



SAN Switch Interoperability in Migration

How Cisco Multilayer Director Switch Operates with Other SAN Switches During SAN Migration



A Cisco on Cisco Case Study: Inside Cisco IT

Overview

- Challenge

Migrate from McDATA-based storage area network (SAN) to a Cisco® MDS-based SAN.

- Solution

Staged migration with the Cisco MDS 9000 Series Multilayer Switch interoperating with McDATA Director and edge switches.

- Results

Cisco MDS 9000 interoperates with McDATA switches; basic SAN features work well, though a few management features, VSAN do not. Eventually migrated to full Cisco MDS SAN.

- Next Steps

Expand storage SANs throughout Cisco data centers.

Challenge: Migrate to Cisco MDS SAN

- Migration from direct attached storage (DAS) to SAN
 - Cisco IT standardized on McDATA SAN switches in the core and edge.
- Migrating an entire SAN to the new Cisco MDS 9500 Series Multilayer Director provides additional features (better management, VSANs).
- Flash-cut migration would be expensive and difficult.
- Gradual migration required interoperating Cisco MDS with McDATA SAN switches for months.
- McDATA and Cisco switches were not certified as working together so feature compatibility was unknown.

Solution: Interoperability Test

- Cisco wanted to test operability on a SAN that supports a mission-critical application with high performance demands.
- Selected IBM Rational ClearCase for the test. Cisco developers rely on ClearCase as their source-code library to develop Cisco IOS Software.

ClearCase is a demanding application with thousands of transactions per second, low latency requirements, and critical availability requirements.

- Cisco IT ran the engineering SAN in interoperability mode to learn its features and functions for customers who would make the same migration.

Solution: Cutover Process

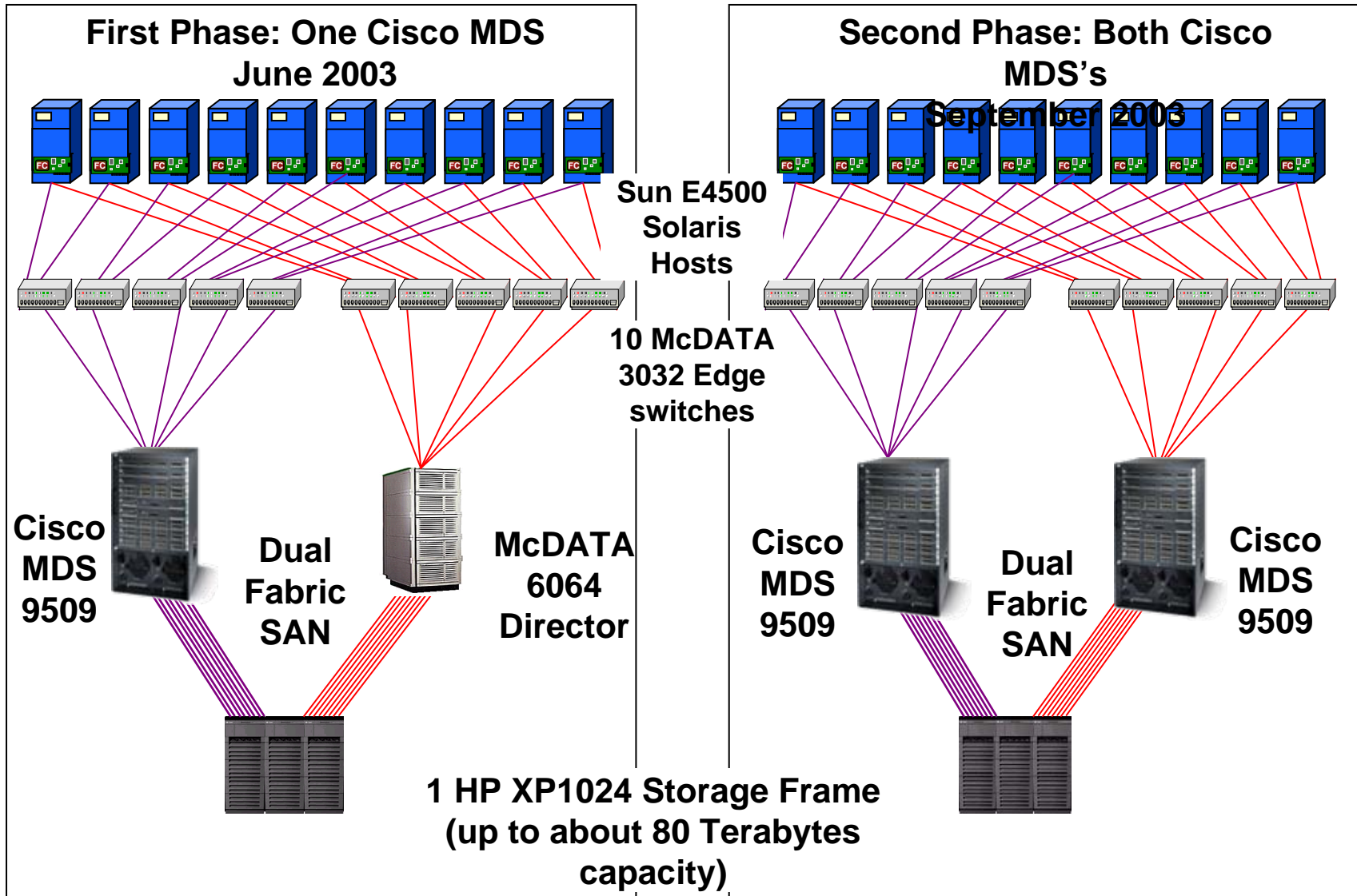
- SAN designed with complete redundancy
- Cutover requirements:
 - Configure Cisco MDS 9509 multilayer director switches
 - Disconnect McDATA 6064 core switches from storage array and McDATA edge switches
 - Reconnect storage array and edge switches to new core Cisco MDS switches
- Two-phase transition: One Cisco MDS 9509 Multilayer Director Switch at a time
 - Phased migration ensured that the host continued operating without interruption during transition

