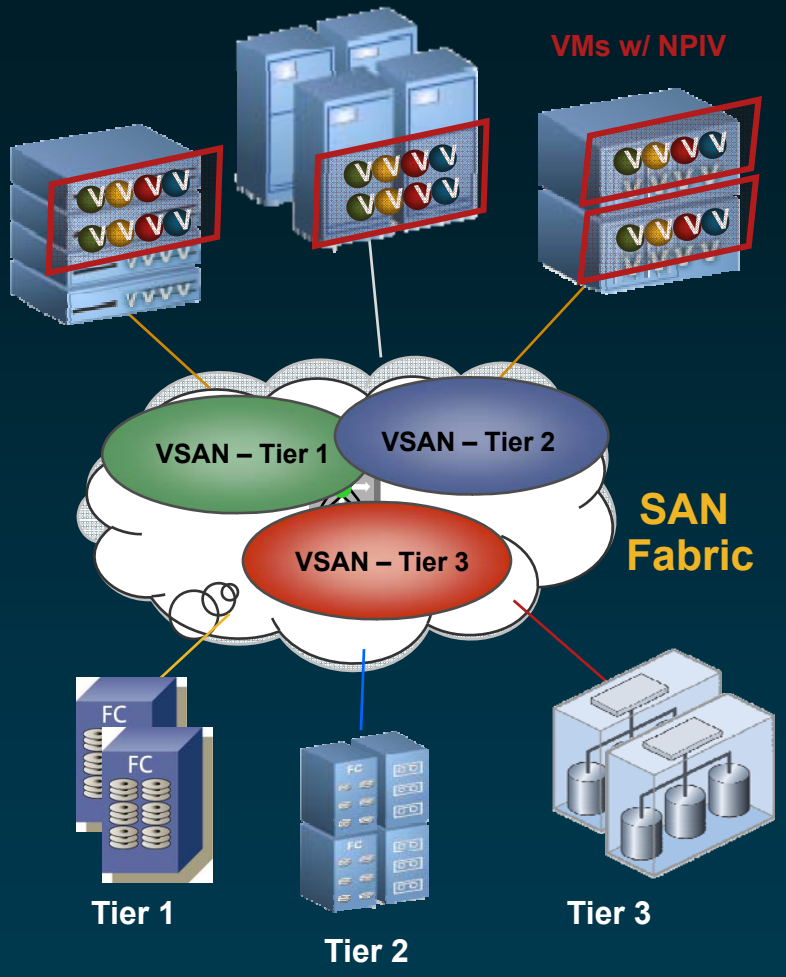
- VMotion may move VMs across physical ports—policy must follow
- Impossible to view or apply policy to locally switched traffic
- Cannot correlate traffic on physical links—from multiple VMs

VN-Link:

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

Virtual Machine-Aware Storage Networks

Critical Element of 'Real World' VM Deployment



Fabric Scalability and Performance
Resilient, high performance fabric to support large, dense VM environments

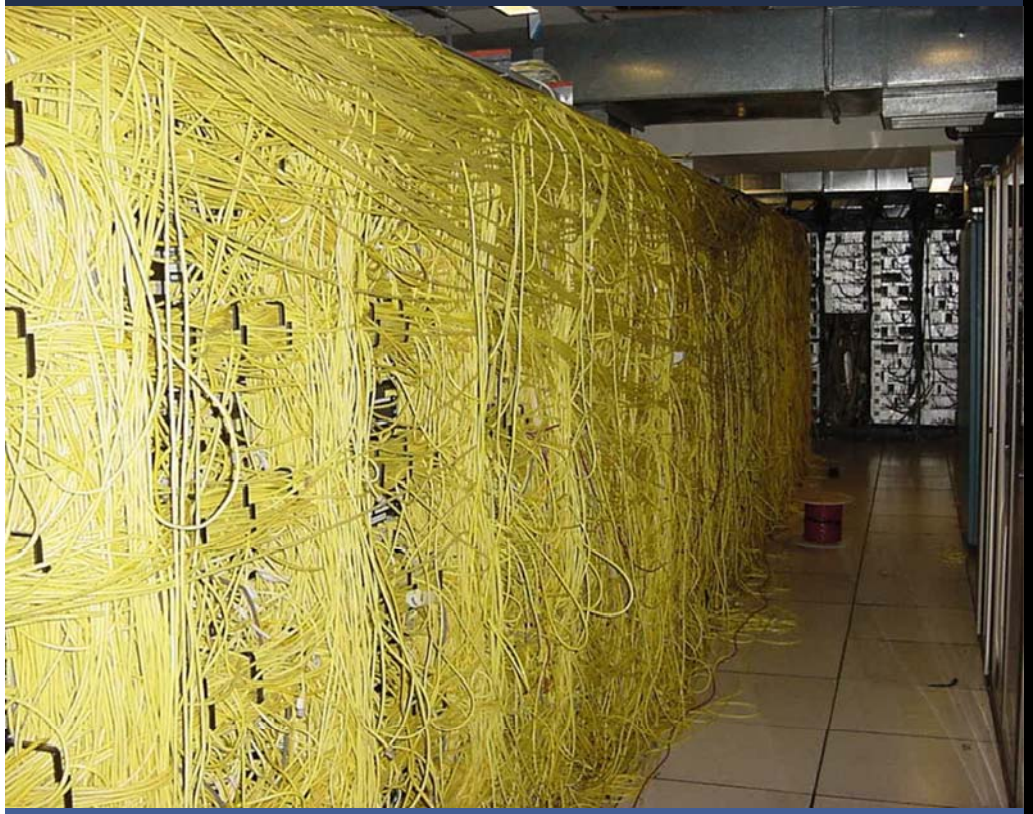
Performance Monitoring and Trending
VM-granular management and troubleshooting

