



## Technical Specifications

This appendix provides technical specifications and includes the following sections:

- [Switch Specifications, page 1-1](#)
- [Module Specifications, page 1-4](#)
- [Power Specifications for the Cisco MDS 9513 Director, page 1-6](#)
- [Power Specifications for the Cisco MDS 9509 Director, page 1-10](#)
- [Power Specifications for the Cisco MDS 9506 Director, page 1-15](#)
- [Transceiver Specifications, page 1-20](#)



Note

Specifications for cables and connectors are provided in [Appendix 1, “Cable and Port Specifications.”](#)

## Switch Specifications

The Cisco MDS 9500 Series supports hot-swappable fan modules that provide 85 cfm (cubic feet per minute) of airflow per slot with 410 W of power dissipation per slot.

[Table 1-1](#) lists the environmental specifications for the Cisco MDS 9500 Series.

**Table 1-1** *Environmental Specifications for the Cisco MDS 9500 Series*

| Description                                                     | Specification                    |
|-----------------------------------------------------------------|----------------------------------|
| Temperature, certified for operation                            | 32 to 104°F (0 to 40°C)          |
| Temperature, designed and tested for operation                  | 32 to 130°F (0 to 55°C)          |
| Temperature, ambient nonoperating and storage                   | -40 to 158°F (-40 to 70°C)       |
| Humidity (RH), ambient (noncondensing) operating                | 10 to 90%                        |
| Humidity (RH), ambient (noncondensing) nonoperating and storage | 5 to 95%                         |
| Altitude, certified for operation                               | 0 to 6500 ft (0 to 2000 m)       |
| Altitude, designed and tested for operation                     | -200 to 10000 ft (-60 to 3000 m) |
| Noise levels                                                    | 70 dB                            |

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Table 1-2 lists the physical specifications for the Cisco MDS 9513 Director.

**Table 1-2 Physical Specifications for the Cisco MDS 9513 Director**

| Description        | Specification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dimensions (HxWxD) | 24.5 x 17.5 x 28 in. (62.2 x 44.5 x 71.1 cm)<br>Chassis requires 14 RU <sup>1</sup> , 15 RU with a rack-mount kit.<br>Chassis depth including cable guide is 33 in. (83.8 cm).<br>Crossbar module: 1.7 x 14.0 x 11.2 in. (4.4 x 35.6 x 28.4 cm)                                                                                                                                                                                                                                                                                                     |
| Weight             | Chassis only: 101 lb (45.36 kg)<br>Fully loaded chassis <sup>2</sup> : 375 lb (170.10 kg)<br>System fan tray: 18 lbs (8.2 kg)<br>Crossbar module fan tray: 2.25 lbs (1.02 kg)                                                                                                                                                                                                                                                                                                                                                                       |
| Power supply       | 6000-W, AC input<br>33 lb (15 kg)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Airflow            | 275 to 325 lfm <sup>3</sup> through system fan module, or 90 cfm <sup>4</sup> per supervisor, switching, or services module. Total of 1150 cfm if all slots are filled.<br>Spacing requirements: <ul style="list-style-type: none"> <li>If installed in an open rack (no side panels), the horizontal distance required between the chassis and any devices that exhaust air towards the chassis is a minimum of 12 in. (304 cm), and the distance required between the chassis air vents and any walls is a minimum of 6 in. (15.2 cm).</li> </ul> |

1. RU = rack unit; 1 RU = 1.75 in. (4.45 cm).
2. Depending on what modules are installed in the chassis.
3. lfm = linear feet per minute.
4. cfm = cubic feet per minute.

Table 1-3 lists the physical specifications for the Cisco MDS 9509 Director.

**Table 1-3 Physical Specifications for the Cisco MDS 9509 Director**

| Description        | Specification                                                                                                                                                                                                                                                     |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dimensions (HxWxD) | 24.5 x 17.25 x 18.8 in. (62.2 x 43.8 x 47.8 cm)<br>Chassis requires 14 RU <sup>1</sup> plus space for shelf brackets.<br>Chassis depth including cable guide is 21.64 in. (55.0 cm).                                                                              |
| Weight             | Chassis only: 55 lb (24.9 kg)<br>Chassis configured with two supervisor modules, and 2500-W power supplies: 120 lb (54.4 kg)<br>Chassis configured with two supervisor modules, and 4000-W power supplies: 140 lb (63.5 kg)<br>System fan tray: 10.5 lb (5.0 kg). |

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**Table 1-3 Physical Specifications for the Cisco MDS 9509 Director (continued)**

| Description  | Specification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power supply | 4000-W, AC input<br>3000-W, AC input<br>2500-W, AC input<br>2500-W, DC input                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Airflow      | 300 lfm <sup>2</sup> through system fan module, or 80 cfm <sup>3</sup> per supervisor, switching, or services module. Total of 720 cfm if all slots are filled.<br><br>Spacing requirements: <ul style="list-style-type: none"> <li>• If installed in a cabinet, a minimum clearance of 2.5 in. (6.4 cm) is required between the chassis air vents and the cabinet walls.</li> <li>• If installed in an open rack (no side panels), the horizontal distance required between the chassis and any devices that exhaust air towards the chassis is a minimum of 6 in. (15.2 cm), and the distance required between the chassis air vents and any walls is a minimum of 2.5 in. (6.4 cm).</li> </ul> |

1. RU = rack unit; 1 RU = 1.75 in. (4.45 cm)
2. lfm = linear feet per minute
3. cfm = cubic feet per minute

Table 1-4 lists the physical specifications for the Cisco MDS 9506 Director.

**Table 1-4 Physical Specifications for the Cisco MDS 9506 Director**

| Description        | Specification                                                                                                                                                                                                          |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dimensions (HxWxD) | 12.25 x 17.37 x 21.75 in. (31.1 x 44.1 x 55.2 cm).<br>Chassis requires 7 RU <sup>1</sup> .<br>Chassis depth including cable guides is 26.75 inches (67.9 cm).                                                          |
| Weight             | Chassis only: 46 lb (20.9 kg).<br>Chassis configured with two supervisor modules, fan module, and two power supplies: 86 lb (39 kg).<br>System fan tray: 7.70 lbs (3.49 kg)<br>1900W AC power supply: 11 lbs (4.99 kg) |

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**Table 1-4 Physical Specifications for the Cisco MDS 9506 Director (continued)**

| Description  | Specification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power supply | 1900-W, AC input<br>1900-W, DC input                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Airflow      | 300 lfm <sup>2</sup> through system fan module, or 80 cfm <sup>3</sup> per supervisor, switching, or services module (total of 480 cfm if all slots are filled).<br>Spacing requirements: <ul style="list-style-type: none"> <li>• If installed in a cabinet, a minimum of 2.5 in. (6.4 cm) is required between the chassis air vents and the cabinet walls.</li> <li>• If installed in an open rack (no side panels), the horizontal distance required between the chassis and any devices that exhaust air towards the chassis is a minimum of 6 in. (15.2 cm), and the distance required between the chassis air vents and any walls is a minimum of 2.5 in. (6.4 cm).</li> </ul> |

1. RU = rack unit; 1 RU = 1.75 in. (4.45 cm)
2. lfm = linear feet per minute
3. cfm = cubic feet per minute

## Module Specifications

Table 1-5 lists the specifications for the Cisco MDS 9500 Series supervisor modules, services modules, and switching modules.

