

# Cisco MDS 9000 Series Release Notes

Release 9.3(2a)

This document describes the features, issues, and deployment guidelines for the Cisco MDS NX-OS software for the use on the Cisco MDS 9000 Series Switches.

**Note:** The documentation set for this product strives to use bias-free language. For this documentation set, bias-free is defined as language that does not imply discrimination based on age, disability, gender, racial identity, ethnic identity, sexual orientation, socioeconomic status, and intersectionality. Exceptions may be present in the documentation due to language that is hardcoded in the user interfaces of the product software, language used based on RFP documentation or language that is used by a referenced third-party product.

**Note:** Release notes are updated on an as needed basis with new information on restrictions and issues. Refer to the following website for the most recent version of the [Cisco MDS 9000 Series Release Notes](#).

Date	Description
December 22, 2023	Added <a href="#">CSCwi36075</a> to the Open Issues section. Added <a href="#">CSCwf85545</a> to the Open Issues section.
November 06, 2023	Added <a href="#">CSCwv93277</a> in the Resolved Issues section.
July 03, 2023	Added <a href="#">CSCwe08911</a> in the Open Issues section.
June 16, 2023	Add restriction for over subscription caused by FPIN notifications.
May 17, 2023	Initial release.

## Introduction

The Cisco MDS 9000 Series of Multilayer Directors and Fabric Switches provide best-in-class high availability, scalability, security, and management, that enables to deploy high-performance storage area networks. Layering a rich set of intelligent features onto a high-performance switch fabric, the Cisco MDS 9000 Series has the flexibility to fit small deployments as well as to addresses the stringent requirements of large data center storage environments: high availability, security, scalability, ease of management, and seamless integration of new technologies.

Release notes are updated on an as needed basis with new information on restrictions and caveats. Refer to the following website for the most recent version of the [Cisco MDS 9000 Series Release Notes](#).

## About Software Images

The Cisco MDS NX-OS operating system is shipped with the Cisco MDS 9000 Series Switches. The Cisco MDS NX-OS software consists of two images: the kickstart image and the system image. These images can be upgraded or downgraded to different versions. The versions of both images must match for the system to boot.

Each model of Cisco MDS switch has unique kickstart and system images. For more information on the image names for each Cisco MDS switch, see the [Cisco MDS 9000 NX-OS Software Upgrade and Downgrade Guide, Release 9.x](#).

To download new Cisco MDS 9000 Series software, including Cisco MDS NX-OS and Cisco NDFC management software, go to the Storage Networking Software download website at <https://software.cisco.com/download/find/MDS>.

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## Choosing Between Cisco MDS NX-OS Open Systems Releases

Cisco uses release numbering to indicate the maturity of a Cisco MDS NX-OS release train. Cisco MDS NX-OS major versions are incremented when significant software features or hardware support are added. Because of the focus on new features and hardware, all defects may not yet have been fixed. After an initial release, minor version numbers of the train are incremented, and only security patches and defect fixes are added, providing better stability to the new features and updated security.

Details about the new features and hardware supported by Cisco MDS NX-OS Release 9.3(2a) can be found in the [New Hardware and Software Features](#) section. For information about other releases, refer to the Release Notes on the [Cisco MDS 9000 NX-OS and SAN-OS Software](#) documentation page.

For Cisco recommended MDS NX-OS releases for each type of hardware, see the [Recommended Releases for Cisco MDS 9000 Series Switches](#) document.

## Components Supported

For information on supported software and hardware components, see the [Cisco MDS 9000 Series Compatibility Matrix](#).

## FICON

Cisco MDS NX-OS Release 9.3(2a) is not IBM FICON qualified. For more information on releases that are IBM FICON qualified, see <http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/products-release-notes-list.html>.

## Upgrading Cisco MDS NX-OS Software Image

This section lists the guidelines recommended for upgrading Cisco MDS NX-OS software image and includes the following topics:

- [General Upgrading Guidelines](#)
- [Open Systems Nondisruptive Upgrade Paths](#)

For detailed instructions for performing a software upgrade using Cisco NDFC, see the [Cisco NDFC Release Notes](#).