Quality of Service (QoS)
VM-granular policy provisioning

VSANs Isolate Fault Domains
Increase availability, simplify troubleshooting, improve security & compliance

Mobility with Security
Wire-speed encryption protects data in transit and VMs during migration

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



Complexity,
Cost, Power

Increased Efficiency,
Simpler Operations

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

Desktop Virtualisation – Growing Interest

But not a “Free Lunch” for Infrastructure

Virtual Desktop Benefits

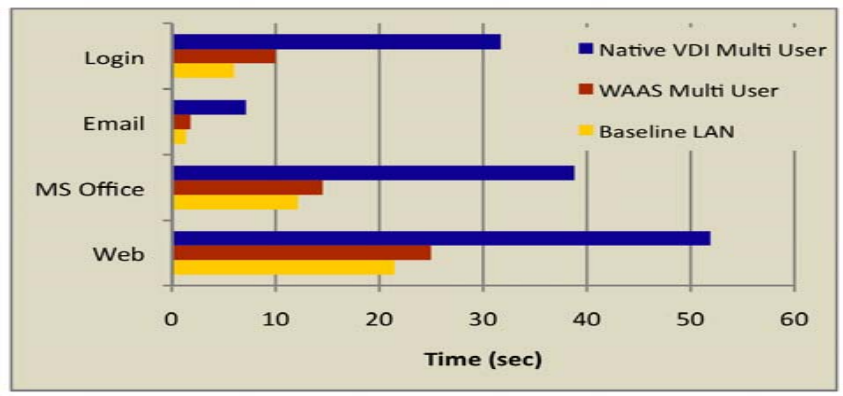
- Lower operating costs for desktops
- Business continuity – tighten desktop control
- Improve productivity – any desktop, any time

Virtual Desktop Challenges

- High bandwidth consumption
- End-user performance and printing over the WAN
- Cost of scalable deployments