**Table 1-5 Cisco MDS 9500 Series Module Specifications**

| Description                                                     | Specification                    |
|-----------------------------------------------------------------|----------------------------------|
| <b>Environmental Requirements</b>                               |                                  |
| Temperature, certified for operation (module intake of ambient) | 32 to 104°F (0 to 40°C)          |
| Temperature, designed and tested for operation                  | 32 to 130°F (0 to 55°C)          |
| Temperature, ambient nonoperating and storage                   | -40 to 167°F (-40 to 75°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                     | -200 to 10000 ft (-60 to 3000 m) |
| <b>Physical Characteristics</b>                                 |                                  |

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**Table 1-5 Cisco MDS 9500 Series Module Specifications (continued)**

| Description | Specification                                                                                                                                                      |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dimensions  | 1.75 x 15.5 x 16.5 in. (4.4 x 39.4 x 41.9 cm)<br><b>Note</b> These are the maximum dimensions of the faceplate and board, and include the connectors on the board. |
| Weight      | 8 to 11.5 lb (1.4 to 5.2 kg)                                                                                                                                       |

## Weight of Modules

Table 1-6 lists the weight for each module in the Cisco MDS 9000 Family.

**Table 1-6 Weight of Modules in the Cisco MDS 9000 Family**

| Module                                                 | Weight             |
|--------------------------------------------------------|--------------------|
| 8-port 10-Gbps FCoE module                             | 8 lb (3.63 kg)     |
| 48-Port 8-Gbps Advanced Fibre Channel Switching module | 10.0 lb (4.5 kg)   |
| 32-Port 8-Gbps Advanced Fibre Channel Switching module | 10.0 lb (4.5 kg)   |
| MDS 9513 256-Gbps Fabric 3 Module                      | 5 lb (2.26 kg)     |
| 16-port Storage Services Node                          | 10.0 lb (4.5 kg)   |
| 48-port 8-Gbps switching module                        | 10.25 lb (4.65 kg) |
| 24-port 8-Gbps switching module                        | 10.25 lb (4.65 kg) |
| 4/44-port 8-Gbps Host-Optimized switching module       | 9.75 lb (4.42 kg)  |
| Fabric 2 external crossbar module (DS-13SLT-FAB2)      | 6 lb (2.7 kg)      |
| Fabric 1 external crossbar module (DS-13SLT-FAB1)      | 6 lb (2.7 kg)      |
| 48-port 4-Gbps switching module                        | 11.0 lb (4.99 kg)  |
| 24-port 4-Gbps switching module                        | 7.75 lb (3.52 kg)  |
| 12-port 4-Gbps switching module                        | 7.5 lb (3.40 kg)   |
| 4-Port 10-Gbps switching module                        | 8.5 lb (3.86 kg)   |
| 32-port FC switching module                            | 9 lb (4.1 kg)      |
| 16-port FC switching module                            | 9 lb (4.1 kg)      |
| SSM                                                    | 11 lb (5 kg)       |
| ASM                                                    | 11 lb (5 kg)       |
| CSM                                                    | 11.5 lb (5.2 kg)   |
| IPS-8                                                  | 10 lb (4.5 kg)     |
| IPS-4                                                  | 9 lb (4.1 kg)      |

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**Table 1-6 Weight of Modules in the Cisco MDS 9000 Family (continued)**

| Module                            | Weight            |
|-----------------------------------|-------------------|
| MSM-18/4                          | 8.5 lb (3.86 kg)  |
| MPS-14/2                          | 10 lb (4.5 kg)    |
| Supervisor-2A for MDS 9500 Series | 7.25 lb (3.3 kg)  |
| Supervisor-2 for MDS 9500 Series  | 7.25 lb (kg)      |
| Supervisor-1 for MDS 9500 Series  | 9 lb (4.1 kg)     |
| Supervisor for MDS 9200 Series    | 9 lb (4.1 kg)     |
| Crossbar module fan tray          | 2.25 lb (1.13 kg) |
| Module blank panels               | 0.50 lb (0.25 kg) |

Table 1-7 lists the specifications for the batteries on the Cisco MDS 9000 Family caching services module.



**Note**

The CSM does not support Cisco SAN-OS Release 3.0(1).

**Table 1-7 Caching Services Module Battery Specifications**

| Attribute               | Value                                                                                  |
|-------------------------|----------------------------------------------------------------------------------------|
| Nominal voltage         | 9.6 V                                                                                  |
| Rated capacity          | Typical discharge capacity at 0.2C rate: 2100 mAh                                      |
|                         | Minimum discharge capacity at 0.2C rate: 2000 mAh                                      |
|                         | Minimum discharge capacity at 5C rate: 1800 mAh (1 V/cell discharge cut-off)           |
| Discharge               | The battery is capable of continuous discharge from 41 to 140°F (5 to 60°C) at 5C-rate |
| Charge                  | From 32 to 59°F (0 to 15°C) at C/10 rate and from 59 to 104°F (15 to 40°C) at C/2 rate |
| Storage temperature     | 32 to 95°F (0 to +35°C)                                                                |
| Relative humidity range | From 5 to 90%                                                                          |

## Power Specifications for the Cisco MDS 9513 Director

This section includes the following topics:

- [Specifications for the Cisco MDS 9513 Power Supplies, page 1-7](#)
- [Component Power Requirements and Heat Dissipation for the Cisco MDS 9513 Director, page 1-7](#)
- [AC Power Consumption for the Cisco MDS 9513 Director, page 1-9](#)

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## Specifications for the Cisco MDS 9513 Power Supplies

The 6000-W AC power supply provides power based upon the input voltage. Each power supply has two AC power connections and will provide power as follows:

- One AC power connection @ 110 VAC = No output
- Two AC power connection @ 110 VAC = 2900 W output
- One AC power connection @ 220 VAC = 2900 W output
- One AC power connection @ 110 VAC and one AC power connection @ 220 VAC = 2900 W output
- Two AC power connection @ 220 VAC = 6000 W output

If a 110 VAC input is chosen, a 110-VAC power cord (CAB-7513AC=) must be ordered separately.



### Note

Power output does not include the power used by the individual modules used in the chassis.

Table 1-8 lists the specifications for the Cisco MDS 9513 power supplies.

**Table 1-8 Specifications for Cisco MDS 9513 Power Supplies**

| Description                   | Specification                                                                                                                                                                                                                                                                                           |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>6000-W AC Power Supply</b> |                                                                                                                                                                                                                                                                                                         |
| Type                          | Autoranging input with power factor corrector.                                                                                                                                                                                                                                                          |
| Voltage                       | 100 to 240 VAC ( $\pm 10\%$ ).                                                                                                                                                                                                                                                                          |
| Current rating                | 16 A maximum at 100 to 120 VAC and 2900-W output.<br>16 A maximum at 200 to 240 VAC and 6000-W output.                                                                                                                                                                                                  |
| Frequency                     | 50 to 60 Hz (nominal) ( $\pm 3$ Hz for full range).                                                                                                                                                                                                                                                     |
| Output capacity               | One AC power connection @ 110 VAC = No output<br>Two AC power connection @ 110 VAC = 2900 W output<br>One AC power connection @ 220 VAC = 2900 W output<br>One AC power connection @ 110 VAC and one AC power connection @ 220 VAC = 2900 W output<br>Two AC power connection @ 220 VAC = 6000 W output |
| Output voltage at 110/120     | 3.3 V at 10 A, 50 V at 57 A                                                                                                                                                                                                                                                                             |
| Output voltage at 200/240     | 3.3 V at 10A, 50 V at 119 A                                                                                                                                                                                                                                                                             |

## Component Power Requirements and Heat Dissipation for the Cisco MDS 9513 Director

Consider heat dissipation when sizing the air-conditioning requirements for an installation. The power and heat associated with a Cisco MDS 9513 Director varies based upon the following considerations:

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

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Table 1-9 lists the power requirements and heat dissipation for the components of the Cisco MDS 9513 Director.

