




# E600i System Installation Guide



Force10

## Notes, Cautions, and Warnings

-  **NOTE:** A NOTE indicates important information that helps you make better use of your computer.
-  **CAUTION:** A CAUTION indicates potential damage to hardware or loss of data if instructions are not followed.
-  **WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

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# About This Guide




This guide provides site preparation recommendations, instructions for rack mounting the Dell Force10 E600i ExaScale chassis, and instructions for installing the fan tray, power modules, route processor modules (RPMs), switch fabric modules (SFMs), and line cards.

The E600i system operates on the Dell Force10 Operating System (FTOS) software. After you complete the hardware installation process and power up the system, refer to the *FTOS Configuration Guide for the E-Series* for preliminary software configuration information.

## Information Symbols

Table 1-1 describes symbols contained in this guide.

**Table 1-1. Information Symbols**

Symbol	Warning	Description
	Note	This symbol informs you of important operational information.
	Caution	This symbol informs you that improper handling and installation could result in equipment damage or loss of data.
	Warning	This symbol signals information about hardware handling that could result in injury.

## Related Publications

For more information about the E600i system, refer to the following documents:

- *FTOS Configuration Guide for the E-Series*
- *FTOS Command Reference for the E-Series*
- Release Notes for the E-Series and FTOS





# The E600i System

## System Overview

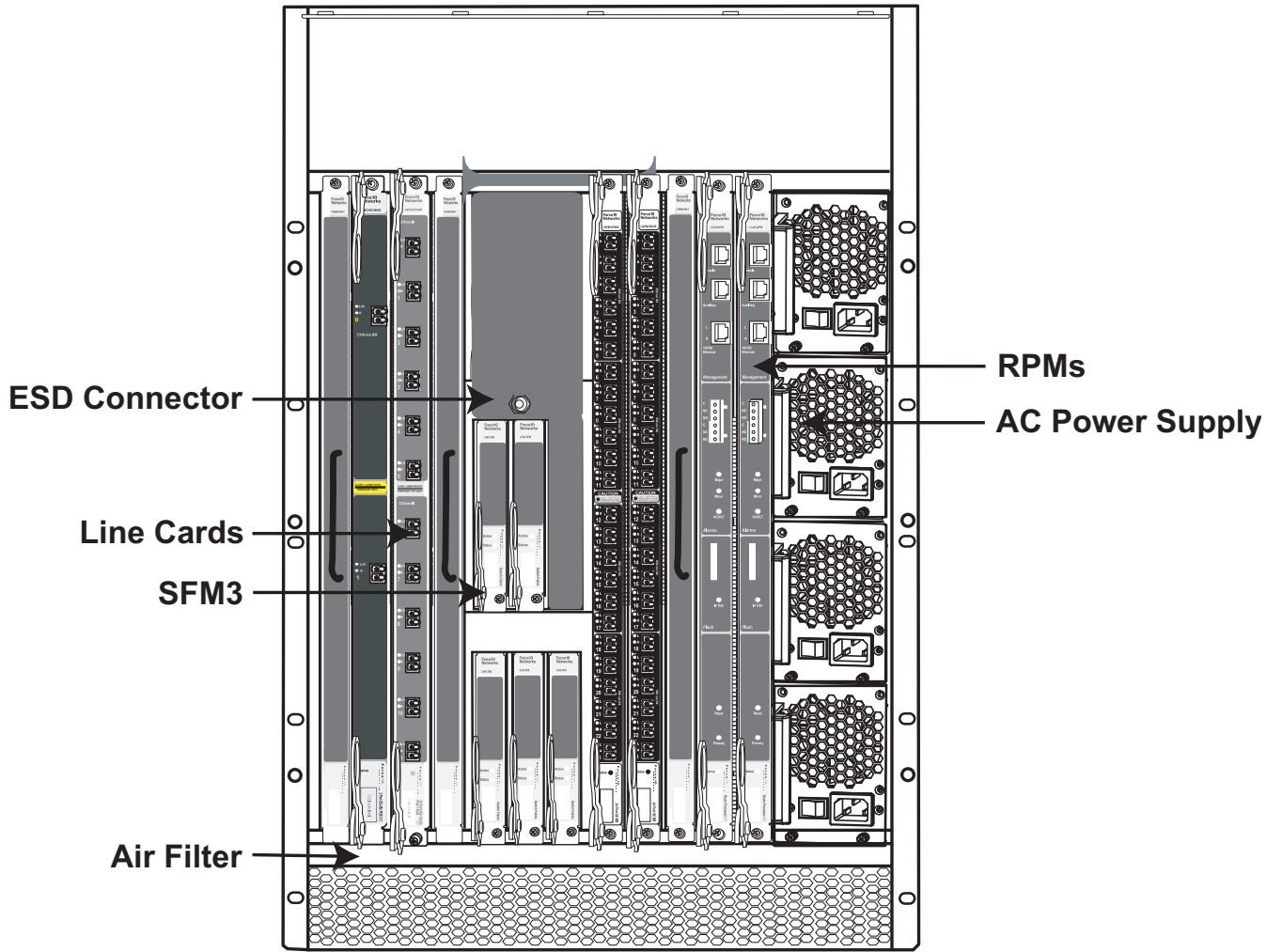
The E600i system requires at least one RPM and line card, and at least four switch fabric modules (SFMs) for packet processing. The RPM is the core for routing and control operations. Routing table entries are built on the RPM and directed to the forwarding information tables on the line cards. All traffic destined to the E600i terminates at the RPM.

RPM software processes, such as management, Layer 2, and Layer 3 functions, are divided among three CPUs. Independent software images run on each CPU. Each CPU has its own memory, which isolates processes from each other, increasing reliability. Operating the E600i system with two RPMs enables automatic failover redundancy.

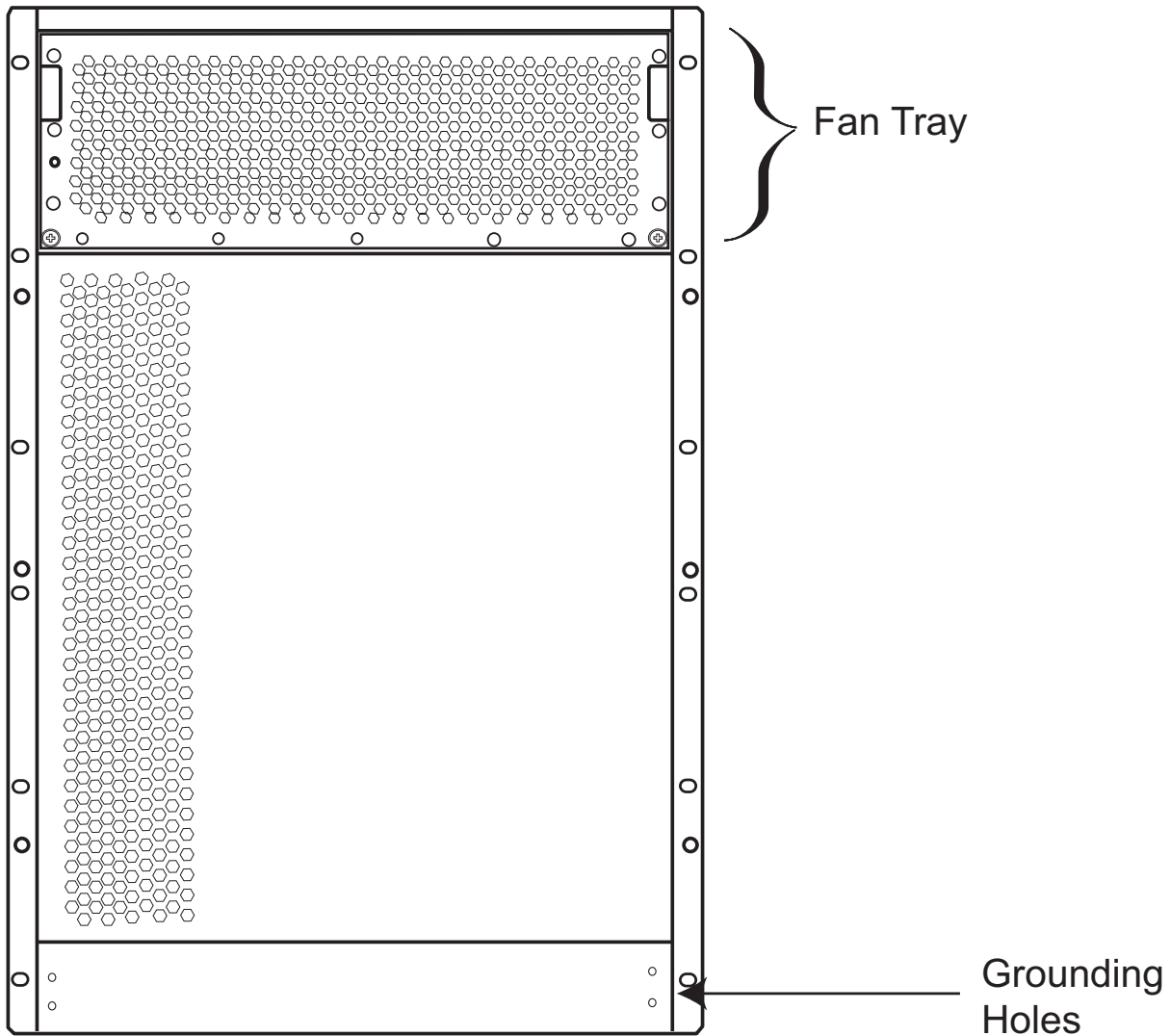
Line cards perform all data forwarding operations. Each line card has Dell Force10 proprietary ASICs; the flexible packet classification (FPC) ASIC and the Buffer and Traffic Manager (BTM) ASIC. The FPC accepts packets, feeds packets to input/output ports, handles packet classification (access lists, Layer 2 and Layer 3 lookups) and packet marking (DSCP or 802.1p). The BTM is responsible for all queuing operations.

The internal flash memory device shipped with the RPM contains the boot ROM and runtime images. Each RPM accommodates an external flash memory card that can be used to copy and store system boot, software images, and configuration files.

Figure 2-1. E600i Chassis Front View with AC Power Supplies



**Figure 2-2. E600i Chassis Rear View**



**Table 2-1. E600i System Component Requirements**

Component	Minimum	Maximum	Field-Replaceable
Backplane (factory installed)	1	1	N
Air filter (factory installed)	1	1	Y
Fan tray	1	1	Y
RPMs	1	2	Y
Line cards	1	7	Y
SFM	4	5	Y
Power Supplies:			
2500 AC Power Supply OR	2	4	Y
DC PEMs	1	2	Y

**Table 2-1. E600i System Component Requirements**

Component	Minimum	Maximum	Field-Replaceable
Cable management system	0	1	Y
Cable management system cover	0	1	Y

## Install the E600i Chassis

To install the E600i system:

Step	Task	Section
1	Prepare the installation site.	<a href="#">Site Preparation</a>
2	Unpack the chassis and components	<a href="#">Unpack the System Components</a>
3	Mount the chassis in a rack or cabinet.	<a href="#">Mount the Chassis in a Rack</a> <a href="#">Mount the Chassis in a Cabinet</a>
4	Install the fan tray.	<a href="#">Install the Fan Tray</a>
5	Install the power supplies, AC or DC.	<a href="#">Install the AC Power Supply Units</a> <a href="#">Install the DC PEMs</a>
6	Install the RPMs, line cards, and SFMs.	<a href="#">Install RPMs, Line Cards, and SFMs</a>
7	Connect network cable	<a href="#">RPM Ports and Cables</a>
8	Supply power to the chassis	

# Site Preparation

This chapter describes the requirements for the room, rack, and cabinet in which you will install your system.

