

Cisco MDS 9222i Multiservice Modular Switch

Product Overview

The Cisco® MDS 9222i Multiservice Modular Switch (Figure 1), the next generation of the highly flexible, industry-leading, proven Cisco MDS 9200 Series Multilayer Switches, is an optimized platform for deploying high-performance SAN extension solutions, distributed intelligent fabric services, and cost-effective multiprotocol connectivity for both open and mainframe environments. With a compact form factor, modularity, 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.

Sharing a consistent architecture with the Cisco MDS 9500 Series Multilayer Directors, the Cisco MDS 9222i offers 18 4-Gbps Fibre Channel ports and 4 Gigabit Ethernet IP storage services ports and a modular expansion slot to host Cisco MDS 9000 Family switching and services modules. The SAN Extension over IP feature set is enabled by default on the 4 Gigabit Ethernet IP storage services ports, enabling features such as Fibre Channel over IP (FCIP) and compression on the switch without the need for additional licenses.

As the storage network continues to expand, the Cisco MDS 9000 Family switching modules can be removed from the Cisco MDS 9222i modular switches and migrated to Cisco MDS 9500 Series directors, providing high flexibility, smooth migration, common sparing, and outstanding investment protection.

Figure 1. Cisco MDS 9222i Multiservice Modular Switch



Main Features and Benefits

The Cisco MDS 9222i provides unique multilayer and multiprotocol functions in a compact form factor:

- **High-density Fibre Channel switch with integrated multiprotocol support:** The Cisco MDS 9222i offers 18 4-Gbps Fibre Channel interfaces for high-performance SAN connectivity and 4 Gigabit Ethernet ports for Fibre Channel over IP (FCIP) and Small Computer System Interface over IP (iSCSI) storage services. The Cisco MDS 9222i has the flexibility to scale up to a 66-port Fibre Channel switch with the Cisco 48-Port 4-Gbps Fibre Channel Switching Module for both open and IBM Fiber Connection (FICON) environments.
- **High-density connectivity through 8-Gbps Fibre Channel ports:** Cisco MDS 9222i supports the Cisco MDS 9000 4/44-Port 8-Gbps Host-Optimized Fibre Channel Switching Module which delivers a high density, cost effective connectivity option.
- **Integrated hardware-based virtual fabric isolation with virtual SANs (VSANs) and Fibre Channel routing with Inter-VSAN Routing (IVR):** VSANs and IVR enable deployment of large-scale multisite and heterogeneous SAN topologies. Integration into port-level hardware allows any port in a system or in a fabric to be partitioned into any VSAN. Integrated IVR provides line-rate routing between any of the ports in a system or in a fabric without the need for external routing appliances.

- **Remote SAN extension with high-performance FCIP:**
 - Simplifies data protection and business continuance strategies by enabling backup, remote replication, and other disaster-recovery services over WAN distances using open-standards FCIP tunneling
 - Optimizes utilization of WAN resources for backup and replication by enabling hardware-based compression, hardware-based encryption, FCIP write acceleration, and FCIP tape read and write acceleration; up to 16 virtual Inter-Switch Link (ISL) connections are provided on the 4 Gigabit Ethernet port through tunneling
 - Preserves Cisco MDS 9000 Family enhanced capabilities, including VSANs, IVR, advanced traffic management, and network security across remote connections
- **Cost-effective iSCSI connectivity to Ethernet-attached servers:**
 - Extends the benefits of Fibre Channel SAN-based storage to Ethernet-attached servers at a lower cost than is possible using Fibre Channel interconnect alone
 - Increases storage utilization and availability through consolidation of IP and Fibre Channel block storage
 - Through transparent operation, preserves the capability of existing storage management applications
- **Advanced FICON services:** The Cisco MDS 9222i supports FICON environments, including cascaded FICON fabrics, VSAN-enabled intermix of mainframe and open systems environments, and N-port ID virtualization (NPIV) for mainframe Linux partitions. IBM Control Unit Port (CUP) support enables in-band management of Cisco MDS 9200 Series switches from the mainframe management console.
- **Integrated Cisco Storage Media Encryption (SME) as distributed fabric service:** Natively supported on the Cisco MDS 9222i, Cisco SME encrypts data at rest on heterogeneous tape drives and virtual tape libraries (VTLs) in a SAN environment using secure IEEE standard Advanced Encryption Standard (AES) 256-bit algorithms. Cisco MDS 9222i helps ensure ease of deployment, scalability, and high availability by using innovative technology to transparently offer Cisco SME capabilities to any device connected to the fabric without the need for reconfiguration or rewiring. Cisco SME provisioning and key management are both integrated into the Cisco Fabric Manager; no additional software is required.
- **Integrated Cisco Data Mobility Manager (DMM):** Natively support on the Cisco MDS 9222i, Cisco DMM enables data migration between heterogeneous targets.
- **Platform for intelligent fabric applications:**
 - Cisco MDS 9222i provides hosting and acceleration of storage applications such as network-hosted volume management, data migration, and backup natively on the supervisor or with the Cisco MDS 9000 18/4-Port Multiservice Module (MSM) or a Cisco MDS 9000 Storage Services Module (SSM) installed in the expansion slot.
 - The Cisco MDS 9222i native supervisor, MDS 9000 18/4-Port Multiservice Module, and MDS 9000 Storage Services Module use the SANTap protocol to assist third-party applications in the fabric.
 - Higher performance for intelligent fabric applications is provided on the Cisco MDS 9222i using the Cisco MDS 9000 16-Port Storage Services Node (SSN).
 - The Cisco MDS 9000 16-Port Storage Services Node initially supports FCIP SAN extension, Cisco SME for tape, and I/O Accelerator (IOA) services and will have other application support in the future. This module has four times the performance of the Cisco MDS 9000 18/4-Port Multiservice Module and has the capability to host four homogeneous or heterogeneous applications concurrently.
- **In Service Software Upgrade (ISSU) for Fibre Channel interfaces:** Cisco MDS 9222i promotes high serviceability by allowing Cisco MDS 9000 SAN-OS Software to be upgraded while the Fibre Channel ports are carrying traffic.

