CHAPTER 4

Cisco MDS SAN-OS Release 3.x Feature Lists

This chapter describes the features that are included in the following 3.x SAN-OS release:

New Features for SAN-OS Release 3.3(5)

3.3(5) Features
There are no new features for this release. The new features for this release are the same as those listed in the Cisco MDS 9000 Family Release Notes for Cisco MDS SAN-OS Release 3.3(1a).

Release Notes for SAN-OS Release 3.3(5)

New Features for SAN-OS Release 3.3(4a)

3.3(4a) Features
There are no new features for this release. The new features for this release are the same as those listed in the Cisco MDS 9000 Family Release Notes for Cisco MDS SAN-OS Release 3.3(1a).

Release Notes for SAN-OS Release 3.3(4a)

New Features for SAN-OS Release 3.3(4)

3.3(4) Features
There are no new features for this release. The new features for this release are the same as those listed in the Cisco MDS 9000 Family Release Notes for Cisco MDS SAN-OS Release 3.3(1a).

Release Notes for SAN-OS Release 3.3(4)

New Features for SAN-OS Release 3.3(3)

3.3(3) Features
There are no new features for this release. The new features for this release are the same as those listed in the Cisco MDS 9000 Family Release Notes for Cisco MDS SAN-OS Release 3.3(1a).

Release Notes for SAN-OS Release 3.3(3)

New Features for SAN-OS Release 3.3(2)

3.3(2) Features
There are no new features for this release. The new features for this release are the same as those listed in the Cisco MDS 9000 Family Release Notes for Cisco MDS SAN-OS Release 3.3(1a).

Release Notes for SAN-OS Release 3.3(2)

New Features for SAN-OS Release 3.3(1c)

3.3(1c) Features
There are no new features for this release. The new features for this release are the same as those listed in the Cisco MDS 9000 Family Release Notes for Cisco MDS SAN-OS Release 3.3(1a).

Release Notes for SAN-OS Release 3.3(1c)

New Features for SAN-OS Release 3.3(1a)

3.3(1a) Features	Description
Cisco SME Enhancements	Cisco SAN-OS Release 3.3(1a) supports the following features: • Rekey Operations • Off-line Data Restore Tool • Media Servers with Drives in Two Fabrics • Expanded Interoperability • Enhanced Performance • Fx-port Zoning Support
NPV Traffic Management	Starting in Cisco MDS SAN-OS Release 3.3(1a), NPV will be supported on the Cisco Fabric Switch for IBM BladeCenter.
Secure Erase	The secure erase feature erases existing data on a given target in such a way that reconstructing that data is virtually impossible. SAN-based secure erase has numerous advantages over traditional data erase mechanisms such as higher speed, lower cost, ease-of-execution, and platform independence.

3.3(1a) Features	Description
FlexAttach	FlexAttach is supported on the Cisco Fabric Switch for HP c-Class BladeSystem switch, the Cisco Fabric Switch for IBM BladeCenter switch, the Cisco MDS 9124 switch, and the Cisco MDS 9134 switch, when NPV mode is enabled. The FlexAttach feature reduces the time and coordination effort required by SAN and server administrators when installing and replacing servers. To alleviate interaction between SAN administrators and server administrators, it is important that changes are not made to the SAN configuration when a new server is installed or when an existing server needs replacement. FlexAttach is a new feature included in SAN-OS Release 3.3(1a) that addresses this issue.
SMI-S	Cisco SAN-OS Release 3.3(1a) includes the following SMI-S enhancements: • FDMI subprofile supporting management of the HBA on the host and the storage device. • SMIS 1.2 compliance with current SAN-OS support. • Basic logging facility. • SMI-S 1.2 compliance for the server and switch profiles with limited support for Indications.
FCIP Interop	In Release 3.3(1a), support is included for FCIP interop between the MSM-18/4 module or MDS 9222i switch and the MPS-14/2 module, the MDS 9216i switch, or the IPS-8 module. FCIP is supported on the MPS-14/2 module, MDS 9216i switch, IPS-8 module, IPS-4 module, MDS 9222i switch, and the MSM-18/4 module.
Copper SFP	Beginning with Release 3.3(1a), copper SFPs are supported on the Ethernet ports of the MSM-18/4 module and the MDS 9222i switch.
Cisco Fabric Manager Enhancements	These sections describe Cisco Fabric Manager enhancements found in Release 3.3(1a): • New Configuration Wizards • Scalability Improvement • Metro-Optical Link Display Java Runtime 1.6 Support

