DATA SHEET

CISCO MDS 9216A MULTILAYER FABRIC SWITCH

PRODUCT OVERVIEW

Scalable 16-Port Multilayer Fabric Switch

The Cisco MDS 9216A Multilayer Fabric Switch (Figure 1) brings new capability and investment protection to the fabric switch market. Sharing a consistent architecture with the Cisco MDS 9500 Series, the Cisco MDS 9216A combines multilayer intelligence with a modular chassis, making it an extremely capable and flexible fabric switch. Starting with 16 2-Gbps Fibre Channel ports, the expansion slot on the Cisco MDS 9216A allows for the addition of any current or future Cisco MDS 9000 Family module for up to 64 total ports.

Figure 1. Cisco MDS 9216A Multilayer Fabric Switch

KEYS FEATURES AND BENEFITS

The Cisco® MDS 9216A Multilayer Fabric Switch is designed for building mission-critical enterprise storage area networks (SANs) where scalability, multilayer capability, resiliency, robust security, and ease of management are imperative. The Cisco MDS 9216A offers the following important features:

- Compelling economics—A modular design provides a 3–rack unit (RU) base system consisting of 16 2-Gbps Fibre Channel ports and can be expanded with a variety of optional switching modules to up to 64 total Fibre Channel ports.
- Cost-effective design—The Cisco MDS 9216A offers advanced management tools for overall lower total cost of ownership (TCO). It includes virtual SAN (VSAN) technology for hardware-enforced isolated environments within a single physical fabric for secure sharing of physical infrastructure, further decreasing TCO.
- Multiprotocol and multitransport—The multilayer architecture of the Cisco MDS 9216A helps enable a consistent feature set over a protocol-independent switch fabric and easily integrates Fibre Channel, IBM Fiber Connection (FICON), Small Computer System Interface over IP (iSCSI), and Fibre Channel over IP (FCIP) in one system.
- Integrated hardware-based VSANs and Inter-VSAN Routing (IVR)—Enables deployment of large-scale multisite and heterogeneous SAN topologies. Integration into port-level hardware allows any port within a system or fabric to be partitioned into any VSAN. Integrated hardware-based inter-VSAN routing provides line-rate routing between any ports within a system or fabric without the need for external routing appliances.
- High-performance inter-switch links (ISLs)—Supports up to 16 Fibre Channel links in a single PortChannel. Links can span any speed-matched ports on any module within a chassis for added scalability and resilience.

- Intelligent network services—Uses VSAN technology for hardware-enforced, isolated environments within a single physical fabric, access control lists (ACLs) for hardware-based intelligent frame processing, and advanced traffic management features such as Fibre Channel Congestion Control (FCC) and fabric-wide quality of service (QoS) to facilitate migration from SAN islands to enterprise-wide storage networks.
- Advanced FICON services—Supports FICON environments, including cascaded FICON fabrics, VSAN-enabled intermix of mainframe and open systems environments, and N_Port ID virtualization for mainframe Linux partitions. CUP (Control Unit Port) support enables in-band management of Cisco MDS 9200 Series switches from the mainframe management console.
- Comprehensive network security framework—Supports RADIUS and TACACS+, Fibre Channel Security Protocol (FC-SP), Secure File Transfer Protocol (SFTP), Secure Shell (SSH) Protocol, and Simple Network Management Protocol Version 3 (SNMPv3) implementing Advanced Encryption Standard (AES), VSANs, hardware-enforced zoning, ACLs, and per-VSAN role-based access control.
- Sophisticated diagnostics—Provides intelligent diagnostics, protocol decoding, and network analysis tools as well as integrated Call Home capability for added reliability, faster problem resolution, and reduced service costs.
- Open platform for intelligent storage applications—Provides the intelligent services necessary for hosting and/or accelerating storage applications such as network-hosted volume management, data migration and backup. Storage services modules can be installed in any Cisco MDS 9500 or MDS 9200 series chassis to provide application hosting and/or acceleration intelligence in the fabric.

Virtual SANs

Ideal for efficient, secure SAN consolidation, VSANs allow more efficient storage network utilization by creating hardware-based isolated environments with a single physical SAN fabric or switch. 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 SAN infrastructure to be shared among more users, while ensuring absolute segregation of traffic and retaining independent control of configuration on a VSAN-by-VSAN basis.

