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# Cisco MDS 9000 Family Release Notes for Storage Services Interface Image Release 2.1(2m)

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**Release Date:** May 22, 2006

**Text Part Number:**OL-8017-09

This document describes the caveats and limitations for the Storage Service Interface (SSI) software for the Cisco MDS Storage Services Module (SSM). Use this document in conjunction with the documents listed in the [“Related Documentation”](#) section on page 7.

## Contents

This document includes the following sections:

- [Introduction, page 2](#)
- [System Requirements, page 2](#)
- [Image Upgrade, page 5](#)
- [New Features, page 5](#)
- [Limitations, page 5](#)
- [Compatibility Matrix, page 5](#)
- [Caveats, page 6](#)
- [Related Documentation, page 7](#)
- [Obtaining Technical Assistance, page 9](#)



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## Introduction

The SSM provides distributed intelligent storage services for the Cisco MDS 9000 Family and supports up to 32 Fibre Channel ports. It provides the following:

- Network-based volume management
- Management and copy services
- Network assisted storage applications via SANTap
- 32 autosensing 1-Gbps/2-Gbps Fibre Channel interfaces
- Hot-swappable Fibre Channel small form-factor pluggable (SFP) transceiver connectivity
  - Short wavelength (SWL) for connectivity up to 500 m
  - Long wavelength (LWL) for connectivity up to 10 km
  - Coarse wavelength-division multiplexing (CWDM) for connectivity up to 100 km and aggregation of up to 8 ports onto a single optical fiber
- Fibre Channel Write Acceleration (FC-WA) and SCSI Flow Statistics
- Network-Accelerated Serverless Backup (NASB)

## System Requirements

This section describes the system requirements for the Cisco MDS Storage Services Interface (SSI) image Release 2.1(2m), and includes the following topics:

- [Components Supported, page 2](#)
- [Determining the Software Version, page 5](#)

## Components Supported

[Table 1](#) lists the software and hardware components supported by the Cisco MDS 9000 Family.

**Table 1 Cisco MDS 9000 Family Supported Software and Hardware Components**

| Component | Part Number                  | Description                                             | Applicable Products             |
|-----------|------------------------------|---------------------------------------------------------|---------------------------------|
| Software  | M95S1K9-2.1.2d <sup>1</sup>  | MDS 9500 Supervisor/Fabric-I, SAN-OS software<br>SAN-OS | MDS 9500 Series only            |
|           | M92S1K9-2.1.2d               | MDS 9216 Supervisor/Fabric-I, SAN-OS Software           | MDS 9216 only                   |
|           | SSI-M9K9-2.1.2m <sup>2</sup> | MDS 9000 Storage Services Interface                     | MDS 9500 Series and<br>MDS 9216 |

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**Table 1** *Cisco MDS 9000 Family Supported Software and Hardware Components (continued)*