Release Notes for SAN-OS Release 3.3(1a).

New Features for SAN-OS Release 3.2(3a)

3.2(3a) Features
There are no new features available for this rele ase.The new features for this release are the same as those listed in the Cisco MDS 9000 Family Release Notes for Cisco MDS SAN-OS Release 3.2(3).

Release Notes for SAN-OS Release 3.2.(3a)

New Features for SAN-OS Release 3.2(3)

3.2(3) Features
There are no new features available for this release.The new features for this release are the same as those listed in the Cisco MDS 9000 Family Release Notes for Cisco MDS SAN-OS Release 3.2(2c).

Release Notes for SAN-OS Release 3.2(3)

New Features for SAN-OS Release 3.2(2c)

3.2(2c) Features	Description
Cisco Storage Media Encryption	Cisco Storage Media Encryption (SME) for the Cisco MDS 9000 family switches offers a highly scalable, reliable, and flexible solution to encrypting sensitive information in the data center. SME is integrated transparently as a fabric service for Fibre Channel SANs. It is a complete solution and offers the following features: • Strong AES-256 encryption of data at rest • Heterogeneous device support: tape drives, virtual tape libraries (VTL) • Seamless integration as a transparent fabric service • Nondisruptive installation and provisioning • High availability and scalability • Secure, comprehensive key management • Full role-based access control support for management • Provisioning and key management integrated with Cisco Fabric Manager and CLI
N-Port Identifier Virtualization Support for Cisco MDS 9124 and 9134 Switches	N-Port Identifier Virtualization (NPIV) support for Cisco MDS 9124 and 9134 fabric switches is included in this release.

3.2(2c) Features	Description
New MIBS	The following new MIB is included in Cisco MDS 9000 SAN-OS release 3.2(2c): • CISCO-SME-MIB
MDS Authentication Mode	As of SAN-OS Release 3.x, Cisco Fabric Manager required users to log in to the Fabric Manager server and the switches in the fabrics. This resulted in a two-step login process. The MDS authentication mode option has been added to the Cisco Fabric Manager installer to enable users to log in to the Fabric Manager server with switch credentials, restoring the one-step login process. This feature can be used with both the standalone and Fabric Manager Server configurations.

Release Notes for SAN-OS Release 3.2(2c).

New Features for SAN-OS Release 3.2(1a)

3.2(1a) Features	Description
Cisco MDS 9134 Multilayer Fabric Switch	The Cisco MDS 9134 Multilayer Fabric Switch is a 32-port 1-, 2-, and 4-Gbps autosensing Fibre Channel and 2-port 10-Gbps switch. It features On-Demand Port Activation Licensing. By default, the first 24 ports are licensed. An additional license is required for the remaining 8 ports. The 210-Gbps ports are not licensed by default, but require a separate license.
Cisco MDS 9222i Multiservice Switch	The Cisco MDS 9222i Multiservice Modular Switch offers eighteen 4-Gbps Fibre Channel ports and four Gigabit Ethernet IP storage services ports, and a modular expansion slot to host Cisco MDS 9000 Family Switching and Services Modules.
Cisco MDS 9000 18/4-Port Multiservice Module (MSM-18/4)	The Cisco MDS 900018/4-Port Multiservice Module (MSM-18/4) offer eighteen 1-, 2-, and 4-Gbps Fibre Channel ports and four Gigabit Ethernet IP storage services ports. Its multiprotocol capabilities integrate in a single-form-factor Fibre Channel, Fibre Channel over IP (FCIP), Small Computer System Interface over IP (iSCSI), IBM Fiber Connectivity (FICON), FICON Control Unit Port (CUP) management, and switch cascading.
Cisco Data Mobility Manager	Cisco MDS Data Mobility Manager (DMM) for the Cisco MDS 9000 family of switches provides capabilities and features that simplify data migration and minimize service disruptions. Data migration is the process of copying data from an existing storage device to a new storage device.