Solution: VDI Content Acceleration

Without WAN Optimisation

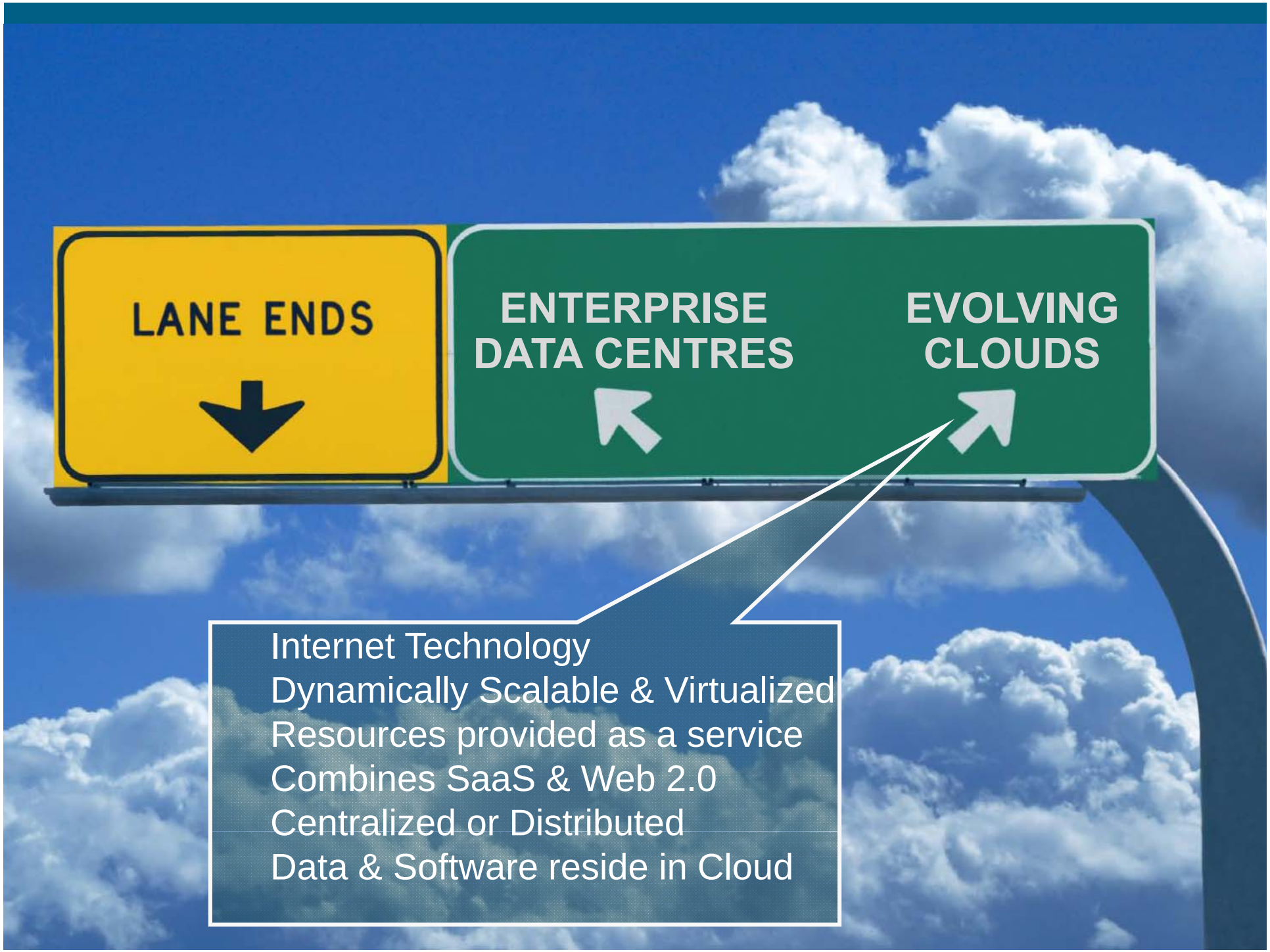


- Difficult to deliver desktop experience to multiple users
- Limited user scalability – 4-5x bandwidth consumption compared to VoIP