Integrated SAN Routing

In another step toward deploying efficient, cost-effective, consolidated storage networks, the Cisco MDS 9216A multilayer fabric switch supports IVR, the industry's first routing functionality for Fibre Channel. IVR allows selective transfer of data between specific initiators and targets on different VSANs while maintaining isolation of control traffic within each VSAN. With IVR, data can transit VSAN boundaries while maintaining control plane isolation, thereby maintaining fabric stability and availability. Integrated IVR eliminates the need for external routing appliances, greatly increasing routing scalability while delivering line-rate routing performance, simplifying management, and eliminating the challenges associated with maintaining separate systems. Integrated IVR means lower total cost of SAN ownership.

Multiprotocol Intelligence

The Cisco MDS 9216A architecture enables multilayer and multiprotocol functionality, allowing it to transparently integrate new transport technologies for maximum flexibility. Beginning with Fibre Channel, FICON, iSCSI, and FCIP, the Cisco MDS 9216A is a robust multiprotocol platform designed for deployment of cost-optimized storage networks. Users can implement up to 10-Gbps Fibre Channel or FICON for high-performance applications, iSCSI over Ethernet for cost-effective connectivity to shared storage pools, and FCIP for connectivity between data centers.

Open Platform for Intelligent Storage Applications

The Cisco MDS 9216A multilayer fabric switch provides an open platform that delivers the intelligence and advanced features required to make multilayer intelligent SANs a reality, including hardware-enabled innovations to host or accelerate applications for data migration, data replication, serverless backup, network-hosted volume management and more. Hosting and/or accelerating these applications in the network can dramatically improve scalability, availability, security and manageability of the storage environment—resulting in increased utility and lower total cost of ownership (TCO).

Integrated Mainframe Support

The Cisco MDS 9216A multilayer fabric switch is mainframe-ready, with full support for IBM zSeries FICON and Linux environments. Qualified by IBM for attachment to all FICON-enabled devices in an IBM zSeries operating environment, Cisco MDS 9216A multilayer fabric switches support transport of the FICON protocol in both cascaded and noncascaded fabrics, as well as an intermix of FICON and open systems Fibre Channel Protocol traffic on the same switch. VSANs simplify an intermix of SAN resources between z/OS, mainframe Linux, and open systems environments, allowing for increased SAN utilization and simplified SAN management. VSAN-based intermix mode eliminates the uncertainty and instability often associated with zoning-based intermix techniques. VSANs also eliminate the possibility of a misconfiguration or component failure in one VSAN affecting operation in other VSANs. VSAN-based management access controls simplify partitioning of SAN management responsibilities between mainframe and open systems environments, enhancing security. FICON VSANs can be managed using the integrated Cisco Fabric Manager; the Cisco CLI; or IBM CUP-enabled management tools, including SA/390, Resource Measurement Facility (RMF), or Dynamic Channel Path Management (DCM).

Advanced Traffic Management

The following advanced traffic management capabilities integrated into the Cisco MDS 9216A simplify deployment and optimization of large-scale fabrics:

- Virtual Output Queuing—helps ensure line-rate performance on each port, independent of traffic pattern, by eliminating head-of-line blocking.
- 255 buffer-to-buffer credits—are assigned to each port for optimal bandwidth utilization across distance.
- PortChannels—Allow users to aggregate up to 16 physical ISLs into a single logical bundle, providing optimized bandwidth utilization across all links. The bundle can consist of any speed-matched ports from any module in the chassis, ensuring that the bundle can remain active even in the event of a module failure.
- Fabric Shortest Path First (FSPF)–based multipathing—provides the intelligence to load balance across up to 16 equal cost paths and, in the event of a switch failure, dynamically reroute traffic.
- QoS—can be used to manage bandwidth and control latency, to prioritize critical traffic.
- Fibre Channel Congestion Control (FCC)—is an end-to-end, feedback-based congestion control mechanism that augments the Fibre Channel buffer-to-buffer credit mechanism to provide enhanced traffic management.

