Cisco MDS 9000 Family: Total Investment Protection

Introduction

Evolving business requirements underscore the need for high-density, high-speed, and low-latency networks that improve data center scalability and manageability while controlling IT costs. As discussed in this document, the Cisco® MDS 9000 Family provides the leading high-density, high-bandwidth storage networking solution along with Integrated Fabric Applications to support dynamic data center requirements. With the addition of the third-generation modules, the Cisco MDS 9000 Family of storage networking products support now 1-, 2-, 4-, 8-, and 10-Gbps Fibre Channel along with being Fibre Channel over Ethernet (FCoE) ready. One major benefit of the Cisco MDS 9000 family architecture is investment protection: the capability of first-, second- and third-generation modules to all coexist in both existing customer chassis and new switch configurations. A quick look at the storage area network (SAN) marketplace and the track record of delivery reveals that Cisco is the leader among SAN providers in delivering compatible architectures and designs that can adapt to future changes in technology, providing true investment protection.

New Challenges

1- , 2-, or 4-Gbps SAN connectivity is no longer sufficient to meet the needs of growing application server farms. Requirements to back up increasing amounts of data within a limited time frame, support increasing numbers of database transactions, and support bandwidth- and storage-intensive applications all underscore the need for high-density 8-Gbps and 10-Gbps Fibre Channel services. This shift in application requirements is also creating demand for network-based services to provide security, ease of migration, and disaster-recovery solutions.

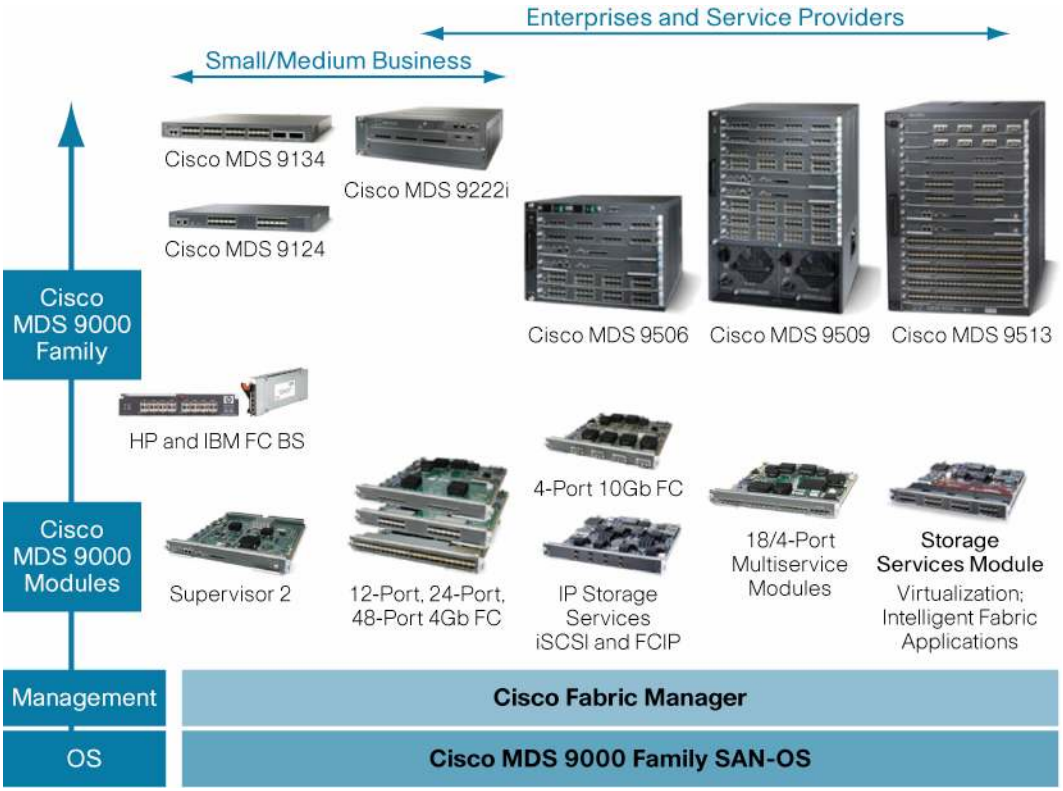
In addition, data centers typically run multiple separate networks, including an Ethernet network for client-to-server and server-to-server communications and a Fibre Channel SAN. To support various types of networks, data centers use separate redundant interface modules for each network and redundant pairs of switches at each layer in the network architecture. Use of parallel infrastructures increases capital costs, makes data center management more difficult, and diminishes business flexibility. A unified fabric can meet these challenges, consolidating I/O in the data center and allowing Fibre Channel and Ethernet networks to share a single, integrated infrastructure. An important pillar of this design is FCoE. FCoE allows Fibre Channel frames to be encapsulated in Ethernet packets without using TCP/IP and is one of the technologies enabling unified I/O.