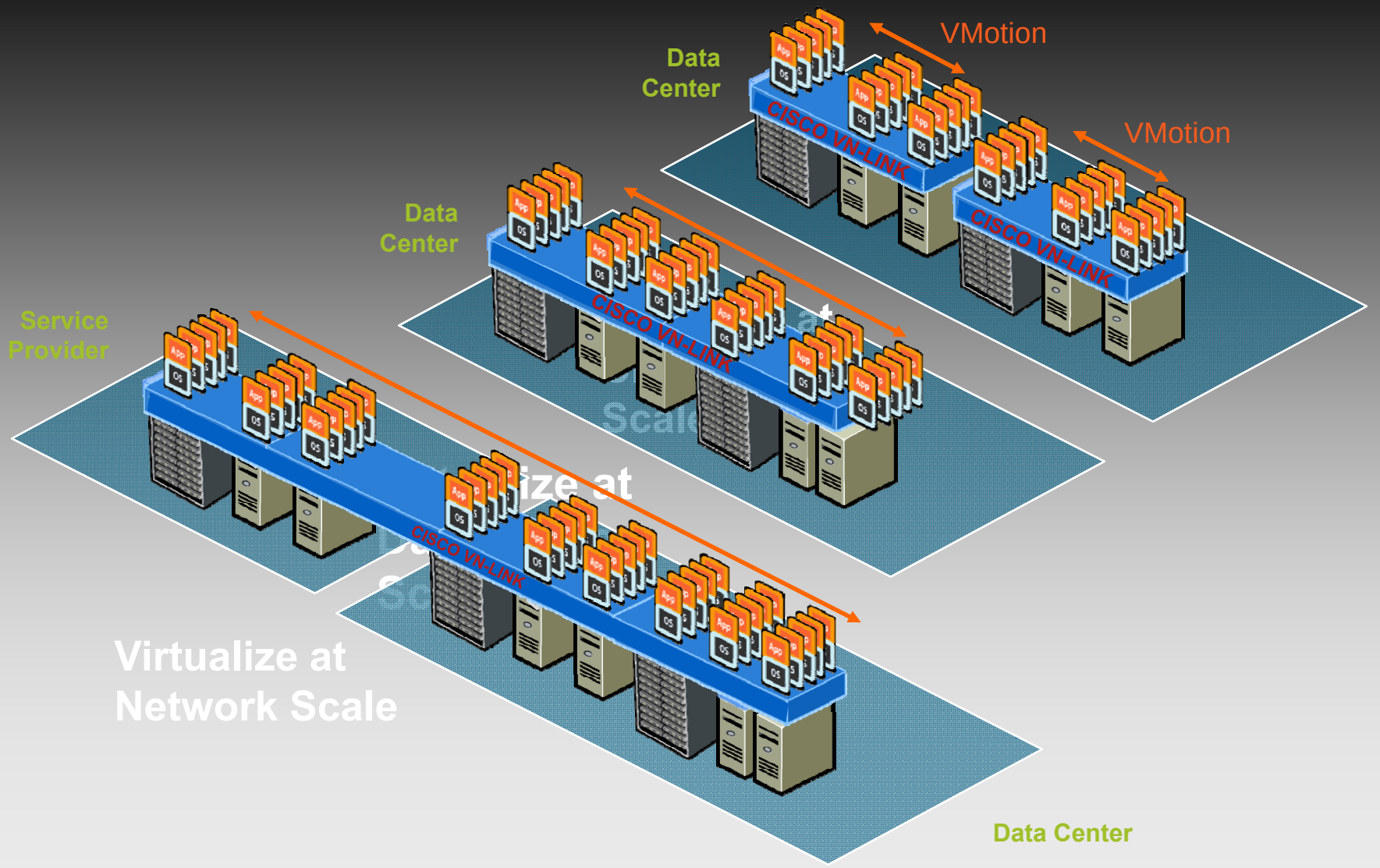
With WAN Optimisation

- Desktop-like performance across the WAN
- Radically reduced bandwidth (60-70%)
- Optimized print services in branch

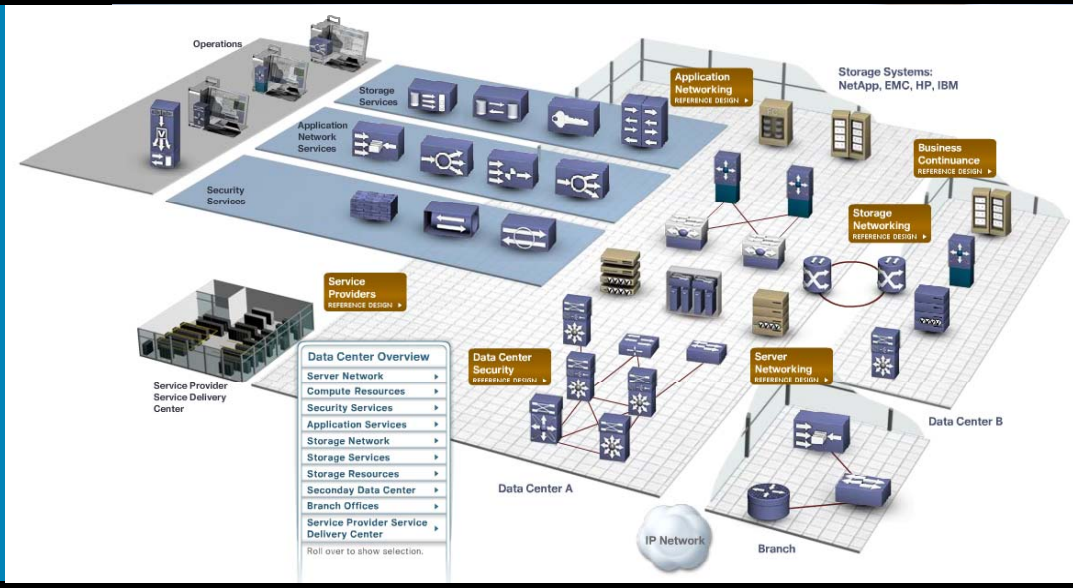
WAN optimization is key to extending reach of virtual desktops to remote branch


LANE ENDS
ENTERPRISE DATA CENTRES
EVOLVING CLOUDS
Internet Technology
Dynamically Scalable & Virtualized
Resources provided as a service
Combines SaaS & Web 2.0
Centralized or Distributed
Data & Software reside in Cloud