- [Site Selection](#)
- [Equipment Rack and Cabinet Requirements](#)
- [Power Requirements](#)
- [Storage Requirements](#)

## Site Selection

Before you begin, make sure that the area where you intend to install your system meets the following requirements:

- 1 The site is in a restricted access area.
- 2 The site is a dry, clean, well-ventilated, and temperature-controlled room, away from heat sources such as hot air vents or direct sunlight.
- 3 The site is away from sources of severe electromagnetic noise.
- 4 The site is near an adequate power source. Connect the system to the appropriate branch circuit protection as defined by local electrical codes.

## Equipment Rack and Cabinet Requirements

- 1 Ensure that the rack has adequate space in the front, rear, and sides after the system is installed to allow proper ventilation, access to cables, and maintenance access. Allow *at least* 18 inches in the front and 20 inches in the rear of the rack.
- 2 Ensure that the rack is bolted to the floor and/or braced to a wall or ceiling.
- 3 The minimum cabinet size is 30 inches deep and 24 inches wide.
- 4 Provide a minimum of 20 inches clearance behind the chassis to access the fan trays.
- 5 Air flows through the system from a filtered intake vent on the bottom front side of the chassis to an exhaust vent at the top rear. For proper ventilation, position the chassis in an equipment rack or cabinet so that the minimum air flow is 750 cubic feet per minute (CFM), this requires a minimum of 3 inches between the doors and the cable management system when the cabinet front doors are closed, and a minimum of 3 inches between the chassis rear and the rear of the cabinet.

## Power Requirements

The E600i supports either 2500W AC power supplies (PSUs), or DC Power Entry Modules (PEMs). Do not mix and match power supplies. Your system must be powered by only AC or DC power, it cannot use both at the same time.

**NOTE:** Do not use different versions of power supplies. If you are replacing an AC power supply, you must replace all the PSUs in your system with the new versions. Contact Dell Force10 Technical Support if you have any question regarding the version of PSU used in your system.

### 2500W AC Power Requirements

The E600i 2500W AC power supply (CAT# CC-E600i-2500W-AC2) can operate at either 100 VAC or 220 VAC. If the E600i is connected to an 100 VAC power supply, it provides up to 1500W.

Parameter	Specifications
Nominal Input Voltage	100 - 120 VAC Requires a minimum of 3 Power Supplies Installed 200 - 240 VAC Requires a minimum of 2 Power Supplies Installed
Maximum AC Power Supply Input	16 A @ 100 VAC per module 12 A @ 200 VAC per module
Maximum System Power Input	4.80 KVA @ 100 VAC 4.60 KVA @ 220 VAC

### DC Power Requirements

Each E-Series system requires at least one DC PEM to operate. Two units are recommended for full facility redundancy.

Parameter	Specifications
Maximum DC PEM Input Current	75 A
System	2800 W (9600 BTU/hour)
Input Voltage	-48 to -60 VDC

## Storage Requirements

If you do not install all of your system components, store them in the original packaging in an environment:

- constant temperature between -40°F to 158°F (-40°C to 70°C)
- non-condensing relative humidity between 5 and 95%
- dry, away from direct sunlight, heat, and air conditioning ducts
- dust-free

# Chassis

This chapter provides instructions to rack mount your chassis into a standard 19-inch or 23-inch equipment rack.

- [Unpack the System Components](#)
- [Install the Equipment Rack Shelf Bar](#)
- [Mount the Chassis in a Rack](#)
- [Mount the Chassis in a Cabinet](#)

## Install the Chassis


Installing the chassis is a three-step process:


- 1 [Unpack the System Components](#)
- 2 [Install the Equipment Rack Shelf Bar](#)
- 3 [Mount the Chassis in a Rack](#) or [Mount the Chassis in a Cabinet](#)

## Unpack the System Components

To prevent electrostatic discharge (ESD) wear an ESD-preventative wrist or foot-heel ground strap when handling system components.

- 1 Remove all contents from the shipping packaging. After you remove the original packaging, place RPMs, SFMs, and line cards on an antistatic surface.
- 2 Move the chassis to the rack. The packaging and contents weigh approximately 400 pounds. The unpacked chassis and floater pallet weigh approximately 100 pounds. Use a hand cart, pallet jack, or forklift to lift and move the chassis.

 **CAUTION:** Lift the chassis from the bottom only. Lifting by the chassis shelves or fan tray opening might damage the chassis.

 **CAUTION:** Do not remove the chassis front shipping cover until you have installed the chassis; this protective cover prevents damage to the internal framework and EMI seals.

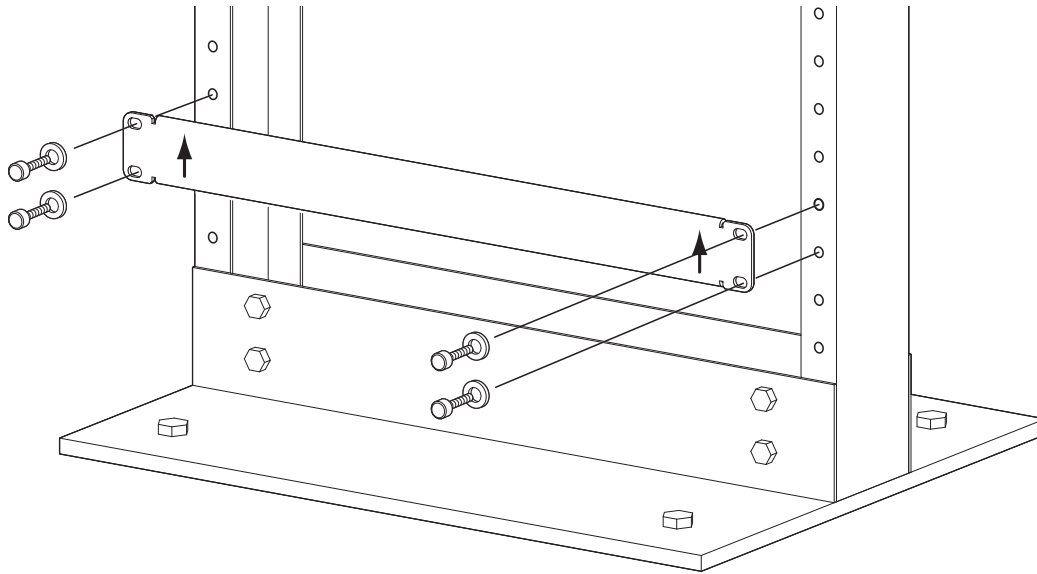
## Install the Equipment Rack Shelf Bar

The rack shelf bar ([Figure 4-1](#)) enables you to easily position the chassis into the rack and provides the unit additional support.

To install a equipment rack shelf bar:

Step	Task
1	Determine the chassis mounting location in the equipment rack. Load the chassis into the lower half of an empty rack to avoid a top-heavy rack. (Figure 4-2).
2	Orient the bar with the arrows pointing upward. The smooth side of the bar should face outward.

**Figure 4-1. Installing the Equipment Rack Shelf Bar**



- 3 Attach the bar to the equipment rack using the mounting screws provided by the rack manufacturer.

## Mount the Chassis in a Rack

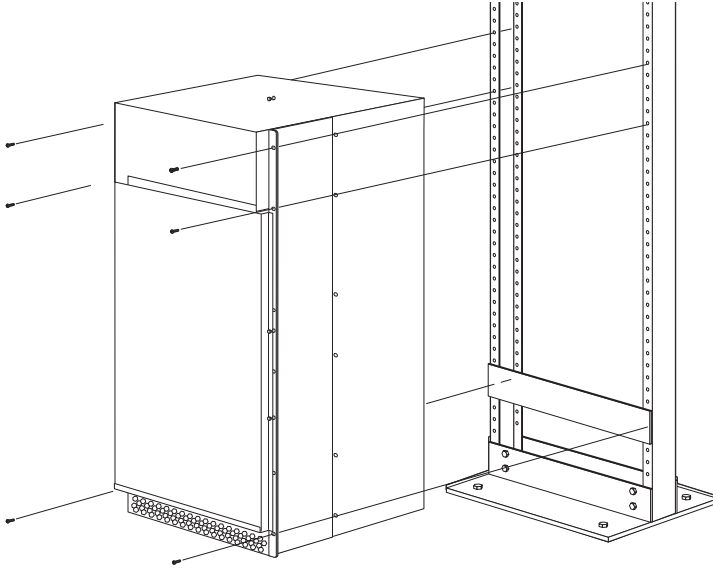
To install the chassis in a rack:

Step	Task
1	Install the equipment rack shelf bar.
2	If you are center or rear mounting the chassis in a 19-inch rack, ensure that the mounting brackets are properly positioned. If your are mounting the chassis in a 23-inch rack, install the 23-inch adaptors.
3	Using a hand cart, pallet jack, or forklift, align the rack mount holes with the rack holes, and sit the chassis on top of the equipment rack shelf bar.



Step	Task
4	Insert rack screws in the holes that are not obscured by the front shipping cover (Figure 4-2), and tighten them.

**Figure 4-2. Rack Mounting the Chassis**



- |   |   |
|---|---|
| 5 | Remove the screws attaching the front shipping cover, and remove the cover.         |
| 6 | Insert the remaining mounting screws and tighten to secure the chassis in the rack. |

## Mount the Chassis in a Cabinet

To install the chassis in an cabinet:

Step	Task
1	Install the equipment rack shelf bar.
2	Using a hand cart, pallet jack, or forklift, align the rack mount holes with the cabinet holes.
3	Insert mounting screws in the holes that are not obscured by the front shipping cover, and tighten them.
4	Remove the screws attaching the front shipping cover, and remove the cover.
5	Insert the remaining mounting screws and tighten to secure the chassis in the cabinet.



# Fan Tray

This chapter provides instructions to install and remove the chassis fan tray.

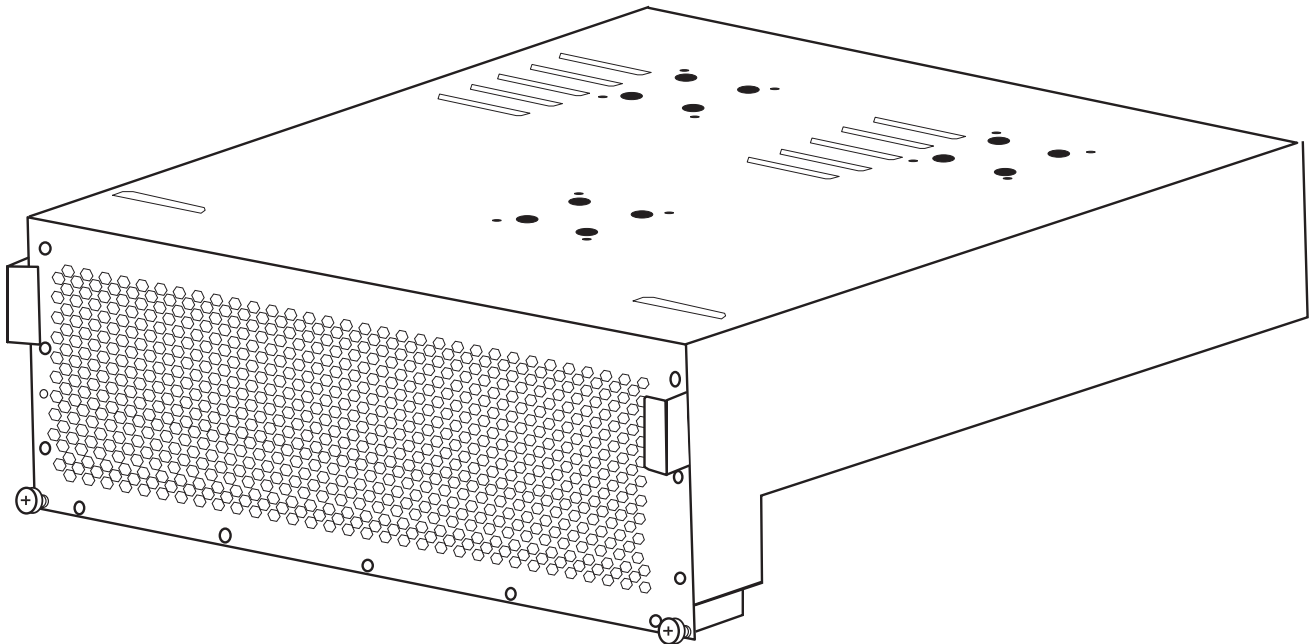
- [Install the Fan Tray](#)
- [Remove the Fan Tray](#)

The fan tray ensures proper temperature and airflow. A temperature sensor in the fan tray controls fan speed according to [Table 5-1](#).