- **Intelligent network services:** Cisco MDS 9222i 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 and fabric-wide quality of service (QoS) to facilitate migration from SAN islands to enterprise-wide storage networks.
- **High-performance ISLs:** Cisco MDS 9222i supports up to 16 Fibre Channel links in a single PortChannel. Links can span any port on any module in a chassis for added scalability and resilience. Up to 4095 buffer-to-buffer credits can be assigned to a single Fibre Channel port to extend storage networks over very long distances.
- **Comprehensive network security framework:** The Cisco MDS 9222i supports RADIUS and TACACS+, Fibre Channel Security Protocol (FC-SP), Secure File Transfer Protocol (SFTP), Secure Shell (SSH) Protocol, Simple Network Management Protocol Version 3 (SNMPv3) implementing AES, VSANs, hardware-enforced zoning, ACLs, and per-VSAN role-based access control (RBAC). Additionally, the Gigabit Ethernet ports offer IP Security (IPsec) authentication, data integrity, and hardware-assisted data encryption for FCIP and iSCSI.
- **IP Version 6 (IPv6) capable:** The Cisco MDS 9222i supports IPv6 as mandated by the U.S. Department of Defense (DoD), Japan, and China. IPv6 support is provided for FCIP, iSCSI, and management traffic routed in band and out of band.
- **Sophisticated diagnostics:** The Cisco MDS 9222i 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.

VSANs

Ideal for efficient, secure SAN consolidation, VSANs enable 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 helping ensure complete segregation of traffic and retaining independent control of configuration on a VSAN-by-VSAN basis.

IVR

In another step toward deploying efficient, cost-effective, consolidated storage networks, the Cisco MDS 9222i supports IVR, the industry's first routing function 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.

FCIP for Remote SAN Extension

Data distribution, data protection, and business continuance services are significant components of today's information-centric businesses. The capability to efficiently replicate critical data on a global scale not only helps ensure a higher level of data protection for valuable corporate information, but also increases utilization of backup resources and lowers total cost of storage ownership.

- Building on Cisco expertise and knowledge of IP networks, the Cisco MDS 9222i switch uses open-standards FCIP to break the distance barrier of current Fibre Channel solutions, enabling interconnection of SAN islands over extended distances.

- The Cisco MDS 9222i dramatically enhances hardware-based FCIP compression performance for both high-bandwidth and low-bandwidth links, providing immediate cost savings for expensive WAN infrastructure. The Cisco MDS 9222i achieves up to a 43:1 compression ratio, with typical ratios of 4:1 over a wide variety of data sources.
- The Cisco MDS 9222i supports hardware-based IPsec encryption for secure transmission of sensitive data over extended distances. Hardware enablement of IPsec helps ensure high throughput. Used together, hardware-based compression and hardware-based encryption provide high-performance, highly secure SAN extension capabilities.

I/O Accelerator (IOA) Services

The Cisco MDS 9222i supports I/O accelerator services, a feature set that can significantly improve application performance when storage traffic is extended across long distances. When Fibre Channel and FCIP write acceleration is enabled, WAN throughput is optimized through reduced latency for command acknowledgments. Similarly, the Cisco MDS 9222i supports Fibre Channel and FCIP tape write acceleration, which allows operation at nearly full throughput over WAN links for remote tape backup and restore operations.

IOA can be deployed in conjunction with disk data replication solutions to extend the distance between data centers or reduce the effects of latency. IOA can also be used to enable remote tape backup and restore operations without significant throughput degradation. The main features of IOA include:

- Fabric service; extends acceleration service as a fabric service to any port in the fabric regardless of where it is attached
- Fibre Channel write acceleration (FC-WA) and Fibre Channel tape acceleration (FC-TA)
- FCIP write acceleration (FCIP-WA) and FCIP tape acceleration (FCIP-TA)
- Fibre Channel and FCIP compression
- High availability using PortChannels with acceleration over Fibre Channel and FCIP
- Unified solution for disk and tape I/O acceleration over metropolitan area networks (MANs) and WANs
- Speed-independent acceleration; accelerates 1/2/4/8/10-Gbps links and consolidates traffic over 8/10-Gigabit ISLs

Cisco SME

The services provided by Cisco SME are mandatory in today's SANs as a result of enactment of recent regulations that require companies to store and protect data at rest for a specified number of years while publicly disclosing security breaches.