## General Upgrading Guidelines

This section lists the general guidelines for performing a software upgrade:

- See [Cisco MDS 9000 Software Upgrade and Downgrade Guide, Release 9.x](#) guide for details on upgrading or downgrading the NX-OS software on MDS switches.
- On switches with dual supervisor modules ensure both modules are installed and functional. The show module command displays one with a status of “active \*\*” and the other with a status of “ha-standby”.
- Install and configure dual supervisor modules before the upgrade.
- Use the **show install all impact upgrade-system-image** command to determine if the upgrade will be nondisruptive.
- Some features are impacted whether an upgrade is disruptive or nondisruptive:

- **Fibre Channel Ports:** Fibre Channel ports can be nondisruptively upgraded without affecting traffic on the ports. See the [Open Systems Nondisruptive Upgrade Paths](#) section for all MDS NX-OS releases.
- **Fibre Channel over Ethernet (FCoE) Ports:** FCoE ports can be nondisruptively upgraded without affecting traffic on the ports. See [Open Systems Nondisruptive Upgrade Paths](#) section for all MDS NX-OS releases.
- **IP Storage (IPS) Ports:** Traffic on IPS ports on Cisco MDS 9220i, Cisco MDS 9250i and Cisco MDS 24/10-Port SAN Extension Modules is disrupted during an upgrade or downgrade. Nodes that are members of VSANs traversing an FCIP ISL are impacted, and a fabric reconfiguration may occur. If supported, iSCSI initiators connected to the IPS ports lose connectivity to iSCSI targets while the upgrade is in progress.

**Note:** In addition to these guidelines, review the information in the [Limitations and Restrictions](#) section before a software upgrade to determine if a feature may possibly behave differently following the upgrade.

- To upgrade or downgrade to a Cisco MDS NX-OS release version, the same release version of the kickstart and system images in the **install all** command must be used.
- If you are upgrading Cisco MDS 9700 Series Directors from Cisco MDS NX-OS Release 8.3(1), Release 8.3(2), Release 8.4(1), or Release 8.4(1a) to Release 8.4(2) or later releases, ensure that you perform a switchover before upgrading. For more information, see [CSCvt87216](#).
- Ensure that you use the **clear logging onboard txcwait** command after upgrading to this release if the prior release is NX-OS 9.2(1) or earlier. Otherwise, the file will be automatically deleted and recreated at the new file size when the file size exceeds 512 KB. For more information, see the [Cisco MDS 9000 Series Interfaces Configuration Guide, Release 9.x](#).

## Open Systems Nondisruptive Upgrade Paths

The software upgrade information in this section applies only to Fibre Channel switching traffic. Upgrading system software disrupts IP traffic and intelligent services traffic.

### Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.3(2a)

Current Release	Nondisruptive Upgrade Paths and Ordered Upgrade Steps
9.x	Upgrade directly to MDS NX-OS Release 9.3(2a)
8.1(x) and above releases <sup>1</sup>	Upgrade directly to MDS NX-OS Release 9.3(2a)
All 7.3(x) releases	<p><b>Step 1.</b>Upgrade directly to MDS NX-OS Release 8.1(1b)</p> <p><b>Step 2.</b>Upgrade to MDS NX-OS Release 9.3(2a)</p>
6.2(29) and above releases	<p><b>Step 1.</b>Upgrade directly to MDS NX-OS Release 8.4(2c)</p> <p><b>Step 2.</b>Upgrade to MDS NX-OS Release 9.3(2a)</p>

<sup>1</sup> If the SAN Analytics feature is enabled, then disable the SAN Analytics feature using the **no feature analytics** command before upgrading from Cisco MDS NX-OS 8.2(x) or Cisco MDS NX-OS 8.3(x) to Cisco MDS NX-OS Release 9.2(1) or later. However, you can upgrade from Cisco MDS NX-OS Release 8.4(1) and later releases to Cisco MDS NX-OS Release 9.2(1) or later without disabling the feature.

Current Release	Nondisruptive Upgrade Paths and Ordered Upgrade Steps
6.2(13a) until 6.2(27)	<p><b>Step 1.</b> Upgrade directly to MDS NX-OS Release 6.2(29)</p> <p><b>Step 2.</b> Upgrade to MDS NX-OS Release 8.4(2c)</p> <p><b>Step 3.</b> Upgrade to MDS NX-OS Release 9.3(2a)</p>
All 6.2(x) releases prior to 6.2(13a)	<p><b>Step 1.</b> Upgrade directly to MDS NX-OS Release 6.2(13a)</p> <p><b>Step 2.</b> Upgrade to MDS NX-OS Release 6.2(33)</p> <p><b>Step 3.</b> Upgrade to MDS NX-OS Release 8.4(2c)</p> <p><b>Step 4.</b> Upgrade to MDS NX-OS Release 9.3(2a)</p>

## Downgrading Cisco MDS NX-OS Software Image

This section lists the guidelines recommended for ISSD of Cisco MDS NX-OS software image and includes the following topics:

- [General Downgrading Guidelines](#)
- [Open Systems Nondisruptive Downgrade Paths](#)