Advanced Diagnostics and Troubleshooting Tools

Management of large-scale storage networks requires proactive diagnostics, tools to verify connectivity and route latency, and mechanisms for capturing and analyzing traffic. The Cisco MDS 9216A integrates advanced analysis and diagnostic tools. Power-on self test (POST) and online diagnostics provide proactive health monitoring. The Cisco MDS 9216A implements diagnostic capabilities such as Fibre Channel Traceroute for detailing the exact path and timing of flows and Switched Port Analyzer (SPAN) to intelligently capture network traffic. After traffic has been captured, it can then be analyzed with the Cisco Fabric Analyzer, an embedded Fibre Channel analyzer. Comprehensive port-based and flow-based statistics facilitate sophisticated performance analysis and service-level agreement (SLA) accounting. With the Cisco MDS 9216A, Cisco Systems® delivers a comprehensive toolset for troubleshooting and analysis of storage networks.

Comprehensive Solution for Robust Security

Addressing the need for failproof security in storage networks, the Cisco MDS 9216A offers an extensive security framework to protect highly sensitive data crossing today's enterprise networks. The Cisco MDS 9216A employs intelligent packet inspection at the port level, including the application of ACLs for hardware enforcement of zones, VSANs, and advanced Port Security features.

Extended zoning capabilities are enabled to ensure that logical unit numbers (LUNs) are accessible only by specific hosts (LUN zoning), to limit SCSI read commands for a certain zone (read-only zoning), and to restrict broadcasts to only the selected zones (broadcast zones). VSANs are

used to achieve higher security and greater stability by providing complete isolation among devices that are connected to the same physical SAN. In addition, FC-SP provides switch-switch and host-switch Diffie-Hellman Challenge Handshake Authentication Protocol (DH-CHAP) authentication supporting RADIUS or TACACS+ to help ensure that only authorized devices access protected storage networks.

Ease of Management

To meet the needs of all users, the Cisco MDS 9216A 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 9216A presents a consistent, logical CLI. Adhering to the syntax of widely known Cisco IOS® Software CLI, the Cisco MDS 9000 Family CLI is easy to learn and delivers broad management capability. The Cisco MDS 9000 Family CLI is an extremely efficient and direct interface designed to provide optimal functionality to administrators in enterprise environments.

Cisco Fabric Manager is a responsive, easy-to-use Java application that simplifies management across multiple switches and fabrics. Cisco Fabric Manager enables administrators to perform vital tasks such as topology discovery, fabric configuration and verification, provisioning, monitoring, and fault resolution. All functions are available through a secure interface, enabling remote management from any location.

Cisco Fabric Manager can be used independently or in conjunction with third-party management applications. Cisco provides an extensive API for integration with third-party and user-developed management tools.

Advanced Software Packages

The Cisco MDS 9216A can be further enhanced through additional software packages that offer advanced intelligence and functionality. Currently available software packages include the following:

- Cisco Enterprise Package—The Cisco Enterprise Package includes a set of traffic engineering and advanced security features such as Inter-VSAN Routing, QoS, switch-switch and host-switch authentication, LUN zoning, and read-only zones that are recommended for enterprise SANs.
- SAN Extension over IP Package—The Cisco SAN Extension over IP Package provides an integrated, cost-effective, and reliable business continuance solution that uses IP infrastructure by offering FCIP for remote SAN extension, along with a variety of advanced features to optimize the performance and manageability of FCIP links.
- Cisco Mainframe Package—The Cisco Mainframe Package is a comprehensive collection of features required for using the Cisco MDS 9500 and MDS 9200 series switches in mainframe storage networks, including FICON protocol, Control Unit Port (CUP) management, switch cascading, fabric binding, and intermixing.
- Cisco Fabric Manager Server Package—The Cisco Fabric Manager Server (FMS) Package extends Cisco Fabric Manager by providing historical performance monitoring for network traffic hot-spot analysis, centralized management services, and advanced application integration.

Versatile Expansion

The modular design of the Cisco MDS 9216A gives it the ability to support current and future Cisco MDS 9000 Family switching or services modules. Currently available modules include the following:

- 16-port and 32-port 2-Gbps Fibre Channel switching modules
- 12-port, 24-port, and 48-port 4-Gbps Fibre Channel switching modules
- 4-port 10-Gbps Fibre Channel Switching Module
- The IP Services Modules, supporting iSCSI and FCIP over both four and eight ports of Gigabit Ethernet
- The Multiprotocol Services Module, supporting 14 ports of 2-Gbps Fibre Channel and iSCSI and FCIP over two ports of Gigabit Ethernet

- The Storage Services Module, supporting integrated network-hosted application services and 32 2-Gbps Fibre Channel ports

Optionally configurable, these modules give the Cisco MDS 9216A superior functionality and versatility.

