Product Overview

The Cisco MDS 9396S Multilayer Fabric Switch (DS-C9396S-K9) is a next generation multilayer Intelligent Services-oriented fabric switch. With powerful, compact, two rack unit (2 RU) form factors, it has an integrated 96-port Fibre Channel functionality. The Cisco MDS 9396S switch meets the requirements for a:

- Standalone storage area network (SAN) in small departmental storage environments.
- Middle-of-row switch in medium-sized redundant fabrics.
- Edge switch in enterprise data center core-edge topologies.

The Cisco MDS 9396S switch has the following major features:

- 96 licensed ports, or 48 licensed ports expandable up to 96 ports in 12 port increments with On-Demand licenses.
- All Fibre Channel ports capable of line rate at 2, 4, 8, 10, 16 Gbps.
- Port interfaces that support field-replaceable, hot-swappable small form-factor pluggable (SFP) transceivers.
- Redundant hot-swappable power supplies and fan trays.
- Port Channels for Inter-Switch Link (ISL) resiliency, and F-port channeling for resiliency on uplinks from a Cisco MDS 9396S operating in NPV mode.
- Enterprise class features such as In-Service Software Upgrades (ISSU), Virtual SANs (VSANs), security features, and Quality of Service (QoS).
- Power On Auto Provisioning (POAP) to automate software image upgrades and configuration file installation on newly deployed switches.
- Generic OnLine Diagnostics (GOLD), a built in diagnostic system with intelligent boot up and periodic runtime tests.
- Full compatibility with the Cisco MDS 9000 Family.

This chapter contains the following topics:

• Supported SFP+ Transceivers, on page 10

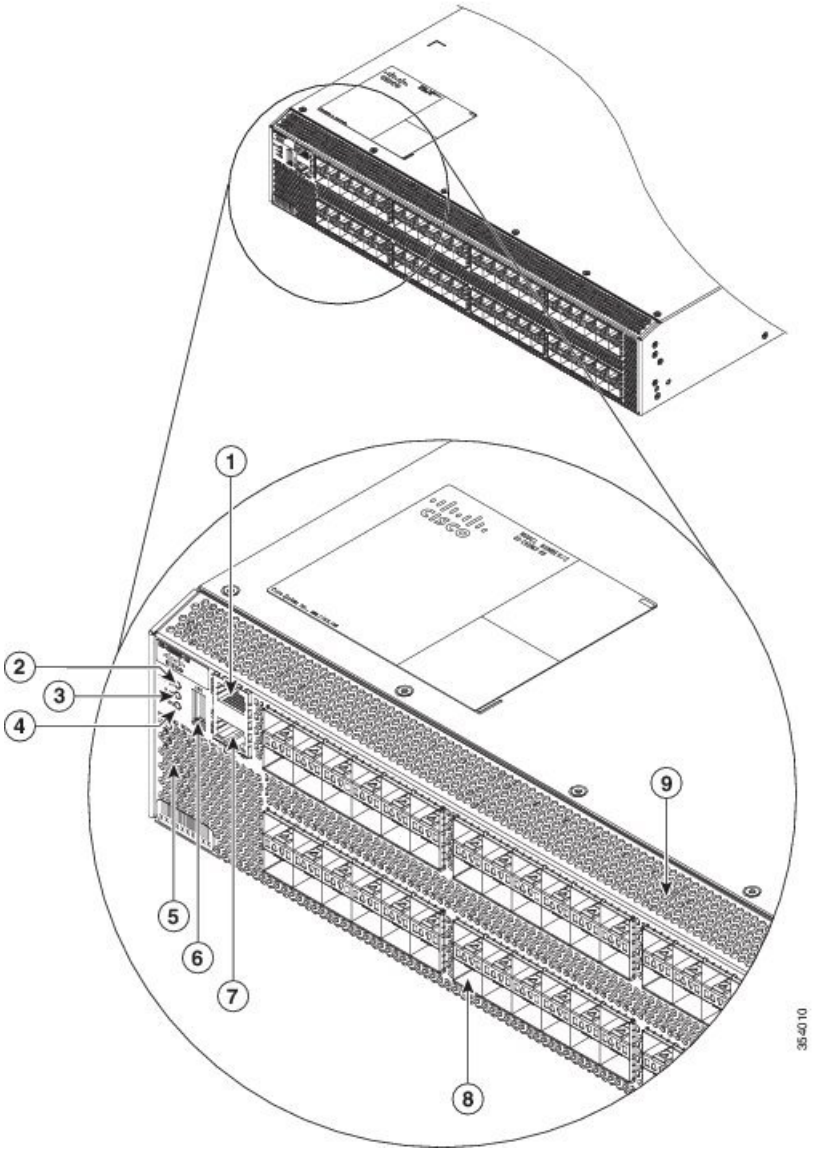
Chassis Components

This section describes the different components of the chassis.