**Note**

Unless noted otherwise, the data listed in Table 1-9 is based on worst-case conditions. Typical numbers are approximately 30 percent below the numbers listed here.

**Table 1-9 Requirements and Heat Dissipation for 6000-W AC Power Supplies**

| Module Type/<br>Product Number                                                                             | NX-OS<br>Release | SAN-OS<br>Release | Power<br>Required<br>(watts) | Heat<br>Dissipation<br>(BTU/hr) | Input Current    |                   |                   |                   |
|------------------------------------------------------------------------------------------------------------|------------------|-------------------|------------------------------|---------------------------------|------------------|-------------------|-------------------|-------------------|
|                                                                                                            |                  |                   |                              |                                 | 90 VAC<br>(amps) | 120 VAC<br>(amps) | 180 VAC<br>(amps) | 240 VAC<br>(amps) |
| Fan tray 1 (front panel),<br>DS-13SLT-FAN-F                                                                |                  | 3.x               | 248                          | 1059                            | 3.44             | 2.58              | 1.72              | 1.29              |
| Fan tray 2 (rear panel),<br>DS-13SLT-FAN-R                                                                 |                  | 3.x               | 70                           | 299                             | 0.97             | 0.73              | 0.49              | 0.36              |
| Cisco MDS 9513 chassis,<br>DS-C9513, with front<br>(DS-13SLT-FAN-F) and rear<br>(DS-13SLT-FAN-R) fan trays |                  | 3.x               | 318                          | 1358                            | 4.41             | 3.31              | 2.21              | 1.65              |
| Cisco MDS 9000 8-Port 10-Gbps<br>FCoE module (DS-X9708-K9)                                                 | 5.2              |                   | 150                          | 640                             | 2.08             | 1.56              | 1.04              | 0.78              |
| 48-Port 8-Gbps Advanced Fibre<br>Channel Switching<br>module(DS-X9248-256K9)                               | 5.2              |                   | 310                          | 1387                            | 4.51             | 3.39              | 2.26              | 1.69              |
| 32-Port 8-Gbps Advanced Fibre<br>Channel Switching<br>module(DS-X9232-256K9)                               | 5.2              |                   | 302                          | 1323                            | 4.31             | 3.23              | 2.15              | 1.61              |
| Cisco MDS 9513 256-Gbps Fabric<br>3 Module (DS-13SLT-FAB3)                                                 | 5.2              |                   | 83                           | 427                             | 1.39             | 1.04              | 0.69              | 0.52              |
| Supervisor-2A,<br>DS-X9530-SF2A-K9                                                                         | 5.2              |                   | 126                          | 538                             | 1.75             | 1.31              | 0.88              | 0.66              |
| Supervisor-2, DS-X9530-SF2-K9                                                                              |                  | 3.x               | 126                          | 538                             | 1.75             | 1.31              | 0.88              | 0.66              |
| 48-port 4-Gbps switching module,<br>DS-X9148                                                               |                  | 3.x               | 185                          | 790                             | 2.57             | 1.93              | 1.28              | 0.96              |
| 24-port 4-Gbps switching module,<br>DS-X9124                                                               |                  | 3.x               | 147                          | 628                             | 2.04             | 1.53              | 1.02              | 0.77              |
| 12-port 4-Gbps switching module,<br>DS-X9112                                                               |                  | 3.x               | 132                          | 564                             | 1.83             | 1.38              | 0.92              | 0.69              |
| 4-port 10-Gbps switching module,<br>DS-X9704                                                               |                  | 3.x               | 172                          | 734                             | 2.39             | 1.79              | 1.19              | 0.90              |
| 18/4 Multiservice module,<br>DS-X9304-18K9                                                                 |                  | 3.2.(1)           | 200                          | 855                             | 2.78             | 2.08              | 1.39              | 1.04              |
| Crossbar module, DS-13SLT-FAB1,<br>DS-13SLT-FAB2                                                           |                  | 3.x               | 63                           | 269                             | 0.88             | 0.66              | 0.44              | 0.33              |



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**Table 1-9 Requirements and Heat Dissipation for 6000-W AC Power Supplies (continued)**

| Module Type/<br>Product Number                                        | NX-OS<br>Release | SAN-OS<br>Release | Power<br>Required<br>(watts) | Heat<br>Dissipation<br>(BTU/hr) | Input Current    |                   |                   |                   |
|-----------------------------------------------------------------------|------------------|-------------------|------------------------------|---------------------------------|------------------|-------------------|-------------------|-------------------|
|                                                                       |                  |                   |                              |                                 | 90 VAC<br>(amps) | 120 VAC<br>(amps) | 180 VAC<br>(amps) | 240 VAC<br>(amps) |
| 48-port 8-Gbps switching module,<br>DS-X9248-96K9                     | 4.x              |                   | 298                          | 1273                            | 4.14             | 3.11              | 2.07              | 1.55              |
| 24-port 8-Gbps switching module,<br>DS-X9224-96K                      | 4.x              |                   | 273                          | 1163                            | 3.79             | 2.84              | 1.90              | 1.42              |
| 4/44-port 8-Gbps Host-Optimized<br>switching module,<br>DS-X9248-48K9 | 4.x              |                   | 214                          | 915                             | 2.98             | 2.23              | 1.49              | 1.12              |
| 16-port Storage Services Node,<br>DS-X9316-SSNK9                      | 4.2(1)           |                   | 298                          | 1273                            | 4.14             | 3.11              | 2.08              | 1.55              |

## AC Power Consumption for the Cisco MDS 9513 Director

Table 1-10 shows the typical AC power consumption for a Cisco MDS 9513 Director.

**Table 1-10 Typical AC Power Consumption for a Cisco MDS 9513 Director**

| Module Type / Product Number                                                                                                                                                                                                                                 | Typical AC Power Consumption (Watts) |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| Cisco MDS 9513 chassis, DS-C9513, with front (DS-13SLT-FAN-F) and rear (DS-13SLT-FAN-R) fan trays, two Supervisor-2 (DS-X9530-SF2-K9) or Supervisor-2A (DS-X9530-SF2A-K9) modules, and two crossbar modules (DS-13SLT-FAB1, DS-13SLT-FAB2, or DS-13SLT-FAB3) | 697                                  |
| 48-port 4-Gbps switching module, DS-X9148                                                                                                                                                                                                                    | 181                                  |
| 24-port 4-Gbps switching module, DS-X9124                                                                                                                                                                                                                    | 127                                  |
| 12-port 4-Gbps switching module, DS-X9112                                                                                                                                                                                                                    | 107                                  |
| 4-port 10-Gbps switching module, DS-X9704                                                                                                                                                                                                                    | 162                                  |
| 48-port 8-Gbps switching module, DS-X9248-96K9                                                                                                                                                                                                               | 230                                  |
| 24-port 8-Gbps switching module, DS-X9224-96K                                                                                                                                                                                                                | 221                                  |
| 4/44-port 8-Gbps Host-Optimized switching module,<br>DS-X9248-48K9                                                                                                                                                                                           | 175                                  |
| 16-port Storage Services Node, DS-X9316-SSNK9                                                                                                                                                                                                                | 257                                  |
| 8-port 10-Gbps FCoE module, DS-X9708-K9                                                                                                                                                                                                                      | 107                                  |
| 48-Port 8-Gbps Advanced Fibre Channel Switching module,<br>DS-X9248-256K9                                                                                                                                                                                    | 267                                  |
| 32-Port 8-Gbps Advanced Fibre Channel Switching module,<br>DS-X9232-256K9                                                                                                                                                                                    | 243                                  |

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## Power Specifications for the Cisco MDS 9509 Director

This section includes the following topics:

- [Specifications for the Cisco MDS 9509 Power Supplies, page 1-10](#)
- [Component Power Requirements and Heat Dissipation for the Cisco MDS 9509 Director, page 1-11](#)
- [AC Power Consumption for the Cisco MDS 9509 Director, page 1-15](#)

### Specifications for the Cisco MDS 9509 Power Supplies

The 3000-W AC power supply provides power based upon the input voltage, as follows:

- Maximum of 1400 W at input of 100 to 120 VAC (1174 W available to modules and fans)
- Maximum of 3000 W at input of 200 to 240 VAC (2774 W available to modules and fans)

The 2500-W AC power supply provides power based upon the input voltage, as follows:

- Maximum of 1325 W at input of 100 to 120 VAC (1150 W available to modules and fans)
- Maximum of 2525 W at input of 200 to 240 VAC (2331 W available to modules and fans)

If a 110-VAC input is chosen, a 110-VAC power cord (CAB-7513AC=) must be ordered separately.