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

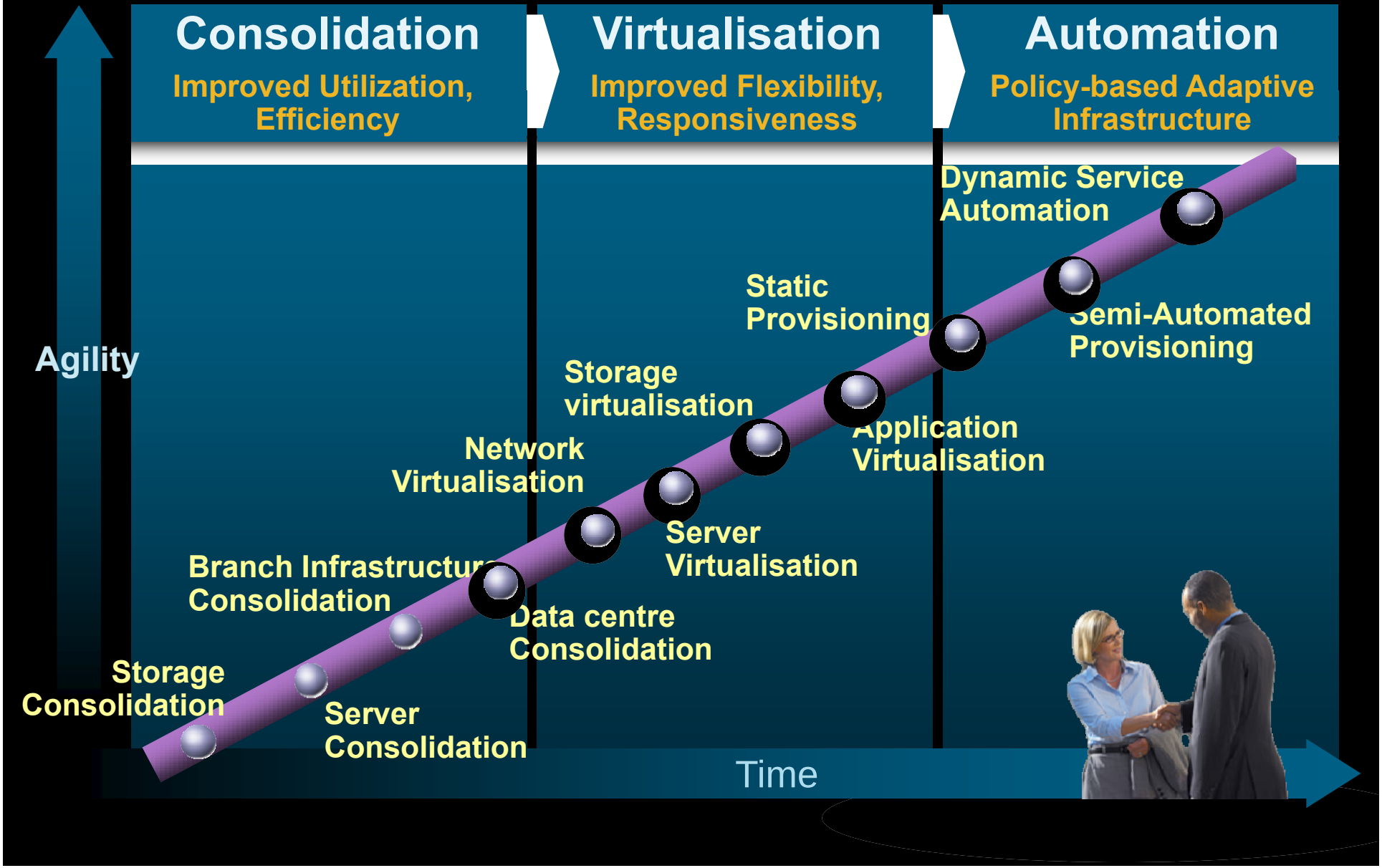


Making the Journey – Pragmatic Adoption



Pragmatic Path to Next-Gen Infrastructure

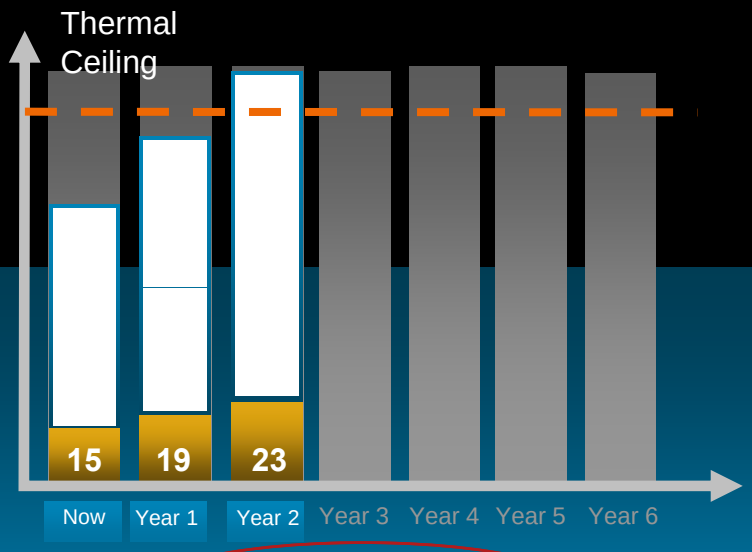
Incremental, Low Risk Evolution via Best Practices