**Table 5-1. Fan Speed and Temperature**

Degrees Celsius	Fan Speed
Less than 25°C	(Low) 1800 RPM
Between 25°C and 45°C	(Med) 2400 RPM
Above 45°C	(High) 3000 RPM

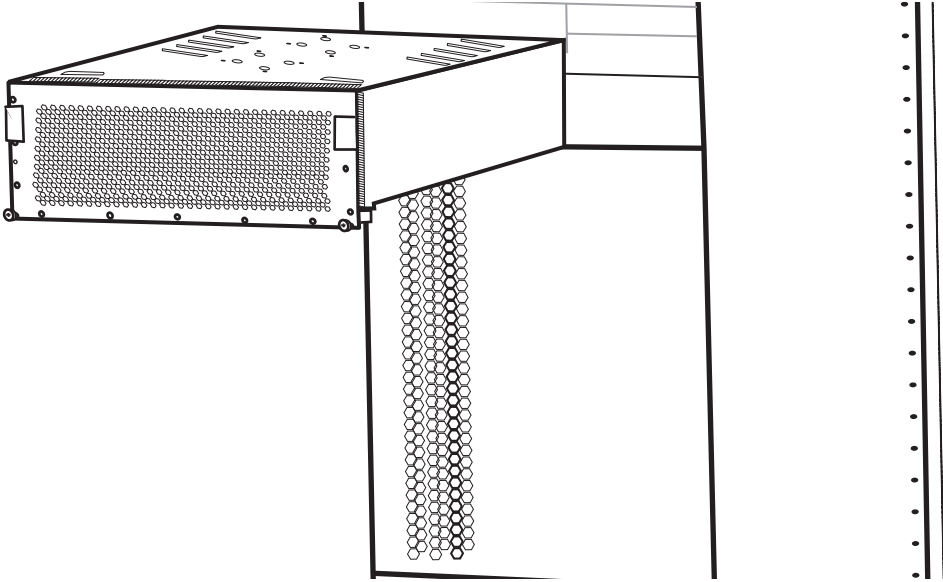
**Figure 5-1. The Fan Tray**



## Install the Fan Tray

To install the fan tray:

Step	Task
1	Slide the connector end of the fan tray into the fan tray slot at the top rear of the chassis.

2	Push the tray until the connector engages the backplane and the fan tray is flush with the chassis.
3	Secure the fan tray to the chassis by tightening the captive screws.

## Remove the Fan Tray

The fan tray LED lights green when the system is online and the fan tray is operating normally. The LED lights amber in case one or more fans in the tray fail. If a fan fails, you must replace the entire fan tray. Never operate the system without a fully functional fan tray.

The fan tray is hot-swappable. While you replace the fan tray, the system operates safely for up to approximately 1 minute at an ambient temperature of 95°F (35°C).

To remove the fan tray:

Step	Task
1	Loosen the captive screws on the fan tray.
2	Pull the fan tray by the handles halfway out of the chassis.
3	Place your hands under the fan tray, and pull it completely out of the chassis.
4	If the chassis is operating, replace the fan tray within 1 minute.

# Power Supply

This chapter provides instructions to install AC Power Supply Units (PSUs) and DC Power Entry Modules (PEMs):

- [AC Power Supply Units](#)
- [DC Power Entry Modules](#)

E-Series systems may contain only one type of power module—AC or DC. The E600i requires a minimum of one DC Power Entry Module or a minimum of two AC Power Supplies.

**Table 6-1. Minimum Power Supply Requirements**

Power Supply Input	Minimum (N)	Redundancy
220VAC	2	N + 1
110VAC	3	N + 1
DC	1	N + 1

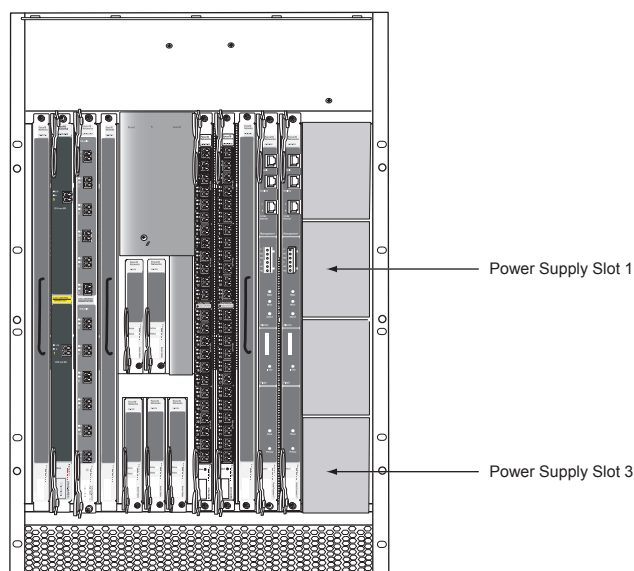
The chassis has four power supply slots ([Figure 6-1](#)). You may install DC PEMs in slots 1 and 3 only; you may install AC power supplies in any slot.

**⚠ WARNING:** Class 1 laser product.

**⚠ ATTENTION:** Produit laser de classe 1.

**⚠ WARNUNG:** Laserprodukt der Klasse 1.

**Figure 6-1. Power Supply Slots**



## AC Power Supply Units

The 2500W AC Power Supply Unit is capable of operating at either 100 VAC or 220 VAC. If the system is connected to a 100 VAC power supply, each unit provides up to 1500W, and three power supply modules are required to power the system; four power supply units are required for power supply redundancy.

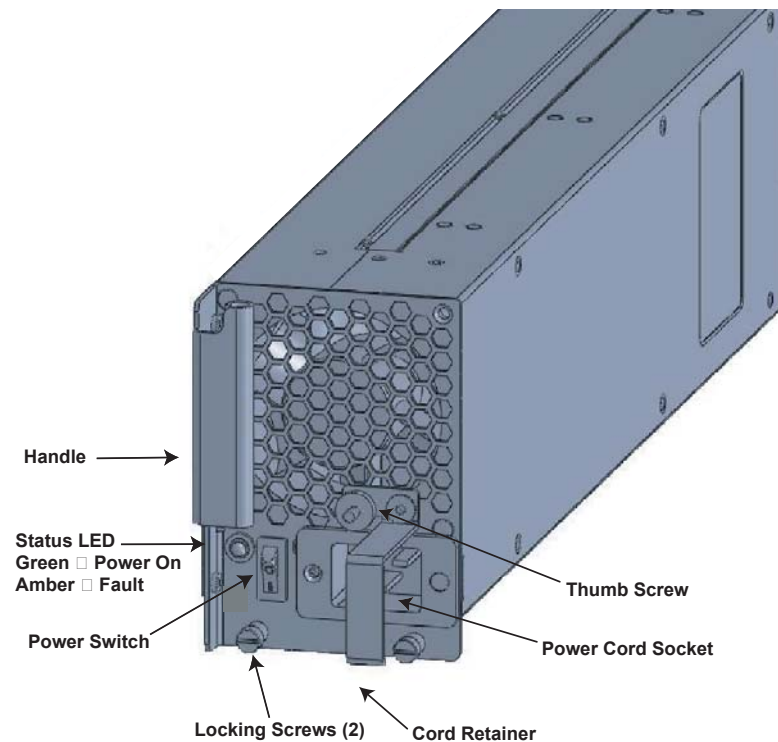
If the system is connected to a 220 VAC power supply, two power supply units are required for providing power to the system, three power supply units are required for power supply redundancy, and four power supply units are required for full facility redundancy.

Full facility redundancy requires two independent power sources (feeds) with two power supplies on each feed. Each independent power source should have a dedicated circuit breaker sized in accordance with your local electrical codes.

**CAUTION:** Before removing and replacing a power supply unit, determine if the E600i is in full redundancy or non-redundant mode. Operating in non-redundant mode will require a complete system power off when removing and replacing a power supply.

**NOTE:** Do not mix power supplies. Installing a 2500W-AC2 power supply into a chassis with 2500W-AC power supplies already installed may result in unpredictable behavior. FTOS version 8.3.1.2 and later will declare an alarm when the PSUs are mixed.

**Figure 6-2. AC Power Supply Unit**



## Power Cord Requirements

If using a power cord other than a Dell Force10 supplied power cord, the cord must terminate at a right angle (IEC320 C19 connector) to the power module, see [Figure 6-3](#). The power source end of the power cord must have an appropriately sized plug that complies with your local electrical codes. Conductor size must also conform to your local electrical codes.

The following are Dell Force10 supplied plug types.

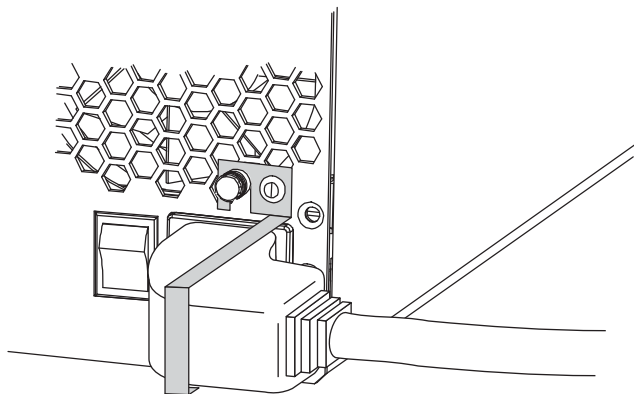
- EU: CEE 7/7
- UK: CEE7/7, BS 1363
- SWZ: CEE7/7, 309
- JAP: NEMA 5-20
- JAP 220: NEMA 6-20, L6-20
- US: C14, C20, NEMA 5-20, L5-20
- US 220: NEMA 6-20, L6-20, L6-30 (30A)

## Install the AC Power Supply Units

To install an AC power supply unit:

Step	Task
1	Verify that the power switch on the power supply is in the OFF position.
2	Orient the power supply handle to the left, and slide the backplane connector end into a power supply slot.
3	Secure the power supply into place by tightening the two locking screws to 5 in-lbs.
4	Plug an AC power cord into the socket on the front of the unit: a Loosen the power cord retainer thumb screw. b Rotate the retainer clockwise away from the socket and plug the power cord into the socket. c Rotate the retainer counter clockwise over the power cord, and tighten the thumb screw to secure the power cord.

**Figure 6-3. Securing the AC Power Cord**



- 5 Plug the AC power cord into an AC outlet.

Step	Task
6	Toggle the power supply switch to the ON position, and verify that Status LED lights green.

## Remove the AC Power Supply

**CAUTION:** This unit has more than one power supply connection; all connections must be removed to remove all power from the unit.