- Cisco SME enables data on tapes and VTLs to be compressed, encrypted, and authenticated for centralized security management and data management and recovery.
- Cisco SME is supported in the fixed slot of the Cisco MDS 9222i, and its performance can be scaled up with either a Cisco MDS 9000 18/4-Port Multiservice Module.
- Cisco SME services employ clustering technology to create a highly available solution. The cryptographic cluster formed enhances reliability and availability, provides automated load balancing and failover capabilities, and simplifies provisioning as a single SAN fabric service rather than as individual switches or modules.
- The Cisco Key Management Center (KMC) provides comprehensive key management for Cisco SME, with support for single- and multiple-site deployments. Cisco KMC provides essential features such as key archival, secure export and import and translation for distribution, and key shredding.

Cisco DMM

Natively supported on the Cisco MDS 9222i, Cisco DMM is a fabric-based data migration solution that transfers block data nondisruptively across heterogeneous storage volumes and across distances, whether the host is online or offline. This data center-class solution helps mitigate the challenges experienced in migrating data, such as downtime, the need to add data migration software to servers, and the potential for data loss and corruption. By simply enabling the Cisco DMM feature on Cisco MDS 9222i located anywhere in the SAN, data migration can be configured without host agents, without rewiring, with little effect on performance, and without downtime.

Platform for Intelligent Fabric Applications

The Cisco MDS 9222i 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, and network-hosted volume management. Hosting 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 9222i 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 9222i 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 intermixing of SAN resources among IBM z/OS, mainframe Linux, and open systems environments, enabling 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 that a misconfiguration or component failure in one VSAN will affect 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 command-line interface (CLI); or IBM CUP-enabled management tools, including SA/390, Resource Measurement Facility (RMF), and Dynamic Channel Path Management (DCM).

Advanced Traffic Management

The following advanced traffic-management capabilities are integrated into the Cisco MDS 9222i to 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
- **Up to 4095 buffer-to-buffer credits:** Can be assigned to an individual port for optimal bandwidth utilization across long distances
- **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, helping ensure 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:** Provides an end-to-end, feedback-based congestion control mechanism that augments the Fibre Channel buffer-to-buffer credit mechanism to provide enhanced traffic management

Comprehensive Solution for Robust Network Security

To address the need for failure-proof security in storage networks, the Cisco MDS 9222i offers an extensive security framework to protect highly sensitive data crossing today's enterprise networks:

- Intelligent packet inspection is provided at the port level, including the application of ACLs for hardware enforcement of zones, VSANs, and advanced port security features.
- Extended zoning capabilities are provided to help ensure that logical unit numbers (LUNs) can be accessed only by specific hosts (LUN zoning), to limit SCSI read commands for a certain zone (read-only zoning), and to restrict broadcasts to only selected zones (broadcast zones).
- VSANs offer higher security and greater stability by providing complete isolation among devices that are connected to the same physical SAN.
- FC-SP provides switch-switch and host-switch Diffie-Hellman Challenge Handshake Authentication Protocol (DH-CHAP) authentication supporting RADIUS and TACACS+ to help ensure that only authorized devices access protected storage networks.
- Comprehensive IPsec protocol suite delivers secure authentication, data integrity, and hardware-based encryption for both FCIP and iSCSI deployments.

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 9000 Family integrates the industry's most advanced analysis and diagnostic tools. Power-on self-test (POST) and online diagnostics provide proactive health monitoring. The Cisco MDS 9222i implements diagnostic capabilities such as Fibre Channel traceroute to detail the exact path and timing of flows, and Switched Port Analyzer (SPAN) to intelligently capture network traffic. After traffic has been captured, it can be analyzed with 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 9000 Family, Cisco delivers a comprehensive toolset for troubleshooting and analysis of storage networks.

Ease of Management

To meet the needs of all users, the Cisco MDS 9222i provides three principal modes of management: the Cisco MDS 9000 Family CLI, Cisco Fabric Manager, and integration with third-party storage management tools.