Payback on Improved Asset Utilization

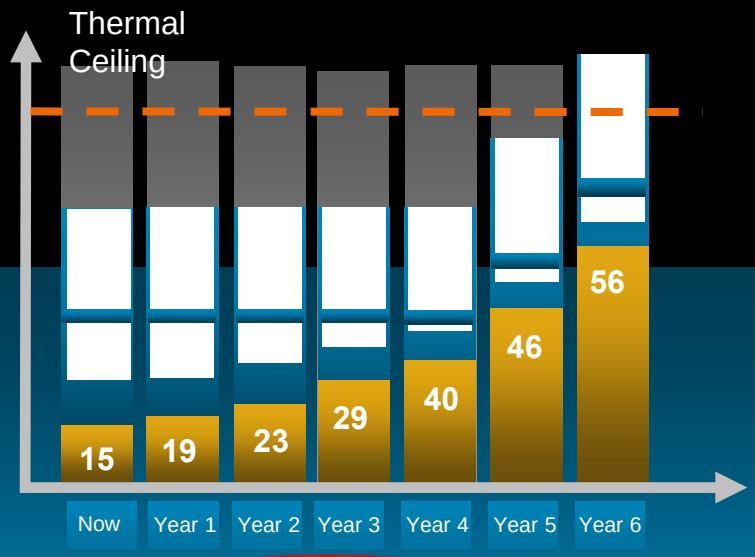
Extend useful asset life, Defer Capital, Attenuate P&C