[Table 1-11](#) lists the specifications for the Cisco MDS 9509 power supplies.

**Table 1-11 Specifications for Cisco MDS 9509 Power Supplies**

| Description                   | Specification                                                                                                                                                                                                                                                    |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>2500-W AC Power Supply</b> |                                                                                                                                                                                                                                                                  |
| Type                          | Autoranging input with power factor corrector.                                                                                                                                                                                                                   |
| Voltage                       | 100 to 240 VAC ( $\pm 10\%$ ).                                                                                                                                                                                                                                   |
| Current rating                | 16 A maximum at 100 to 120 VAC and 1300-W output.<br>16 A maximum at 200 to 240 VAC and 2500-W output.<br><b>Note</b> For current ratings of plugs, see <a href="#">Figure 1-5 on page 1-9</a> .                                                                 |
| Frequency                     | 50 to 60 Hz (nominal) ( $\pm 3$ Hz for full range).                                                                                                                                                                                                              |
| Output capacity               | 1325 W maximum (100 to 120 VAC).<br>2525 W maximum (200 to 240 VAC).                                                                                                                                                                                             |
| Output voltage at 110/120     | 3.3 V at 15 A; 5 V at 5 A; 12 V at 12 A; 42 V at 27.5 A.                                                                                                                                                                                                         |
| Output voltage at 200/240     | 3.3 V at 15 A; 5 V at 5 A; 12 V at 12 A; 42 V at 55.5 A.                                                                                                                                                                                                         |
| <b>2500-W DC Power Supply</b> |                                                                                                                                                                                                                                                                  |
| Voltage                       | -48 VDC to -60 VDC continuous.                                                                                                                                                                                                                                   |
| Current rating                | 70 A at -48 VDC; 55 A at -60 VDC; 80 A at -40.5 VDC.                                                                                                                                                                                                             |
| Terminal block                | Accommodates 2 to 14 AWG copper conductors. Use 90°C copper conductors for North American installations.<br><b>Note</b> Actual size of the wire required is determined by the installer or local electrician. Terminal block material is rated at 302°F (150°C). |
| Output capacity               | 2525 W maximum (-48 to -60 VDC).                                                                                                                                                                                                                                 |

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**Table 1-11 Specifications for Cisco MDS 9509 Power Supplies (continued)**

| Description                   | Specification                                                                                                                                                                          |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Output voltage                | 3.3 V at 15 A; 5 V at 5 A; 12 V at 12 A; 42 V at 55.5 A.                                                                                                                               |
| <b>3000-W AC Power Supply</b> |                                                                                                                                                                                        |
| Type                          | Autoranging input with power factor corrector.                                                                                                                                         |
| Voltage                       | 100 to 240 VAC ( $\pm 10\%$ ).                                                                                                                                                         |
| Current rating                | 17.6 A maximum at 100 to 120 VAC and 1400-W output.<br>17.6 A maximum at 200 to 240 VAC and 3000-W output.<br>For current ratings of plugs, see <a href="#">Figure 1-5 on page 1-9</a> |
| Frequency                     | 50 to 60 Hz (nominal) ( $\pm 3$ Hz for full range).                                                                                                                                    |
| Output capacity               | 1400 W maximum (100 to 120 VAC).<br>3000 W maximum (200 to 240 VAC).                                                                                                                   |
| Output voltage at 110/120     | 3.3 V at 15 A; 12 V at 12 A; 42 V at 27.9 A.                                                                                                                                           |
| Output voltage at 200/240     | 3.3 V at 15 A; 12 V at 12 A; 42 V at 66 A.                                                                                                                                             |
| <b>4000-W AC Power Supply</b> |                                                                                                                                                                                        |
| Type                          | High-line input with power factor corrector, 220 VAC, single-phase circuit.                                                                                                            |
| Voltage                       | 200 to 240 VAC ( $\pm 10\%$ ).                                                                                                                                                         |
| Current rating                | 23 A<br><b>Note</b> For current ratings of plugs, see <a href="#">Figure 1-8 on page 1-11</a> .                                                                                        |
| Frequency                     | 50/60 Hz (nominal) ( $\pm 3\%$ for full range).                                                                                                                                        |
| Output capacity               | 4000 W maximum.                                                                                                                                                                        |
| Output voltage at 200/240     | 3.3 V at 15 A; 5 V at 5 A; 12 V at 12 A; 42 V at 91.2 A                                                                                                                                |

## Component Power Requirements and Heat Dissipation for the Cisco MDS 9509 Director

When sizing the air-conditioning requirements for an installation, consider heat dissipation. The power and heat associated with a Cisco MDS 9509 Director varies based upon the following considerations:

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

[Table 1-12](#) and [Table 1-13](#) list the power requirements and heat dissipation for the components of the Cisco MDS 9509 Director.



### Note

Unless noted otherwise, the data listed in [Table 1-12](#) and [Table 1-13](#) is based on worst-case conditions. Typical numbers are approximately 30 percent below the numbers listed here.

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**Table 1-12 Requirements and Heat Dissipation for 2500-, 3000-, and 4000-W AC Power Supplies**