Solution: Connect McDATA and Cisco Switches

- First, one McDATA 6064 switch replaced by Cisco Cisco MDS 9509 Multilayer Director Wwitch
- Three months later, second Cisco MDS 9509 replaced all McDATA at the core connected to the existing McDATA 3032 edge switches and storage arrays
- McDATA edge switches connected to the Cisco MDS switch one at a time using Inter-Switch Links (ISLs)
- Transition to mixed Cisco MDS and McDATA SAN achieved without service interruption

“When we took out one core switch, the host did not falter and the clients did not even notice.” David Angulo, Program Manager, Cisco

Solution: Two-Phase Plan Migration



Results: High Availability Operation

- Cisco engineering SAN ran without failure in interoperability mode from June 2003 to January 2004.
- ClearCase host experienced no service interruption during migration, and no application outages since then have been attributable to the Cisco MDS 9000 Series multilayer switches.
- Interoperability demonstration successful after six months and Cisco replaced McDATA 3032 edge switches with Cisco MDS 9120 multilayer fabric edge switches to gain benefits of SAN based exclusively on Cisco MDS switches.

MDS 9120



Results: Improved Utilization

- During interoperability phase, Cisco improved scalability and utilization and achieved availability goals.

Higher port density of the Cisco MDS 9509 Multilayer Director Switch (32 ports per blade and up to 224 Fibre Channel) reduces costs, improves utilization, and frees data center floor space.

- High availability is a result of redundant supervisor engines, fully stateful supervisor engine failover, redundant crossbars, hitless software upgrades, individual process restart ability, and process isolation within VSANs.