3.2(1a) Features	Description
N-Port Virtualization	The N-Port virtualization (NPV) feature reduces the number of Fibre Channel domain IDs in core-edge SANs. Switches operating in the NPV mode do not join a fabric, they just pass traffic between core switch links and end-devices, which eliminates the domain IDs for these edge switches. This feature is available only for Cisco MDS 9000 blade switches, the Cisco MDS 9124 Multilayer Fabric Switch, and the Cisco MDS 9134 Multilayer Fabric Switch.
Digital Diagnostic Enhancements	The digital diagnostics capabilities for small form-factor pluggable (SFP) and 10 Gbps X2 form factor optics have been enhanced in Cisco SAN-OS release 3.2(1a): • Added support for Dense Wave Division Multiplexing (DWDM) SFPs • Traps can be generated when digital diagnostic thresholds are exceeded • Digital diagnostic values are viewable in Cisco Fabric Manager (previously only through CLI)
Universal Serial Bus Support	The two Universal Serial Bus (USB) 2.0 compatible ports on the Cisco MDS 9500 Series Supervisor-2 modules are available for use with Cisco SAN-OS release 3.2(1a). USB flash drives connected to these ports may be used for the same functions as media in the external compact flash slot.
Intelligent Fabric Application Enhancements	Several intelligent fabric application enhancements are included in Cisco SAN-OS 3.2(1a): • SANTap Enhancements • Software Image Compatibility Check - verifies the compatibility of partner software with the SAN-OS storage services interface (SSI) version before loading it. • Partner Software Reset - allows network hosted applications to be reset without reloading a SSM.
TACACS+ Password Expiry Notification	When an end-user authenticates to a Cisco MDS 9000 switch via a TACACS+ account, this feature lets them know when a password has expired or is about to expire. If the password has expired, the end-user is prompted to change the password.
SMI-S Enhancements	Indications supported has been expanded to allow meaningful monitoring of Cisco MDS 9000 family switches. The following indications have been added: • Switch FC port status change • Switch environmental failure • Zoneset activated • Switch field replaceable unit change
Common Criteria	Validation of Common Criteria (CC) evaluation assurance level 3 (EAL 3) for the Cisco MDS 9000 Family members running Cisco SAN-OS 3.0(2a) shall be achieved by the release 3.2(1a) time frame.

3.2(1a) Features	Description
Server LUN Map Discovery Commands	Server LUN map discovery commands have been added to the CLI to discover all LUNs in a disk array that are masked for access by a particular host. You can specify a VSAN, a specific host interface, and the targets to query. The commands allow you to find LUNs that are zoned, and also LUNs that are not zoned if the disk array allows this. A Cisco MDS 9000 Storage Services Module (SSM) is required to use this feature.
New MIBS	The following new MIB is included in Cisco MDS 9000 SAN-OS release 3.2(1a): • CISCO-DMM-MIB
In-service Software Upgrades for the Cisco MDS 9222i Switch	Cisco SAN-OS 3.2(1a) includes non-disruptive, in service software upgrades (ISSU) for the Cisco MDS 9222i switch. This feature does not apply to the Cisco MDS 9216 and 9216i fabric switches.
New CLI Command to Recover the Modflash Partition	The infrastructure of the Storage Services Module (SSM) includes a non-volatile modflash partition to store partner specific images and configuration files. Any detectable partitioning and file system errors are automatically repaired during the module initialization procedures. However, certain types of file system errors cannot be auto-detected or auto-repaired. Manual procedures might be required to recover from these types of errors. This recovery procedure is destructive, since it reformats and recreates the modflash partition. All data in the modflash partition is deleted. SSM initial provisioning procedures need to be followed for completing the recovery procedure. For these situations, a new CLI command is included in Cisco MDS SAN-OS Release 3.2(1a). The following example shows the **debug mkfs modflash** command. switch# **attach module slot** Attaching to module x ... To exit type 'exit', to abort type '$.' module-slot# **debug mkfs modflash**
Cisco Fabric Manager Enhancements	Cisco Fabric Manager includes the following enhancements : • New Installation Process • Custom Report Enhancements • Analysis Reports • Threshold Configuration Flexibility