The Cisco MDS 9000 family offers both investment protection and a nondisruptive upgrade path to higher-port-density SAN switching, including 8-Gbps switching, network-based services, and support for FCoE all in the same chassis that shipped in 2002.

Cisco MDS 9000 Family Products

Figure 1 provides an overview of the Cisco MDS 9000 family products.

Figure 1. Cisco MDS 9000 Family: Positioned for Investment Protection



Cisco MDS 9500 Series Multilayer Directors

Cisco MDS 9500 Series Multilayer Directors raise the standard for director-class switches. Providing industry-leading availability, scalability, security, and management, the Cisco MDS 9500 Series allows the deployment of high-performance SANs with low total cost of ownership (TCO). With a rich set of intelligent features in a high-performance, open-protocol switch fabric, the Cisco MDS 9500 Series addresses the stringent requirements of large data center storage environments, providing high availability, security, scalability, ease of management, and transparent integration of new technologies.

- The Cisco MDS 9506 Multilayer Director raises the standard for director-class switches. Providing industry-leading availability, scalability, security, and management, the Cisco MDS 9506 allows enterprises to deploy high-performance SANs with low total cost of ownership (TCO).
- The Cisco MDS 9509 Multilayer Director adds intelligent features to a high-performance core to provide uncompromising high availability, security, scalability, ease of management, and transparent integration of new technologies.
- The Cisco MDS 9513 Multilayer Director, the flagship product of the Cisco MDS 9500 Series, raises the standard for director-class switches. The industry-leading scalability, availability, security, and management offered by the Cisco MDS 9513 allows enterprises to deploy highly scalable, high-performance SANs, maintain an extremely low TCO, and meet the stringent requirements of large data center storage environments.

Cisco MDS 9200 Series Multilayer Fabric Switches

Cisco MDS 9200 Series Multilayer Fabric Switches integrate high-performance Fibre Channel and IP into a single module that takes advantage of the cost effectiveness and ubiquity of IP for more robust business continuance services. As the storage network expands, Cisco MDS 9000 family modules can be migrated from the expansion slot of the Cisco MDS 9200 Series Switches into Cisco MDS 9500 Series Multilayer Directors, providing smooth migration, common sparing, and outstanding investment protection.

- The Cisco MDS 9222i Multiservice Modular Switch delivers state-of-the-art multiprotocol and distributed multiservice convergence, offering high-performance SAN extension and disaster-recovery solutions, Intelligent Fabric Services such as Cisco Storage Media Encryption (SME), and cost-effective multiprotocol connectivity. With a compact form factor, the modularity of the expansion slot, and advanced capabilities normally available only on director-class switches, the Cisco MDS 9222i is an ideal solution for departmental and remote branch-office SANs requiring the features present in a Director but at a lower entry cost.

