EMC Connectrix B Series
ED-DCX-4S-B
Version 6.2

Hardware Reference Manual
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EMC Connectrix B Series v6.2 ED-DCX-4S-B Hardware Reference Manual

Preface

As part of an effort to improve and enhance the performance and capabilities of its product lines, EMC periodically releases revisions of its hardware and software. Therefore, some functions described in this document may not be supported by all versions of the software or hardware currently in use. For the most up-to-date information about product features, refer to your product release notes.

If a product does not function properly or does not function as described in this document, please contact your EMC representative.

Audience
This document is a hardware reference manual written for system administrators and technicians experienced with networking, Fibre Channel, and SAN technologies to help them install, set up, configure, operate, maintain, and troubleshoot the ED-DCX-4S-B.

This document presents information on setting up and operating the ED-DCX-4S-B. It is organized in a loosely chronological order, beginning with an overview of the ED-DCX-4S-B and ending with removal and replacement procedures of field replaceable components.

Related documentation
Related documents include:

◆ *EMC Connectrix B Series Fabric OS ES-5832B Hardware Reference Manual*

◆ *EMC Connectrix B Series Encryption Administration Guide*

◆ *EMC Connectrix B Series Fabric OS Administrator's Guide*

◆ *EMC Connectrix B Series Fabric OS Command Reference Guide*

◆ *EMC Connectrix B Series Fabric OS Fabric Watch Administrator's Guide*

◆ *EMC Connectrix B Series Fabric OS Message Reference Guide*

◆ *EMC Connectrix B Series Fabric OS MIB Reference Guide*

◆ *EMC Connectrix B Series Fabric OS Web Tools Administrator's Guide*

◆ *EMC Connectrix B Series Troubleshooting and Diagnostics Guide*

EMC Support Matrix and E-Lab Interoperability Navigator

For the most up-to-date information, always consult the *EMC Support Matrix* (ESM), available through E-Lab Interoperability Navigator (ELN) at: http://elabnavigator.EMC.com, under the **PDFs and Guides** tab.

Conventions used in this document

EMC uses the following conventions for special notices.

Note: A note presents information that is important, but not hazard-related.

CAUTION

A caution contains information essential to avoid data loss or damage to the system or equipment.

IMPORTANT

An important notice contains information essential to software or hardware operation.

Typographical conventions

EMC uses the following type style conventions in this document:

Normal	Used in running (nonprocedural) text for:
	• Names of interface elements (such as names of windows, dialog boxes, buttons, fields, and menus)
	• Names of resources, attributes, pools, Boolean expressions, buttons, DQL statements, keywords, clauses, environment variables, functions, utilities
	• URLs, pathnames, filenames, directory names, computer names, filenames, links, groups, service keys, file systems, notifications
Bold	Used in running (nonprocedural) text for:
	• Names of commands, daemons, options, programs, processes, services, applications, utilities, kernels, notifications, system calls, man pages

	Used in procedures for: • Names of interface elements (such as names of windows, dialog boxes, buttons, fields, and menus) • What user specifically selects, clicks, presses, or types
Italic	Used in all text (including procedures) for: • Full titles of publications referenced in text • Emphasis (for example a new term) • Variables
Courier	Used for: • System output, such as an error message or script • URLs, complete paths, filenames, prompts, and syntax when shown outside of running text
Courier bold	Used for: • Specific user input (such as commands)
Courier italic	Used in procedures for: • Variables on command line • User input variables
< >	Angle brackets enclose parameter or variable values supplied by the user
[ ]	Square brackets enclose optional values
|	Vertical bar indicates alternate selections - the bar means "or"
{ }	Braces indicate content that you must specify (that is, x or y or z)
...	Ellipses indicate nonessential information omitted from the example

Where to get help   EMC support, product, and licensing information can be obtained as follows.

Product information — For documentation, release notes, software updates, or for information about EMC products, licensing, and service, go to the EMC Powerlink website (registration required) at:

http://Powerlink.EMC.com

Technical support — For technical support, go to EMC Customer Service on Powerlink. To open a service request through Powerlink, you must have a valid support agreement. Please contact your EMC sales representative for details about obtaining a valid support agreement or to answer any questions about your account.

Working with customer support   Contact the EMC Customer Support Center for hardware, firmware, and software support, including product repairs and part ordering. To expedite your call, have the following information available:

◆ General Information

- Technical Support contact number, if applicable
- Switch model
- Switch operating system version
- Error numbers and messages received
- **supportSave** command output
- Detailed description of the problem and specific questions
- Description of any troubleshooting steps already performed and results
- Serial console and telnet session logs
- syslog message logs

◆ Switch serial number

The switch serial number and corresponding bar code are provided on the serial number label, as shown here:

```
*FT00X0054E9*
FT00X0054E9
```

The serial number label is located as follows:

- *DS-220B*— On the nonport side of the chassis
- *DS-5000B*— On the switch ID pull out tab located on the bottom up of the port side of the switch
- *DS-4100B, DS-4900B, and MP-7500B*— On the switch ID pull-out tab located inside the chassis on the port side on the left
- *ED-48000B*— Inside the chassis next to the power supply bays
- *AP-7600B*— On the bottom of the chassis
- *DS-300B, DS-5100B, DS-5300B, ES-5832B*— On the switch ID pull-out tab located on the bottom of the port side of the switch.
- *ED-DCX-B, ED-DCX-4S-SB*— On the bottom right on the port side of the chassis

World Wide Name (WWN) is obtained by providing the license ID. Use the **licenseIdShow** command to display the license ID.

Your comments   Your suggestions will help us continue to improve the accuracy, organization, and overall quality of the user publications. Please send your opinion of this document to:

techpubcomments@EMC.com

If you have issues, comments, or questions about specific information or procedures, please include the title and, if available, the part number, the revision (for example, A01), the page numbers, and any other details that will help us locate the subject you are addressing.

General precautions When installing or servicing the ED-DCX-4S-B, follow these practices:

- Use correct tools.

- Use correct replacement parts.

- Keep all installation and service-related paperwork up to date, complete, and accurate.

ESD precautions The ED-DCX-4S-B contains electrostatic discharge (ESD) sensitive FRUs. When working with any ED-DCX-4S-B FRU, use correct ESD procedures.

- Wear a wrist grounding strap connected to chassis ground (if the ED-DCX-4S-B is plugged in) or a bench ground.

- Store ESD-sensitive components in antistatic packaging.

1

Hardware Overview

This chapter contains the following information:

ED-DCX-4S-B features

The ED-DCX-4S-B is a highly robust network switching platform that combines breakthrough performance, scalability, and energy efficiency with long-term investment. The ED-DCX-4S-B is designed to address the data growth and application demands of evolving enterprise data centers, achieve server, SAN, and data center consolidation, and reduce infrastructure and administrative costs.

Key features of the ED-DCX-4S-B include:

◆ Up to 192 port horizontal chassis with four usable port blades (in addition to two core switching and two core processing blades).

◆ Support for all of the application, port blade, and control processor (CP) blades supported in the ED-DCX-B (with the exception of the ED-DCX-B Core Switch Blade), thereby providing flexible system configurations and fewer types of new blades.

◆ Up to 384 ports can connect with the use of inter-chassis links (ICLs).

◆ Support for high-performance port blades running at 1-, 2-, 4-, 8-, or 10-Gbps, enabling flexible system configuration.

◆ Support for 1-, 2-, 4-, and 8-Gbps auto-sensing Fibre Channel ports. Trunking technology groups up to eight ports to create high performance 64-Gbps ISL trunks between switches (10 Gbps ports (PB-48K-10G-6) are 10 Gbps only).

◆ Dual-redundant control processor blades (CP8) and core switch blades (CR4S-8) that provide high availability and enable nondisruptive software upgrades.

◆ Redundant and hot-swappable CP8 and CR4S-8 blades, power supplies, blower assemblies, and WWN cards that enable a high availability platform for mission-critical SAN applications.

◆ Universal ports that self-configure as E_Ports, F_Ports, FL_Ports, EX_Ports and M_Ports (mirror ports). 10 Gbps ports (PB-48K-10G-6 blade) are E_Ports only.

◆ Data cryptographic (encryption/decryption) and data compression capabilities through the PB-DCX-16EB.

Hardware components

The ED-DCX-4S-B features a modular and scalable mechanical construction that allows a wide range of flexibility in installation, fabric design, and maintenance. The chassis may be mounted with the cables facing the front of the equipment rack or to the rear, and consists of the following:

◆ Up to four hot-swappable port blade assemblies that can be configured in a single chassis, delivering up to 192 Fibre Channel ports.

◆ Two slots for control processor blades (CP8):

• A single active CP8 blade can control all 192 ports in the chassis.

• The standby CP8 blade assumes control of the ED-DCX-4S-B if the active CP fails.

◆ Two slots for core switch blades (CR4S-8):

• CR4S-8 blade interconnects all port blades.

• Two inter-chassis link (ICL) connectors per blade connect to another chassis.

• Both CR4S-8 blades are active.

◆ Modular hot-swappable port blades:

• 16-port, 8-Gbps blades (PB-DCX-16P).

• 32-port, 8-Gbps blades (PB-DCX-32P).

• 48-port, 8-Gbps blades (PB-DCX-48P).

• 6-port, 10-Gbps blades (PB-48K-10G-6).

◆ Modular hot-swappable application blades:

• PB-48K-AP4-18: 18-port (16 FC + 2 10/100/1000 BaseT Ethernet copper interfaces), up to 4 blades per chassis, supporting Fibre Channel Application Services and blade management.

• PB-48K-18i: 18-port (16 FC + 2 GbE), up to 4 blades per chassis, supporting Fibre Channel Routing Services and FCIP.

◆ Modular hot-swappable encryption blades:

• PB-DCX-16EB: 16-port, up to 4 blades per chassis, supporting data cryptographic (encryption/decryption) and data-compression capabilities.

> **Note:** If the encryption blade (PB-DCX-16EB) is used, 220 VAC is required.

◆ Modular hot-swappable field replaceable units (FRUs):

   • Two blower assemblies.
   • Two 100 to 240 VAC power supplies.
   • Two WWN cards.
   • Small Form-factor Pluggable (SFP and SFP+) optical transceivers (1-, 2-, 4-, and 8-Gbps).
   • Extended Form-factor Pluggable (XFP) optical transceivers (10-Gbps).

Note: The 8-Gbps SFPs autonegotiate at 2, 4, and 8 Gbps. The 4-Gbps SFPs autonegotiate at 1, 2, and 4 Gbps.

◆ Blades that are serviced from the port side of the ED-DCX-4S-B. Blowers, power supplies, and power cables that are serviced from the nonport side.

◆ World Wide Name (WWN) cards on the nonport side, with WWN status LEDs located under the bezel.

◆ Improved cable management using two vertical cable management fingers and a redesigned chassis door.

◆ Constant intake and FRU temperature monitoring.

◆ Redundant AC primary power connections to ensure high availability. Each power supply has its own connector.

Port side of the ED-DCX-4S-B

Note: Airflow in the ED-DCX-4S-B is from the nonport side to the left side of the chassis (viewed from the port side) and out the exhaust vent. If you use the Port Side Exhaust Kit the air vents on the port side of the chassis (see Figure 2 on page 20). The port side exhaust kit is required when mounting the ED-DCX-4S-B in any closed side cabinet.

Figure 1 on page 19 displays a sample configuration of the port side of the ED-DCX-4S-B.

1 PB-DCX-48P port blade (example, 4x)   3 Control processor blade (CP8) (2x)

2 Core switch blade (CR4S-8) (2x)   4 Exhaust vent
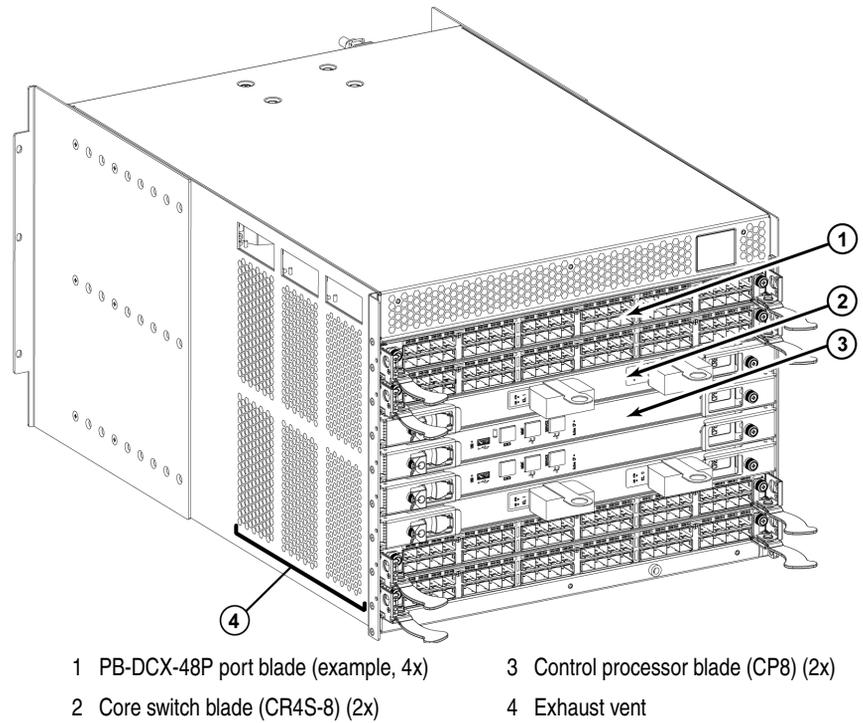
Figure 1   Port side of the ED-DCX-4S-B (sample configuration)
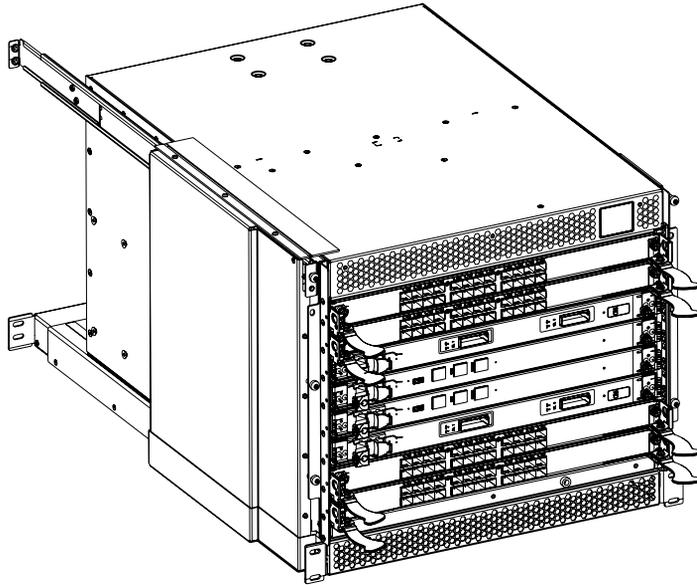
Figure 2   Port side of the ED-DCX-4S-B with the port side exhaust kit installed (sample configuration)

Nonport side of the ED-DCX-4S-B

Figure 3 on page 21 displays a sample configuration of the nonport side view of the ED-DCX-4S-B.
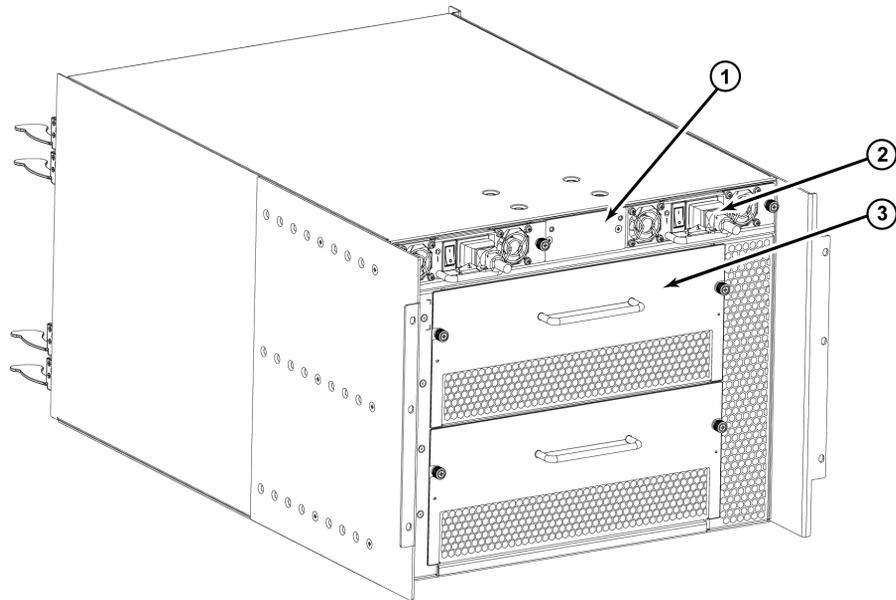
| 1 | WWN card bezel (logo plate) | 2 | Power supply (2x) |
| 3 | Blower assembly (2x) | | |

Figure 3   nonport side of the ED-DCX-4S-B (sample configuration)

ED-DCX-4S-B blades

Table 1 summarizes the port, application, control processor, and core switch blades that are available for the ED-DCX-4S-B.

Table 1   Blades available for the ED-DCX-4S-B (page 1 of 2)

Description	Name	Function
ED-DCX-4S-B control processor blade	CP8	The CP8 blade contains the control plane for the chassis. There are two CP8 blades for redundancy. This control processor blade is compatible with the ED-DCX-B and the ED-DCX-4S-B.
ED-DCX-4S-B core switch blade	CR4S-8	The CR4S-8 blade contains the ASICs for switching between port blades. Core switch blades have additional front port connectivity to connect multiple chassis and backplane connections for the storage server blade. This core switch blade is compatible only with the ED-DCX-4S-B.
16-port 8-Gbps port blade	PB-DCX-16P (FC8-16)	A 16-port EMC port blade supporting 1, 2, 4, and 8 Gbps port speeds. This port blade is compatible with the ED-48000B Director, the ED-DCX-B and the ED-DCX-4S-B.
32-port 8-Gbps port blade	PB-DCX-32P (FC8-32)	A 32-port EMC port blade supporting 1, 2, 4, and 8 Gbps port speeds. This port blade is compatible with the ED-48000B Director, the ED-DCX-B and the ED-DCX-4S-B.
48-port 8-Gbps port blade	PB-DCX-48P (FC8-48)	A 48-port EMC port blade supporting 1, 2, 4, and 8 Gbps port speeds. This port blade is compatible with the ED-DCX-B and the ED-DCX-4S-B.
6-port 10-Gbps port blade	PB-48K-10G-6 (FC10-6)	A 6-port EMC port blade supporting 10 Gbps port speed. Blade provides 10-Gbps ISLs. This port blade is compatible with the ED-48000B Director, the ED-DCX-B and the ED-DCX-4S-B.

Table 1   Blades available for the ED-DCX-4S-B (page 2 of 2)

Description	Name	Function
Fibre Channel application blade	PB-48K-AP4-18 (FA4-18)	The FR4-18 blade has 16 (1-, 2-, and 4-Gbps) physical ports supporting Fibre Channel Application Services and 2 10/100/1000 BaseT Ethernet copper interfaces supporting blade management. This application blade is compatible with the ED-48000B Director, the ED-DCX-B and the ED-DCX-4S-B.
Fibre Channel router blade	PB-48K-18i (FA4-18i)	The PB-48K-18i blade has 16 physical Fibre Channel SFP ports supporting Fibre Channel Routing Services and 2 physical Gigabit Ethernet (GbE) SFP ports supporting Fibre Channel Over IP (FCIP). The two physical GbE ports can support up to 16 virtual E_Ports. This application blade is compatible with the ED-48000B Director, the ED-DCX-B and the ED-DCX-4S-B.
Storage encryption blade	PB-DCX-16EB (FS8-18)	The PB-DCX-16EB blade enables data cryptographic (encryption/decryption) and data-compression capabilities. It has 16 Fibre Channel optical SFP ports. This blade requires the use of a 220 VAC power supply in the ED-DCX-4S-B. This application blade is compatible only with the ED-DCX-B and the ED-DCX-4S-B.

Note: The blade identifiers in parenthesis in Table 1 reflect the Brocade blade model names. These are the names that will appear in the various CLI output and logs.

High availability

The following features contribute to the ED-DCX-4S-B high-availability design:

- Redundant, hot-swappable blades and FRUs.
- Enhanced data integrity on all data paths.
- Fabric Shortest Path First (FSPF) rerouting around failed links.
- Integration with Simple Network Management Protocol (SNMP) managers.
- Automatic control processor failover.
- Nondisruptive "hot" software code loads and activation.
- Easy configuration, save, and restore.
- Hot-swappable World Wide Name (WWN) cards.

The high-availability software architecture of the ED-DCX-4S-B provides a common framework for all applications that reside on the system, allowing global and local states to be maintained through any component failure. High-availability elements consist of the High Availability Manager, the heartbeat, the fault/health framework, the replicated database, initialization, and software upgrade.

The High Availability Manager controls access to the standby control processor, facilitates software upgrades, prevents extraneous switchover activity, closes and flushes streams, provides flow control and message buffering, and supports a centralized active and standby state.

Reliability

The ED-DCX-4S-B uses the following error detection and correction mechanisms to ensure reliability of data:

- ◆ Error Detection and Correction mechanism, which checks for encoder errors and fault isolation (EDFI), such as cyclic redundancy checking (CRC), parity checking, checksum, and illegal address checking.

- ◆ Power-on self-test (POST).

- ◆ Dual control processors that enable hot, nondisruptive fast firmware upgrades.

- ◆ One serial port and two Ethernet ports (on each control processor) for management and for service. Offline control processor diagnostics and remote diagnostics simplify troubleshooting. The standby control processor monitors diagnostics to ensure it is operational, should a failover be necessary.

- ◆ Bus monitoring and control of blades and other field-replaceable units (FRUs).

Serviceability

The ED-DCX-4S-B provides the following features to enhance and ensure serviceability:

◆ Modular design with hot-swappable components.

◆ Flash memory that stores two firmware images per control processor.

◆ USB port on control processor blades for all tasks that formerly required an FTP/SCP server, including software and firmware upgrades.

◆ Redesigned cable management using vertical fingers to accommodate the horizontal orientation of the blades.

◆ Nonvolatile random-access memory (NVRAM), containing the EMC OEM serial number, Brocade serial number, revision information, and part number information.

◆ Background health-check daemon.

◆ Memory scrubber, self test, and bus ping to determine if a bus is not functioning.

◆ RASlog messages.

◆ SMI-S compliant.

◆ Watchdog timers.

◆ Status LEDs.

◆ Predictive diagnostics analysis through Fabric Watch.

◆ SNMP (including version 3) integration with higher-layer managers.

Software features

The Fabric OS allows any Fibre Channel-compliant device to attach to the switches as long as it conforms to the device login, name service, and related Fibre Channel standards. Each operating environment requires that a Fibre Channel host bus adapter (HBA) be available with a standards-compliant driver for correct interface to the fabric.

Fabric OS consists of a set of embedded applications running on top of an embedded Linux operating system kernel. These applications include:

◆ Name server.

◆ Alias server.

◆ Zone server

◆ Simple Network Management Protocol (SNMP) agent.

◆ SMI-S compliant API.

◆ Syslog auditing.

◆ RCS (Reliable Commit Service).

◆ NTP.

◆ Tasks to manage address assignment, routing, link initialization, fabric initialization, link shutdown, ED-DCX-4S-B shutdown, and the user interface.

Security

Table 2 highlights some of the key security features available for the ED-DCX-4S-B.

Table 2   EMC security features

EMC Security Features	
DH-CHAP	Login banner
SSHv2 (using AES, 3DES, RSA)	Monitoring of attempted security breaches (through audit logging)
HTTPS (using AES)	Monitoring of attempted security breaches (through Fabric Watch Security Class)
SNMPv3	Fibre Channel security policies: DCC and SCC
FC-SP	Trusted Switch (FCS) for central security management
Secure RPC	Management access controls (SNMPv3, Telnet, FTP, serial port, front panel)
Secure file copy (SCP)	Hardware-enforced zoning by WWN, domain/port ID, or both
Telnet disable	Default zoning
Telnet timeout	RSCN suppression and aggregation
IP filters (block listeners)	Configurable RSCN suppression by port
Secure passwords (centralized control through RADIUS/CHAP)	NTPv3 (to synchronize timestamps)
Multiple user accounts (MUAs). Up to 255.	Event auditing
Role-based access controls (RBACs)	Change tracking
Administrative domains/Virtual fabrics	Firmware change alerts in Fabric Manager
Boot PROM password reset	Persistent port disable
Password hardening policies	Persistent domain ID
Upfront login in Web Tools	E_Port disable

Network manageability

The ED-DCX-4S-B has a single domain and is managed as a single element with Connectrix Manager Data Center Edition (CMDCE). The ED-DCX-4S-B responds to its own IP address and appears as a separate entity to the Telnet protocol and SNMP.

All management interfaces, such as Telnet, Web Tools, standards-compliant SMI-S, and Management Server, support a "port N within blade M" naming scheme.

The ED-DCX-4S-B supports SNMPv1 and SNMPv3. When SNMP devices send SNMP messages to a management console running SAN management software, the information is stored in a management information base (MIB). Fabric OS v6.2 supports the latest Fibre Alliance Fibre Channel Management (FCMGMT) and Storage Management Initiative (SMI) MIBs, which allow common information necessary for management software to provide information to a SAN administrator. Refer to the *EMC Connectrix B Series Fabric OS MIB Reference* for additional MIB information.

EMC Connectrix B Series v6.2 ED-DCX-4S-B Hardware Reference Manual

2

Installation

This chapter contains the following information:

Time and items required

⚠️ **IMPORTANT**

EMC recommends that the installation of the ED-DCX-4S-B be performed by trained EMC service personnel. The content in this chapter is being provided for informational purposes only and is not intended to be a "how to" manual for customer set up of the ED-DCX-4S-B.

You can set up and install the ED-DCX-4S-B in the following ways:

◆ As a standalone unit on a flat surface.

◆ In a chassis with the ED-DCX-4S-B Port Side Exhaust Kit (provided) in a EMC-qualified rack.

◆ In a 19-in. Electronic Industries Association (EIA) cabinet, using the Rack Mount Kit (either a 27-31 in. or 18-34 in. kit depending on rack used).

◆ In a mid-mount telecommunications (Telco) rack, using the optional Mid-Mount Rack Kit.

Note: The Port Side Exhaust kit is required for installation in any closed side cabinet. See Appendix E, "Port Side Exhaust Kit Installation Procedure" for installation instructions.

This chapter describes how to set up the ED-DCX-4S-B as a standalone unit. For rack-mount installation instructions, refer to the appropriate manual that comes with your kit.

Table 3 on page 33 describes the main installation and setup tasks and the estimated time required for each, based on a fully populated ED-DCX-4S-B (192 Fibre Channel ports). Configurations with fewer ports require less time. These time estimates assume a prepared installation site and appropriate power and network connectivity.

Table 3   Installation tasks, time, and items required

Installation task	Time estimate	Items required
Site preparation and unpacking ED-DCX-4S-B.	30 minutes	1/2-in. socket wrench (to remove pallet bolts). #2 Phillips screwdriver. (for cable management comb). Pallet jack. Hydraulic lift or assisted lift, able to rise to a minimum of 55 in. (140 cm), with a minimum capacity of 113 kg (250 lb). The ED-DCX-4S-B weighs 68 kg (150 lb) with four PB-DCX-48P port cards installed (192 ports).
Installing the rack mount kit or port side exhaust kit.	30 minutes	Port Side Exhaust Kit Installation Procedure, included in the accessory kit and as Appendix E.
Mounting and securing ED-DCX-4S-B in rack.	15 minutes	For rack mount instructions, refer to the rack mount installation procedures that come with your kit.
Installing power cables and powering on the ED-DCX-4S-B.	10 minutes	Power cables.
Establishing serial connection, logging on to ED-DCX-4S-B, and configuring IP addresses.	20 minutes	Serial cable (provided in the accessory kit). Workstation computer with a serial port or terminal server port and a terminal emulator application (such as HyperTerminal). Ethernet IP addresses for the switch.
Installing an Ethernet cable, opening a Telnet session, and configuring the ED-DCX-4S-B domain ID, date and time, and additional system parameters. Verify and back up configuration.	20 minutes	Ethernet cable for Telnet access. Refer to the *EMC Connectrix B Series Fabric OS Administrator's Guide*.
Installing SFPs. Attaching and managing fiber optic cables.	15 minutes	SFP optical transceivers. Fiber optic cables and cable ties.

Preparing for ED-DCX-4S-B installation

The following steps are required to ensure correct installation and operation.

1. Provide a space that is 9 rack units (9U) high, 61.19 cm (24.09 in.) deep, and 43.74 cm (17.22 in.) wide. 1U is equal to 4.45 cm (1.75 in.). If you do not use the provided port side exhaust kit, the space needs to be only 8 rack units (8U) high.

   The ED-DCX-4S-B can be installed facing either direction in a cabinet, if serviceability and cooling requirements are met.

2. Ensure that dedicated electrical branch circuits with the following characteristics are available:

   - 200 – 240 VAC, 50–60 Hz (two branch circuits)
   - Two cables for the 200 - 240 VAC service
   - Power supply standards ("Power specifications") are met
   - Protected by a circuit breaker in accordance with local electrical codes
   - Supply circuit, line fusing, and wire size adequate to the electrical rating on the chassis nameplate
   - Location close to the chassis and easily accessible
   - Grounded outlets installed by a licensed electrician and compatible with the power cords

   Note: To maximize fault tolerance, connect each power cord to a separate power source.

3. Plan for cable management before installing the chassis ("Managing cables").

   Cables can be managed in a variety of ways, such as by routing cables below the chassis, along either the port or the nonport side of the chassis, through cable channels on the sides of the cabinet, or by using patch panels.

4. Ensure that the following is available for configuration of the ED-DCX-4S-B:

   – Workstation with an installed terminal emulator, such as HyperTerminal
   – Serial cable (provided)

      – Three Ethernet cables (including one spare)

      – Access to an FTP server for backing up the switch configuration or collecting **supportsave** output data (optional)

      – A Brocade-branded USB stick for collecting **supportsave** output data (optional)

      – SFPs and compatible cables

5. Ensure that the air intake vents have a minimum of 2 inches of airspace.

6. Ensure that the air temperature on the air intake side is less than 40 degrees Celsius (104 degrees Fahrenheit) during operation.

Unpacking and installing the ED-DCX-4S-B

⚠ **CAUTION**

Use safe lifting practices when moving the product.

Note: A fully populated ED-DCX-4S-B (four PB-DCX-48P port cards, 192 ports) weighs approximately 68 kg (150 lbs) and requires a hydraulic or assisted lift to install it.

1. Unpack and install the ED-DCX-4S-B.

    a. Cut the bands that encircle the packaging.

    b. Remove the lid and the kits and foam from the top of the chassis.

    c. Lift the cardboard box off the chassis and remove the plastic bag from around the chassis.
       Save the packing materials for use when returning the old chassis.

    d. Leave the chassis on top of the plastic shipping tray if the chassis must be transported to the installation location.

Note: The ED-DCX-4S-B packaging does not incorporate a wood pallet and pallet brackets. The chassis sits on top of a plastic shipping tray.

2. Use a pallet jack or other assisted lift to transport the new chassis to the installation area. Doorways must be wider than 36 in. (91 cm) to accommodate the chassis.

3. Remove the ED-DCX-4S-B port side exhaust kit, accessory kit, packing foam, and antistatic plastic from the chassis and set aside.

4. Remove the chassis door from the ED-DCX-4S-B.

5. Remove the vertical cable management fingers.

6. Use a lift to raise the chassis to the correct level. If installing the chassis in a cabinet, follow the instructions provided by the port side exhaust kit installation procedure and the appropriate rack kit installation procedure.