PRODUCT SPECIFICATIONS

Table 1 lists the product specifications for the Cisco MDS 9216A.

Table 1. Product Specifications

Feature	Description
Product Compatibility	Cisco MDS 9000 Family
Software Compatibility	Cisco MDS SAN-OS Release 1.3(2) or later
Protocols	Fibre Channel standards – FC-PH, Revision 4.3 (ANSI/INCITS 230-1994) – FC-PH, Amendment 1 (ANSI/INCITS 230-1994/AM1-1996) – FC-PH, Amendment 2 (ANSI/INCITS 230-1994/AM2-1999) – FC-PH-2, Revision 7.4 (ANSI/INCITS 297-1997) – FC-PH-3, Revision 9.4 (ANSI/INCITS 303-1998) – FC-PI, Revision 13 (ANSI/INCITS 352-2002) – FC-PI-2, Revision 10 (ANSI/INCITS 404-2006) – FC-FS, Revision 1.9 (ANSI/INCITS 373-2003) – FC-FS-2, Revision 0.91 – FC-LS, Revision 1.2 – FC-AL, Revision 4.5 (ANSI/INCITS 272-1996) – FC-AL-2, Revision 7.0 (ANSI/INCITS 332-1999) – FC-AL-2, Amendment 1 (ANSI/INCITS 332-1999/AM1-2003) – FC-AL-2, Amendment 2 (ANSI/INCITS 332-1999/AM2-2006) – FC-SW-2, Revision 5.3 (ANSI/INCITS 355-2001) – FC-SW-3, Revision 6.6 (ANSI/INCITS 384-2004) – FC-SW-4, Revision 7.5 (ANSI/INCITS 418-2006) – FC-GS-3, Revision 7.01 (ANSI/INCITS 348-2001) – FC-GS-4, Revision 7.91 (ANSI/INCITS 387-2004) – FC-GS-5, Revision 8.2 – FC-BB, Revision 4.7 (ANSI/INCITS 342-2001) – FC-BB-2, Revision 6.0 (ANSI/INCITS 372-2003) – FC-BB-3, Revision 6.8 (ANSI/INCITS 414-2006) – FCP, Revision 12 (ANSI/INCITS 269-1996) – FCP-2, Revision 8 (ANSI/INCITS 350-2003) – FCP-3, Revision 4 (ANSI/INCITS 416-2006) – FC-SB-2, Revision 2.1 (ANSI/INCITS 349-2001) – FC-SB-3, Revision 1.6 (ANSI/INCITS 374-2003) – FC-VI, Revision 1.84 (ANSI/INCITS 357-2002) – FC-FLA, Revision 2.7 (INCITS TR-20-1998) – FC-PLDA, Revision 2.1 (INCITS TR-19-1998) – FC-Tape, Revision 1.17 (INCITS TR-24-1999)

Feature	Description
	– FC-MI, Revision 1.92 (INCITS TR-30-2002) – FC-MI-2, Revision 2.6 (INCITS TR-39-2005) – FC-SP, Revision 1.6 – FC-DA, Revision 3.1 (INCITS TR-36-2004) – FAIS, Revision 0.7 IP over Fibre Channel (RFC 2625) IPv6, IPv4 and ARP over FC (RFC 4338) Extensive IETF-standards based TCP/IP, SNMPv3, and remote monitoring (RMON) MIBs Class of Service: Class 2, Class 3, Class F Fibre Channel standard port types: E, F, FL, B Fibre Channel enhanced port types: SD, ST, TE
Cards, Ports, Slots	Base: 16 fixed autosensing 1/2-Gbps Fibre Channel ports Expansion: 1 empty expansion slot
Features and Functions	
Fabric Services	Name server Internet Storage Name Server (iSNS) Registered State Change Notification (RSCN) Login services Fabric Configuration Server (FCS) Private loop Public loop Translative loop Broadcast In-order delivery
Advanced Functionality	VSAN Inter-VSAN Routing PortChannel with Multipath Load Balancing QoS-flow-based, zone-based Fibre Channel Congestion Control
Diagnostics and Troubleshooting Tools	POST diagnostics Online diagnostics Internal port loopbacks SPAN and Remote SPAN Fibre Channel Traceroute Fibre Channel Ping Fibre Channel Debug Cisco Fabric Analyzer Syslog Online system health Port-level statistics Real-Time Protocol Debug
Network Security	VSANs ACLs Per-VSAN role-based access control Fibre Channel Zoning – N_Port WWN – N_Port FC-ID – Fx_Port WWN