| Module Type/<br>Product Number                             | NX-OS<br>Release | SAN-OS<br>Release | Power<br>Required<br>(watts) | Heat<br>Dissipation<br>(BTU/hr) | Input Current    |                   |                   |                   |
|------------------------------------------------------------|------------------|-------------------|------------------------------|---------------------------------|------------------|-------------------|-------------------|-------------------|
|                                                            |                  |                   |                              |                                 | 90 VAC<br>(amps) | 120 VAC<br>(amps) | 180 VAC<br>(amps) | 240 VAC<br>(amps) |
| Cisco MDS 9509 chassis with fan<br>module<br>DS-C9509      |                  | 3.x               | 210                          | 897                             | 2.92             | 2.19              | 1.46              | 1.09              |
|                                                            |                  | 2.x and<br>1.x    | 216                          | 920                             | 3.00             | 2.25              | 1.50              | 1.13              |
| Supervisor/fabric 1<br>DS-X9530-SF1                        |                  | 3.x               | 210                          | 897                             | 2.92             | 2.19              | 1.46              | 1.09              |
|                                                            |                  | 2.x and<br>1.x    | 220                          | 940                             | 3.05             | 2.29              | 1.53              | 1.15              |
| Supervisor-2, DS-X9530-SF2-K9                              |                  | 3.x               | 126                          | 538                             | 1.75             | 1.31              | 0.88              | 0.66              |
| 48-port 4-Gbps switching module,<br>DS-X9148               |                  | 3.x               | 185                          | 790                             | 2.57             | 1.93              | 1.28              | 0.96              |
|                                                            |                  | 2.x and<br>1.x    | —                            | —                               | —                | —                 | —                 | —                 |
| 24-port 4-Gbps switching module,<br>DS-X9124               |                  | 3.x               | 147                          | 628                             | 2.04             | 1.53              | 1.02              | 0.77              |
|                                                            |                  | 2.x and<br>1.x    | —                            | —                               | —                | —                 | —                 | —                 |
| 12-port 4-Gbps switching module,<br>DS-X9112               |                  | 3.x               | 132                          | 564                             | 1.83             | 1.38              | 0.92              | 0.69              |
|                                                            |                  | 2.x and<br>1.x    | —                            | —                               | —                | —                 | —                 | —                 |
| 4-port 10-Gbps switching module,<br>DS-X9704               |                  | 3.x               | 172                          | 734                             | 2.39             | 1.79              | 1.19              | 0.90              |
|                                                            |                  | 2.x and<br>1.x    | —                            | —                               | —                | —                 | —                 | —                 |
| 32-port 1-Gbps/2-Gbps Fibre<br>Channel module,<br>DS-X9032 |                  | 3.x               | 191                          | 816                             | 2.65             | 1.99              | 1.33              | 0.99              |
|                                                            |                  | 2.x and<br>1.x    | 200                          | 855                             | 2.78             | 2.08              | 1.39              | 1.04              |
| 16-port 1-Gbps/2-Gbps Fibre<br>Channel module,<br>DS-X9016 |                  | 3.x               | 210                          | 897                             | 2.92             | 2.19              | 1.46              | 1.09              |
|                                                            |                  | 2.x and<br>1.x    | 220                          | 940                             | 3.05             | 2.29              | 1.53              | 1.15              |
| 18/4 Multiservice module,<br>DS-X9304-18K9                 |                  | 3.2.(1)           | 200                          | 855                             | 2.78             | 2.08              | 1.39              | 1.04              |
| MPS-14/2 module DS-X9302-14K9                              |                  | 3.x               | 200                          | 854                             | 2.78             | 2.08              | 1.39              | 1.04              |
|                                                            |                  | 2.x and<br>1.x    | 227                          | 970                             | 3.15             | 2.37              | 1.57              | 1.19              |
| 8-port IPS module<br>DS-X9308-SMIP                         |                  | 3.x               | 200                          | 854                             | 2.78             | 2.08              | 1.39              | 1.04              |
|                                                            |                  | 2.x and<br>1.x    | 220                          | 940                             | 3.05             | 2.29              | 1.53              | 1.15              |
| 4-port IPS module<br>DS-X9304-SMIP                         |                  | 3.x               | 160                          | 683                             | 2.22             | 1.67              | 1.11              | 0.83              |
|                                                            |                  | 2.x and<br>1.x    | 185                          | 789                             | 2.57             | 1.93              | 1.28              | 0.96              |

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**Table 1-12 Requirements and Heat Dissipation for 2500-, 3000-, and 4000-W AC Power Supplies (continued)**

| Module Type/<br>Product Number                                               | NX-OS<br>Release | SAN-OS<br>Release | Power<br>Required<br>(watts) | Heat<br>Dissipation<br>(BTU/hr) | Input Current    |                   |                   |                   |
|------------------------------------------------------------------------------|------------------|-------------------|------------------------------|---------------------------------|------------------|-------------------|-------------------|-------------------|
|                                                                              |                  |                   |                              |                                 | 90 VAC<br>(amps) | 120 VAC<br>(amps) | 180 VAC<br>(amps) | 240 VAC<br>(amps) |
| 32-port SSM<br>DS-X9032-SSM                                                  |                  | 3.x               | 281                          | 1200                            | 3.90             | 2.93              | 1.95              | 1.46              |
|                                                                              |                  | 2.x and<br>1.x    | 295                          | 1260                            | 4.10             | 3.07              | 2.05              | 1.54              |
| 32-port ASM<br>DS-X9032-SMV                                                  |                  | 3.x               | 281                          | 1200                            | 3.90             | 2.93              | 1.95              | 1.46              |
|                                                                              |                  | 2.x and<br>1.x    | 295                          | 1260                            | 4.10             | 3.07              | 2.05              | 1.54              |
| CSM<br>DS-X9560-SMC                                                          |                  | 3.x               | 200                          | 854                             | 2.78             | 2.08              | 1.39              | 1.04              |
|                                                                              |                  | 2.x and<br>1.x    | 210                          | 919                             | 2.99             | 2.19              | 1.50              | 1.12              |
| 48-port 8-Gbps switching module,<br>DS-X9248-96K9                            | 4.x              |                   | 298                          | 1273                            | 4.14             | 3.11              | 2.07              | 1.55              |
| 24-port 8-Gbps switching module,<br>DS-X9224-96K                             | 4.x              |                   | 273                          | 1163                            | 3.79             | 2.84              | 1.90              | 1.42              |
| 4/44-port 8-Gbps Host-Optimized<br>switching module,<br>DS-X9248-48K9        | 4.x              |                   | 214                          | 915                             | 2.98             | 2.23              | 1.49              | 1.12              |
| 16-port Storage Services Node,<br>DS-X9316-SSNK9                             | 4.2(1)           |                   | 298                          | 1273                            | 4.14             | 3.11              | 2.08              | 1.55              |
| Cisco MDS 9000 8-Port 10-Gbps<br>FCoE module (DS-X9708-K9)                   | 5.2              |                   | 150                          | 640                             | 2.08             | 1.56              | 1.04              | 0.78              |
| 48-Port 8-Gbps Advanced Fibre<br>Channel Switching<br>module(DS-X9248-256K9) | 5.2              |                   | 310                          | 1387                            | 4.51             | 3.39              | 2.26              | 1.69              |
| 32-Port 8-Gbps Advanced Fibre<br>Channel Switching<br>module(DS-X9232-256K9) | 5.2              |                   | 302                          | 1323                            | 4.31             | 3.23              | 2.15              | 1.61              |
| Supervisor-2A,<br>DS-X9530-SF2A-K9                                           | 5.2              |                   | 126                          | 538                             | 1.75             | 1.31              | 0.88              | 0.66              |

**Table 1-13 Power Requirements and Heat Dissipation for the 2500-W DC Power Supply**

| Module Type/<br>Product Number                        | SAN-OS Release | Power<br>Required<br>(watts) | Heat<br>Dissipation<br>(BTU/hr) | Input Current    |                  |
|-------------------------------------------------------|----------------|------------------------------|---------------------------------|------------------|------------------|
|                                                       |                |                              |                                 | 48 VDC<br>(amps) | 60 VDC<br>(amps) |
| Cisco MDS 9509<br>chassis with fan module<br>DS-C9509 | 3.x            | 210                          | 956                             | 5.83             | 4.67             |
|                                                       | 2.x and 1.x    | 216                          | 983                             | 6.00             | 4.80             |
| Supervisor/fabric 1<br>DS-X9530-SF1                   | 3.x            | 210                          | 956                             | 5.83             | 4.67             |
|                                                       | 2.x and 1.x    | 220                          | 1000                            | 6.10             | 4.88             |

