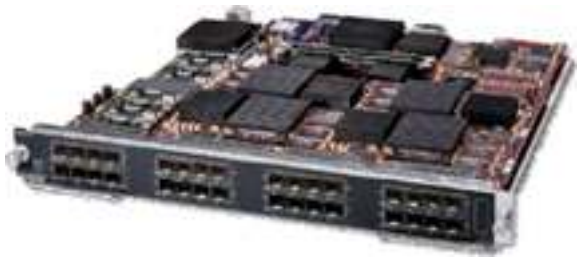
DATA SHEET

CISCO MDS 9000 FAMILY ADVANCED SERVICES MODULE

CISCO MDS 9000 ADVANCED SERVICES MODULE

The Cisco MDS 9000 Family 32-Port Fibre Channel Advanced Services Module enables pooling of heterogeneous storage for increased storage utilization, simplified storage management, and reducing total cost of storage ownership. The Advanced Services Module incorporates all the capabilities of the Cisco MDS 9000 Family 32-Port Fibre Channel Switching Module and also provides scalable, in-band storage virtualization services. Combining a highly distributed processing architecture and integrated VERITAS Storage Foundation for Networks software, the Cisco Advanced Services Module delivers best-in-class virtualization performance, which can be scaled by simply adding modules anywhere in the fabric to meet the performance needs of even the largest enterprises. The Cisco Advanced Services Module is available in a 32-port configuration and accepts the same 2-Gbps Fibre Channel small form-factor pluggable (SFP) optical modules as MDS 9000 Family Fibre Channel switching modules.

Figure 1. Cisco MDS 9000 Advanced Services Module



VERITAS STORAGE FOUNDATION™ FOR NETWORKS SOLUTION DESCRIPTION

VERITAS Storage Foundation for Networks enables companies to simplify the complex IT storage environment and gain control of capital and operating costs by providing consistent and automated management of storage. VERITAS Storage Foundation for Networks can reduce inefficiencies by obscuring the complexities of the underlying environment to create a single pool of storage that is simple to manage. This network-based intelligent software platform improves interoperability, enables consistent administration of multiple classes of storage, and increases utilization. In addition to enhanced manageability, VERITAS Storage Foundation for Networks also increases overall availability through mirroring, point-in-time snapshots, online configuration and re-layout capabilities, and provides multiple paths to storage devices.

Consistent, Centralized Management

VERITAS Storage Foundation for Networks enables a new level of simplicity in managing operating system and storage device heterogeneity. By adding software services such as storage virtualization to the SAN infrastructure, organizations can create a layer of abstraction in the network that masks the complexity of the underlying storage infrastructure. By providing a consistent way to manage all storage, administrators will be able to manage more capacity than if they were required to learn multiple interfaces for different operating systems or storage devices. This ability to consistently manage across platforms also endows businesses with the flexibility to choose the right operating system platform and the proper storage system for a particular application—without having to invest in further training on the underlying infrastructure.

When software intelligence is added to the network itself, management is centralized. Reducing the number of touch points for the administrator reduces implementation risk and further justifies the investment in SAN infrastructure. A single set of advanced copy services,

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such as point-in-time-copy, enable a single copy services command set to be applied across heterogeneous storage. VERITAS Storage Foundation for Networks enables organizations to quickly adapt and scale to meet changing business requirements.

Efficiently Utilize Capacity

By deploying VERITAS Storage Foundation for Networks, an organization can virtually eliminate a common problem associated with storage silos—inefficient capacity utilization. Research from leading storage analysts concludes that storage utilization rates are typically in the 35 to 50 percent range for storage tied to a single application and host. Improving storage utilization rates will allow IT professionals to optimize existing resources, making the return on investment for new or existing projects very attractive.

VERITAS Storage Foundation for Networks can also help to ensure that applications not only get enough capacity, but are also allocated the class of storage they require. VERITAS Storage Foundation for Networks can combine storage of varying tiers and vendors into a single pool, enabling administrators to easily allocate applications the proper class of storage.

Highly Available Data Access

When users need more storage, they want it in a timely manner that does not affect the availability of their applications. VERITAS Storage Foundation for Networks enables the administrator to provision capacity on demand, without removing access to applications and their associated data. Disk storage configuration changes can be performed without interruption, since the servers are isolated from the devices. These configuration changes can be made from a central point of management, increasing the administrator's span of control. The solution provides continuous access to data while updating or upgrading the underlying storage—online storage relayout enables data to be seamlessly migrated to any available underlying storage.