$250M New Data centre
$25M/yr Opex



20% Efficiency

Savings: $180M / 4.5 yrs
$15M/yr Capital
$25M/yr Opex



60% Efficiency

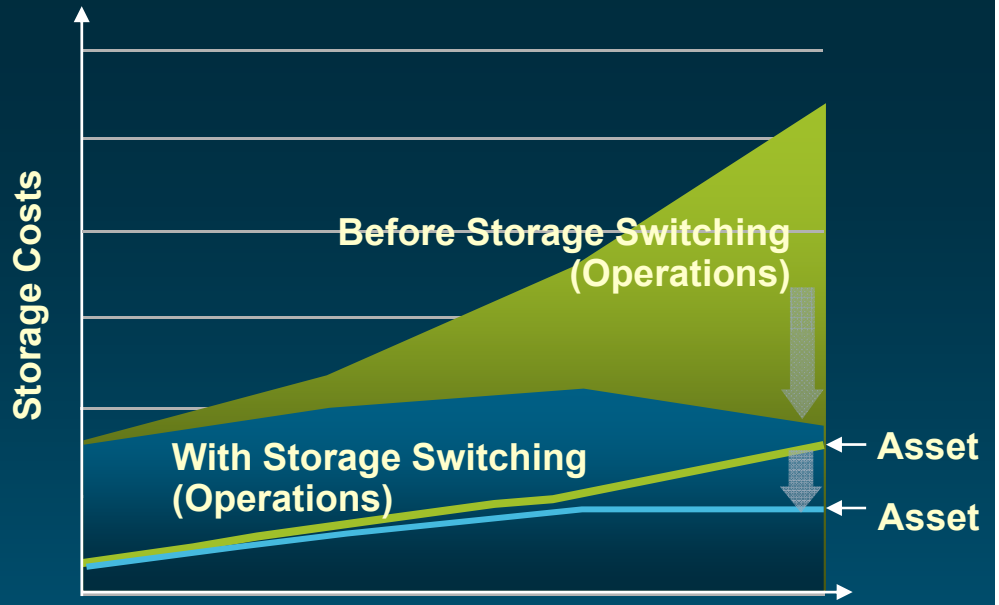
Total Capacity

Utilized Capacity

Improved TCO, Operations, Responsiveness

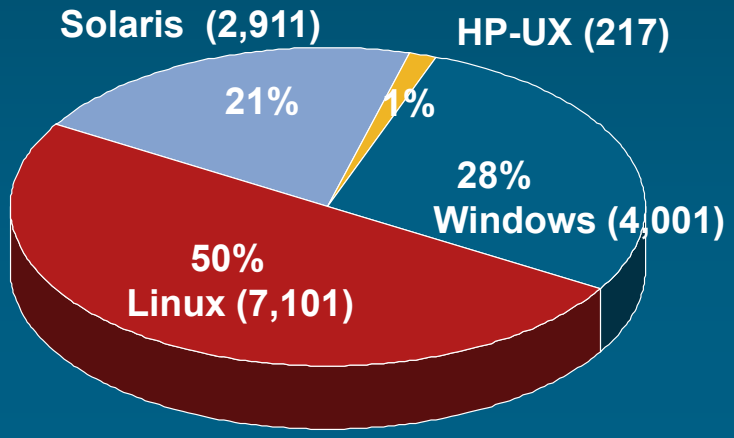
Storage

- 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

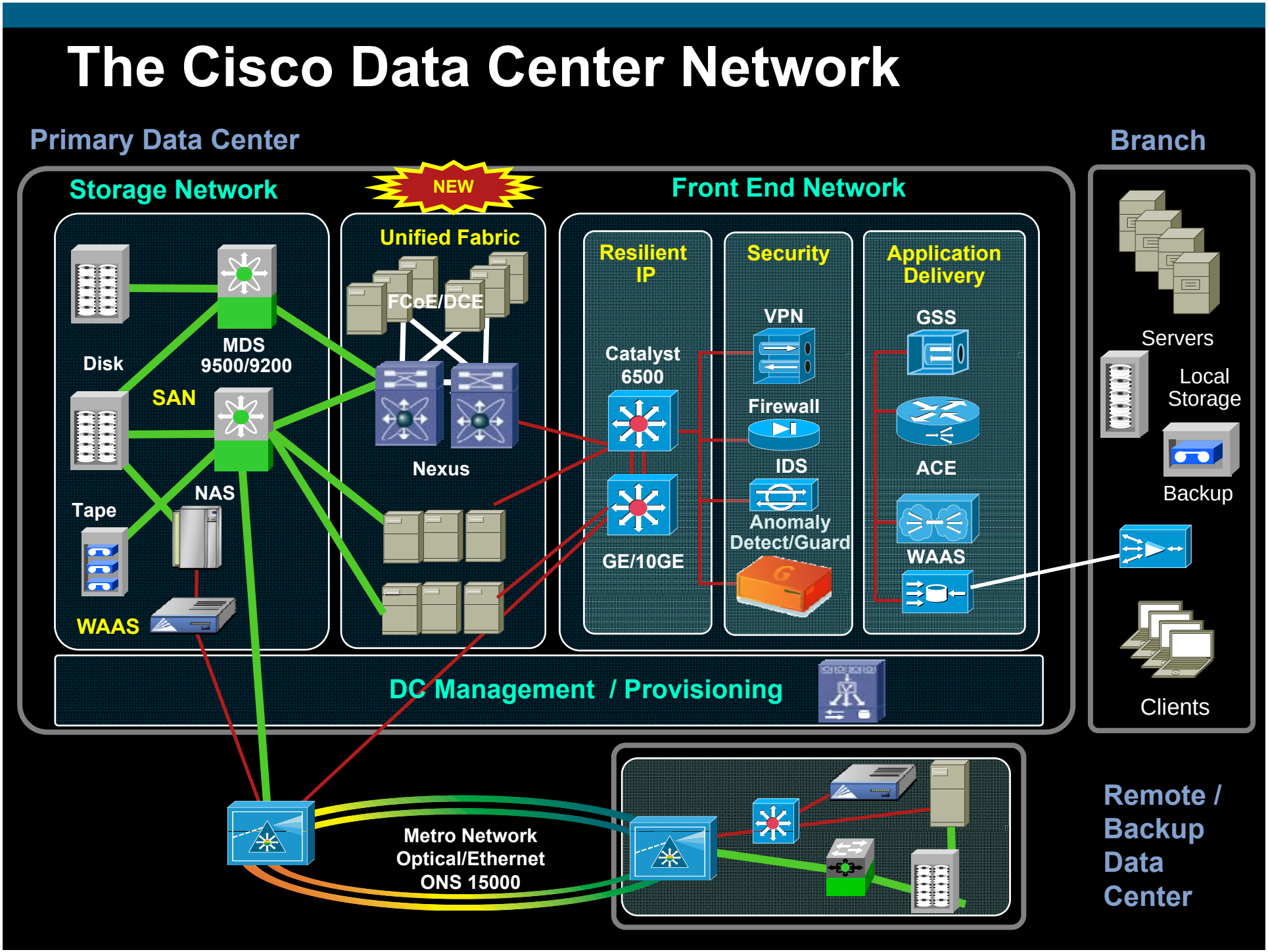


Servers

- 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

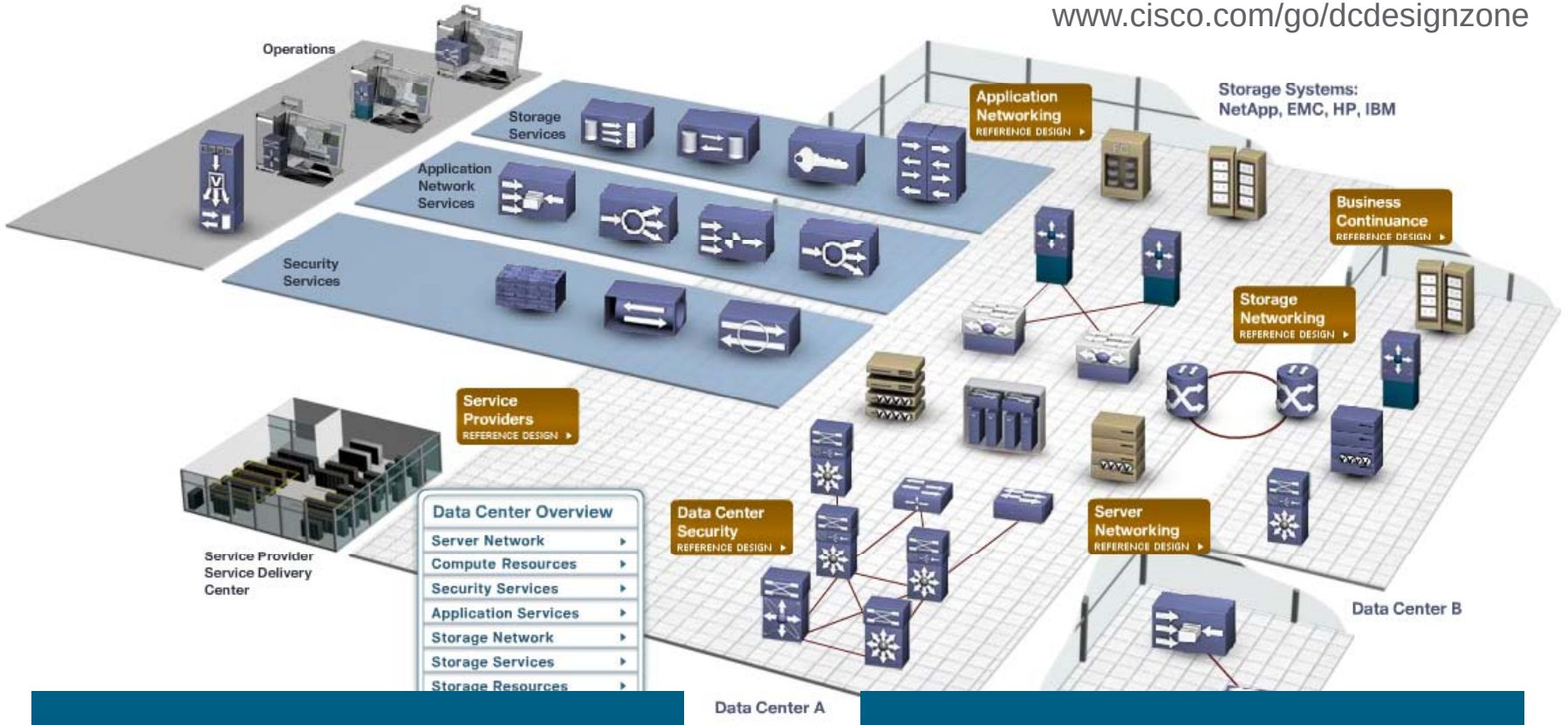


The Cisco Data Center Network



Design Best Practices for Virtualized DC
Data Center Assurance Program 4.0

www.cisco.com/go/dcdesignzone

