Overview of Cisco MDS 9148T Fibre Channel Switch

The Cisco MDS 9148T switch has 48 x 4/8/16/32-Gbps multispeed ports and is a powerful and compact 1-rack unit (1RU) SAN fabric switch. This switch has the following major features:

- Provides consistent 32-Gbps quality performance for every Fibre Channel port on the switch.
- Provides availability and reliability similar to the previous generations of the Cisco MDS9000 Series switches. Additionally, port-channel link members can be used across the three 16-port port groups providing additional high availability.
- Provides minimum configuration option of twenty four 32-Gbps Fibre Channel ports in the base variant, which can be enabled in increments of 8 ports to up to 48 ports. This allows four possible configurations of 24, 32, 40, and 48 ports.
- Supports enterprise-class features, such as Auto Zone, Smart Zoning, Slow Drain Detection and Isolation, Virtual SAN (VSAN) and Inter-VSAN routing (IVR), and migration from fabricwide Quality of Service (QoS) from SAN islands to enterprisewide storage networks.
- Provides intelligent diagnostics tools such as Inter-Switch Link (ISL) diagnostics, HBA diagnostics with leading HBA vendors, read diagnostic parameters, protocol decoding, network analysis tools, and integrated Cisco Call Home.
- Supports the Virtual Machine Identifier (VMID) feature that provides visibility into virtual machines that are accessing the storage devices in the fabric.
- Supports Representational State Transfer (REST) and Cisco NX-API capabilities.
- Supports onboard hardware that protects the switch from malicious attacks by securing access to critical components such as the bootloader, system image loader, and Joint Test Action Group (JTAG) interface.

This chapter contains the following topics:

- Chassis Components, on page 2
- Fan Modules, on page 7
- Power Supplies, on page 7

