

Technical Specifications

This chapter provides technical specifications and includes the following sections:

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Switch Specifications

Note These equipment are designed to boot up in less than 30 minutes, depending on its neighboring devices be fully up and running.

Note To support 64G optics, the FC Series LC must be running firmware version 9.3(1) or later. A reload of the LC is required to apply the firmware update.

The following table lists the environmental specifications for the Cisco MDS 9700 Series.

Table 1: Environmental Specifications for the Cisco MDS 9700 Series

Description	Specification
Temperature, certified for operation	32 to 104°F (0 to 40°C)
Temperature, ambient non operating and storage	–40 to 158°F (–40 to 70°C)
Humidity (RH), ambient (non condensing) operating	10 to 90%
Humidity (RH), ambient (non condensing) non operating and storage	10 to 95%
Altitude, certified for operation	–197 to 6500 ft (–60 to 2000 m)

This section contains the switch specifications for the following models:

Switch Specifications for Cisco MDS 9706 Director

The following table lists the physical specifications for the Cisco MDS 9706 Director.

Table 2: Physical Specifications for the Cisco MDS 9706 Director

Description	Specification
Dimensions (HxWxD)	9 rack units (9 RU) 15.6 x 17.3 x 32.0 in. (39.62 x 43.9 x 81.3 cm)
Weight	Chassis (includes fans): 145 lb (65.8 kg)
Airflow	700 (LFM) average system velocity and between 40 and 160 cubic feet per minute (CFM) total flow through each line-card slot depending on the line-card type and fan-speed setting

Switch Specifications for Cisco MDS 9710 Director

The following table lists the physical specifications for the Cisco MDS 9710 Director.

Table 3: Physical Specifications for the Cisco MDS 9710 Director

Description	Specification
Dimensions (HxWxD)	14 rack units (14 RU) 24.35 x 17.3 x 34.0 in. (61.9 x 43.9 x 86.4 cm)
Weight	Chassis (includes fans): 185.5 lb (84.2 kg)
Airflow	700 (LFM) average system velocity and between 40 and 160 cubic feet per minute (CFM) total flow through each line-card slot depending on the line-card type and fan-speed setting

Switch Specifications for Cisco MDS 9718 Director

The following table lists the physical specifications for the Cisco MDS 9718 Director.

Table 4: Physical Specifications for the Cisco MDS 9718 Director

Description	Specification
Dimensions (HxWxD)	26 rack units (26 RU) 45.25 x 17.3 x 35 in. (114.9 x 43.9 x 88.9 cm)
Weight	Chassis (includes fans): 300 lb (136 kg)

Description	Specification
Airflow	700 (LFM) average system velocity and between 40 and 160 cubic feet per minute (CFM) total flow through each line-card slot depending on the line-card type and fan-speed setting

Module Specifications

This sections contains the following specifications:

Supervisor-4 Module Specifications

The following table lists the specifications for the Cisco MDS 9700 Supervisor-4 Module (DS-X97-SF4-K9).

Table 5: Cisco MDS 9700 Supervisor-4 Module Specifications

Description	Specification
Environmental Requirements	
Temperature, certified for operation (module intake of ambient)	32 to 104°F (0 to 40°C)
Temperature, ambient nonoperating and storage	-40 to 158°F (-40 to 70°C)
Humidity (RH), ambient (noncondensing) operating	10 to 90%
Altitude, designed and tested for operation	-197 to 6500 ft (-60 to 2000 m)
Physical Characteristics	
Dimensions	2.04 x 8.07 x 23.5 in. (5.18 x 20.49 x 59.69 cm)
Weight	7.7 lb (3.5 kg)

Supervisor-1E Module Specifications

The following table lists the specifications for the Cisco MDS 9700 Supervisor-1E Modules (DS-X97-SF1E-K9).

Table 6: Cisco MDS 9700 Supervisor-1E Module Specifications

Description	Specification
Environmental Requirements	
Temperature, certified for operation (module intake of ambient)	32 to 104°F (0 to 40°C)

Description	Specification
Temperature, ambient nonoperating and storage	-40 to 158°F (-40 to 70°C)
Humidity (RH), ambient (noncondensing) operating	10 to 90%
Altitude, designed and tested for operation	-197 to 6500 ft (-60 to 2000 m)
Physical Characteristics	
Dimensions	2.04 x 7.94 x 21.85 in. (5.18 x 20.17 x 55.5 cm)
Weight	8.5 lb (3.86 kg)

Supervisor-1 Module Specifications

The following table lists the specifications for the Cisco MDS 9700 Supervisor-1 Modules.

