

## Cisco MDS 9506 Multilayer Director



The Cisco MDS 9506 Multilayer Director offers dual Supervisor Modules with up to 128 Fibre Channel ports in a 7U enclosure

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### Highlights

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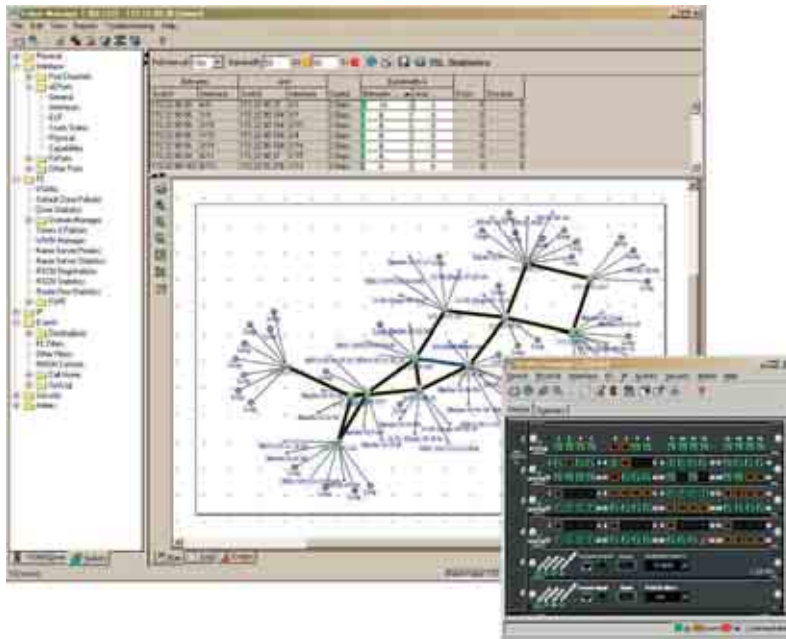
- **Provides Fibre Channel throughput of up to 2 Gbps per port and up to 32 Gbps with each PortChannel Inter-Switch Link connection**
- **Offers scalability from 14 to 128 Fibre Channel ports and two to 24 Gigabit Ethernet IP ports for iSCSI or FCIP connectivity**
- **Includes Virtual SAN (VSAN) capability for SAN consolidation into virtual SAN islands on a single physical fabric**
- **Includes high-availability design with nondisruptive firmware upgrades**
- **Enterprise, SAN Extension over IP, Mainframe and Storage Services Enabler Packages and Fabric Manager Server provide added intelligence and value**

### High performance and manageability for SANs

The Cisco MDS 9506 Multilayer Director supports 1 Gbps and 2 Gbps 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 9506 to help address the needs for high performance and reliability in SAN environments ranging from small work-groups to very large, integrated enterprise SANs.

### Routing and load balancing capabilities

The Cisco MDS 9506 Multilayer Director includes two Supervisor Modules designed for high availability and performance. The Supervisor Module combines an intelligent control module and a high-performance cross-bar switch fabric in a single unit. It uses Fabric Shortest Path First (FSPF)



Cisco Fabric Manager provides flexible views of the SAN

multipath routing, which provides intelligence to load balance across a maximum of 16 equal-cost paths and to dynamically reroute traffic if a switch fails.

A single Supervisor Module has 720 Gbps of internal nonblocking switching capacity; a dual Supervisor Module configuration provides a total bandwidth of 1.44 Tbps. Because this bandwidth capability is more than twice that required for current 2 Gbps modules, the Cisco MDS 9506 has built-in capacity to support future 10 Gbps modules.

### **Connectivity, compatibility and traffic management**

Switching modules are designed to optimize performance, flexibility and density. The Cisco MDS 9506 Multilayer Director requires a minimum of one and allows a maximum of four switching modules. These modules are available in either a 16- or 32-port configuration, allowing the Cisco MDS 9506 to support 16 to 128 Fibre Channel ports per chassis.

The Fibre Channel switching modules provide auto-sensing 1 Gbps and 2 Gbps interfaces for high-performance connectivity and compatibility with legacy devices. Switching modules are hot-swappable with 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 2 Gbps (500 meters at 1 Gbps) or longwave SFPs for connectivity up to 10 km (at either 1 Gbps or 2 Gbps). 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.