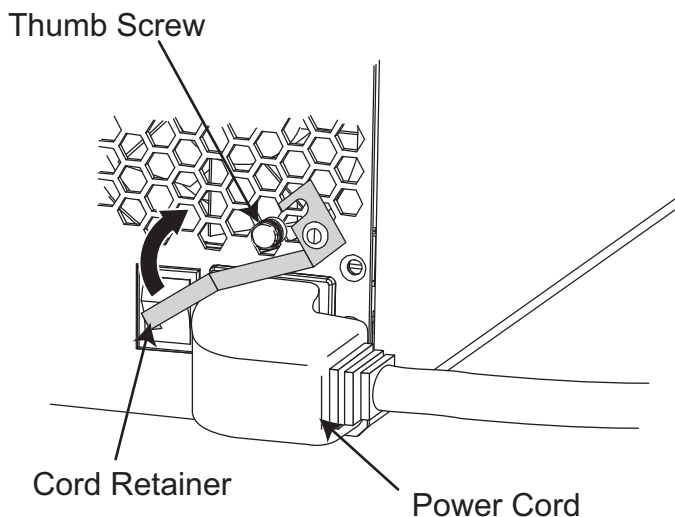
**ATTENTION:** Cette unité est équipée de plusieurs raccordements d'alimentation. Pour supprimer tout courant électrique de l'unité, tous les cordons d'alimentation doivent être débranchés.

**WARNUNG:** Diese Einheit verfügt über mehr als einen Stromanschluß; um Strom gänzlich von der Einheit fernzuhalten, müssen alle Stromzufuhren abgetrennt sein.

To remove an AC power supply unit:

Step	Task
1	Determine if the system is operating in power supply redundancy. If the system is operating with non-redundant power, removing a power supply powers down the system.
2	Toggle the power switch on the on the unit to the OFF position.
3	Unplug the power cord from the AC Power Supply and the AC power outlet. <ul style="list-style-type: none"> <li>a Loosen the power cord retainer thumb screw.</li> <li>b Rotate the retainer clockwise away from the socket and unplug the power cord from the socket.</li> </ul>

**Figure 6-4. Removing the AC Power Cord**



- 4 Loosen the locking screws.
- 5 Slide the power supply out of the slot.
- 6 If you are not replacing the power supply, place a power supply blank in the empty slot.

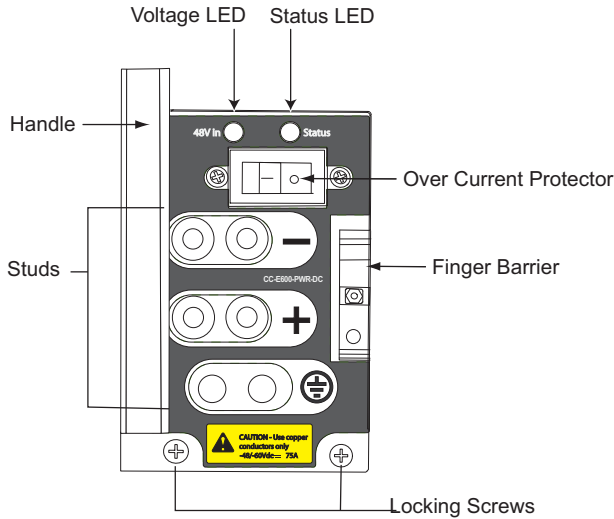


# DC Power Entry Modules

The system requires a minimum of one load-sharing PEM to operate, but two are recommended for redundancy. Connect the E600i PEMs to the appropriate branch circuit protection as defined by local electrical codes.

For full redundancy, each PEM must be attached to an independent power source with a dedicated circuit breaker.

**Figure 6-5. DC Power Entry Module**



## Cable and Connector Requirements

- 1 You must provide your own cables to connect to a remote power source in your equipment rack. Verify that your cables are:
  - rated for at least 80A service to allow for a fully loaded E600i system at low input voltage per your local electrical codes
  - limit voltage drop across the cable length to 0.5V or less
- 2 Before you make the cable connections, apply a coat of anti-oxidant paste to unplated metal contact surfaces.
- 3 File unplated connectors, braided straps, and bus bars to a shiny finish. It is not necessary to file and coat tinned connectors or other plated connection surfaces, such as on the PEM studs.

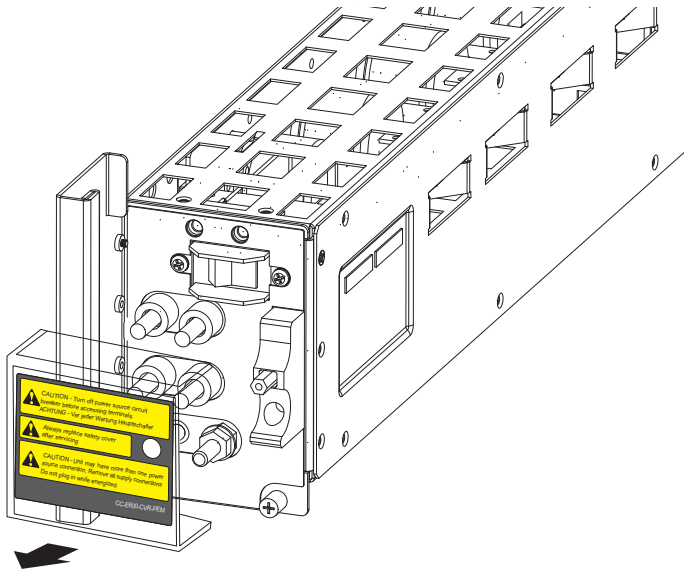
## Install the DC PEMs

To install a DC PEM:

Step	Task
1	Make sure that the remote power source (the circuit breaker panel) is in the <b>OFF</b> position.
2	Make sure that the over current protector (located on the PEM front panel) is in the <b>OFF</b> position.

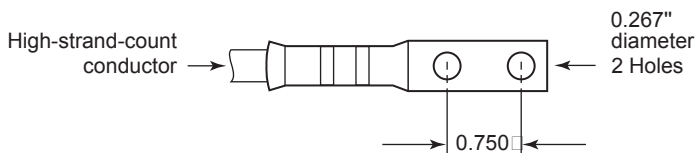
- 3 Loosen the retaining screw and remove PEM safety cover (Figure 6-6).

**Figure 6-6. Removing the DC PEM Safety Cover**



- 4 Slide the backplane connector end of the PEM into Power Supply Slot 1 or 3. Secure the PEM to the chassis by tightening the two locking screws.
- 5 Secure the chassis ground connection:  
Remove one outer nut and one washer from each of the six studs. The inner nut should remain tight on the stud, at no more than 25 inch-lbs.  
Locate the chassis ground connector studs on the PEM front panel (see Figure 6-5). The two bottom studs are the ground connection.  
Attach the grounding cable onto the ground studs. The grounding cable must comply with your local electrical codes in size and color (typically the color is green or green with yellow stripe), and the grounding cable must be terminated only with a UL-listed 2-hole lug with 1/4-inch holes on 3/4-inch spacing (see Figure 6-7).  
Replace the two washers and nuts.  
With a 7/16-inch box or socket wrench, tighten the nuts to 25 in-lbs.  
Connect the opposite end of the grounding cable to the nearest appropriate facility grounding post.

**Figure 6-7. Cable Connector for DC Power Entry Modules**



## Replace the DC PEM

The PEM Status LED is unlit or amber if the unit fails. In this case, replace the entire unit. There are no field serviceable parts inside the PEM unit.

To remove a PEM:

---

<b>Step</b>	<b>Task</b>
1	If the system is operating with power supply redundancy, you may remove either PEM at any time. If the system is operating without power supply redundancy, power down the system before removing the PEM.
2	Power off the remote power source, and then verify that the PEM status LED and Voltage LED are unlit. To be completely sure that power is off, measure the voltage across the negative (-) and positive (+) source DC leads using a voltmeter. The measurement across the positive and negative leads must be zero (0) volts before you proceed.
3	Toggle the Over Current Protector (located on the PEM front panel) to the OFF position.
4	Loosen the PEM safety cover retaining screw, and remove the cover.
5	Disconnect power cables attached to the PEM.
6	Slide the PEM out of the slot.
7	If you are not replacing the PEM, place a power supply blank in the empty slot.

---



# Installing RPMs, Line Cards, and SFMs

This chapter provides instructions to install cards into the E-Series chassis and includes the following sections:

- [Install RPMs, Line Cards, and SFMs](#)
- [Remove RPMs, Line Cards, and SFMs](#)

## Route Processor Modules

The system requires at least one Route Processor Module (RPM), two RPMs provide redundancy. Chassis slots R0 and R1 are RPM slots. They are keyed to fit into these slots and not line card slots to prevent improper installation.

You can insert a second RPM into an online system without performance interruption or software intervention. A second RPM provides redundant functionality and uninterrupted performance if the system transitions from the active RPM to the standby RPM.

### RPM LEDs

[Table 7-1](#) describes the RPM LED states.

**Table 7-1. RPM LEDs**


Section	Label	Description
Management	10/100 Ethernet	L: Green: link is up A: Green: activity on port
Alarms	Major	Red: a critical condition exists, such as a severe over-temperature condition, a fan tray failure, an over-current condition in a power supply, or an out-of-tolerance voltage. The RPM LEDs are controlled by software which sets the threshold levels for triggering the different stages of alarms. Unlit: no major conditions.
	Minor	Amber: a serious condition exists, such as an over-temperature condition, a single fan failure, or a line card failure. The RPM LEDs are controlled by software, which sets the threshold levels for triggering the different stages of alarms. Unlit: no minor alarm conditions.
	LT	Allows you to test the operability of LEDs to verify that they are able to light. Press the LT button to temporarily illuminate the LEDs on the RPM.
Flash		Green: flash memory card is in the process of a read or write process. Do not remove the flash card when the In Use LED is lit. Unlit: not in use.
Primary		Green: primary Unlit: secondary (or standby)

**Table 7-1. RPM LEDs**

Status	This is a bi-color LED. Green: operational Amber: fault detected Flashing green: booting Unlit: in secondary mode or power is off
Location	This LED is either lit blue or is unlit. It is used to locate a chassis and is turned on via the command line interface.

## Line Cards

Line cards provide external interfaces for connections to other network devices and are hot-swappable. There are seven line card slots numbered 0 through 6. The ports are numbered from the top, starting from 0.

 **WARNING:** The line card temperatures in E600i slots 0 and 1 rise above 80 F if traffic is flowing at line rate in a fully loaded chassis.

### Line Card LEDs

Line card LEDs are described in the documentation specific to each line card. Refer to the installation documentation that came with the card.

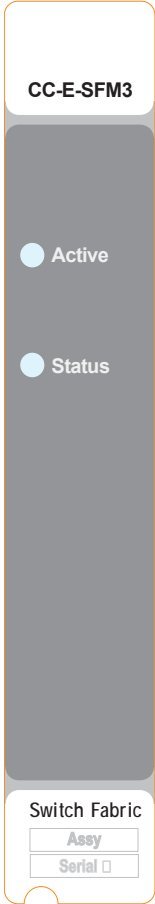
## Switch Fabric Modules

SFMs plug into the backplane and carry traffic between line cards or between RPMs and a line card. A minimum of four SFMs are required in order for the E-Series system to operate properly. There is an additional slot available for a redundant SFM; if you are not operating the system with SFM redundancy, install a blank panel in the unused slot.

## SFM Front Panel and LEDs

Table 7-2 describes the SFM front panel and LED displays.