Front View

The front of the Cisco MDS 9396S switch contains LEDs, console and management ports, and 96 2/4/8/10/16 Gbps line rate Fibre Channel ports.

Figure 1: Front View of the Cisco MDS 9396S Switch

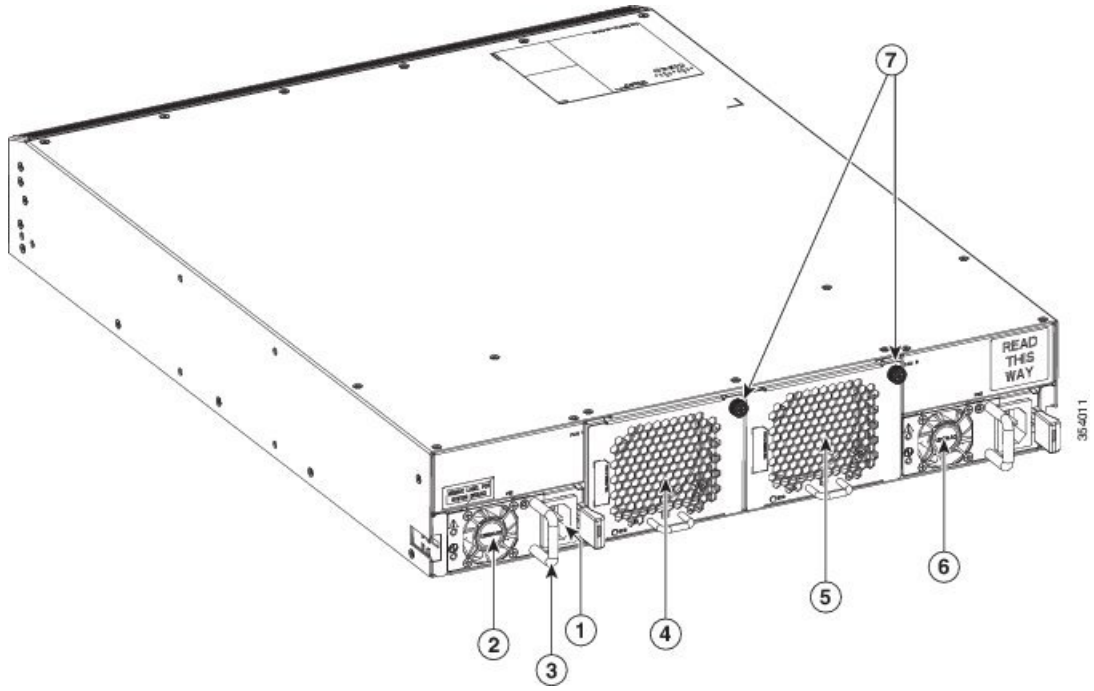


1	Serial console port	6	USB port
2	System status LED	7	10/100/1000 Mbps Ethernet management port
3	Power supply LED	8	Fibre Channel ports
4	Fan LED	9	Exhaust grill
5	Exhaust grill		

Rear View

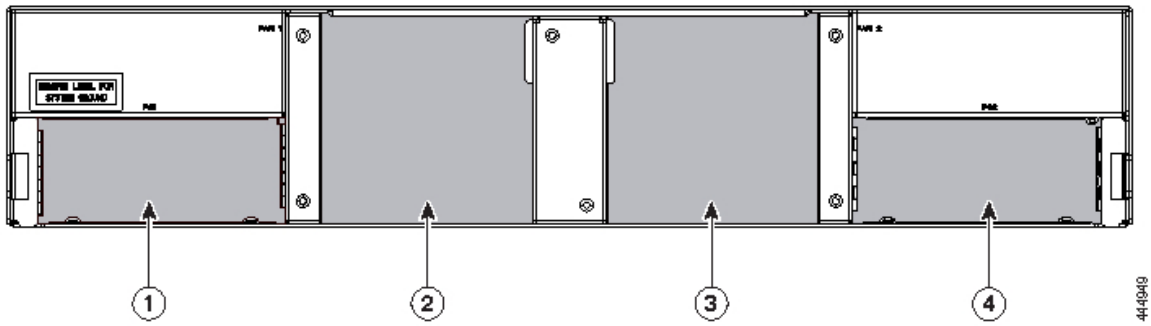
The rear of the Cisco MDS 9396S switch has two PSU bays for the redundant AC PSUs, two fan bays for the redundant fan modules and the chassis ground pad. Each side panel has attachments points for rack mount rails.