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**Table 1-13 Power Requirements and Heat Dissipation for the 2500-W DC Power Supply (continued)**

| Module Type/<br>Product Number                            | SAN-OS Release | Power<br>Required<br>(watts) | Heat<br>Dissipation<br>(BTU/hr) | Input Current    |                  |
|-----------------------------------------------------------|----------------|------------------------------|---------------------------------|------------------|------------------|
|                                                           |                |                              |                                 | 48 VDC<br>(amps) | 60 VDC<br>(amps) |
| 32-port 1-Gbps/2-Gbps Fibre Channel<br>module<br>DS-X9032 | 3.x            | 191                          | 869                             | 5.31             | 4.24             |
|                                                           | 2.x and 1.x    | 200                          | 911                             | 5.56             | 4.45             |
| 16-port 1-Gbps/2-Gbps Fibre Channel<br>module<br>DS-X9016 | 3.x            | 210                          | 956                             | 5.83             | 4.67             |
|                                                           | 2.x and 1.x    | 220                          | 1000                            | 6.10             | 4.88             |
| MSM-18/4 module, DS-X9304-18K9                            | 3.2(1)         | 200                          | 855                             | 2.78             | 2.08             |
| MPS-14/2 module<br>DS-X9302-14K9                          | 3.x            | 200                          | 910                             | 5.56             | 4.44             |
|                                                           | 2.x and 1.x    | 227                          | 970                             | 3.15             | 2.37             |
| 8-port IPS module<br>DS-X9308-SMIP                        | 3.x            | 200                          | 910                             | 5.56             | 4.44             |
|                                                           | 2.x and 1.x    | 220                          | 1000                            | 6.10             | 4.88             |
| 4-port IPS module<br>DS-X9304-SMIP                        | 3.x            | 160                          | 728                             | 4.44             | 3.56             |
|                                                           | 2.x and 1.x    | 185                          | 841                             | 5.14             | 4.11             |
| 32-port SSM<br>DS-X9032-SSM                               | 3.x            | 281                          | 1279                            | 7.81             | 6.24             |
|                                                           | 2.x and 1.x    | 295                          | 1342                            | 8.19             | 6.56             |
| 32-port ASM<br>DS-X9032-SMV                               | 3.x            | 281                          | 1279                            | 7.81             | 6.24             |
|                                                           | 2.x and 1.x    | 295                          | 1342                            | 8.19             | 6.56             |
| CSM<br>DS-X9560-SMC                                       | 3.x            | 200                          | 910                             | 5.56             | 4.44             |
|                                                           | 2.x and 1.x    | 210                          | 956                             | 5.83             | 4.67             |

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## AC Power Consumption for the Cisco MDS 9509 Director

Table 1-14 shows the typical AC power consumption for the Cisco MDS 9509 Director

**Table 1-14** Typical AC Power Consumption for a Cisco MDS 9509 Director

| Module Type / Product Number                                                                                                  | Typical AC Power Consumption (Watts) |
|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| Cisco MDS 9509 chassis, DS-C9509, with fan module, and two Supervisor-2 (DS-X9530-SF2-K9) or Supervisor-2A (DS-X9530-SF2A-K9) | 380                                  |
| Cisco MDS 9509 chassis, DS-C9509, with fan module, and two Supervisor-1 (DS-X9530-SF1-K9)                                     | 622                                  |
| 48-port 4-Gbps switching module, DS-X9148                                                                                     | 181                                  |
| 24-port 4-Gbps switching module, DS-X9124                                                                                     | 127                                  |
| 12-port 4-Gbps switching module, DS-X9112                                                                                     | 107                                  |
| 4-port 10-Gbps switching module, DS-X9704                                                                                     | 162                                  |
| 32-port 1-Gbps/2-Gbps Fibre Channel module, DS-X9032                                                                          | 174                                  |
| 16-port 1-Gbps/2-Gbps Fibre Channel module, DS-X9016                                                                          | 144                                  |
| Cisco MDS 9000 Family 18/4 - port Multiservice module                                                                         | 199.8                                |
| MPS-14/2 module, DS-X9302-14K9                                                                                                | 178                                  |
| 32-port SSM, DS-X9032-SSM                                                                                                     | 211                                  |
| 8-port IPS module, DS-X9308-SMIP                                                                                              | 175                                  |
| 4-port IPS module, DS-X9304-SMIP                                                                                              | 128                                  |
| 48-port 8-Gbps switching module, DS-X9248-96K9                                                                                | 230                                  |
| 24-port 8-Gbps switching module, DS-X9224-96K                                                                                 | 221                                  |
| 4/44-port 8-Gbps Host-Optimized switching module, DS-X9248-48K9                                                               | 175                                  |
| 16-port Storage Services Node, DS-X9316-SSNK9                                                                                 | 257                                  |
| Cisco MDS 9000 8-Port 10-Gbps FCoE module (DS-X9708-K9)                                                                       | 107                                  |
| 48-Port 8-Gbps Advanced Fibre Channel Switching module(DS-X9248-256K9)                                                        | 267                                  |
| 32-Port 8-Gbps Advanced Fibre Channel Switching module(DS-X9232-256K9)                                                        | 243                                  |
| Supervisor-2A, DS-X9530-SF2A-K9                                                                                               | 697                                  |

## Power Specifications for the Cisco MDS 9506 Director

This section includes the following topics:

- [Specifications for the Cisco MDS 9506 Power Supplies, page 1-16](#)
- [Component Power Requirements and Heat Dissipation for the Cisco MDS 9506 Director, page 1-17](#)
- [AC Power Consumption for the Cisco MDS 9506 Director, page 1-20](#)

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## Specifications for the Cisco MDS 9506 Power Supplies



### Caution

The following applies to AC power supplies on the Cisco MDS 9506 only:  
The DS-C9506 equipment is suitable for use on TN power systems and the IT-power system connection of Norway (max 230 v phase-phase). If connected to a 230/400-V IT power system, beware of high-leakage current. Earth connection is essential before connecting the supply.

The 1900-W AC power supply provides power based upon the input voltage:

- Maximum of 1050 W at input of 100 to 120 VAC
- Maximum of 1900 W at input of 200 to 240 VAC

A 110-VAC power cord (CAB-7513AC=) must be ordered separately.

[Table 1-15](#) lists the specifications for the Cisco MDS 9506 power supplies.

**Table 1-15 Specifications for Cisco MDS 9506 Power Supplies**

| Description                   | Specification                                                                                                                                                                                                                                                       |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1900-W AC Power Supply</b> |                                                                                                                                                                                                                                                                     |
| Type                          | Autoranging input with power factor corrector.                                                                                                                                                                                                                      |
| Voltage                       | 100 to 240 VAC ( $\pm 10\%$ ).                                                                                                                                                                                                                                      |
| Current rating                | 12 A maximum at 100 to 120 VAC and 1050-W output.<br>12 A maximum at 200 to 240 VAC and 1900-W output.<br><b>Note</b> For current ratings of plugs, see <a href="#">Figure 1-5 on page 1-9</a> .                                                                    |
| Frequency                     | 50/60 Hz (nominal) ( $\pm 3$ Hz for full range).                                                                                                                                                                                                                    |
| Output capacity               | 1050 W maximum (at input of 100 to 120 VAC).<br>1900 W maximum (at input of 200 to 240 VAC).                                                                                                                                                                        |
| Output voltage at 110/120     | 3.3 V at 2.5 A; 1.5 V at 15 A; 50 V at 20.4 A.                                                                                                                                                                                                                      |
| Output voltage at 200/240     | 3.3 V at 2.5 A; 1.5 V at 15 A; 50 V at 37.4 A.                                                                                                                                                                                                                      |
| <b>1900-W DC Power Supply</b> |                                                                                                                                                                                                                                                                     |
| Voltage                       | -48 to -60 VDC continuous.                                                                                                                                                                                                                                          |
| Current rating                | 50 A at -48 VDC, 40 A at -60 VDC, 60 A at -40.5 VDC.                                                                                                                                                                                                                |
| Terminal block                | Accommodates 2 to 14 AWG copper conductors.<br>Use 90°C copper conductors for North American installations.<br><b>Note</b> Actual size of the wire required is determined by the installer or local electrician. Terminal block material is rated at 302°F (150°C). |
| Output capacity               | 1900 W maximum (at input of -48 to -60 VDC).                                                                                                                                                                                                                        |
| Output voltage                | 3.3 V at 2.5 A; 1.5 V at 15 A; 50 V at 37.4 A.                                                                                                                                                                                                                      |



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## Component Power Requirements and Heat Dissipation for the Cisco MDS 9506 Director

When sizing the air-conditioning requirements for an installation, consider heat dissipation. The power and heat associated with a Cisco MDS 9506 Director varies depending upon the following:

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

Table 1-16 and Table 1-17 list the AC and DC power requirements and heat dissipation for the components of the Cisco MDS 9506 Director.