Table 7: Cisco MDS 9700 Supervisor-1 Module Specifications

Description	Specification
Environmental Requirements	
Temperature, certified for operation (module intake of ambient)	32 to 104°F (0 to 40°C)
Temperature, ambient nonoperating and storage	-40 to 158°F (-40 to 70°C)
Humidity (RH), ambient (noncondensing) operating	8 to 80%
Altitude, certified for operation	0 to 6500 ft (0 to 2000 m)
Altitude, designed and tested for operation	-197 to 6500 ft (-60 to 2000 m)
Physical Characteristics	
Dimensions	2.04 x 7.5 x 21.8 in. (5.18 x 19.05 x 55.37 cm)
Weight	7 lb (3.2 kg)

Crossbar Fabric Switching Module Specifications

The following table lists the specifications for the Cisco MDS 9700 Series Crossbar Fabric Switching Modules.

Table 8: Cisco MDS 9700 Series Crossbar Fabric Switching Module Specifications

Description	Specification
Environmental Requirements	
Temperature, certified for operation (module intake of ambient)	32 to 104°F (0 to 40°C)

Description	Specification
Temperature, ambient nonoperating and storage	-40 to 158°F (-40 to 70°C)
Humidity (RH), ambient (noncondensing) operating	10 to 90%
Altitude, certified for operation	0 to 6500 ft (0 to 2000 m)
Altitude, designed and tested for operation	-197 to 6500 ft (-60 to 2000 m)
Physical Characteristics	
Dimensions	MDS 9718 Crossbar Switching Module • Fabric-1: 32.40 x 2.02 x 10.22 in. (82.3 x 5.13 x 25.96 cm) • Fabric-3: 32.40 x 2.02 x 10.22 in. (82.3 x 5.13 x 25.96 cm)
	MDS 9710 Crossbar Switching Module • Fabric-1: 18.09 x 2.02 x 9.22 in. (45.95 x 5.13 x 23.42 cm) • Fabric-3: 18.09 x 2.02 x 9.22 in. (45.95 x 5.13 x 23.42 cm)
	MDS 9706 Crossbar Switching Module • Fabric-1: 11.30 x 2.01 x 7.26 in. (28.02 x 5.11 x 18.44 cm) • Fabric-3: 11.30 x 2.01 x 7.26 in. (28.02 x 5.11 x 18.44 cm)

Description	Specification
Weight	MDS 9718 Crossbar Switching Module • Fabric-1: 20 lb (9.07kg) • Fabric-3: 20 lb (9.07 kg)
	MDS 9710 Crossbar Switching Module • Fabric-1: 11 lb (5.0 kg) • Fabric-3: 11 lb (5.0 kg)
	MDS 9706 Crossbar Switching Module • Fabric-1: 5.7 lb (2.6 kg) • Fabric-3: 5.5 lb (2.5 kg)
	MDS 9706 Crossbar Switching Fabric-1 Module 5.7 lb (2.6 kg)

40-Gigabit FCoE Switching Module Specifications

The following table lists the specifications for the Cisco MDS 9700 Series 40-Gigabit FCoE Switching Module.

Table 9: Cisco MDS 9700 Series 40-Gigabit FCoE Switching Module Specifications

Description	Specification
Environmental Requirements	
Temperature, certified for operation (module intake of ambient)	32 to 104°F (0 to 40°C)
Temperature, ambient nonoperating and storage	-40 to 158°F (-40 to 70°C)
Humidity (RH), ambient (noncondensing) operating	5 to 90%
Altitude, certified for operation	0 to 6500 ft (0 to 2000 m)
Altitude, designed and tested for operation	-197 to 6500 ft (-60 to 2000 m)
Physical Characteristics	
Dimensions	1.75 x 15.9 x 21.8 in. (4.4 x 40.39 x 55.37 cm)
Weight	17lb (7.7kg)

10-Gigabit FCoE Switching Module Specifications

The following table lists the specifications for the Cisco MDS 9700 Series 10-Gigabit FCoE Switching Module.

