Une architecture de réseau de Data Center orientées services

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Agenda

- Introduction
- Les enjeux du Datacenter
- Les solutions Datacenter
- Le management
- Conclusion
Traditional IT Applications and Infrastructure
Slow Business Responsiveness and Growth

43% of IT departments are regularly unable to make requested changes [1]
70% of cost is running operations, 30% available for new projects

Business, Application and Infrastructure Silos
Applications Integrated via Multiple Complex Proprietary Interfaces
More Servers and Storage are purchased than are needed-
More space, heat, power, cooling used than necessary
Adding new technology or new applications very difficult

Cost-Agility-Resilience
Where the Networking Industry is Going Today

Everything over IP
All Services Virtualized

Everything on Ethernet
All Devices Networked
Cisco’s Technology Vision: The Intelligent Information Network (IIN)

- Get more value from applications and services
- Get more value from infrastructure & resources
- Get more value from the network foundation

INTEGRATED TRANSPORT

INTEGRATED SERVICES

INTEGRATED APPLICATIONS

- Application Networking Services
  - PHASE 3

- Virtualized Networking Resources
  - PHASE 2

The Intelligent Movement of Data / Voice / Video across a System of Networks
  - PHASE 1

Network Intelligence

Connectivity

Intelligent Communications
Service Oriented Network Architecture (SONA)

Principes d’architecture en 3 couches

- **Application Layer**: Business Applications, Collaboration Applications
- **Interactive Services Layer**: Application Networking Services, Infrastructure Services
- **Networked Infrastructure Layer**: Server, Storage, Clients, Network

Couche services
MS-Windows based Desktop computing came of age

Departments deployed their own ‘workgroup’ or ‘departmental’ servers based on Novell Netware or MS-Windows NT

Large compute servers cost $70k - $100k each-size was dictated by storage requirement

IT maintained the ‘legacy’ mainframes and datacenters

Cisco Value was providing IP/IPX/Appletalk LAN/WAN and workgroup LAN switching – usually Catalyst 5000 series.
Evolution of the Data Center Infrastructure

**Phased Approach**

**CONSOLIDATION**
Centralization and Standardization to Lower Costs, Improve Efficiency and Uptime

**VIRTUALIZATION**
Management of Resources Independent of Underlying Physical Infrastructure to Increase Utilization, Efficiency and Flexibility

**AUTOMATION**
Dynamic Provisioning and Information Lifecycle Management (ILM) to Enable Business Agility

- Business Policies
  - On-Demand
  - Service Oriented

- Compute
- Network
- Storage

**Data Network**
- LAN
- WAN
- MAN

**Storage Network**
- SAN

**Server Fabric Network**
- HPC Cluster
- GRID

**Intelligent Information Network**
Data Center Architectural Evolution
Phase Illa – SANs and Storage Consolidation

Storage Networks allowed Disk and Tape consolidation and sharing across multiple servers

Storage Utilization was driven from ~20% to ~40-50%.

Reduced storage capital outlay by >3x from a Direct-Attached Only Model

Allowed rapid server provisioning via net-boot

10RU Servers ($100k) were replaced with multiple 4RU servers ($15k)

Increased compute capacity, network dependency/utilization, and loosely-coupled application message transfer
Multiprotocol, Multitransport Support

- Fibre Channel Protocol (FCP)
  - 1-2-4 Gbps FC-SW
  - Full range of port modes
- IBM Fiber Connection (FICON)
- Gigabit Ethernet Support, for...
- Small Computer System Interface over IP (iSCSI)
  - Allows Ethernet attached initiators to access FC attached targets
  - Extend SAN benefits to more servers
  - Network Boot over iSCSI
- Fibre Channel over IP (FCIP)
  - Connect FC fabrics over an IP network
  - Use IP networks for cost-effective business continuance solutions
The WAN is a Challenge

- Most applications designed for reliable, high bandwidth, low latency LANs
- **WAN-induced bottlenecks are key barriers to application performance**
  - Chatty application protocols
  - High link latency, low throughput, spotty reliability
  - Little bandwidth management capability
The average organization has between 50 – 150 branch office locations with each branch having between 3 and 5 servers.

There are over 150 – 750 branch office servers, on average, that can be consolidated to centralized datacenters.

Cisco Wide-Area File Services, integrated with the ISR series routers allows consolidation of branch office servers into centralized datacenter facilities.