7. If applicable, lock the wheels of the lift.

8. Gently slide the chassis onto the final installation surface, ensuring that it remains supported during the transfer.

9. Ensure the chassis can be oriented so that the nonport side has access to intake air (cool).

10. Reinstall the vertical cable management fingers.

11. If ICL cables will not be used, ensure that the ICL sockets in the core switch blades have EMI plugs inserted.

12. Reinstall the chassis door.

Items included with the ED-DCX-4S-B

The ED-DCX-4S-B ships with the following:

◆ ED-DCX-4S-B chassis, populated with:

• Control processor blades (CP8)

• Core switch blades (CR4S-8)

• Port blades, application blades, and encryption blades (included based on customer specification)

• Blade slot filler panels (for slots not filled by blades)

• WWN cards

• WWN bezel (logo plate)

• Power supplies

• Power supply filler panel (included if there is only one power supply)

• Blower assemblies

• Chassis door

◆ Accessory kit containing the following items:

• Cable management comb

• ESD grounding strap

• Port side exhaust kit

• RS-232 serial cable. The RS-232 cable has an adapter at one end that can be removed to provide an RJ-45-style connector.

◆ ED-DCX-4S-B Rack mount kit with instructions

Order the optical transceivers (SFP and XFP) from EMC. The ED-DCX-4S-B supports SWL, LWL, and ELWL transceivers.

Powering on the ED-DCX-4S-B

DANGER

Use the supplied power cords. Ensure the facility power receptacle is the correct type, supplies the required voltage, and is properly grounded.

1. Connect the two AC power cords to each of the two power supplies.

2. Connect the power cords to a power source with a voltage of 200 to 240 VAC, 47 to 63 Hz.

3. Turn the AC power switches on the power supplies to ON. The AC power switches light green when switched on and power is supplied.

4. The ED-DCX-4S-B performs a power-on self-test (POST) each time it is powered on. POST takes approximately ten minutes and is complete when the indicator light activity displays the operational state. For information about LED patterns, see Chapter 4, "Monitor System Components."

Note: Do not connect the switch to the network until the IP addresses are configured.

Installing SFPs and attaching cables

Follow these steps to install SFPs (or XFPs with a PB-48K-10G-6 port card installed) and cables to the ED-DCX-4S-B.

The ports are color-coded to indicate which can be used in the same port group for trunking (trunking port groups can be up to eight ports). The ports and cables used in trunking groups must meet specific requirements. Refer to the *EMC Connectrix B Series Fabric OS Administrator's Guide* for more information.

1. Position one of the optical transceivers so that the key is oriented correctly to the port. Insert the transceiver into the port until it is firmly seated and the latching mechanism clicks.

   Transceivers are keyed so that they can only be inserted with the correct orientation. If a transceiver does not slide in easily, ensure that it is correctly oriented.

2. Position a cable so that the key (the ridge on one side of the cable connector) is aligned with the slot in the transceiver. Insert the cable into the transceiver until the latching mechanism clicks.

   Cables are keyed so that they can be inserted in only one way. If a cable does not slide in easily, ensure that it is correctly oriented.

3. Repeat step 1 and step 2 for the remaining ports.

Managing cables

Note: The minimum bend radius for a 50 micron cable is 2 in. under full tensile load and 1.2 in. with no tensile load.

Cables can be organized and managed in a variety of ways: for example, using cable channels on the port or nonport sides of the cabinet or patch panels to minimize cable management. With the horizontal orientation of the blades in the DCX-4S, a pair of vertical cable management finger assemblies have been provided to keep the cables from hanging down in front of other blades.

Following is a list of recommendations:

- Leave at least 1 m (3.28 ft) of slack for each port cable. This provides room to remove and replace the ED-DCX-4S-B, allows for inadvertent movement of the rack, and helps prevent the cables from being bent to less than the minimum bend radius.

- If ISL Trunking is in use, group the cables by trunking group. The ports are color-coded to indicate which ports can be used in the same ISL Trunking group: eight ports marked with solid black ovals alternate with eight ports marked with oval outlines.

- For easier maintenance, label the fiber optic cables and record the devices to which they are connected.

- Route the cables to both the left and right sides of the DCX-4S through the cable management fingers.

- Keep LEDs visible by routing port cables and other cables away from the LEDs.

For the procedure to install the ICL cables see "RRP: Inter-chassis link (ICL) cables" on page 122.

3

Log In and Configuration

This chapter contains the following information:

ED-DCX-4S-B Configuration Overview

Note: If the PB-DCX-16EB encryption blade is installed, refer to the *Fabric OS Encryption Administrator's Guide* for the procedures to configure the encryption functions.

The ED-DCX-4S-B must be configured before it is connected to the fabric, and all of the configuration commands must be entered through the active CP blade. The ED-DCX-4S-B configuration includes the following parameters:

◆ IP address and subnet mask for the chassis

◆ IP addresses, host names, subnet masks, and gateway addresses for both CP blades

◆ Switch name

◆ Domain ID (optional)

◆ WWN (optional)

The ED-DCX-4S-B WWN is initially set by the factory to match the license ID (which is based on the chassis serial number).

The configuration information is mirrored to the standby CP blade, which allows the current configuration to remain available even if the active CP blade fails. The configuration information for the ED-DCX-4S-B is stored in the WWN cards and the flash memory of the CP blades. The configuration can be backed up to a workstation (uploaded) and then downloaded to the active CP blade if necessary.

Figure 4 on page 45 illustrates the flow of the basic configuration tasks.

Configuration Tasks
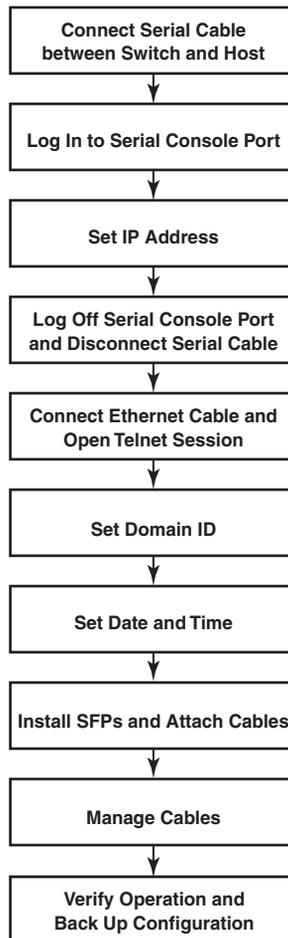
Figure 4   Configuration tasks

Connecting a serial cable between ED-DCX-4S-B and host

Follow these steps to connect a serial cable.

1. Verify that the ED-DCX-4S-B is powered on and that POST is complete by ensuring that all power LED indicators on the port, control processor, and core switch blades display a steady green light.

2. Remove the shipping cap from the CONSOLE port on the active CP. Use the serial cable provided with the ED-DCX-4S-B to connect the CONSOLE port on the active CP to a computer workstation. The active CP blade is indicated by an illuminated (blue) LED.

   Note: The CONSOLE port is intended primarily for the initial setting of the IP address and for service purposes.

3. Access the ED-DCX-4S-B using a terminal emulator application (such as HyperTerminal in a Windows environment or tip in a Linux environment).

4. Disable any serial communication programs running on the workstation (such as synchronization programs).

5. Open a terminal emulator application (such as HyperTerminal on a PC, or term, tip, or kermit in a UNIX environment), and configure the application as follows:

   • In a Windows environment:

Parameter	Value
Bits per second	9600
Databits	8
Parity	None
Stop bits	1
Flow control	None

   • In a UNIX environment, enter the following string at the prompt:

   ```
   tip /dev/ttyb -9600
   ```

If ttyb is already in use, use `ttya` instead and enter the following string at the prompt:

```
tip /dev/ttya -9600
```

Logging in to the serial console port

To log in to the ED-DCX-4S-B through the serial connection, follow these steps.

1. When the terminal emulator application stops reporting information, press **Enter**. You receive the following login prompt:

   ```
   CP0 Console Login:
   ```

2. Log in to the ED-DCX-4S-B as **admin**, using the default password: **password**. You are prompted to change the default passwords at initial login.

   ```
   swDir login: admin
   Password:
   Please change your passwords now.
   Use Control-C to exit or press 'Enter' key to proceed.

   Password was not changed. Will prompt again at next
   login
   until password is changed.
   swDir:admin>
   ```

   Note: Passwords can be 8 to 40 characters long. They must begin with an alphabetic character. They can include numeric characters, the dot (.), and the underscore (_). Passwords are case-sensitive, and they are not displayed when you enter them on the command line.

Setting the IP addresses

The ED-DCX-4S-B requires three IP addresses, which are configured using the **ipAddrSet** command. IP addresses are required for both CP blades (CP0 and CP1) and for the single logical switch (shown as SWITCH under the **ipAddrShow** command) in the ED-DCX-4S-B.

Note: The default IP addresses and host names for the ED-DCX-4S-B are:
– 10.77.77.75 / CP0 (the CP blade in slot 4 at the time of configuration)
– 10.77.77.74 / CP1 (the CP blade in slot 5 at the time of configuration)

Note: Resetting an IP address while the ED-DCX-4S-B has active IP traffic or has management and monitoring tools running, such as Fabric Manager, Fabric Watch, and SNMP, can cause traffic to be interrupted or stopped.

1. Log in to the active CP as **admin** using the serial cable connection.

2. Set up the ED-DCX-4S-B IP address by entering the **ipaddrset -sw 0** command:

   ```
   swDir:admin> ipaddrset –chassis
   ```

   Enter the information at the prompts. Specify the **-sw 0** IP address. There is no **-sw 1** IP address.

   Note: The addresses 10.0.0.0 through 10.0.0.255 are reserved and used internally by the ED-DCX-4S-B. External IPs must not use these addresses.

3. Set up the CP0 IP address by entering the **ipaddrset -cp 0** command:

   ```
   swDir:admin> ipAddrSet -cp 0
   ```

   Enter the information at the prompts.

4. Set up the CP1 IP address by entering the **ipaddrset -cp 1** command:

   ```
   swDir:admin> ipAddrSet -cp 1
   ```

   Enter the information at the prompts.

   This is a sample IP configuration:

   ```
   swDir:admin> ipaddrset –chassis
   Ethernet IP Address [0.0.0.0]: 123.123.123.120
   ```

```
                    Ethernet Subnetmask [0.0.0.0]: 123.123.123.123
                    Committing configuration...Done.

                    swDir:admin> ipaddrset -cp 0
                    Host Name [cp0]:
                    Ethernet IP Address [10.77.77.75]: 123.123.123.121
                    Ethernet Subnetmask [0.0.0.0]: 123.123.123.123
                    Gateway IP Address [0.0.0.0]: 123.123.123.124
                    IP address is being changed...Done.
                    Committing configuration...Done.

                    swDir:admin> ipaddrset -cp 1
                    Host Name [cp1]:
                    Ethernet IP Address [10.77.77.74]: 123.123.123.122
                    Ethernet Subnetmask [0.0.0.0]: 123.123.123.123
                    Gateway IP Address [0.0.0.0]: 123.123.123.124
                    IP address of remote CP is being changed...Done.
                    Committing configuration...Done.

                    swDir:admin> reboot
```

5. Type **reboot** to reboot the ED-DCX-4S-B.

Logging off the serial console port and disconnecting the serial cable

You can use the serial port to monitor error messages through the serial connection. If the serial port is no longer required, use the **logout** command to log out of the serial console, remove the serial cable, and replace the plug in the serial port.

Connecting an Ethernet cable and opening a Telnet session

Note: Connecting the CP blades to a private network/VLAN is recommended.

After using a serial connection to configure the IP addresses for the ED-DCX-4S-B, you can connect the active CP blade to the local area network (LAN).

By establishing an Ethernet connection, you can complete the ED-DCX-4S-B configuration using either a serial session, Telnet, or a management application such as Web Tools or Connectrix Manager Data Center Edition (CMDCE). To create an Ethernet connection to the ED-DCX-4S-B, follow these steps.

1. Remove the shipping plug from the Ethernet port on the active CP blade.

2. Insert one end of an Ethernet cable into the Ethernet port.

3. Connect the other end to an Ethernet 10/100/1000 BaseT LAN.

   The ED-DCX-4S-B can be accessed through a remote connection using any of the management tools, such as Telnet, Web Tools, or CMDCE.

4. To complete any additional ED-DCX-4S-B configuration procedures through a Telnet session, log in to the ED-DCX-4S-B by Telnet, using the **admin** login. The default password is **password**.

Customizing a switch name

The switch name of the ED-DCX-4S-B can be up to 15 characters long; it can include alpha, numeric, and underscore characters; and must begin with an alpha character.

Note: Changing the name causes a domain address format RSCN to be issued.

1. Type **switchName** followed by the new name in quotes.

    ```
    swDir:admin> switchName "swModularSwitch5"
    Committing configuration...
    Done.
    swModularSwitch5:admin>
    ```

2. Record the new name for reference.

Setting the domain ID

Each switch in the fabric must have a unique domain ID. The domain ID can be manually set through the **configure** command or can be automatically set. The default domain ID for the ED-DCX-4S-B is "1". Use the **fabricShow** command to view the already assigned domain IDs.

1. Enter **switchDisable** to disable the ED-DCX-4S-B.

2. Enter **configure**.

3. Enter **y** at the "Fabric parameters" prompt:

   ```
   Fabric parameters (yes, y, no, n): [no] y
   ```

4. Enter a unique domain ID:

   ```
   Domain: (1.239) [1] 3
   ```

5. Complete the remaining prompts or press **Ctrl+D** to accept the settings and exit.

6. Enter **switchEnable** to re-enable the ED-DCX-4S-B.

Setting the date and time

The date and time settings are used for logging events. Switch operation does not depend on the date and time; a switch with an incorrect date and time value still functions properly. However, because the date and time are used for logging, error detection, and troubleshooting, they should be set correctly.

Setting the date

To set the date, follow these steps.

1. If necessary, log on to the ED-DCX-4S-B by Telnet, using the **admin** account.

2. Enter the **date** command, using the following syntax:

   date "mmddHHMMyy"

   Where:

   - mm is the month; valid values are 01 through 12.
   - dd is the date; valid values are 01 through 31.
   - HH is the hour; valid values are 00 through 23.
   - MM is minutes; valid values are 00 through 59.
   - yy is the year; valid values are 00 through 99 (values greater than 69 are interpreted as 1970 through 1999, and values less than 70 are interpreted as 2000-2069).

   ```
   switch:admin> date
   Fri Sep 26 17:01:48 UTC 2008
   switch:admin> date "0926123008"
   Fri Sep 26 12:30:00 UTC 2008
   switch:admin>
   ```

Setting the time zone

To set the time zone, follow these steps.

1. If necessary, log on to the switch by Telnet, using the **admin** account.

2. Enter the **tsTimeZone** command as follows:

   ```
   switch:admin> tstimezone [--interactive]/ [,
   timezone_fmt]
   ```

   Use **timezone_fmt** to set the time zone by Country/City or by time zone ID, such as MST.

The following example shows how to change the time zone to US/Mountain.

```
switch:admin> tstimezone
Time Zone : US/Pacific
switch:admin> tstimezone US/Mountain
switch:admin> tstimezone
Time Zone : US/Mountain
```

The following procedure describes how to set the current time zone using interactive mode.

1. Type the **tsTimeZone** command as follows:

   ```
   switch:admin> tstimezone --interactive
   ```

   You are prompted to select a general location.

   ```
   Please identify a location so that time zone rules can
   be set correctly.
   ```
2. Enter the appropriate **number** or **Ctrl-D** to quit.

3. At the prompt, select a **country location**.

4. At the prompt, enter the appropriate **number** to specify the time zone region or **Ctrl-D** to quit.

Synchronizing local time

To synchronize the local time of the principal or primary switch with that of an external NTP server, follow these steps.

1. If necessary, log on to the switch by Telnet, using the **admin** account.

2. Enter the **tsClockServer** command:

   switch:admin> tsclockserver "*<ntp1;ntp2>*"

   where *ntp1* is the IP address or DNS name of the first NTP server, which the switch must be able to access. The variable *ntp2* is the second NTP server and is optional. The operand "<ntp1;ntp2>" is optional; by default, this value is LOCL, which uses the local clock of the principal or primary switch as the clock server.

   The **tsClockServer** command accepts multiple server addresses in either IPv4, IPv6, or DNS name formats. When multiple NTP server addresses are passed, **tsclockserver** sets the first obtainable address as the active NTP server. The rest will be stored as backup servers that can take over if the active NTP server fails. The principal or primary FCS switch synchronizes its time with the NTP server every 64 seconds.

```
switch:admin> tsclockserver
LOCL
switch:admin> tsclockserver "132.163.135.131"

switch:admin> tsclockserver
132.163.135.131
switch:admin>
```

The following example shows how to set up more than one NTP server using a DNS name:

```
switch:admin> tsclockserver
"10.32.170.1;10.32.170.2;ntp.localdomain.net"
Updating Clock Server configuration...done.
Updated with the NTP servers

Changes to the clock server value on the principal or
primary FCS switch are propagated to all switches in
the fabric
```

Software licenses

Certain licenses are factory installed on the ED-DCX-4S-B. To determine which licenses are enabled, use the **licenseShow** command.

```
swDir:admin> licenseshow
AAbbccDDeeFFeeGG:
    Web license
    Zoning license
    Extended Fabric license
    Fabric Watch license
    Performance Monitor license
    Trunking license
    Security license
```

In this example, the license key is AAbbccDDeeFFeeGG. Keep a copy of the license key for reference.

The 64-bit chassis ID is required to obtain and activate licenses for the ED-DCX-4S-B. The chassis ID is available through the **licenseIdShow** command. The **licenseShow** and **licenseIdShow** commands must be entered on the active CP blade. Refer to the *EMC Connectrix B Series Fabric OS Administrator's Guide* for more information.

Verifying correct operation and backing up the configuration

To verify correct operation and back up the ED-DCX-4S-B configuration, follow these steps.

1. Check the LEDs to verify that all components are functional. For information about LED patterns, see Table 4 on page 71.

2. If necessary, log on to the switch by Telnet, using the **admin** account.

3. Run the **portCfgPersistentEnable** command to activate the FC ports for FC operation.

4. Verify the correct operation of the ED-DCX-4S-B by entering the **switchShow** command from the workstation. This command provides information about switch and port status.

5. Verify the correct operation of the ED-DCX-4S-B in the fabric by entering the **fabricShow** command from the workstation. This command provides general information about the fabric.

6. To back up the configuration, enter the **configUpload** command. This command uploads the ED-DCX-4S-B configuration to the server so that it is available for downloading to a replacement ED-DCX-4S-B.

7. Run the following commands and save the output to a file on a secure host.

   • **configShow**
   • **ipaddrShow**
   • **licenseShow**
   • **switchShow**

   Alternatively, you can save the configuration file to a Brocade-branded USB.

Note: Passwords are not saved in the configuration file, and are not uploaded during a **configUpload**.

Note: It is recommended that the configuration be backed up on a regular basis to ensure that a complete configuration is available for downloading to a replacement ED-DCX-4S-B.

Powering off the ED-DCX-4S-B

1. Shut down the ED-DCX-4S-B using the **sysShutdown** command.

```
switch::admin> sysshutdown
This command will shutdown the operating systems on
your switch.
You are required to power-cycle the switch in order to
restore operation.
Are you sure you want to shutdown the switch [y/n]?y
HA is disabled
Stopping blade 1
Shutting down the blade....
Stopping blade 2
Shutting down the blade....
Stopping blade 8
Shutting down the blade....

Broadcast message from root (pts/1) Tue Aug 23 14:23:06
2008...

The system is going down for system halt NOW !!
```

2. Power off the chassis by flipping the AC power switches on the power supplies to "0" (LEDs inside AC power switches should turn off). To maintain the ground connections, leave power cords connected to the power supplies and to the electrical outlets.

4

Monitor System Components

This chapter contains the following information:

Monitoring overview

The ED-DCX-4S-B is engineered for reliability and requires no routine operational steps or maintenance. This chapter provides information about determining the status of each component using LEDs and CLI commands. Refer to the *EMC Connectrix B Series Fabric OS Administrator's Guide* for additional information.

Determining the status of a port, application, or encryption blade

1. Check the LEDs on the blade.

   - Figure 5 on page 64 illustrates the PB-DCX-16P port blade.
   - Figure 6 on page 65 illustrates the PB-DCX-32P port blade.
   - Figure 7 on page 66 illustrates the PB-DCX-48P port blade.
   - Figure 8 on page 67 illustrates the PB-48K-10G-6 port blade.
   - Figure 9 on page 68 illustrates the PB-48K-18i application blade.
   - Figure 10 on page 69 illustrates the PB-48K-AP4-18 application blade.
   - Figure 11 on page 70 illustrates the PB-DCX-16EB encryption blade.

   The LED patterns may temporarily change during POST and other diagnostic tests. For information about how to interpret the LED patterns, see Table 4 on page 71.

2. Check the blade status by entering **slotShow**.

1	Power LED	3	Fibre Channel port
2	Status LED	4	Port Status LED
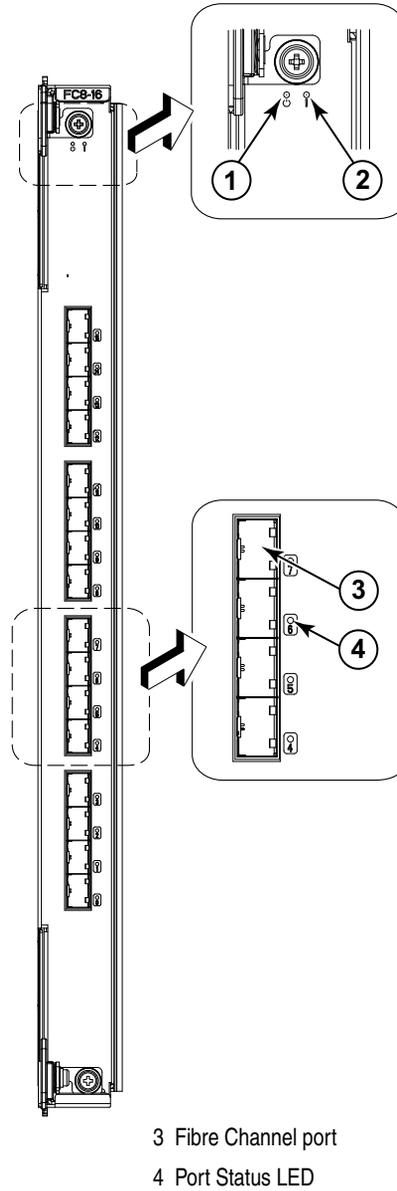
Figure 5   PB-DCX-16P Port blade
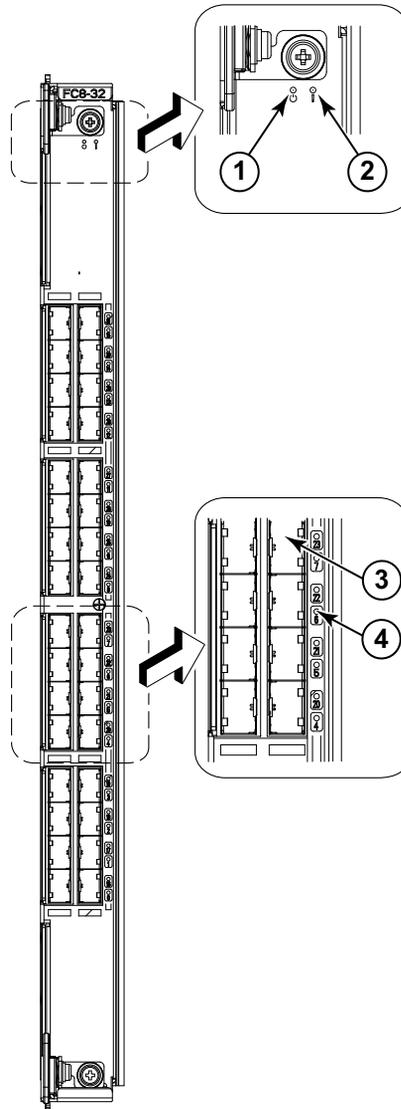
1	Power LED	3	Fibre Channel port
2	Status LED	4	Port Status LED

Figure 6   PB-DCX-32P Port blade
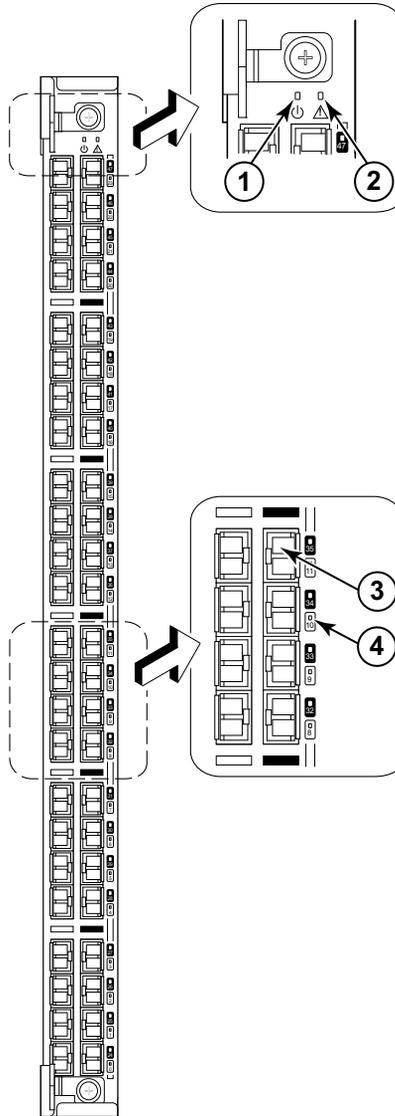
1 Power LED	3 Fibre Channel port
2 Status LED	4 Port Status LED

Figure 7   PB-DCX-48P Port blade
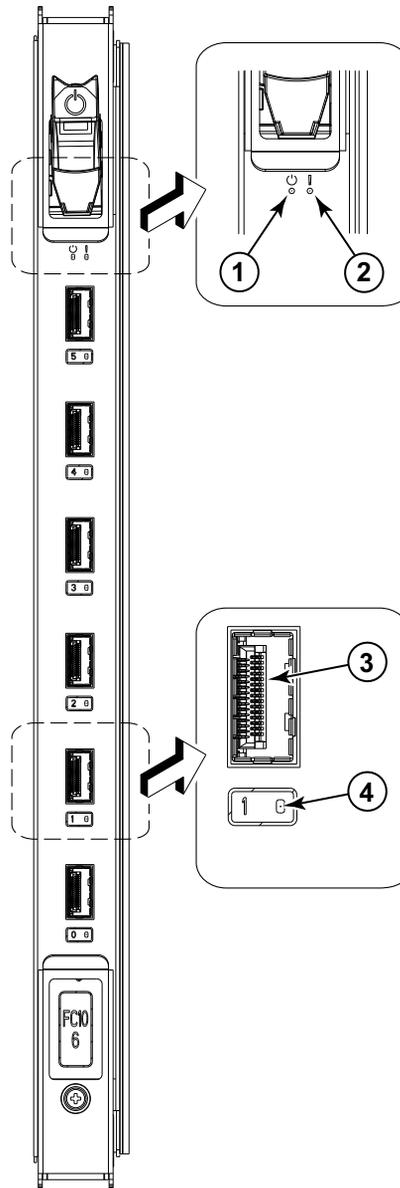
1	Power LED	3	Fibre Channel port
2	Status LED	4	Port Status LED

Figure 8   PB-48K-10G-6 Port blade
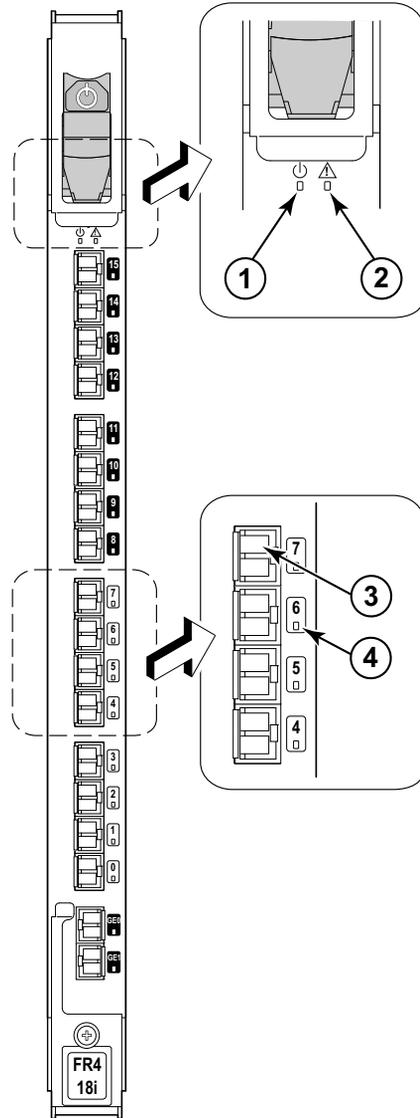
1	Power LED	3	Fibre Channel port
2	Status LED	4	Port Status LED

Figure 9   **PB-48K-18i Application blade**
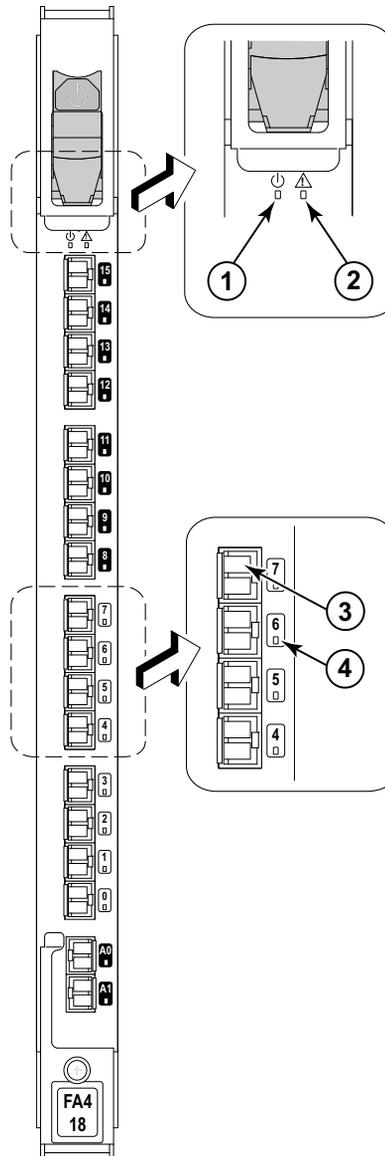
1	Power LED	3	Fibre Channel port
2	Status LED	4	Port Status LED

Figure 10   PB-48K-AP4-18 Application blade
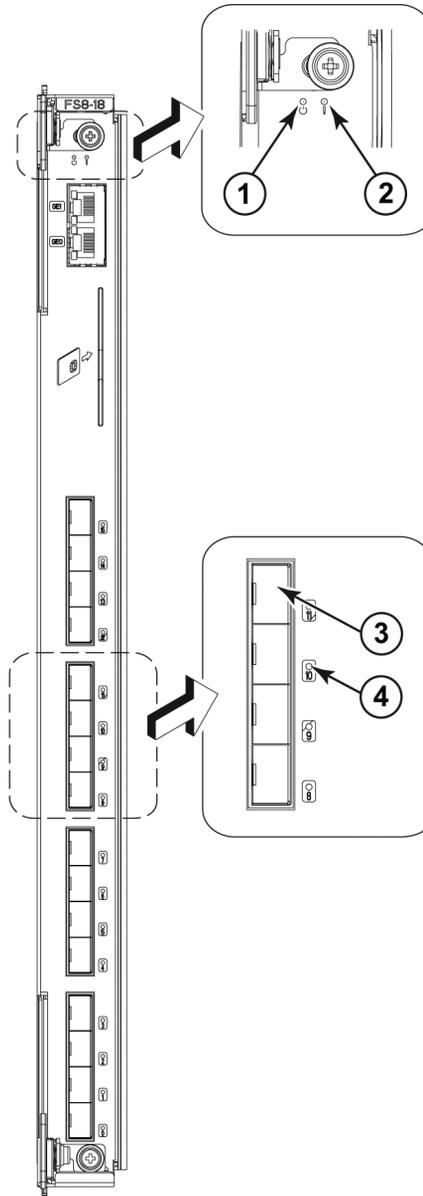
1 Power LED	3 Fibre Channel port
2 Status LED	4 Port Status LED

Figure 11   **PB-DCX-16EB Encryption blade**

Table 4 describes the port, application, and encryption blade LED patterns and the recommended actions for those patterns.