**Table 7-2. SFM Front Panel and LED Descriptions**

	LED	Description
	Active	Green: active and passing traffic Unlit: in standby mode
	Status	Flashing Green: booting Green: operational Flashing Amber: communication failure Amber: fault detected Unlit: no power

## Blank Panels

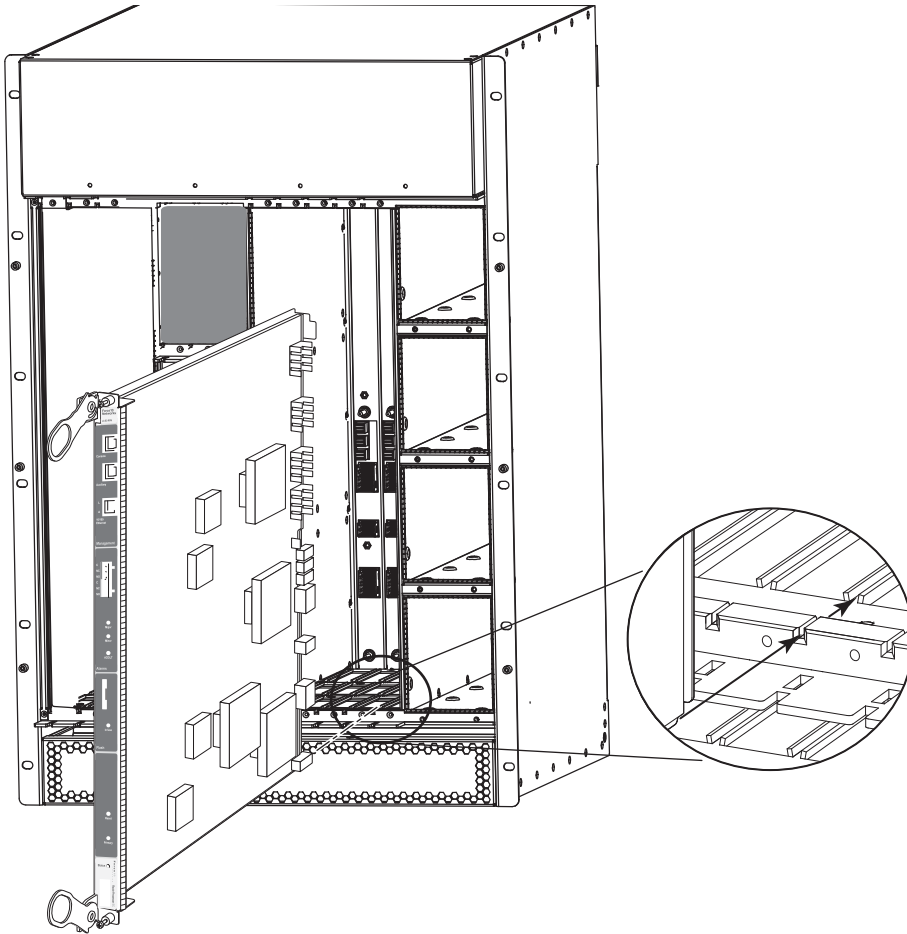
Blank panels are required to prevent excess dust accumulation, control airflow, and prevent electromagnetic interference. Blank panels are like line cards but do not have circuit boards or ejector levers. The same blank panel is used for empty line card and RPM slots.

# Install RPMs, Line Cards, and SFMs

The installation process is the same for RPMS, line cards, and SFMs:

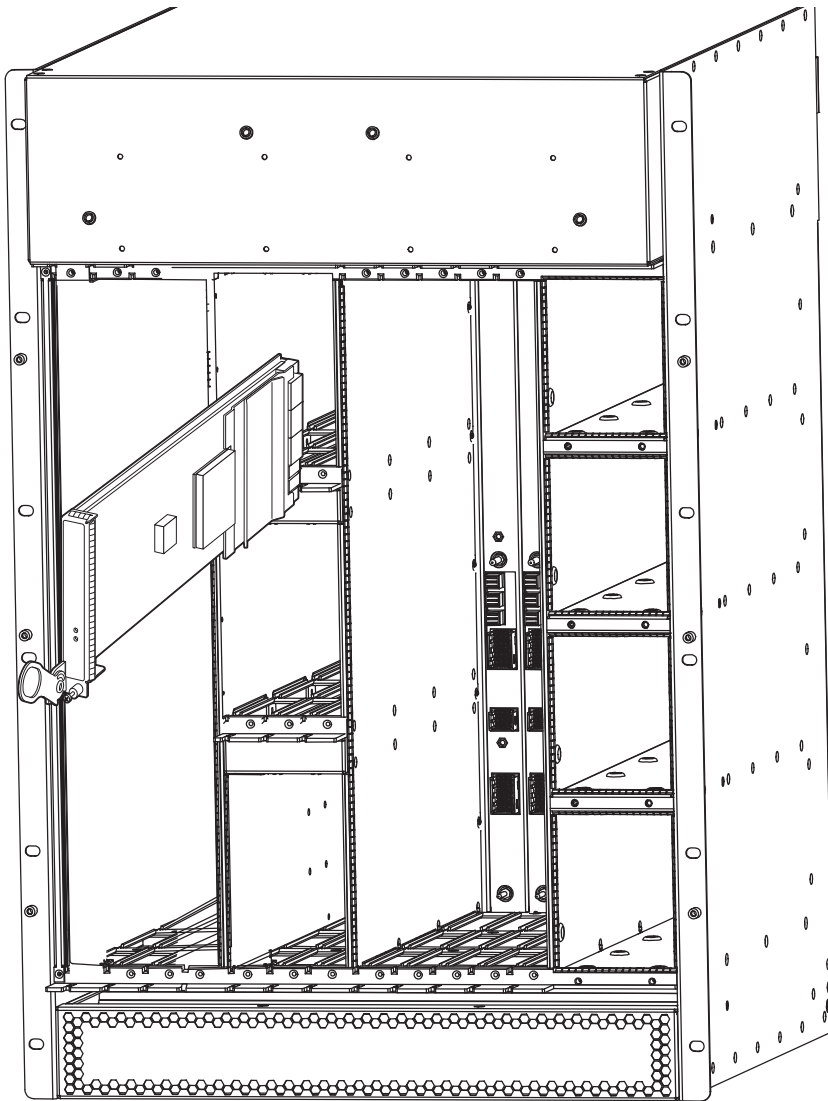
Step	Task
1	Hold the card by the edges. Avoid touching the printed circuit board and connector pins. Extend the top and bottom card levers before you insert the card into the slot.
2	Align the card with the slot guide for the appropriate (RPM, line card, or SFM) slot and gently slide it in until the connectors engage with the chassis backplane.
3	Rotate the lever(s) to seat the card in the chassis.
4	Secure card in place by tightening the captive screw(s) on each card.
5	Install blank panels in all unused RPM and line card slots.

**Figure 7-1. Installing RPMs and Line Cards into the E600i**





**Figure 7-2. Installing SFMs into the E600i**



## Remove RPMs, Line Cards, and SFMs

You can add, replace, or remove redundant modules without interrupting the system power or system operations. RPMs, line cards, and SFMs are hot-swappable.

To remove RPMs and line cards:

Step	Task
1	Determine if the system is operating with line card and RPM redundancy. If the system is operating with only one RPM or line card, removing either halts traffic processing.
2	Unplug the network interface cables connected to the line card or RPM.
3	Loosen the captive screws and pull the ejector lever(s) towards you to disengage the backplane connections.


---

Step	Task
4	Hold the card by the edges. Avoid touching the printed circuit board and connector pins. Slide the card out of the slot, and store the card in the original anti-static packaging.
5	If you are not planning to install a new card immediately, install a blank panel.

---

#### To remove an SFM:

---

Step	Task
1	Loosen the captive screw and pull the ejector lever towards you to disengage the backplane connections.
2	Slide the card out of the slot and store it in the original anti-static packaging. System messages appear on the console, including the following: %TSM-6-SFM_REMOVE: Removed SFM Wait 5 to 10 seconds to install a new SFM or reinsert an SFM. *
	 <b>NOTE:</b> If you mistakenly insert an SFM too quickly after removing it, traffic flow is interrupted. To correct the situation, remove an active SFM or the standby SFM, wait several seconds, and reinsert. System messages stating that the active interfaces' status changed and that the switch fabric is up appear when an fifth SFM is inserted correctly and traffic is flowing.
3	If you are not planning to install a new card immediately, install a blank panel.

---

# RPM Ports and Cables

This chapter describes standard RPM cables and adapter pin assignments.

- [Connecting to the Console and Auxiliary Ports](#)
- [Connecting to the 10/100 Ethernet Management Port](#)

There are three ports on the RPM:

- **Console:** A Universal Asynchronous Receiver/Transmitter (UART) port with an RJ-45 jack, is used for system configuration and monitoring. Modem connections are not supported on this port.
- **Auxiliary:** A UART port with an RJ-45 jack that allows modem access to the system from a remote location.
- **10/100 Ethernet:** A 10/100 Ethernet port that is the Management port, which is a channel to download images and manage the system. You must provide a cable terminated with an RJ-45 style connector to attach to this port.

## Connecting to the Console and Auxiliary Ports

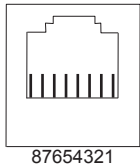
The console and auxiliary ports are asynchronous serial ports. If you connect a device to these ports, it must be capable of asynchronous transmission. Your terminal or terminal emulation mode must be set to VT100 with the following settings:

- 9600 baud rate (to avoid autobaud input, the default is set to a 9600 bps baud rate)
- No parity
- 8 data bits
- 1 stop bit
- Window Terminal Emulator option set to **NO**
- 24 lines X 80 characters
- No flow control (console port only)
- Hardware flow control (RTS/CTS) (for auxiliary port only)

### Cable and Adapter Pin Assignments

Use the E-Series Console port on the RPM to connect to a terminal port, PC serial port, or a terminal server to configure and monitor your system. Use the E-Series Auxiliary port on the RPM to connect to a modem.

Both the Console and Auxiliary port are RJ-45 ports. [Figure 8-1](#) displays the pinouts in an RJ-45 port.

**Figure 8-1. Pinouts for an RJ-45 Connector End of Adaptor**

[Table 8-1](#) displays the RJ-45 console port pin assignments. [Table 8-2](#) displays the RJ-45 auxiliary port pin assignments.

**Table 8-1. Console Port (RJ-45) Pin Assignments**

Pin	Signal	Input/Output
1	NC (unused)	-
2	DTR	Output
3	TxD	Output
4	GND	-
5	GND	-
6	RxD	Input
7	DSR	Input
8	NC (unused)	-

**Table 8-2. Auxiliary Port (RJ-45) Pin Assignments**

Pin	Signal	Input/Output
1	RTS	Output
2	DTR	Output
3	TxD	Output
4	GND	-
5	GND	-
6	RxD	Input
7	DSR	Input
8	CTS	Input

### Accessing the Console with a DB-9 Adapter

You can connect to the console using a RJ-45 to RJ-45 rollover cable and a RJ-45 to DB-9 female DTE adapter (labeled “TERMINAL”) to a terminal server (for example, PC). [Table 8-3](#) lists the pin assignments.

**Table 8-3. Pin Assignments between the E-Series Console and a DTE Terminal Server**

E-Series Console Port	RJ-45 to RJ-45 Rollover Cable		RJ-45 to DB-9 Adapter	Terminal Server Device
	Signal	RJ-45 pinout	RJ-45 Pinout	
RTS	1	8	8	CTS
DTR	2	7	6	DSR
TxD	3	6	2	RxD
GND	4	5	5	GND
GND	5	4	5	GND
RxD	6	3	3	TxD
DSR	7	2	4	DTR
CTS	8	1	7	RTS

### Accessing the Console with a DB-25 Adapter

You can connect to the console using a RJ-45 to RJ-45 rollover cable and a RJ-45 to a DB-25 female DTE adapter. [Table 8-4](#) lists the pin assignments.