Cisco MDS 9100 Series Multilayer Fabric Switches and Blade Switches

The Cisco MDS 9100 Series Multilayer Fabric Switches and blade switches are cost-effective, scalable, easy-to-install, and highly configurable Fibre Channel switches that are ideal for small to medium-sized businesses (SMBs). The Cisco MDS 9100 Series is competitively priced and supports Director Class features such as virtual storage area networks (VSANs), Port Channels, non-disruptive code upgrade, security (authentication, authorization, and accounting [AAA], role-based access control [RBAC], etc.), and extensive troubleshooting and diagnostic functions. By offering advanced storage networking capabilities at affordable price points, the Cisco MDS 9100 Series allows organizations of all sizes to enjoy the benefits of intelligent storage area networks (SANs). The fabric switches are also available as blade switch form factors for the market-leading blade servers from IBM and HP.

- The Cisco MDS 9134 Multilayer Fabric Switch is a follow on to the Cisco MDS 9124 Multilayer Fabric Switch. The Cisco MDS 9134 and 9124 can be used as the foundation for small standalone SANs or as edge switches in large core-edge SAN infrastructures. Additionally, Cisco MDS 9134 switches can be stacked in pairs to form a 48-port or 64-port 4-Gbps Fibre Channel switch.
- The MDS 9124 offers up to 24 4/2/1-Gbps auto-sensing Fibre Channel ports in a compact 1RU form-factor chassis. With dedicated 4 Gbps of dedicated bandwidth for each port, the MDS 9124 has been designed to address the performance and scalability requirements for the most demanding environments. The Cisco MDS 9124 Switch supports “On demand” port activation license; provides 8-port, 16-port and 24-port configurations to optimize price and growth.

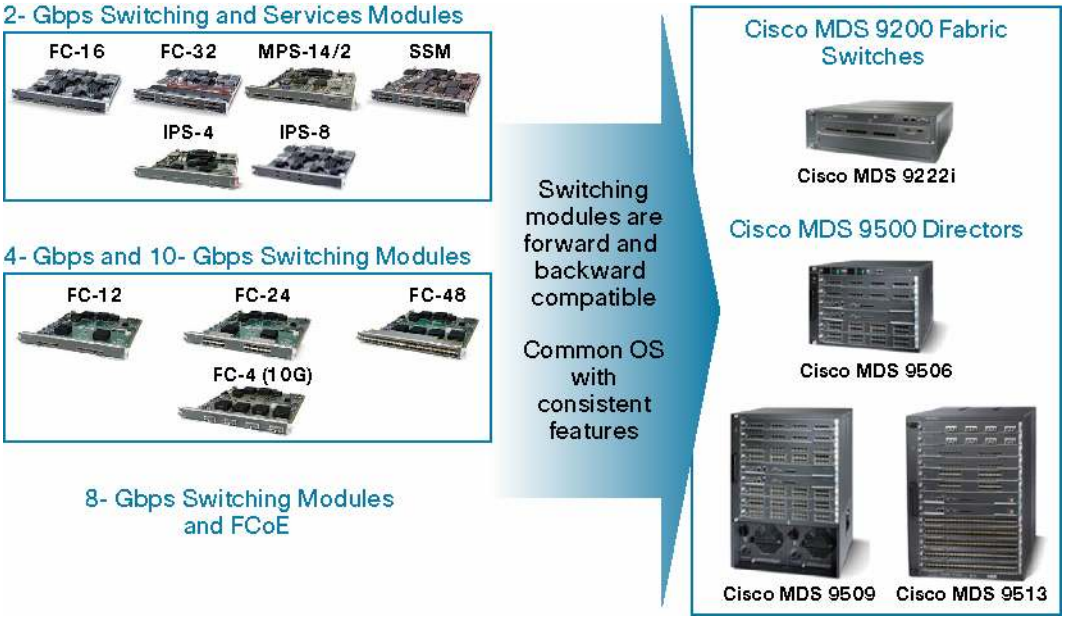
The Cisco MDS 9100 Series is fully compatible with the Cisco MDS 9500 Series Multilayer Directors and the Cisco MDS 9200 Series Switches for transparent, end-to-end service delivery in large data-center core-edge deployments.

Business Benefits: Total Investment Protection

The introduction of third-generation hardware represents an evolutionary step for Cisco MDS 9000 family switches. The fundamental switch architecture and frame flow remain the same on all chassis, allowing modules from any generation to be mixed and matched.