### General Downgrading Guidelines

Follow these general guidelines before performing a software downgrade:

- Disable all features that are not supported by the downgrade release. Use the **show incompatibility system downgrade-image** command to determine the features that needs to be disabled.
- Use the **show install all impact downgrade-system-image** command to determine if the downgrade is nondisruptive.
- Some features are impacted whether a downgrade is disruptive or nondisruptive:
  - **Fibre Channel Ports:** Fibre Channel ports can be nondisruptively downgraded without affecting traffic on the ports. See [Open Systems Nondisruptive Downgrade Paths](#) section for all MDS NX-OS releases.
  - **Fibre Channel over Ethernet (FCoE) Ports:** FCoE ports can be nondisruptively downgraded without affecting traffic on the ports. See [Open Systems Nondisruptive Downgrade Paths](#) section for all MDS NX-OS releases.
  - **IPStorage Ports:** Traffic on IPStorage ports on MDS 9220i, MDS 9250i, and MDS 24/10-Port SAN Extension Modules is disrupted during an upgrade or downgrade. Nodes that are members of VSANs traversing an FCIP ISL are impacted, and a fabric reconfiguration may occur. If supported, iSCSI initiators that are connected to the IPStorage ports lose connectivity to iSCSI targets while the upgrade is in progress.
  - **I/O Acceleration:** Traffic that uses I/O Acceleration is disrupted during a downgrade.
- If you are downgrading from this release to a release before Cisco MDS NX-OS Release 9.2(1), ensure that you run the **clear logging onboard txwait** command after the downgrade is complete. Otherwise, logging to the OBFL TxWait file may cease with an error. For more information, see the [Cisco MDS 9000 Series Interfaces Configuration Guide, Release 9.x](#).
- Any hardware that is not supported by the downgrade release version will be powered down when the downgrade release starts running. Power off and or remove any unsupported components

before downgrading. For more information about supported hardware see the [Cisco MDS 9000 Series Compatibility Matrix](#).

## Open Systems Nondisruptive Downgrade Paths

### Nondisruptive Downgrade Paths from NX-OS Release 9.3(2a)

Current Release	Nondisruptive Downgrade Paths and Ordered Upgrade Steps
9.3(x)	Downgrade to the target release
9.2(x)	Downgrade to the target release
8.1(x) and above releases	Downgrade to the target release
All 7.3(x) releases	<b>Step 1.</b> Downgrade directly to MDS NX-OS Release 8.1(1b) <b>Step 2.</b> Downgrade to the target release

## New Hardware and Software Features

- [New Hardware Features](#)
- [New Software Features](#)
- [Unsupported Features for all Releases](#)

### New Hardware Features

There are no new hardware features introduced in Cisco MDS NX-OS Release 9.3(2a).

### New Software Features

Product	Feature	Description
Security	LDAP parameter limit is increased to 512 characters.	LDAP search-filter, rootDN and BaseDN character limit is increased to 512 from 128 characters.  For more information, see the <a href="#">Cisco MDS NX-OS Security Configuration Guide, Release 9.x</a> .

## Unsupported Features for all Releases

### SDV feature

Cisco MDS NX-OS Release 9.3(2) and/or later does not support Cisco SAN device virtualization (SDV).

### Traditional and Smart Licensing Version 1.0 Licenses

Cisco MDS NX-OS Release 9.2(2) and/or later does not support installation of Product Authorization Key (PAK) or Smart Licensing version 1.0 licenses.

For more information such as how to migrate licenses software updates, see the “Smart Licensing Using Policy” chapter in the [Cisco MDS 9000 Series Licensing Guide, Release 9.x](#).

### Python 2

Support for Python 2 is deprecated from Cisco MDS NX-OS Release 9.2(2). Python 3 continues to be supported instead. Python 2 scripts should be checked for compatibility with Python 3 to ensure they continue to function as expected.

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For more information, see the 'Python API' chapter in the [Cisco MDS 9000 Series Programmability Guide, Release 9.x](#).

### **Zoning Features**

LUN zoning, read-only zones, and broadcast zones are no longer supported.

If these features are already configured, completely remove all the configurations that include these features before attempting to boot any module. In addition, you cannot configure these features after you bring up any module.

### **XRC Acceleration License**

From Cisco MDS NX-OS Release 8.1(1a), the Cisco Extended Remote Copy (XRC) acceleration license is obsoleted on Cisco MDS 9000 Series Switches due to improvements in the mainframe XRC feature.

### **Virtual Router Redundancy Protocol (VRRP)**

From Cisco MDS NX-OS Release 8.3(1) and later, the VRRP feature is not supported on Cisco MDS 9000 Series Switches.