### Note

Unless noted otherwise, the information listed in Table 1-16 and Table 1-17 is based on worst-case conditions. Typical numbers are approximately 30 percent below the numbers listed here.

**Table 1-16** Power Requirements and Heat Dissipation for the 1900-W AC Power Supply

| Module Type/<br>Product Number                                               | NX-OS<br>Release | SAN-OS<br>Release | Power<br>Required<br>(watts) | Heat<br>Dissipation<br>(BTU/hr) | Input Current    |                   |                   |                   |
|------------------------------------------------------------------------------|------------------|-------------------|------------------------------|---------------------------------|------------------|-------------------|-------------------|-------------------|
|                                                                              |                  |                   |                              |                                 | 90 VAC<br>(amps) | 120 VAC<br>(amps) | 180 VAC<br>(amps) | 240 VAC<br>(amps) |
| Cisco MDS 9506 chassis with fan<br>module<br>DS-C9506                        |                  | 3.x               | 126                          | 538                             | 1.75             | 1.31              | 0.88              | 0.66              |
|                                                                              |                  | 2.x and<br>1.x    | 126                          | 538                             | 1.75             | 1.32              | 0.88              | 0.66              |
| Supervisor/fabric 1<br>DS-X9530-SF1                                          |                  | 3.x               | 210                          | 897                             | 2.92             | 2.19              | 1.46              | 1.09              |
|                                                                              |                  | 2.x and<br>1.x    | 220                          | 940                             | 3.05             | 2.29              | 1.53              | 1.15              |
| Cisco MDS 9000 8-Port 10-Gbps<br>FCoE module (DS-X9708-K9)                   | 5.2              |                   | 150                          | 640                             | 2.08             | 1.56              | 1.04              | 0.78              |
| 48-Port 8-Gbps Advanced Fibre<br>Channel Switching<br>module(DS-X9248-256K9) | 5.2              |                   | 310                          | 1387                            | 4.51             | 3.39              | 2.26              | 1.69              |
| 32-Port 8-Gbps Advanced Fibre<br>Channel Switching<br>module(DS-X9232-256K9) | 5.2              |                   | 302                          | 1323                            | 4.31             | 3.23              | 2.15              | 1.61              |
| Supervisor-2A,<br>DS-X9530-SF2A-K9                                           | 5.2              |                   | 126                          | 538                             | 1.75             | 1.31              | 0.88              | 0.66              |
| Supervisor-2, DS-X9530-SF2-K9                                                |                  | 3.x               | 126                          | 538                             | 1.75             | 1.31              | 0.88              | 0.66              |
| 48-port 4-Gbps switching module,<br>DS-X9148                                 |                  | 3.x               | 185                          | 790                             | 2.57             | 1.93              | 1.28              | 0.96              |
|                                                                              |                  | 2.x and<br>1.x    | —                            | —                               | —                | —                 | —                 | —                 |
| 24-port 4-Gbps switching module,<br>DS-X9124                                 |                  | 3.x               | 147                          | 628                             | 2.04             | 1.53              | 1.02              | 0.77              |
|                                                                              |                  | 2.x and<br>1.x    | —                            | —                               | —                | —                 | —                 | —                 |

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**Table 1-16 Power Requirements and Heat Dissipation for the 1900-W AC Power Supply (continued)**

| Module Type/<br>Product Number                            | NX-OS<br>Release | SAN-OS<br>Release | Power<br>Required<br>(watts) | Heat<br>Dissipation<br>(BTU/hr) | Input Current    |                   |                   |                   |
|-----------------------------------------------------------|------------------|-------------------|------------------------------|---------------------------------|------------------|-------------------|-------------------|-------------------|
|                                                           |                  |                   |                              |                                 | 90 VAC<br>(amps) | 120 VAC<br>(amps) | 180 VAC<br>(amps) | 240 VAC<br>(amps) |
| 12-port 4-Gbps switching module,<br>DS-X9112              |                  | 3.x               | 132                          | 564                             | 1.83             | 1.38              | 0.92              | 0.69              |
|                                                           |                  | 2.x and<br>1.x    | —                            | —                               | —                | —                 | —                 | —                 |
| 4-port 10-Gbps switching module,<br>DS-X9704              |                  | 3.x               | 172                          | 734                             | 2.39             | 1.79              | 1.19              | 0.90              |
|                                                           |                  | 2.x and<br>1.x    | —                            | —                               | —                | —                 | —                 | —                 |
| 32-port 1-Gbps/2-Gbps Fibre<br>Channel module<br>DS-X9032 |                  | 3.x               | 191                          | 816                             | 2.65             | 1.99              | 1.33              | 0.99              |
|                                                           |                  | 2.x and<br>1.x    | 200                          | 855                             | 2.78             | 2.08              | 1.39              | 1.04              |
| 16-port 1-Gbps/2-Gbps Fibre<br>Channel module<br>DS-X9016 |                  | 3.x               | 210                          | 897                             | 2.92             | 2.19              | 1.46              | 1.09              |
|                                                           |                  | 2.x and<br>1.x    | 220                          | 940                             | 3.05             | 2.29              | 1.53              | 1.15              |
| 18/4 Multiservice module,<br>DS-X9304-18K9                |                  | 3.2.(1)           | 200                          | 855                             | 2.78             | 2.08              | 1.39              | 1.04              |
| MPS-14/2 module<br>DS-X9302-14K9                          |                  | 3.x               | 200                          | 854                             | 2.78             | 2.08              | 1.39              | 1.04              |
|                                                           |                  | 2.x and<br>1.x    | 227                          | 970                             | 3.15             | 2.37              | 1.57              | 1.19              |
| 8-port IPS module<br>DS-X9308-SMIP                        |                  | 3.x               | 200                          | 854                             | 2.78             | 2.08              | 1.39              | 1.04              |
|                                                           |                  | 2.x and<br>1.x    | 220                          | 940                             | 3.05             | 2.29              | 1.53              | 1.15              |
| 4-port IPS module<br>DS-X9304-SMIP                        |                  | 3.x               | 160                          | 683                             | 2.22             | 1.67              | 1.11              | 0.83              |
|                                                           |                  | 2.x and<br>1.x    | 185                          | 789                             | 2.57             | 1.93              | 1.28              | 0.96              |
| 32-port SSM<br>DS-X9032-SSM                               |                  | 3.x               | 281                          | 1200                            | 3.90             | 2.93              | 1.95              | 1.46              |
|                                                           |                  | 2.x and<br>1.x    | 295                          | 1260                            | 4.10             | 3.07              | 2.05              | 1.54              |
| 32-port ASM<br>DS-X9032-SMV                               |                  | 3.x               | 281                          | 1200                            | 3.90             | 2.93              | 1.95              | 1.46              |
|                                                           |                  | 2.x and<br>1.x    | 295                          | 1260                            | 4.10             | 3.07              | 2.05              | 1.54              |
| CSM<br>DS-X9560-SMC                                       |                  | 3.x               | 200                          | 854                             | 2.78             | 2.08              | 1.39              | 1.04              |
|                                                           |                  | 2.x and<br>1.x    | 210                          | 907                             | 2.95             | 2.22              | 1.48              | 1.11              |
| 48-port 8-Gbps switching module,<br>DS-X9248-96K9         | 4.x              |                   | 298                          | 1273                            | 4.14             | 3.11              | 2.07              | 1.55              |
| 24-port 8-Gbps switching module,<br>DS-X9224-96K          | 4.x              |                   | 273                          | 1163                            | 3.79             | 2.84              | 1.90              | 1.42              |