Cisco provides investment protection by designing the system to support operation of previous-generation switching modules along with next-generation supervisors, switching modules, and chassis (Figure 2). In addition, the introduction of the new modules increases the scalability, flexibility and serviceability of the existing chassis.

Figure 2. Investment Protection: Extensible Architecture for Ease of Migration



Cisco MDS 9500 Series Multilayer Directors share a common architecture, the Cisco MDS 9000 SAN-OS Software operating system, and switching and services modules that are backward and forward compatible throughout the entire Cisco MDS 9500 and 9200 Series.

Cisco MDS 9000 Family Investment Protection Main Features

- Highly scalable directors: Up to 528 ports
  - High density: 192-, 336-, and 528-port systems
  - High availability: Redundant system bandwidth
  - High stability: Virtual SANs (VSANs), inter-VSAN Routing (IVR), and per-VSAN fabric services
- Exceptional investment protection
  - Transparent upgrades to 8 Gbps
  - FCoE support
  - Forward and backward compatibility
  - 1, 2, 4, 8, and 10 Gbps in a single platform
- Support for IBM Fibre Connection (FICON), Fibre Channel Protocol, FCIP, and iSCSI
- Intelligent Fabric Applications
  - Network-hosted volume management
  - Continuous Data Replication
  - Cisco SME
  - Virtualization
  - Data migration

Case Study

OhioHealth is a not-for-profit, charitable, healthcare organization that serves and supports the Ohio community. Based in Columbus, OhioHealth has a network of 17 hospitals, 20 health and surgery centers, home-health providers, and medical equipment and health service suppliers throughout a 46-county area.

OhioHealth has a central business office that handles the organization's scheduling, billing, and collections operations. OhioHealth also has offices in several locations, including its main hospital, Riverside Methodist Hospital; Grant Medical Center; Doctors Hospital; and Dublin Methodist Hospital. As the operations of the healthcare industry overall have increasingly become electronic and automated, the amount of data, especially in the areas of diagnostic imaging in radiology and cardiology, was on the rise at OhioHealth. The requirements for increased bandwidth and storage capacity became constant challenges, as were the requirements for business continuity and disaster recovery capabilities.

OhioHealth was already successfully using Cisco Catalyst® 3750 Series Switches at the edge and Cisco Catalyst 6500 Series Switches at the core, with Cisco wireless solutions deployed throughout the network of hospitals for visitors and staff to access. The IT staff decided to upgrade the storage networking by deploying a Cisco SAN composed of two Cisco MDS 9509 Multilayer Directors with 244 ports on each switch: one for use at the primary data center and the other for the secondary data center. After evaluating storage switches on the market, the OhioHealth IT team selected the Cisco MDS 9000 family solution for its scalability, manageability, and investment protection. The Cisco MDS 9000 family also offered features such as VSANs that helped integrate connections between the two data centers and better utilize SAN resources.

http://www.cisco.com/en/US/prod/collateral/ps4159/ps6409/ps4358/case_study_c36-468864.pdf

Why Cisco

With the proliferation of data in today's business environment, organizations are consolidating data center operations into fewer, larger, more manageable SANs. Scalability is crucial because companies must effectively manage and consolidate data center resources while continuously responding to changing business requirements. With the Cisco MDS 9000 family architecture, customers do not need to upgrade their entire current network to support demanding business needs. The Cisco MDS 9000 family provides industry-leading investment protection by delivering full compatibility with existing and new Cisco MDS 9000 family modular switching products. Delivering long-term Investment protection and designs that remain compatible with future architectures, Cisco MDS 9000 family SAN solutions have an industry-leading track record of providing full investment protection. The Cisco MDS 9000 Family chassis shipped in 2002 supports 8 Gbps and FCoE, providing true investment protection.

For More Info

- http://www.cisco.com/go/storage
- http://www.cisco.com/go/datacenter
- http://www.cisco.com/go/nexus

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV
Amsterdam, The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.

Printed in USA C22-473536-01 09/09