Table 10: Cisco MDS 9700 Series 10-Gigabit FCoE Switching Module Specifications

Description	Specification
Environmental Requirements	
Temperature, certified for operation (module intake of ambient)	32 to 104°F (0 to 40°C)
Temperature, ambient nonoperating and storage	-40 to 158°F (-40 to 70°C)
Humidity (RH), ambient (noncondensing) operating	8 to 80%
Altitude, certified for operation	0 to 6500 ft (0 to 2000 m)
Altitude, designed and tested for operation	-197 to 6500 ft (-60 to 2000 m)
Physical Characteristics	
Dimensions	1.75 x 15.9 x 21.8 in. (4.4 x 40.39 x 55.37 cm)
Weight	17lb (7.7kg)

10-Gigabit FCoE Switching Module Specifications

The following table lists the specifications for the Cisco MDS 9700 Series 10-Gigabit FCoE Switching Module.

Table 11: Cisco MDS 9700 Series 10-Gigabit FCoE Switching Module Specifications

Description	Specification
Environmental Requirements	
Temperature, certified for operation (module intake of ambient)	32 to 104°F (0 to 40°C)
Temperature, ambient nonoperating and storage	-40 to 158°F (-40 to 70°C)
Humidity (RH), ambient (noncondensing) operating	5 to 90%
Altitude, designed and tested for operation	-197 to 6500 ft (-60 to 2000 m)
Physical Characteristics	
Dimensions	1.75 x 15.9 x 21.8 in. (4.4 x 40.39 x 55.37 cm)
Weight	17lb (7.7kg)

48-Port 64-Gbps FC Switching Module Specifications

The following table lists the specifications for the Cisco MDS 9700 Series 48-Port 64-Gbps FC Switching Module.

Table 12: Cisco MDS 9700 Series 48-Port 64-Gbps FC Switching Module Specifications

Description	Specification
Environmental Requirements	
Temperature, certified for operation (module intake of ambient)	32 to 104°F (0 to 40°C)
Temperature, ambient nonoperating and storage	-40 to 158°F (-40 to 70°C)
Humidity (RH), ambient (noncondensing) operating	10 to 90%
Altitude, designed and tested for operation	-197 to 6500 ft (-60 to 2000 m)
Physical Characteristics	
Dimensions	1.73 x 16.9 x 23.6 in. (4.4 x 43.04 x 59.89 cm)
Weight	17.6 lb (8.0 kg)

48-Port 32-Gbps FC Switching Module Specifications

The following table lists the specifications for the Cisco MDS 9700 Series 48-Port 32-Gbps FC Switching Module.

Table 13: Cisco MDS 9700 Series 48-Port 32-Gbps FC Switching Module Specifications

Description	Specification
Environmental Requirements	
Temperature, certified for operation (module intake of ambient)	32 to 104°F (0 to 40°C)
Temperature, ambient nonoperating and storage	-40 to 158°F (-40 to 70°C)
Humidity (RH), ambient (noncondensing) operating	10 to 90%
Altitude, designed and tested for operation	-197 to 6500 ft (-60 to 2000 m)
Physical Characteristics	
Dimensions	1.73 x 15.9 x 21.8 in. (4.4 x 40.39 x 55.37 cm)
Weight	17.5 lb (7.94 kg)

48-Port 16-Gbps FC Switching Module Specifications

The following table lists the specifications for the Cisco MDS 9700 Series 48-Port 16-Gbps FC Switching Module.

Table 14: Cisco MDS 9700 Series 48-Port 16-Gbps FC Switching Module Specifications

Description	Specification
Environmental Requirements	
Temperature, certified for operation (module intake of ambient)	32 to 104°F (0 to 40°C)
Temperature, ambient nonoperating and storage	-40 to 158°F (-40 to 70°C)
Humidity (RH), ambient (noncondensing) operating	10 to 90%
Altitude, designed and tested for operation	-197 to 6500 ft (-60 to 2000 m)
Physical Characteristics	
Dimensions	1.75 x 15.9 x 21.8 in. (4.4 x 40.39 x 55.37 cm)
Weight	17 lb (7.71 kg)

Power Specifications

This section includes the following topics:

Power Supply Specifications — 3000-W AC Power Supply

The following table lists the specifications for the Cisco MDS 9700 Series power supplies for 3000-W AC Power Supply.