| Component          | Part Number     | Description                                                                                                                                                                    | Applicable Products      |
|--------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| License            | M9500ENT1K9     | Enterprise package                                                                                                                                                             | MDS 9500 Series          |
|                    | M9200ENT1K9     | Enterprise package                                                                                                                                                             | MDS 9200 Series          |
|                    | M9100ENT1K9     | Enterprise package                                                                                                                                                             | MDS 9100 Series          |
|                    | M9500FIC1K9     | Mainframe package                                                                                                                                                              | MDS 9500 Series          |
|                    | M9200FIC1K9     | Mainframe package                                                                                                                                                              | MDS 9200 Series          |
|                    | M9100FIC1K9     | Mainframe package                                                                                                                                                              | MDS 9100 Series          |
|                    | M9500FMS1K9     | Fabric Manager Server package                                                                                                                                                  | MDS 9500 Series          |
|                    | M9200FMS1K9     | Fabric Manager Server package                                                                                                                                                  | MDS 9200 Series          |
|                    | M9100FMS1K9     | Fabric Manager Server package                                                                                                                                                  | MDS 9100 Series          |
|                    | M9500EXT1K9     | SAN Extension over IP package for IPS-8 module                                                                                                                                 | MDS 9500 Series          |
|                    | M9200EXT1K9     | SAN Extension over IP package for IPS-8 module                                                                                                                                 | MDS 9200 Series          |
|                    | M9500EXT14K9    | SAN Extension over IP package for IPS-4 module                                                                                                                                 | MDS 9500 Series          |
|                    | M9200EXT14K9    | SAN Extension over IP package for IPS-4 module                                                                                                                                 | MDS 9200 Series          |
|                    | M9500EXT12K9    | SAN Extension over IP package for MPS-14/2 module                                                                                                                              | MDS 9500 Series          |
|                    | M9200EXT12K9    | SAN Extension over IP package for MPS-14/2 module                                                                                                                              | MDS 9200 Series          |
|                    | M9500SSE1K9     | Storage Services Enabler package                                                                                                                                               | MDS 9500 Series with SSM |
|                    | M9200SSE1K9     | Storage Services Enabler package                                                                                                                                               | MDS 9200 Series with SSM |
| Chassis            | DS-C9509        | MDS 9509 director, base configuration (9-slot modular chassis includes 7 slots for switching modules and 2 slots for supervisor modules—SFPs sold separately)                  | MDS 9509 only            |
|                    | DS-C9506        | MDS 9506 director (6-slot modular chassis includes 4 slots for switching modules and 2 slots for supervisor modules—SFPs <sup>3</sup> sold separately)                         | MDS 9506 only            |
|                    | DS-C9216-K9     | MDS 9216 16-port semi-modular fabric switch (includes 16 1-Gbps /2-Gbps Fibre Channel ports, power supply, and expansion slot—SFPs sold separately)                            | MDS 9216 only            |
|                    | DS-C9216A-K9    | MDS 9216A 16-port semi-modular fabric switch (includes 16 1-Gbps/2-Gbps Fibre Channel ports, power supply, and expansion slot—SFPs sold separately).                           | MDS 9216A only           |
|                    | DS-C9216i-K9    | MDS 9216i 16-port semi-modular fabric switch (includes 14 1-Gbps/2-Gbps Fibre Channel ports, 2 Gigabit Ethernet ports, power supply, and expansion slot—SFPs sold separately). | MDS 9216i only           |
| Supervisor modules | DS-X9530-SF1-K9 | MDS 9500 Supervisor/Fabric-I, module                                                                                                                                           | MDS 9500 Series only     |

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**Table 1 Cisco MDS 9000 Family Supported Software and Hardware Components (continued)**