Figure 2: Side and Rear view of the Cisco MDS 9396S Switch



1	Power receptable	5	Fan module 2
2	Power supply 1	6	Power supply 2
3	Power module handle	7	Fan securing screws
4	Fan module 1		

Figure 3: Rear Panel Slot Numbering of Cisco MDS 9396S Switch

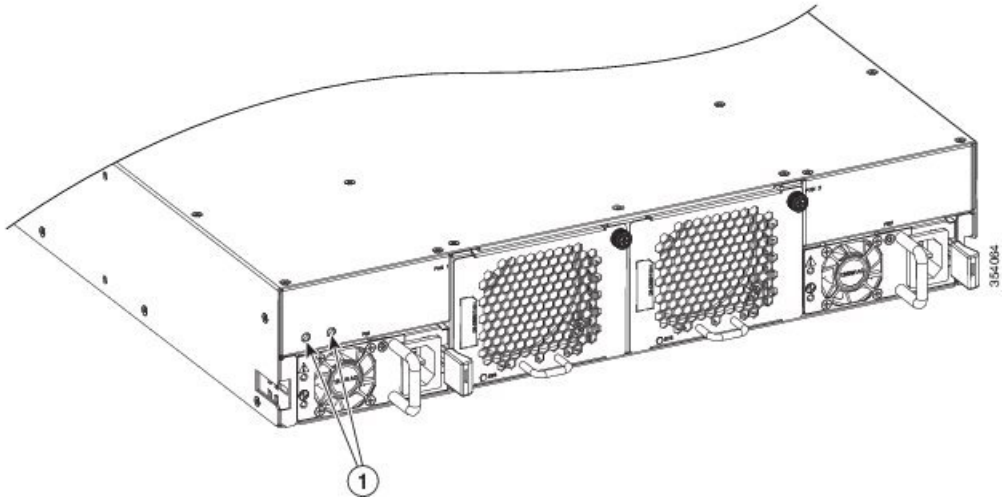


1	Power supply unit slot 1	3	Chassis fan module slot 2
2	Chassis fan module slot 1	4	Power supply unit slot 2

Grounding Point

The rear of the Cisco MDS 9396S switch also contains the grounding point which is present under a label (Figure 2).