<table>
<tr><th>Feature</th><th>Description</th></tr>
<tr><td></td><td>– Fx_Port WWN and interface index
– Fx_Port domain ID and interface index
– Fx_Port domain ID and port number
– LUN
– Read-only
– Broadcast
FC-SP
– DH-CHAP switch-switch authentication
– DH-CHAP host-switch authentication
Port Security and Fabric Binding
Management access
– SSHv2 implementing AES
– SNMPv3 implementing AES
– SFTP</td></tr>
<tr><td>FICON</td><td>FC-SB-3 compliant
Cascaded FICON fabrics
Intermix of FICON and Fibre Channel FCP traffic
UP management interface</td></tr>
<tr><td>Serviceability</td><td>Configuration file management
Call Home
Power management LEDs
Port beaconing
System LED
SNMP traps for alerts
Network boot</td></tr>
<tr><td>Performance</td><td>Port speed: 1/2-Gbps autosensing, optionally configurable
Buffer credits: up to 255 per port
Ports per chassis: 16 fixed configuration. Up to 64 Fibre Channel ports, up to eight 1-Gbps Ethernet ports when configured with optional module
Ports per rack: up to 896 when configured with optional module
PortChannel: up to 16 ports
Supported optics, media, and transmission distances (fixed-configuration Fibre Channel ports):
<table>
<tr><th>Optics:</th><th>Media:</th><th>Distance:</th></tr>
<tr><td>1-Gbps-SW, LC SFP</td><td>• 50/125-micron multimode</td><td>• 500 m</td></tr>
<tr><td>1-Gbps-SX, LC SFP</td><td>• 50/125-micron multimode</td><td>• 550 m</td></tr>
<tr><td>1-Gbps-SW, LC SFP</td><td>• 62.5/125-micron multimode</td><td>• 300 m</td></tr>
<tr><td>1-Gbps-SX, LC SFP</td><td>• 62.5/125-Micron Multimode</td><td>• 275 M</td></tr>
<tr><td>1-Gbps-LW, LC SFP</td><td>• 9/125-Micron Single-Mode</td><td>• 10 Km</td></tr>
<tr><td>1-Gbps-LX/LH, LC SFP</td><td>• 9/125 or 10/125-Micron Single-Mode</td><td>• 10 Km</td></tr>
<tr><td>1-Gbps-CWDM, LC SFP</td><td>• 9/125-Micron Single-Mode</td><td>• 100 Km</td></tr>
<tr><td>2-Gbps-SW, LC SFP</td><td>• 50/125-Micron Multimode</td><td>• 300 M</td></tr>
<tr><td>2-Gbps-SW, LC SFP</td><td>• 62.5/125-Micron Multimode</td><td>• 150 M</td></tr>
<tr><td>2-Gbps-LW, LC SFP</td><td>• 9/125-Micron Single-Mode</td><td>• 10 Km</td></tr>
<tr><td>2-Gbps-CWDM, LC SFP</td><td>• 9/125-Micron Single-Mode</td><td>• 100 Km</td></tr>
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Feature	Description
Reliability and Availability	Hot-swappable, 1+1 redundant power supplies Hot-swappable fan tray with integrated temperature and power management Hot-swappable SFP optics Hot-swappable switching module Passive backplane Stateful process restart Any module, any port configuration for PortChannels Fabric-based multipathing Per-VSAN fabric services Port tracking Virtual Routing Redundancy Protocol (VRRP) for management Online diagnostics
Network Management	Access methods – Out-of-band 10/100 Ethernet port – RS-232 serial console port – In-band IP over Fibre Channel – DB-9 COM port – In-band FICON CUP over Fibre Channel Access protocols – CLI—using console and Ethernet ports – SNMPv3—using Ethernet port and in-band IP over Fibre Channel access – Storage Networking Industry Association (SNIA) Storage Management Initiative Specification (SMI-S) – FICON CUP Distributed Device Alias service Network security – Per-VSAN role-based access control using RADIUS-based and TACACS+-based authentication, authorization, and accounting (AAA) functions – SFTP – SSHv2 implementing AES – SNMPv3 implementing AES Management applications – Cisco MDS 9000 Family CLI – Cisco Fabric Manager – Cisco Device Manager – CiscoWorks Resource Manager Essentials (RME) and Device Fault Manager (DFM)
Programming Interfaces	Scriptable CLI Fabric Manager GUI Device Manager GUI