Release Notes for SAN-OS Release 3.2(1a)

New Features for SAN-OS Release 3.1(4)

3.1(4) Features	Description
FCIP Tape Acceleration Supports Overlapping LUN IDs	In previous Cisco MDS SAN-OS releases, there was a restriction that LUN IDs could not overlap for LUNs behind the same target port, even for multiple hosts. As of Cisco SAN-OS 3.1(4), this restriction has been removed. Overlapping LUN IDs are now supported.

Release Notes for SAN-OS Release 3.1(4)

New Features for SAN-OS Release 3.1(3a)

3.1(3a) Features
There are no new features for this release. The new features for this release are the same as those listed in the Cisco MDS 9000 Family Release Notes for Cisco MDS SAN-OS Release 3.1(3).

Release Notes for SAN-OS Release 3.1(3a)

New Features for SAN-OS Release 3.1(3)

3.1(3) Features	Description
New CompactFlash Test Capabilities	As of Cisco MDS SAN-OS 3.1(3), the ability to detect a faulty CompactFlash is built into the SAN-OS software. A new CompactFlash cyclic redundancy check (CRC) checksum test can check the state of the CompactFlash firmware on select modules. If the CompactFlash firmware is not corrupted, then the SAN-OS software can automatically update the CompactFlash firmware.
System Default Port Mode F	As of Cisco SAN-0S Release 3.1(3), a new CLI command allows you to globally change the mode of Fibre Channel ports whose default mode is Auto, while avoiding traffic disruption caused by the formation of unwanted inter-switch links (ISLs). The new system default switchport mode F command sets the administrative mode of ports to mode F, while switch operation remains graceful. No ports are flapped.
Changes in SAN Device Virtualization	Cisco SAN-OS Release 3.1(3) supports the following features of SAN Device Virtualization: • Virtual initiators • LUN zoning

Release Notes for SAN-OS Release 3.1(3)

New Features for SAN-OS Release 3.1(2b)

3.1(2b) Features	Description
Install Option to Use Oracle Express Database	In Cisco Fabric Manager, you now have the option of using an Oracle Express database or the existing Hypersonic HSQL database. We recommend that you use an Oracle Express database if you are using Performance Manager on a large fabric of 1000 or more end devices.
User Interface Changes	As of Cisco SAN-OS Release 3.1(2b), the following changes can be seen in the user interface of Cisco Fabric Manager: A **Create flows on all cards** option has been added to the Define Traffic Flows dialog box. The **User Encryption** option has been removed from the Add Fabric and Edit Fabric dialog boxes that are accessible from the List of Fabrics Monitored by Fabric Manager Server pane. A new column has been added to the Open Fabric Table dialog box that shows license information for a selected fabric, as follows: Licensed: there is a permanent license, or a there is a license checked out with time remaining on it. Eval License: there is an evaluation license with time remaining on it. No License: there is no license, or all evaluation licenses have expired.

