Cisco MDS 9500 and 9700 Series Multilayer Directors

Overview

Cisco® MDS 9500 and 9700 Series Multilayer Directors are director-class SAN switches designed for deployment in large, scalable enterprise clouds to enable business transformation. Layering a comprehensive set of intelligent features onto a high-performance, protocol-independent switch fabric, the Cisco MDS 9000 Family addresses the stringent requirements of large data center storage environments - uncompromising high availability, security, scalability, ease of management, and transparent integration of new technologies - for extremely flexible data center SAN solutions. Sharing the same operating system and management interface with other Cisco data center switches, the Cisco MDS 9000 Family enables easy deployment of unified fabrics with high-performance Fibre Channel and Fibre Channel over Ethernet (FCoE) connectivity to achieve low total cost of ownership (TCO).

Available in a 10-slot configuration at first customer shipment (FCS), the Cisco MDS 9700 Series supports 2-, 4-, 8-, 10-, and 16-Gbps Fibre Channel and FCoE[1].

It supports up to 384 2/4/8-Gbps, 10-Gbps or 4/8/16-Gbps autosensing line-rate Fibre Channel ports in a single chassis and up to 1152 Fibre Channel ports per rack.

Available in 6-, and 13-slot configurations, the Cisco MDS 9500 Series supports 1-, 2-, 4-, 8-, and 10-Gbps Fibre Channel; 10-Gbps FCoE; 1-Gbps Fibre Channel over IP (FCIP); and 1-Gbps Small Computer System Interface over IP (iSCSI) port speeds. It supports up to 528 1/2/4/8-Gbps autosensing Fibre Channel ports in a single chassis and up to 1584 Fibre Channel ports per rack.

Cisco MDS 9500 and 9700 Series Multilayer Directors also are ready for integration of future high-speed standards, helping ensure continued investment protection.

Cisco MDS 9000 NX-OS Software

The Cisco MDS 9000 NX-OS Software, included at no charge with every Cisco MDS 9000 Family multilayer SAN switch, is the underlying system software that powers the award-winning Cisco MDS 9000 Family. Cisco MDS 9000 NX-OS provides many unique features that help the Cisco MDS 9000 Family deliver low TCO and a quick return on investment (ROI). By providing an open, standards-based platform, Cisco MDS 9000 NX-OS enables intelligent fabric applications, such as Cisco Data Mobility Manager (DMM) for heterogeneous data migration between storage arrays, and Cisco MDS 9000 I/O Accelerator (IOA) for increased performance and reduced latency over long-distance SAN extension links.

Cisco MDS 9000 NX-OS provides virtual machine-optimized and blade server-optimized services that let IT managers dynamically respond to changing business needs in virtual environments. It also supports IPv6 as mandated by the U.S. Department of Defense (DoD), Japan, and China.

Cisco MDS 9500 and 9700 Series Director Models

Table 1 summarizes the Cisco MDS 9500 and 9700 Series models.

Table 1. Cisco MDS 9500 and MDS 9700 Series Multilayer Directors

Switch Type	Cisco MDS 9710 Multilayer Director	Cisco MDS 9513 Multilayer Director	Cisco MDS 9506 Multilayer Director
Cisco part number	DS-C9710	DS-C9513	DS-C9506
Description	Modular, multilayer, multiprotocol, highly available, dual supervisor modules with 6 fabric slots with 8 module slots (14 rack units [14RU])	Modular, multilayer, multiprotocol, highly available, dual supervisor modules with 11 module slots (14RU)	Modular, multilayer, multiprotocol, highly available, dual supervisor modules with 4 module slots (7RU)
Maximum ports	384	528	192

Switch Type	Cisco MDS 9710 Multilayer Director	Cisco MDS 9513 Multilayer Director	Cisco MDS 9506 Multilayer Director
Target group	SAN core, large enterprises, and service providers	SAN core, large enterprises, and service providers	SAN core, medium-sized to large enterprises, and service providers
Support modules	• 16-Gbps Fibre Channel: Cisco MDS 9710 48-port 16-Gbps Fibre Channel switching module • 10-Gbps FCoE: 48-port 10-Gbps FCoE module[1]	• 8- and 10-Gbps Fibre Channel: Cisco MDS 9000 32- and 48-port 8-Gbps Advanced Fibre Channel Switching Modules • IP and storage services: 16-Port Storage Services Node (SSN) • 10-Gbps Fibre Channel: Cisco MDS 9000 4-Port 10-Gbps Fibre Channel Switching Module • 10-Gbps FCoE: Cisco MDS 8-Port 10-Gbps FCoE Module	
Recommended solutions	• Data center SAN consolidation • Business continuance • Centralized SAN management	• Data center SAN consolidation • Business continuance • Centralized SAN management	• Data mobility and migration • Advanced SAN security for compliance and regulation • Centralized backup, recovery, and archiving through intelligent fabric applications (network-hosted storage virtualization)

Cisco MDS 9000 Family Software License Packages

In addition to the unique software features included in the base switch configuration such as integrated VSANs, an advanced security suite, advanced diagnostics and troubleshooting tools, and the comprehensive Cisco Prime Data Center Network Manager (DCNM), Cisco offers a set of advanced software features logically grouped into software license packages (Table 2 and Table 3).