Figure 4: Grounding Point and fan Securing Screws

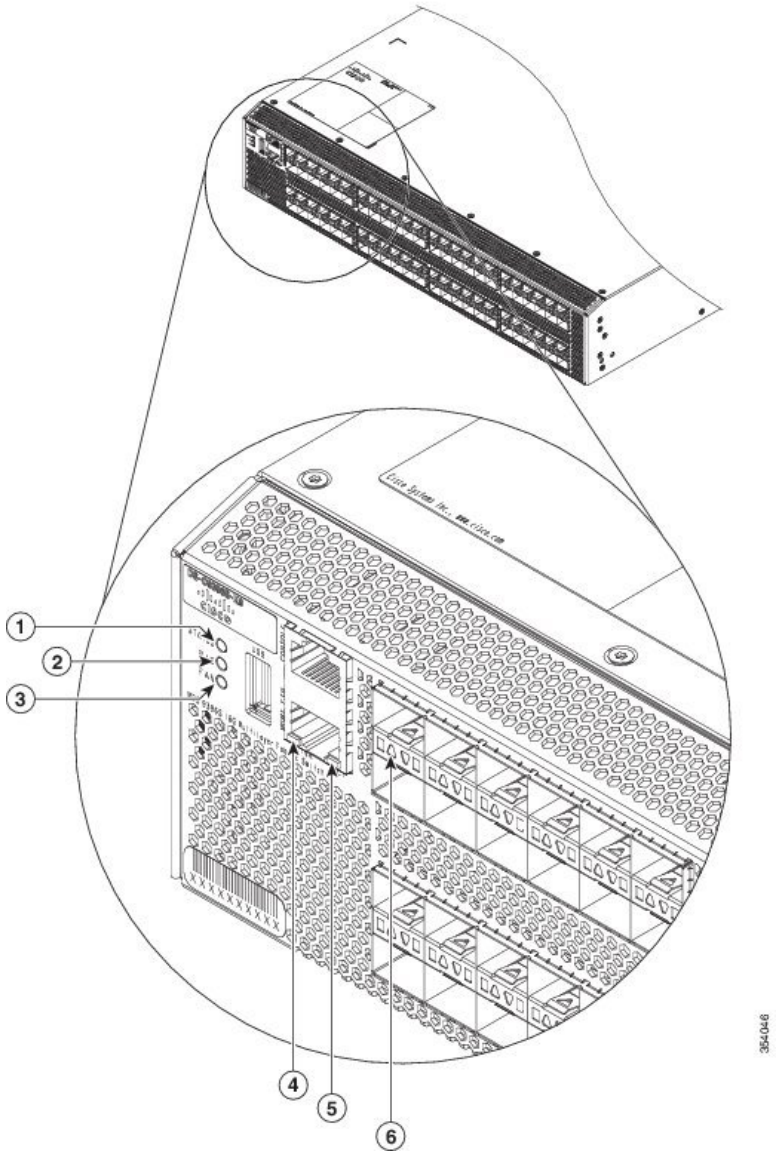


1	Grounding point

Switch LEDs

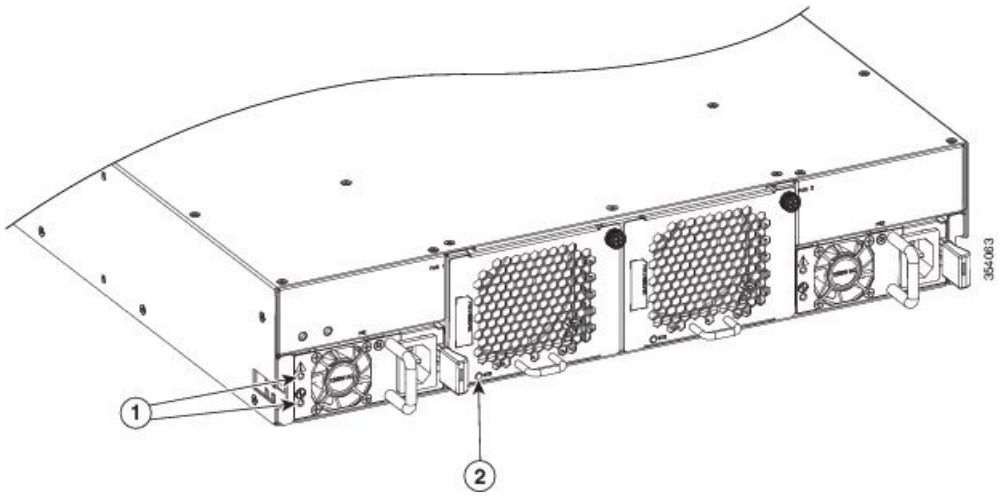
The Cisco MDS 9396S Multilayer Fabric Switch includes the LEDs shown in the following figure. You can use the LEDs to quickly identify the system status.

Figure 5: LEDs : Front view of the Cisco MDS 9396S Switch



1	System status LED	4	Management port link LED
2	Power subsystem status LED	5	Management port activity LED
3	Fan subsystem status LED	6	FC port link status LED

Figure 6: LEDs: Rear view of the Cisco MDS 9396S Switch



1	PSU status LED	2	Fan module status LED

The following table describes the chassis activity LEDs for the Cisco MDS 9396S switch.

Indicator	Location	Color	Status	State
Power subsystem status LED	Front panel of chassis	Off	Off	Either of the following conditions exists: • The system is not receiving sufficient power from the PSUs. • NXOS is not running.
		Green	Solid On	Both PSUs are installed and operating
		Red	Solid On	A PSU has failed.