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**Table 1-16 Power Requirements and Heat Dissipation for the 1900-W AC Power Supply (continued)**

| Module Type/<br>Product Number                                  | NX-OS<br>Release | SAN-OS<br>Release | Power<br>Required<br>(watts) | Heat<br>Dissipation<br>(BTU/hr) | Input Current    |                   |                   |                   |
|-----------------------------------------------------------------|------------------|-------------------|------------------------------|---------------------------------|------------------|-------------------|-------------------|-------------------|
|                                                                 |                  |                   |                              |                                 | 90 VAC<br>(amps) | 120 VAC<br>(amps) | 180 VAC<br>(amps) | 240 VAC<br>(amps) |
| 4/44-port 8-Gbps Host-Optimized switching module, DS-X9248-48K9 | 4.x              |                   | 214                          | 915                             | 2.98             | 2.23              | 1.49              | 1.12              |
| 16-port Storage Services Node (DS-X9316-SSNK9)                  | 4.2(1)           |                   | 298                          | 1273                            | 4.14             | 3.11              | 2.08              | 1.55              |

**Table 1-17 Power Requirements and Heat Dissipation for the 1900-W DC Power Supply**

| Module Type/<br>Product Number                      | SAN-OS Release | Power<br>Required<br>(watts) | Heat<br>Dissipation<br>(BTU/hr) | Input Current |               |
|-----------------------------------------------------|----------------|------------------------------|---------------------------------|---------------|---------------|
|                                                     |                |                              |                                 | 48 VDC (amps) | 60 VDC (amps) |
| Cisco MDS 9506 chassis with fan module DS-C9506     | 3.x            | 126                          | 573                             | 3.50          | 2.80          |
|                                                     | 2.x and 1.x    | 126                          | 573                             | 3.50          | 2.80          |
| Supervisor/fabric 1 DS-X9530-SF1                    | 3.x            | 210                          | 956                             | 5.83          | 4.67          |
|                                                     | 2.x and 1.x    | 220                          | 1000                            | 6.10          | 4.88          |
| 32-port 1-Gbps/2-Gbps Fibre Channel module DS-X9032 | 3.x            | 191                          | 869                             | 5.31          | 4.24          |
|                                                     | 2.x and 1.x    | 200                          | 911                             | 5.56          | 4.45          |
| 16-port 1-Gbps/2-Gbps Fibre Channel module DS-X9016 | 3.x            | 210                          | 956                             | 5.83          | 4.67          |
|                                                     | 2.x and 1.x    | 220                          | 1000                            | 6.10          | 4.88          |
| 18/4 Multiservice module, DS-X9304-18K9             | 3.2.(1)        | 200                          | 855                             | 2.78          | 2.08          |
| MPS-14/2 module DS-X9302-14K9                       | 3.x            | 200                          | 910                             | 5.56          | 4.44          |
|                                                     | 2.x and 1.x    | 227                          | 970                             | 3.15          | 2.37          |
| 8-port IPS module DS-X9308-SMIP                     | 3.x            | 200                          | 910                             | 5.56          | 4.44          |
|                                                     | 2.x and 1.x    | 220                          | 1000                            | 6.10          | 4.88          |
| 4-port IPS module DS-X9304-SMIP                     | 3.x            | 160                          | 728                             | 4.44          | 3.56          |
|                                                     | 2.x and 1.x    | 185                          | 841                             | 5.14          | 4.11          |
| 32-port SSM DS-X9032-SSM                            | 3.x            | 281                          | 1279                            | 7.81          | 6.24          |
|                                                     | 2.x and 1.x    | 295                          | 1342                            | 8.19          | 6.56          |
| 32-port ASM DS-X9032-SMV                            | 3.x            | 281                          | 1279                            | 7.81          | 6.24          |
|                                                     | 2.x and 1.x    | 295                          | 1342                            | 8.19          | 6.56          |
| CSM DS-X9560-SMC                                    | 3.x            | 200                          | 910                             | 5.56          | 4.44          |
|                                                     | 2.x and 1.x    | 210                          | 955                             | 5.83          | 4.66          |

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## AC Power Consumption for the Cisco MDS 9506 Director

Table 1-18 shows the typical AC power consumption for the Cisco MDS 9506 Director.

**Table 1-18** Typical AC Power Consumption for a Cisco MDS 9506 Director

| Module Type / Product Number                                                                                                          | Typical AC Power Consumption (Watts) |
|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| Cisco MDS 9506 chassis, DS-C9506, with fan module, and two Supervisor-2 (DS-X9530-SF2-K9) or Supervisor-2A (DS-X9530-SF2A-K9) modules | 395                                  |
| Cisco MDS 9506 chassis, DS-C9506, with fan module, and two Supervisor-1 (DS-X9530-SF1-K9)                                             | 624                                  |
| 48-port 4-Gbps switching module, DS-X9148                                                                                             | 181                                  |
| 24-port 4-Gbps switching module, DS-X9124                                                                                             | 127                                  |
| 12-port 4-Gbps switching module, DS-X9112                                                                                             | 107                                  |
| 4-port 10-Gbps switching module, DS-X9704                                                                                             | 162                                  |
| 32-port 1-Gbps/2-Gbps Fibre Channel module, DS-X9032                                                                                  | 174                                  |
| 16-port 1-Gbps/2-Gbps Fibre Channel module, DS-X9016                                                                                  | 144                                  |
| Cisco MDS 9000 Family 18/4 - port Multiservice module                                                                                 | 199.8                                |
| MPS-14/2 module, DS-X9302-14K9                                                                                                        | 178                                  |
| 32-port SSM, DS-X9032-SSM                                                                                                             | 211                                  |
| 8-port IPS module, DS-X9308-SMIP                                                                                                      | 175                                  |
| 4-port IPS module, DS-X9304-SMIP                                                                                                      | 128                                  |
| 48-port 8-Gbps switching module, DS-X9248-96K9                                                                                        | 230                                  |
| 24-port 8-Gbps switching module, DS-X9224-96K                                                                                         | 221                                  |
| 4/44-port 8-Gbps Host-Optimized switching module, DS-X9248-48K9                                                                       | 175                                  |
| 16-port Storage Services Node (DS-X9316-SSNK9)                                                                                        | 257                                  |
| Cisco MDS 9000 8-Port 10-Gbps FCoE module (DS-X9708-K9)                                                                               | 107                                  |
| 48-Port 8-Gbps Advanced Fibre Channel Switching module(DS-X9248-256K9)                                                                | 267                                  |
| 32-Port 8-Gbps Advanced Fibre Channel Switching module(DS-X9232-256K9)                                                                | 243                                  |
| Supervisor-2A, DS-X9530-SF2A-K9                                                                                                       | 697                                  |

## Transceiver Specifications

The Cisco MDS 9500 Series is compatible with X2, SFP, and SFP+ transceivers and cables that have SC and LC connectors. For more information, see the Cisco MDS 9000 Family Pluggable Transceivers data sheet at this URL:

[http://www.cisco.com/en/US/prod/collateral/ps4159/ps6409/ps4358/product\\_data\\_sheet09186a00801bc698.html](http://www.cisco.com/en/US/prod/collateral/ps4159/ps6409/ps4358/product_data_sheet09186a00801bc698.html) .