Feature	Description
Environmental	Temperature, ambient operating: 32 to 104℉ (0 to 4 0℃) Temperature, ambient nonoperating and storage: 40 to 158℉ (40 to 75℃) Relative humidity, ambient (noncondensing) operating: 10 to 90% Relative humidity, ambient (noncondensing) nonoperating and storage: 10 to 95% Altitude, operating: -197 to 6500 ft (60 to 2000 m)
Physical Dimensions	Dimensions (H x W x D): 5.25 x 17.32 x 22.66 in. (13.34 x 43.99 x 57.56 cm), 3 RU – All units rack mountable in standard 19 in. EIA rack Weight – Fully configured chassis with optional switching module: 70 lb (32 kg)
Power and Cooling	Power supply (845WAC) – AC input characteristics –100 to 240 VAC (10% range) –50 to 60 Hz (nominal) Airflow – 200 linear feet per minute (lfm) through system fan assembly – Cisco recommends that you maintain a minimum air space of 2.5 in. (6.4 cm) between walls and chassis air vents and a minimum horizontal separation of 6 in. (15.2 cm) between two chassis to prevent overheating.
Approvals and Compliance	Safety compliance – CE Marking – UL 60950 – CAN/CSA-C22.2 No. 60950 – EN 60950 – IEC 60950 – TS 001 – AS/NZS 3260 – IEC60825 – EN60825 – 21 CFR 1040 EMC compliance – FCC Part 15 (CFR 47) Class A – ICES-003 Class A – EN 55022 Class A – CISPR 22 Class A – AS/NZS 3548 Class A – VCCI Class A – EN 55024 – EN 50082-1 – EN 61000-6-1 – EN 61000-3-2 – EN 61000-3-3

ORDERING INFORMATION

Table 2 lists ordering information for the Cisco MDS 9216A.