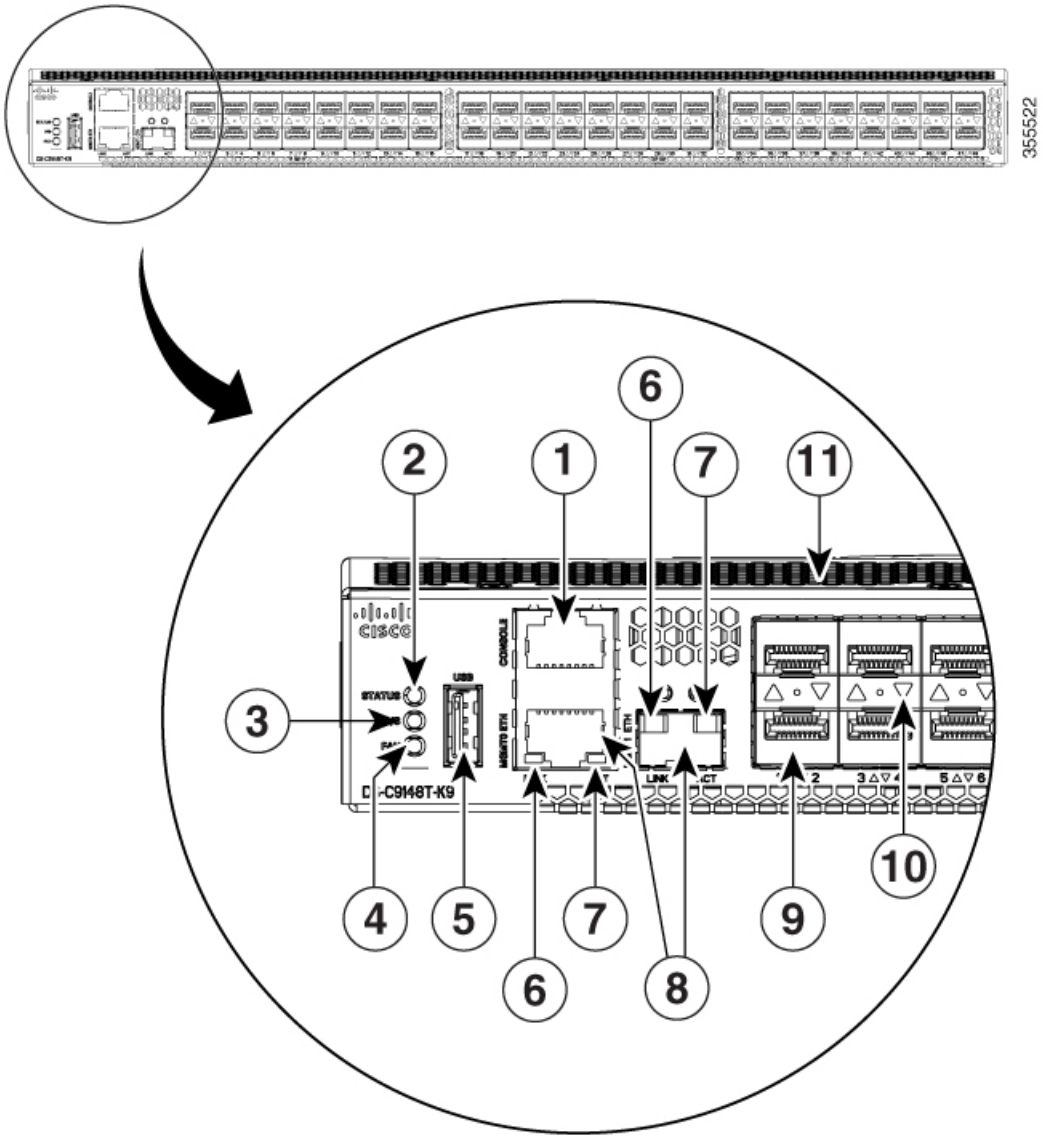
Chassis Components

This section describes the different components of the chassis.

Front View

The following figure shows the front view of a Cisco MDS 9148T Switch:

Figure 1: Front View of the Cisco MDS 9148T Switch



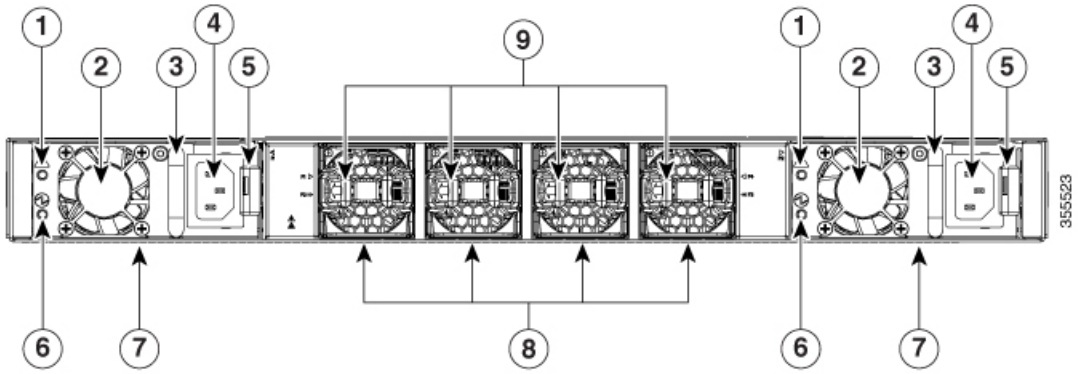
1	Serial console port	7	Activity status LED

2	System status LED	8	Ethernet management ports (2)
3	Power status LED	9	Fixed FC ports
4	Fan status LED	10	FC port status LEDs (48)
5	USB port	11	Airflow grill
6	Link status LED		

Rear View

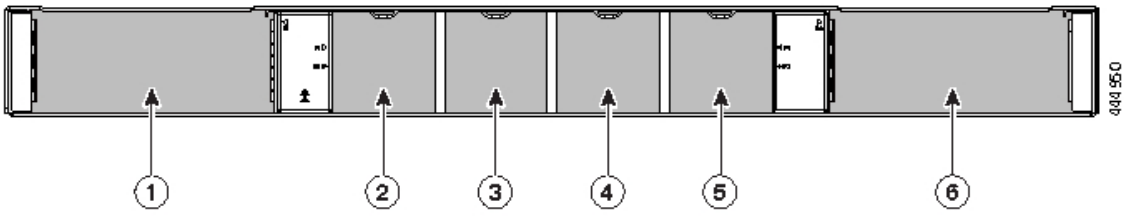
The following figure shows the rear view of a Cisco MDS 9148T Switch:

Figure 2: Rear View of the Cisco MDS 9148T Switch



1	Power supply failure status LED	6	Power supply status LED
2	Power supply unit fan	7	Power supply units (2 units)
3	Power supply unit handle	8	Chassis fan modules (4 units)
4	Unswitched power receptacle	9	Chassis fan module release latches (8)
5	Power supply unit latch release		

Figure 3: Rear Panel Slot Numbering of Cisco MDS 9148T



1	Power supply unit slot 1	4	Chassis fan module slot 3
2	Chassis fan module slot 1	5	Chassis fan module slot 4

3	Chassis fan module slot 2	6	Power supply unit slot 2

LEDs

The Cisco MDS 9148T switch has LEDs on both the front and back of the switch to indicate the status of different system components during bootup tests and online operation. The following tables describe the location of each LED and the meaning of its color:

Table 1: Chassis Activity LEDs for a Cisco MDS 9148T Switch

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

Indicator	Location	Function	Color	Status	State
Status LED	Front panel of the chassis	System Status	Green	Solid On	All diagnostics have passed, Cisco 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 exceeded.
			Red	Blinking	Mismatched airflow direction observed in one of the following modules: • Fan modules—The switch will go down in 10-15 seconds. • PSUs—The switch will go down after 10 minutes. • Fan modules and PSUs—The switch will go down after 10 minutes.
				Solid On	One of the following conditions exists: • A diagnostic test failed or another fault occurred during bootup. • A major temperature threshold is exceeded.
Fan status	Front panel of the chassis	Fan health	Green	Solid on	All fan modules are operational.
			Red	Solid on	Fan failure.