Advanced traffic management capabilities are integrated into the switching modules to help simplify deployment and to optimize performance across a large fabric. The PortChannel capability allows users to aggregate up to 16 physical 2 Gbps Inter-Switch Links into a single logical bundle, providing optimized bandwidth utilization across all links. The bundle may span any port from any 16-port switching module within the chassis, providing up to 32 Gbps throughput.

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

The **16-port switching module** is designed to deliver high performance for demanding storage networking applications. Auto-sensing 1 Gbps and 2 Gbps ports deliver up to 64 Gbps of continuous aggregate bandwidth, which provides up to 200 MBps and 255 buffer credits per port. The 16-port switching module is well suited for attaching high-performance servers and storage subsystems as well as to connect to other switches using Inter-Switch Link (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 32 Gbps of total bandwidth. Bandwidth is allocated across eight 4-port groups, supporting 4 Gbps (200 MBps) of sustained bandwidth per port-group. This module provides a low-cost means of attaching lower performance servers and storage subsystems to the high-performance crossbar switch fabric without requiring ISLs. All Fibre Channel ports must be populated with **shortwave** or **longwave SFP transceiver** features.

### **A switch designed for high availability**

The Cisco MDS 9506 Multilayer Director combines support for nondisruptive software upgrades, stateful process restart/failover and redundancy of active hardware components to support director-class availability.

The Supervisor Module has the ability to automatically restart failed processes, making it highly robust. If a Supervisor Module is reset, complete synchronization between the active and standby Supervisor Modules helps support stateful failover without disruption to traffic.

### **Simplified storage network management**

The Cisco MDS 9506 supports 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 9506 presents the user with a consistent, logical CLI. Adhering to the syntax of the widely known Cisco IOS® CLI, the Cisco MDS 9000 Family CLI has broad functionality.

### **Multiprotocol support and traffic management features**

The unique architecture of the Cisco MDS 9506 Multilayer Director allows integration of new transport protocols for greater flexibility. For example, the Cisco MDS 9506 is designed to support Fibre Channel, Internet SCSI (iSCSI) and Fibre Channel over IP (FCIP).

IP and Multiprotocol Storage Services Module features offer two to twenty-four 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 **Multiprotocol Services Module** feature offers two Gigabit Ethernet iSCSI ports and fourteen Fibre Channel ports.

**Tri-Rate shortwave and longwave SPF Transceiver** features are required for each port to be used. The **SAN Extension over IP Package** for IP Services Modules and Multiprotocol Services Module features add Fibre Channel over IP support. SAN Extension over IP Package helps improve performance with FCIP Compression, Write Acceleration and Tape Acceleration and helps improve security with Inter-VSAN Routing for FCIP. Users may now use iSCSI for cost-effective connectivity to shared storage pools and FCIP for metro and global connectivity between data centers.

### **Security for large enterprise SANs**

Because storage networks require security, the Cisco MDS 9506 Multilayer Director utilizes 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** feature is designed to provide advanced security and management capabilities. The package helps improve management with Quality of Service (QoS) and helps improve security with Inter-VSAN Routing for Fibre Channel, and enhanced network security capabilities including Switch-Switch and Host Authentication, LUN Zoning, Read-only zones and Port lockdown, VSAN-Based Access Control and IP Security (IPsec) for iSCSI and FCIP connectivity. This feature helps simplify SAN consolidation for secure infrastructure simplification solutions.

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. This feature helps simplify management of large enterprise SAN infrastructures.

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. This feature helps provide secure mainframe and open system SAN infrastructure consolidation and helps provide integrated IBM TotalStorage® Virtual Tape Server and IBM TotalStorage DS8000 series metro and global mirroring business continuity solutions.

### **Capabilities to help reduce TCO**

VSAN capability is designed to allow more efficient SAN utilization by creating multiple isolated environments within a single SAN fabric. Each VSAN can be zoned as a typical SAN. It 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 provide segregation and security of traffic and retaining independent control of configurations on a VSAN-by-VSAN basis.

The **Storage Services Module**, based upon the 32-port Switching Module, is a highly specialized feature which provides intelligent storage services in addition to 1 and 2 Gbps Fibre Channel switching. All Fibre Channel ports must be populated with shortwave or long-wave SFP transceiver features. When combined with the Enterprise Package feature, Fibre Channel Write Acceleration is designed to improve IBM TotalStorage DS4000 metro mirroring performance.