### **Data Encryption Standard (DES) Encryption for SNMP**

From Cisco MDS NX-OS Release 8.5(1), AES-128 is the default encryption mechanism for SNMPv3. DES encryption for SNMP is supported only for DES users who upgrade from previous releases to Cisco MDS NX-OS Release 8.5(1). Ensure that you delete all the SNMPv3 users configured with DES encryption before upgrading to Cisco MDS NX-OS Release 8.5(1) and later releases. Any downgrades from Cisco MDS NX-OS Release 8.5(1) will be restricted if any of the SNMPv3 users have DES encryption configured as the privacy protocol. All such users will either need to be deleted or reconfigured to use no privacy protocol or AES128 encryption before downgrading.

For more information, see [Cisco MDS 9000 Series System Management Configuration Guide, Release 9.x](#).

## **Limitations and Restrictions**

### **SAN Extension Tuner**

San Extension Tuner (SET) is not supported on Cisco MDS 9220i switches in Cisco MDS NX-OS Release 8.5(1) or later.

### **Fibre Channel Read Diagnostic Parameters**

Fibre Channel RDP querying is not supported on NP, Port Channel, or FCoE links.

### **Slow Drain Detection and Congestion Isolation**

ER\_RDY is not supported on FC interfaces running at 10 Gbps.

### **FPIN**

FPIN is not supported on switches that are operating in NPV mode.

FPIN Notification for oversubscription-based congestion is not supported.

## FCIP Support

- In Cisco MDS NX-OS Release 9.2(2) or later releases, FCIP Write Acceleration is not supported between 24/10 San Extension Module and Cisco 18+4 MSM module and between 24/10 San Extension Module and Cisco SSN16 module.
- In Cisco MDS NX-OS Release 9.2(2) or later releases, simultaneous use of IVR and FCIP Write Acceleration features is not supported on FCIP tunnels configured on Cisco MDS 9700 Series switches.
- FCIP tunnels using Cisco MDS 24/10 Port SAN Extension Module cannot be used across FSPF equal cost paths.
- On Cisco MDS 24/10 Port SAN Extension Module, configuring multiple ECMP port channels with FCIP members in the same VSAN is not a valid configuration. If this is configured, then the traffic will flow through only one of the port channels.

## iSCSI Support

iSCSI is not supported on Cisco MDS 9700 Directors with Cisco MDS 24/10 port SAN Extension Modules and Cisco MDS 9220i Fabric Switch.

## HVDC PSU Support

The Cisco MDS 9700 HVDC PSU (DS-CHV-3.5KW) is not supported in releases prior to Cisco MDS NX-OS Release 8.1(1a). Do not attempt to load these releases on devices equipped with these PSUs or the systems will fail to power up.

## Cisco TrustSec FC Link Encryption

Cisco TrustSec FC Link Encryption support is available only on certain ports for the following modules/switches:

Model	Description	Cisco TrustSec Capable Ports	Encryption Key Length
DS-X9748-3072K9	64 Gbps Fibre Channel Switching module	9, 11, 13, 15, 25, 27, 29, 31	AES 128 bit
DS-X9648-1536K9	32 Gbps Fibre Channel Switching Module	9-12, 25-28, 41-44	AES 128 bit
DS-X9448-768K9	16 Gbps Fibre Channel Switching module	All FC ports	AES 128 bit
DS-X9334-K9	24/10 Port SAN Extension Module	All FC ports	AES 128 bit
DS-C9132T-K9	MDS 9132T Fabric Switch	9-12, 25-28	AES 128 bit
DS-C9148T-K9	MDS 9148T Fabric Switch	9-12, 25-28, 41-44	AES 128 bit
DS-C9396T-K9	MDS 9396T Fabric Switch	Base ports: 9-12, 25-28, 41-44	AES 128 bit
DS-C9220I-K9	MDS 9220i 32-Gbps 12-Port Fibre Channel Fabric Switch	9-12	AES 128 bit



Model	Description	Cisco TrustSec Capable Ports	Encryption Key Length
<b>DS-C9124V-24PEVK9</b>	MDS 9124V 64-Gbps 24-Port Fibre Channel Fabric Switch	9,11,13,15	AES 128 bit
<b>DS-C9148V-48PETK9</b>	MDS 9148V 64-Gbps 48-Port Fibre Channel Fabric Switch	9,11,13,15,25,27,29,31	AES 128 bit