Table 4   Port, application, and encryption blade LED descriptions

LED purpose	Color	Status	Recommended action
Power LED	Steady green	Blade is enabled.	No action required.
	No light (LED is off)	Blade is not enabled.	Ensure that the blade is firmly seated.
Status LED	No light (LED is off)	Blade is either healthy or does not have power.	Verify that the power LED is on.
	Steady amber	Blade is faulty.	Ensure that the blade is firmly seated and check the status by entering the **slotShow** command. If LED remains amber, contact EMC Customer Service.
	Slow-flashing amber (on 2 seconds, then off 2 seconds)	Blade is not seated correctly or is faulty.	Pull the blade out and reseat it. If LED continues to flash, replace the blade.
	Fast-flashing amber (on 1/2 second, then off 1/2 second)	Environmental range exceeded.	Check for out-of-bounds environmental condition and correct it.

Table 4   Port, application, and encryption blade LED descriptions (continued)

LED purpose	Color	Status	Recommended action
Port Status	No light (LED is off)	Port has no incoming power, or there is no light or signal carrier detected.	Verify that the power LED is on, check the transceiver and cable.
		Polling is in progress.	Allow 60 seconds for polling to complete.
		Connected device is configured in an offline state.	Verify the status of the connected device.
	Steady green	Port is online (connected to an external device) but has no traffic.	No action required.
	Slow-flashing green (on 1 second, then off 1 second)	Port is online but segmented, indicating a loopback plug or cable or an incompatible switch.	Verify that the correct device is attached to the ED-DCX-4S-B.
	Fast-flashing green (on 1/4 second, then off 1/4 second	Port is in internal loopback (diagnostic).	No action required.
	Flickering green	Port is online, with traffic flowing through port.	No action required.
	Steady amber	Port is receiving light or signal carrier, but it is not online yet.	Reset the port from the workstation using the **portEnable** or **portCfgPersistentEnable** command.
	Slow-flashing amber (on 2 seconds, then off 2 seconds)	Port is disabled due to diagnostic tests or **portDisable** or **portCfgPersistentEnable** command.	Reset the port from the workstation using the **portEnable** or **portCfgPersistentEnable** command.
	Fast-flashing amber (on 1/2 second, then off 1/2 second)	Transceiver or port is faulty.	Change the transceiver or reset the switch from the workstation.
	Alternating green/amber	Port is bypassed.	Reset the port from the workstation using the **portEnable** or **portCfgPersistentEnable** command.

Determining the status of a control processor blade (CP8)

1. Check the LED indicators on the CP blade as shown in Figure 12 on page 74. The LED patterns may temporarily change during POST and other diagnostic tests. For information about how to interpret the LED patterns, see Table 5 on page 75.

2. Check the port blade status by entering **slotShow** and **haShow**.

Figure 12 on page 74 identifies the CP8 blade.
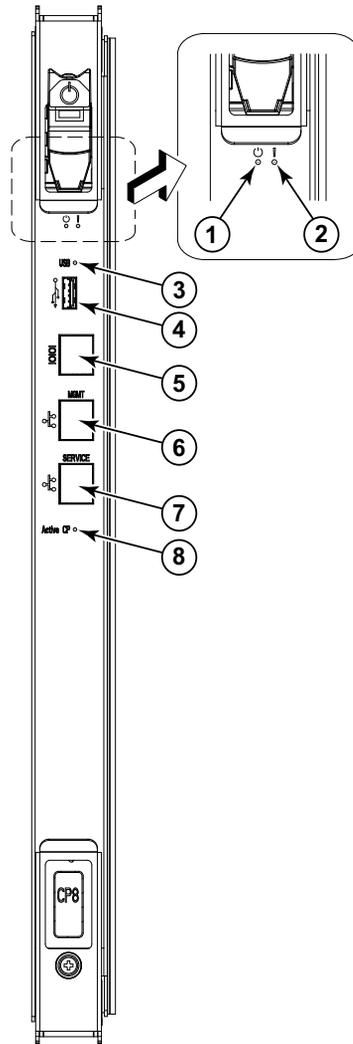
1	Status LED	5	Console port (10101)
2	Power LED	6	Ethernet port (MGM IP)
3	USB LED	7	Ethernet port (SERVICE IP)
4	USB port	8	Active CP LED

Figure 12   Control processor blade (CP8)

Table 5 describes the CP blade LED patterns and the recommended actions for those patterns.

Table 5   **CP blade LED descriptions (page 1 of 2)**

LED purpose	Color	Status	Recommended action
Power	Steady green	CP blade is on.	No action required.
	No light (LED is off)	CP blade is not on.	Ensure that the blade is firmly seated and has power.
Status	No light (LED is off)	CP blade is either healthy or does not have power.	Verify that the power LED is on.
	Steady amber	CP blade is faulty or the switch is still booting.	Ensure that the blade is firmly seated and the switch has completed booting. If LED remains yellow, contact EMC Customer Service.
	Slow-flashing amber (on 2 seconds; then off 2 seconds)	CP blade is not seated correctly or is faulty.	Pull the blade out and reseat it. If the LED continues to flash, replace the blade.
	Fast-flashing amber (on 1/2 second; then off 1/2 second)	Environmental range exceeded.	Check for out-of-bounds environmental condition and correct it.
Ethernet Link Status	No light (LED is off)	Either an Ethernet link is not detected, or it does not have incoming power.	Ensure that the blade has power, the Ethernet cable is firmly seated, and the connected device is functioning.
	Flickering green/amber	Ethernet link is healthy and traffic is flowing through port.	No action required.
Ethernet Link Speed	No light (LED is off)	Ethernet link speed is 10 Mbps or CP blade does not have incoming power.	Ensure that the CP has power. **Note:** To force a persistent Ethernet link speed, enter the **ifModeSet** command.
	Steady green	Ethernet link speed is 100/1000 Mbps.	No action required.

Table 5   CP blade LED descriptions (page 2 of 2)

LED purpose	Color	Status	Recommended action
USB Status	Lamp on	USB stick enabled.	No action required.
	Lamp off	USB stick not present or disabled.	No action required.
Active CP	Steady blue	Active CP blade.	No action required.
	No light (LED is off)	Standby CP blade.	No action required.

Determining status of a core switch blade (CR4S-8)

1. Check the LED indicators on the core switch blade (Figure 13 on page 77). The LED patterns may temporarily change during POST and other diagnostic tests; for information about how to interpret the LED patterns, see Table 6 on page 78.

2. Check the core switch blade status by entering **slotShow** and **haShow**.

Figure 13 on page 77 identifies the core switch blade.
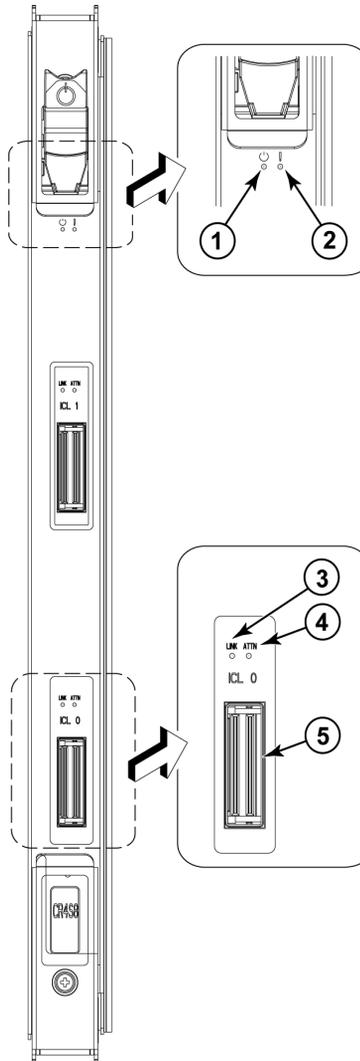
1	Status LED	4	ATTN LED
2	Power LED	5	ICL connector
3	LINK LED		

Figure 13   Core switch blade (CR4S-8)

Table 6 describes the core switch blade LED patterns and the recommended actions for those patterns.

Table 6   CR4S-8 blade LED descriptions

LED purpose	Color	Status	Recommended action
Power	Steady green	CR4S-8 blade is on.	No action required.
	No light (LED is off)	CR4S-8 blade is not on.	Ensure that the blade is firmly seated and has power.
Status	No light (LED is off)	CR4S-8 blade is either healthy or does not have power.	Verify that the power LED is on.
	Steady amber	CR4S-8 blade is faulty or the switch is still booting.	Ensure that the blade is firmly seated and the switch has completed booting. If the LED remains yellow, contact EMC Customer Service.
	Slow-flashing amber (on 2 seconds; then off 2 seconds)	CR4S-8 blade is not seated correctly or is faulty.	Pull the blade out and reseat it. If the LED continues to flash, replace the blade.
	Fast-flashing amber (on 1/2 second; then off 1/2 second)	Environmental range exceeded.	Check for out-of-bounds environmental condition and correct it.
LINK LED	No light (LED is off)	No ICL, or ICL cable present but no connection.	Ensure that the ICL cable is correctly installed.
	Steady green	ICL connected.	No action required.
ATTN LED	No light (LED is off)	ICL operational.	No action required.
	Blinking amber	Attention required.	Ensure that the ICL cable is correctly installed.

Determining the status of a power supply

1. Check the LED indicator on the power supply as shown in Figure 14. The LED patterns may temporarily change during POST and other diagnostic tests; for information about how to interpret the LED patterns, see Table 7 on page 80.

2. Check the power supply status by entering **psShow**.

   The power supply status displays **OK**, **Absent**, or **Faulty**. If a power supply is absent or faulty, contact EMC Customer Service to order replacement parts.

Figure 14 displays the power supply.
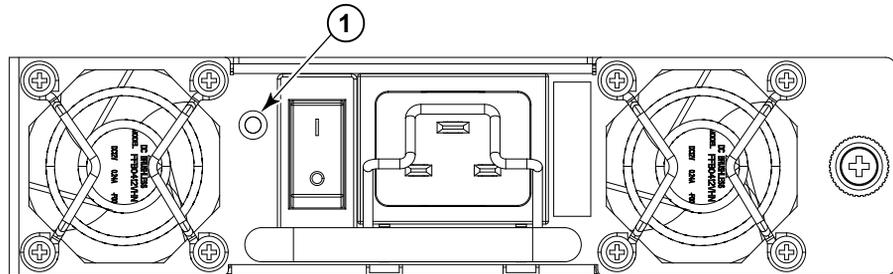
1 Power LED

Figure 14   Power supply

Table 7 on page 80 describes the power supply LED patterns and the recommended actions for those patterns.

Table 7   Power supply LED descriptions

LED purpose	Color	Status	Recommended action
Power	No light (LED is off)	Power supply does not have incoming power and is not providing power to the ED-DCX-4S-B.	Ensure that the power supply is firmly seated, the ED-DCX-4S-B has incoming power, both power cables are connected, and AC power switches are on.
	Steady green	Power supply has incoming power and is providing power to the ED-DCX-4S-B.	No action required.
	Flashing green	Power supply is about to fail.	Replace the power supply.

Determining the status of a blower assembly

1. Check the LED indicators on the blower assembly as shown in Figure 15. The LED patterns may temporarily change during POST and other diagnostic tests; for information about how to interpret the LED patterns, see Table 8 on page 81.

2. Check the blower assembly status using the **fanShow** command.

   The status for each blower assembly displays **OK**, **Absent**, or **Faulty**. The RPM of each fan in the assembly is also provided. If a blower assembly is absent or faulty, contact EMC Customer Service to order replacement parts.

   Figure 15 displays the blower assembly.
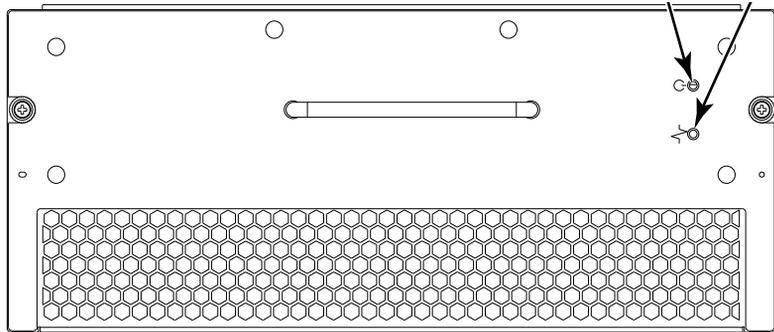
1 Power LED   2 Fault LED

Figure 15   Blower assembly

Table 8   Blower assembly LED descriptions

LED purpose	Color	Status	Recommended action
Power ⏻	No light (LED is off)	Blower assembly does not have power.	Ensure that the blower assembly is firmly seated and has power.
	Steady green	Blower assembly has power.	No action required.

Table 8   Blower assembly LED descriptions (continued)

LED purpose	Color	Status	Recommended action
Fault	No light (LED is off)	Blower assembly is either healthy or does not have power.	Ensure that the blower assembly has power.
	Steady amber	Blower assembly has a failure (full or partial).	Replace the blower assembly.
	Slow-flashing amber (on 2 sec, then off 2 sec)	Blower assembly is not seated correctly or is faulty.	Pull the unit out and reseat it. If the LED continues to flash, replace the unit.
	Flashing amber (on 1/2 sec, then off 3.5 sec)	Fan is disabled.	Run the **fanEnable** command to enable the fan.
	Fast-flashing amber (on 1/2 sec, then off 1/2 sec)	Environmental range exceeded.	Check for out-of-bounds environmental condition, resolve any problems, and reseat the unit. If the LED continues to flash, replace the unit.

Determining the status of a WWN card

The WWN bezel (logo plate) covers the WWN cards. The LEDs on the WWN cards are not visible unless the bezel is removed.

1. Enter the **chassisShow** command to display information about the WWN card. (WWN units correspond to information specific to the WWN card.) Error messages that may indicate problems with a WWN card are summarized in Table 9.

Table 9   Messages that may indicate WWN card failure

Type of message	Sample error message
WWN unit fails its FRU header access.	0x24c (fabos): Switch: switchname, error EM-I2C_TIMEOUT, 2, WWN 1 I2C timed out: state 0x4
WWN unit is being faulted.	0x24c (fabos): Switch: switchname, Critical EM-WWN_UNKNOWN, 1, Unknown WWN #2 is being faulted
WWN unit is not present or is not accessible.	0x24c (fabos): Switch: switchname, Error EM-WWN_ABSENT, 2, WWN #1 not present
Writing to the FRU history log (**hilSetFruHistory**) has failed.	0x24c (fabos): Switch: switchname, Error EM-HIL_FAIL, 2, HIL Error: hilSetFruHistory failed, rc=-3 for SLOT 3

Figure 16 displays the WWN bezel (logo plate).
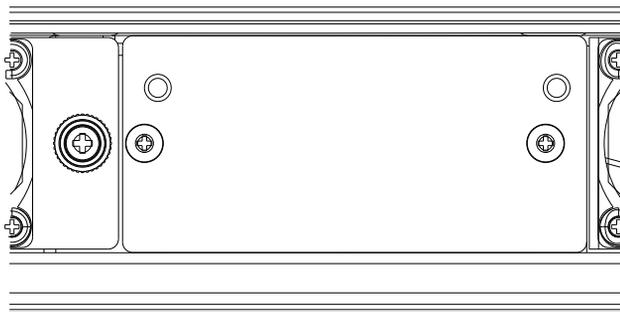
Figure 16   WWN bezel (logo plate)

Removal and Replacement Procedures (RRPs)

This chapter contains the following information:

Introduction

Repair and replacement of faulty parts on the ED-DCX-4S-B should be performed by a trained EMC Support representative.

⚠️ **IMPORTANT**

Customer servicing of the ED-DCX-4S-B could result in the voiding of the warranty or service agreement.

The information in this section is provided for information purposes only and is not intended to be a "how to" guide for customer performed maintenance. Not all of the FRUs described in this chapter are available from EMC. Consult your EMC Support representative for information concerning which components are replaceable in the field.

The field replaceable units (FRUs) in the ED-DCX-4S-B can be removed and replaced without special tools. The ED-DCX-4S-B can continue operating during many of the FRU replacements if the conditions specified in the procedure are followed.

The following sections contain FRU removal and replacement procedures (RRPs).

RRP: Chassis door

Note: The chassis door must be installed to ensure the ED-DCX-4S-B meets EMI and other regulatory certifications. Additionally, if ICL cables are not used, EMI plugs must be inserted in the ICL cable ports to meet certification standards.

Time and items required

The replacement procedure for the chassis door takes less than five minutes.

Removing a chassis door

Support the door to prevent it from falling. Pull and remove the door.
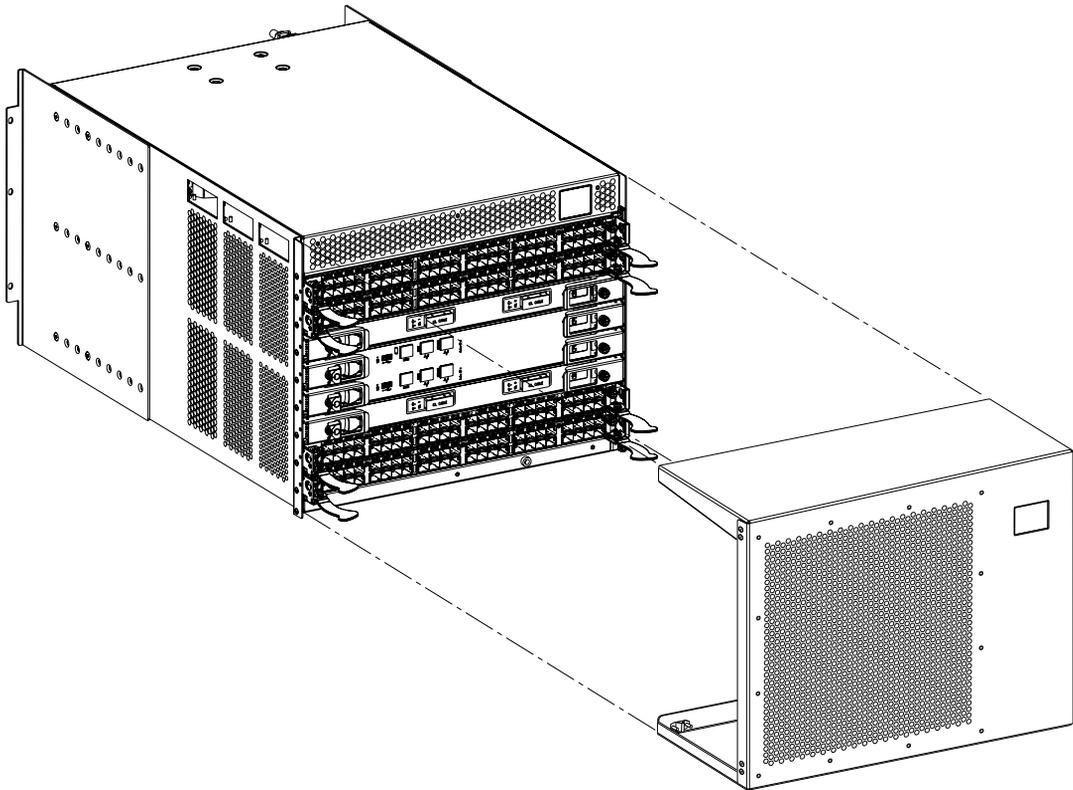
Figure 17   RRP: Chassis door

Replacing a chassis door

1. Align the holes in the door with the pins in the chassis.

2. Push the door into place.

RRP: Vertical cable management fingers

The ED-DCX-4S-B comes equipped with two vertical cable management finger assemblies. It can continue to operate during the replacement of the cable management fingers. Due to the horizontal orientation of the blades in the DCX-4S, the finger assemblies are attached to the uprights of the mounting rack.

Time and items required

The replacement procedure for the cable management fingers takes less than five minutes. A #1 Phillips screwdriver is required.

Removing a cable management finger assembly

1. Rearrange the cables around one of the cable management finger assemblies.

2. Unscrew and save the three (3) screws holding the finger assembly to the rack upright (). Support the assembly to prevent it from falling.

3. Remove the cable management finger assembly.

4. If necessary, repeat steps 1-3 for the other finger assembly.
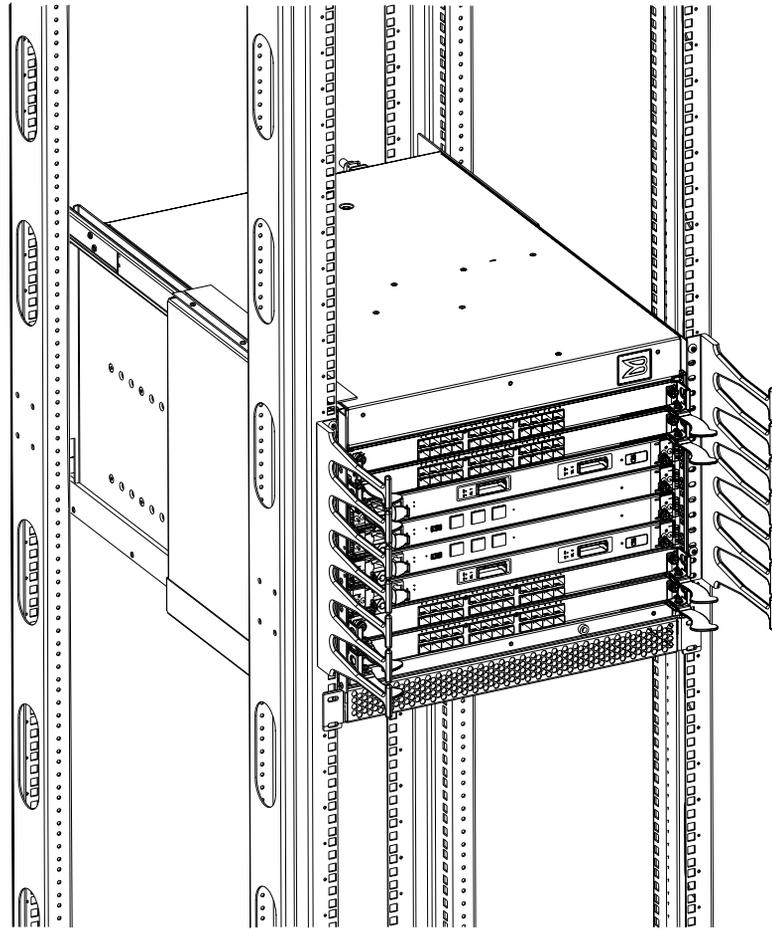
Figure 18   RRP: Vertical cable management finger assemblies

Replacing a cable management finger assembly

1. Position and tighten the three (3) screws to secure the vertical cable management finger assembly to the rack upright.

2. Arrange the cables along the cable management finger assembly.

3. If necessary, repeat steps 1-2 for the other cable management assembly.

RRP: Port, application, and encryption blades

This section describes how to remove and replace port, application, and encryption blades.

Note: A blade should be removed only when being replaced with another port, application, or encryption blade, or a filler panel ("RRP: Blade filler panel"). Any slot that is not occupied by a blade should be occupied by a filler panel to ensure correct cooling of the chassis and protection from dust.

Slots are numbered from 1 through 8, from bottom to top when facing the port side of the ED-DCX-4S-B. Port, application, and encryption blades can be installed in slots 1-2 and 7-8.

Time and items required

The replacement procedure for each blade takes less than 10 minutes. The following items are required for the blade and filler panel replacement:

◆ ESD (electrostatic discharge) grounding strap

◆ Workstation computer

◆ Replacement blade or filler panel

◆ Phillips screwdriver

◆ Small form-factor pluggable (SFP) or extended form-factor pluggable (XFP, PB-48K-10G-6 blade only) transceivers (as needed)

◆ Optical cables (as needed)

Removing a blade

Note: Follow ESD precautions ("ESD precautions").

1. Remove the chassis door ("RRP: Chassis door").

2. Check the power LED, status LED, and port status LED to identify any possible problems. A failed port or application blade can be identified by inspecting the LEDs on the front panel of each blade. See Figure 5 on page 64 to Figure 11 on page 70 for LED locations.

3. Establish a Telnet or console session.

Before replacing a blade, establish a Telnet or console connection to determine a failure and verify operation after replacement. Use the **switchShow** command to view the status of blades.

4. Check for adequate cable slack. Ensure there is plenty of cable slack to remove a blade without cable obstruction.

5. Ensure that the part number on the unit being replaced matches the replacement part number. The **chassisShow** command displays information about the blades, including part numbers (*xx-xxxxxxx-xx*), serial numbers, and additional status.

6. Ensure that traffic is not flowing through the blade (port status LED should be off) prior to disconnecting cables.

   Note: Before removing any cables from a blade, note the cable order (identify each cable by its physical port). If multiple blades are being replaced, replace one blade at a time.

7. Ensure that traffic is not flowing through the blade.

8. Disconnect all cables and SFP or XFP transceivers from the blade.

9. Perform the appropriate following action based on the type of blade:

   • **For PB-DCX-16P, PB-DCX-32P, PB-DCX-48P port blades, and PB-DCX-16EB encryption blade:** Unscrew the two thumb screws from the top and bottom ejectors on the blade using the Phillips screwdriver. Unscrew the top thumb screw until it pops out. This initiates a hot-swap request. Adjust the ejectors to the open position (Figure 19 on page 93).

   • **For PB-48K-10G-6 port blade, and PB-48K-AP4-18, and PB-48K-18i application blades:** Turn the blade off by sliding the slider switch in the left ejector to the right, to the off position. This initiates a hot-swap request.

10. Wait for the power LED to turn off in response to the hot-swap request before removing the blade.

11. Perform the appropriate following action based on the type of blade:

    • **For PB-DCX-16P, PB-DCX-32P, and PB-DCX-48P port blades, and PB-DCX-16EB encryption blade:** Open the ejectors. Pull the blade out of the chassis using the ejectors (Figure 19 on page 93).

- **For PB-48K-10G-6 port blade, and PB-48K-AP4-18, and PB-48K-18i application blades:** Unscrew the two thumb screws from the top and bottom ejectors on the blade using the Phillips screwdriver. Lever both ejectors open simultaneously to approximately 45 degrees and pull the blade out of the chassis.

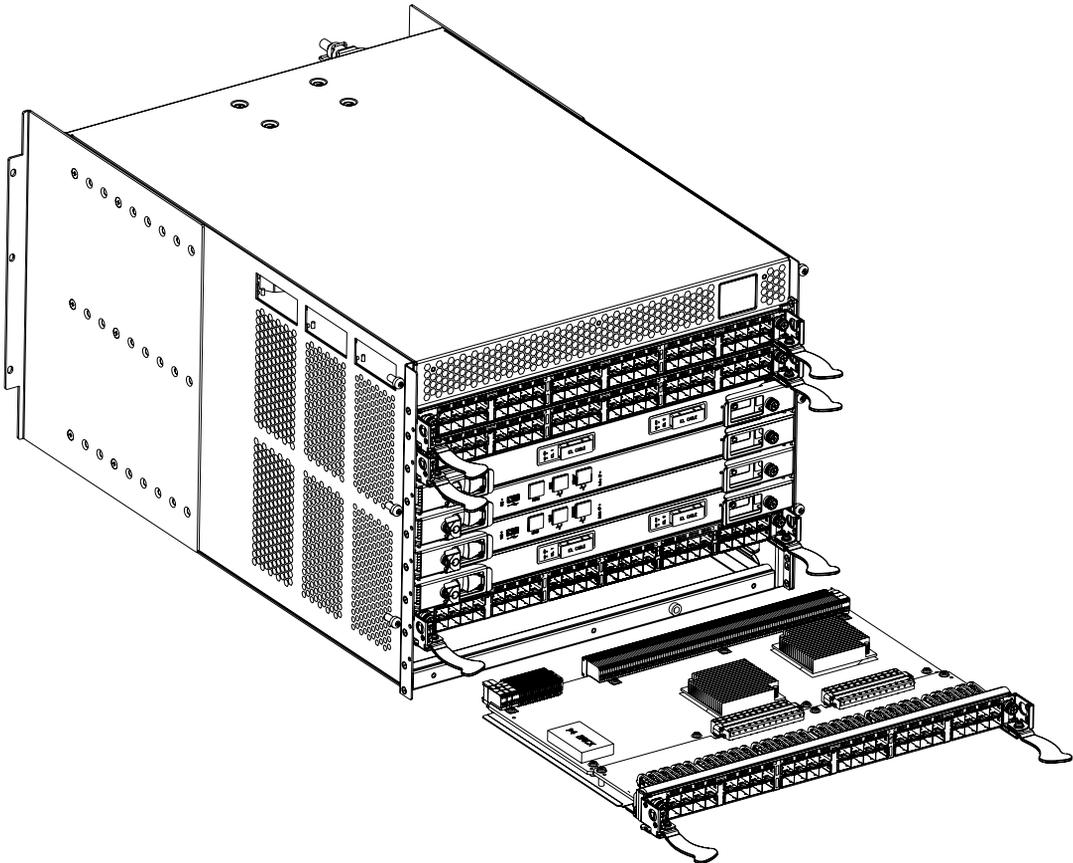12. If the blade is not being replaced by another blade, install a filler panel ("RRP: Blade filler panel").

Figure 19   **RRP: Port, application, or encryption blade (PB-DCX-48P port blade shown)**

Replacing a blade

Note: Follow ESD precautions ("ESD precautions").

Note: A PB-48K-AP4-18i application blade and the ED-DCX-4S-B must have the same version of firmware. To upgrade firmware versions, refer to the *EMC Connectrix B Series Fabric OS Administrator's Guide*.

1. Orient the blade so that the ports are at the front of the chassis and the flat side of the blade is on the bottom.

2. Perform the appropriate following action based on the type of blade:

   • **For PB-DCX-16P, PB-DCX-32P, PB-DCX-48P port blades, and PB-DCX-16EB encryption blade:** Adjust the ejectors to the open position, align the flat side of the blade inside the left and right rail guides in the slot, and slide the blade into the slot until it is firmly seated.

   • **For PB-48K-10G-6 port blade, and PB-48K-AP4-18, and PB-48K-18i application blades:** Open the ejectors to approximately 45 degrees, align the flat side of the port blade inside the left and right rail guides in the slot, and slide the blade into the slot until it is firmly seated.

3. Perform the appropriate following action based on the type of blade:

   • **For PB-DCX-16P, PB-DCX-32P, PB-DCX-48P port blades, and PB-DCX-16EB encryption blade:** Adjust the ejectors to the closed position by pulling them away from the center of the blade.

   • **For PB-48K-10G-6 port blade, and PB-48K-AP4-18, and PB-48K-18i application blades:** Close the ejectors by pushing the handles toward the center of the blade until the ejectors lock. The levering action of the handles seats the blade in the slot.