The Advantages of Cisco MDS 9000 Fabric-Based Virtualization Services

Cisco MDS 9000 fabric-based in-line virtualization offers several advantages over other virtualization methods. Cisco MDS 9000 virtualization services can be used by any host that can connect to a SAN without specialized hardware and without a performance impact on the host CPU—and provide a level of security that virtualization in the host cannot.

APPLICATION SCALABILITY THROUGH DISTRIBUTED INTELLIGENCE

The Cisco MDS 9000 Family virtualization architecture overcomes the inherent bottlenecks associated with other virtualization architectures. Virtualization performance can be easily scaled to the level required by even the largest organizations. Simply adding service modules adds virtualization performance and host connectivity in increments of 32 ports. Because Cisco MDS 9000 virtualization is switch-based, any host can access any virtual volume from anywhere in the fabric, independent of the host's attachment point in the SAN. In addition to virtualization services, the Cisco MDS 9000 Advanced Services Module takes advantage of all of the Fibre Channel features and services found on other Cisco MDS 9000 switching modules, and all of the advanced SAN-OS features available on the Cisco MDS 9000 platform—simplifying security, diagnostics, and management.

CISCO MDS 9000 FABRIC-BASED VIRTUALIZATION SERVICES—INTELLIGENT NETWORKING FEATURES

Cisco MDS 9000 fabric-based virtualization provides a level of integration with intelligent SAN services that is unavailable to host-based or appliance-based virtualization solutions. The Cisco MDS 9000 platform with the integrated Advanced Services Module delivers the intelligence and advanced features required to make multilayer intelligent storage area networks a reality, including hardware-enabled innovations that dramatically improve scalability, availability, security, and manageability of storage networks—resulting in increased utility and lower total cost of ownership (TCO).

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Multiprotocol Intelligence

The Cisco Advanced Services Module is an integral component of the Cisco MDS 9000 multiprotocol platform, which is designed for the deployment of cost-optimized storage networks. Veritas Storage Foundation™ for Networks intends to support IETF standard iSCSI protocol over Ethernet and Fibre Channel over IP (FCIP), using the Cisco MDS 9000 platform. Companies will be able to provide virtualization services to clients attached either directly via Fibre Channel or by using the IETF standard iSCSI protocol over Ethernet for cost-effective connectivity to shared storage pools. Cisco MDS 9000 Fibre Channel over IP (FCIP) capability simplifies deployment of virtualization services over extended distances, eliminating the need for separate channel extension devices. The Cisco MDS 9000 platform is designed to support future storage protocols so that users can migrate to new technologies while retaining a consistent set of features, services, and management tools.

VSANs

VSANs allow more efficient SAN utilization by creating hardware-based isolated environments within a single SAN fabric. Each VSAN can be configured with Fibre Channel zones and maintains its own fabric services for added scalability and resilience. VSANs allow SAN infrastructure costs to be shared among more users, while assuring absolute segregation and security of traffic and retaining independent control of configuration on a VSAN-by-VSAN basis. VSANs provide a protective barrier between application hosts (host VSANs) and physical storage (disk VSANs), enhancing data integrity in a virtualized storage environment.

Comprehensive Security

Recognizing the need for airtight security in virtualized storage networks, the Cisco Advanced Services Module with VERITAS Storage Foundation for Networks software integrates seamlessly into the Cisco MDS 9000 security infrastructure. Cisco MDS 9000 family switches apply extensive security measures at all possible points of attack. SSH, RADIUS, SNMPv3, and per-VSAN role-based access control are employed against unauthorized management access. Data-plane traffic is secured with VSANs, guaranteeing segregation of traffic across shared fabrics, and with zoning, LUN zoning, and read-only zones to satisfy traffic segregation requirements within a VSAN.

The Cisco Advanced Services Module is fully compatible with the MDS 9000 Family's advanced network analysis and debug tools. For fault management in large-scale storage networks, the Cisco MDS 9000 Family delivers commands such as FC Traceroute to detail the exact path and timing of flows and uses Switched Port Analyzer (SPAN) and Remote Switched Port Analyzer (RSPAN) to efficiently capture network traffic. Once traffic has been captured, it can then be analyzed with Cisco Fabric Analyzer, an embedded Fibre Channel analyzer. Integrated call-home capability is provided for added reliability, faster problem resolution, and reduced service costs. The Cisco MDS 9000 Family with the integrated Advanced Services Module delivers the most comprehensive toolset for troubleshooting and analysis of an organization's virtualized storage environment.