When combined with the **Storage Services Enabler Package**, the module is designed to enable independent software vendors (ISVs) to develop intelligent fabric applications. Network-accelerated storage applications such as “serverless” backup; network-assisted appliance-based storage applications using Cisco MDS 9000 SANTap Service such as global data replication; and network-hosted storage applications based upon proposed Fabric

Application Interface Standard (FAIS) APIO may be offered by ISVs. IBM support for these ISV applications is limited to IBM TotalStorage Proven Networking Solutions.

This feature helps expand the portfolio of IBM TotalStorage Proven business continuity solutions.

For the most current IBM TotalStorage Proven application information, visit: **[ibm.com/storage/proven](http://ibm.com/storage/proven)**

## Cisco MDS 9506 Multilayer Director at a glance<sup>1</sup>

### Physical characteristics

Dimensions	31.11 cm H x 44.12 cm W x 55.25 cm D (12.25 in x 17.37 in x 21.75 in)
Rack height	7U
Depth including cable guide	67.9 cm (26.75 in)
Weight (fully configured chassis)	56 kg (124 lb)

Director is rack mountable in a standard 19-inch EIA rack, meeting Cisco requirements defined in the recommended installation procedures.<sup>2</sup>

### Operating environment

Temperature	0° to 40° C (32° to 104° F)	
Relative humidity	10% to 90%	
Power supplies	<b>D04 Model:</b>	<b>T04 Model:</b>
Input	1900 W AC	1900 W DC
	100 to 240 V AC	to -60V DC
	50-60 Hz nominal	
Output	1050 W at 100 to 100 V AC	1900W (50 VDC)
	1900 W at 200 VAC	

### IBM product numbers

2062-D04<sup>3</sup>—Cisco MDS 9506 Multilayer Director designed for IT data centers, includes dual AC power supplies and one year, 24x7, same day, on-site warranty

2062-T04<sup>3</sup>—Cisco MDS 9506 Multilayer Director designed for telco environments, includes dual AC power supplies and one year, 24x7, same day, on-site warranty

All models include Cisco SAN-OS 2.1 firmware with Cisco Fabric Manager, VSAN and PortChannel capabilities

FC 2010—Supervisor Module with one Compact Flash Memory drive (two required)

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

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

FC 2208—8 Port IP Services Module (no optics)

FC 2210—SAN Extension over IP for 8 Port IP Services Module

FC 2214—Multiprotocol Services Module

FC 2216—FCIP Activation for Multiprotocol Services Module

FC 2216—SAN Extension over IP for 4 Port IP Services Module

FC 2218—4 Port IP Services Module (no optics)

FC 2220—SAN Extension over IP for 4 Port IP Services Module

FC 2400—Storage Services Module

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 5810—Cisco Flash Memory Card

FC 5811—Cisco Spare Flash Memory Card

FC 7021—MDS 9000 Enterprise Package

FC 7026—MDS 9500 Fabric Manager Server Package

FC 7036—MDS 9500 Mainframe Package

FC 7040—Storage Services Enabler

One to four year post warranty support features are available.

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## Cisco MDS 9506 Multilayer Director at a glance<sup>1</sup>

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

**Supported systems<sup>4</sup>** 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

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## For more information

Contact your IBM representative or  
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<sup>1</sup> For complete and current Cisco specifications, please visit [www.cisco.com/go/ibm/storage](http://www.cisco.com/go/ibm/storage).

<sup>2</sup> Because this switch is designed with side-to-side airflow, Cisco recommends a minimum air space of 16 cm (6 in) between walls and the chassis air vents, and a minimum separation of 30.5 cm (12 in) between two chassis to prevent overheating.

<sup>3</sup> Each model includes four slots for 16- or 32-port switching modules, IP service modules, or both. The base configuration requires selection of a minimum of one switching module and two Supervisor Modules. Two power supplies, a fan tray and firmware support for Cisco Fabric Manager, VSAN and PortChannel are included.

<sup>4</sup> For the most current list of supported servers and storage, please visit [ibm.com/storage/cisco](http://ibm.com/storage/cisco).