- The Cisco MDS9222i presents a consistent, logical CLI. Adhering to the syntax of the widely known Cisco IOS® Software CLI, the Cisco MDS 9000 Family CLI is easy to learn and delivers broad management capabilities. It is an extremely efficient and direct interface designed to provide optimal functions for 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 9222i can be further enhanced through additional software packages that offer advanced intelligence and functions. Currently available software packages include the following:

- **Cisco MDS 9000 Enterprise Package:** This package includes a set of traffic engineering and advanced security features such as IVR, QoS, switch-to-switch and host-to-switch authentication, LUN zoning, and read-only zones that are recommended for enterprise SANs.
- **Cisco MDS 9000 Mainframe Package:** This package is a comprehensive collection of features required for using the Cisco MDS 9500 Series and MDS 9200 Series switches in mainframe storage networks, including FICON protocol, CUP management, switch cascading, fabric binding, and intermixing.
- **Cisco Fabric Manager Server (FMS) Package:** This package extends Cisco Fabric Manager by providing historical performance monitoring for network traffic hot-spot analysis, centralized management services, and advanced application integration.
- **Cisco MDS 9000 Storage Media Encryption (SME) Package:** Separate packages for the fixed slot on the Cisco MDS 9222i and for either the Cisco MDS 9000 18/4-Port Multiservice Module or Cisco MDS 9000 16-Port Storage Services Node in the expansion slot enable Cisco SME to secure data stored on heterogeneous tapes and VTLs.
- **Cisco MDS 9000 Data Mobility Manager (DMM) Package:** Separate packages for the fixed slot on the Cisco MDS 9222i and for either the Cisco MDS 9000 18/4-Port Multiservice Module in the expansion slot enable Cisco DMM to perform fabric-based data migration that transfers block data nondisruptively across heterogeneous storage volumes and across distances, regardless of whether the host is online or offline.
- **Cisco MDS 9000 I/O Accelerator (IOA) Services Package:** This package can be used in the fixed slot on the Cisco MDS 9222i and also on either the Cisco MDS 9000 18/4-Port Multiservice Module or Cisco MDS 9000 16-Port Storage Services Node in the expansion slot. This package enables advanced Fibre Channel and FCIP acceleration features.
- **Cisco MDS 9000 SAN Extension over IP Package:** The features in this package are enabled in the fixed slot on the Cisco MDS 9222i by default without the need of a license. This package can scale further by having it enabled in the Cisco MDS 9000 18/4-Port Multiservice Module or the Cisco MDS 9000 16-Port Storage Services Node modules inserted in the empty slot. For these optional IP storage services-enabled modules, the Cisco MDS 9000 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 MDS 9000 Storage Services Enabler:** Storage Services for intelligent fabric applications may be enabled in the in the fixed slot on the Cisco MDS 9222i and also on either the Cisco MDS 9000 18/4-Port Multiservice Module or Cisco MDS 9000 32-Port Storage Services Module placed in the empty slot.

Product Specifications

Table 1 lists the product specifications for the Cisco MDS 9222i.

Table 1. Product Specifications

Feature	Description
Product compatibility	Cisco MDS 9000 Family
Software compatibility	Cisco MDS 9000 SAN-OS Release 3.2(1) or later

<p>Protocols</p>	<ul style="list-style-type: none"> • 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) • 10GFC, Revision 4.0 (ANSI INCITS 364-2003) • 10GFC, Amendment 1 (ANSI INCITS 364-2003/AM1-2007) • FC-FS, Revision 1.9 (ANSI INCITS 373-2003) • FC-FS-2, Revision 1.01 (ANSI INCITS 424-2007) • FC-FS-2, Amendment 1 (ANSI INCITS 424-2007/AM1-2007) • FC-LS, Revision 1.62 (ANSI INCITS 433-2007) • 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 8.51 (ANSI INCITS 427-2007) • 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-SB-3, Amendment 1 (ANSI INCITS 374-2003/AM1-2007) • FC-VI, Revision 1.84 (ANSI INCITS 357-2002) • FC-SP, Revision 1.8 (ANSI INCITS 426-2007) • FAIS, Revision 1.03 (ANSI INCITS 432-2007) • 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) • FC-MI, Revision 1.92 (INCITS TR-30-2002) • FC-MI-2, Revision 2.6 (INCITS TR-39-2005) • FC-DA, Revision 3.1 (INCITS TR-36-2004) • Class of service: Class 2, Class 3, and Class F • Fibre Channel standard port types: E, F, FL, and B • Fibre Channel enhanced port types: SD, ST, and TE • IP over Fibre Channel (RFC 2625) • IPv6, IPv4, and Address Resolution Protocol (ARP) over Fibre Channel (RFC 4338) • Extensive IETF-standards based TCP/IP, SNMPv3, and remote monitoring (RMON) MIBs • IP standards <ul style="list-style-type: none"> ◦ RFC 791 IPv4 ◦ RFC 793 and 1323 TCP ◦ RFC 894 IP/Ethernet ◦ RFC 1041 IP/802 ◦ RFC 792, 950, and 1256 ICMP ◦ RFC 1323 TCP performance enhancements ◦ RFC 2338 VRRP ◦ RFC 2460 and 4291 IPv6 ◦ RFC 2463 and 4443 ICMPv6 ◦ RFC 2461 and 2462 IPv6 neighbor discovery and stateless autoconfiguration ◦ RFC 2464 IPv6/Ethernet
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	<ul style="list-style-type: none"> ◦ RFC 3270 and 3980 iSCSI ◦ RFC 3643 and 3821 FCIP • Ethernet standards <ul style="list-style-type: none"> ◦ IEEE Std 802.3-2005 Ethernet ◦ IEEE Std 802.1Q-2005 VLAN ◦ IPsec ◦ RFC 2401 and 4301 security architecture for IP ◦ RFC 2403 and 2404 HMAC ◦ RFC 2405, 2406, 2451, and 4303 IP ESP ◦ RFC 2407 and 2408 ISAKMP ◦ RFC 2412 OAKLEY Key Determination Protocol ◦ RFC 3566, 3602, and 3686 AES ◦ Internet Key Exchange (IKE) ◦ RFC 2409 IKEv1 ◦ RFC 4306 IKEv2
Cards, ports, and slots	<ul style="list-style-type: none"> • Base: 18 fixed autosensing 1/2/4-Gbps Fibre Channel ports and 4 fixed 1-Gbps Ethernet ports • Expansion: 1 empty expansion slot with support for the following: <ul style="list-style-type: none"> • Cisco 12-, 24-, and 48-port 4-Gbps Fibre Channel Switching Modules • Cisco 4/44-Port 8-Gbps Host-Optimized Fibre Channel Switching Module • Cisco MDS 9000 4-Port 10-Gbps Fibre Channel Switching Module • Cisco MDS 9000 18/4-Port Multiservice Module • Cisco MDS 9000 32-Port Storage Services Module • Cisco MDS 9000 16-Port Storage Services Node • Cisco MDS 9000 8-Port IP Storage Services Module
Features and Functions	
Fabric services	<ul style="list-style-type: none"> • Name server • Internet Storage Name Server (iSNS) • Registered State Change Notification (RSCN) • Login services • Fabric Configuration Server (FCS) • Public loop • Broadcast • In-order delivery
Advanced functions	<ul style="list-style-type: none"> • VSAN • IVR • PortChannel with multipath load balancing • Flow-based and zone-based QoS • Fibre Channel congestion control • FCIP tape read and write acceleration • Cisco SME
Diagnostics and troubleshooting tools	<ul style="list-style-type: none"> • POST diagnostics • Online diagnostics • Internal port loopbacks • SPAN and Remote SPAN (RSPAN) • Fibre Channel traceroute • Fibre Channel ping • Fibre Channel debug • Cisco Fabric Analyzer • Syslog • Online system health • Port-level statistics • Real-Time Protocol (RTP) debug