**Table 8-4. Pin Assignments between the E-Series Console and DB-25 Adapter**

E-Series Console Port	RJ-45 to RJ-45 Rollover Cable		RJ-45 to DB-25 Modem Adapter	Terminal Server Device
	Signal	RJ-45 Pinout	RJ-45 Pinout	
RTS	1	8	5	CTS
DTR	2	7	6	DSR
TxD	3	6	3	RxD
GND	4	5	7	GND
GND	5	4	7	GND
RxD	6	3	2	TxD
DSR	7	2	20	DTR
CTS	8	1		RTS

### Accessing the Auxiliary Port by Modem

You can access the auxiliary port using a dial-up modem using a RJ-45 to RJ-45 rollover cable and a RJ-45 to a DB-25 male DCE adapter (labeled “MODEM”). [Table 8-5](#) lists the pin assignments.

**Table 8-5. RJ-45 to DB-25 Adapter Pin Assignments**

E-Series Auxiliary Port	RJ-45 to RJ-45 Rollover Cable		RJ-45 to DB-25 Modem Adapter	Modem
	Signal	RJ-45 Pinout	RJ-45 Pinout	
RTS	1	8	4	RTS

**Table 8-5. RJ-45 to DB-25 Adapter Pin Assignments**

E-Series Auxiliary Port	RJ-45 to RJ-45 Rollover Cable		RJ-45 to DB-25 Modem Adapter	Modem
Signal	RJ-45 Pinout	RJ-45 Pinout	DB-45 Pinout	Signal
DTR	2	7	20	DTR
TxD	3	6	3	TxD
GND	4	5	7	GND
GND	5	4	7	GND
RxD	6	3	2	RxD
DSR	7	2	8	DCD
CTS	8	1	5	CTS

## Connecting to the 10/100 Ethernet Management Port

Configure the 10/100 Ethernet management port, labeled **10/100 Ethernet** on the primary RPM card in to obtain network access to the chassis for management functions like upgrading the FTOS image.

**Table 8-6. 10/100 Ethernet Management Port LEDs**

Label	Description
L (Link)	Lit: Link is up. Unlit: No connection
A (Activity)	Lit: Activity on port. Unlit: No activity

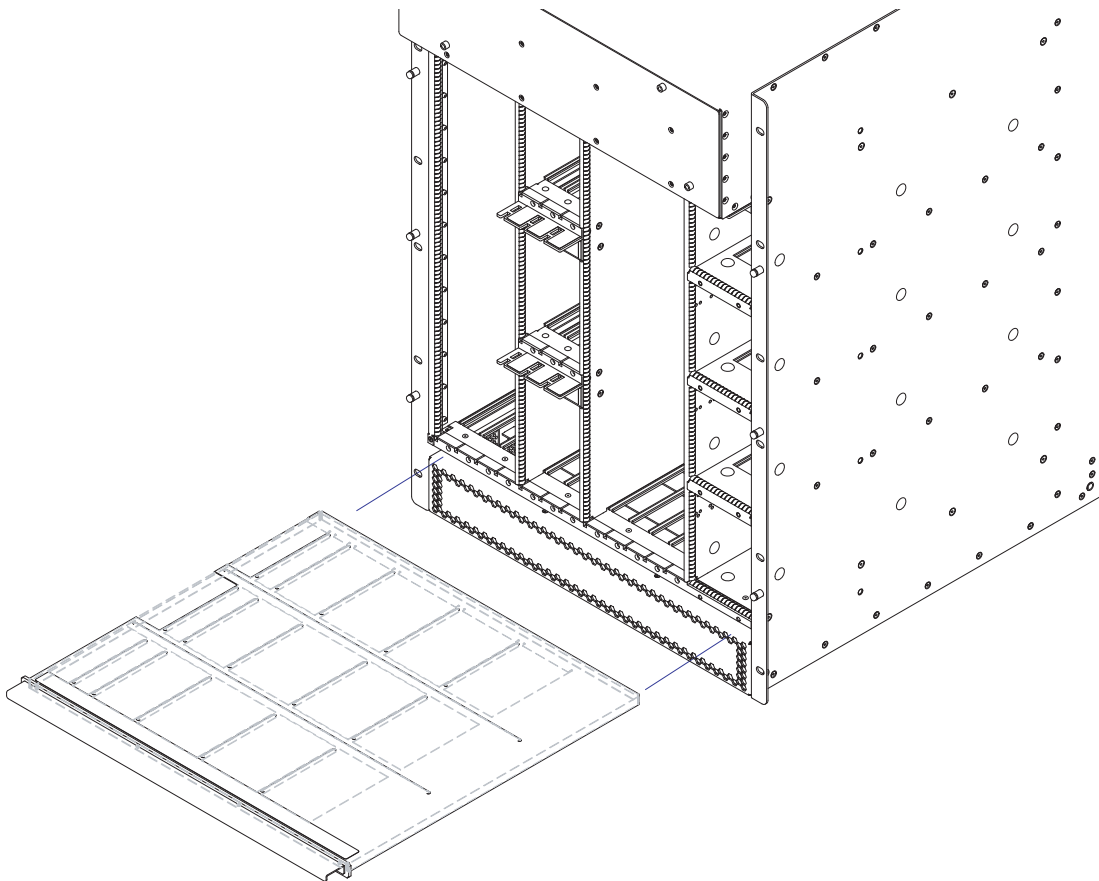
## Air Filter

A factory-installed air filter is shipped with the E-Series system. The hot-swappable air filter prevents large particles, debris, and dust from entering and circulating through the system, and ensures proper air flow. Inspected monthly and replace them at least every twelve months.

To install the filter, orient it so that the label “This Side Up” is facing upward. Guide the filter into the slot until it makes contact with the back of the chassis. An improperly installed air filter restricts air flow and generates thermal problems throughout the chassis. Ensure that the air filter is oriented correctly and seated securely in the slot.

To remove the filter, pull it straight out of the chassis. Do not operate the chassis without a filter for longer than 3 minutes to avoid card over-temperature conditions.

**Figure 9-1. Installing the Air Filter in an E600i**







## Using a Flash Memory Card


This appendix provides information about using an external flash memory card and contains the following sections:

- [External Flash Memory Card Overview](#)
- [Formatting an External Flash Card](#)
- [Inserting the External Flash Memory Card](#)
- [Removing the External Flash Memory Card](#)
- [Copying Files to the External Flash](#)
- [Displaying Files Stored on the External Flash](#)

### External Flash Memory Card Overview

Each RPM card is designed with a slot to accommodate an external flash memory card (slot0:). You can use a flash card to copy the image and configuration files for storage and backup purposes. For complex configurations, use the copies for other E-Series systems in your network. Configure your boot execution process to use the images stored on a flash card as the primary (active), secondary (standby), or default boot order preference. Optional external flash memory cards are shipped blank.

#### Inserting the External Flash Memory Card

 **NOTE:** Only insert the external flash before system boot or after the system has completed its boot and is runtime mode.

To install the flash memory card:

Step	Task
1	Press the ejector button to ensure it is in the extended position. Hold the flash card vertically (with the manufacturers able on the left and the barcode on the right).
2	Gently insert the flash card into the primary RPM flash slot until the is card is flush with the front panel. Do not force the flash card into the slot.
3	The In Use LED illuminates only during read or write operations.

#### Removing the External Flash Memory Card

To remove the flash memory card:

Step	Task
1	Extend the ejector button by pressing the ejector button. Then press the ejector button again to eject the memory card.
2	Remove the card and store it in an antistatic bag.

## Formatting an External Flash Card

New external flash cards must be formatted in the E-Series before use.

Flash cards used on systems other than the E-Series as well as cards formatted on PCs must be reformatted in the E-Series flash slot before they can be used. Similar to formatting a new diskette, formatting erases all information stored on the flash card. To format the flash card:

Step	Task
1	Insert the flash card into the flash slot on the <i>primary</i> RPM.
2	In the EXEC CLI mode, enter format slot0:
3	The formatted flash card is ready to use.

## Copying Files to the External Flash

Copy files to the flash when you want keep a backup image. The In Use LED illuminates during a read or write operation. Do not eject the flash card from the slot while this LED is lit.

To copy files to the external flash card use the following command:

Command Syntax	Command Mode	Purpose
copy file-url1 file-url2	EXEC Privilege	Configure the following parameters: <ul style="list-style-type: none"> <li>file-url1: the file source</li> <li>file-url2: enter slot0://</li> </ul>

## Displaying Files Stored on the External Flash

Flash cards can be used to copy and store system images, boot images, and configuration files. Optional flash memory cards are shipped blank.

To display files stored on a flash use the following command:

Command Syntax	Command Mode	Purpose
dir [filesystem]	EXEC Privilege	Configure the following optional parameters to view files on the flash card: <ul style="list-style-type: none"> <li>filesystem: enter either flash: for the internal flash or slot0: for the external flash.</li> </ul> The default is flash: (the internal flash). To view the external flash, enter dir slot0:

**Figure 10-1. dir Command Example**

```

Forcel0#dir slot0:
Directory of slot0:

 1  -rwx      6478482   Sep 7 101 16:54:34  E1200.BIN
  
```

FTOS supports up to a 40-character file name length, up to a 180-character local file path length, and up to a 256-character remote file path length.

Refer to the *FTOS Command Line Interface Reference* for CLI commands.



# System Boot


This appendix provides instructions to boot the E-Series system from the `BOOT_USER` prompt.

## The E-Series System Boot Process

When you supply power to the E-Series system, the system performs a series of power-on self-tests. RPM, and line card Status LEDs blink during initialization. No user interaction is required as long as the boot process proceeds without interruption. Observe the process on your console monitor and note the message output on the display. When the boot process is complete, the RPM and line card Status LEDs remain online (green) and the console monitor displays the command line interface (CLI) prompt, `Force10>`.

The RPM cards in the E-Series system contain an internal flash memory card (flash:). This is the default storage area for the boot files and the startup configuration file. Upon system power up or a system reset, the boot process uses parameters stored in non-volatile random access memory (NVRAM) to boot the system.

Each RPM is equipped with a slot for an external flash memory card (slot0:). You can copy the image files and configuration files to the external flash device on the *primary* RPM. You can also begin your boot process by accessing a remote server containing the boot image and system image files. When you configure your system to boot, you can specify the boot preference order: primary, secondary, or default in the in the `BOOT_USER` mode and the CLI mode.

 **NOTE:** The E-Series system supports up to a 40-character file name length, up to a 180-character local file path length, and up to a 256-character remote file path length.

For information about the flash memory card, see [Appendix 10, , on page 41](#).

## Booting from the `BOOT_USER` Prompt

To get into the `BOOT_USER` mode, you can issue a break control sequence (`CNTL+^`) to interrupt the automatic boot process or if you experience boot problems. This mode allows you to modify the parameters necessary to manage the boot process. Only console port access is enabled for the `BOOT_USER` mode.

To configure the chassis from the BOOT\_USER prompt:

- 1     help  
      or  
      ?
- The BOOT\_USER # prompt appears after an autoboot interruption. This is the default boot prompt, not the CLI prompt.
  - Enter help or ? to display a list of available commands and syntax.
  - Enter syntax help to display syntax information and variable descriptions.
  - Some display output you are given the option to continue the help screen display <cr> or to stop q<cr>.
  - You can abbreviate the boot commands by entering only the first letter of a command word. A matching algorithm displays the commands starting with the letter or letters you entered. For example, b displays the commands starting with the letter b, boot change and boot selector. Entering s h displays the syntax help information.
  - All commands are case insensitive.