Availability

Like all other Cisco MDS 9000 Family modules, the Advanced Services Module is hot-swappable and fully integrates into the Cisco MDS 9000 high-availability architecture. The Cisco MDS 9500 Family combines non-disruptive software upgrades, stateful process restart/failover, and full redundancy of all major components for a new standard in director-class availability. Additionally, the distributed processing design of VERITAS Storage Foundation™ for Networks extends the availability and accessibility to a Virtual LUN in the event of a hardware failure, ensuring maximum uptime.

Fabric-level availability via Cisco PortChannel capability allows users to aggregate up to 16 physical links into one logical bundle. The bundle can consist of any port in the chassis, ensuring that the bundle remains active in the event of a port, application-specific integrated circuit (ASIC), or module failure. The bundle can sustain the failure of any physical link without causing a reset. Fabric Shortest Path First (FSPF) multipathing provides the intelligence to load-balance across up to 16 equal cost paths and, in the event of a switch failure, to dynamically reroute traffic. Additionally, VERITAS Storage Foundation for Networks takes advantage of the QoS features embedded within the Cisco MDS9000, maximizing the efficiency and prioritization of control and data traffic.

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STORAGE RESOURCE MANAGEMENT INTEGRATION

VERITAS Storage Foundation for Networks integrates with VERITAS SANPoint Control to further simplify the complexities of managing multivendor storage networks. Through SANPoint Control, a company can visually look at its entire storage infrastructure and centrally manage any changes to it. By creating a global view of storage, the time to repair, configure, change, and provision storage is reduced. SANPoint Control drastically reduces the inherent risk in performing day-to-day storage management tasks.

CISCO MDS 9000 ADVANCED SERVICES MODULE HIGHLIGHTS

Features	Benefits
Availability	
Dynamic multipathing (DMP) and dynamic path selection	Support of multiple paths to the virtual LUNs and to the disk arrays removes potential downtime caused by path, switch, host-bus adaptor (HBA), or interface card failure
Online storage re-layout	No interruption of data access for planned system maintenance and migration of storage
Data redundancy (RAID 1, RAID 0+1, RAID 1+0)	Can be used with hardware RAID arrays to further increase data availability by mirroring data across more than one RAID array in the switch. It can also be used without hardware RAID arrays to reduce the costs associated with expensive arrays without sacrificing data redundancy by mirroring data in the switch
Hot relocation of failed redundant storage	Increases availability through automatic restoration of data redundancy when disks fail, and returns the configuration to its original state after a failed disk has been replaced
Quick mirror recovery with Dirty Region Logging (DRL)	Provides fast recovery of mirrored volumes after a system failure
Online snapshot with support for backup packages	Enables full backup without data lockout
Highly available architecture	Storage survives failure of a switch or line card failure.
Performance and Scalability	
Online performance monitoring and tuning tools	Easy identification and minimization of I/O bottlenecks
Preferred-plex (striping and selective disk mirroring)	Increases throughput and bandwidth, while providing scalable performance and load balancing
VERITAS FlashSnap™	Enables resource-intensive operations to be performed on a secondary server, significantly reduces the time to synchronize a split mirror with the primary volume, and enables fast recovery from logical errors
Management	
Intuitive GUI; VERITAS Enterprise Administrator (VEA)	Displays logical view of storage devices, providing easy monitoring of disk I/O configuration and simplified device configuration and management

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Features	Benefits
Management of free-space pool for volume growth	Pooling of heterogeneous storage simplifies administration and provides flexible use of available hardware
Multiple disk spanning	Eliminates physical storage limitations, allowing customers to choose the storage that best meets their needs
VERITAS SANPoint Control integration	Provides administrators with a single, centralized, consistent storage management interface to simplify the complex tasks involved in deploying, managing, and growing multivendor networked storage
Heterogeneous Support	
Ability to move data between heterogeneous arrays	Helps to provide applications with the class of storage they require
Supports multiple disk arrays	Provides maximum flexibility by allowing businesses to select the storage hardware that best meets their application needs
Consistent management across heterogeneous platforms	Reduces training costs and increases IT productivity
Platform-independent GUI	Reduces storage administration and training costs
Advanced Multilayer Storage Platform—Cisco MDS 9000 Family	
VSANs	High availability by maintaining isolation of fabric services, separating host access from physical storage
Security	The MDS 9000 platform applies extensive security measures at all possible points of attack with RADIUS authentication, Simple Network Management Protocol Version 3 (SNMPv3), VSANs, role-based access control, VSAN-based roles, Secure Shell Protocol (SSH), Secure File Transfer Protocol (SFTP), Fibre Channel Security Protocol (FC-SP), hardware-enforced zoning, LUN zoning, read-only zones, and ACLs.
Intelligent network services	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 enable migration from SAN islands to multilayer storage networks
Port Channels	Ensures that the connectivity remains active in the event of a port, ASIC, or module failure
iSCSI and FCIP	Multiprotocol access to clients attached either directly via Fibre Channel or by using the IETF standard iSCSI protocol over Ethernet for cost-effective connectivity to shared storage pools. Fibre Channel over IP (FCIP) simplifies virtualization services over extended distances.
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