4. Perform the appropriate following action based on the type of blade:

   • **For PB-DCX-16P, PB-DCX-32P, PB-DCX-48P port blades, and PB-DCX-16EB encryption blade:** Tighten the upper and lower thumb screws using the Phillips screwdriver.

- **For PB-48K-10G-6 port blade, and PB-48K-AP4-18, and PB-48K-18i application blades:** Tighten the thumb screw inside each handle using the Phillips screwdriver.

5. Perform the appropriate following action based on the type of blade:

   - **For PB-DCX-16P, PB-DCX-32P, PB-DCX-48P port blades, and PB-DCX-16EB encryption blade:** Skip to step 6.

   - **For PB-48K-10G-6 port blade, and PB-48K-AP4-18, and PB-48K-18i application blades:** Turn the blade on by sliding the slider switch in the left ejector to the left, covering the thumb screw.

6. Verify that the power LED on the port blade is displaying a steady green light. If it does not turn on, ensure that the blade is firmly seated.

7. Install the SFP or XFP (PB-48K-10G-6 only) transceivers and cables in the port blade.

8. Group and route the cables through the vertical cable fingers.

9. Replace the chassis door ("RRP: Chassis door").

RRP: Blade filler panel

This section describes how to remove and replace blade filler panels.

Removing a filler panel

Note: A filler panel should be removed only when being replaced with a port, application, or encryption blade, or new filler panel. Any slot that is not occupied by a blade should be occupied by a filler panel to ensure correct cooling of the chassis and protection from dust.

1. Remove the chassis door ("RRP: Chassis door").

2. Unscrew the thumb screw at the bottom of the panel using the Phillips screwdriver.

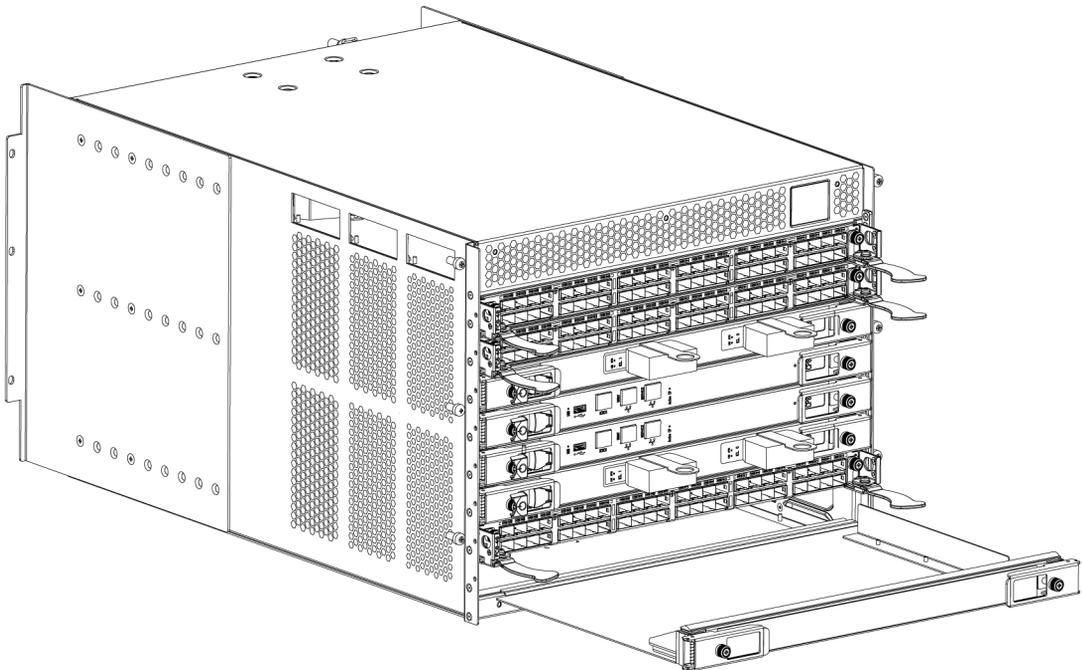3. Pull the filler panel out of the chassis (Figure 20).

Figure 20   RRP: Blade filler panel

Replacing a filler panel

1. Orient the filler panel (Figure 20 on page 96).

2. Slide the filler panel into the slot until it is firmly seated.

3. Tighten the thumb screw at the bottom of the panel.

4. Replace the chassis door ("RRP: Chassis door").

RRP: Control processor blade (CP8)

This section describes how to remove and replace a control processor (CP8) blade. Each ED-DCX-4S-B has two CP8 blades located in slot 4 and slot 5.

Note: If the new CP blade does not have the same firmware as the active CP blade, the new blade must be upgraded to the same firmware version. Refer to the *EMC Connectrix B Series Fabric OS Administrator's Guide* for information.

Time and items required

The replacement procedure for the CP blade takes approximately 30 minutes. The following items are required for the CP blade replacement:

◆ ESD (electrostatic discharge) grounding strap

◆ Workstation computer

◆ Serial cable

◆ IP address of an FTP server for backing up the ED-DCX-4S-B configuration

◆ Phillips #2 screwdriver

◆ Replacement CP blade. Requires the ED-DCX-4S-B CP blade (CP8)

Verifying the necessity of replacement

Confirm that you need to replace the CP blade. The following events might indicate that a CP blade is faulty:

◆ The status LED on the CP blade is lit amber, or the power LED is not lit.

◆ The CP blade does not respond to Fabric OS commands, or the serial console is not available.

◆ The **slotShow** command does not show that the CP blade is enabled.

◆ The **haShow** command indicates an error.

◆ The clock is inaccurate, or the CP blade does not boot up or shut down normally.

◆ Any of the following messages display in the error log:

- "Slot unknown" message relating to a CP slot
- CP blade errors or I^2C timeouts
- FRU: FRU_FAULTY messages for a CP blade
- Configuration loader messages or "Sys PCI config" messages
- Generic system driver messages ("FABSYS")
- Platform system driver messages ("Platform")
- EM messages that indicate a problem with a CP blade
- Function fail messages for the CP master

For more information about error messages, refer to the *EMC Connectrix B Series Fabric OS Message Reference*.

Recording critical ED-DCX-4S-B information

Back up the ED-DCX-4S-B configuration before you replace a CP blade. Refer to the *EMC Connectrix B Series Fabric OS Administrator's Guide* for backup information.

1. Connect to the ED-DCX-4S-B and log in as **admin**, using either a Telnet or a serial console connection.

2. Enter **haShow** to determine which CP blade is active:

```
switch:admin> haShow
Local CP (Slot 5, CP1) : Active
Remote CP (Slot 4, CP0) : Standby, Healthy
HA Enabled, Heartbeat Up, HA State Synchronized
```

3. Enter all remaining commands from the serial console for the *active* CP blade, unless otherwise indicated. For more information about commands, refer to the *EMC Connectrix B Series Fabric OS Command Reference.*

4. If the functioning CP blade is performing as the active CP blade, go to step 5 on page 101. If the faulty CP blade is performing as the active CP blade, fail over the blades:

   a. Log in to the faulty CP blade as **admin**, using either a Telnet or a serial console connection.

   If you connect successfully to the faulty CP, continue to step b.

If you cannot connect to the faulty CP, remove the faulty CP blade for repair as follows:

– Turn the CP blade off and notify the ED-DCX-4S-B of a hot swap request by sliding the slider switch in the top ejector down to the off position (Figure 21 on page 102).

– Wait until the active CP LED on the functioning CP blade is lit. Remove the CP blade.

b. Enter **haFailover**. The functioning CP blade becomes the active CP blade.

c. Wait until the status LED on the functioning CP blade is no longer lit.

d. Enter **haShow** from the functioning CP blade (the new active CP blade) to verify the failover.

This is an example of failing over a CP blade:

```
Fabric OS (cp1)

cp1 login: admin
Password:
switch:admin> hashow
Local CP (Slot 5, CP1): Active
Remote CP (Slot 4, CP0): Standby, Healthy

HA enabled, Heartbeat Up, HA State synchronized
switch:admin> hafailover
Local CP (Slot 5, CP1): Active
Remote CP (Slot 4, CP0): Standby, Healthy
HA enabled, Heartbeat Up, HA State synchronized

Warning: This command is being run on a redundant control
processor(CP) system. If the above status does not indicate
'HA State synchronized', then the CPs are not synchronized
and this operation will cause the active CP to reset. This
will cause disruption to devices attached to both switch 0
and switch 1 and will require that existing Telnet sessions
be restarted. To reboot a single logical switch on this
system, use the switchreboot command while logged in to
that logical switch.

Are you sure you want to fail over to the standby CP [y/n]?

switch:admin> haShow
Local CP (Slot 5, CP1) : Standby, Healthy
Remote CP (Slot 4, CP0) : Active
HA Enabled, Heartbeat Up, HA State Synchronized
```

5. Enter **firmwareShow** to note the firmware version of the active CP blade.

6. Enter **haDisable** from the active CP blade to prevent failover or communication between the CP blades during the replacement.

7. Logged into the active CP, use the **configUpload** command to upload the ED-DCX-4S-B configuration to a specified FTP server. Enter information at the prompts.

   This is a sample of backing up the configuration files:

   ```
   switch:admin> configUpload
   Protocol (scp or ftp) [ftp]: ftp
   Server Name or IP Address [host]: 123.456.78.90
   User Name [None]: user
   File Name [config.txt]: config.txt
   Password: xxxxxxxx
   upload complete
   ```

Removing a control processor blade (CP8)

The ED-DCX-4S-B continues to operate while a CP blade is being replaced if the redundant CP blade is active and a failover does not occur. You can prevent failover by entering the **haDisable** command.

Note: Follow ESD precautions ("ESD precautions").

Note: The CP8 blade is compatible only with the ED-DCX-B and the ED-DCX-4S-B.

1. Remove the chassis door ("RRP: Chassis door").

2. Log in to the active CP as the **admin** user. You can use a serial cable or Telnet, Web Tools, or Fabric Manger. Determine which CP is active using the **haShow** command or view the active LED on the front of the CP.

3. If the faulty CP is the active CP, issue the **haFailover** command. Wait until the failover has completed. Use the **haShow** command to verify the CPs are synchronized and the failover is complete.

4. Power off the blade by sliding the slider switch in the top ejector down to the off position (Figure 21 on page 102).

5. Disconnect all cables from the faulty (standby) CP.

6. Unscrew the thumb screw from both ejectors using the Phillips screwdriver.

7. Lever open both ejector handles simultaneously to approximately 45 degrees and pull the CP blade out of the chassis as shown in Figure 21.
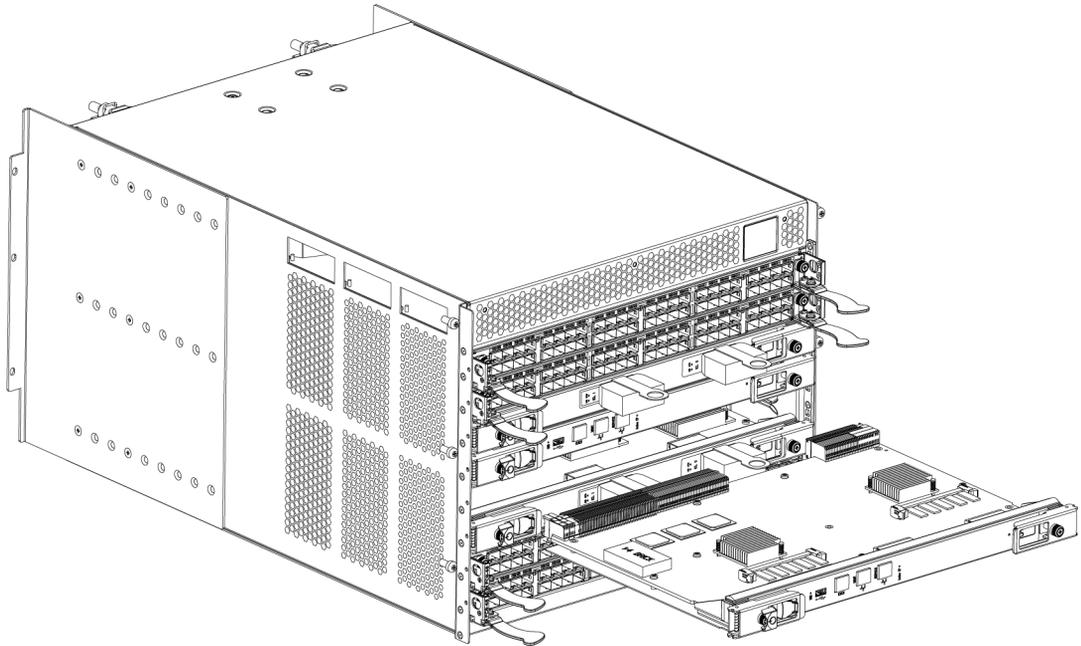
Figure 21   RRP: Control processor blade (CP8)

Replacing a control processor blade (CP8)

Note: Follow ESD precautions ("ESD precautions").

1. Open the ejector handles to approximately 45 degrees. Orient the CP blade so that the handles are toward you and the flat metal side is on the bottom.

2. Align the flat metal side of the CP blade inside the left and right blade guides in the slot. Slide the CP blade into the slot until it is firmly seated.

3. Tighten the thumb screw inside each handle using the Phillips screwdriver.

4. Turn the CP blade on by sliding the ON/OFF switch in the left handle to the left, to cover the thumb screw.

5. Verify that the power LED is green. If not, ensure that the CP blade has power and is firmly seated and that the ejectors are in the locked position.

6. Connect the cables to the new CP blade.

7. Verify the installation ("Verifying operation of the new CP blade").

8. Replace the chassis door ("RRP: Chassis door").

Verifying operation of the new CP blade

Perform the following steps to verify that boot and POST are complete on the new CP blade and that the CP blade has achieved failover redundancy.

1. Log in to the active CP as **admin**.

2. Enable the redundancy feature using the **haEnable** command.

3. Verify HA is enabled using the **haShow** command. The command output includes "HA Enabled Heartbeat Up" and "HA-state in sync."

   If HA is not enabled, POST is not complete or the CP blades have not achieved redundancy. Wait one or two minutes and re-enter the command until you can verify that redundancy has been achieved.

4. Enter **slotShow**. The command output shows the new CP blade as "enabled":

```
switch:admin> slotShow

Slot    Blade Type   ID     Status
--------------------------------


   1      UNKNOWN            VACANT
   2      SW BLADE     55    ENABLED
   3      CORE BLADE 52      ENABLED
   4      CP BLADE     50    ENABLED
   5      CP BLADE     50    ENABLED
```

```
                                  6        CORE BLADE 52      ENABLED
                                  7        UNKNOWN            VACANT
                                  8        SW BLADE   51      ENABLED

                        switch:admin>
```

5. Determine the Fabric OS version by typing **firmwareShow**.

   This example shows sample output for the **firmwareShow** command:

   ```
   switch:admin> firmwareShow
   Local CP (Slot 4, CP1): Active
           Primary partition:      v6.2.0
           Secondary Partition:    v6.2.0
   Remote CP (Slot 5, CP0): Standby
           Primary partition:      v6.2.0
           Secondary Partition:    v6.2.0

   Note: If Local CP and Remote CP have different versions
   of firmware, please retry firmwaredownload command.

   switch:admin>
   ```

6. If the firmware version on the replacement blade does not match that on the active CP blade, bring the replacement blade to the same firmware level as the active blade.

7. Enter **firmwareDownload -s** to download the firmware to one of the CP blades. Enter all requested information (use default values):

```
switch:admin> firmwaredownload -s
Server Name or IP Address: 192.168.100.1
User Name: user
File Name: /software/v6.2.0
Password: ********
Do Auto-Commit after Reboot [Y]:
Reboot system after download [N]:
Firmwaredownload has started.
2008/07/03-14:59:21, [SULB-1001], 923,, WARNING, ED-DCX-4S-B, Firmwaredownload
command has started.
Start to install packages......
dir                          ################################################
ldconfig                     ################################################
glibc                        ################################################
bash                         ################################################
readline                     ################################################
terminfo                     ################################################
termcap                      ################################################
setup                        ################################################
```

```
<output truncated>

tz                      ##################################################
mtracer-tool            ##################################################
lkcd                    ##################################################
sysstat                 ##################################################
Removing unneeded files, please wait ...
Finished removing unneeded files.

All packages have been downloaded successfully.
Firmwaredownload has completed successfully.
2008/07/03-15:05:56, [SULB-1002], 924,, INFO, ED-DCX-4S-B, Firmwaredownload
command has completed successfully.
```

8. Enter **firmwareDownloadStatus** to verify that the firmware has been updated.

9. Enter **haEnable** to re-enable HA on the active CP blade.

10. Verify that the reboot is complete and the CP blades have achieved failover redundancy:

    a. Wait until the status LEDs on both CP blades are not lit.

    b. Enter **haShow** and verify that the command output includes "HA Enabled Heartbeat Up". If not, reenter the command until you have verified that redundancy is achieved.

11. Enter **firmwareShow** to verify that the firmware version has been updated.

12. Pack the faulty CP blade in the packaging provided with the new CP blade, and contact EMC Customer Service to determine the return procedure.

13. Replace the chassis door ("RRP: Chassis door").

RRP: Core switch blade (CR4S-8)

This section describes how to remove and replace a core switch blade. The ED-DCX-4S-B has two core switch blades: one in slot 3 and one in slot 6. Note that the blade shown in the removal illustration () is shown with EMI plugs installed.

Time and items required

The replacement procedure for the core switch blade takes approximately 30 minutes. The following items are required for the core switch blade replacement:

◆ ESD (electrostatic discharge) grounding strap

◆ Phillips #2 screwdriver

◆ Replacement core switch blade (ED-DCX-4S-B requires the CR4S-8 core switch blade)

Verifying the necessity of replacement

Confirm that you need to replace the core switch blade before continuing. The following events might indicate that a core switch blade is faulty:

◆ The status LED on the core switch blade is lit amber, or the power LED is not lit.

◆ The **slotShow** command does not show that the core switch blade is enabled.

◆ The **haShow** command indicates an error.

◆ Any of the following messages display in the error log:

• "Slot unknown" message relating to a core switch blade slot.

• Core switch blade errors or I^2C timeouts.

• FRU: FRU_FAULTY messages for a core switch blade.

• Configuration loader messages or "Sys PCI config" messages.

• Generic system driver messages ("FABSYS").

• Platform system driver messages ("Platform").

• EM messages that indicate a problem with a core switch blade.

• Function fail messages for the core switch blade master.

For more information about error messages, refer to the *EMC Connectrix B Series Fabric OS Message Reference*.

Removing a core switch blade (CR4S-8)

The ED-DCX-4S-B continues to operate while a core switch blade is being replaced.

Note: Follow ESD precautions ("ESD precautions").

Note: The CR4S-8 blade is compatible only with the ED-DCX-4S-B.

1. Remove the chassis door ("RRP: Chassis door" on page 87).

2. Power off the blade by sliding the slider switch in the left ejector to the right to the off position (Figure 22 on page 108).

3. Disconnect all cables from the faulty core switch blade. If ICL cables are not used, remove the EMI plugs from the cable sockets.

4. Unscrew the thumb screw from both ejectors using the Phillips screwdriver.

5. Lever open both ejector handles simultaneously to approximately 45 degrees and pull the core switch blade out of the chassis (Figure 22 on page 108).
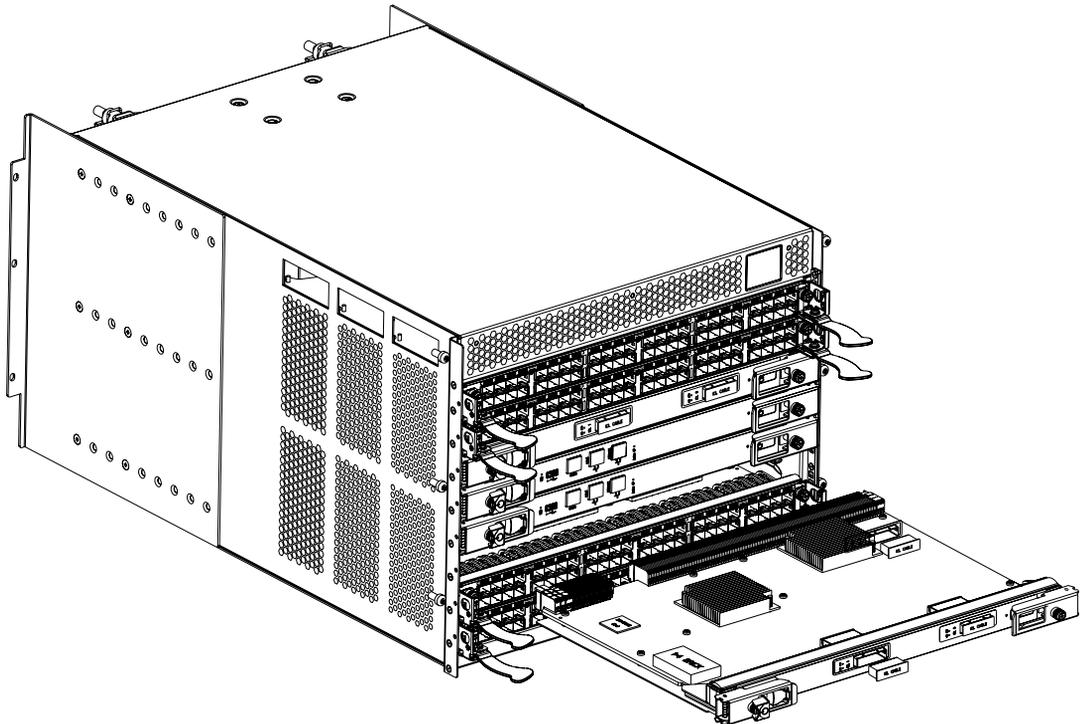
Figure 22   RRP: Core switch blade (CR4S-8)

Replacing a core switch blade (CR4S-8)

Note: Follow ESD precautions ("ESD precautions").

1. Open the ejector handles to approximately 45 degrees; then, orient the CR blade so that the handles are toward you and the flat metal side is on the bottom.

2. Align the flat metal side of the core switch blade inside the left and right blade guides in the slot; then, slide the core switch blade into the slot until it is firmly seated.

3. Tighten the thumb screw inside each handle using the Phillips screwdriver.

4. Turn the core switch blade on by sliding the ON/OFF switch in the left handle to the left, to cover the thumb screw.

5. Verify that the power LED is green (might require a few seconds). If not, ensure that the core switch blade has power and is firmly seated and that the ejectors are in the locked position.

6. Connect the cables to the new core switch blade. If ICL cables are not used, insert EMI plugs into the cable sockets.

7. Replace the chassis door ("RRP: Chassis door").

8. Pack the faulty core switch blade in the packaging provided with the new core switch blade, and contact EMC Customer Service to determine the return procedure.

RRP: Power supply

Use this procedure to remove and replace a power supply.

Note: The ED-DCX-4S-B can continue operating during the replacement if the second 220 VAC power supply is operating,

Time and items required

The replacement procedure for each power supply takes less than 5 minutes. A power supply unit or filler panel is required for the power supply replacement.

Identification

Figure 23 on page 111 shows the location and identification of the power supplies.

1 Power supply 1 (PS1)   2 Power supply 2 (PS2))
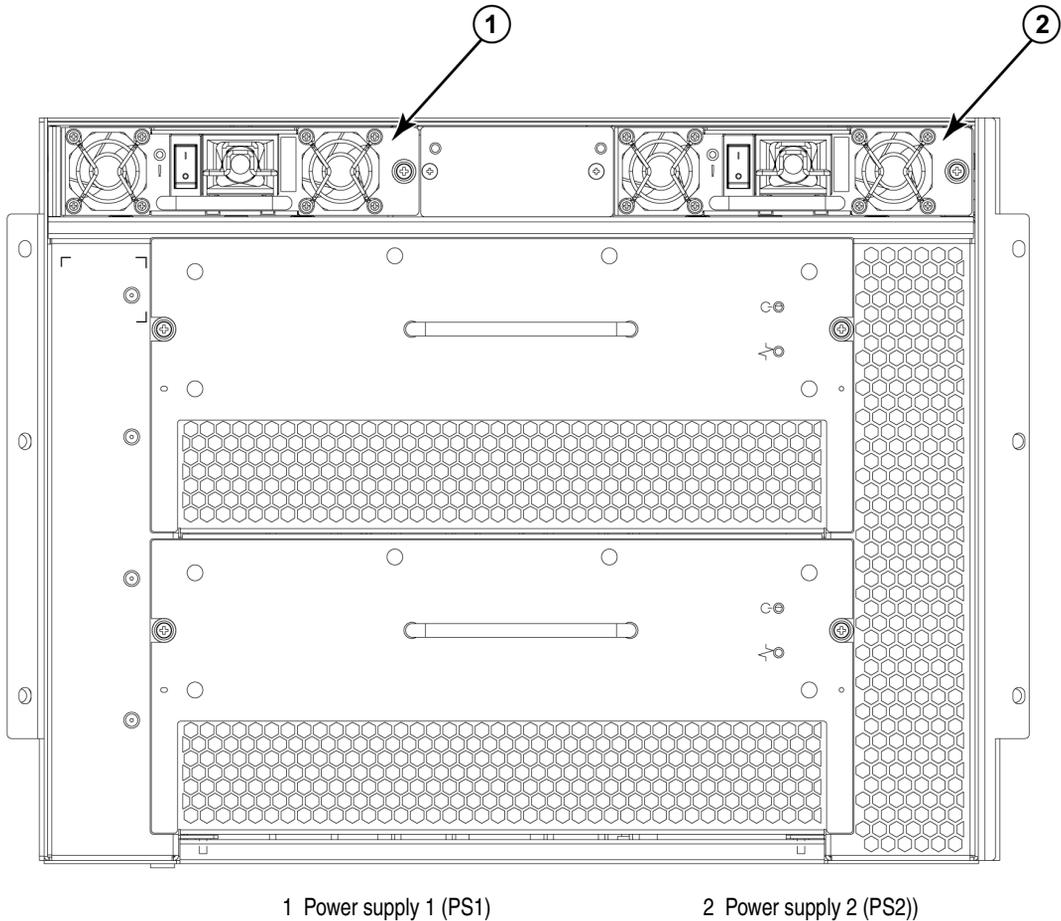
Figure 23   Power supply identification

Removing a power supply

1. Perform the appropriate following action based on whether the ED-DCX-4S-B is operating:

    •   If the ED-DCX-4S-B is not operating during the replacement procedure, go to step 2.

- If the ED-DCX-4S-B is operating and will continue to operate during the replacement, check the power LEDs to verify that the minimum number of power supplies is functioning. A fully populated ED-DCX-4S-B requires a minimum of one power supply at all times.

2. Turn off the power switch.

3. Remove the power cord.

4. Loosen the thumb screw as shown in Figure 24.

5. Grasp the handle and pull, sliding the power supply from the chassis and supporting the power supply from beneath as you remove it.

6. If you are not replacing the power supply, insert a power supply filler panel into the slot.
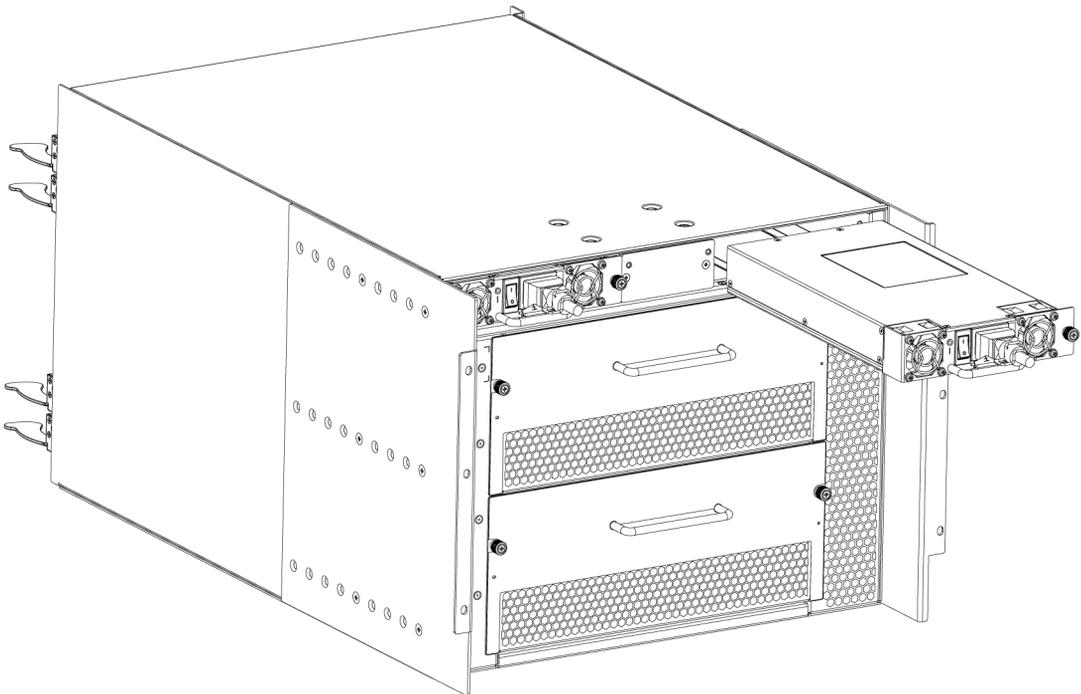

Figure 24   RRP: Power supply

Replacing a power supply

1. Remove any filler panel.

2. Insert the power supply into the slot. Verify that the power supply is seated by gently pulling on the handle. The power supply should resist movement as you pull.

3. Tighten the thumb screw.

4. Replace the power cord.

5. Turn on the power switch.

6. Verify that the power LED on the power supply displays a steady green light.

RRP: Blower assembly

This procedure provides instructions for removing and replacing a blower assembly.

Note: The ED-DCX-4S-B can continue operating during the replacement if the second blower assembly is operating,

Time and items required

The replacement procedure for each blower assembly takes less than 5 minutes. The following items are required for the blower assembly replacement:

◆ Replacement blower assembly

◆ Phillips #2 screwdriver

Removing a blower assembly

1. Before removing a blower assembly, verify that the other blower assembly is functioning correctly. The power LEDs should be steady green.

2. Use the screwdriver to loosen the captive screws at the left and right of the blower assembly as shown in .

3. Grasp the handle and pull, sliding the blower assembly from the chassis and supporting the blower assembly from beneath as you remove it.

