

Cisco MDS 9216 Multilayer Fabric Switch



The Cisco MDS 9216 Multilayer Fabric Switch offers up to 48 Fibre Channel ports

Highlights

- **Supports throughput of up to 2Gbps per port and up to 32Gbps with each Port Channel Inter-Switch Link (ISL) connection**
- **Offers scalability from 14 to 48 Fibre Channel ports**
- **Offers 2 to 10 Gigabit Ethernet ports for iSCSI or FCIP connectivity**
- **Features modular design with excellent availability capabilities**
- **Uses intelligent network services to help simplify Storage Area Network (SAN) management and reduce total cost**
- **Helps provide security for large enterprise SANs**
- **Includes Virtual SAN (VSAN) capability for SAN consolidation into virtual SAN islands on a single physical fabric**
- **Offers compatibility with a broad range of IBM® servers as well as disk and tape storage devices**

High performance and manageability for SANs

The Cisco MDS 9216 Multilayer Fabric Switch provides 1Gbps and 2Gbps Fibre Channel switch connectivity and intelligent network services to help improve the security, performance and manageability required to consolidate geographically dispersed storage devices into a large enterprise SAN. Administrators can use the Cisco MDS 9216 to help address the needs for high performance and reliability in SAN environments ranging from small work-groups to very large, integrated enterprise SANs. Up to 14 Cisco MDS 9216 Multilayer Fabric Switches may be installed in a single 42U rack, with up to 672 ports in a single footprint.

Connectivity, compatibility and traffic management

The Cisco MDS 9216 Multilayer Fabric Switch includes 14 Fibre Channel ports plus two IP ports or 16 Fibre Channel ports in base switch and accepts one optional 16- or 32-port module, allowing the switch to support 16, 32 or 48 Fibre Channel ports per chassis. The optional switching modules are designed for hot-swap capability.

Fibre Channel ports provide an autosensing 1Gbps and 2Gbps interface for high-performance connectivity and compatibility with legacy devices. These ports use small form-factor pluggable (SFP) optic transceivers and support LC interfaces. Individual ports can be configured with either shortwave SFPs for connectivity up to 300 meters at 2Gbps (500 meters at 1Gbps) or longwave SFPs for connectivity up to 10 km (at either 1Gbps or 2Gbps). Ports can be configured to operate in standard expansion port (E_Port), fabric port (F_Port) and fabric loop port (FL_Port) modes as well as in unique Cisco port modes.

16- and 32-port switching modules: configuring the switch for the application environment

The **16-port switching module** supports high performance for the most demanding storage networking applications. Autosensing 1Gbps and 2Gbps

ports are capable of delivering up to 64Gbps of continuous aggregate bandwidth, which provides up to 200MB/sec per port. The 16-port switching module can attach high-performance servers and storage subsystems as well as connect to other switches using ISL connections.

The **32-port switching module** is designed to deliver an optimal balance of performance and port density. It provides high line-card port density along with 32Gbps of total bandwidth. Bandwidth is allocated across eight 4-port groups, providing 4Gbps (200MB/sec) of sustained bandwidth per port-group. This module is designed to provide a low cost means of attaching lower performance servers and storage subsystems to the high-performance crossbar switch fabric without requiring ISLs.

A modular switch designed for high availability

The Cisco MDS 9216 Multilayer Fabric Switch uses Fabric Shortest Path First (FSPF) multipath routing, using intelligence to load balance across a maximum of 16 equal-cost paths and to dynamically reroute traffic if a switch fails.

The basic Cisco MDS 9216 configuration has redundant power supplies and cooling components. Hot-swappable components include an optional switching module, SFP optics, power supplies and a fan tray with integrated temperature and power management.

Simplified storage network management

The Cisco MDS 9216 provides three principal modes of management: the Cisco MDS 9000 Family command-line interface (CLI), Cisco Fabric Manager and integration with third-party storage management tools.

The Cisco MDS 9216 presents the user with a consistent, logical CLI. Adhering to the syntax of the widely known Cisco IOS, Fabric Manager is a responsive Java™ interface which allows remote management from any location on the network.

Cisco Fabric Manager may be used independently or in conjunction with third-party management applications. Cisco provides an extensive application programming interface (API) for integration with third-party and user-developed management tools.

Multiprotocol support and traffic management features

The unique architecture of the Cisco MDS 9216 Fabric Switch allows integration of new transport protocols for greater flexibility. For example, the Cisco MDS 9216 is designed to support Fibre Channel, Internet SCSI (iSCSI) and Fibre Channel over IP (FCIP).

IP Storage Services Module features offer four or eight Gigabit Ethernet ports for iSCSI or FCIP connectivity, software configurable on a port-by-port basis. The IP Storage Services Module feature provides four or eight iSCSI ports. The Tri-Rate Longwave SPF Transceiver feature is required for each port to be used. The FCIP Activation for 4 or 8 Port IP Storage Services Module feature adds Fibre Channel over IP (FCIP) support. **Multiprotocol Services Module** offers two Gigabit Ethernet iSCSI ports and fourteen Fibre Channel ports. FCIP Activation for the Multiprotocol Fabric Switch and for Multiprotocol Service Module features add FCIP support.

Many of today's users are likely to implement 2Gbps Fibre Channel for high-performance applications. However, as users migrate to new technologies, they also may use iSCSI over Ethernet for cost-effective connectivity to shared storage pools and FCIP for connectivity between data centers. The Cisco MDS 9509 is designed to be compatible with future 10Gbps modules.