Indicator	Location	Color	Status	State
Status LED	Front panel of chassis	Green	Solid On	All diagnostics have passed, NX-OS is running and the system is operational.
		Orange	Solid On	Any of the following conditions exists: • The system is running bootup diagnostics. • The system is booting. • A minor temperature threshold is currently exceeded.
		Red	Blinking	Unmatched airflow direction for PSU/Fan tray.
			Solid On	Any of the following conditions exists: • A diagnostic test failed or another fault occurred during bootup. • A major temperature threshold is currently exceeded.
Fan status	Front panel of chassis	Green	Solid on	Both fan modules are operational.
		Red	Solid on	Fan failure.

Indicator	Location	Color	Status	State
PSU Status Indicators	Faceplate of each PSU	Green	Off	No input to the PSU.
			Solid on	PSU output is OK.
			Blinking	PSU output is not OK, but input is OK.
		Amber	Solid on	Any of the following conditions exists in the PSU: Over voltage Over current Over temperature Fan failure.
			Blinking	PSU has a fault, but is still operating.
			Off	PSU is operating normally.
Fan Status	Faceplate of each Fan Module	Green	Solid on	Fan module is operating normally.
		Amber	Solid on	One fan in the fan module has failed.
		Red	Solid on	Both fans in the fan module have failed.

Fan Modules

The Cisco MDS 9396S Multilayer Fabric switch supports two hot-swappable fan modules that allow the switches to continue to run if a fan module is removed, provided that the preset temperature thresholds have not been exceeded. You can swap out a fan module without having to bring the system down. Each fan module on the Cisco MDS 9396S switch has two fans.

New fan modules which support reverse airflow (port-side intake) have been introduced in Cisco MDS NX-OS Releases 6.2(x) starting from Cisco MDS NX-OS Release 6.2(15) and Cisco MDS NX-OS Releases 7.3(x) starting from Cisco MDS NX-OS Release 7.3(1)D1(1).

Note In Cisco MDS NX-OS Release 7.3(0)DY(1) and 7.3(1)DY(1), DS-CAC-1200W power supply unit and DS-C96S-FAN-I as port side intake fan tray are not supported on Cisco MDS 9396S Switch.

To verify the direction of airflow in fan modules, the following colors are denoted on the fan modules:

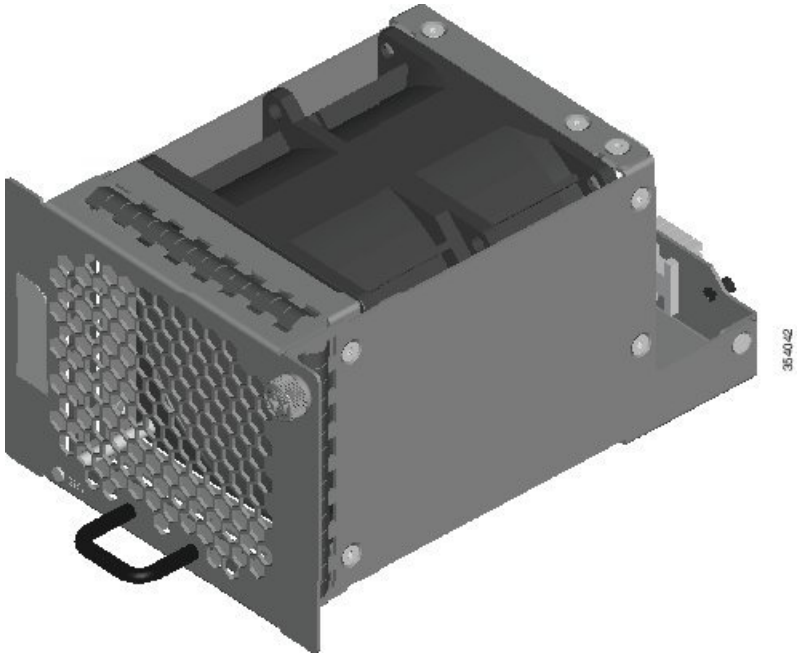
- Red—Port-side intake airflow (DS-C96S-FAN-I)
- Blue—Port-side exhaust airflow (DS-C96S-FAN-E)

Fan modules which support port-side intake airflow can be used with a new Power Supply Unit, DS-CAC-1200W, only. If an older PSU (DS-CAC-1200W-E) is used with the fan modules which support port-side intake airflow, a warning is issued on the software after which the switch shuts down in 10 minutes.