- 2     Execute the following show commands to display important boot information:  
      show boot selector

The show boot selector command displays the boot ROM image currently selected and the most recently booted ROM image.

```
BOOT_USER # show boot selector

ROM BOOTSTRAP SELECTOR PARAMETERS:
=====
```

- 3     show bootflash

This command displays information about the current boot ROM.

```
BOOT_USER # show bootflash

GENERAL BOOTFLASH INFO
=====
Bootflash Partition A:
  Forcel0 Networks System Boot
  Copyright 1999-2001 Forcel0 Networks, Inc.
  ROM Header Version 1.0
  Official CP_IMG_BOOT, BSP Release 2.0.0.14
  Created Fri Sep  2 18:22:47 US/Pacific 2004

Bootflash Partition B:
```

4

show bootvar

This command displays the current operating system boot configuration parameters.

```

BOOT_USER # show bootvar

PRIMARY OPERATING SYSTEM BOOT PARAMETERS:
=====
boot device           : flash
file name             : /E600i-x.bin

SECONDARY OPERATING SYSTEM BOOT PARAMETERS:


```

5

boot change {primary | secondary | default}


If your configuration displays no preconfigured operating system boot parameters, use the boot change command to edit appropriate fields.

- The primary operating system boot parameters are used in the first attempt to boot the system.
- The secondary operating system boot parameters are used if the primary operating system boot selection is not available.
- The default operating system boot parameters are used if the secondary operating system boot parameter selection is not available. The default parameters always reside on the internal flash device (flash:).

 **NOTE:** These parameters, as well as other boot parameters, can be modified in the CLI mode.

When you enter the boot change command, you are prompted for a response.

- Enter a new parameter or press the ENTER key (carriage return) to accept the default parameter.
- Enter . (period) to clear a field.
- Enter - (dash) to edit a field above the current cursor position.

 **NOTE:** When you enter a new parameter that extends beyond 80 characters, you cannot use the BACKSPACE key to correct any mistakes. If you make a mistake, you must re-enter the parameter.

```

BOOT_USER # boot change primary
'.' = clear field; '-' = go to previous field
boot device           : flash
file name             : /E600i-6.x.bin
BOOT_USER # boot change default
'.' = clear field; '-' = go to previous field
boot device           : flash
file name             : /E600i-6.x.bin

BOOT_USER #

```

- 6 interface management port config 100m  
interface management port config 10m  
interface management port config auto-negotiate  
interface management port config no auto-negotiate  
interface management port config full-duplex  
interface management port config half-duplex  
interface management port config show
- (OPTIONAL) Use these commands to set the speed and duplex settings for the Management interface. The default setting is full-duplex and auto-negotiation.
  - Use the interface management port config show command to view the Management interface's physical settings.
- 7 show interface management ethernet  
interface management ethernet ip address ip-address ip-address-mask
- Use the show interface management ethernet command to display the IP address and network mask of the management Ethernet port.
  - If the show command output does not display configured IP address information, use the interface management ethernet ip address ip-address ip-address-mask command to set the IP address of the Management Ethernet port for network (ftp/tftp) operating system boot.

```

BOOT_USER # show interface management ethernet
No IP address set for interface management ethernet 0/0!

BOOT_USER # interface management ethernet ip address 1.2.3.4 255.255.0.0
Management ethernet 0/0 IP address: 1.2.3.4 255.255.0.0

BOOT_USER # show interface management ethernet

Management ethernet IP address: 1.2.3.4:ffffff00

BOOT_USER #

```

- 8 show default-gateway  
default-gateway ip-address
- (OPTIONAL) Use the show default-gateway command to view gateway information.
- If your server is on the same subnet, you do not need to configure a gateway parameter.
- If your server is not on the same subnet, use the default-gateway ip-address command to set the gateway IP address.

```

BOOT_USER # show default-gateway

No gateway IP address specified!

BOOT_USER # default-gateway ip 1.2.3.5
Gateway IP address 1.2.3.5
BOOT_USER # show default-gateway

Gateway IP address: 1.2.3.5

BOOT_USER #


```



- 9      `dir flash:`                      Use the `dir flash:` command to list files stored on the internal flash device.  
`dir slot0:`                      Use the `dir slot0:` command to list files stored on the external flash device.

```
BOOT_USER # dir flash:
Displaying files in flash:
  size      date      time      name
-----
11187685   FEB-15-2006  05:37:58  E600i-.bin
11031398   FEB-23-2006  22:42:46  E600i-3.bin
 9280984   FEB-17-2006  21:02:36  E600i-2.bin
10778521   FEB-18-2006  22:53:26  E600i-3.1.bin
   1787    FEB-23-2006  22:42:46  startup-config

BOOT_USER #
```

- 10      `reload`                      Reload software.  
                                 The autoboot program initializes and displays self-test results on the console screen.  
                                  **NOTE:** Do not press break control sequence at any time during the boot/reboot process. Doing so causes the boot process to terminate.
- 11      `Force10>`                      When the reboot completes, the CLI defaults to the EXEC mode.

---

Refer to the *FTOS Command Line Interface Reference* for CLI details, and to the *FTOS Configuration Guide* for configuration procedures.



# Alarms

The E-Series generates major and minor alarms for the following conditions:

- fan tray status
- power supply status
- RPMs status
- high temperature on RPMs
- line cards status
- high temperature on line cards
- SFMs status
- high temperature on SFMs.

A major alarm is any fault that may render the E-Series non-functional.

A minor alarm is any fault that threatens the operation of the E-Series.

You can monitor alarm conditions on the E-Series system through the console, LEDs, and audible alarms. If you configure the SNMP command (`snmp-server enable traps envmon`), the FTOS also sends an SNMP trap.

In the E-Series system, alarms are logged for each occurrence, but the system may not send an event log for multiple occurrences. For example, whenever a module exceeds the shutdown threshold, the module shuts down. If more than one module exceeds the warning or high temperature thresholds within a five minute period, the system generates one event for all effected modules, but alarms are logged for each occurrence. If the modules temperature falls to 5° lower than the warning threshold temperature, the system clears the alarm and an SNMP trap.

**Table B-1. Alarm Events and Reporting**

Module	Alarm Event	Alarm LED	Reported in event log	Status LED on Module	Audible Alarm?
Fan tray	More than one fan within the module fails or hardware failure in the module	major (red)	major	amber	yes
	One fan within the module fails	minor (amber)	minor	amber	no
AC Power Supplies	Hardware failure in a non-redundant power configuration (3 power supplies)	major (red)	major	red or unlit	yes
	Hardware failure in a redundant power configuration (4 power supplies)	minor (amber)	minor	red or unlit	no

**Table B-1. Alarm Events and Reporting**

Module	Alarm Event	Alarm LED	Reported in event log	Status LED on Module	Audible Alarm?
Line Card	Hardware failure	major (red)	major	amber	no
	Exceeds high temperature limit	major (red)	major	unlit	yes
	Exceeds warning temperature limit	minor (amber)	minor	green	yes
	Individual interface fails	minor (amber)	reported	amber <sup>a</sup>	no
RPM (Non-redundant Configuration with 1 RPM)					
	Exceeds high temperature limit	major (red)	major	unlit	yes
	Exceeds warning temperature limit	minor (amber)	minor	green	no
	RPM fails but CP is ok	major (red)	major	amber	yes
SFM s (Redundant Configuration with 5 SFMs)					
	Exceeds high temperature limit	major (red)	major	unlit	yes
	Exceeds warning temperature limit	minor (amber)	minor	green	no
	Any card fails	minor (amber)	minor	amber	no
	Any card removed	minor (amber)	minor	unlit	no
SFM s (Non-Redundant Configuration with 4 SFMs)					
	Exceeds high temperature limit	major (red)	major	unlit	yes
	Exceeds warning temperature limit	minor (amber)	minor	green	no
	Any card fails	major (red)	major	amber	yes
	Any card removed	major (red)	major	unlit	yes

a. The interface's Link LED is unlit.

## AC Power Supplies and Alarms

During system boot, if the redundant power supply (the fourth power supply) is missing or fails, the FTOS does not generate any alarm messages since the minimum configuration of three power supplies is operating. Yet, if a fourth AC power supply is installed, and later one of the four power supplies is removed or fails, the system generates a minor alarm.

If only three power supplies are installed and one of them fails while the E-Series is operating, the software generates a major alarm and an SNMP trap, lights the major LED, and activates the audible alarm.

When you operate the E-Series with three AC power supplies and six or more line cards, the software lists a redundancy alarm on the console and in the `show alarms` command output. All line cards operate normally.

## SFMs and Alarms

The number of SFMs present in the system when it boots determines the level of alarms sent when a fifth (redundant) SFM is removed or fails. At boot time, if five SFMs are present and functioning, the E-Series system issues no alarms. However, if one SFM fails or is removed, the system send a minor alarm stating that four SFMs are present. The system requires four functioning SFMs to pass traffic.

At boot time, if four SFMs are present and functioning, the E-Series system issues no alarms. The system issues no alarms if a fifth SFM is added to the system; however, if the number of functioning SFMs changes from five to four, the system sends a minor alarm event. The system always triggers a major alarm when the number of working SFMs reaches three.




# System Specifications

This appendix contains the following major sections:

- [Chassis Physical Design](#)
- [AC Power Supply Unit Requirements](#)
- [DC Power Entry Module Requirement](#)
- [Agency Compliance](#)

## Chassis Physical Design

Parameter	Specifications
Height	28 inches (71.1 cm)
Width	17.4 inches (44.2 cm)
Depth (without cable management system)	21.5 inches (54.6 cm)
Chassis weight with factory-installed components (backplane and air filter)	81 pounds (36.7 kg)
Weight fully loaded (backplane, air filter, fan tray, SFMs, RPMs, and 7 line cards)	242 pounds (109.8 kg)
Mounting	Factory-installed rack mount brackets for front, center, or rear mounting in a standard 19-inch rack. Optional brackets for mounting in a standard 23-inch rack or cabinet.
Rack clearance required	Front: 18-inches Rear: 20-inches
Maximum Thermal output:	
 <b>NOTE:</b> Thermal output is directly proportional to system configuration and number of line cards.	
• Maximum for fully loaded chassis	120 VAC powered: 4705W (16,065 BTU/hour) 200/240 VAC powered: 4250W (14,500 BTU/hour) DC powered: 2800W (9600 BTU/hour)

## Environmental

Parameter	Specifications
<b>Operating</b>	
Temperature	32° to 104°F (0° to 40°C)
Maximum altitude	No performance degradation to 10,000 feet (3,048 meters)
Relative humidity	5 to 85 percent, noncondensing
<b>Non-operating</b>	
Temperature	-40° to 158°F (-40° to 70°C)
Maximum altitude	15,000 feet (4,572 meters)
Relative humidity	5 to 95 percent, noncondensing

## AC Power Supply Unit Requirements

Parameter	Specifications
Nominal Input Voltage	120 - 240 VAC 50/60 Hz
Maximum AC Power Supply Input	16 A @ 100 VAC per module 12 A @ 200 VAC per module
Maximum Thermal Output (3,172 W)	10,822 BTU/hour at 100/120 VAC
Maximum Thermal Output (2,906 W)	9,914 BTU/hour at 200/240 VAC
Maximum AC Supply Input Current (based on 2500 W output for 100/120V and 200/240V lines.)	11.6 A @ 100 VAC 9.7 A @ 120 VAC 8.0 A @ 200 VAC 6.7 A @ 240 VAC
Maximum System Power Input	3.5 KVA @ 100/120 VAC 3.2 KVA @ 220/240 VAC
Maximum Power Consumption	3,422 W at 100/120 VAC 3,156 W at 200/240 VAC

Nominal Input Voltage	100 - 120 VAC Requires a minimum of 3 Power Supplies Installed 200 - 240 VAC Requires a minimum of 2 Power Supplies Installed
Maximum System Power Input	4.80 KVA @ 100 VAC 4.60 KVA @ 220 VAC

Parameter	Specifications
Maximum DC PEM Input Current	75A
System	2800W (9600 BTU/hour)
Input Voltage	-48 to -60 Vdc



# DC Power Entry Module Requirement

Parameter	Specifications
Nominal Input Voltage	-44 to 60 VDC
Maximum Current Draw (per DC PEM)	100 A
Maximum Thermal Output (2,590 W)	8,838 BTU/hour
Maximum Power Consumption	2,840 W

## SFM and RPM Power Requirements

Module	Power Requirement in Watts (in BTUs)
SFM	60W (210 BTU/hour)
RPM	150W (510 BTU/hour)

## Agency Compliance

The E-Series is designed to comply with the following safety and agency requirements.