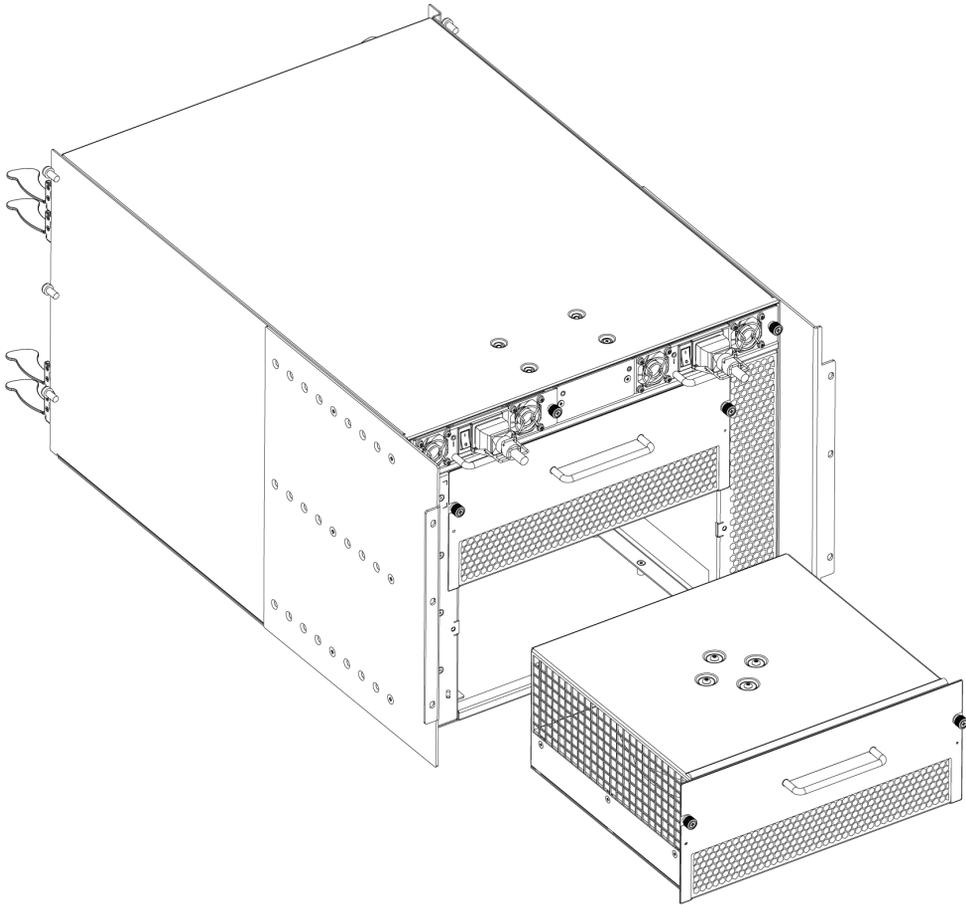**Figure 25   RRP: Blower assembly**

Replacing a blower assembly

1. Orient the blower assembly and slide it into the chassis, pushing firmly to ensure that it is seated.

2. Verify that the power LED displays a green light.

3. Use the screwdriver or your fingers to tighten the captive screws.

RRP: WWN card

Note: The World Wide Name (WWN) cards contain fully redundant circuits and normally do not require replacement. Two WWN cards are located beneath the WWN bezel (logo plate).

Time and items required

Allow approximately 20 minutes to replace a WWN card. The following items are needed to replace a WWN card:

◆ Electrostatic discharge (ESD) grounding strap

◆ #2 Phillips screwdriver (required only for some versions of the WWN card)

◆ If a serial console session is used: serial cable and a workstation computer with a terminal emulator application (such as HyperTerminal for Windows systems or TIP for Solaris systems)

Verifying necessity of replacement

Before replacing a WWN card, verify that the replacement is necessary. Any of the following events can indicate that the card requires replacement:

◆ Status LED on WWN card (beneath the bezel) indicates a problem

◆ Problems viewing or modifying the data stored on the WWN card

◆ Error messages regarding WWN units #1 or #2

Note: On the DCX-4S the power and status LEDs for all blades are no longer present on the WWN card.

Determining the status of a WWN card

1. Check the WWN card status using the commands listed in Table 10 on page 117. Difficulty retrieving or modifying this data could indicate a WWN card failure.

Table 10   Commands identifying the WWN card status

Data	Related commands
WWN values	wwn, chassisShow
Data about the chassis and WWN card	chassisShow
Ethernet and Fibre Channel IP address information for the CP blades	ipAddrShow, ipAddrSet
History log information	historyShow, historyLastShow
Name of switch	switchName

2. Enter the **chassisShow** command to display information about the WWN card. WWN units correspond to information specific to the WWN card. An error message is logged that indicates the status of the WWN unit as shown in Table 11.

Table 11   WWN card related system log messages

Type of message	System message (errshow or errdump)
WWN unit removal was detected	`<timestamp>, [EM-1050], <sequence-number>,, INFO, <system-name>, FRU WWN # removal detected.`
WWN unit insertion was detected	`<timestamp>, [EM-1049], <sequence-number>,, INFO, <system-name>, FRU WWN # insertion detected.`
WWN unit fails to power on	`<timestamp>, [EM-1004], <sequence-number>,, CRITICAL, <system-name>, WWN # failed to power on`
WWN unit is being faulted	`<timestamp>, [EM-1034], <sequence-number>,, ERROR, <system-name>, WWN # set to faulty, rc=<return code>`

Removing the WWN bezel (logo plate) and WWN card

Note: Follow ESD precautions ("ESD precautions").

1. Open a Telnet session to the ED-DCX-4S-B and log in to the active CP as **admin**. The default password is **password**.

2. Verify that you are logged in to the active CP. Run the **haShow** command to determine the active CP.

3. Remove the two screws from the WWN bezel (Figure 26 on page 119). Pull the bezel away from the chassis and set it aside. The WWN cards and their status LEDs are visible.

4. Enter **fruReplace wwn** from the active CP blade and wait for the phrase "Do you wish to continue [y/n]?" to display; then enter **y**.

5. Wait until the WWN card data is backed up. Do *not* enter **continue** until the mechanical replacement is complete.

```
switch:admin> frureplace wwn
This is the WWN card hot swap interface.
Continuing from this point will require
the whole process to be completed.
If this process is not complete due to a power cycle, or CP failover, follow
the recovery procedure in Core Switch WWN Card Removal and Replacement document.
Do you wish to continue [y/n]? y

Backing up WWN card data, wait about 25 seconds for further instruction.
Install the new FRU now.

If this session lost for any reason, re-enter the frureplace command and
follow the instructions to complete the operation.

Enter the word `continue' after the new WWN card has been installed:
```

6. Wait until all the LEDs on the WWN card turn off.

7. Use a Phillips screwdriver to unscrew the screw that secures the WWN card to the chassis. Use the pull tab to remove the card.

8. Disconnect the WWN cable by depressing the cable connector latch and pulling the connector from the WWN module.

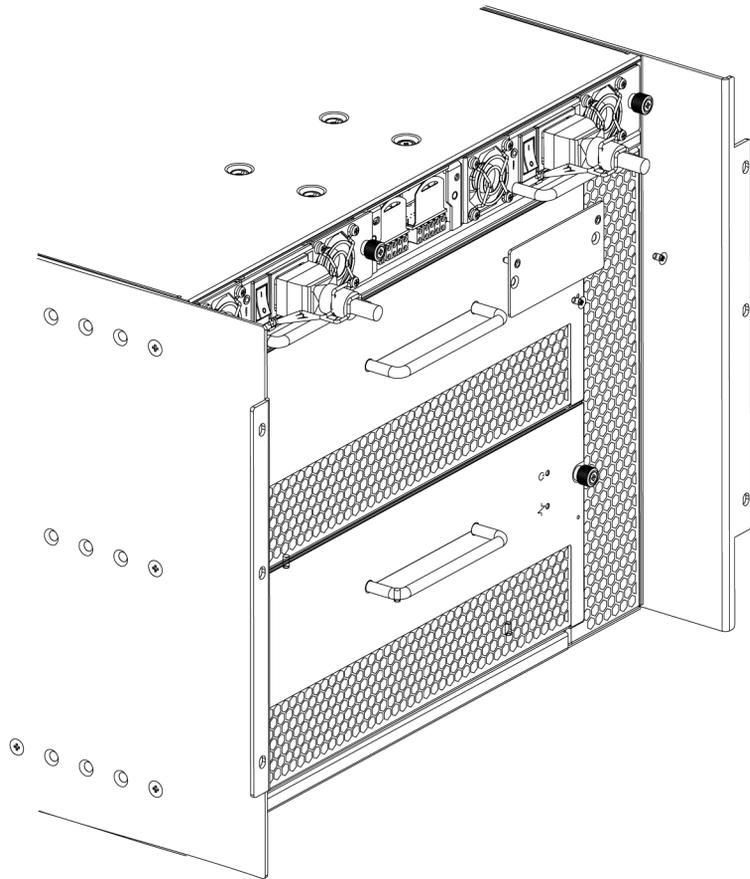9. Set the WWN card on a static-free surface, such as a grounding pad.

Figure 26   RRP: WWN bezel (logo plate) and WWN card

Replacing the WWN bezel (logo plate) and WWN card

Note: Follow ESD precautions ("ESD precautions").

1. Unpack the new WWN card and save the packaging for the faulty WWN card.

2. Hold the card by the pull tab and insert the WWN cable onto the WWN module until it is fully seated. Use the Phillips screwdriver and the two screws to attach the WWN card to the chassis.

Note: If a serial console session is active, several "removal detected" and"insertion detected" messages display on the console because of the replacement.

3. In the CLI session, enter **continue** to indicate that the replacementhas been completed.

```
Please enter the word `continue' after the new WWN card has been installed: continue
 Restoring the information to the replacement FRU now, please wait about 20 seconds
to complete Verifying the replacement FRU now...
WWN card hot swap is now complete.
FRU replacement completed successfully!
```

4. Verify that the WWN card is correctly connected by checking the LED on the WWN card.

Note: The LED might take up to 2 minutes after WWN card installation to begin functioning.

5. Install the WWN bezel. Orient the bezel on the chassis as shown in Figure 26 on page 119. Insert and tighten the two screws.

6. Pack the faulty WWN card in the packaging provided with the new card and return it to EMC.

RRP: SFPs and XFPs

Note: The 8-Gbps SFPs autonegotiate at 2, 4, and 8 Gbps. The 4-Gbps SFPs autonegotiate at 1, 2, and 4 Gbps.

To remove an SFP or XFP (FC6-10 blade only) transceiver, pull the bale down and out, sliding the transceiver out of the port or application blade.

To install an SFP or XFP, position one of the transceivers so that the key is oriented correctly to the port. Insert the transceiver into the port until it is firmly seated and the latching mechanism clicks. Transceivers are keyed so that they can only be inserted with the correct orientation. If a transceiver does not slide in easily, ensure that it is correctly oriented.

The ED-DCX-4S-B comes with a transceiver extraction tool (Figure 27) and holster. The extraction tool is designed to remove transceivers from blades where the space is limited. To use the extraction tool, slide the tool on to the bale of the transceiver and pull it out.
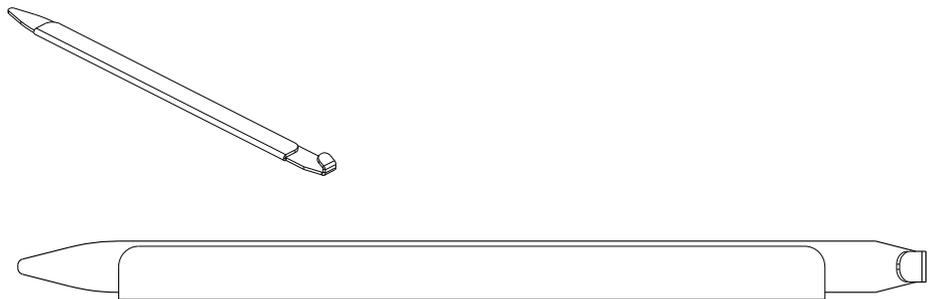

Figure 27   **Optical transceiver (SFP and XFP) extraction tool**

RRP: Inter-chassis link (ICL) cables

Note: ICL ports can be used only with an ICL license. After the addition or removal of a license, the license enforcement is performed on the ICL ports only when the **portDisable** and **portEnable** commands are issued on the ports. An ICL license must be installed on both EMC Backbones forming the ICL connection. The backbones can be either two ED-DCX-4S-B units or one ED-DCX-4S-B and one ED-DCX-B.

Note: If ICL cables are not in use, the ports must have EMI plugs installed to meet EMI and other regulatory certifications.

Table 12 describes the ICL connector port LED patterns and the recommended actions for those patterns.

Table 12   ICL connector port LEDs

LED purpose	Color	Status	Recommended action
LINK LED	No light (LED is off)	No ICL, or ICL cable present but no connection.	Ensure that the ICL cable is correctly installed.
	Steady green	ICL connected.	No action required.
ATTN LED	No light (LED is off)	ICL operational.	No action required.
	Blinking amber	Attention required.	Ensure that the ICL cable is correctly installed.

Follow this procedure to install the ICL cables. Refer to the *EMC Connectrix B Series Fabric OS Administrator's Guide* for the configuration procedure and requirements.

Figure 28 on page 123 shows an ICL cable. The ICL cables (2 meters long) and the ICL connectors shown in Figure 13 on page 77 are color-coded and labeled for ease of installation. Four cables are required for a complete installation.

Time required   The replacement procedure for an ICL cable takes less than five minutes.

Items required   Replacement ICL cable.

**Removing an ICL
cable**

Note: To prevent the latch mechanism from wear, use the color-coded (green) latch-release tab for cable removal. Pull the tab to disengage the retention latch before cable removal.

1. Using the latch release tabs, pull each plug on the cable from its respective socket on the core switch blades (CR4S-8). If you are installing cables for the first time, remove the EMI plugs from the sockets.
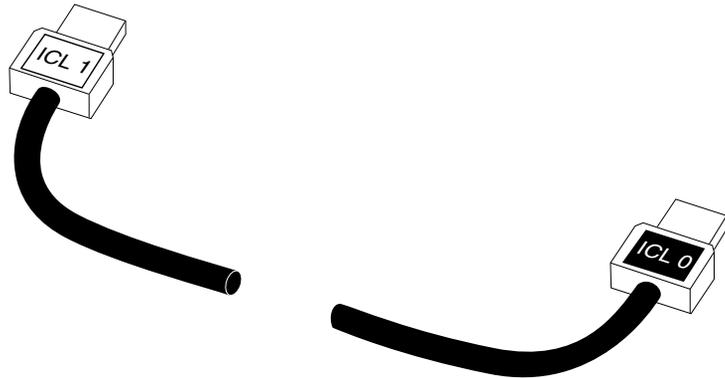
2. Repeat for each cable that requires replacement.

Figure 28   ICL cable

**Replacing an ICL
cable**

1. Align the color-coded and labeled (ICL 1 and ICL 0) plugs on either end of the ICL cable with their respective connectors on the core switch blades (CR4S-8).

2. Push each plug in until the latch mechanism clicks into place.

3. Repeat steps 1 and 2 for each cable that requires replacement.

   If you are installing ICL cables for the first time, pay particular attention to the configuration in which the cables must be installed.

   Note: Since the blades in the ED-DCX-4S-B are installed horizontally, the familiar top-to-bottom orientation becomes a left-to-right orientation. Connect the cables from the left (top) connectors (ICL 1) of the CR4S-8 blades in the first chassis to the right (bottom) connectors (ICL 0) of the CR4S-8 blades in the second chassis.
   Similarly, connect the cables from the right (bottom) connectors (ICL 0) of the CR4S-8 blades in the first chassis to the left (top) connectors (ICL 1) of the CR4S-8 blades in the second chassis.

Figure 29 and Figure 30 on page 125 show two of the acceptable cabling configurations for the ICL feature between two ED-DCX-4S-B chassis and between an ED-DCX-4SB and an ED-DCX-B. The drawings show the cables attached between the blades in slot 3 on one chassis and slot 6 on the second chassis. It is also acceptable to attach the cables from slot 3 on one chassis to slot 3 on the second chassis (or slot 6 to slot 6) as long as the left-to-right (top-to-bottom) rule is followed.

4. Once all the cables are attached, see the *EMC Connectrix B Series Fabric OS Administrator's Guide* for the configuration procedure.
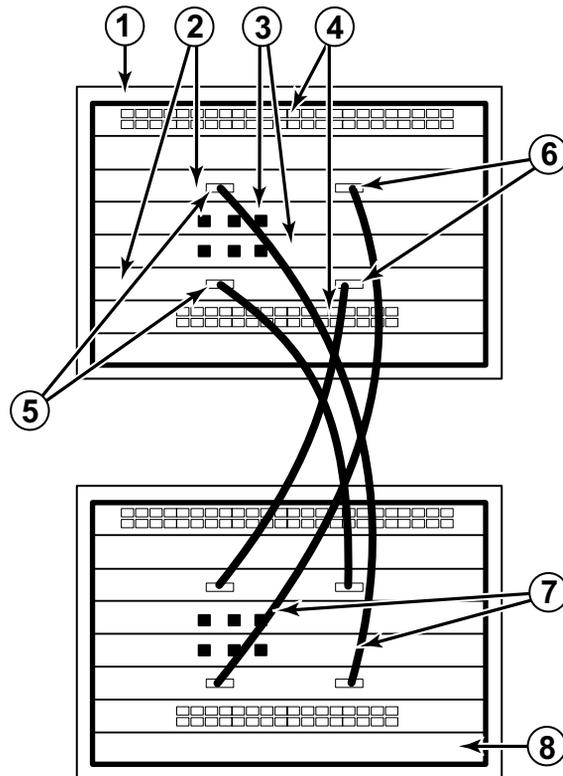
1 Chassis 1	5 ICL connector (ICL 1)
2 Core switch blades (CR4S-8)	6 ICL connector (ICL 0)
3 Control processor blades (CP8)	7 ICL cables
4 Port blades	8 Chassis 2

Figure 29   ICL cable connections – between two ED-DCX-4S-B chassis
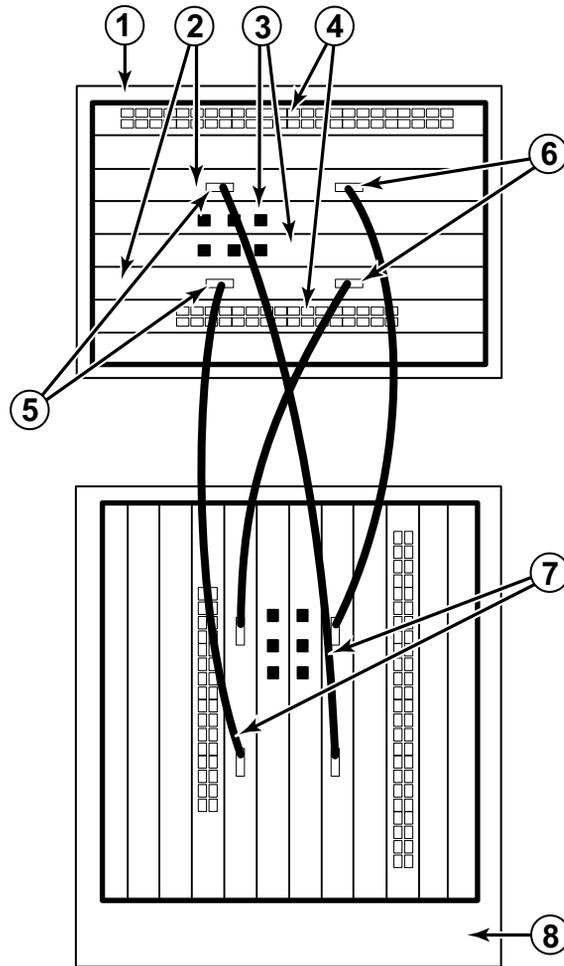
1 Chassis 1 (ED-DCX-4S-B)	5 ICL connector (ICL 1)
2 Core switch blades (CR8)	6 ICL connector (ICL 0)
3 Control processor blades (CP8)	7 ICL cables
4 Port blades	8 Chassis 2 (ED-DCX-B)

Figure 30   ICL cable connections between an ED-DCX-4S-B and an ED-DCX-B

RRP: ED-DCX-4S-B chassis

This section describes how to remove and replace the ED-DCX-4S-B chassis (with its backplane). The basic steps are:

1. "Verifying need for replacement"

2. "Recording critical ED-DCX-4S-B and SAN information"

3. "Disconnecting from the network and fabric"

4. "Removing components from the chassis"

5. "Installing the replacement chassis"

6. "Installing components into the new chassis"

7. "Verifying correct operation of system"

8. "Reconnecting the system to the network and fabric"

9. "Verifying correct configuration of the fabric"

Note: The ED-DCX-4S-B must be removed from the fabric and powered off to perform this procedure. Contact your support provider if you have any questions about whether the chassis requires replacement.

Time required

The chassis replacement takes approximately 3 hours.

Items required

The following items are required for the chassis replacement:

◆ Electrostatic discharge (ESD) grounding strap

◆ ESD grounding pads for protecting all blades and WWN cards

◆ Serial cable and workstation computer with a terminal emulator application (such as HyperTerminal for Windows systems or TIP for Solaris systems), required only if serial console session used

◆ Pallet jack or hydraulic or assisted lift that raises a minimum of 55 in. (140 cm) and carries a minimum of 250 lb (113 kg)

◆ A surface to place the old chassis on, such as a second lift or the pallet originally provided with the old chassis

◆ #2 Phillips screwdriver

Verifying need for replacement

Verify that replacement of the chassis is necessary. Ensure that the components are firmly seated when troubleshooting, and contact your support provider with any questions about whether the chassis should be replaced.

Any of the following events might indicate the need to replace the chassis:

◆ Visible mechanical damage to the chassis, including damage to sheet metal or card guides that prevents correct installation of a blade.

◆ Bent or damaged connectors on the backplane (the surface inside the chassis to which the blades connect).

◆ One or more components (such as a power supply, blower assembly, port blade, control processor blade (CP8), core switch blade (CR4S-8), or WWN card) do not function properly even after the component was replaced.

◆ The **psShow** or **fanShow** commands continue to show a faulty component even though the component was replaced.

◆ The **slotShow** command continues to show a faulty control processor (CP8), core switch (CR4S-8), or port blade even though the blade was replaced.

Recording critical ED-DCX-4S-B and SAN information

All commands must be entered from a CLI session (Telnet or serial) to the active CP blade unless otherwise indicated.

Note: Run **supportShow** which includes all of the information in Table 13 on page 128 and more.

For detailed information about Fabric OS commands, refer to the *Connectrix B Series Fabric OS Command Reference Guide*. Use a checklist provided in Table 13 on page 128 to ensure that all required information is recorded.

Table 13   Critical information checklist

Configuration information	
	Location of "config-switch.txt" file
	Location of "config-miscinfo.txt" file
	IP address, subnet mask
	WWN for ED-DCX-4S-B
SAN profile	
	Location of "SANbefor.txt" file
	Notes regarding **nsshow** output
	Notes regarding **nsallshow** output
	Notes regarding **switchshow** output
	Notes regarding **fabricshow** output
Output from supportshow command	
	Location of "spptshow.txt" file
	Notes regarding **supportshow** output
Information about the new chassis	
	New Factory Serial Num
	New Serial Num (if available)

1. Open a Telnet session and log in to the ED-DCX-4S-B as **admin**. The default password is **password**. Enable the logging function on your Telnet or serial console connection.

2. Back up the current configuration.

   • Enter **configUpload**; then, enter the requested information at the prompts.

     This command uploads the ED-DCX-4S-B configuration to the customer-defined FTP server, making it available for downloading. For more information about this command, refer to the *EMC Connectrix B Series Fabric OS Command Reference*.

```
switch:admin> configupload
Protocol (scp or ftp) [ftp]: ftp
Server Name or IP Address [host]: 123.123.123.123
User Name [user]: Admin24
File Name [config.txt]: config-switch0.txt
Password: xxxxxxxx
Upload complete
switch:admin>
```

- Alternatively, you can save the configuration file to a Brocade-branded USB.

3. Record the ED-DCX-4S-B values on a workstation (step 4 through step 9).

4. Record the WWN value: Enter **wwn**; then, copy the command output into a file named "config-miscinfo.txt".

```
switch:admin> wwn
10:00:00:60:69:00:00:0a
```

5. Record the IP address information.

   Enter **ipAddrShow**; then, copy the command output into the "config-miscinfo.txt" file.

```
switch:admin> ipaddrshow

CHASSIS
Ethernet IP Address: 10.32.50.12
Ethernet Subnetmask: 255.55.0.0

CP0
Ethernet IP Address: 10.32.50.10
Ethernet Subnetmask: 255.55.0.0
HostName : cp0
Gateway Address: 10.32.40.1

CP1
Ethernet IP Address: 10.32.50.11
Ethernet Subnetmask: 255.55.0.0
HostName : cp1
Gateway Address: 10.32.40.1

Backplane IP address of CP0 : 10.0.0.4
Backplane IP address of CP1 : 10.0.0.5
switch:admin>switch:admin>
```

6. Display and record the manufacturer serial numbers.

   Enter **chassisShow**; then, copy the command output into the "config-miscinfo.txt" file.

"Factory Serial Num" and "Serial Num" are listed under "Chassis/WWN Unit 1." If the current WWN cards are the original cards, the factory serial number listed is the same as the chassis serial number.

```
switch:admin> chassisshow

Chassis Backplane Revision: 1F

SW BLADE  Slot: 1
Header Version:        2
Power Consume Factor:  -50
Factory Part Num:      60-0001532-03
Factory Serial Num:    KP000000195
Manufacture:           Day: 1  Month: 1  Year: 2007
Update:                Day: 14  Month: 3  Year: 2012
Time Alive:            187 days
Time Awake:            3 days

<output truncated>

CHASSIS/WWN  Unit: 1    (in same assembly as WWN Unit:
2)
Header Version:        2
Power Consume Factor:  -3
Factory Part Num:      60-0001501-07
Factory Serial Num:    FT02X805BE2
Manufacture:           Day: 26  Month: 3  Year: 2007
Update:                Day: 14  Month: 3  Year: 2009
Time Alive:            207 days
Time Awake:            3 days

<output truncated>

switch:admin>
```

7. Create a SAN "profile" by entering and recording the information provided by the following commands:

   - **nsShow**
   - **nsAllShow**
   - **switchShow**
   - **fabricShow**

   Copy the command output into a text file named "SANbefor.txt". After the ED-DCX-4S-B is restored to the fabric, this information can be used to verify that no unintentional changes have occurred to the fabric.

```
switch:admin> nsshow
Enter Pid COS PortName NodeName TTL
<output truncated>

switch:admin> nsallshow
   12 Nx_Ports in the Fabric
<output truncated>

switch:admin> switchshow
switchName: switch
<output truncated>

switch:admin> fabricshow
Switch ID Worldwide Name Enet IP Addr FC IP Addr Name
<output truncated>

switch:admin>
```

8. Enter **supportShow**; then, copy the command output into a text file named "spptshow.txt".

   Note: The **supportShow** command has a very long output and time for completion. It may last 20 minutes or longer depending on the size of the SAN.

   This file provides a backup of all the information that might be required by EMC Customer Service. The information can be used after the ED-DCX-4S-B is restored to the fabric, to verify that no unintentional changes have occurred to the fabric.

   ```
   switch:admin> supportshow
   version: 6.2.0
   <output truncated>

   switch:admin>
   ```

9. Record the cable connections between the ED-DCX-4S-B and the target device and ports (Table 14 on page 139).

Disconnecting from the network and fabric

1. Shut down the ED-DCX-4S-B using the **sysShutdown** command.

   ```
   switch:admin> sysshutdown
   This command will shutdown the operating systems on
   your switch.
   You are required to power-cycle the switch in order to
   restore operation.
   Are you sure you want to shutdown the switch [y/n]?y
   ```

```
                              HA is disabled
                              Stopping blade 1
                              Shutting down the blade....
                              Stopping blade 2
                              Shutting down the blade....
                              Stopping blade 8
                              Shutting down the blade....

                              Broadcast message from root (pts/1) Tue Jul 18 14:23:06
                              2008...

                              The system is going down for system halt NOW !!
```

⚡ **DANGER**

Turn off the power switches and disconnect the power cords

2. Power off the chassis by flipping all AC power switches to "0". (Power supply Status LED should turn off.)

3. Remove the power cords from the power supplies and the power outlets.

4. Label the cables connected to all blades and record the connections in Table 14 on page 139.

5. Remove the chassis door ("RRP: Chassis door").

6. Disconnect the cables from the port blades and set them aside. The SFP or XFP transceivers can be left in the port blades or removed.

7. Disconnect all cables from the CP8 and CR4S-8 blades.

8. Disconnect any ICL cables.

Removing components from the chassis

Note: Follow ESD precautions ("ESD precautions").

1. Remove the cable management fingers ("RRP: Vertical cable management fingers").

2. Remove the port, application, and encryption blades or filler panels ("RRP: Port, application, and encryption blades" and "RRP: Blade filler panel").

3. Remove the core switch blades (CR4S-8) ("RRP: Core switch blade (CR4S-8)").

4. Remove the control processor blades (CP8) ("RRP: Control processor blade (CP8)").

5. Remove the power supplies or filler panels ("RRP: Power supply").

6. Remove the blower assemblies ("RRP: Blower assembly").

7. Remove the WWN bezel (logo plate) and WWN cards ("RRP: WWN card").

Installing the replacement chassis

⚠️ **CAUTION**

Use safe lifting practices when moving the product. (C015)

Note: A fully populated ED-DCX-4S-B (four PB-DCX-48P port cards, 192 ports) weighs approximately 68 kg (150 lbs) and requires a hydraulic or assisted lift to install it.

Note: If the ED-DCX-4S-B is installed in a cabinet, ensure that the cabinet is balanced and secured mechanically and that the removal and installation procedure will not compromise cabinet stability.

1. If the chassis is in a cabinet, remove it from the cabinet, remove the rack mount hardware, and save the hardware for use with the new chassis.

2. Place the chassis on a lift or on the shipping pallet provided with the original chassis.

3. Unpack the new chassis:

   a. Cut the bands that encircle the packaging.

   b. Remove the lid and the kits and foam from the top of the chassis.

   c. Lift the cardboard box off the chassis and remove the plastic bag from around the chassis.
   Save the packing materials for use when returning the old chassis.

   d. Leave the chassis on top of the plastic shipping tray if the chassis must be transported to the installation location.

Note: The ED-DCX-4S-B packaging does not incorporate wood pallet and pallet brackets. The chassis sits on top of plastic shipping tray.

4. Use a pallet jack or other assisted lift to transport the new chassis to the installation area. Doorways must be wider than 91 cm (36 in.) to accommodate the chassis on the pallet.

5. Use a lift to raise the chassis to the correct level. If installing the chassis in a cabinet, follow the instructions provided with the rail kit.

Installing components into the new chassis

Note: Follow ESD precautions ("ESD precautions").

1. Replace the WWN bezel (logo plate) and WWN cards ("RRP: WWN card").

2. Replace the blower assemblies ("RRP: Blower assembly").

3. Replace the power supplies or filler panels ("RRP: Power supply").

4. Replace the control processor blades (CP8) ("RRP: Control processor blade (CP8)").

5. Replace the core switch blades (CR4S-8) ("RRP: Core switch blade (CR4S-8)").

6. If ICL cables are not used, insert EMI plugs in the ICL sockets in the core switch blades (CR4S-8).

7. Replace the port blades or filler panels ("RRP: Port, application, and encryption blades" and "RRP: Blade filler panel").

8. Replace the cable management fingers ("RRP: Vertical cable management fingers").

9. Connect the power cords to the power supplies and the power outlets.

10. Replace the chassis door ("RRP: Chassis door").

11. Power-on the ED-DCX-4S-B ("Connecting a serial cable between ED-DCX-4S-B and host").

The ED-DCX-4S-B performs a power-on self-test (POST). The POST takes a minimum of three minutes and is complete when LED activity returns to standard state.

12. Verify that the ED-DCX-4S-B is powered on and POST is complete (all power LED indicators on the port, control processor, and core switch blades should be a steady green).

13. Verify that all components are functioning correctly by checking their LEDs. If the LEDs do not indicate correct operation, try reinstalling the corresponding component.