| Component               | Part Number      | Description                                                                                                                                   | Applicable Products      |
|-------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Switching modules       | DS-X9016         | MDS 9000 16-port 1-Gbps /2-Gbps Fibre Channel module (SFPs sold separately)                                                                   | MDS 9500 Series and 9216 |
|                         | DS-X9032         | MDS 9000 32-port 1-Gbps /2-Gbps Fibre Channel module (SFPs sold separately)                                                                   |                          |
| Services modules        | DS-X9308-SMIP    | 8-port Gigabit Ethernet IP Storage Services module                                                                                            |                          |
|                         | DS-X9304-SMIP    | 4-port Gigabit Ethernet IP Storage Services module                                                                                            | MDS 9000 Family          |
|                         | DS-X9032-SSM     | MDS 9000 32-Port 1-Gbps/2-Gbps Fibre Channel Storage Services Module (SSM)                                                                    |                          |
| LC-type fiber-optic SFP | DS-SFP-FC-2G-SW  | 1-Gbps /2-Gbps Fibre Channel — short wavelength SFP                                                                                           |                          |
|                         | DS-SFP-FC-2G-LW  | 1-Gbps /2-Gbps Fibre Channel — long wavelength SFP                                                                                            |                          |
|                         | DS-SFP-FCGE-SW   | 1-Gbps Ethernet and 1-Gbps /2-Gbps Fibre Channel—short wavelength SFP                                                                         |                          |
|                         | DS-SFP-FCGE-LW   | 1-Gbps Ethernet and 1-Gbps /2-Gbps Fibre Channel — long wavelength SFP                                                                        |                          |
| CWDM <sup>4</sup>       | CWDM-SFP-xxxx-2G | Gigabit Ethernet and 1-Gbps /2-Gbps Fibre Channel SFP LC interface xxxx nm, where xxxx = 1470, 1490, 1510, 1530, 1550, 1570, 1590, or 1610 nm | MDS 9000 Family          |
|                         | CWDM-MUX-4       | Add/drop multiplexer for 4 CWDM wavelengths                                                                                                   |                          |
|                         | CWDM-MUX-8       | Add/drop multiplexer for 8 CWDM wavelengths                                                                                                   |                          |
|                         | CWDM-CHASSIS-2   | Two slot chassis for CWDM add/drop multiplexer(s)                                                                                             |                          |
| Power supplies          | DS-CAC-300W      | 300-W <sup>5</sup> AC power supply                                                                                                            | MDS 9100 Series only     |
|                         | DS-CAC-845W      | 845-W AC power supply                                                                                                                         | MDS 9216 only            |
|                         | DS-CAC-2500W     | 2500-W AC power supply                                                                                                                        | MDS 9509 only            |
|                         | DS-CDC-2500W     | 2500-W DC power supply                                                                                                                        |                          |
|                         | DS-CAC-4000W-US  | 4000-W AC power supply for US (cable attached)                                                                                                |                          |
|                         | DS-CAC-4000W-INT | 4000-W AC power supply international (cable attached)                                                                                         | MDS 9506 only            |
|                         | DS-CAC-1900W     | 1900-W AC power supply                                                                                                                        |                          |
|                         | DS-CDC-1900W     | 1900-W DC power supply                                                                                                                        |                          |
| CompactFlash            | MEM-MDS-FLD512M  | MDS 9500 supervisor Compact Flash disk, 512 MB                                                                                                | MDS 9500 Series only     |
| Port analyzer adapter   | DS-PAA           | A standalone Fibre Channel-to-Ethernet adapter that allows for simple, transparent analysis of Fibre Channel traffic in a switched fabric     | MDS 9000 Family          |
|                         | DS-PAA-2         |                                                                                                                                               |                          |

- For a complete list of compatible versions of SAN-OS software, see the *Cisco MDS SAN-OS Release Compatibility Matrix for Storage Service Interface Images*.
- Supports the Storage Services Module (SSM) only. The last SSI image supported on the ASM is SSI-M9K9-2.1.1.
- SFP = small form-factor pluggable
- CWDM = coarse wavelength division multiplexing
- W = Watt

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## Determining the Software Version



### Note

We strongly recommend that you use the latest available software release supported by your vendor for all Cisco MDS 9000 Family products.

To determine the version of the Cisco SAN-OS software currently running on a Cisco MDS 9000 Family switch using the CLI, log into the switch and enter the **show version EXEC** command.

To determine the version of the Cisco SAN-OS software currently running on a Cisco MDS 9000 Family switch using the Fabric Manager, from the Switches tab in the information pane, locate the switch using the IP address, logical name, or WWN, and then check its version in the Release column.

## Configuration Requirements

For Release 2.1(2m), a minimum of 5000 write acceleration buffers per SCSI flow is recommended.

## Image Upgrade

If SSMs are present in a Cisco MDS 9000 Family switch, several kinds of upgrade may be performed as required—upgrading a previously provided package, upgrading the SAN-OS image, or reformatting the SSM add-on image.

## New Features

There are no new features in this release.

## Limitations

Release 2.1(2m) supports SCSI flow statistics in a unidirectional flow configuration; however, it does not support bidirectional flow configurations.

## Compatibility Matrix

The latest *Cisco MDS SAN-OS Release Compatibility Matrix for Storage Service Interface Images* is available from the following Cisco Systems website.

[http://www.cisco.com/en/US/products/ps5989/products\\_device\\_support\\_table09186a0080485272.html](http://www.cisco.com/en/US/products/ps5989/products_device_support_table09186a0080485272.html)

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## Caveats

This section lists the open and resolved caveats for this release. Use [Table 2](#) to determine the status of a particular caveat. In the table, "O" indicates an open caveat and "R" indicates a resolved caveat.