Table 15: Specifications for Cisco MDS 9700 Series Power Supplies - 3000-W AC Power Supply

Description	Specification
Type	Autoranging input with power factor corrector.
Voltage	100 to 240 VAC (±10%).
Current rating	16 A maximum at 100 to 120 VAC and 1451-W output. 16 A maximum at 200 to 240 VAC and 3051-W output. For current ratings of plugs, see Supported Plugs for 3000 W AC Power Supplies
Frequency	50 to 60 Hz (nominal) (±3 Hz for full range).

Description	Specification
Output capacity	1451 W maximum (100 to 120 VAC, 1400W available to chassis) 3051 W maximum (200 to 240 VAC, 3000W available to chassis)
Output voltage at 110/120	3.4V (+/- 4%) at 15A; 50V(+/- 4%) at 28A.
Output voltage at 200/240	3.4V (+/- 4%) at 15A; 50V(+/- 4%) at 28A
Efficiency	>94% at 50% load (80Plus Platinum certified)
ITHD	<5.1% at 50% load

Power Supply Specifications — 3500-W High Voltage AC/DC Power Supply

The following table lists the specifications for the Cisco MDS 9700 Series power supplies for 3500-W High Voltage AC/DC Power Supply.

Table 16: Specifications for Cisco MDS 9700 Series Power Supplies - 3500-W High Voltage AC/DC Power Supply

Description	Specification
Type	Autoranging input with power factor corrector.
Input Voltage Range	120 VAC nominal low-line mode (85 to 132 VAC) 240 VAC nominal high-line mode (170 to 264 VAC) 277 VAC nominal high line mode (188 to 305 VAC) 240 VDC nominal high-line mode (192 to 288 VDC) 380 VDC nominal high-line mode (260 to 400 VDC)
Input Current	20A service, 16A maximum at nominal line voltage (240 or 277 VAC) 20A service, 16A maximum at nominal line voltage (240 or 380 VDC)
Input Frequency	47 to 63 Hz
Output capacity	1500 W maximum (100 to 120 VAC) 3100 W maximum (200 to 210 VAC) 3500 W maximum (215 to 240 and 277 VAC) 3100 W maximum (200 to 215 VDC) 3500 W maximum (220 to 380 VDC)
Efficiency	>96% at 50% load (80Plus Titanium certified)
ITHD	<6.3% at 50% load

Power Supply Fuse Information

The following table provides the power supply fuse information for Cisco MDS 9700 Series power supplies.

Table 17: Power Supply Fuse Information

Part Number	PID	Type	Fuse Rated AMP	I2T	Fuse Melting Time
341-0579-03	DS-CAC97-3KW	Fast Acting	25 A	2500 5000	1000s@32A,0.1s@160A 1000s@35A,0.1s@160A
341-0578-01	DS-CDC97-3KW	Fast Acting	60 A	2297	1000s@80A,0.1s@380A

Component Power Requirements and Heat Dissipation

When sizing the air-conditioning requirements for an installation, consider heat dissipation. The power and heat associated with a Cisco MDS 9700 Directors varies based upon the following considerations:

- Power supply type
- Switching module type and number of switching modules installed
- Average switching traffic levels

Note Starting from Cisco MDS NX-OS Release 9.4(1),

- The power required by the fan modules is reduced. See the table Power Requirements for the Components of the Cisco MDS 9700 Directors.
- Power off unused power supplies. See Removing a Fan Module or Tray.

The following table lists the power requirements for the components of the Cisco MDS 9700 Directors.

Table 18: Power Requirements for the Components of the Cisco MDS 9700 Directors

Module Type/Product Number	Maximum Capacity per Chassis	Power Required (watts)	
		Maximum	Typical
Cisco MDS 9700 48 port 64 Gbps Switching Module (DS-X9748-3072K9)	4 (Cisco MDS 9706) 8 (Cisco MDS 9710) 16 (Cisco MDS 9718)	350	300
Cisco MDS 9700 48 port 32 Gbps Switching Module (DS-X9648-1536K9)		350	260
Cisco MDS 48 port 16 Gbps Switching Module (DS-X9448-768K9)		650	480
Cisco MDS 48 Port 10 Gigabit Fibre Channel over Ethernet Module (DS-X9848-480K9)		500	400
24 Port 40 Gbps Fibre Channel over Ethernet (FCoE) Module (DS-X9824-960K9)		740	550
24/10 port SAN Extension Module (DS-X9334-K9)		480	450
Cisco MDS 9700 Series Supervisor-4 Module (DS-X97-SF4-K9)	2	120	100
Cisco MDS 9700 Series Supervisor-1E Module (DS-X97-SF1E-K9)		265	160
Cisco MDS 9700 Series Supervisor-1 Module (DS-X97-SF1-K9)		190	110
Cisco MDS 9718 Crossbar Switching Fabric-3 Module (DS-X9718-FAB3)	6	330	285
Cisco MDS 9718 Crossbar Switching Fabric-1 Module (DS-X9718-FAB1)		300	260
Cisco MDS 9710 Crossbar Switching Fabric-3 Module (DS-X9710-FAB3)		150	135
Cisco MDS 9706 Crossbar Switching Fabric-3 Module (DS-X9706-FAB3)		85	64
Cisco MDS 9710 Crossbar Switching Fabric-1 Module (DS-X9710-FAB1)		150	135
Cisco MDS 9706 Crossbar Switching Fabric-1 Module (DS-X9706-FAB1)		85	64