Verifying correct operation of system

1. Log in to the ED-DCX-4S-B as **admin**:

```
switch:admin> login
login: admin
password: xxxxxxxx
switch:admin>
```

2. Enter **slotShow** command and verify that all the installed cards are detected and that their status is operational (enabled).

```
switch:admin> slotShow

Slot    Blade Type    ID    Status
-------------------------------

   1       SW BLADE    55    ENABLED
   2       UNKNOWN           VACANT
   3       CORE BLADE  52    ENABLED
   4       CP BLADE    50    ENABLED
   5       CP BLADE    50    ENABLED
   6       CORE BLADE  52    ENABLED
   7       UNKNOWN           VACANT
   8       SW BLADE    51    ENABLED

switch:admin>
```

3. Verify that the ED-DCX-4S-B is functioning correctly by typing **switchShow** or **switchStatusShow**.

   This **switchShow** command displays ED-DCX-4S-B and port status information.

```
switch:admin> switchshow
switchName:    switch
switchType:    62.1
switchState:   Online
```

```
switchMode:     Native
switchRole:     Subordinate
switchDomain:   11
switchId:       fffc0b
switchWwn:      10:00:00:05:1e:39:59:67
zoning:         OFF
switchBeacon:   OFF
blade3 Beacon:  OFF
blade5 Beacon:  OFF
blade8 Beacon:  OFF
blade10Beacon:  OFF


Index    Slot    Port    Address    Media  Speed  State   Proto
===========================================================
  32      3       0      0b2000     id     N4     Online      L-Port 5 public
  33      3       1      0b2100     __     N8     No_Module
  34      3       2      0b2200     __     N8     No_Module
  35      3       3      0b2300     __     N8     No_Module
  36      3       4      0b2400     id     N4     Online      F-Port
10:00:00:00:c9:51:00:2d
  37      3       5      0b2500     __     N8     No_Module

switch:admin>
```

4. Verify that all the IP address information is correct by typing
   ipAddrShow and checking the results against the IP information
   recorded in the "config-miscinfo.txt" file.

   ```
   switch:admin> ipaddrshow

   CHASSIS
   Ethernet IP Address: 10.32.50.12
   Ethernet Subnetmask: 255.55.0.0

   CP0
   Ethernet IP Address: 10.32.50.10
   Ethernet Subnetmask: 255.55.0.0
   HostName : cp0
   Gateway Address: 10.32.40.1

   CP1
   Ethernet IP Address: 10.32.50.11
   Ethernet Subnetmask: 255.55.0.0
   HostName : cp1
   Gateway Address: 10.32.40.1

   Backplane IP address of CP0 : 10.0.0.4
   Backplane IP address of CP1 : 10.0.0.5
   switch:admin>switch:admin>
   ```

Reconnecting the system to the network and fabric

See the cable routing information recorded in Table 14 on page 139 for the following steps.

1. Connect the CP blades to the local area network:

    a. Insert the appropriate Ethernet cables into each Ethernet port.

    b. Connect the other ends to an Ethernet 10/100 Base-T LAN, if not already connected.

    Note: The ED-DCX-4S-B can be accessed by remote connection using any of the available management tools, such as Telnet or Web Tools. Ensure that the ED-DCX-4S-B is not modified using other connections during the rest of this procedure.

2. Reconnect the transceivers and cables to the port blades:

    Note: The ports and cables used in trunking groups must meet specific requirements. For a list of these requirements, refer to the *EMC Connectrix B Series Fabric OS Administrator's Guide.*

    a. Position one of the transceivers so that the key is oriented correctly to the port and insert the transceiver into the port until it is firmly seated and the latching mechanism clicks.

    b. Select the cable that corresponds to the port and position it so that the key (the ridge on one side of the cable connector) is aligned with the slot in the transceiver; then, insert the cable into the transceiver until the latching mechanism clicks.

    c. Repeat step a and step b for the remaining ports.

    Note: Do not route cables in front of the air exhaust vent (located on the upper port side of the chassis).

    d. Organize the cables as required.

Verifying correct configuration of the fabric

Copying the command outputs from this section into a file is recommended.

1. Create an "after" SAN profile by entering the following commands and copying the output to a text file named "SANafter.txt":

   - **nsShow**

   - **nsAllShow**

   - **switchShow**

   - **fabricShow**

```
switch:admin> nsshow
Type Pid    COS     PortName NodeName TTL(sec)
 N   020f00;    3;10:00:00:01:73:00:29:46;10:00:00:01:73:00:29:46; na
    Fabric Port Name: 20:0f:00:60:69:90:03:f0
<output truncated>

switch:admin> nsallshow
{
 020f00 021fda 021fdc 021fe0 021fe1
5 Nx_Ports in the Fabric}

switch:admin> switchshow
switchName: rsl8-st03-dcx-01
<output truncated>

switch:admin> fabricshow
Switch ID Worldwide Name Enet IP Addr FC IP Addr Name
<output truncated>

switch:admin>
```

2. Determine any differences between the information in the "SANafter.txt" file and the information in the "SANbefor.txt" file created earlier. In particular, look for differences in the following:

   - Device types

   - Number of devices

   - ISL and port states

   - Number of switches in the fabric

3. Resolve any issues or unintentional changes to the ED-DCX-4S-B or fabric.

   - If there are any mechanical problems, try reseating the associated component.

- If the configuration information is not correct for the ED-DCX-4S-B, modify as required. If necessary, the configuration saved before the replacement can be downloaded using the **configDownload** command.

  The **configDownload** command can be entered through a Telnet or serial session, but the ED-DCX-4S-B must have an Ethernet connection to the server name or IP of the host for the download process to complete. For more information, refer to the **help configdownload** command or the *EMC Connectrix B Series Fabric OS Command Reference*.

```
switch:admin> configdownload
Server Name or IP Address [host]: 123.123.123.123
User Name [None]: Admin24
File Name [config.txt]: config-switch.txt
Password: xxxxxxxx
download complete
switch:admin>
```

- If other issues exist, contact your support provider.

Cable routing table

Table 14 is a 48-port template for a cable-routing table. Expand the table for the number of ports in the ED-DCX-4S-B.

Table 14   Cable routing table for ED-DCX-4S-B (48 ports shown) (page 1 of 3)

Slot/port		Cable labels		Connected device	Slot/port of device
Slot	Port	Switch end	Device end		
	0				
	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				

Table 14   Cable routing table for ED-DCX-4S-B (48 ports shown) (page 2 of 3)

Slot/port		Cable labels		Connected device	Slot/port of device
Slot	Port	Switch end	Device end		
	10				
	11				
	12				
	13				
	14				
	15				
	16				
	17				
	18				
	19				
	20				
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				

Table 14   Cable routing table for ED-DCX-4S-B (48 ports shown) (page 3 of 3)

Slot/port		Cable labels		Connected device	Slot/port of device
Slot	Port	Switch end	Device end		
	34				
	35				
	36				
	37				
	38				
	39				
	40				
	41				
	42				
	43				
	44				
	45				
	46				
	47				

A

Specifications

This appendix contains the following information:

General specifications

The ED-DCX-4S-B is compliant with United States and International safety and EMC (Electromagnetic Compatibility) standards. Table 15 lists the general specifications for the ED-DCX-4S-B.

Table 15   General specifications

Specification	Description
Configurable port types	F_Port, FL_Port, E_Port, VEX_Port, VE_Port, EX_Port, and M_Port
System architecture	Nonblocking shared memory
System processor	FreeScale 8548, 1.2 GHz
ANSI Fibre Channel protocol	FC-PH (Fibre Channel Physical and Signalling Interface standard)
Modes of operation	Fibre Channel Class 2, Class 3, and Class F
Fabric initialization	Complies with FC-SW 5.0
FC-IP (IP over Fibre Channel)	Complies with FC-IP 2.3 of the FCA profile
Aggregate I/O bandwidth	3 Tbps per chassis
Port to port latency	Less than 2 microseconds with no contention (destination port is free)
Routing capacity	A minimum aggregate routing capacity of four million frames per second (for Class 2, Class 3, and Class F frames in a 64-port switch)

System architecture

Table 16 describes the system architecture of the ED-DCX-4S-B.

Table 16   System architecture (page 1 of 2)

Fibre Channel Ports	Up to 192 ports, universal (E_Port, F_Port, FL_Port, EX_Port, and M_Port)
Control Processor	Redundant (active/standby) control processor modules
Scalability	Full fabric architecture: 239 switches maximum
Performance	1.063 Gbps line speed, full duplex 2.125 Gbps line speed, full duplex 4.25 Gbps line speed, full duplex 8.50 Gbps line speed, full duplex 10.51875 Gbps line speed, full duplex (with PB-48K-10G-6 blade) Autosensing of 1, 2, 4, and 8 Gbps port speeds optionally programmable to fixed port speed, speed matching between 1, 2, 4, and 8 Gbps port speeds. Range depends on use of 4 Gbps or 8 Gbps SFPs
ISL Trunking	Can use up to 8 ports in a trunk group to form a 64 Gbps trunk
Aggregate bandwidth	3 Tbps per chassis
Switch latency	PB-DCX-16P blade: <2.1 µsec any port to any port at 8 Gbps, cut-through routing. PB-DCX-32P blade: <2.1 µsec any port to any port at 8 Gbps, cut-through routing. PB-DCX-48P blade: <2.1 µsec any port to any port at 8 Gbps, cut-through routing. PB-48K-AP4-18 blade: <3.6 µsec any port to any port at 4 Gbps, cut-through routing. PB-48K-18i blade: <3.6 µsec any port to any port at 4 Gbps, cut-through routing.
Maximum frame size	2112-byte payload
Frame buffers	2048 per ASIC, dynamically allocated
Classes of service	Class 2, Class 3, Class F (interswitch frames)

Table 16   System architecture (page 2 of 2)

Port types	The PB-DCX-16P and PB-DCX-32P supports these port types: - FL_Port, F_Port, E_Port, and M_Port PB-DCX-48P supports these port types: - E_Port, F_Port, and M_Port PB-48K-10G-6 supports this port type: - E_Port and M_Port PB-48K-AP4-18 supports these port types: - FL_Port, F_Port, E_Port, and M_Port PB-48K-18i supports these port types: - FL_Port, F_Port, E_Port, M_Port, VE_Port, EX_Port, and VEX_Port PB-DCX-16EB supports these port types: - FL_Port, F_Port, E_Port, EX_Port, and M_Port **Note:** Self-discovery is based on switch type (U_Port) with an optional port type control.
Data traffic types	Fabric switches supporting unicast, multicast (255 groups), and broadcast
Media types	4Gb: PB-DCX-16P, -32, and -48; PB-48K-18i; PB-48K-AP4-18; and PB-DCX-16EB blades require EMC hot-pluggable, Small Form-factor Pluggable (SFP), LC connector; 4Gb Short-Wavelength Laser (SWL); 4Gb Long-Wavelength Laser (LWL); 4Gb Extended Long-Wavelength Laser (ELWL) 8Gb: PB-DCX-16P, -32, and-48; and PB-DCX-16EB blades require EMC hot-pluggable SFP, LC connector; 8Gb SWL 10Gb: PB-48K-10G-6 blades utilize non-EMC hot-pluggable, 10Gb Small Form Factor Pluggable (XFP), LC connector; 10Gb SWL; 10Gb LWL Distance subject to fiber optic cable and port speed
Fabric Services	Advanced Performance Monitoring; Adaptive Networking (Ingress Rate Limiting, Traffic Isolation, QoS); BB credit recovery; EMC Advanced Zoning (default zoning, port/WWN zoning, broadcast zoning); Dynamic Path Selection (DPS); Extended Fabrics; Fabric Watch; FDMI; Frame Redirection; FSPF; Integrated Routing (PB-48K-18i SAN Extension blade not required for routing); IPFC; ISL Trunking; Management Server; N_Port Trunking; NPIV; NTP v3; Port Fencing; Registered State Change Notification (RSCN); Reliable Commit Service (RCS); Simple Name Server (SNS); Top Talkers; Virtual Fabrics (Logical Switch, Logical Fabric)
Inter-chassis linking (ICL)	Chassis-to-chassis linkage through connectors on the core switch blade (CR4S-8)

System size and weight

The weight of the ED-DCX-4S-B can vary considerably depending on the combination of blades installed. Use Table 17 and Table 18 on page 148 to determine the weight of the ED-DCX-4S-B with your combination of port and application blades.

Table 17   System size and weight

System	Size and weight
Width	43.74 cm (17.22 in.)
Height	61.24 cm (24.11 in./8U) 68.90 cm (27.12 in./9U) with Port Side Exhaust Kit
Depth	61.29 cm (24.09 in.)
Depth (with door)	73.20 cm (28.82 in.)
ED-DCX-4S-B: 192-port configuration with four PB-DCX-48P port blades	68 kg (150 lb.)
Empty chassis: • No blades • No CPs • No CRs • No power supplies • No fan assemblies	25.76 kg (56.8 lb.)

System blade and FRU weights

Table 18 lists the weights of the compatible blades and FRUs.

Table 18   **System FRU weights**

FRU	Weight
CP blade (CP8)	3.0 kg (6.6 lb.)
CR blade (CR4S-8)	3.27 kg (7.2 lb.)
PB-DCX-16P (FC8-16) port blade	3.0 kg (6.6 lb.) without media
PB-DCX-32P (FC8-32)	3.27 kg (7.2 lb.) without media
PB-DCX-48P (FS8-48) port blade	3.36 kg (7.4 lb.) without media
PB-48K-10G-6 (FC10-6)port blade	3.1 kg (6.8 lb) without media
PB-48K-AP4-18 (FA4-18) application blade	3.36 kg (7.4 lb) without media
PB-48K-18i (FR4-18i) application blade	3.36 kg (7.4 lb) without media
PB-DCX-16EB (FS8-18) encryption blade	5.5 kg (12.0 lb)
Port card filler panel	1.5 kg (3.2 lb)
Power supply	2.45 kg (5.4 lb.)
Blower assembly	5.73 kg (12.6 lb.)
WWN bezel	0.3 kg (0.6 lb)
Vertical cable management fingers	0.45 kg (1.0 lb.)
Chassis door	2.09 kg (4.6 lb.)

Note: Note: The blade identifiers in parenthesis in Table 18 reflect the Brocade blade model names. These are the names that will appear in the various CLI output and logs.

Facility requirements

The facility where the ED-DCX-4S-B is in use must meet the following requirements to provide for correct operation:

♦ Adequate supply circuit, line fusing, and wire size, as specified by the electrical rating on the chassis nameplate.

♦ An air flow of at least 350 cubic feet per minute (595 cubic meters per hour) in the immediate vicinity of the ED-DCX-4S-B.

♦ Electrical interference less than the levels stated in the standards listed in Table 15 on page 144.

♦ The environmental specifications listed in Table 19 on page 150.

♦ The power specifications listed in Table 20 on page 152.

Furthermore, if the ED-DCX-4S-B will be installed in an EIA rack, ensure the following:

♦ All equipment installed in the rack has a reliable branch circuit ground connection, and does not rely on a connection to a branch circuit, such as a power strip.

♦ The rack is balanced and mechanically secured to provide stability in the event of an earthquake.

♦ Additional equipment does not exceed the rack's weight limits.

Environmental requirements

Table 19 lists the environmental operating ranges for the ED-DCX-4S-B. The requirements for non-operating conditions are also provided for acceptable storage and transportation environments.

Table 19   Environmental requirements

Condition	Acceptable range during operation	Acceptable range during nonoperation
Ambient temperature	10° to 40° C outside switch (50° to 104° F)	-40° to +70° C outside switch (-40° to 158° F)
Humidity	5% to 85% RH noncondensing, at 40° Celsius, with maximum gradient of 10% per hour	10% to 93% RH noncondensing, at 70° Celsius
Altitude	Up to 3 km (10,000 ft.) above sea level	0 to 12 km (40,000 ft.) above sea level
Shock	20G, 6ms duration, half-sine wave	33G, 11ms duration, half-sine wave
Vibration	0.5G p-p, 5-500 Hz at 1.0 octave/minute	2.0G p-p, 5-500 Hz at 1.0 octave/minute
Air flow	350 cu ft/min. (0.00059 cu m/hr)	None required
Heat dissipation	841 Watts or 2869 BTU/hr (Four PB-DCX-48P blades, two CP8 blades, and two CR4S-8 blades)	Not applicable

Note: The 10° to 40° Celsius range applies to the ambient air temperature at the air intake vents on the nonport side of the ED-DCX-4S-B.

The temperature inside the ED-DCX-4S-B can be up to 75° Celsius during operation. If the internal temperature range exceeds the operating ranges of the components, the LEDs, error messages, and Fabric Watch alerts will indicate a problem. Use the **tempShow** command or Fabric Watch commands to view temperature status.

Fibre Channel port specifications

The Fibre Channel ports in the ED-DCX-4S-B support full duplex link speeds at 10, 8, 4, 2, or 1 Gbps inbound and outbound, automatically negotiating to the highest common speed of all devices connected to the port.

The ports are compatible with optical SWL (short wavelength: approximately 850 nm), optical LWL (long wavelength: approximately 1310 nm), and Extended Long Wavelength (ELWL) laser transmitter SFPs and XFPs (PB-48K-10G-6 only) (approximately 1550 nm). The strength of the signal is determined by the type of SFP or XFP in use.

The ports are universal and self-configuring, capable of becoming F_Ports (fabric ports), FL_Ports (fabric loop enabled), or E_Ports (expansion ports).

The ports meet all required safety standards. For a listing of these standards, see "Regulatory compliance".

Power specifications

The power subsystem is a redundant +48V DC power distribution system with a provision for up to two 2000-watt, 48V DC bulk power supplies. Two bulk power supplies produce the intermediate distribution voltage in the distributed power system.

The power specifications in Table 20 are calculated for fully loaded systems with two power supplies, four PB-DCX-48P port blades, two CP8 blades, two CR4S-8 blades, and two blower assemblies.

Note: If the EMC encryption blade (PB-DCX-16EB) is used, 220 VAC is required.

Table 20   Power specifications

Specification	Value
Voltage	Range: 85 - 264 VAC Auto-volt, Nominal: 100 to 240 VAC
Power supply output (each)	Low line (85- 132 VAC), 1000W; High line (180 - 264 VAC), 2000W
Input frequency	Range: 47-63 Hz; Nominal: 50 - 60 Hz
AC inrush	Maximum 20A peak
System power consumption	AC power consumption is configuration-specific. A system with four PB-DCX-48P port blades (loaded with 1W SFPs), two CP8 blades, two CR4S-8 blades, and two blower assemblies consumes 841W.

Power cords

The types of power cords provided with the ED-DCX-4S-B are specific to the country where it is installed. For each of these types of power cords (Table 21), the end that connects to the ED-DCX-4S-B has an IEC 60320/C19 cable connector. The AC power receptacles on each power supply are equipped with IEC 60320/C20 power connectors.

To order a power cord, contact your EMC account representative.

Table 21   Power cord types (international) (page 1 of 4)

| Country | Plug style | | | | |
	NEMA L6-20 USA, Canada, Mexico, other North American locations	CEE-7/7 "Schuko" Continental Europe/Ireland	BS-1363A United Kingdom/ Hong Kong	AS 3112 Australia/New Zealand	IEC-60309 32A-6h, 230 V~
Argentina					X
Australia				X	
Austria		X			
Bahrain			X		
Belgium		X			
Brazil	X				
Chile	X				
China, People's Rep.				X	
Czech, Rep. of					X
Denmark					X

Table 21   Power cord types (international) (page 2 of 4)

	Plug style				
	NEMA L6-20 USA, Canada, Mexico, other North American locations	CEE-7/7 "Schuko" Continental Europe/Ireland	BS-1363A United Kingdom/ Hong Kong	AS 3112 Australia/New Zealand	IEC-60309 32A-6h, 230 V~
Country					
Egypt					X
England					X
Finland					X
France		X			
Germany		X			
Greece		X			
Hong Kong		X			
Hungary			X		
India		X			
Indonesia					X
Ireland, North				X	
Ireland, South		X			
Israel			X		
Italy					X
Japan					X
Korea, South					X
Malaysia		Alternate			Recommended
Mexico	X				

Table 21   Power cord types (international) (page 3 of 4)

Country	Plug style				
	NEMA L6-20 USA, Canada, Mexico, other North American locations	CEE-7/7 "Schuko" Continental Europe/Ireland	BS-1363A United Kingdom/ Hong Kong	AS 3112 Australia/New Zealand	IEC-60309 32A-6h, 230 V~
Monaco		X			
Netherlands					X
New Zealand				X	
Norway					X
Poland					X
Portugal		X			
Puerto Rico	X				
Russia		X			
Saudi Arabia					X
Scotland					X
Singapore			X		
South Africa			X		
Spain					X
Sweden					X
Switzerland					X
Taiwan	X				
Turkey					X

Table 21   Power cord types (international) (page 4 of 4)

Country	Plug style				
	NEMA L6-20 USA, Canada, Mexico, other North American locations	CEE-7/7 "Schuko" Continental Europe/Ireland	BS-1363A United Kingdom/ Hong Kong	AS 3112 Australia/New Zealand	IEC-60309 32A-6h, 230 V~
United Arab Emirate		X			
United Kingdom / Ireland					X
United States	X				
Venezuela	X				
Yugoslavia					X

Data transmission ranges

Table 22 provides the data transmission ranges for different cable types and port speeds.

Note: The full range of 1, 2, 4, and 8 Gbps can only be achieved by a combination of 4 Gbps SFPs (1, 2, and 4 Gbps) and 8 Gbps SFP+ (2, 4, and 8 Gbps).

Table 22   Supported optics, speeds, cables, and distances

Transceiver type	Form factor	Speed	Multimedia (62.5 um) (OM1)	Multimedia (50 um) (OM2)	Multimedia (50 um) (OM3)	Single Mode Media (9 um)
SW	SFP	1 Gbps	300 m	500 m	860 m	N/A
	SFP/SFP+	2 Gbps	150 m	300 m	500 m	N/A
	SFP/SFP+	4 Gbps	70 m	150 m	380 m	N/A
	SFP+	8 Gbps	21 m	50 m	150 m	N/A
LW	SFP	2 Gbps	N/A	N/A	N/A	30 km
	SFP	4 Gbps	N/A	N/A	N/A	30 km
	SFP+	8 Gbps	N/A	N/A	N/A	N/A

Regulatory compliance

This section describes the regulatory compliance requirements for the ED-DCX-4S-B. It contains:

Power-cord notice

CAUTION

This switch might have more than one power cord. To reduce the risk of electric shock, disconnect both power cords before servicing.

Power-cord notice (Japan, Denan)

注意 – 添付の電源コードを他の装置や用途に使用しない
添付の電源コードは本装置に接続し、使用することを目的として設計され、その安全性が確認されているものです。決して他の装置や用途に使用しないでください。火災や感電の原因となる恐れがあります。

Note: Never use the power cord packed with your equipment for other products.

FCC warning (US only)

This equipment has been tested and complies with the limits for a Class A computing device pursuant to Part 15 of the FCC Rules. These limits are designed 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, and if not installed and used in accordance with the instruction manual, might cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at the user's own expense.

KCC statement (Republic of Korea)

사용자 안내문 : A 급기기

이 기기는 업무용으로 전자파 적합 등록을 받은 기기
이오니, 판매자 또는 사용자는 이점을 주의하시기
바라며, 만약 잘못 구입하셨을 때에는 구입한 곳에
서 비업무용으로 교환하시기 바랍니다.

VCCI statement (Japan)

This is a 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 might arise. When such trouble occurs, the user might be required to take corrective action.

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に要求されることがあります。

BSMI statement (Taiwan)

The BSMI Statement is applicable to the power supplies.

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，
在這種情況下，使用者會被要求採取某些適當的對策。

CE statement

This is a Class A product. In a domestic environment, this product might cause radio interference, and the user might be required to take corrective measures.

The standards compliance label on the product contains the CE mark which indicates that this system conforms to the provisions of the following European Council directives, laws, and standards:

◆ Electromagnetic Compatibility (EMC) Directive 2004/108EEC

◆ Low Voltage Directive (LVD) 73/23/EEC and the Complementary Directive 93/68/EEC

◆ EN55022:2006 (European Emissions Requirements)

◆ EN55024:1998, +A1:2001 and +A2:2003 (European Immunity Requirements)

◆ EN61000-3-2:2006/JEIDA (European and Japanese Harmonics Spec)

◆ EN61000-3-3:1995, +A1:2001 and +A2:2005

Canadian requirements

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations, ICES-003 Class A.

Laser compliance

This equipment contains Class 1 laser products and complies with FDA Radiation Performance Standards, 21 CFR Subchapter I and the international laser safety standard IEC 825-2.

Use only optical transceivers that are qualified by EMC and comply with the FDA Class 1 radiation performance requirements defined in 21 CFR Subchapter I, and with IEC 825-2. Optical products that do not comply with these standards might emit light that is hazardous to the eyes.

Regulatory compliance standards

Table 23 on page 161 lists the regulatory compliance standards for which the ED-DCX-4S-B is certified.

Table 23   Regulatory compliance standards

Country	Standards		Agency Certifications and Markings	
	Safety	**EMC**	**Safety**	**EMC**
United States	Bi-Nat UL/CSA 60950-1 1st Ed or latest	ANSI C63.4	cCSAus	FCC Class A and Statement
Canada	Bi-Nat UL/CSA 60950-1 1st Ed or latest	ICES-003 Class A	cCSAus	ICES A and Statement
Japan		CISPR22 and JEIDA (Harmonics)		VCCI-A and Statement
European Union	EN60950-1 or latest	EN55022 and EN55024	TUV-GS, N	CE marking
Australia, New Zealand		EN55022 or CISPR22 or AS/NZS CISPR22		C-Tick mark
Argentina	IEC60950-1 or latest		"S" mark	
Russia	IEC60950-1 or latest	51318.22-99 and 51318.24.99 or latest	GOST mark	GOST mark
Korea		KN22 and KN24		KCC mark Class A
China (PS only)	GB4943-2001 and GB9254-1998 or latest	GB17625.1-2003 or latest	CQC logo	CQC logo
Taiwan (PS only)	CNS 14336(94) or latest	CNS 13438(95) or latest	BSMI mark	BSMI mark

Environmental regulation compliance

This section describes the China RoHS environmental regulatory compliance requirements for the ED-DCX-4S-B.

China RoHS

The contents included in this section are per the requirements of the People's Republic of China- Management Methods for Controlling Pollution by Electronic Information products.

遵守环境法规

中国 **RoHS**

本节中包含的内容都遵守了中华人民共和国《电子信息产品污染控制管理办法》的要求。

Environmental Protection Use Period (EPUP) Disclaimer

In no event do the EPUP logos shown on the product and FRUs alter or expand that warranty that EMC provides with respect to its products as set forth in the applicable contract between EMC and its customer. EMC hereby disclaims all other warranties and representations with respect to the information contained on this CD including the implied warranties of merchantability, fitness for a particular purposes and non-infringement.

The EPUP assumes that the product will be used under normal conditions in accordance with the operating manual of the product.

环保使用期限 **(EPUP)** 免责声明：

EPUP 标志不会出现在产品和 FRU 的改装产品中，也不会对 Brocade 所提供的相关产品保修条款（该保修条款在 Brocade 及其客户间达成的适用合同中列出）进行增补。对于此 CD 上包含的相关信息，如适销性、针对特定用途的适用性和非侵权性的暗示保证，Brocade 在此郑重声明本公司对于与上述信息相关的所有其他保证和陈述概不负责。EPUP 假设在"产品操作手册"中注明的常规条件下使用该产品。

China RoHS hazardous substances/toxic substances (HS/TS) concentration chart

In accordance with China's Management Measures on the Control of Pollution caused by Electronic Information products (Decree No. 39 by the Ministry of Information Industry), the following information is provided regarding the names and concentration level of hazardous substances (HS) which may be contained in this product.

	Hazardous/Toxic Substance/Elements					
Name of the Component	**Lead (PB)**	**Mercury (Hg)**	**Cadmium (CD)**	**Hexavalent Chromium (CR6+)**	**Polybrominated Biphenyl (PBB)**	**Polybrominated Diphenyl Ether (PBDE)**
Fiber Channel Switch	X	O	O	O	O	O
Fan , Blower assemblies	X	O	O	O	O	O
PCBA cards	X	O	O	O	O	O
Host Bus Adapter (HBA)	X	O	O	O	O	O
USB Flash Drive	O	O	O	O	O	O
Power Supply kit	X	O	O	O	O	O
SFPs (optical cable connectors) [20]	X	O	O	O	O	O
Sheet Metal	X	O	O	O	O	O
Chassis Assembly	X	O	O	O	O	O
Mechanical brackets & Slides	X	O	O	O	O	O
Slot Filler	X	O	O	O	O	O
Cable management tray	X	O	O	O	O	O
Cable Comb	O	O	O	O	O	O
Cables and power cords [20]	O	O	O	O	O	O
Replacement Doors	X	O	O	O	O	O
Software / Documentation CDs	O	O	O	O	O	O

X indicates that the concentration of such hazardous/toxic substance in all the units of homogeneous material of such component is higher than the SJ/T11363-2006 Requirements for Concentration Limits.

O indicates that no such substances are used or that the concentration is within the aforementioned limits.

CHINA ROHS 有害物质/有毒物质(HS/TS)限量列表

有毒与有害物质或元素的名称及含量

根据中国的<<电子信息产品污染控制管理办法>> (信息产业部第 39 号令)，本公司提供以下有关产品中可能含有的有害物质(HS)的名称及含量水平的信息。

主要部件名称	有害/有毒物质或元素					
	铅 （Pb）	汞 （Hg）	镉 （Cd）	六价铬 （CR6+）	多溴联苯 （PBB）	多溴二苯醚 （PBDE）
光纤通道交换机	X	O	O	O	O	O
风扇/冷却组装件	X	O	O	O	O	O
线路板部件	X	O	O	O	O	O
主机总线适配器 (HBA)	X	O	O	O	O	O
USB 闪存器	O	O	O	O	O	O
电源	X	O	O	O	O	O
(20) SFP（光纤接头）	X	O	O	O	O	O
钣金件	X	O	O	O	O	O
机箱部件	X	O	O	O	O	O
机械支架及滑轨	X	O	O	O	O	O
插槽填充物	X	O	O	O	O	O
电缆整理盘	X	O	O	O	O	O
梳状线缆	O	O	O	O	O	O
(20) 线束及电源线	O	O	O	O	O	O
替换门	X	O	O	O	O	O
软件/文档光盘	O	O	O	O	O	O

X   表示此类部件内同质材料中的有害/有毒含量高于 SJ/T 11363-2006 的限量要求。

O   表示未使用此类物质或其含量低于上述限量要求。

Application and Encryption Blades

This appendix contains the following information:

PB-48K-AP4-18 blade

The PB-48K-AP4-18 blade has 16 physical Fibre Channel SFP ports supporting the Fibre Channel Application Services, and two physical Gigabit 10/100/1000 BaseT Ethernet copper ports supporting blade management.

The PB-48K-AP4-18 blade is intended as a platform for Fibre Channel Application Services and blade management. Refer to the *EMC Connectrix B Series Fabric OS Administrator's Guide* for information on configuring these features.

PB-48K-18i blade

The PB-48K-18i blade has 16 physical Fibre Channel SFP ports supporting the Fibre Channel Routing Services, and two physical Gigabit Ethernet (GbE) SFP ports supporting the Fibre Channel Over IP (FCIP) feature. It operates with the Fabric Operating System and can communicate with another PB-48K-18i or an MP-7500B for both Fibre Channel Routing services and FCIP, or a AP-7420B for Fibre Channel Routing Services.

The PB-48K-18i blade is intended as a platform for Fibre Channel Routing Services and FCIP. Refer to the *EMC Connectrix B Series Fabric OS Administrator's Guide* for information on configuring these features.

The PB-48K-18i blade provides the following features:

◆ 16 Fibre Channel SFP ports supporting the Fibre Channel Routing Services with link speeds up to 1, 2, or 4 Gbps.

◆ 2 GbE ports supporting the FCIP and Fibre Channel Routing Services with fixed link speed at 1 Gbps:

  • Each GbE port can support up to eight FCIP tunnels.

  • Each FCIP tunnel is represented and managed as a virtual Fibre Channel E_Port.

  • Fibre Channel Routing Services can be used over the FCIP link.