**Table 2** *Open and Resolved Caveats for Cisco MDS SAN-OS Release 2.1.2m*

| DDTS Number                | 2.1(2m) |
|----------------------------|---------|
| <b>Severity 2</b>          |         |
| <a href="#">CSCse16033</a> | R       |
| <b>Severity 3</b>          |         |
| <a href="#">CSCse24825</a> | R       |
| <a href="#">CSCse26440</a> | R       |
| <a href="#">CSCse29496</a> | O       |
| <a href="#">CSCse30131</a> | R       |

## Resolved Caveats

- [CSCse16033](#)

**Symptom:** The Data Path Process or (DPP) fails to respond when it is configured with a bidirectional SCSI flow and a large number of Logical Unit Numbers (LUNs) for example, 3000 LUNs. This condition occurs when I/O-data buffering support is present in SSI Release 2.1(2l) and earlier on the SCSI-initiator side DPP. This condition also triggers high DPP dd utilization under heavy traffic when thousands of LUNs are serviced by a single DPP.

**Workaround:** Configure only unidirectional SCSI flows for SSI Release 2.1(2j) and earlier.

- [CSCse24825](#)

**Symptom:** When the DPP software fails and is then reset, the Ternary Content Addressable Memory (TCAM) keys on that virtualization engine (for the SCSI flows managed by that DPP) are cleared, but the usage count is not reset. As a result, there is a leak in the TCAM resource on a DPP failure.

**Workaround:** None.

- [CSCse26440](#)

**Symptom:** When the DPP software fails and is then reset, the SCSI-flow count for that DPP is not reset by the SCSI-flow client process on the SSM. As a result, unprovision commands entered after this event will fail.

**Workaround:** None.

- [CSCse30131](#)

**Symptom:** When the DPP buffers are exhausted and an attempt is made to create a new SCSI flow, the SCSI flow client on the SSM incorrectly increases the flow count per DPP. As a result, unprovision commands entered after this event will fail.

**Workaround:** Avoid causing buffer exhaustion on the DPP.

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## Open Caveats

- CSCse29496

**Symptom:** SCSI flow shows an unprovisioned state while in a provisioned state. Switch ports are not provisioned for bidirectional flow. This symptom may occur as a result of an un-provision followed by a re-provision of the SCSI flow feature.

**Workaround:** Remove the affected SCSI flows and then add them back.

- CSCse34126

**Symptom:** Using Fabric Manager, link flaps may occur when enabling or disabling the Fibre Channel Write Acceleration (FC-WA) and SCSI Flow Statistics services at the same time. This caveat may also occur when provisioning or un-provisioning a SCSI flow service with FC-WA and/or SCSI Flow Statistics services enabled.

**Workaround:** Enable or disable one service at a time. If you are provisioning or un-provisioning the SCSI flow service, disable FC-WA and SCSI Flow Statistics one service at a time. After re-provisioning the SCSI flow service, enable the associated services one at a time.

## Related Documentation

The documentation set for the Cisco MDS 9000 Family includes the following documents. To find a document online, use the Cisco MDS SAN-OS Documentation Locator at:

[http://www.cisco.com/en/US/products/ps5989/products\\_documentation\\_roadmap09186a00804500c1.html](http://www.cisco.com/en/US/products/ps5989/products_documentation_roadmap09186a00804500c1.html).

