Taking the Next Step in Data Center Transformation

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Data Center Challenges
Scaling operations and infrastructure

By 2009:
- 65% of enterprises will be using x86 server virtualization
- 45% of x86 servers will be virtualized
- Percent of virtualized workloads will double each year through 2012

Moving Beyond Consolidation
- VM portability, Security and Visibility
- High Availability and Continuous operations
- “Anywhere” Applications
- Cloud Computing
Expanding Role of Server Virtualization

Server Consolidation And Virtualization Are #1 & #2 Spending Priorities

Source: Goldman Sachs CIO Survey

10% of server workloads virtualized in 2008; forecast to be 50%-60% in next 5 years

Source: Industry analyst reports

Increasing Use of VMotion and DRS resulting in Multiplicative Increase in Complexity

Source: Cisco

Desktop Virtualization Gaining Traction as Tool to Address Desktop Manageability, Security and Cost

Source: Goldman Sachs IT Spending Survey
Is Server Virtualization the solution?

- Security, Network Segregation, Isolation
- Capacity Control (Resource Management)
- What happens to other resources (non server or storage)?
- Live Migration Problems?
  - CPU Type, 64-bit OS/HW, HBA/NICs
  - Unplanned Downtime?
- Recovery?
  - Using SRM with SRA
  - What happens to network?
Data Center and Network Evolution

Data Center 1.0
Mainframe

Data Center 2.0
Client-Server and Distributed Computing

Data Center 3.0
Service Oriented and Web 2.0 Based

Consolidate
Virtualize
Automate

IT Relevance and Control

Application Architecture Evolution

Centralized

Decentralized

Virtualized
The Data Center 3.0 Foundation

- Massive proliferation of server resources

- Orchestrate pools of compute, storage and I/O

- Based on application, process, or business objectives

Data Center Network Fabric
Resilient, Scalable, Real Time

Resource Pool
Data Center Virtualization via the Network

Service Orchestration

End-to-End Service Provisioning

Client  Security  Appl’n Delivery  LAN  Servers  SAN  Storage

Disk and Tape  NAS/FILE
Overview
Service Oriented Data Center (SODC)

SODC Target State:
Pooled Virtual Resources, Automated, Standard Services Based, Secure, Intelligent Unified Data Center Network
SODC Design Phases

- **Consolidate**
  - Optimize Data Center Resources
  - Increase Resource Utilization

- **Virtualize**
  - Virtual Resource Pools
  - Increase Availability and Agility

- **Automate**
  - Adaptive Orchestration
  - Rapid Delivery of Services
## Data Center Evolution

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### Phases
- **Consolidation Phase** (2004 - 2005)
- **Virtualization Phase** (2006 - 2009)
- **Automation Phase** (2008 - 2013)
Data Center Server Landscape

- 14,230 virtual/physical servers
- 3,775 Applications
- 317 Production Databases

Source: Cisco IT, July 2008
SODC Server Virtualization

- **Data Center Server Consolidation**
  - Improve Operational Agility
  - Lower Data Center Operating Expense

- **Increase Utilization of Physical Servers**
  - Optimize TCO
  - Improve Data Center Capacity Management

- **Reduce Service Provisioning Times**
  - Rapid deployment of Operational Services

- **Increase Operational Efficiencies**
  - Support of Environments
  - Zero down time Operations
Services Oriented Data Center
VMware and Virtualization

190 VMware Servers

25 Clusters

8 Data Centers

➢ 2300 Active Virtual Machines
➢ ~20% of Server Environment

Nearly 200 TB of Storage

~300 New VMs/Qtr (Greenfield)

Target 80% of All New Servers Deployed as a Virtual Machine
SODC – VMware Growth

~300 New VMs/Qtr (Greenfield)

Migrations Lag Far Behind

Average over 60% of server deployments

~3,160 VMs Deployed to Date

~2300 Active VMs

190 VMware Servers Across
25 Clusters in 8 Data Centers
Benefits

- Improved Agility and Integrated Business Continuance
- Services Delivered Under 3 Days
- Improved Availability
- 2,718 Total Virtual Machines Today
- Over $20.4 M in Savings And Cost Reduction To Date
Take Your Next Steps

- **Infrastructure Virtualization Roadmap**
  Unified Fabric (Nexus), VM-aware Networking (VN-Link), Storage Virtualization (MDS), Data Center Interconnect

- **Application Networking Roadmap**
  Application Acceleration, WAN Optimization

- **Security Roadmap**
Data Center 3.0
Virtualization Roadmap

Server Networking
- Catalyst LAN Switching
- Security
- Application Networking

Storage Networking
- MDS Directors
- Intelligent Storage Applications
- Fabric SAN
- Branch WAN Optimization

Unified Fabric
- Data Center Ethernet
- FCoE
- Nexus 7K/5K NX-OS 10/40/100 GIG

VM-Optimized Networking
- In the Network
- On the Server
- Per VM Services
- VM Mobility
- Branch Virtual Machines on WAAS

Transparent Visualization
- All Resources Connect to a Cisco Unified Fabric
- Automated, Virtualized, Unified, Transparent
Cisco Security Portfolio for Data Center
Edge, Web, Applications, Storage, Management

**Data-Center Edge**
- Firewall and IPS
- DoS protection
- Application protocol inspection
- Web Services security
- VPN termination
- E-mail and Web access control

**Web Access**
- Web security
- Application security
- Application isolation
- Content inspection
- SSL encryption and offload
- Server hardening

**Applications and Database**
- XML, SOAP, and AJAX security
- DoS prevention
- Application-to-application security
- Server hardening

**Storage**
- Data encryption
  - In motion
  - At rest
- Stored data access control
- Segmentation

**Management**
- Tiered access
- Monitoring and analysis
- Role-based access
- AAA access control

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Cisco® WAAS
Cisco Catalyst 6000
Cisco FWSM
Cisco ASA
Cisco IronPort
Cisco ACE
AXG (Web Applications)
Cisco Security Agent
Cisco MDS
Tier 1/2/3 Storage
Tape/Offsite Backup
ACS
CSM
Cisco Security Agent-MC
CW-LMN
Cisco Security MARS

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