Table 2. Cisco MDS 9700 Family Licenses

License Type	Enterprise	DCNM	Mainframe Package[1]
Description	Cisco MDS 9700 Series Enterprise package includes advanced traffic engineering and advanced security features for enterprise SANs	Cisco Prime DCNM is the Network industry's first converged SAN and LAN management solution. Cisco DCNM can manage all Cisco NX-OS Software based devices including the Cisco MDS 9000 Family and Cisco Nexus Family products. The intuitive GUI simplifies day-to-day operations of Cisco unified fabrics in today's highly virtualized data center environments.	The Cisco Mainframe package includes features required in mainframe environments. IBM Fiber Connection (FICON) is architecture for high-speed connectivity between mainframe and I/O devices.
Features	Advanced traffic management (Inter-VSAN Routing [IVR], quality of service [QoS], and extended credits) and security features (switch-to- switch and host-to-switch authentication, port security, VSAN-based access control, and fabric binding for Fibre Channel)	• Monitoring of events and performance historically and at scale • Wizard and Template based provisioning of Cisco NX-OS Software based technologies and services • Dynamic Topology Views with extended visibility into virtual infrastructure • Resource Management through trend analysis of inventory and performance • Rule-based event notification and filtering • Role-Based Access Control (RBAC), providing separation between Network and Storage teams	VSAN for FICON and FCP intermixing, FICON Control Unit Protocol (CUP), fabric binding, switch cascading, IBM TotalStorage Virtual Tape Server, FICON native mode and native mode channel-to-channel operation, persistent FICON Fibre Channel ID (FCID) assignment, port swapping for host channel cable connectors, and FICON tape.

Table 3. Cisco MDS 9500 Family Licenses

License Type	Enterprise	DCNM	SAN Extension over IP	IOA	DMM	Mainframe Package	XRC Acceleration
Description	The Cisco MDS 9500 Enterprise package includes advanced traffic engineering and advanced security features for enterprise SANs.	Cisco Prime DCNM is the Network industry's first converged SAN and LAN management solution. Cisco DCNM can manage all Cisco NX-OS Software based devices including the Cisco MDS 9000 Family and Cisco Nexus Family of products. The intuitive GUI simplifies day-to-day operations of Cisco unified fabrics in today's highly virtualized data center environments.	The Cisco MDS 9000 SAN Extension over IP package provides an integrated, cost-effective, and reliable business-continuance solution that uses the existing IP infrastructure.	Cisco MDS 9000 IOA provides a fabric- based service to accelerate SCSI disk write and tape read and write I/O operations across metropolitan area network (MAN) and WAN links. The IOA feature is delivered as a highly available service with clustering capability, increasing reliability, performance, scalability, and application stability.	The Cisco DMM license is required to enable the Cisco MDS 9000 Family data migration feature. Two versions of the license are available. A permanent license that does not have any expiration period is available only to end-user customers who want to use this feature for their own data mobility needs and do not plan to sell services using this product. Service provider customers expecting to sell services based on Cisco DMM must purchase the 180-day license.	The Cisco Mainframe package includes features required in mainframe environments. IBM Fiber Connection (FICON) is an architecture for high-speed connectivity between mainframe and I/O devices.	Cisco MDS 9000 XRC Acceleration accelerates dynamic updates for IBM z/OS Global Mirror (formerly called XRC) over WAN links when used in conjunction with the Cisco MDS 9000 SAN Extension over IP and Mainframe packages.
Features	Advanced traffic management (Inter-VSAN Routing [IVR], quality of service [QoS], and extended credits) and security features (switch-to-switch and host-to-switch authentication, port security, VSAN-based access control, IP Security [IPsec] for iSCSI, and FCIP), Internet Key Exchange (IKE) digital certificates, and fabric binding for Fibre Channel.	• Monitoring of events and performance historically and at scale • Wizard- and Template-based provisioning of Cisco NX-OS Software based technologies and services • Dynamic Topology Views with extended visibility into virtual infrastructure • Resource Management through trend analysis of inventory and performance • Rule-based event notification and filtering • RBAC, providing separation between Network and Storage teams	FCIP support including FCIP compression, write acceleration, and read and write tape acceleration; SAN extension tuner; and IVR for FCIP.	Acceleration of disk write and tape read and write operations over both WAN FCIP and MAN Fibre Channel links, transparent insertion of fabric service, clustering of IOA service engines with load balancing and failover, PortChannels across line cards for Fibre Channel and FCIP, and compression for Fibre Channel links.	Transparent insertion of service (Cisco MDS 9000 Family customers can turn on this service and move data from one array to another without any disruption of host applications), capability to schedule cutover to the new array (the point at which the old array is phased out), rate control of administrative traffic, and synchronous and asynchronous migrations both within and across geographically dispersed data centers.	VSAN for FICON and FCP intermixing, FICON Control Unit Protocol (CUP), fabric binding, switch cascading, IBM TotalStorage Virtual Tape Server, FICON native mode and native mode channel-to-channel operation, persistent FICON FCID assignment, port swapping for host channel cable connectors, and FICON tape.	Elimination of the need for a separate FICON acceleration appliance by running the Cisco MDS 9222i Multiservice Modular Switch (MMS) or MDS 9000 18/4-Port MSM used for FCIP; support for multiple IBM Service Delivery Managers (SDMs), multiple readers, and IBM Parallel Access Volumes (PAVs) and HyperPAVs; and simple management from the command-line interface (CLI), Cisco DCNM GUI, or IBM z/OS tools.