  • Fabrics connected through FCIP merge if the ports are configured as VE_Ports, and do not merge if they are configured as VEX_Ports. If VE_Ports are used in a Fibre Channel Routing Services backbone fabric configuration, then the backbone fabric merges, but the EX_Port-attached edge fabrics do not merge. For more information refer to the *EMC Connectrix B Series Fabric OS Administrator's Guide.*

PB-DCX-16EB blade

The PB-DCX-16EB encryption blade is a high performance 16 port auto-sensing blade with data cryptographic (encryption/decryption) and data compression capabilities designed for enterprises to secure their data against theft or unauthorized use and to compress tape data for maximum utilization of tape media. The encryption blade is a network-based solution that secures data-at-rest for heterogeneous tape drives, disk array LUNs, and virtual tape libraries.

The PB-DCX-16EB blade provides the following major features:

◆ 16 auto-sensing F, FL, E, EX, and M ports at 8 Gbps FC ports

◆ 16 SFP media interfaces

◆ Encryption engines

◆ Key management/generation

◆ Key management with these hardware interfaces:

  • Two 1000 Base copper type media interfaces

  • One smart card interface

◆ Security supervisor tamper detection and response capability

◆ CC (Common Criteria) EAL-3 compliant

C

Diagnostics and Troubleshooting

This appendix contains the following information:

Introduction

For information about troubleshooting the entire fabric, refer to the *EMC Connectrix B Series Fabric OS Troubleshooting and Diagnostics Guide.*

The ED-DCX-4S-B includes a number of diagnostic aids to assist with troubleshooting, including LEDs on the hardware, commands that display current status, diagnostic tests for hardware and software, and error messages. In addition, a number of managing and monitoring features are available, such as Fabric Manager, Web Tools, Fabric Watch, and Advanced Performance Monitoring.

If the ED-DCX-4S-B does not operate as expected, the following steps can be taken to diagnose the problem:

◆ Check the LEDs and see the LED tables (Chapter 4, "Monitor System Components,") for interpretation and recommended actions.

◆ Review the results of the last POST run by the ED-DCX-4S-B ("Interpreting POST and boot results").

◆ Review the error logs. (Refer to the *EMC Connectrix B Series Fabric OS Troubleshooting and Diagnostics Guide* for more information).

  • Review RASlog entries.

  • Type the **sensorShow** command to determine the status of the hardware components.

  • Run diagnostic tests ("Diagnostics").

  • Reboot the ED-DCX-4S-B or power the entire chassis off and then on ("Powering off the ED-DCX-4S-B" and "Connecting a serial cable between ED-DCX-4S-B and host").

If the problem is still unresolved after these steps, contact your EMC Customer Service representative.

Obtaining chassis and component status

The CLI commands in Table 24 provide status and environmental information about the chassis and its components. These commands provide information only, and they do not interrupt traffic flow. For more information about these commands, refer to the *EMC Connectrix B Series Fabric OS Command Reference.*

Table 24   Environmental status and maintenance commands

Command	Information displayed
sensorShow	Temperature readings for the port blades
	Temperature readings for the CP blades
	Status and RPM of all operational fans
	Status of all operational power supplies
tempShow	Temperature readings for the port blades
	Temperature readings for the CP blades
psShow	Status of all operational power supplies
fanShow	Status and RPM of all operational fans
chassisShow	Serial number, time awake, and additional information about each component
slotShow	Slot occupancy
errShow errDump	System error log. Refer to the *EMC Connectrix B Series Fabric OS Message Reference* for more information on the messages in this log.

Interpreting POST and boot results

The ED-DCX-4S-B performs Power On Self Test (POST) by default each time the chassis is powered on, rebooted, or reset. The ED-DCX-4S-B can be rebooted using the **reboot** (to reboot each CP individually) or **fastBoot** commands. The **fastBoot** command reboots the switches without running POST. If the active CP blade is rebooted, it fails over to the standby CP blade.

POST

To verify that POST has completed without error:

◆ Verify that all LEDs return to a normal state after POST completes (Chapter 4, "Monitor System Components.")

If one or more LEDs do not return to a normal state, and this is not due to the ED-DCX-4S-B being set to beacon, refer to the relevant LED table to identify and correct the problem. For port blades and CP and core switch blades, the **slotShow** command can be used to check the status of the slots. For information about turning beaconing on/off, refer to the *EMC Connectrix B Series Fabric OS Administrator's Guide*.

◆ Verify that the switch prompt displays when POST completes.

If it does not display, POST was not successfully completed. Contact the ED-DCX-4S-B supplier for support.

◆ Review the system error log using the **errShow** or **errDump** commands.

Any errors detected during POST are written to the system log, which is accessible through the **errShow** command. For information about error messages, refer to the *EMC Connectrix B Series Fabric OS Message Reference*.

POST includes the following steps:

1. Preliminary POST diagnostics are run.

2. Operating system is initialized.

3. Hardware is initialized.

4. Diagnostic tests are run on several functions, including circuitry, port functionality, ability to send and receive frames, all aspects of memory, parity, statistics counters, and serialization.

Boot

In addition to POST, boot includes the following steps after POST is complete:

1. Universal port configuration is performed.

2. Links are initialized.

3. Fabric is analyzed. If any ports are connected to other switches, the ED-DCX-4S-B participates in a fabric configuration.

4. The ED-DCX-4S-B obtains a domain ID and assigns port addresses.

5. Unicast routing tables are constructed.

6. Normal port operation is enabled.

Diagnostics

Diagnostic tests are automatically run during POST to check the status of the ED-DCX-4S-B. Any error messages generated during POST are sent to the error logs and to the serial console, if connected.

Diagnostic tests can also be run manually to test and troubleshoot the hardware and the firmware, including internal connections and circuitry, transceivers, and port cables. However, diagnostic tests are generally intended for use by support personnel.

Note: Error messages do not necessarily indicate that the ED-DCX-4S-B requires maintenance.

Each diagnostic test can be implemented by entering the related command through a Telnet or serial session. For a list of diagnostic tests and commands, refer to the *EMC Connectrix B Series Fabric OS Administrator's Guide*. All diagnostic tests are run at link speeds of 1, 2, 4, and 8 Gbps. They might temporarily lock the transmit and receive speeds to a specific speed. Some diagnostic tests require interconnecting the ports to each other or using loopback plugs. If ports are interconnected, the media (cables and transceivers) at each end of the connection must be of the same type. For example, short wavelength media must be connected to short wavelength media, and likewise with long wavelength media and copper media.

For more information about diagnostic tests and how to run them, refer to the *EMC Connectrix B Series Fabric OS Administrator's Guide* and the *EMC Connectrix B Series Fabric OS Command Reference*. For information about system error messages (**errShow** or **errDump**), refer to the *EMC Connectrix B Series Fabric OS Troubleshooting and Diagnostics Guide*.

Troubleshooting

Table 25 provides a list of issues, possible causes, and recommended actions.

Table 25   Troubleshooting the ED-DCX-4S-B (page 1 of 3)

Issue	Possible cause	Recommended action
Entire chassis powers off automatically.	Power supplies are inadequate to support the installed components.	Add an additional power supply.
Several or all components are not operating.	One or both power cables may not be connected to a live source.	Ensure that both power cables are connected to live outlets.
	One or both AC power switches might be off.	Ensure that both AC power switches are on (AC switches light up green when on).
Serial connection is faulty or serial port logs have incorrect or missing information.	Serial cable is not connected correctly.	Ensure that the cable is firmly connected to the workstation computer and to the ED-DCX-4S-B.
	Terminal emulator application parameters are not set correctly.	Ensure that the terminal emulator application is configured as follows: 9600 bits per second, 8 databits, no parity, 1 stop bit, no flow control.
	Serial port might be incompatible (only RS-232 is supported).	Ensure that the ED-DCX-4S-B is connected to an RS-232 port. RS-423 serial ports might experience difficulties due to corner-case incompatibilities of the standards.
	Pins on the serial cable or serial port might be damaged.	Remove the cable and inspect the pins on the cable and in the serial port. Do not reinstall if the pins on either component have any visible damage, as this could damage the pins on the other component. Replace the components as required.
CP Ethernet link speed is different than expected or a link cannot be established.	There might be a conflict with the CP Ethernet link speed negotiation set up by the network.	Specify the CP Ethernet link speed by typing the **ifModeSet** command.
Configuration data is inaccurate or cannot be accessed.	Chassis was powered off/on while a WWN card was uninstalled or failed.	Install an operational WWN card and power the system off/on again.
	The ED-DCX-4S-B was rebooted while a WWN card was uninstalled or failed.	
Initial set up results in IP address/Domain ID conflict.	The ED-DCX-4S-B was connected to the fabric before being configured.	See Chapter 3, "Log In and Configuration," and the *EMC Connectrix B Series Fabric OS Administrator's Guide* for configuration information.

Table 25   Troubleshooting the ED-DCX-4S-B (page 2 of 3)

Issue	Possible cause	Recommended action
LEDs on one or more components are changing rapidly or do not indicate a healthy state.	The ED-DCX-4S-B might be booting or running POST.	Verify that boot and POST are complete. The ED-DCX-4S-B requires a minimum of 3 minutes, usually, after power-on to complete POST.
	Beaconing might be on for the entire ED-DCX-4S-B or for individual components.	Determine whether beaconing is on by typing the **switchShow** command and reviewing the output for the status of switch beaconing and blade beaconing
	Individual components might have failed.	See the LED tables in Chapter 4, "Monitor System Components," for interpretation and recommended actions.
	Pins on the components might be damaged.	Remove the component from the chassis and inspect the pins on the component and inside the chassis. Do not reinstall if pins on either component are damaged, as this could damage pins on other components. Replace the parts as required.
None of the LEDs on a component are on.	Component might not be seated correctly.	Ensure that the ED-DCX-4S-B has power and the component is firmly seated. If the problem continues, enter the **sensorShow** command to determine the component status. If the component is a CP blade or port blade, enter the **slotShow** command to determine the status.
	Component might have failed.	Replace the component as necessary.
CP blades are failing over frequently.	A third-party application has a memory leak.	Check application for memory leaks.
	There is excessive serial port activity.	Ensure that the serial port activity remains below the specified level.
	CP blade is attached to an Ethernet with high traffic loads.	Ensure that the Ethernet traffic remains below the specified level
	Chassis is overheated.	Enter the **tempshow** and **sensorShow** commands to check internal temperature. If components are overheating, shut down port blades as necessary to return the temperature to the operating range.

Table 25   Troubleshooting the ED-DCX-4S-B (page 3 of 3)

Issue	Possible cause	Recommended action
One or more port blades have either shut down or failed POST as indicated by the error log.	Blades might be overheated.	Enter the **sensorShow** command to check the internal temperature readings. If components are overheating, shut down port blades as necessary to return the temperature readings to the operating ranges.
	Blades might be faulty.	Enter the **slotShow** command to determine status. For more information, enter the **diagDisablePost** command; then, use the **slotPowerOff [slot number]** and **slotPowerOn [slot number]** command. Resolve the source of the problem or replace the blade as required.
	Pins on the blade or the backplane might be damaged.	Remove the blade from the chassis and inspect the pins on the blade and on the backplane inside the slot. Do not reinstall if the pins on either component are damaged, as this could damage pins on other components. Replace the components as required.
An individual component is not operating as expected.	Component may not have power or may not be firmly seated.	Ensure that the component is receiving power (power LED should be on) and the component is firmly seated.
	Pins on the component or the backplane might be damaged.	Remove the component from the chassis and inspect the pins on the blade and inside the chassis. Do not reinstall if the pins on either component are damaged, as this could damage pins on other components. Replace parts as required.
	The component might have failed.	Enter the **tempshow** and **sensorShow** commands to determine the component status. If the component is a CP blade or port blade, enter the **slotShow** command to determine the status. Replace the component as necessary

D

Port Numbering Template

Print or copy the following templates in this appendix and use them to document the port numbering pattern for the ED-DCX-4S-B. These templates show:

- Port side populated with four PB-DCX-48P port blades, two CR4S-8 blades, and two CP8 blades
- Port side populated with four PB-DCX-32P port blades, two CR4S-8 blades, and two CP8 blades
- Port side populated with four PB-DCX-16P port blades, two CR4S-8 blades, and two CP8 blades
- PB-48K-10G-6 port blades
- PB-48K-18i application blades
- PB-48K-AP4-18 application blades
- PB-DCX-16EB encryption blades

The individual blades are shown vertically to make it easier to read the port numbering. Their orientation in the DCX-4S chassis is horizontal.
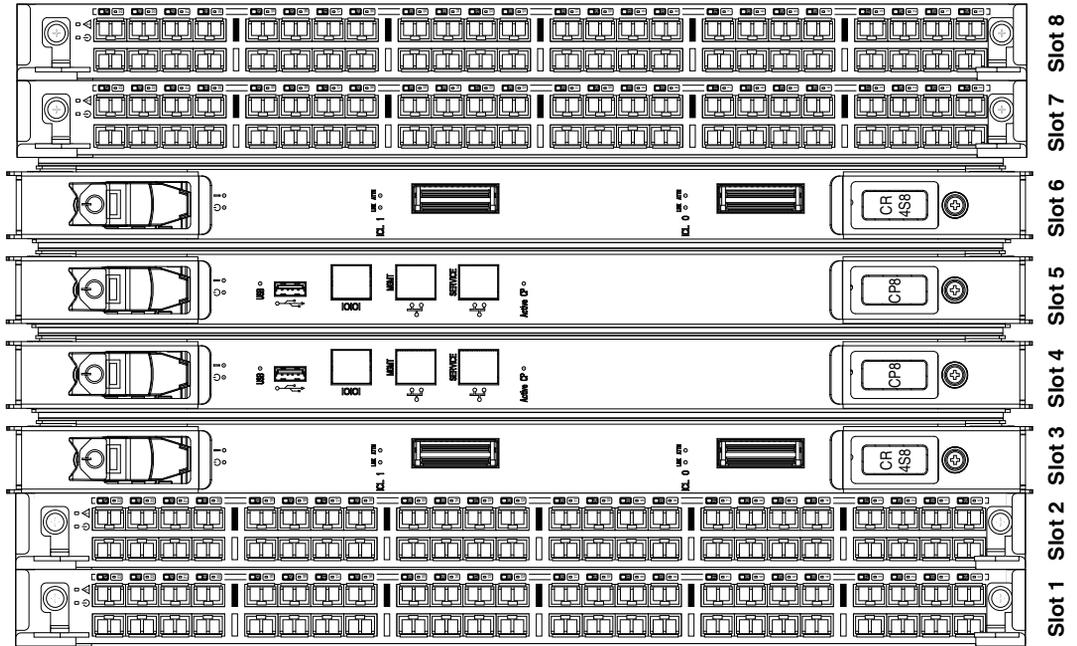
Figure 31   Port side populated with four PB-DCX-48P port blades, two CR4S-8
blades, and two CP8 blades
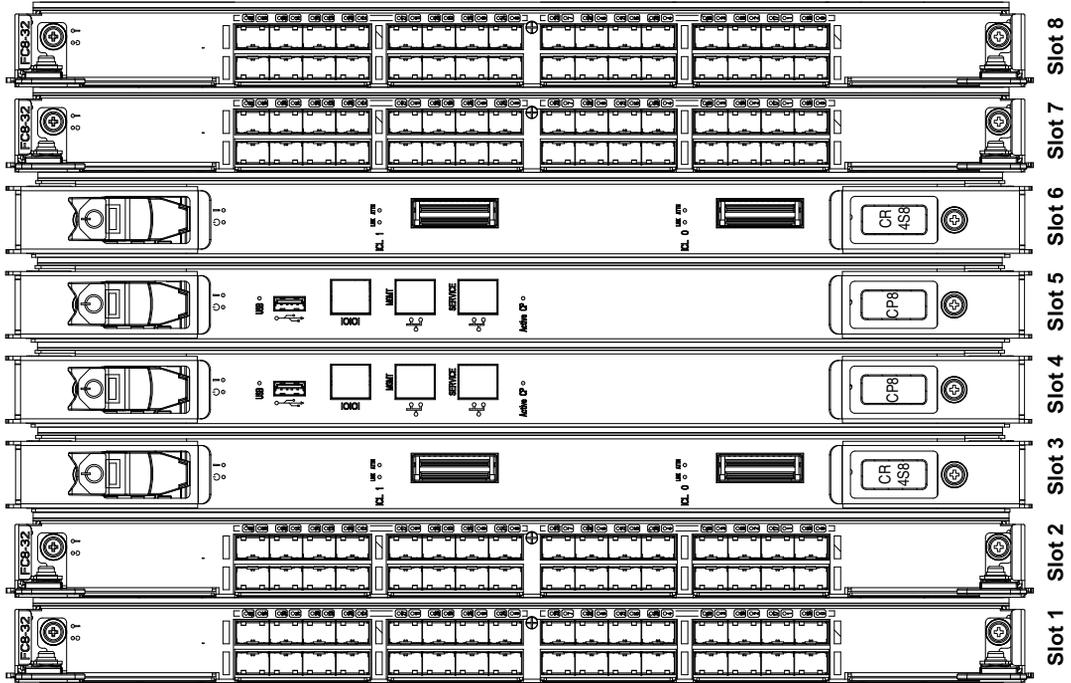
Figure 32   Port side populated with four PB-DCX-32P port blades, two CR4S-8 blades, and two CP8 blades
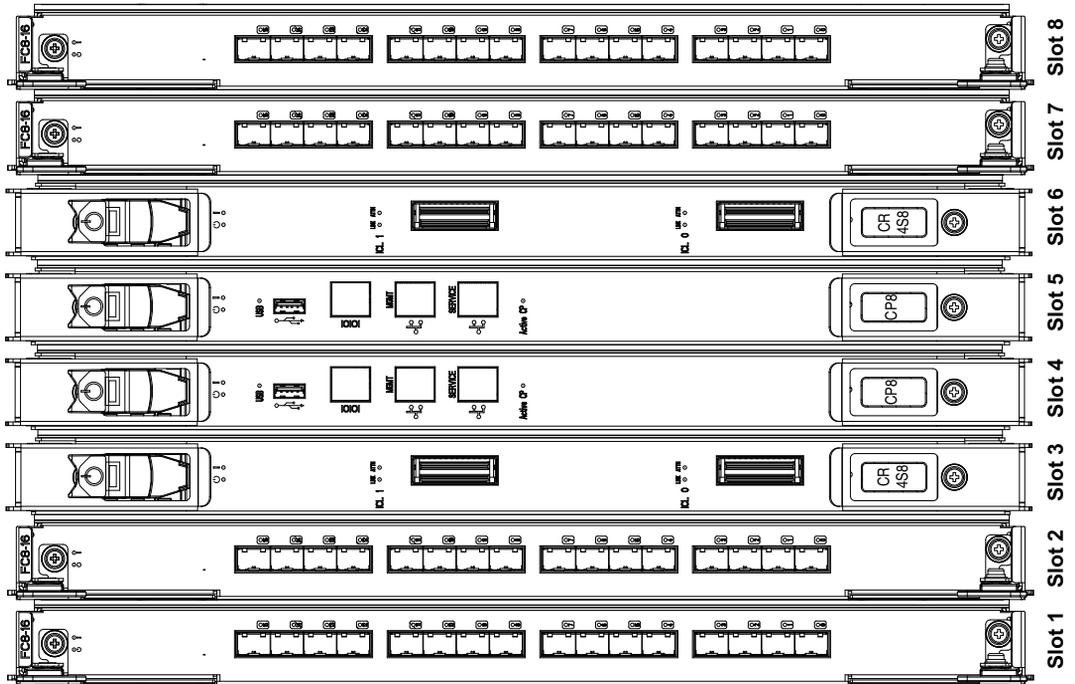
Figure 33   Port side populated with four PB-DCX-16P port blades, two CR4S-8 blades, and two CP8 blades
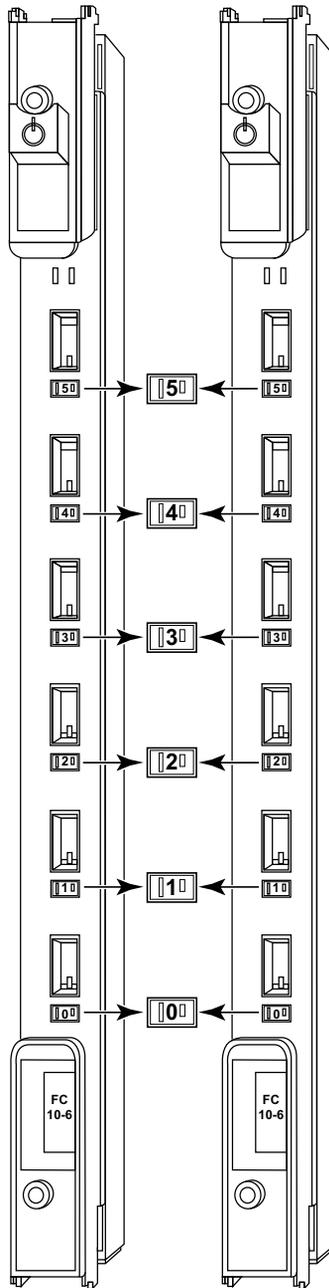
Figure 34   PB-48K-10G-6 port blades
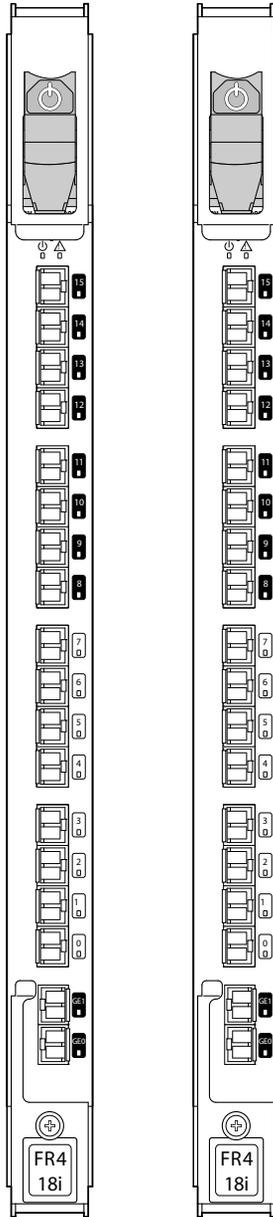
Figure 35   PB-48K-18i application blades
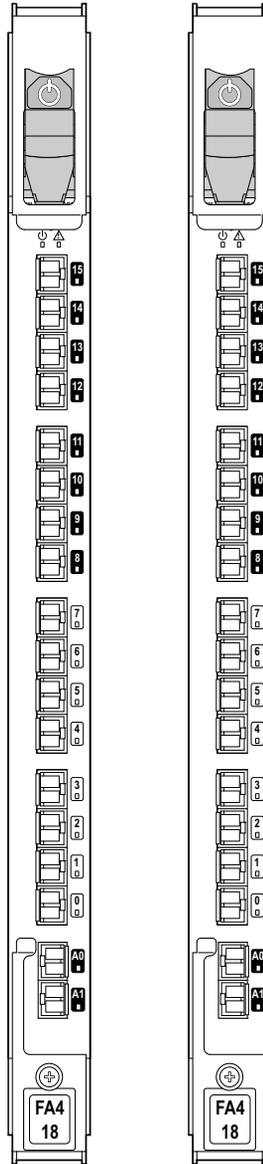
Figure 36   **PB-48K-AP4-18 application blades**
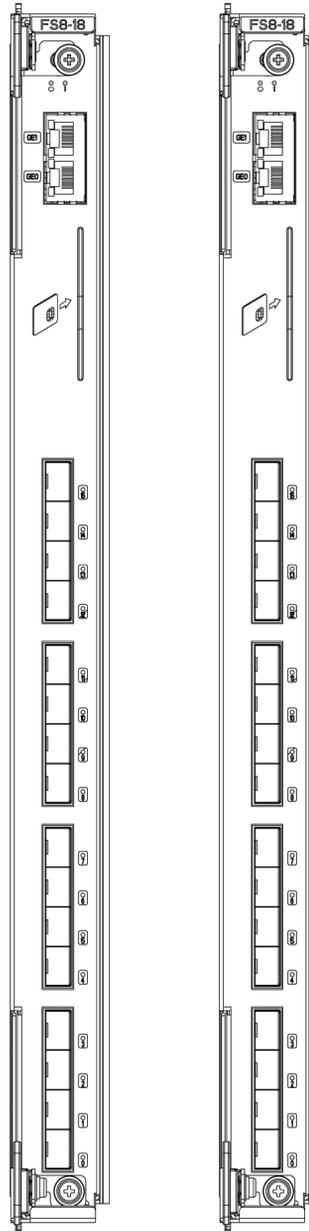
Figure 37   PB-DCX-16EB encryption blades

E

Port Side Exhaust Kit Installation Procedure

Air flows into the ED-DCX-4S-B through its non-port side and out through the exhaust vent on the side of the unit, The Port-Side Exhaust Mount Kit is designed to route this airflow out the exhaust vents on the port side of the unit while mounted in the equipment cabinet. This document provides instructions to install an ED-DCX-4S-B in a 19 in. (48.26 cm) Electronic Industries Association (EIA) cabinet using the following Brocade Port-Side Exhaust Mount Kits:

- Kit for cabinet rail-to-rail depth of 27 to 31 in. (68.58 to 78.74 cm).

- Kit for cabinet rail-to-rail depth of 18 to 24 in. (45.72 to 60.96 cm).

Safety

⚠️ **CAUTION**

Use safe lifting practices when moving the product.

Note: A fully populated ED-DCX-4S-B weighs 103.50 kg (228.20 lb) with four PB-DCX-48P port cards installed (192 ports) and requires a hydraulic or assisted lift to install it.

Installation Guidelines

⚠️ **IMPORTANT**

To ensure adequate cooling, install the chassis with the air intake (nonport side) facing the cool-air aisle.

Follow these general installation guidelines:

◆ The shelf in the kit is 1 U high, so you need a total of 9 U of cabinet space to install the shelf and the ED-DCX-4S-B. 1U is equal to 4.45 cm (1.75 in.).

◆ To allow the quick removal of all power from the chassis, use AC power sources that are easily accessible and located near the chassis.

◆ Verify that the additional weight of the chassis does not exceed the weight limits of the cabinet.

◆ Plan for cable management before installing the chassis. Refer to "Managing cables" on page 41 for more information.

◆ Ensure that one or two dedicated electrical branch circuits with the following characteristics are available:

   • 200-240 VAC, 50-60 Hz

   • Protected by a circuit breaker in accordance with local electrical codes

   • Supply circuit, line fusing, and wire size are adequate, according to the electrical rating on the chassis nameplate

   • Grounded outlets are installed by a licensed electrician and compatible with the power cords

   • Located close to the enterprise-class platform chassis and easily accessible

◆ To maximize fault tolerance, connect each power cord to a separate power source.

◆ Ensure that all equipment installed in the cabinet is grounded through a reliable branch circuit connection. Do not rely on a secondary connection to a branch circuit, such as a power strip.

◆ Ensure that the product fans have access to a total minimum airflow of 350 cubic ft (9.91 cubic meters) per minute. Do not block intake vents. Allow for a minimum of 14 in. (35.66 cm) clearance.

◆ Ensure that the air temperature on the air intake side is less than 104º Fahrenheit (40º Celsius) during operation.

Installing the ED-DCX-4S-B in Equipment Cabinet

Use the following instructions to install the ED-DCX-4S-B in an equipment cabinet using the Port-Side Exhaust Kit.

Time required

Allow approximately one hour to unpack and install a chassis in a cabinet.

Tools required

The following tools are required when installing the rack mount kit:

- Torque wrench with #2 Phillips screwdriver tip
- Flathead screwdriver
- Hydraulic or assisted lift with a minimum raise of 55 in. (140 cm) and a minimum capacity of 250 lbs (113 kg).

Unpacking the Brocade DCX-4S

Follow the procedures in "Unpacking and installing the ED-DCX-4S-B" on page 36.

Installing with 27 to 31 in. (68.58 to 78.74 cm) kit

Use the following procedures to install the ED-DCX-4S-B in a cabinet with rail-to-rail depth of 27 to 31 in.(68.58 to 78.74 cm). Be sure to use the 27-31 in. Port-Side Exhaust Kit for this installation.

Parts list

The following parts list refers to items illustrated in Figure 38 on page 195.

Table 26   Hardware for Port-Side Exhaust Kit for 27 to 31 in. (68.58 to 78.74 cm) cabinets

| Item	Description	Quantity
A	Top rail	1
B	Duct	1
C	Shelf	1
D	10-32 x .5 in. (1.27 cm) Phillips screw (blue Loctite on threads)	12
E	10-32 x .63 in.(1.60 cm) Phillips screw with square cone washer	12
F	10-32 clip nut for cabinets that have rails with round holes	8
G	10-32 retainer nut for cabinets that have rails with square holes	8
H	Alignment washer for cabinets that have rails with square holes	12
I	6-32 x .25 in. (.635 cm) Phillips screw	2
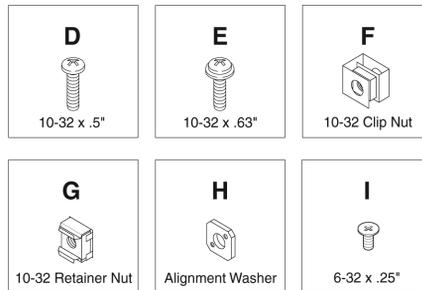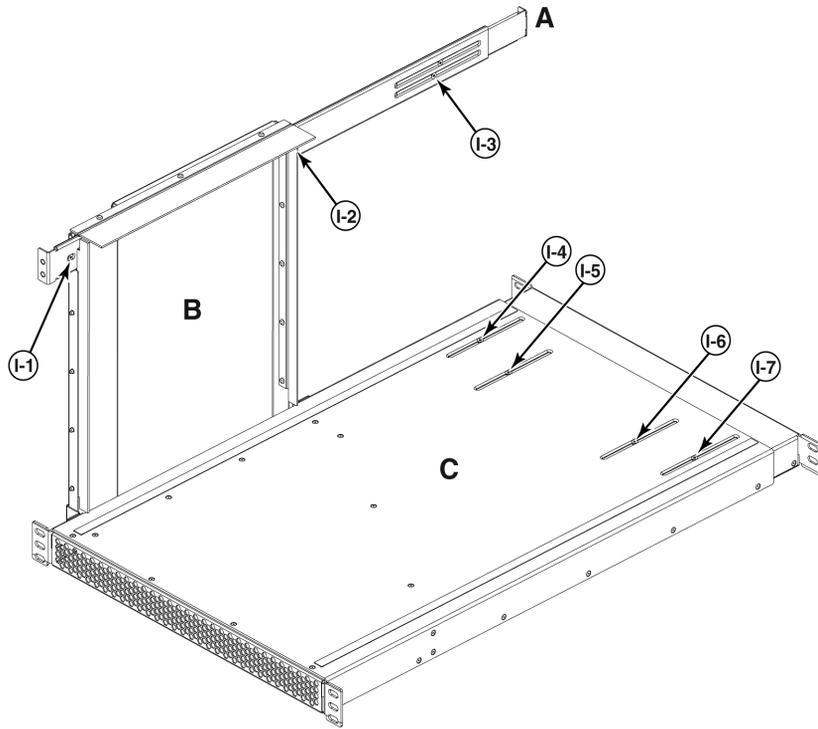
Figure 38   Port-Side Exhaust Kit assembly for 27 to 31 in. (68.58 to 78.74 cm) cabinets

Torque requirements   Use the following torque settings when tightening screws that secure the rack mount kit and ED-DCX-4S-B to the equipment cabinet.