Central Archival, Backup, Compliance, with remote Print/File/Login serving through the network.
WAAS File Services Solution

Cost per Remote Branch Office
- Distributed DAS - $40K/yr
- Centralized WAAS - $10K/yr
- SAVINGS $13K - $30K/yr
Cisco WAFS shows 4x to 9x faster performance as compared to the WAN, and similar performance to LAN for typical operations on Office applications.
Data Center Architectural Evolution
Phase IIIc – Data Center Consolidation
Evolution of the Data Center Infrastructure

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  - Centralization and Standardization to Lower Costs, Improve Efficiency and Uptime

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- **AUTOMATION**
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- **Business Policies**
  - On-Demand Service Oriented

- **Compute**
- **Network**
- **Storage**
As Storage Networks allowed increased disk utilization they started appearing all over the data center.

Storage networks grew into ‘islands’ predicated on the size of the storage switches available at the time.

Cisco released the MDS9500 with Virtual SANs (VSANs) which allowed the consolidation and virtualization of SAN islands into a large common resource pool.

This drove storage utilizations to ~70%.

2004 and Ongoing
Network-Hosted Storage Applications

STORAGE VIRTUALIZATION—TODAY
- Host-Based Apps
  - App Integration
  - Multi-Pathing
  - Volume Mgmt
- Array-Based Apps
  - RAID/Vol Mgmt
  - Multiple Paths
  - Snapshot
  - Replication

NETWORK-HOSTED VIRTUALIZATION
- Host-Based Apps
  - App Integration
  - Multi-Pathing
- Network-Hosted Apps
  - Volume Mgmt
  - Snapshot
  - Replication
- Array-Based Apps
  - RAID
  - Multiple Paths

Customer Benefit | Proof Points
--- | ---
Information Lifecycle Management | - Simplified management
| - Non-disruptive data migration across tiered storage
Increased Storage Utilization | - Heterogeneous storage pooling
| - Flexible storage provisioning
Improved Business Continuance | - Supports point-in-time copy, replication
| - Flexible data protection services
always use **BOLD** in text on slides

Data Center Architectural Evolution
Phase IV – Data Center Virtualization

MPLS/ATM/

Asynchronous Replication

Asynchronous Replication

Synchronous Storage and Application Replication
Evolution of the Data Center

Infrastructure
Phased Approach

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CONSOLIDATION
Centralization and Standardization to Lower Costs, Improve Efficiency and Uptime

Data Network
Storage Network
Server Fabric Network

LAN
WAN
SAN
HPC Cluster GRID

Intelligent Information Network

Enterprise Applications

 Compute
Network
Storage

Business Policies
On-Demand Service Oriented

Compute
Network
Storage
Today’s Solution—Horizontal Provisioning

- Results
  - Longer Deployment Time
  - More costly
  - Inefficient
Today’s Enterprise Service Provisioning
A Scale-Out Example

Assume you just want to add one server to a web-farm…

The challenge is one of ‘coordination delays’. This type of simple scale-out of an existing serve often takes enterprises 90-days.

New service turn-ups, after the application has been developed, often take 180+ days.

VFrame is designed to eliminate these delays and automate the provisioning of services.

- NetOps ensures Branch connectivity/ Routable Subnet
- SecOps checks security policy, expands FW Port Range
- SLB Admin Adds Server to Pool
- NetOps connects Ethernet cabling, configures VLAN/Port Config
- SysAdmin racks new server Loads O/S and Applications
- StorageOps configures LUN, maps to Server
- StorageOps provisions disk volume and resources
Vertical Data Center Provisioning with VFrame

Result: An Application-Centric, Service Oriented Data Center
End-to-end Data Center Provisioning Vision
Cisco Virtualized Data Center

Application Service Provisioned!
Pour résumer
Application Delivery Services
Any Application Anywhere

Majority of Users are Remote

Customers

Mobile User

Branch

Partner

Call Center

Telecommuter

Web Access: HTTP, HTTPS

E-Mail: MAPI, IMAP, WebDAV

File Access: CIFS, NFS, WebDAV

Streaming Media, Voice: MMS, RTSP/RTP

Thin Client: ICA, TN3270

AVS WAAS

WAN, VPN, Internet

Storage & Tape Arrays

MDS 9500

Catalyst 6500

Application Network Services

Catalyst 6500

AVS

WAAS

MDS 9500

Storage & Tape Arrays

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Data Center Best Practices
Validated, Tested, Documented Designs

Recent Designs Published

• Server Farm Security
• Blade Server Integration
• SAN Extension
• Site Selection
• Internet Edge
• Integrating SSL, Load Balancing, & Security
• Server Farm Scaling
• Layer 2/3 Design

www.cisco.com/go/datacenter
Summary

- The network is the **only** common, **single** element that connects and enables **all** components of the IT infrastructure.

  Only Cisco offers a comprehensive network infrastructure and intelligent networking services

- Cisco SONA enables businesses to benefit from the “network multiplier” effect

  Optimizing business processes and applications

- Cisco lifecycle services, proven enterprise architectures and experience across industries can help you meet your business imperatives in real-time

Convergence  Integration  Virtualization  Automation