Table 4. Cisco MDS 9000 Family Modules

Switching Modules	48-Port 16-Gbps Fibre Channel Modules	8-Gbps Advanced Fibre Channel Modules	16-Port Storage Services Node	10-Gbps 8-Port FCoE Module
Platform	MDS 9700 Series	MDS 9500 Series	MDS 9500 Series	MDS 9500 Series
Cisco part number	• DS-X9448-768K9 MDS 9710 48-port 16-Gbps FC Module	• DS-X9232-256K9 MDS 9000 32-port 8-Gbps Advanced FC Module • DS-X9248-256K9 MDS 9000 48-port 8-Gbps Advanced FC Module	• DS-X9316-SSNK9 MDS 9000 16-Port Storage Services Node	• DS-X9708-K9 MDS 9000 10-Gbps 8-Port FCoE Module

Advanced features	• Port speed: 2/4/8-Gbps and 4/8/16-Gbps autosensing, optionally configurable for 10- Gbps Fibre Channel
	
	• Buffer credits: 500 per port and up to 4095 on an individual port (with optional Enterprise license activated)
		• Port speed: 1/2/4/8-Gbps autosensing, optionally configurable for 10-Gbps Fibre Channel
		
		• Buffer credits: 32 per port (shared-mode ports), up to 500 per port (dedicated-mode ports), and up to 4095 on an individual port (dedicated-mode ports with optional Enterprise license activated)
			• 16 Gigabit Ethernet IP storage services ports
			
			• IP storage services
			  – FCIP
			  – IPsec encryption
			  – FCIP compression
			  – FCIP tape acceleration
			  – FCIP tape read-write acceleration
			• Performance
			  – Port speed: 1-Gbps Ethernet
			  – IP storage services ports per chassis: Up to 208 ports per chassis
			  – IP storage services ports per rack: Up to 628 ports per 42-unit rack
			  – FCIP tunnels: Up to 3 per port
				• Port speed: 10 Gbps
				
				• Compatible with FCoE connectivity to the Cisco Nexus 5000 and 7000 Series Switches
				
				• PortChannel: Up to 16 ports

Switching Modules	48-Port 16-Gbps Fibre Channel Modules	8-Gbps Advanced Fibre Channel Modules	16-Port Storage Services Node	10-Gbps 8-Port FCoE Module

	• PortChannel: Up to 16 ports
	• Cisco TrustSec® Fibre Channel link-level encryption[1]
	• FICON[1]:
	  – FC-SB-3 compliant
	  – Cascaded FICON fabrics
	  – Intermix of FICON and Fibre Channel FCP traffic
	  – IBM CUP management interface
		• PortChannel: Up to 16 ports
		• Cisco TrustSec Fibre Channel link-level encryption
		• FICON:
		  – FC-SB-3 compliant
		  – Cascaded FICON fabrics
		  – Intermix of FICON and Fibre Channel FCP traffic
		  – IBM CUP management interface
			• Cisco MDS 9000 IOA
			• PortChannel: Up to 16 ports
			• FICON
			  – FC-SB-3 compliant
			  – Cascaded FICON fabrics
			  – Intermix of FICON and Fibre Channel FCP traffic
			  – IBM CUP management interface
				• Full line-rate bandwidth with no oversubscription
				• Full standards-based Multihop FCoE
				• PortChannel: Up to 16 ports

Optics supported	• 16-Gbps short-wavelength (SW) and long-wavelength (LW) SFP+ • 10-Gbps SW and LW SFP+ • 8-Gbps SW, LW, and extended-reach (ER) SFP+ • 10-Gbps short-range (SR), long-range (LR), and ER SFP+	• 10-Gbps SW and LW SFP+ • 8-Gbps SW, LW and ER SFP+ • 4-Gbps CWDM, DWDM, SW, and LW LC SFP	• Gigabit Ethernet and Gigabit Ethernet copper 2-Gbps CWDM, dense wavelength-division multiplexing DWDM, and LC SFP	• 10 Gigabit Ethernet –SR and –LR • Active CX-1 (7 and 10m) • Passive CX-1 (1, 3, and 5m)

[1] This feature will be supported in a future software release.

For more Information

For more information, please visit http://www.cisco.com/go/storage.