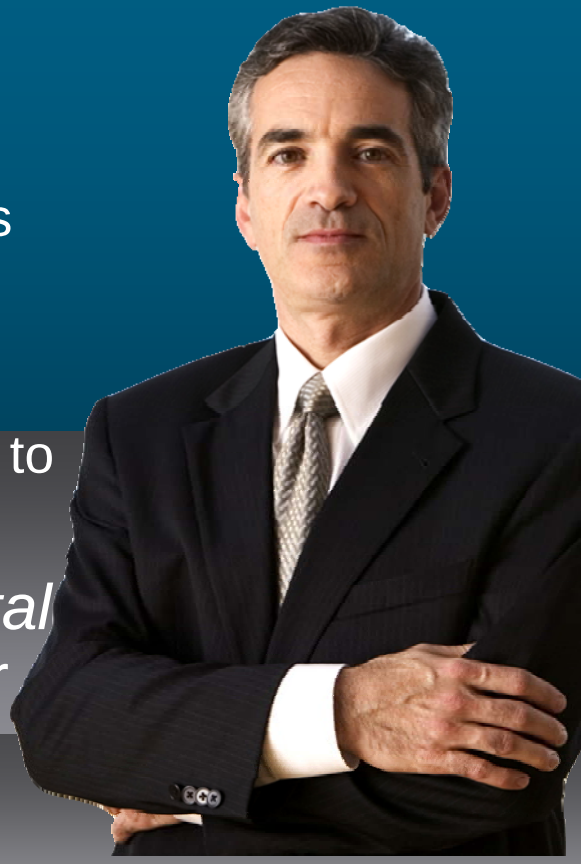


- End-to-end baseline implementations (System Assurance Guides)
- Optimized for ISV Appl'ns (Deployment Guides)
- Tested and Documented Designs (Cisco Validated Design Guides)

- 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 take advantage of future Cloud models
- The approach allows a *proven, incremental low risk adoption path* that leverages your existing IT investments



Increased IT Efficiency
Greater Business Agility

Increased IT Responsiveness
Greater Business Productivity

Increased IT Resilience
Greater Business Continuity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