<p>Network security</p>	<ul style="list-style-type: none"> • VSANs • ACLs • Per-VSAN RBAC • Fibre Channel zoning • N-port worldwide name (WWN) • N-port FC-ID • Fx-port WWN • Fx-port WWN and interface index • Fx-port domain ID and interface index • Fx-port domain ID and port number • LUN • Read-only • Broadcast • iSCSI zoning • iSCSI name • IP address • FC-SP • DH-CHAP switch-to-switch authentication • DH-CHAP host-to-switch authentication • Port security and fabric binding • IPsec for FCIP and iSCSI • IKEv1 and IKEv2 • Management access • SSHv2 implementing AES • SNMPv3 implementing AES • SFTP 		
<p>FICON</p>	<ul style="list-style-type: none"> • FC-SB-3 compliant • Cascaded FICON fabrics • Intermix of FICON and Fibre Channel Protocol traffic • CUP management interface 		
<p>Serviceability</p>	<ul style="list-style-type: none"> • Configuration file management • ISSU for Fibre Channel interfaces • Call home • Power-management LEDs • Port beaconing • System LED • SNMP traps for alerts • Network boot 		
<p>Performance</p>	<ul style="list-style-type: none"> • Port speed: 1/2/4-Gbps autosensing, optionally configurable • Buffer credits: 16 per port (shared-mode ports), up to 250 per port (dedicated-mode ports), and up to 4095 on an individual port (dedicated-mode ports with optional Cisco MDS 9000 Enterprise Package license activated) • Ports per chassis: 18 to 66 Fibre Channel ports and up to 20 Gigabit Ethernet ports • Ports per rack: Up to 980 • PortChannel: Up to 16 physical links • FCIP tunnels: Up to 3 per port 		
	<p>Speed</p>	<p>Media</p>	<p>Distance</p>
<p>Supported Cisco optics, media, and transmission distances (4-Gbps optics modules)</p>	<ul style="list-style-type: none"> • 1-Gbps SW, LC SFP • 1-Gbps SW, LC SFP • 1-Gbps SW, LC SFP • 1-Gbps LW, LC SFP • 2-Gbps SW, LC SFP • 2-Gbps SW, LC SFP • 2-Gbps SW, LC SFP • 2-Gbps LW, LC SFP • 2-Gbps LW, LC SFP • 4-Gbps SW, LC SFP • 4-Gbps SW, LC SFP • 4-Gbps SW, LC SFP • 4-Gbps SW, LC SFP • 4-Gbps MR, LC SFP • 4-Gbps LW, LC SFP 	<ul style="list-style-type: none"> • 50/125-micron multimode (OM3) • 50/125-micron multimode • 62.5/125-micron multimode • 9/125-micron single mode • 50/125-micron multimode (OM3) • 50/125-micron multimode • 62.5/125-micron multimode • 9/125-micron single mode • 50/125-micron multimode (OM3) • 50/125-micron multimode • 62.5/125-micron multimode • 9/125-micron single mode • 9/125-micron single mode 	<ul style="list-style-type: none"> • 860m • 500m • 300m • 10 km • 500m • 300m • 150m • 10 km • 380m • 150m • 70m • 4 km • 10 km