Table 2. Ordering Information

Part Number	Product Name
DS-C9216A-K9	Cisco MDS 9216A Multilayer Fabric Switch
Optional Switching Modules, SFPs	
DS-X9016	Cisco MDS 9000 Family 16-Port 1/2-Gbps Fibre Channel Module, SFP/LC
DS-X9032	Cisco MDS 9000 Family 32-Port 1/2-Gbps Fibre Channel Module, SFP/LC
DS-X9032-SSM	Cisco MDS 9000 Family 32-Port Storage Services Module
DS-X9112	Cisco MDS 9000 Family 1/2/4-Gbps 12-Port Fibre Channel Switching Module
DS-X9124	Cisco MDS 9000 Family 1/2/4-Gbps 24-Port Fibre Channel Switching Module
DS-X9148	Cisco MDS 9000 Family 1/2/4-Gbps 48-Port Fibre Channel Switching Module
DS-X9302-14K9	Cisco MDS 9000 Family 14/2-Port Multiprotocol Services Module
DS-X9304-SMIP	Cisco MDS 9000 Family 4-Port 1-Gigabit Ethernet IP Storage Services Module
DS-X9308-SMIP	Cisco MDS 9000 Family 8-Port 1-Gigabit Ethernet IP Storage Services Module
DS-X9704	Cisco MDS 9000 Family 10-Gbps 4-Port Fibre Channel Switching Module
DS-SFP-FC-2G-SW	Cisco MDS 9000 Family 1/2-Gbps Fibre Channel—Shortwave, SFP, LC (Supported only with 1/2-Gbps FC modules)
DS-SFP-FCGE-SW	Cisco MDS 9000 Family Gigabit Ethernet, 1/2-Gbps Fibre Channel—Shortwave, SFP, LC (Supported only with 1/2-Gbps FC modules, IP Storage Services Modules, and Multiprotocol Services Modules)
DS-SFP-FCGE-LW	Cisco MDS 9000 Family Gigabit Ethernet, 1/2-Gbps Fibre Channel—Longwave, SFP, LC (Supported only with 1/2-Gbps FC modules, IP Storage Services Modules, and Multiprotocol Services Modules)
DS-SFP-GE-T	Gigabit Ethernet Copper SFP, RJ-45 (Supported only with Gigabit Ethernet ports)
DS-SFP-FC4G-SW	Cisco MDS 9000 Family 1/2/4-Gbps Fibre Channel—Shortwave, SFP, LC (Supported only with 1/2/4-Gbps FC modules)
DS-SFP-FC-2G-LW	Cisco MDS 9000 Family 1/2-Gbps Fibre Channel—Longwave, SFP, LC (Supported only with 1/2-Gbps FC modules)
DS-SFP-FC4G-MR	Cisco MDS 9000 Family 1/2/4-Gbps Fibre Channel—Longwave, SFP, LC (4-km reach) (Supported only with 1/2/4-Gbps FC modules)
DS-SFP-FC4G-LW	Cisco MDS 9000 Family 1/2/4-Gbps Fibre Channel—Longwave, SFP, LC (10-km reach) (Supported only with 1/2/4-Gbps FC modules)
DS-X2-FC10G-SR	10-Gbps Fibre Channel—SR X2 Transceiver (Supported only with 10-Gbps FC modules)
DS-X2-FC10G-LR	10-Gbps Fibre Channel—LR X2 Transceiver (Supported only in 1/2/4-Gbps FC modules)
Advanced Software Packages	
M9200EXT12K9	Cisco MDS 9200 SAN Extension over IP Package for Cisco MDS 9000 Family 14/2-Port Multiprotocol Services Module
M9200EXT1K9	Cisco MDS 9200 SAN Extension over IP Package for Cisco MDS 9000 Family 8-Port 1-Gigabit Ethernet IP Storage Services Module
M9200EXT14K9	Cisco MDS 9200 SAN Extension over IP Package for Cisco MDS 9000 Family 4-Port 1-Gigabit Ethernet IP Storage Services Module
M9200ENT1K9	Cisco MDS 9200 Series Enterprise Package
M9200FMS1K9	Cisco MDS 9200 Series Fabric Manager Server Package
M9200FIC1K9	Cisco MDS 9200 Series Mainframe Package