### USA Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designated to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy. If it is not installed and used in accordance to the instructions, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to take whatever measures necessary to correct the interference at their own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Dell Force10 is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications in the equipment. Unauthorized changes or modification could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

### Canadian Department of Communication Statement

#### Industry Canada Class A emission compliance statement

This Class A digital apparatus complies with Canadian ICES-003.


#### Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

### European Union EMC Directive Conformance Statement

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. Dell Force10 cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of this product, including the fitting of non-Dell Force10 option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22/ European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

 **WARNING:** This is a Class A product. In a domestic environment, this device may cause radio interference, in which case, the user may be required to take adequate measures.

**European Community Contact**

Dell Force10, EMEA - Central  
 Dahlienweg 19  
 66265 Heusweiler  
 Germany

<http://www.force10networks.com/german/>

Tel: +49 172 6802630

Email: EMEA Central Sales

**Japan: VCCI Compliance for Class A Equipment**

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

This is Class A product based on the standard of the Voluntary Control Council For Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

**⚠ WARNING:** AC Power cords are for use with Dell Force10 equipment only. Do not use Dell Force10 AC power cords with any unauthorized hardware.

本製品に同梱いたしております電源コードセットは、本製品専用です。本電源コードセットは、本製品以外の製品ならびに他の用途でご使用いただくことは出来ません。製品本体には同梱された電源コードセットを使用し、他製品の電源コードセットを使用しないで下さい。

**Korea (MIC certification)****Korean Class A Warning Statement**


이 기기는 업무용으로 전자파 적합등록을 받은 기기 이오니, 판매자 또는 사용자는 이 점을 주의하시기 바라며, 만약 잘못 구입하셨을 때에는 구입한 곳에서 비업무용으로 교환하시기 바랍니다.

**Korea Certification**

A급 기기  
 (업무용 방송통신기자재)

이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

## Korea Information

	 [equipment type]
품명(Product Name)	Ethernet Switch
모델명(Model)	[model number]
신청인(Applicant)	Force10 Networks, Inc.
제조사(Manufacturer)	Delta Networks, (Dongguan) Ltd.
제조년월(Manufacturing Date)	[date]
제조국(Country of Origin)	China

## Safety Standards and Compliance Agency Certifications

- CUS UL (60950-1, 1st Edition)
- CSA 60950-1-03, 1st Edition
- EN 60950-1, 1st Edition
- EN 60825-1, 1st Edition
- EN 60825-1 Safety of Laser Products—Part 1: Equipment Classification Requirements and User's Guide
- EN 60825-2 Safety of Laser Products—Part 2: Safety of Optical Fibre Communication Systems
- FDA Regulation 21CFR 1040.10 and 1040.11
- IEC 60950-1, 1st Ed, including all National Deviations and Group Differences

## Electromagnetic Compatibility (EMC)

### Emissions

- Australia/New Zealand: AS/NZS CISPR 22: 2006, Class A
- Canada: ICES-003, Issue-4, Class A
- Europe: EN55022 2006 (CISPR 22: 2006), Class A
- Japan: VCCI V3/ 2007.04 Class A
- USA: FCC CFR47 Part 15, Subpart B, Class A

### Immunity

- EN 300 386 V1.3.3: 2005 EMC for Network Equipment
- EN 55024 1998 + A1: 2001 + A2: 2003
  - EN 61000-3-2 Harmonic Current Emissions
  - EN 61000-3-3 Voltage Fluctuations and Flicker
  - EN 61000-4-2 ESD
  - EN 61000-4-3 Radiated Immunity

- EN 61000-4-4 EFT
- EN 61000-4-5 Surge
- EN 61000-4-6 Low Frequency Conducted Immunity

## Product Recycling and Disposal

This switch must be recycled or discarded according to applicable local and national regulations. Dell Force10 encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. Dell Force10 offers a variety of product return programs and services in several countries to assist equipment owners in recycling their IT products.

*Waste Electrical and Electronic Equipment (WEEE) Directive for Recovery, Recycle and Reuse of IT and Telecommunications Products*

Dell Force10 switches are labeled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used appliances as applicable throughout the European Union. This label, as shown in [Figure C-1](#), is applied to various products to indicate that the product is not to be thrown away, but rather reclaimed upon end of life per this Directive.

**Figure C-1. The European WEEE symbol**



In accordance with the European WEEE Directive, electrical and electronic equipment (EEE) is to be collected separately and to be reused, recycled, or recovered at end of life. Users of EEE with the WEEE marking per Annex IV of the WEEE Directive, as shown above, must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to customers for the return, recycling and recovery of WEEE. Customer participation is important to minimize any potential effects of EEE on the environment and human health due to the potential presence of hazardous substances in EEE.

Dell Force10 products, which fall within the scope of the WEEE, are labeled with the crossed-out wheeled-bin symbol, as shown above, as required by WEEE.

For information on Dell Force10 product recycling offerings, see the WEEE Recycling instructions on iSupport at: <https://www.force10networks.com/CSPortal20/Support/WEEEandRecycling.pdf>.

For more information, contact the Dell Force10 Technical Assistance Center (TAC) (see [Contacting the Technical Assistance Center on page 62](#)).

For California:

**Perchlorate Material** — Special handling may apply.

See: <http://www.dtsc.ca.gov/hazardouswaste/perchlorate>

The foregoing notice is provided in accordance with California Code of Regulations Title 22, Division 4.5 Chapter 33. Best Management Practices for Perchlorate Materials.

# Technical Support

This appendix contains these major sections:

- [The iSupport Website](#)
- [Contacting the Technical Assistance Center](#)
- [Requesting a Hardware Replacement](#)
- [Requesting a Hardware Replacement](#)

## The iSupport Website

iSupport provides a range of documents and tools to assist you with effectively using Dell Force10 equipment and mitigating the impact of network outages. Through iSupport you can obtain technical information regarding Dell Force10 products, access to software upgrades and patches, and open and manage your Technical Assistance Center (TAC) cases. Dell Force10 iSupport provides integrated, secure access to these services.

The iSupport website (<http://www.force10networks.com/support/>) contains a publicly available interface that includes access to techtips, white papers, and user manuals. After you get an account and log in, the available documentation expands to other types, including bug lists, error message decoder, release notes. You can even track your own Dell Force10 inventory.

Once you are logged in, the following five tabs become available:

- **Home:** Summary of open cases, RMA management, and field notices (as shown below)
- **Service Request:** Case management
- **Software Center:** Software downloads, bug fixes, and bug tracking tool
- **Documents:** User documentation, FAQs, field notices, technical tips, and white papers
- **Support Programs:** Information on the suite of Dell Force10 support and professional support services.

## Accessing iSupport Services

The URL for iSupport is <http://www.force10networks.com/support/>. To access iSupport services you must have a userid and password. If you do not have one, you can request one at the website:

- 1 On the Dell Force10 iSupport page, click the **Account Request** link.
- 2 Fill out the User Account Request form, and click **Send**. You will receive your userid and password by E-mail.
- 3 To access iSupport services, click the **LOGIN** link, and enter your userid and password. See [Contacting the Technical Assistance Center](#), below, for more.

# Contacting the Technical Assistance Center

---

<b>How to Contact Dell Force10 TAC</b>	Log in to iSupport at <a href="http://www.force10networks.com/support/">http://www.force10networks.com/support/</a> , and select the <b>Service Request</b> tab.
<b>Information to Submit When Opening a Support Case</b>	<ul style="list-style-type: none"> <li>• Your name, company name, phone number, and E-mail address</li> <li>• Preferred method of contact</li> <li>• Model number</li> <li>• Serial Number (see <a href="#">Requesting a Hardware Replacement</a>)</li> <li>• Software version number</li> <li>• Symptom description</li> <li>• Screen shots illustrating the symptom, including any error messages. These can include: <ul style="list-style-type: none"> <li>• Output from the show tech-support [non-paged] command (This report is very long, so the storage buffer in your terminal program should be set high.)</li> <li>• Output from the show logging eventlog [unit] command, where unit is the stack ID of the member unit that experienced the failure (This report is included as a section in the output of show tech-support.)</li> <li>• Console captures showing the error messages</li> <li>• Console captures showing the troubleshooting steps taken</li> <li>• Saved messages to a syslog server, if one is used</li> </ul> </li> </ul>
<b>Managing Your Case</b>	Log in to iSupport, and select the <b>Service Request</b> tab to view all open cases and RMAs.
<b>Downloading Software Updates</b>	Log in to iSupport, and select the <b>Software Center</b> tab.
<b>Technical Documentation</b>	Log in to iSupport, and select the <b>Documents</b> tab. This page can be accessed without logging in via the <b>Documentation</b> link on the iSupport page.
<b>Contact Information</b>	<p>E-mail: <a href="mailto:support@force10networks.com">support@force10networks.com</a></p> <p>Web: <a href="http://www.force10networks.com/support/">http://www.force10networks.com/support/</a></p> <p>Telephone:</p> <p>US and Canada: 866.965.5800</p> <p>International: 408.965.5800</p>

---

## Requesting a Hardware Replacement

To request replacement hardware, follow these steps:

---

Step	Task
1	Determine the part number and serial number of the component. To list the numbers for all components installed in the chassis, use the show hardware command.

Step	Task
2	<p data-bbox="241 239 1474 296">Request a Return Materials Authorization (RMA) number from TAC by opening a support case. Open a support case by:</p> <ul data-bbox="269 312 1458 856" style="list-style-type: none"> <li data-bbox="269 312 1458 340">• Using the Create Service Request form on the iSupport page (see <a href="#">Contacting the Technical Assistance Center</a>).</li> <li data-bbox="269 354 1458 411">• Contacting Dell Force10 directly by E-mail or by phone (see <a href="#">Contacting the Technical Assistance Center</a>). Provide the following information when using E-mail or phone:</li> <li data-bbox="269 428 935 455">• Part number, description, and serial number of the component.</li> <li data-bbox="269 472 1159 499">• Your name, organization name, telephone number, fax number, and e-mail address.</li> <li data-bbox="269 516 1458 543">• Shipping address for the replacement component, including a contact name, phone number, and e-mail address.</li> <li data-bbox="269 560 1089 588">• A description of the failure, including log messages. This generally includes: <ul data-bbox="269 604 1435 856" style="list-style-type: none"> <li data-bbox="269 604 1435 661">• Output from the show tech-support [non-paged] command (This report is very long, so the storage buffer in your terminal program should be set high.)</li> <li data-bbox="269 678 1435 735">• Output from the show logging eventlog [unit] command, where unit is the stack ID of the member unit that experienced the failure (This report is included as a section in the output of show tech-support.)</li> <li data-bbox="269 751 773 779">• Console captures showing the error messages</li> <li data-bbox="269 795 906 823">• Console captures showing the troubleshooting steps taken</li> <li data-bbox="269 840 808 867">• Saved messages to a syslog server, if one is used</li> </ul> </li> </ul>





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