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Features	Benefits
Built-in Device Manager and Fabric Manager	Responsive, easy-to-use Java application that enables administrators to perform vital tasks such as topology discovery, fabric configuration and verification, provisioning, monitoring, and fault resolution

PRODUCT SPECIFICATIONS

Table 1 lists the product specifications for the Cisco MDS 9000 Family Advanced Services Module.

Table 1. Product Specifications

Product Compatibility	Cisco MDS 9000 Family
Software Compatibility	Cisco MDS SAN-OS Release 1.2(2a) 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-FS, Revision 1.9 (ANSI/INCITS 373-2003) [the final revision is 1.9, not 1.7] – FC-AL, Revision 4.5 (ANSI/INCITS 272-1996) – FC-AL-2, Revision 7.0 (ANSI/INCITS 332-1999) – FC-AL-2, Amendement 1 (ANSI/INCITS 332-1999/AM1-2003) – FC-SW-2, Revision 5.3 (ANSI/INCITS 355-2001) – FC-SW-3, Rev. 6.6 (ANSI/INCITS 384-2004) – FC-GS-3, Revision 7.01 (ANSI/INCITS 348-2001) – FC-GS-4, Rev. 7.91 (ANSI/INCITS 387-2004) – FC-BB, Revision 4.7 (ANSI/INCITS 342-2001) – FC-BB-2, Rev. 6.0 (ANSI/INCITS 372-2003) – FCP, Revision 12 (ANSI/INCITS 269-1996) – FCP-2, Revision 8 (ANSI/INCITS 350-2003) – 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)

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	– FC-Tape, Revision 1.17 (INCITS TR-24-1999) – FC-MI, Revision 1.92 (INCITS TR-30-2002) – FC-SP, Revision 1.6 – FC-DA, Revision 3.1 • IP over Fibre Channel (RFC 2625) • 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, TL
Cards/Ports/Slots	Thirty-two fixed auto-sensing 1 / 2-Gbps Fibre Channel ports
Features and Functions	• Volume Management Services – VERITAS Storage Foundation for Networks • 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 – FC Write Acceleration • Diagnostics and troubleshooting tools – Power-on-self-test (POST) diagnostics – Online diagnostics – Internal port loopbacks – SPAN and Remote SPAN

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- 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
  - Access Control Lists
  - Per-VSAN role-based access control
  - Fibre Channel Zoning
    - N_Port 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
  - Fibre Channel Security Protocol (FC-SP)
    - DH-CHAP switch-switch authentication
    - DH-CHAP host-switch authentication
  - Port Security and Fabric Binding
  - Management access
    - SSH v2 implementing AES
    - SNMPv3 implementing AES
    - SFTP

- Serviceability
  - Configuration file management
  - Nondisruptive software upgrades for Fibre Channel interfaces
  - Call Home
  - Power-management LEDs
  - Port beaconing
  - System LED

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<table>
<tr><td></td><td>

– SNMP traps for alerts
– Network boot

</td></tr>
<tr><td>Performance</td><td>

Port speed: 1 / 2-Gbps auto-sensing, optionally configurable
Buffer credits: Up to 255 per port
PortChannel: Up to 16 2 Gbps ports
Supported optics, media, and transmission distances:

<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—SW, LC SFP</td><td>62.5/125 micron multimode</td><td>300 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—CWDM, LC SFP</td><td>9/125 micron single-mode</td><td>Up to 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>Up to 100 km</td></tr>
</table>
</td></tr>
<tr><td>Reliability and Availability</td><td>

Hot-swappable module
Hot-swappable SFP optics
Online diagnostics
Stateful Process Restart
Non-disruptive Supervisor Failover
Any module, any port configuration for PortChannels
Fabric-based multipathing
Per-VSAN fabric services
Port Tracking
Virtual Routing Redundancy Protocol (VRRP) for management and FCIP or iSCSI connections

</td></tr>
<tr><td>Network Management</td><td>

Access methods through Cisco MDS 9500 Series Supervisor module

– Out-of-band 10/100 Ethernet port
– RS-232 serial console port
– In-band IP-over-Fibre Channel
– DB-9 COM port

Access protocols

– CLI—via console and Ethernet ports
– SNMPv3—via Ethernet port and in-band IP-over-Fibre Channel access