Supported Cisco optics, media, and transmission distances (4-Gbps coarse wavelength-division multiplexing [CWDM] optics modules)	<ul style="list-style-type: none"> • 4-Gbps CWDM, LC SFP 	<ul style="list-style-type: none"> • 9/125-micron single mode 	<ul style="list-style-type: none"> • Up to 25 km (40 km in point-to-point application)
Supported Cisco optics, media, and transmission distances (Ethernet transceivers for Gigabit Ethernet ports)	<ul style="list-style-type: none"> • 1-Gbps SX, LC SFP • 1-Gbps SX, LC SFP • 1-Gbps LX/LH, LC SFP 	<ul style="list-style-type: none"> • 50/125-micron multimode • 62.5/125 micron multimode • 9/125 or 10/125 micron single mode 	<ul style="list-style-type: none"> • 550m • 275m • 10 km
Supported Cisco optics, media, and transmission distances (2-Gbps optics modules supported for Cisco Storage Services Module only)	<ul style="list-style-type: none"> • 1-Gbps SW, LC SFP • 1-Gbps SW, LC SFP • 1-Gbps LW, LC SFP • 2-Gbps SW, LC SFP • 2-Gbps SW, LC SFP • 2-Gbps LW, LC SFP 	<ul style="list-style-type: none"> • 50/125-micron multimode • 62.5/125-micron multimode • 9/125-micron single mode • 50/125-micron multimode • 62.5/125-micron multimode • 9/125-micron single mode 	<ul style="list-style-type: none"> • 500m • 300m • 10 km • 300m • 150m • 10 km
Supported Cisco optics, media, and transmission distances (2-Gbps CWDM optics modules)	<ul style="list-style-type: none"> • 1-Gbps CWDM, LC SFP • 2-Gbps CWDM, LC SFP 	<ul style="list-style-type: none"> • 9/125-micron single mode • 9/125-micron single mode 	<ul style="list-style-type: none"> • Up to 100 km • Up to 100 km
Supported Cisco optics, media, and transmission distances (2-Gbps dense wavelength-division multiplexing [DWDM] optics modules)	<ul style="list-style-type: none"> • 1-Gbps DWDM, LC SFP • 2-Gbps DWDM, LC SFP 	<ul style="list-style-type: none"> • 9/125-micron single mode • 9/125-micron single mode 	<ul style="list-style-type: none"> • Up to 200 km • Up to 200 km
Supported Cisco optics, media, and transmission distances (10-Gbps optics modules supported for Cisco MDS 9000 4-Port 10-Gbps Fibre Channel Switching Module only)	<ul style="list-style-type: none"> • 10-Gbps SR, SC X2 • 10-Gbps SR, SC X2 • 10-Gbps LR, SC X2 • 10-Gbps ER, SC X2 	<ul style="list-style-type: none"> • 50/125-micron multimode (OM3) • 62.5/125-micron multimode • 9/125-micron single mode • 9/125-micron single mode 	<ul style="list-style-type: none"> • 300m • 33m • 10 km • 40 km
Reliability and availability	<ul style="list-style-type: none"> • ISSU • Hot-swappable, 1+1 redundant power supplies • Hot-swappable fan tray with integrated temperature and power management • Hot-swappable Small Form-Factor Pluggable (SFP) optics • Hot-swappable switching module • Passive backplane • Stateful process restart • Any module and any port configuration for PortChannels • Fabric-based multipathing • Per-VSAN fabric services • Port tracking • VRRP for management and FCIP or iSCSI connections • Online diagnostics 		

Network management	<ul style="list-style-type: none"> • 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 the console and Ethernet ports • SNMPv3 using the 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 RBAC using RADIUS 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	<ul style="list-style-type: none"> • Scriptable CLI • Cisco Fabric Manager GUI • Cisco Device Manager GUI
Environmental	<ul style="list-style-type: none"> • Temperature, ambient operating: 32 to 104°F (0 to 40°C) • Temperature, ambient nonoperating and storage: 40 to 158°F (-40 to 75°C) • 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 2000m)
Physical dimensions	<ul style="list-style-type: none"> • 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 rack units (3RUs; all units rack mountable in standard 19-inch Electronic Industries Alliance [EIA] rack) • Weight of fully configured chassis with optional switching module: 62 lb (28.2 kg)
Power and cooling	<ul style="list-style-type: none"> • Power supply: 845W AC • AC input characteristics • 100 to 240V AC (10% range) • 50 to 60 Hz (nominal) • Airflow (side to side) • 200 linear feet per minute (LFM) through system fan assembly • Cisco recommends maintaining 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	<ul style="list-style-type: none"> • 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
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Ordering Information

Table 2 lists ordering information for the Cisco MDS 9222i.

