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Cisco MDS 9000 Family Release Notes for Storage Services Interface Image Release 3.0(2j)

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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 8.

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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



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- 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 Cisco MDS SAN-OS Release 3.0(2j) 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	M95S1K9-3.0.2	MDS 9500 Supervisor/Fabric-I, SAN-OS software SAN-OS	MDS 9500 Series only
	M92S1K9-3.0.2	MDS 9216 Supervisor/Fabric-I, SAN-OS Software	MDS 9216 only
	SSI-M9K9-3.0.2j ¹	MDS 9000 Storage Services Interface	MDS 9500 Series and 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 ² 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	
	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	MDS 9000 Family
	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 ³	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 ⁴ 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)	
	DS-CAC-1900W	1900-W AC power supply	MDS 9506 only
	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		

1. Supports the Storage Services Module (SSM) only. The last SSI image supported on the ASM is SSI-M9K9-2.1.1.
2. SFP = small form-factor pluggable
3. CWDM = coarse wavelength division multiplexing
4. 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.

Downloading Software

To download the latest Cisco software, access the Software Center at this URL:

<http://www.cisco.com/public/sw-center>



Note

If you would like to request code to be provided under the terms of either GNU General Public License (GPL) or the GNU Lesser General Public License (LGPL), please contact mds-software-disclosure@cisco.com.

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

This section describes the new features introduced in this release. For more information about the features listed, refer to the documentation set listed in the “[Related Documentation](#)” section on page 8.

The SSI image release 3.0(2j) add-on image is compatible with the Cisco MDS SAN-OS Release 3.0(2a) image and the Cisco MDS SAN-OS Release 3.0(2b) image.

Limitations


This sections lists limitations or restrictions associated with this release.

Configuration Limits

[Table 2](#) describes SANTap configuration limits associated with SSI 3.0(2j).


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Table 2 **SANTap Configuration Limits**

Attribute	Limit	Description
Hosts per DVT	16	<p>A data virtual target (DVT) is a proxy entity for a target port. Up to 16 hosts are allowed to access a DVT.</p> <p> Note If a host does not need a SANTap based service, then the administrator should consider leaving the host in the target VSAN just so that this host does not use DVT resources.</p> <p>When 16 hosts log into a DVT, an administrator will need to use the PURGE command to reclaim host resources should that host be removed on a permanent basis. This is because SANTap does not dynamically delete resources assigned to a host on account of the fact that it cannot determine that a host going away is a temporary or permanent situation.</p>
LUNs per host	256	There can only be 256 LUNs that are exposed by a DVT for 1 host.
LUNs per DVT	1024	In theory, the number of LUNs supported per DVT is 4096. But there is a current SSM hardware limitation of 1024 LUNs per DPP. Given that a DVT is tied to a DPP, that limitation supersedes the theoretical LUNs per DVT number.
DVTs per SSM	16	The theoretical numbers are higher, but the scaling tests were limited to this quoted number.
Sessions per SSM	1024	<p>Sessions are also referred to as ITLs. Sessions are equivalent to target LUNs that require SANTap based services.</p> <p>It is important to understand that while all sessions are ITLs, all ITLs are not sessions as there can be DVT LUNs for which sessions are not created because the end-user is not interested in SANTap based services for those LUNs.</p> <p>This number is expected to go up with each successive release. Even though an SSM supports 8192 ITLs today, the ceiling on sessions could end up being 4096 because of the amount of processing involved in failure scenarios.</p>
LUN ID address	16 bits	<p>Even though the LUN ID field in the FCP command frame is 8-bytes long, most arrays use the single level peripheral device addressing method, which means that 8 to 16 bits are of significance.</p> <p>SANTap leverages the preceding fact to complete an efficient data structure search when it receives frames from the host. However, this assumption leads to the fact that higher numbers of bits for LUN IDs are not currently supported.</p> <p>This element of SANTap design can be upgraded should there be newly introduced targets that use a larger number of bit-to-address LUN IDs.</p>

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Table 2 *SANTap Configuration Limits (continued)*

Attribute	Limit	Description
ITLs per DPP	1024	<p>The total number of ITLs that each DPP supports.</p> <p> Note An appliance may need an appliance virtual target (AVT) to be able to get host-proxy access to the target. An AVT for a host-target pair needs to be co-located on the same DPP as the DVT for that target. Appliances access LUNs on the target by creating AVT LUNs. The ITLs created for these AVT LUNs count against this 1024 limit.</p> <hr/> <p>Some appliances minimize the impact by dynamically creating and deleting AVTs and AVT LUNs.</p>
ITLs per SSM	1024	There are 8 DPPs on each SSM card. Each DPP supports 1024 ITLs for a total of 8192. However, in the current release the ITLs per SSM supported is 1024.

Configuring SSM Ports in Auto Mode

Starting with Cisco MDS SAN-OS Release 3.0(1), the SSM front panel ports can no longer be configured in auto mode. Because auto mode is the default for releases prior to Release 3.0(1), you should modify the configuration of the ports before upgrading the SAN-OS software image to Release 3.0(2) to avoid any traffic disruption.

For information on how to reconfigure the SSM ports, refer to the “Reconfiguring SSM Ports Before Upgrading to SAN-OS Release 3.0(2)” section of the [Cisco MDS 9000 Family Release Notes for Cisco MDS SAN-OS Release 3.0\(2\)](#).

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

Caveats

This section lists the open and resolved caveats for this release. Use [Table 3](#) to determine the status of a particular caveat. In the table, "O" indicates an open caveat and "R" indicates a resolved caveat.

Table 3 *Open and Resolved Caveats for Cisco MDS SSI Release 3.0(2j)*

DDTS Number	Status
Severity 2	
CSCse58756	R

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Table 3 Open and Resolved Caveats for Cisco MDS SSI Release 3.0(2j)

DDTS Number	Status
CSCsf98427	R
Severity 3	
CSCsg04686	R
CSCsg24501	O

Resolved Caveats

- [CSCse58756](#)
Symptom: While testing a configuration with 512 sessions, SANTap crashed.
Workaround: None. This issue is resolved.
- [CSCsf98427](#)
Symptom: The QLogic 2460 HBA fails to remote boot when it connects to a VT instantiated by SANTap on the SSM because the QLogic 2460 BIOS sends a test ready unit with an invalid command reference number (CRN) and task attribute field. This same HBA can boot when SANTap and the SSM are not part of the configuration.
Workaround: None. This issue is resolved.
- [CSCsg04686](#)
Symptom: An internal call (ScsiSend) was failing because the SCSI DL exceeded 59.9K of read/write requests. This resulted in a memory error.
Workaround: None. This issue is resolved.

Open Caveats

- [CSCsg24501](#)
Symptom: If you use the **no ssm enable feature santap force** command to unprovision SANTap on the SSM, the SANTap configuration is not properly removed.
Workaround: Do not use the **force** option.

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.

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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 Storage Service Interface Images*

Regulatory Compliance and Safety Information

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

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*

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- *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*

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

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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

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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