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

The following table describes the Ethernet port LEDs for a Cisco MDS 9148T switch.

LED Position	Status	State
Left	Off	There is no link.
	Solid Green	Indicates a physical link.
Right	Off	There is no link traffic.
	Blinking Amber	Indicates link traffic.

The following table describes the Fibre Channel port LEDs for a Cisco MDS 9148T switch.

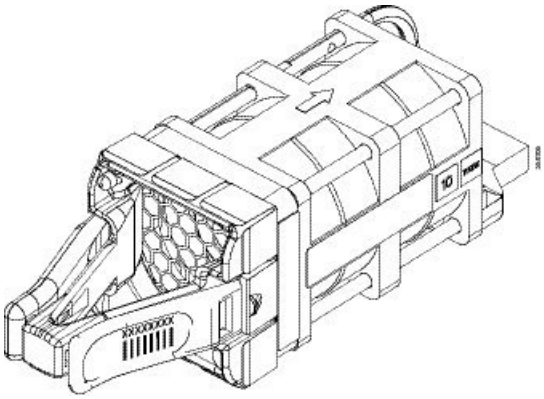
Status	State
Solid Green	The link is up.
Regular Blinking Green	The link is up and the port beacon is active.
Intermittent Blinking Green	The link is up (and traffic is flowing through the port).

Status	State
Solid Orange	The link is disabled by the software.
Blinking Orange	A fault condition exists.
Off	No link.

Fan Modules

The fan modules have a fixed handle for insertion and removal from the chassis. The switch requires a minimum of two operating fan modules to prevent automatic shutdown. It supports up to four fan modules. This provides redundancy for uninterrupted operation in the event of fan module failure. The fan modules are hot-swappable to also allow swapping out of a fan module during operation for uninterrupted operation. During a fan module replacement, the internal airflow through the chassis is changed. If the internal airflow is disrupted for too long, the preset temperature thresholds will be exceeded and the system will automatically shut down to prevent permanent damage.

Figure 4: Fan Module



To facilitate different data center cooling configurations of hot or cold aisles and racks, there are two models of fan modules. The first type has airflow with port-side intake and exhaust at the rear of the chassis. The second type has airflow in the opposite direction, that is, rear-chassis intake and port-side exhaust. The airflow direction is denoted on each fan module as follows:

- Red—Port-side intake airflow
- Blue—Port-side exhaust airflow

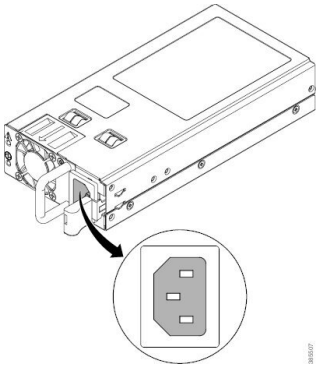
For more information on installing and removing fan modules, see Installing and Removing Fan Modules.

Power Supplies

The Cisco MDS 9148T Switch PSUs have an unswitched power receptacle, a PSU status LED and a handle for insertion and removal of the PSU from the chassis. The Cisco MDS 9148T Switch requires a minimum of one operating PSU. It supports up to two PSUs. This provides redundancy for uninterrupted operation in the event of PSU or grid failure. The PSUs are hot-swappable to allow swapping out of a PSU during operation

for uninterrupted operation. During a PSU replacement, the internal airflow through the chassis is changed. If the internal airflow is disrupted for too long, the preset temperature thresholds will be exceeded and the system will automatically shut down to prevent permanent damage.

Figure 5: Cisco MDS 9148T PSU



To facilitate different data center cooling configurations of hot or cold aisles and racks, there are two models of PSUs. The first type has airflow with port-side intake and exhaust at the rear of the chassis. The second type has airflow in the opposite direction, that is, rear-chassis intake and port-side exhaust. The airflow direction is denoted on each PSU as follows:

- Red—Port-side intake airflow
- Blue—Port-side exhaust airflow

The switch supports PSUs of only one airflow type at a time. Both PSUs have to be either port-side exhaust, or port-side intake PSUs.

Note The direction of PSU airflow must match the direction of the fan module airflow.

For more information on installing and removing PSUs, see Installing and Removing Power Supply Units.