For information on IBM TotalStorage SAN Volume Controller Storage Software for the Cisco MDS 9000 Family, refer to the IBM TotalStorage Support website:

<http://www.ibm.com/storage/support/2062-2300/>

## Release Notes

- *Cisco MDS 9000 Family Release Notes for Cisco MDS SAN-OS Releases*
- *Cisco MDS 9000 Family Release Notes for Storage Services Interface Images*
- *Cisco MDS 9000 Family Release Notes for Cisco MDS SVC Releases*
- *Cisco MDS 9000 Family Release Notes for Cisco MDS 9000 EPLD Images*

## Compatibility Information

- *Cisco MDS 9000 SAN-OS Hardware and Software Compatibility Information*
- *Cisco MDS 9000 Family Interoperability Support Matrix*
- *Cisco MDS SAN-OS Release Compatibility Matrix for IBM SAN Volume Controller Software for Cisco MDS 9000*
- *Cisco MDS SAN-OS Release Compatibility Matrix for Storage Service Interface Images*

## Regulatory Compliance and Safety Information

- *Regulatory Compliance and Safety Information for the Cisco MDS 9000 Family*

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## Hardware Installation

- *Cisco MDS 9500 Series Hardware Installation Guide*
- *Cisco MDS 9200 Series Hardware Installation Guide*
- *Cisco MDS 9216 Switch Hardware Installation Guide*
- *Cisco MDS 9100 Series Hardware Installation Guide*
- *Cisco MDS 9020 Fabric Switch Hardware Installation Guide*

## Cisco Fabric Manager

- *Cisco MDS 9000 Family Fabric Manager Quick Configuration Guide*
- *Cisco MDS 9000 Family Fabric Manager Configuration Guide*
- *Cisco MDS 9000 Fabric Manager Online Help*
- *Cisco MDS 9000 Fabric Manager Web Services Online Help*

## Command-Line Interface

- *Cisco MDS 9000 Family Software Upgrade and Downgrade Guide*
- *Cisco MDS 9000 Family CLI Quick Configuration Guide*
- *Cisco MDS 9000 Family CLI Configuration Guide*
- *Cisco MDS 9000 Family Command Reference*
- *Cisco MDS 9000 Family Quick Command Reference*
- *Cisco MDS 9020 Fabric Switch Configuration Guide and Command Reference*
- *Cisco MDS 9000 Family SAN Volume Controller Configuration Guide*

## Troubleshooting and Reference

- *Cisco MDS 9000 Family Troubleshooting Guide*
- *Cisco MDS 9000 Family MIB Quick Reference*
- *Cisco MDS 9020 Fabric Switch MIB Quick Reference*
- *Cisco MDS 9000 Family SMI-S Programming Reference*
- *Cisco MDS 9000 Family System Messages Reference*
- *Cisco MDS 9020 Fabric Switch System Messages Reference*

## Installation and Configuration Note

- *Cisco MDS 9000 Family SSM Configuration Note*
- *Cisco MDS 9000 Family Port Analyzer Adapter Installation and Configuration Note*

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## Obtaining Technical Assistance

Cisco Technical Support provides 24-hour-a-day award-winning technical assistance. The Cisco Technical Support & Documentation website on Cisco.com features extensive online support resources. In addition, if you have a valid Cisco service contract, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not have a valid Cisco service contract, contact your reseller.

## Cisco Technical Support & Documentation Website

The Cisco Technical Support & Documentation website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The website is available 24 hours a day, at this URL:

<http://www.cisco.com/techsupport>

Access to all tools on the Cisco Technical Support & Documentation website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

<http://tools.cisco.com/RPF/register/register.do>



### Note

Use the Cisco Product Identification (CPI) tool to locate your product serial number before submitting a web or phone request for service. You can access the CPI tool from the Cisco Technical Support & Documentation website by clicking the **Tools & Resources** link under Documentation & Tools. Choose **Cisco Product Identification Tool** from the Alphabetical Index drop-down list, or click the **Cisco Product Identification Tool** link under Alerts & RMAs. The CPI tool offers three search options: by product ID or model name; by tree view; or for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

## Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco engineer. The TAC Service Request Tool is located at this URL:

<http://www.cisco.com/techsupport/servicerequest>

For S1 or S2 service requests or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)

EMEA: +32 2 704 55 55

USA: 1 800 553-2447

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For a complete list of Cisco TAC contacts, go to this URL:

<http://www.cisco.com/techsupport/contacts>

## Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

**Severity 1 (S1)**—Your network is “down,” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

**Severity 2 (S2)**—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

**Severity 3 (S3)**—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

**Severity 4 (S4)**—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

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