Module Type/Product Number	Maximum Capacity per Chassis	Power Required (watts)	
		Maximum	Typical
Cisco MDS 9718 Fan Module or Tray (DS-C9718-FAN)	3	750 [1]	75
Cisco MDS 9710 Fan Module or Tray (DS-C9710-FAN)		500 [2]	50
Cisco MDS 9706 Fan Module or Tray (DS-C9706-FAN)		250 [3]	40

[1] Starting from Cisco MDS NX-OS Release 9.4(1)

900 for releases prior to Cisco MDS NX-OS Release 9.4(1)

[2] Starting from Cisco MDS NX-OS Release 9.4(1)

600 for releases prior to Cisco MDS NX-OS Release 9.4(1)

[3] Starting from Cisco MDS NX-OS Release 9.4(1)

300 for releases prior to Cisco MDS NX-OS Release 9.4(1)

Power Requirements and Heat Dissipation for MDS 9710 with 3000 W AC Power Supplies and 64 Gbps Fibre Channel switching modules

The following table lists the requirements and heat dissipation for 3000 W AC power supplies at 64 Gbps speed using Cisco MDS 9700 48 port 64 Gbps Switching Module (DS-X9748-3072K9) and six Fabric Modules for 64 Gbps Speed and three Fabric Modules for 32 Gbps Speed.

Table 19: 64-Gbps Power Requirements Using 3000 W AC PSUs

Number of Switching Modules	Number of Ports	Power Required (Watts)				Typical Heat Dissipation (BTU/hr)	
		Typical (32 Gbps)	Typical (64 Gbps)	Worst Case (32 Gbps)	Worst Case (64 Gbps)	Typical (32 Gbps)	Typical (64 Gbps)
1	48	995	1460	2790	3290	3393	4979
2	96	1235	1760	3090	3640	4211	6002
3	144	1475	2060	3390	3990	5030	7025
4	192	1715	2360	3690	4340	5848	8048
5	240	1955	2660	3990	4690	6667	9071
6	288	2195	2960	4290	5040	7485	10094
7	336	2435	3260	4590	5390	8303	11117
8	384	2675	3560	4890	5740	9122	12140

Power Requirements and Heat Dissipation for MDS 9710 with 3000 W AC Power Supplies and 32 Gbps Fibre Channel switching modules

The following table lists the requirements and heat dissipation for 3000 W AC power supplies at 32 Gbps speed using Cisco MDS 9700 48 port 32 Gbps Switching Module (DS-X9648-1536K9) and six Fabric 1 Modules.

Table 20: 32-Gbps Power Requirements Using 3000 W AC PSUs

Number of Switching Modules	Number of Ports	Power Required (Watts)		Typical Heat Dissipation (BTU/hr)
		Typical	Worst Case	
1	48	1440	3340	4910
2	96	1700	3600	5797
3	144	1960	3860	6683
4	192	2220	4120	7570
5	240	2480	4380	8457
6	288	2740	4640	9343
7	336	3000	4900	10230
8	384	3260	5160	11117

The following table lists the requirements and heat dissipation for 3000 W AC power supplies at 32 Gbps speed using Cisco MDS 9700 48 port 32 Gbps Switching Module (DS-X9648-1536K9) and three Fabric 3 Modules.