Next Steps: SAN Expansion

- SAN expansion in San Jose Building 5

Continue expanding SAN in engineering data center, adding additional hosts and storage frames as needed

- Storage frames

Each storage frame can house 80 terabytes; with two storage frames the SAN can serve 180 TB, or more than 10% of all Cisco storage

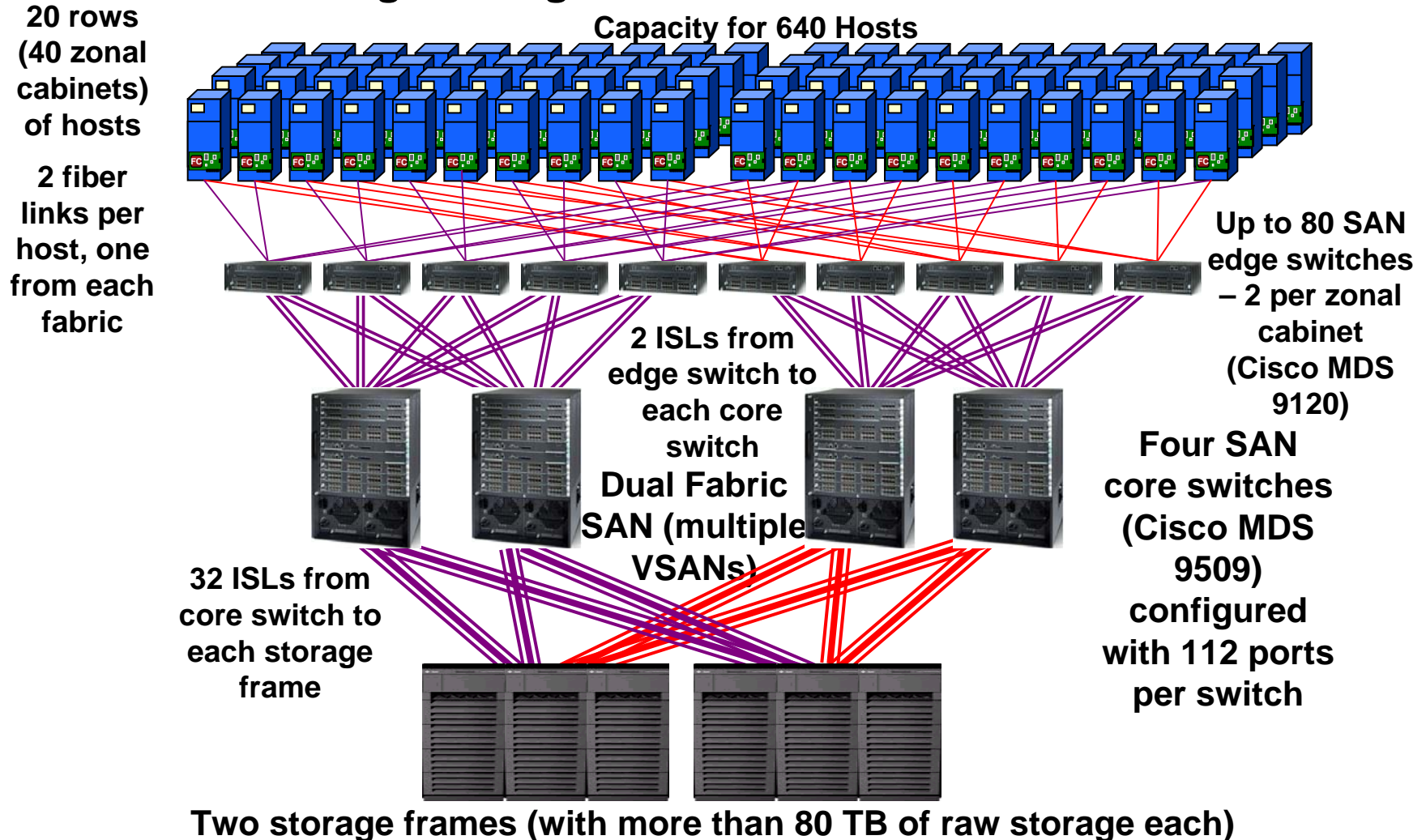
- Data centers

Install Cisco MDS-based SANs in engineering data centers in Bangalore, India; South Netanya, Israel; RTP, North Carolina, USA; and Boxborough, Massachusetts, USA

Next Steps

Engineering Data Center: Capacity for 640 Hosts

Engineering Data Center Final Architecture



Cisco MDS 9000 Series Multilayer Switch

- Cisco MDS 9000 Series:
Using Cisco products to
help save, time, space,
and money



**Cisco MDS Family: 9506, 9513, 9509
Multilayer Directors and 9216 Multilayer
Fabric Switch**



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