Part Number	Product Name
M9200SSE1K9	Cisco MDS 9200 Storage Services Enabler Package for the Cisco MDS 9000 Family Advanced Services Module or the Cisco MDS 9000 Family Storage Services Module
Spare Components	
DS-2SLOT-FAN=	Cisco MDS 9200 fan module, spare
DS-CAC-845W=	Cisco MDS 9200 AC power supply—845 W, spare
DS-X9016=	Cisco MDS 9000 Family 16-Port 1/2-Gbps Fibre Channel Module, SFP/LC, Spare
DS-X9032=	Cisco MDS 9000 Family 32-Port 1/2-Gbps Fibre Channel Module, SFP/LC
DS-X9032-SSM=	Cisco MDS 9000 Family 32-Port Storage Services Module, Spare
DS-X9112=	Cisco MDS 9000 Family 1/2/4-Gbps 12-Port Fibre Channel Switching Module, Spare
DS-X9124=	Cisco MDS 9000 Family 1/2/4-Gbps 24-Port Fibre Channel Switching Module, Spare
DS-X9148=	Cisco MDS 9000 Family 1/2/4-Gbps 48-Port Fibre Channel Switching Module, Spare
DS-X9302-14K9=	Cisco MDS 9000 Family 14/2-Port Multiprotocol Services Module, Spare
DS-X9304-SMIP=	Cisco MDS 9000 Family 4-Port 1-Gigabit Ethernet IP Storage Services Module, Spare
DS-X9308-SMIP=	Cisco MDS 9000 Family 8-Port 1-Gigabit Ethernet IP Storage Services Module, Spare
DS-X9704=	Cisco MDS 9000 Family 10-Gbps 4-Port Fibre Channel Switching Module, Spare
DS-SFP-FC-2G-SW=	Cisco MDS 9000 Family 1/2-Gbps Fibre Channel—Shortwave, SFP, LC, Spare (Supported only with 1/2-Gbps FC modules)
DS-SFP-FC-2G-LW=	Cisco MDS 9000 Family 1/2-Gbps Fibre Channel—Longwave, SFP, LC, Spare (Supported only with 1/2-Gbps FC modules)
DS-SFP-FCGE-SW=	Cisco MDS 9000 Family 1-Gbps Ethernet, 1/2-Gbps Fibre Channel—Shortwave, SFP, LC, Spare (Supported only with 1/2-Gbps FC modules, IP Storage Services Modules, and Multiprotocol Services Modules)
DS-SFP-FCGE-LW=	Cisco MDS 9000 Family 1-Gbps Ethernet, 1/2-Gbps Fibre Channel—Longwave, SFP, LC, Spare (Supported only with 1/2-Gbps FC modules, IP Storage Services Modules, and Multiprotocol Services Modules)
DS-SFP-GE-T=	Gigabit Ethernet Copper SFP, RJ-45, Spare (Supported only with Gigabit Ethernet ports)
DS-SFP-FC4G-SW=	Cisco MDS 9000 Family 1/2/4-Gbps Fibre Channel—Shortwave, SFP, LC, Spare (Supported only with 1/2/4-Gbps FC modules)
DS-SFP-FC4G-MR=	Cisco MDS 9000 Family 1/2/4-Gbps Fibre Channel—Longwave, SFP, LC (4-km reach), Spare (Supported only with 1/2/4-Gbps FC modules)
DS-SFP-FC4G-LW=	Cisco MDS 9000 Family 1/2/4-Gbps Fibre Channel—Longwave, SFP, LC (10-km reach), Spare (Supported only with 1/2/4-Gbps FC modules)
DS-X2-FC10G-SR=	10-Gbps Fibre Channel—SR X2, Spare (Supported only with 10-Gbps FC modules)
DS-X2-FC10G-LR=	10-Gbps Fibre Channel—LR X2, Spare (Supported only with 10-Gbps FC modules)
M9200EXT12K9=	Cisco MDS 9200 SAN Extension over IP Package for Cisco MDS 9000 Family 14/2-Port Multiprotocol Services Module, Spare
M9200EXT1K9 =	Cisco MDS 9200 SAN Extension over IP Package for Cisco MDS 9000 Family 8-Port 1-Gigabit Ethernet IP Storage Services Module, Spare
M9200EXT14K9=	Cisco MDS 9200 SAN Extension over IP Package for Cisco MDS 9000 Family 4-Port 1-Gigabit Ethernet IP Storage Services Module, Spare
M9200ENT1K9=	Cisco MDS 9200 Series Enterprise Package, Spare
M9200FMS1K9=	Cisco MDS 9200 Series Fabric Manager Server Package, Spare
M9200FIC1K9=	Cisco MDS 9200 Series Mainframe Package, Spare
M9200SSE1K9=	Cisco MDS 9200 Storage Services Enabler Package for the Cisco MDS 9000 Family Advanced Services Module or the

Part Number	Product Name
	Cisco MDS 9000 Family Storage Services Module, Spare
DS-CWDM-1470=	Cisco 1470 NM CWDM Gigabit Ethernet and 1/2-Gbps Fibre Channel SFP, Spare
DS-CWDM-1490=	Cisco 1490 NM CWDM Gigabit Ethernet and 1/2-Gbps Fibre Channel SFP, Spare
DS-CWDM-1510=	Cisco 1510 NM CWDM Gigabit Ethernet and 1/2-Gbps Fibre Channel SFP, Spare
DS-CWDM-1530=	Cisco 1530 NM CWDM Gigabit Ethernet and 1/2-Gbps Fibre Channel SFP, Spare
DS-CWDM-1550=	Cisco 1550 NM CWDM Gigabit Ethernet and 1/2-Gbps Fibre Channel SFP, Spare
DS-CWDM-1570=	Cisco 1570 NM CWDM Gigabit Ethernet and 1/2-Gbps Fibre Channel SFP, Spare
DS-CWDM-1590=	Cisco 1590 NM CWDM Gigabit Ethernet and 1/2-Gbps Fibre Channel SFP, Spare
DS-CWDM-1610=	Cisco 1610 NM CWDM Gigabit Ethernet and 1/2-Gbps Fibre Channel SFP, Spare

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FOR MORE INFORMATION

For more information about the Cisco MDS 9216A, visit http://www.cisco.com/en/US/products/hw/ps4159/ps4358/index.html or contact your local account representative.

Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
168 Robinson Road
#28-01 Capital Tower
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

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