Table 21: 32-Gbps Power Requirements Using 3000 W AC PSUs

Number of Switching Modules	Number of Ports	Power Required (watts)		Typical Heat Dissipation (BTU/hr)
		Typical	Worst Case	
1	48	1015	2750	3461
2	96	1275	3010	4348
3	144	1535	3270	5234
4	192	1795	3530	6121
5	240	2055	3790	7008
6	288	2315	4050	7894
7	336	2575	4310	8781
8	384	2835	4570	9667

AC Power Consumption for the Cisco MDS 9706 Director

The following table lists the typical AC power consumption for the Cisco MDS 9706 Director.

Note The indicated power consumption values refer to when switch ports are fully populated with SFP short wave type.

Table 22: Typical AC Power Consumption for Cisco MDS 9706 Director

Speed/Module Type	Number of Fabric Modules	Typical AC Power Consumption (Watts)	
		96 ports	192 ports
64-G operating speed Fibre Channel ports with Cisco MDS 9700 48-port 64-Gbps Switching Module (DS-X9748-3072K9)	6	1304	1904
32-G operating speed Fibre Channel ports with Cisco MDS 9700 48-port 32-Gbps Switching Module (DS-X9648-1536K9)		1244	1764
16-G operating speed Fibre Channel ports with Cisco MDS 9700 48-port 32-Gbps Switching Module (DS-X9648-1536K9)	3	1052	1572
16-G operating speed Fibre Channel ports with Cisco MDS 9700 48-port 16-Gbps Switching Module (DS-X9448-768K9)	3	1492	2452

AC Power Consumption for the Cisco MDS 9710 Director

The following table lists the typical AC power consumption for the Cisco MDS 9710 Director.

Note The indicated power consumption values refer to when switch ports are fully populated with SFP short wave type.

Table 23: Typical AC Power Consumption for Cisco MDS 9710 Director

Speed/Module Type	Number of Fabric Modules	Typical AC Power Consumption (Watts)	
		192 ports	384 ports
64-G operating speed Fibre Channel ports with Cisco MDS 9700 48-port 64-Gbps Switching Module (DS-X9748-3072K9)	6	2360	3560
32-G operating speed Fibre Channel ports with Cisco MDS 9700 48-port 32-Gbps Switching Module (DS-X9648-1536K9)		2220	3260

Speed/Module Type	Number of Fabric Modules	Typical AC Power Consumption (Watts)	
		192 ports	384 ports
16-G operating speed Fibre Channel ports with Cisco MDS 9700 48-port 32-Gbps Switching Module (DS-X9648-1536K9)	3	1815	2855
16-G operating speed Fibre Channel ports with Cisco MDS 9700 48-port 16-Gbps Switching Module (DS-X9448-768K9)	3	2695	4615

AC Power Consumption for the Cisco MDS 9718 Director

The following table lists the typical AC power consumption for the Cisco MDS 9718 Director.

Note The indicated power consumption values refer to when switch ports are fully populated with SFP short wave type.

Table 24: Typical AC Power Consumption for Cisco MDS 9718 Director

Speed/Module Type	Number of Fabric Modules	Typical AC Power Consumption (Watts)		
		192 ports	384 ports	768 ports
64-G operating speed Fibre Channel ports with Cisco MDS 9700 48-port 64-Gbps Switching Module (DS-X9748-3072K9)	6	3335	4535	6935
32-G/16-G operating speed Fibre Channel ports with Cisco MDS 9700 48-port 32-Gbps Switching Module (DS-X9648-1536K9)		3145	4185	6265
16-G operating speed Fibre Channel ports with Cisco MDS 9700 48-port 16-Gbps Switching Module (DS-X9448-768K9)		4025	5945	9785

AC Power Supply Requirements for Grid Redundancy of Cisco MDS 9706 Director

The following table lists the AC PSU Requirements for Grid Redundancy of Cisco MDS 9706 Director.

Table 25: MDS 9706 AC PSU Requirements for Grid Redundancy

Configurations	Minimum PSUs Required for Grid Redundancy		
	3000 Watts AC	3000 Watts DC	3500 Watts AC/DC
Up to 3 x Cisco MDS 48 Port 64-Gbps Fibre Channel Switching Modules or Cisco MDS 48-Port 32-Gbps Fibre Channel Switching Modules	2	2	2
Up to 4 x Cisco MDS 48 Port 64-Gbps Fibre Channel Switching Modules or Cisco MDS 48-Port 32-Gbps Fibre Channel Switching Modules	4 [4]	4 [4]	4 [4]
	2 [5]	2 [5]	2 [5]
Any other supported module or a combination of supported modules: • 48 Port 64-Gbps Fibre Channel Switching Module • 48-Port 32-Gbps Fibre Channel Switching Module • 24/10 port SAN Extension Module • 24 Port 40-Gbps Fibre Channel over Ethernet Module • 48 Port 16-Gbps Fibre Channel Switching Module • 48 Port 10-Gbps Fibre Channel over Ethernet Module	4	4	4