Release Notes for SAN-OS Release 3.1(2b)

New Features for SAN-OS Release 3.1(2a)

3.1(2a) Features
There are no new features for this release. The new features for this release are the same as those listed in the Cisco MDS 9000 Family Release Notes for Cisco MDS SAN-OS Release 3.1(2).

Release Notes for SAN-OS Release 3.1(2a)

New Features for SAN-OS Release 3.1(2)

3.1(2) Features	Description
Cisco Fabric Switch for HP c-Class BladeSystem	Supports the new Cisco Fabric Switch for HP c-Class BladeSystem. Through the on-demand port activation license, this switch can be configured with sixteen internal and eight external active ports and four 4-Gb SFPs installed, or with eight internal and four external active ports and two 4-Gb SFPs installed. The Cisco Fabric Switch for HP c-Class BladeSystem also features nondisruptive software upgrades.
Cisco Fabric Switch for IBM BladeCenter	Supports the new Cisco Fabric Switch for IBM BladeCenter. This switch includes fourteen internal and six external ports, and it features an on-demand port activation license and nondisruptive software upgrades.
SAN Device Virtualization	Allows you to create virtual devices that represent physical end-devices when configuring switches with Cisco SAN-OS Release 3.1(2) and later. Virtualization of SAN devices accelerates swap-out or failover to a replacement disk.
Enable/Disable Link Traps	Allows you to control whether SNMP link state traps are enabled or disabled.
Daylight Savings Time Change	Allows you to change the switch configuration to make the daylight saving time adjustment.
FCS Discovery of Virtual Devices	Allows you to discover virtual devices in a particular VSAN or in all VSANs.
Online Health Management System (OHMS) for the MDS 9124 Switch	Provides hardware fault detection and recovery on the Cisco MDS 9124 Switch.
Compact Flash Report in Cisco Fabric Manager	Scans your switch fabric automatically and reports the status of Compact Flash on certain modules.

Release Notes for SAN-OS Release 3.1(2)

New Features for SAN-OS Release 3.0(3b)

3.0(3b) Features
There are no new features for this release. The new features for this release are the same as those listed in the Cisco MDS 9000 Family Release Notes for Cisco MDS SAN-OS Release 3.0(3).

Release Notes for SAN-OS Release 3.0(3b)

New Features for SAN-OS Release 3.0(3)

3.0(3) Features	Description
Command Scheduler Remote User Passwords	Allows you to specify passwords for remote users to allow them to configure command scheduler jobs.
IVR Zones and Zone Members	Increases the limits for IVR zones to 8,000 and for IVR zone members to 10,000.
Preferred Path	Allows you to specify preferred Fibre Channel route maps for data traffic. A new MIB, CISCO-PREFERRED-PATH-MIB, configures and monitors this Preferred Path feature.
Fabric Manager Enhancements	The Cisco MDS 9000 Family Fabric Manager supports: • Load balancing tool enhanced for Generation 2 modules • Preferred path tables • Launching CTC (Cisco Transport Controller) on ISLs from the Topology Map

Release Notes for SAN-OS Release 3.0(3)

New Features for SAN-OS Release 3.0(2b)

3.0(2b) Features
There are no new features for this release. The new features for this release are the same as those listed in the Cisco MDS 9000 Family Release Notes for Cisco MDS SAN-OS Release 3.0(2).

Release Notes for SAN-OS Release 3.0(2b)

New Features for SAN-OS Release 3.0(2a)

3.0(2a) Features
There are no new features for this release. The new features for this release are the same as those listed in the Cisco MDS 9000 Family Release Notes for Cisco MDS SAN-OS Release 3.0(2).