Table 2. Ordering Information

Part Number	Description
DS-C9222i-K9	Cisco MDS 9222i Multiservice Modular Switch
Optional Components	
DS-X9316-SSNK9	Cisco MDS 9000 16-Port Storage Services Node
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-X9304-18K9	Cisco MDS 9000 Family 18/4-Port Multiservice Module
DS-X9308-SMIP	Cisco MDS 9000 Family 8-Port 1-GE IP Storage Services Module
DS-X9704	Cisco MDS 9000 Family 10-Gbps 4-Port Fibre Channel Switching Module
DS-X9248-48K9	Cisco MDS 9000 Family 4/44-Port Host Optimized 8G Fibre Channel 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 ports)
DS-SFP-FC-2G-LW	Cisco MDS 9000 Family 1/2-Gbps Fibre Channel-Longwave, SFP, LC (Supported only with 1/2-Gbps FC ports)
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 ports and IP Services ports)
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 ports and IP Services ports)
DS-SFP-GE-T	Gigabit Ethernet Copper SFP, RJ-45 (Supported only with IP Services 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 ports)
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 ports)
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 ports)
DS-X2-FC10G-SR	10-Gbps Fibre Channel-SR X2 Transceiver (Supported only with 10-Gbps FC ports)

DS-X2-FC10G-LR	10-Gbps Fibre Channel-LR X2 Transceiver (Supported only with 10-Gbps FC ports)
DS-X2-FC10G-ER	10-Gbps Fibre Channel-ER X2 Transceiver (Supported only with 10-Gbps FC ports)
CAB-9K10A-AR	Power Cord, 250VAC 10A IRAM 2073 Plug, Argentina
CAB-9K10A-AU	Power Cord, 250VAC 10A 3112 Plug, Australia
CAB-9K10A-CH	Power Cord, 250VAC 10A GB1002 Plug, China
CAB-9K10A-EU	Power Cord, 250VAC 10A CEE 7/7 Plug, EU
CAB-9K10A-ISR	Power Cord, 250VAC 10A SI16S3 Plug, Israel
CAB-9K10A-IT	Power Cord, 250VAC 10A CEI 23-16/VII Plug, Italy
CAB-9K10A-KOR	Power Cord, 125VAC 13A KSC8305 Plug, Korea
CAB-9K10A-SA	Power Cord, 250VAC 10A SABS 164/1 Plug, South Africa
CAB-9K10A-SW	Power Cord, 250VAC 10A, Straight C15, MP232 Plug, SWITZ
CAB-9K10A-TWN	Power Cord, 125VAC 15A CNS10917-2, Taiwan
CAB-9K10A-UK	Power Cord, 250VAC 13A BS1363 Plug (13 A fuse), UK
CAB-9K12A-NA	Power Cord, 125VAC 15A NEMA 5-15 Plug, North America
CAB-C15-CBN	Cabinet Jumper Power Cord, 250 VAC 16A, C14-C15 Connectors
Advanced Software Packages	
M9200EXT1AK9	Cisco MDS 9200 SAN Extension Over IP package for 18/4-Port Multiservice Module
M9200EXT1K9	Cisco MDS 9200 SAN Extension over IP Package for Cisco MDS 9000 Family 8-Port 1-GE 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
M9200SSE1K9	Cisco MDS 9200 Storage Services Enabler Package for the Cisco MDS 9000 Family Storage Services Module
M9200SME1MK9	Cisco MDS 9200 Storage Media Encryption package for 18/4-Port Multiservice Module
M9200SME1FK9	Cisco MDS 9200 Storage Media Encryption package for Cisco MDS 9222i Multiservice Modular Switch fixed slot
Spare Components	
DS-2SLOT-FAN=	Cisco MDS 9200 Fan Module, spare
DS-CAC-845W=	Cisco MDS 9200 AC power supply-845W, spare
DS-X9316-SSNK9=	Cisco MDS 9000 16-Port Storage Services Node, spare
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-X9304-18K9=	Cisco MDS 9000 Family 18/4-Port Multiservice Module, spare
DS-X9308-SMIP=	Cisco MDS 9000 Family 8-Port 1-GE 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 ports)
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 ports)
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 ports and IP Services ports)
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 ports and IP Services ports)
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 ports)
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 ports)