## Resolved Issues

### Severity 2 (Severe) Issues

Defect ID	Headline	Known Impacted Releases
<a href="#">CSCwd63288</a>	"Ldap Daemon" crashes on MDS 9000 due to heartbeat failure.	8.5(1) 8.1(1)

### Severity 3 (Moderate) Issues

Defect ID	Headline	Known Impacted Releases
<a href="#">CSCvw93277</a>	Interface CRCs not incrementing on MDS 32G modules/switches.	8.5(1) 8.4(1), 8.4(1a), 8.4(2), 8.4(2a), 8.4(2b) 8.3(1), 8.3(2) 8.2(1), 8.2(2) 8.1(1), 8.1(1a), 8.1(1b)
<a href="#">CSCwd54301</a>	ips port stuck in init with switch reload multiple iterations	9.3(1)
<a href="#">CSCwe46073</a>	'show tech-support details' command hangs and doesn't print any output	9.3(2), 9.3(1) 8.4(2e)

### Severity 6 (Enhancement) Issues

Defect ID	Headline	Known Impacted Releases
<a href="#">CSCvk14774</a>	LDAP search-filter character limit should be increased to at least 512 characters	8.3(2) 8.2(2)
<a href="#">CSCwe35699</a>	sudo message from "show logging onboard migration status" output should be suppressed	9.3(2)
<a href="#">CSCwe35689</a>	sudo message from "show hardware internal cpu-mac eobc registers" output should be suppressed	9.3(2)

## Open Issues

### Severity 2 (Severe) Issues

Defect ID	Headline	Known Impacted Releases
<a href="#">CSCwf22337</a>	FCIP performance impact caused by RED packet drops	9.3(2), 9.3(2a)

### Severity 3 (Moderate) Issues

Defect ID	Headline	Known Impacted Releases
<a href="#">CSCwf85545</a>	"port" service crash	9.3(2a), 9.3(2), 9.3(1), 9.2(2), 9.2(1a) 8.4(2f), 8.4(2e)
<a href="#">CSCwi36075</a>	Interfaces stuck in offline status after storage processor upgrade	9.4(1a), 9.4(1) 9.3(2a), 9.3(2), 9.3(1)

### Severity 4 (Minor) Issues

Defect ID	Headline	Known Impacted Releases
<a href="#">CSCwd74002</a>	CISCO-ACCELINK DS-SFP-FC64G-SW SFPs reporting high Rx/Tx power warnings when operating at 16G speed	9.3(2)

### Severity 5 (Cosmetic) Issues

Defect ID	Headline	Known Impacted Releases
<a href="#">CSCvs67788</a>	"rmon event 5" displays as PMON@INFO instead of NOTIFICATION(5) owner PMON@NOTIFICATION	8.4(1)

### Severity 6 (Enhancement) Issues

Defect ID	Headline	Known Impacted Releases
<a href="#">CSCvw77444</a>	Need to automatically sync bootflash:/scripts directory between active and standby sups	8.1(1a)
<a href="#">CSCwa89654</a>	Enhancement: Upgrade MDS 9000 nginx to >= 1.20.1	8.4(2c)
<a href="#">CSCwb13413</a>	Repeated sync loss does not bring down crossbar.	8.4(1)
<a href="#">CSCwe08911</a>	Sending clear FPIN to end device, immediately after congestion clear	9.3(2a), 9.3(2), 9.3(1), 9.2(2), 9.2(1a), 9.2(1) 8.5(1)

## Related Documentation

The documentation set for the Cisco MDS 9000 Series includes the documents listed in this section. To find a document online, access the following URL:

[http://www.cisco.com/en/US/products/ps5989/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/ps5989/tsd_products_support_series_home.html)

The documentation set for Cisco Prime Data Center Network Manager is available from the following URL:

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[http://www.cisco.com/en/US/products/ps9369/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/ps9369/tsd_products_support_series_home.html)

#### **Release Notes**

<http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/products-release-notes-list.html>

#### **Licensing Information**

<https://www.cisco.com/c/en/us/td/docs/dcn/mds9000/sw/9x/configuration/licensing/cisco-mds-9000-nx-os-licensing-guide-9x.html>

#### **Regulatory Compliance and Safety Information**

<http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/hw/regulatory/compliance/RCSI.html>

#### **Compatibility Information**

<http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/products-device-support-tables-list.html>

#### **Installation and Upgrade**

<http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/products-installation-guides-list.html>

#### **Configuration Guides**

<http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/products-installation-and-configuration-guides-list.html>

#### **Command-Line Interface**

<http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/products-command-reference-list.html>

#### **Troubleshooting and Reference**

<http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/tsd-products-support-troubleshoot-and-alerts.html>

### **Documentation Feedback**

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