Security for large enterprise SANs

Because storage networks require security, the Cisco MDS 9216 Multilayer Fabric Switch employs a comprehensive security framework: It is designed to provide extensive security measures at possible points of attack to help prevent unauthorized management access and snooping. These measures include Secure Shell (SSHv2), Simple Network Management Protocol (SNMPv3), RADIUS (Remote Authentication Dial-In User Service) authentication and Role-Based Access Control (RBAC).

Additionally, data plane traffic is secured through VSANs, which are designed to segregate traffic between multiple virtual fabrics within the single physical fabric infrastructure, and through hardware-enforced zoning, which further segregates traffic within each VSAN.

Advanced security and management

The Cisco MDS 9000 Enterprise Package is designed to provide advanced security and management

capabilities. The package includes LUN Zoning, Read-only zones and Port lockdown. The Cisco MDS 9000 **Enterprise Package Bundle** includes two years post warranty support.

The Cisco MDS 9000 **Fabric Manager Server Package** is designed to extend Cisco Fabric Manager by providing historical performance data collection, centralized management services and support for advanced application integration. The Cisco MDS 9000 Enterprise Package Bundle includes two years post warranty support.

Cisco **Mainframe Package** feature is designed to enable mainframe storage network applications including FICON®

protocol; FICON Control Unit Port (CUP); FICON and FCP intermixing; FICON Switch Cascading and Fabric Binding. The Cisco Mainframe Package Bundle includes two years post warranty support.

IBM TotalStorage Virtualization Family Cisco MDS 9000 **Caching Service Modules** are designed to provide advanced virtualization technology for use with IBM TotalStorage® SAN Volume Controller software for Cisco MDS 9000. The modules provide scalable, in-band storage virtualization services within the network. This solution combines two modules into a high availability cluster with 16GB of mirrored cache memory.

Capabilities to help reduce TCO

VSAN capability allows more efficient SAN utilization by creating multiple isolated environments within a single SAN fabric. Each VSAN can be zoned as a typical SAN and maintains its own fabric services for added scalability and resilience. VSANs allow the cost of the SAN infrastructure to be shared among more users, while helping to segregate and secure traffic and retain independent control of configurations on a VSAN-by-VSAN basis.

Cisco MDS 9216 Multilayer Fabric Switch at a glance¹

Physical characteristics

Dimensions	13.3 cm H x 43.9 cm W x 57.6 cm D (5.25 in x 17.25 in x 22.7 in)
Rack height	3U
Weight (fully configured chassis)	32 kg (70 lb)

Switches are rack mountable in a standard 19-inch EIA rack, meeting Cisco requirements defined in the recommended installation procedures².

Operating environment

Temperature	0° to 40° C (32° to 104° F)
Relative humidity	10% to 90%
Power supplies	845 W AC
Input	100 to 240 V AC 50-60 Hz nominal

IBM product numbers

2062-D1A—Cisco MDS 9216A Multilayer Fabric Switch is ready for future line cards, includes dual AC power supplies and one 16-port switching module integrated into the base chassis.

2062-D1H—Cisco MDS 9216i Multilayer Fabric Switch is ready for future line cards, includes dual AC power supplies and one multiprotocol services module with 14 Fibre Channel ports and 2 IP ports integrated into the base switch.

2062-D01—Cisco MDS 9216 Multilayer Fabric Switch includes dual AC power supplies and one 16-port switching module integrated into the base chassis.

All models include one slot for an optional Fibre Channel or IP Storage Services module and firmware for Cisco Fabric Manager, VSAN, PortChannel capabilities and one year, 24x7, same day, on-site warranty.

FC 2116—16-port 1Gbps and 2Gbps Fibre Channel Switching Module (no optics)

FC 2132—32-port 1Gbps and 2Gbps Fibre Channel Switching Module (no optics)

FC 2208—8 Port IP Storage Services Module

FC 2209—FCIP Activation for 8 Port IP Storage Services Module

FC 2214—Multiprotocol Services Module

FC 2216—FCIP Activation for Multiprotocol Services Module

FC 2218—4 Port IP Storage Services Module

FC 2219—FCIP Activation for 4 Port IP Storage Services Module

FC 2300 and 2301—Caching Services Modules (both required)

FC 5210—Tri-Rate SW SPF Transceiver (1 & 2 Gbps FC and Gig Ethernet)

FC 5220—Tri-Rate LW SPF Transceiver (1 & 2 Gbps FC and Gig Ethernet)

FC 5230—Fibre Channel port shortwave SFP transceiver

FC 5240—Fibre Channel port longwave SFP transceiver

FC 5311 to 5318—Cisco CWDM SFP transceivers

FC 7010—MDS 9216 Enterprise Package Bundle

FC 7020—MDS 9216 Enterprise Package Bundle

FC 7030—MDS 9216 Mainframe Package Bundle

One to four year post warranty support features are available

Fiber optic cables: Multimode, 50u fiber optical cables with SC and/or LC connectors are available

Supported systems²

IBM @server® pSeries® and selected IBM RS/6000® servers; IBM @server xSeries® and selected IBM Netfinity® servers; other Intel® processor-based servers running the Linux®, Microsoft® Windows NT® or Microsoft Windows® 2000 operating systems; selected Sun and HP servers; IBM TotalStorage® Enterprise Storage Server® (ESS); IBM TotalStorage DS8000 series; IBM TotalStorage DS6000 series; IBM TotalStorage DS4000 series (formerly FASTT Storage Servers); IBM TotalStorage 3590 and 3592 Tape Drives; IBM TotalStorage 3494 Tape Library; IBM 3532, 3583 Ultrium® Tape Libraries and IBM 3584 UltraScalable Tape Library; and other selected storage systems

For more information

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¹ For complete and current Cisco specifications, please visit www.cisco.com/go/ibm/storage.

² For the most current list of supported servers and storage, please visit ibm.com/storage/cisco.