[4] Prior to Cisco MDS NX-OS Release 9.4(1)
[5] Starting from Cisco MDS NX-OS Release 9.4(1)

AC Power Supply Requirements for Grid Redundancy of Cisco MDS 9710 Director

The following table lists the AC PSU Requirements for Grid Redundancy of Cisco MDS 9710 Director.

Table 26: MDS 9710 AC PSU Requirements for Grid Redundancy

Configurations	Minimum PSUs Required for Grid Redundancy		
	3000 Watts AC	3000 Watts DC	3500 Watts AC/DC
Up to 8 x Cisco MDS 48 Port 64-Gbps Fibre Channel Switching Modules	6	6	6

Configurations	Minimum PSUs Required for Grid Redundancy		
	3000 Watts AC	3000 Watts DC	3500 Watts AC/DC
Up to 8 x Cisco MDS 48 Port 32-Gbps Fibre Channel Switching Modules	6 [6]	6 [6]	6 [6]
	4 [7]	4 [7]	4 [7]
Any other supported module or a combination of supported modules: • 48 Port 64-Gbps Fibre Channel Switching Module • 48 Port 32-Gbps Fibre Channel Switching Module • 24/10 port SAN Extension Module • 24 Port 40-Gbps Fibre Channel over Ethernet Module • 48 Port 16-Gbps Fibre Channel Switching Module • 48 Port 10-Gbps Fibre Channel over Ethernet Module	6	6	6

[6] Prior to Cisco MDS NX-OS Release 9.4(1)
[7] Starting from Cisco MDS NX-OS Release 9.4(1)

AC Power Supply Requirements for Grid Redundancy of Cisco MDS 9718 Director

The following table lists the AC PSU Requirements for Grid Redundancy of Cisco MDS 9718 Director.

Table 27: MDS 9718 AC PSU Requirements for Grid Redundancy

Configurations	Minimum PSUs Required for Grid Redundancy		
	3000 Watts AC	3000 Watts DC	3500 Watts AC/DC
Up to 16 x Cisco MDS 48 Port 64-Gbps Fibre Channel Switching Modules	8	8	8
Up to 16 x Cisco MDS 48 Port 32-Gbps Fibre Channel Switching Modules	8	8	8
Up to 12 x Cisco MDS 48 Port 32-Gbps Fibre Channel Switching Modules and up to 4 x 24/10 port SAN Extension Module	8	8	8

Configurations	Minimum PSUs Required for Grid Redundancy		
	3000 Watts AC	3000 Watts DC	3500 Watts AC/DC
Any other supported module or a combination of supported modules: • 48 Port 64-Gbps Fibre Channel Switching Module • 48 Port 32-Gbps Fibre Channel Switching Module • 24/10 port SAN Extension Module • 24 Port 40-Gbps Fibre Channel over Ethernet Module • 48 Port 16-Gbps Fibre Channel Switching Module • 48 Port 10-Gbps Fibre Channel over Ethernet Module	12	12	12

SFP+ Transceiver Specifications

The Cisco MDS 9700 Series switch is compatible with SFP+ transceivers and cables that have LC connectors. The wavelength of each transceiver must match the transceiver on the other end of the cable, and the cable must not exceed the stipulated cable length for reliable communications.

Cisco SFP+ transceivers provide the uplink interfaces, laser transmit (Tx) and laser receive (Rx), and support 850 to 1610 nm nominal wavelengths, depending upon the transceiver.

Use only genuine Cisco SFP+ transceivers in Cisco MDS 9700 Series switches. Each Cisco SFP+ transceiver is encoded with serial number, vendor name, and other parameters that enable Cisco NX-OS to verify that the transceiver meets the requirements of the switch. If discrepancies are found, the SFP+ will be allowed to function, if possible, but will cause a warning syslog message to be generated. Cisco TAC does not support switch ports populated with non-Cisco SFP+ transceivers.

For more information and detailed specifications, see the Cisco MDS 9000 Family Pluggable Transceivers Data Sheet.