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 ports)
DS-X2-FC10G-SR=	10-Gbps Fibre Channel-SR X2, spare (Supported only with 10-Gbps FC ports)
DS-X2-FC10G-LR=	10-Gbps Fibre Channel-LR X2, spare (Supported only with 10-Gbps FC ports)
DS-X2-FC10G-ER=	10-Gbps Fibre Channel-ER X2, spare (Supported only with 10-Gbps FC ports)
DS-X2-E10G-SR=	10-Gbps Ethernet-SR X2, spare (Supported only with 10-Gbps FC ports)
DS-CWDM-XXXX=	Cisco XXXX NM CWDM Gigabit Ethernet and 1/2-Gbps Fibre Channel SFP, spare (where XXXX=1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610)
DS-CWDM4GXXXX=	Cisco XXXX NM CWDM 4-Gbps Fibre Channel SFP, spare (where XXXX=1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610)
DWDM-SFP-XXXX=	Cisco XXXX NM DWDM 1/2-Gbps Fibre Channel SFP, spare (where XXXX=6061, 5979, 5898, 5817, 5655, 5575, 5494, 5413, 5252, 5172, 5092, 5012, 4851, 4772, 4692, 4612, 4453, 4373, 4294, 4214, 4056, 3977, 3898, 3819, 3661, 3582, 3504, 3425, 3268, 3190, 3112, 3033)
DS-SCR-K9=	Cisco MDS 9000 Family Smart Card Reader, spare
DS-SC-K9=	Cisco MDS 9000 Family Smart Cards, spare
CAB-9K10A-AR=	Power Cord, 250VAC 10A IRAM 2073 Plug, Argentina, spare
CAB-9K10A-AU=	Power Cord, 250VAC 10A 3112 Plug, Australia, spare
CAB-9K10A-CH=	Power Cord, 250VAC 10A GB1002 Plug, China, spare
CAB-9K10A-EU=	Power Cord, 250VAC 10A CEE 7/7 Plug, EU, spare
CAB-9K10A-ISR=	Power Cord, 250VAC 10A SI16S3 Plug, Israel
CAB-9K10A-IT=	Power Cord, 250VAC 10A CEI 23-16/VII Plug, Italy, spare
CAB-9K10A-KOR=	Power Cord, 125VAC 13A KSC8305 Plug, Korea, spare
CAB-9K10A-SA=	Power Cord, 250VAC 10A SABS 164/1 Plug, South Africa, spare
CAB-9K10A-SW=	AC Power Cord, 250VAC 10A, Straight C15, MP232 Plug, SWITZ, spare
CAB-9K10A-TWN=	Power Cord, 125VAC 15A CNS10917-2, Taiwan, spare
CAB-9K10A-UK=	Power Cord, 250VAC 13A BS1363 Plug (13 A fuse), UK, spare
CAB-9K12A-NA=	Power Cord, 125VAC 15A NEMA 5-15 Plug, North America, spare
CAB-C15-CBN=	Cabinet Jumper Power Cord, 250 VAC 16A, C14-C15 Connectors, 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
M9200XRC=	Cisco MDS 9200 XRC Acceleration Package for IBM series z, spare
M9200EXT1AK9=	Cisco MDS 9200 SAN Extension over IP Package for 18/4-Port Multiservice Module, spare
M9200EXT1K9=	Cisco MDS 9200 SAN Extension over IP Package for Cisco MDS 9000 Family 8-Port 1-GE IP Storage Services Module, spare
M92EXTSSNK9=	Cisco MDS 9200 SAN Extension over IP Package (1 engine) for the 16-Port SSN module in Cisco MDS 9222i, spare
M9200SSE1K9=	Cisco MDS 9200 Storage Services Enabler Package for the Cisco MDS 9000 Family Storage Services Module, spare
M9222iSSE1K9=	Cisco MDS 9200 Storage Services Enabler Package for the Cisco MDS 9222i Multiservice Modular Switch fixed slot, spare
M9200SSE184K9=	Cisco MDS 9200 Storage Services Enabler Package for the Cisco MDS 9000 Family 18/4-Port MSM, spare
M9222iIOA=	Cisco I/O Accelerator Services License for the Cisco MDS 9222i Multiservice Modular Switch fixed slot, spare
M92IOA184=	Cisco I/O Accelerator Services License for 18/4-Port MSM on Cisco MDS 9200, spare
M92IOASSN=	Cisco I/O Accelerator Services License (1 engine) for the 16-Port SSN on Cisco MDS 9200, spare
M9200SME1MK9=	Cisco MDS 9200 Storage Media Encryption Package for 18/4-Port Multiservice Module, spare
M9200SME1FK9=	Cisco MDS 9200 Storage Media Encryption Package for Cisco MDS 9222i Multiservice Modular Switch fixed slot, spare
M92SMESSNK9=	Cisco MDS 9200 Storage Media Encryption Package for 16-Port SSN (1 engine), spare
M92DMMS1K9=	Cisco MDS 9200 Data Mobility Manager (DMM) License for one Storage Services Module, spare
M9222IDMMK9=	Cisco MDS 9222i Multiservice Modular Switch fixed-slot Data Mobility Manager (DMM) License, spare

M9222IDMMTSK9=

Cisco MDS 9222i Multiservice Modular Switch fixed-slot Data Mobility Manager (DMM) License for 180 days, spare

For detailed information about supported transceivers, see [Cisco MDS 9000 Family Pluggable Transceivers](#).

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For More Information

For more information about the Cisco MDS 9222i, visit

<http://www.cisco.com/en/US/products/hw/ps4159/ps4358/index.html> or contact your local account representative.



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