Distributed Device Alias service
Network security

</td></tr>
</table>

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	– Per-VSAN role-based access control using RADIUS and TACACS+ based authentication, authorization, and accounting (AAA) functions – SFTP – SSH v2 implementing AES – SNMPv3 implementing AES • Management applications – Cisco MDS 9000 Family CLI – Cisco Fabric Manager – Cisco Device Manager – CiscoWorks 2000 Resource Manager Essentials
Programming Interfaces	• Scriptable CLI • Fabric Manager GUI • Device Manager GUI
Environmental	• Temperature, ambient operating – 32 to 104°F (0 to 40°C) • Temperature, ambient non-operating and storage – 40 to 167°F (-40 to 75°C) • Relative humidity, ambient (non-condensing) operating – 10 to 90 percent • Relative humidity, ambient (non-condensing) non-operating and storage – 10 to 95 percent • Altitude, operating – -197 to 6500 feet (-60 to 2000 meter)
Physical Dimensions	• Dimensions (H x W x D) – 1.75 x 14.4 x 16 inches (3.0 x 35.6 x 40.6 centimeter) – Occupies one slot in a Cisco MDS 9200 Series or MDS 9500 Series chassis • Weight – Storage Services Module only: 10 pound (4.5 kilogram)
Approvals and Compliance	• Safety compliance – CE Marking – UL 60950 – CAN/CSA-C22.2 No. 60950 – EN 60950 – IEC 60950 – TS 001 – AS/NZS 3260

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	– 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 9000 Family Advanced Services Module

Table 2. Ordering Information

Part Number	Product Description
DS-X9032-SMV	Cisco MDS 9000 Family 32-port Advanced Services Module
DS-SFP-FC-2G-SW	Cisco MDS 9000 Family 1 / 2-Gbps Fibre Channel-SW, SFP, LC
DS-SFP-FC-2G-LW	Cisco MDS 9000 Family 1 / 2-Gbps Fibre Channel-LW, SFP, LC
DS-SFP-FCGE-SW	Cisco MDS 9000 Family Gigabit Ethernet, 1 / 2-Gbps Fibre Channel-SW, SFP, LC
DS-SFP-FCGE-LW	Cisco MDS 9000 Family Gigabit Ethernet, 1 / 2-Gbps Fibre Channel-LW, SFP, LC
Advanced Software Packages	
M9200SSE1K9	Cisco MDS 9200 Storage Services Enabler Package for the Cisco MDS 9000 Family Advanced Services Module
M9200ENT1K9	Cisco MDS 9200 Enterprise Package
M9200FMS1K9	Cisco MDS 9200 Fabric Manager Server Package
M9500SSE1K9	Cisco MDS 9500 Storage Services Enabler Package for the Cisco MDS 9000 Family Advanced Services Module
M9500ENT1K9	Cisco MDS 9500 Enterprise Package
M9500FMS1K9	Cisco MDS 9500 Fabric Manager Server Package

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Part Number	Product Description
Spare Components	
DS-X9032-SMV=	Cisco MDS 9000 Family 32-port Advanced Services Module, Spare
DS-SFP-FC-2G-SW=	Cisco MDS 9000 Family 1 / 2-Gbps Fibre Channel-SW, SFP, LC, Spare
DS-SFP-FC-2G-LW=	Cisco MDS 9000 Family 1 / 2-Gbps Fibre Channel-LW, SFP, LC, Spare
DS-SFP-FCGE-SW=	Cisco MDS 9000 Family Gigabit Ethernet, 1 / 2-Gbps Fibre Channel-SW, SFP, LC, Spare
DS-SFP-FCGE-LW=	Cisco MDS 9000 Family Gigabit Ethernet, 1 / 2-Gbps Fibre Channel-LW, SFP, LC, 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
	Cisco MDS 9200 Storage Services Enabler Package for the Cisco MDS 9000 Family Advanced Services Module, Spare
M9200ENT1K9=	Cisco MDS 9200 Enterprise Package, Spare
M9200FMS1K9=	Cisco MDS 9200 Fabric Manager Server Package, Spare
M9500SSE1K9=	Cisco MDS 9500 Storage Services Enabler Package for the Cisco MDS 9000 Family Advanced Services Module, Spare
M9500ENT1K9=	Cisco MDS 9500 Enterprise Package, Spare
M9500FMS1K9=	Cisco MDS 9500 Fabric Manager Server Package, Spare

SOLUTION COMPONENTS

Software	Description
Contact VERITAS for a quote	VERITAS Storage Foundation™ for Networks, Cisco

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