If a chassis has two different fan modules, one supporting port-side exhaust airflow and the other supporting port-side intake airflow, the switch is immediately powered down.

Note To verify the current fan module on the switch, use the **show inventory fan** command.

Figure 7: Cisco MDS 9396S Fan Module



Caution The Cisco MDS 9396S switch has internal temperature sensors that can shut down the system if the temperature at different points within the chassis exceeds certain safety thresholds. To be effective, the temperature sensors require the presence of airflow; therefore, in the event a fan module is removed from the chassis, the Cisco MDS 9396S switch will shut down after five minutes to prevent potentially undetectable overheating. However, the switches will shut down sooner if the higher-level temperature threshold is exceeded. For normal operation, the Cisco MDS 9396S switch requires four fans. Fan module status is also indicated on a front panel LED. To check temperature threshold values, use the **show environment temperature** command.

Procedures for replacing and installing the fan modules are available in the Removing and Installing Components section.

Power Supplies

The Cisco MDS 9396S Multilayer Fabric switch supports two hot swappable AC power supply units (PSUs). Each unit has a power receptacle and a status LED on the faceplate, and a handle for inserting and removing

the unit from the chassis. In the event of a PSU or AC supply (in grid redundant mode) failure, the system will continue to run. PSUs are hot swappable and can be individually replaced without shutting down the system. Procedures for installing and removing PSUs are detailed in the Removing and Installing AC Power Supplies section.

A new high voltage AC and DC PSU (DS-CAC-1200W) which supports bidirectional airflow, port-side exhaust airflow and port-side intake airflow, of fan modules has been introduced in Cisco MDS NX-OS Releases 6.2(x) starting from Cisco MDS NX-OS Release 6.2(17) and Cisco MDS NX-OS Releases 7.3(x) starting from Cisco MDS NX-OS Release 7.3(1)D1(1).

To verify the direction of airflow in PSUs, the following colors are denoted on the PSUs:

- White (DS-CAC-1200W)—Represents bidirectional airflow. Port-side intake airflow or port-side exhaust airflow depending on the type of airflow of the system fan modules. This PSU automatically configures itself to work in port-side exhaust airflow mode if the switch has Blue system fan modules installed. Similarly, the PSU automatically configures itself to work in port-side intake airflow mode if the switch has Red fan modules installed. For more information on the direction of airflow in fan modules, see the Fan Modules, on page 8 section.
- Blue (DS-CAC-1200W-E)—Represents port-side exhaust airflow. This power supply can only be used with the port-side exhaust airflow fan (DS-C96S-FAN-E).

Switch Ports

The Cisco MDS 9396S Multilayer Fabric Switch provides host, target and Inter Switch Link (ISL) connectivity. Each port has an LED which indicates the link status. The ports support SFP+ type Fibre Channel transceivers. For more information on transceivers, see the Supported SFP+ Transceivers section.

Up to 96 auto speed detecting Fibre Channel ports capable of 2, 4, 8, 10, and 16 Gbps speeds are available. By default, the first 48 ports are licenced and activated. The remaining ports can be activated by purchasing On Demand Port Activation Licences, which are available in 12 port increments.

The Cisco 9396S switch has an out of band Ethernet management port. This port has link and link activity LEDs. There is also an out of band RS-232 console port for access and monitoring the system in the boot mode. This port provides software flow control only.

The Cisco 9396S switch has a USB port. This can be used for increasing the flash storage of the system or moving files between the system and outside world through a USB stick.

Supported SFP+ Transceivers

SFP+ transceivers are field-replaceable. You can use any combination of SFP+ transceivers that are supported by the switch. The only restrictions are that Shortwave (SW) transceivers must be paired with SW transceivers, and Longwave (LW) transceivers with LW transceivers, and the cable must not exceed the stipulated cable length for reliable communications.

For the list of SFP+ transceivers supported on the Cisco MDS 9396S Switch, see the Cisco MDS 9000 Family Release Notes for Cisco MDS NX-OS Release 6.2(13). For more information about a specific Cisco SFP+ transceiver, see the SFP Transceiver Specifications section. SFP+ transceivers can be ordered separately or with the Cisco MDS 9396S Switch.

Note Use only Cisco SFP+ transceivers on the Cisco MDS 9396S switches. Each Cisco SFP+ transceiver is encoded with model information that enables the switch to verify that the SFP+ transceiver meets the requirements for the switch.