Release Notes for SAN-OS Release 3.0(2a)

New Features for SAN-OS Release 3.0(2)

3.0(2) Features	Description
Domain Manager Fast Restart	Shortens the time it takes for Domain Manager to select a new principal link. Enabling this feature and having an available backup link means Domain Manager takes only a few milliseconds to select a new principal link. The reconfiguration required to select the new principal link only affects the two switches that are directly attached to the failed link, and not the entire VSAN.
FICON Configuration	Provides the following FICON features to the Cisco Fabric Manager and Device Manager: • ESCON style port configuration display • FICON configuration locking • FICON port configuration table row title locking • FICON port configuration for multiple VSANs

Release Notes for SAN-OS Release 3.0(2)

New Features for SAN-OS Release 3.0(1)

3.0(1) Features	Description
Supervisor-2 Module Support	Includes support for Supervisor-2 module features, including configuring modem parameters on the console port and COM1 port, and allowing 1000-Mbps speed on the management port.
CFS Over IP Distribution	Distributes application data over IP connections. The distribution is transparent to the application, but the application must first register with CFS. The following CFS applications register for the CFS over IP distribution option: NTP, role, RADIUS, TACACS+, syslogd, and Call Home.
N-Port Identifier Virtualization (NPIV)	Provides a means to assign multiple port IDs to a single N port. This feature allows multiple applications on the N port to use different identifiers and allows access control, zoning, and port security to be implemented at the application level. NPIV must be globally enabled for all VSANs on the MDS switch to allow the NPIV-enabled applications to use multiple N port FC IDs.
McDATA Native Interoperability	Includes commands to configure McDATA native mode interoperability.

Generation 2 Switching Module Support	Includes the following set of switching modules that are supported by the Cisco MDS 9500 Series of switches: • DS-X9148 MDS 9000, 48-port 4-Gbps Fibre Channel module • DS-X9124 MDS 9000, 24-port 4-Gbps Fibre Channel module • DS-X9112 MDS 9000, 12-port 4-Gbps Fibre Channel module • DS-X9704 MDS 9000, 4-port 10-Gbps Fibre Channel module
In-Order-Delivery Enhancement	Ensures that frames are delivered in order within the switch latency drop period.
MS-CHAP	Allows user logins to an MDS switch through a remote authentication server (RADIUS or ACACS+). MS-CHAP must be explicitly enabled to be used.
Certificate Authorities and Digital Certificates	Interoperates with certificate authorities and uses digital certificates for secure communication with peers.
IKE Digital Certificates	Allows IKE to use digital certificates for authentication instead of using preshared keys.
SNMP over TCP/IP	Allows SNMP messages to be transported over TCP rather than UDP for management traffic on the out-of-band Gigabit Ethernet management port (mgmt0).
Fabric Binding for Fibre Channel	Supports fabric binding for Fibre Channel VSANs as well as FICON VSANs.
FCIP Tape Read Acceleration	Supports tape read acceleration over FCIP interfaces as well as tape write acceleration.
iSCSI Server Load Balancing (iSLB)	Provides a means to easily configure large scale iSCSI deployments containing hundreds or even thousands of initiators. iSLB provides the following features: The iSLB initiator configuration is simplified with support for initiator targets and auto-zones. Cisco Fabric Services (CFS) eliminates the need for manual configuration by distributing the iSLB initiator configuration among all MDS switches in the fabric. There is dynamic load balancing of iSLB initiators using iSCSI login redirect and VRRP.
IP version 6 (IPv6)	Provides extended addressing capability beyond those provided in IP version 4 (IPv4) in Cisco MDS SAN-OS. The architecture of IPv6 has been designed to allow existing IPv4 users to transition easily to IPv6 while providing services such as end-to-end security, quality of service (QoS), and globally unique addresses. IPv6 provides the following enhancements over IPv4: Allows networks to scale and provide global reachability. Handles packets more efficiently because the IPv6 packet header format is simplified. Reduces the need for private address and network address translation (NAT). Provides simpler autoconfiguration of addresses.

SMI-S 1.1.0 Compliant	Supports an embedded CIM agent that is compliant with SMI-S version 1.1.0. The new CIM agent includes a new access point profile.
Call Home Enhancements	Allows customization of alert group messages.

Release Notes for SAN-OS Release 3.0(1)