Table 27   Torque requirements for mounting screws

Screw size	Torque
6-32 x .25 in. (.635 cm) Phillips screw	8.75 in.-lbs (10 cm-kg)
10-32 x .63 in.(1.60 cm) Phillips screw	32 in.-lbs (36.86 cm-kg)

Install cabinet hardware

1. Determine how the ED-DCX-4S-B can be oriented in the equipment cabinet so that the nonport side has access to intake air (cool).

2. Install clip nuts (F in Figure 38 on page 195) or retainer nuts (G in Figure 38 on page 195) in cabinet rail locations shown in Figure 39 on page 197. These nuts will secure the 10-32 screws that mount the Port Side Exhaust Kit shelf and the ED-DCX-4S-B to the cabinet. For rails with round holes, use clip nuts. For rails with square holes, use retainer nuts. Note that Figure 39 on page 197 shows relative positions for these nuts in the cabinet rails to mount the shelf and ED-DCX-4S-B. You may mount the shelf and the ED-DCX-4S-B in 9 U of cabinet space higher or lower in the cabinet than shown.
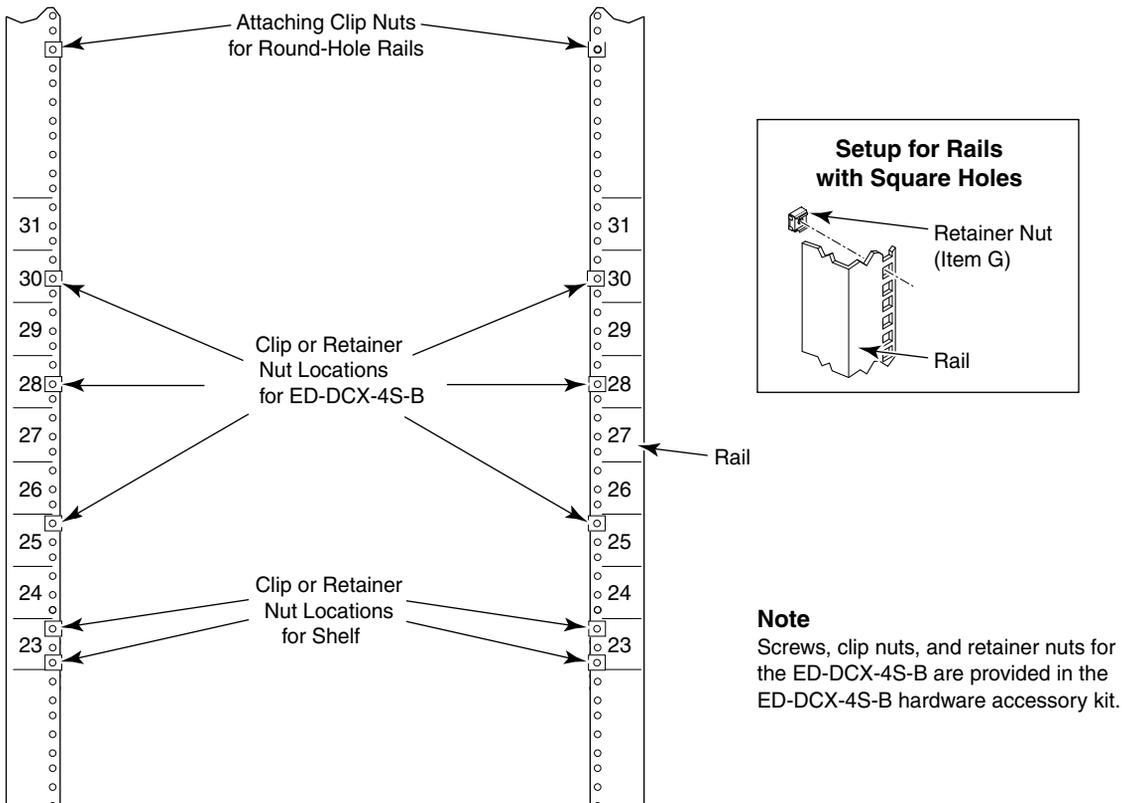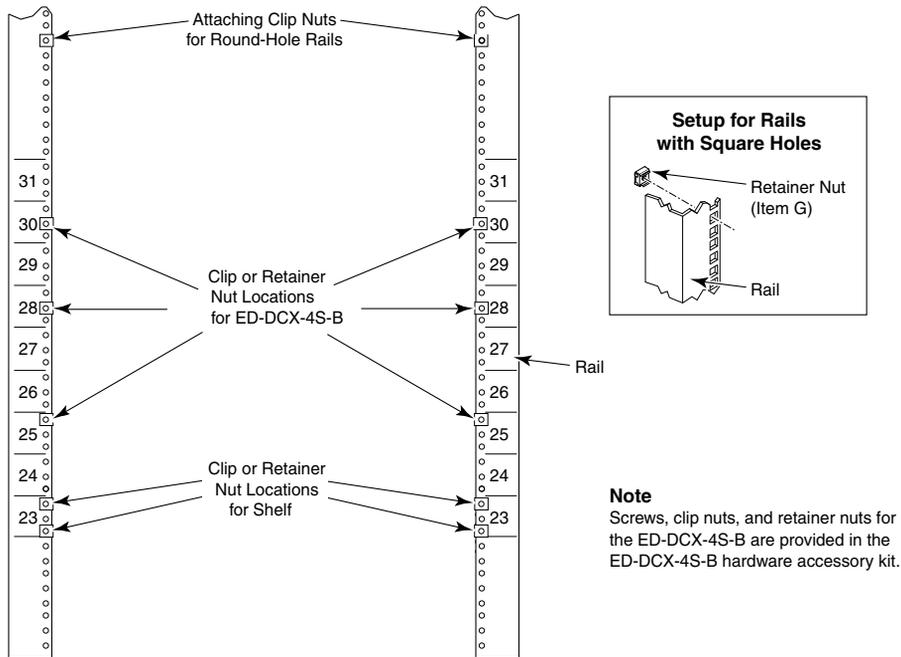
Figure 39   Clip and retainer nut locations on cabinet rails

3. Install the shelf (C in Figure 38 on page 195):

   a. The shelf can be adjusted to a length of between 27 and 31 inches (68.58 and 78.74 cm) to accommodate your cabinet size. To lengthen or shorten the shelf, loosen the four 6-32 screws in the four slots on the shelf (I-4 through I-7 in Figure 38 on page 195) and adjust the shelf to the desired length. Once adjusted, tighten the four 6-32 screws.

   b. Secure the shelf to the cabinet with eight 10-32 screws with washers (E in Figure 38 on page 195), two screws in each corner of the shelf (see Figure 40 on page 198). Tighten screws according to specifications under "Torque requirements" on page 195.
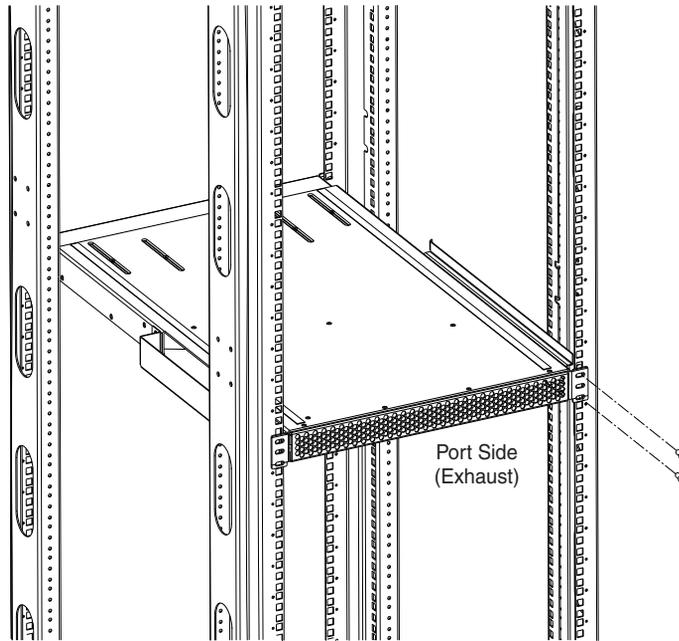
Figure 40   Shelf installed in cabinet

4. Install the air-duct assembly by inserting it down into the side slot on the shelf. Ensure that the tabs of the duct align and engage with the slots in the shelf.
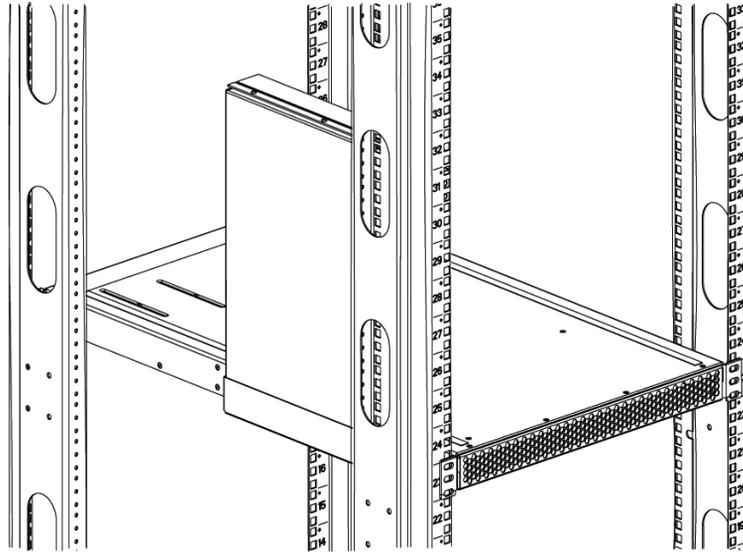
Figure 41   Installing air duct into side slot on shelf

5. Install the top-rail assembly (A in Figure 38 on page 195) to the air-duct assembly. Refer to Figure 42 on page 200.

   a. The top-rail assembly can be adjusted to a length of between 27 and 31 inches (68.58 to 78.74 cm) to fit on the inside of the cabinet rails. To lengthen or shorten the top-rail assembly, loosen the two 6-32 screws (I-3 in Figure 38 on page 195) and adjust the top-rail assembly to the desired length. The length will be approximately the length of the adjustable shelf. Once adjusted, tighten the two 6-32 screws.

   b. Insert the top-rail assembly down into the air-duct assembly and then secure the top-rail assembly to the air-duct assembly with two 6-32 screws, one screw on each side of the air-duct assembly (I-1 and I-2 in Figure 38 on page 195). Tighten screws according to specifications under "Torque requirements" on page 195.

Install screws

Install screws

Install screws
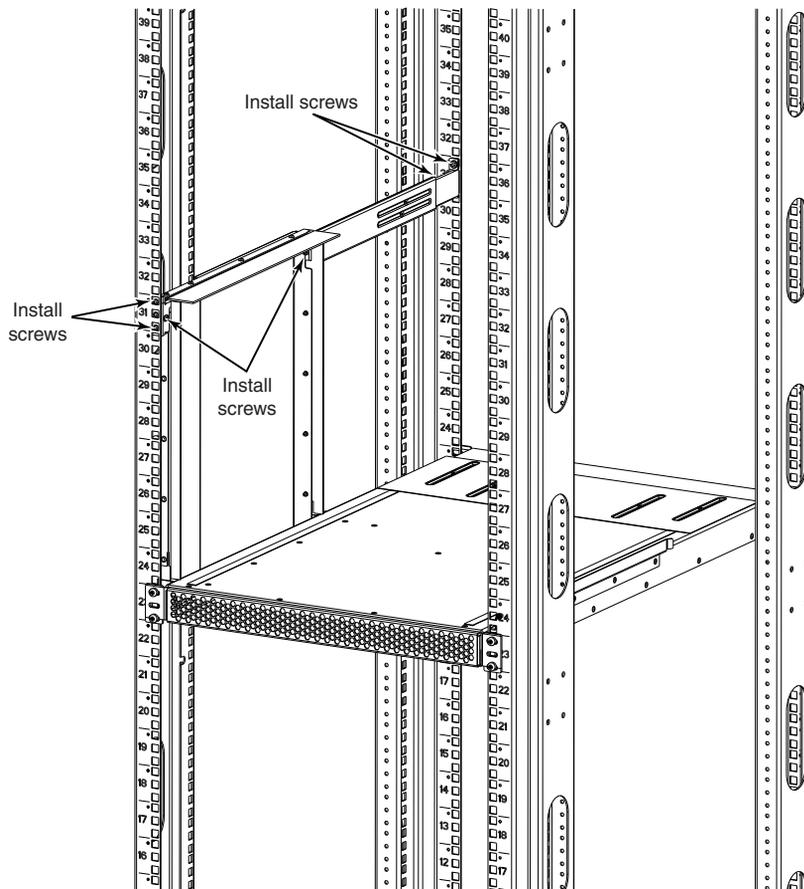
Figure 42   Securing top rail in cabinet.

6. Secure the top-rail assembly to the cabinet with four 10-32 screws, two screws on each end of the top-rail assembly.

   • For rails with round holes:

     Use two 10-32 screws with washers (E in Figure 38 on page 195) on each end of the top rail assembly. Tighten screws according to specifications under "Torque requirements" on page 195.

   • For rails with square holes:

Use the two standard 10-32 screws (D in Figure 38 on page 195) with blue Loctite on the threads and alignment washers (H in Figure 38 on page 195) on each end of the top rail assembly. Tighten screws according to specifications under "Torque requirements" on page 195.

Install the ED-DCX-4S-B in cabinet

1. Ensure that the door is removed from the port side of the ED-DCX-4S-B.

2. Use a lift to raise the chassis to the correct level.

⚠️ **CAUTION**

Use safe lifting practices when moving the product.

3. If applicable, lock the wheels of the lift.

4. Carefully lift the ED-DCX-4S-B and slide it into the cabinet.

5. Secure the ED-DCX-4S-B to the cabinet with six 10-32 screws with washers. Tighten screws according to specifications under "Torque requirements" on page 195.

Note: Screws, clip nuts, and retainer nuts to secure the DCX-4S to the cabinet are provided in the ED-DCX-4S-B hardware accessory kit.
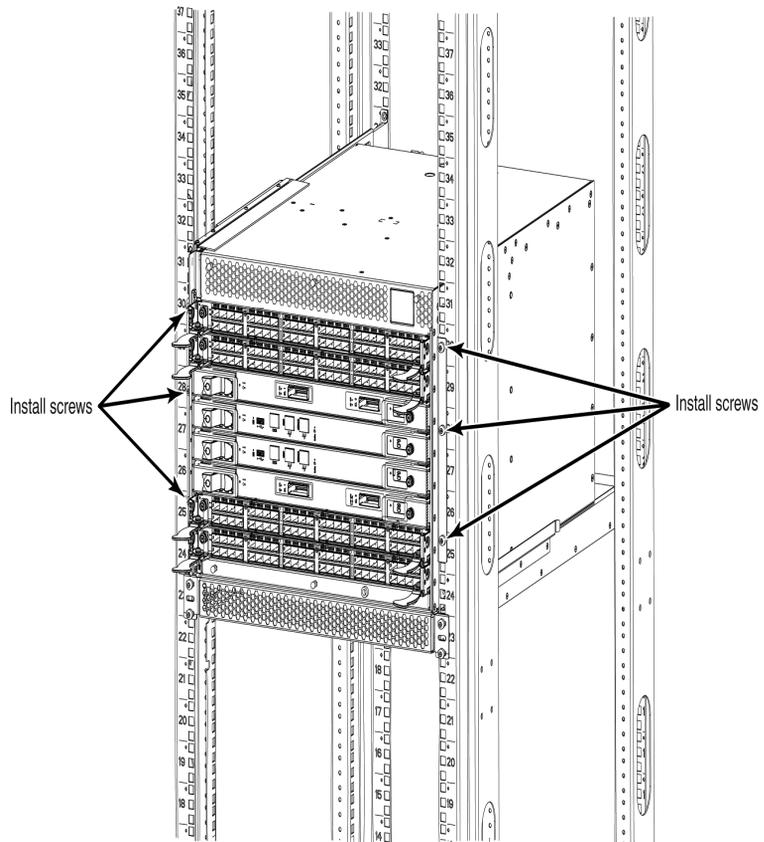
Figure 43   ED-DCX-4S-B with 27 to 31 in. (68.58 to 78.74 cm) Port-Side Exhaust Kit installed in cabinet

Note: For rails with round holes, use the clip nuts (F in Figure 38 on page 195) on the rails for securing the 10-32 screws. For rails with square holes, use the retainer nuts (G in Figure 38 on page 195). Also refer to Figure 39 on page 197.

6. Install the ED-DCX-4S-B door and required cable management system. Refer to "RRP: Chassis door" on page 87 and "RRP: Vertical cable management fingers" on page 89.

Installing with 18-24 in. (45.72 to 60.96 cm) kit

Parts list

The parts list shown in Table 28 refers to items illustrated in Figure 44 on page 204.

Table 28   Hardware for Port-Side Exhaust Kit for 18-in. to 24 in. (45.72 to 60.96 cm) cabinets

Item	Description	Quantity
A	Top rail	1
B	Top rail mounting brackets for 18-20 in., (45.72-50.8 cm) 20-22-in. (50.8-55.88 cm), and 22-24.in (55.88-60.96 cm) cabinets	3
C	Duct	1
D	Shelf	1
E	Shelf saddle	1
F	10-32 x .5 in. (1.27 cm) Phillips screw (blue Loctite on threads)	12
G	10-32 x .63 in.(1.60 cm) Phillips screw with square-cone washer	12
H	10-32 clip nut for cabinets that have rails with round holes	8
I	10-32 retainer nut for cabinets that have rails with square holes	8
J	Alignment washer for cabinets that have rails with square holes	12
K	6-32 x .25 in. (.635 cm) Phillips screw	2
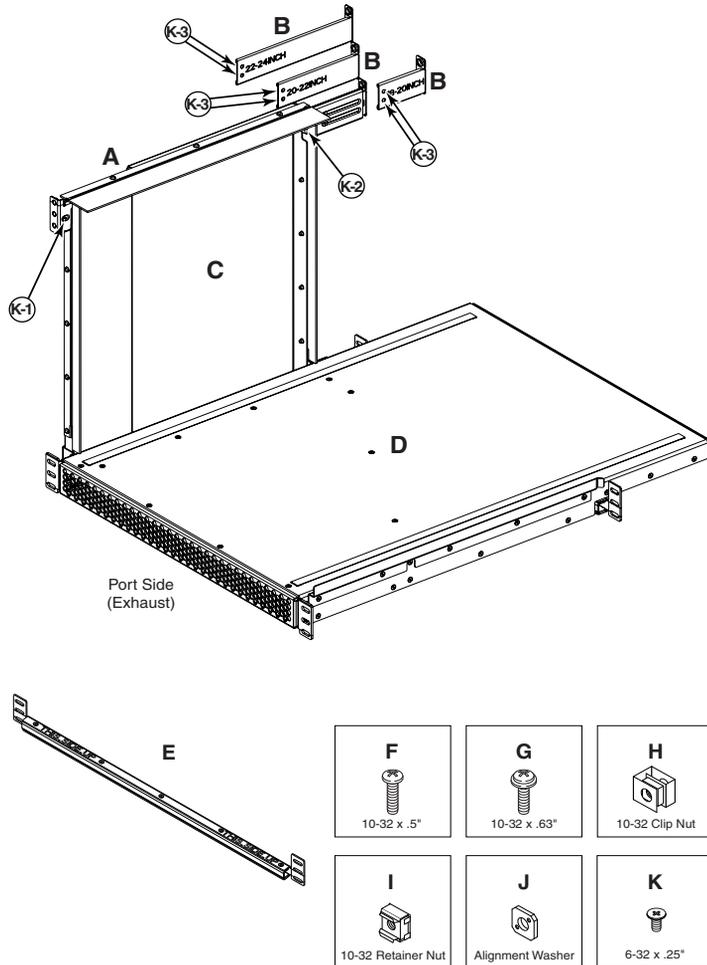
Port Side
(Exhaust)

Figure 44   Port-Side Exhaust Kit assembly for 18 to 24 in. (45.72 to 60.96 cm) cabinets

Torque requirements

Use the following torque settings when tightening screws that secure the rack mount kit and ED-DCX-4S-B to the equipment cabinet.

Table 29   Torque requirements for mounting screws

Screw size	Torque
6-32 x .25 in. (.635 cm) Phillips screw	8.75 in.-lbs (10 cm-kg)
10-32 x .63 in.(1.60 cm) Phillips screw	32 in.-lbs (36.86 cm-kg)

Install cabinet hardware

1. Determine how the ED-DCX-4S-B can be oriented in the equipment cabinet so that the nonport side has access to intake air (cool).

2. Install clip nuts (H in Figure 44 on page 204) or retainer nuts (I in Figure 44 on page 204) in cabinet rail locations shown in Figure 45 on page 206. These nuts will secure the 10-32 screws that mount the Port Side Exhaust Kit shelf and ED-DCX-4S-B to the cabinet. For rails with round holes, use clip nuts. For rails with square holes, use retainer nuts. Note that Figure 45 on page 206 shows relative positions for these nuts in the cabinet rails to mount the shelf and ED-DCX-4S-B. You may mount the shelf and the ED-DCX-4S-B in 9 U of cabinet space higher or lower in the cabinet than shown.

Figure 45   Clip and retainer nut locations on cabinet rails

3. Install the shelf saddle (E in Figure 44 on page 204) to the nonport side of the equipment cabinet .Install the saddle in the same vertical location as where the shelf installs on the port side of the rack. In using Figure 45 on page 206 as example, if the shelf is installed in location 23 on the port side, install the saddle in location 23 on the nonport side. Ensure that the words "THIS SIDE UP" on the saddle face towards the port side of the rack (refer to Figure 46 on page 207).

Secure the saddle to the equipment cabinet using four 10-32 screws with washers (G in Figure 44 on page 204), two screws on each side of the saddle. Tighten screws according to specifications under "Torque requirements" on page 204.

Port Side (Exhaust)

Install screws
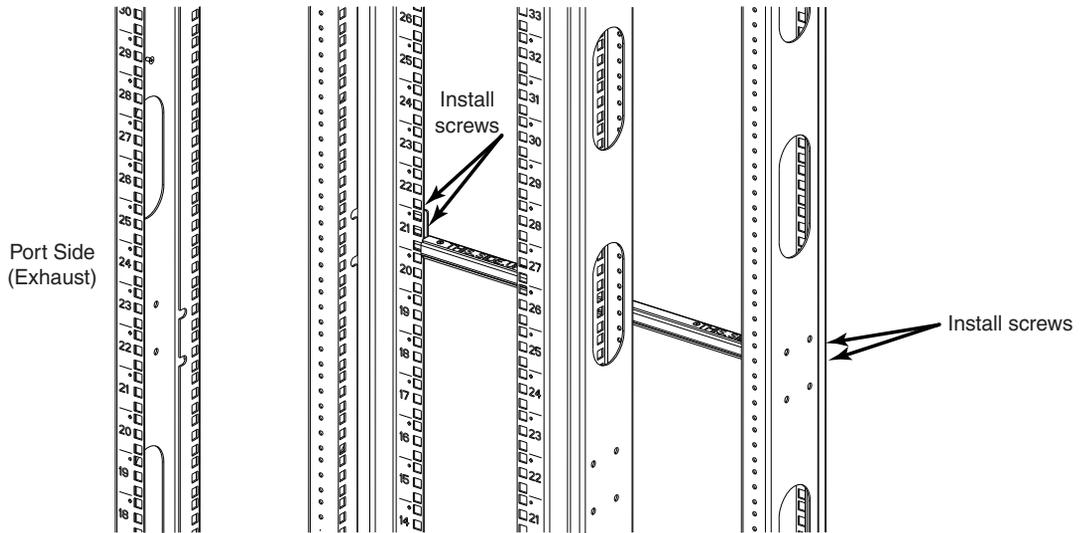
Install screws

Figure 46   Installing saddle to equipment cabinet

Note: For rails with round holes, use the clip nuts (H in Figure 44 on page 204) on the rails for securing 10-32 screws. For rails with square holes, use the retainer nuts (I in Figure 44 on page 204). Also refer to Figure 45 on page 206.

4. Place the shelf (D in Figure 44 on page 204) on the saddle then secure it to the cabinet rails using four 10-32 screws with washers (G in Figure 44 on page 204). Tighten screws according to specifications under "Torque requirements" on page 204.

Install screws

Port Side
(Exhaust)
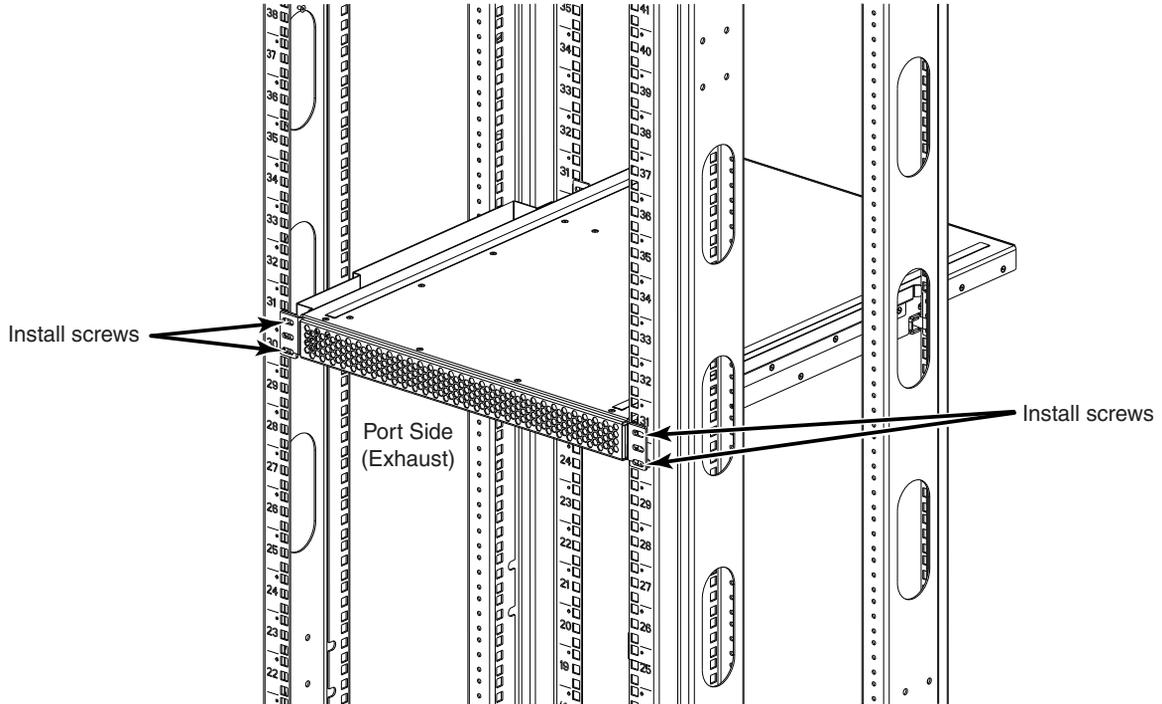
Install screws

Figure 47   Shelf installed in cabinet

> **Note:** For rails with round holes, use the clip nuts on the front rails for securing 10-32 screws. For rails with square holes, use the retainer nuts (H and I in Figure 44 on page 204). Also refer to Figure 45 on page 206.

5. Install the air-duct assembly (C in Figure 44 on page 204) by inserting it down into the side-slot on the shelf. Ensure that the tabs of the duct align and engage with the slots in the shelf. Also refer to Figure 48 on page 209.
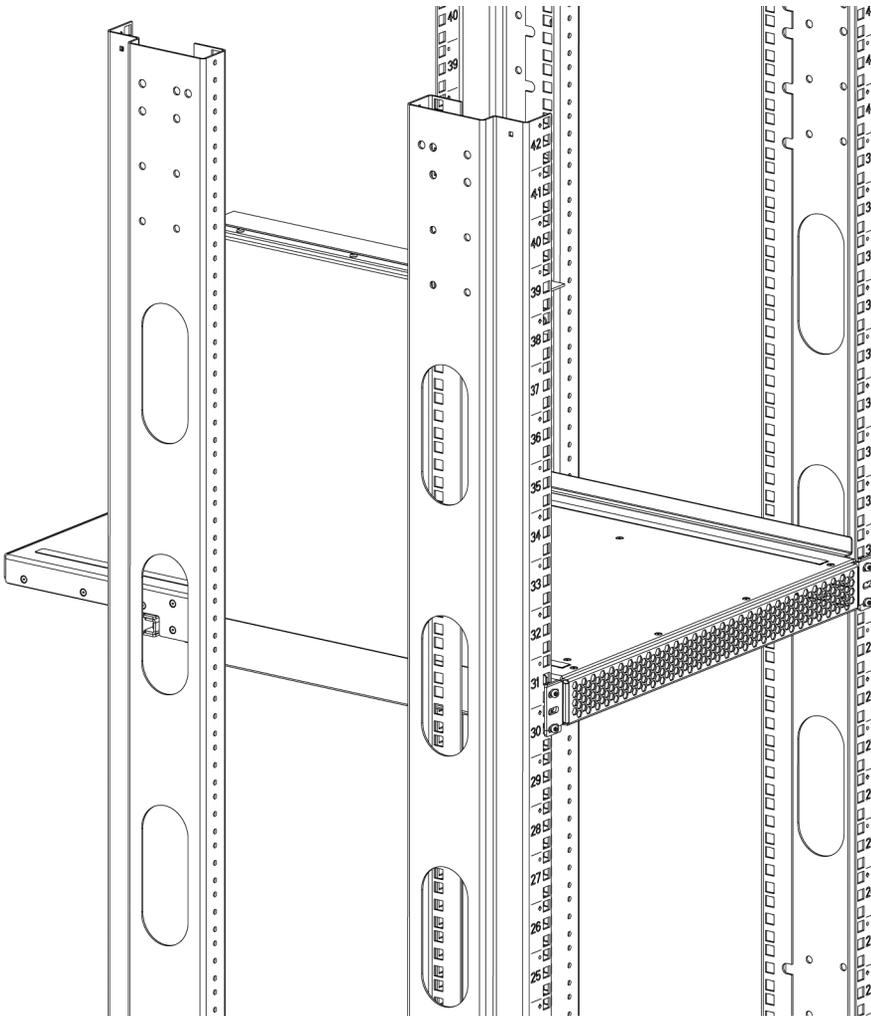
Figure 48   Installing air duct into side slot on shelf

6. Install the top-rail inner bracket to the top-rail assembly:

    a. Determine the size of the top-rail inner bracket that you will need to install on the top rail so that the top rail will fit on the inside of the equipment cabinet rails. Remove the appropriate bracket from the accessory kit. Note that the accessory kit contains three sizes, depending the depth of your equipment cabinet (B in Figure 44 on page 204).

    b. Secure the top-rail inner bracket to the top-rail assembly with two 6-32 screws (K-3 inFigure 44 on page 204). Tighten screws according to specifications under "Torque requirements" on page 204.

7. Install the top-rail assembly:

    a. Insert the top-rail assembly (with the top-rail inner bracket attached) down into the air-duct assembly and then secure the top-rail assembly to the air-duct assembly with two 6-32 screws, one screw on each side of the air-duct assembly (K-1 and K-2 in Figure 44 on page 204). Also refer to Figure 49 on page 211.

    b. Secure the top-rail assembly to the rack. Refer to Figure 49 on page 211.

    For rails with round holes

    Use two 10-32 screws with washers (G in Figure 45 on page 206) on each end of the top rail assembly. Tighten screws according to specifications under "Torque requirements" on page 204.

    For rails with square holes

    Use the two standard 10-32 screws (F in Figure 44 on page 204) with blue Loctite on the threads and alignment washers (J in Figure 44 on page 204) on each end of the top rail assembly. Tighten screws according to specifications under "Torque requirements" on page 204.
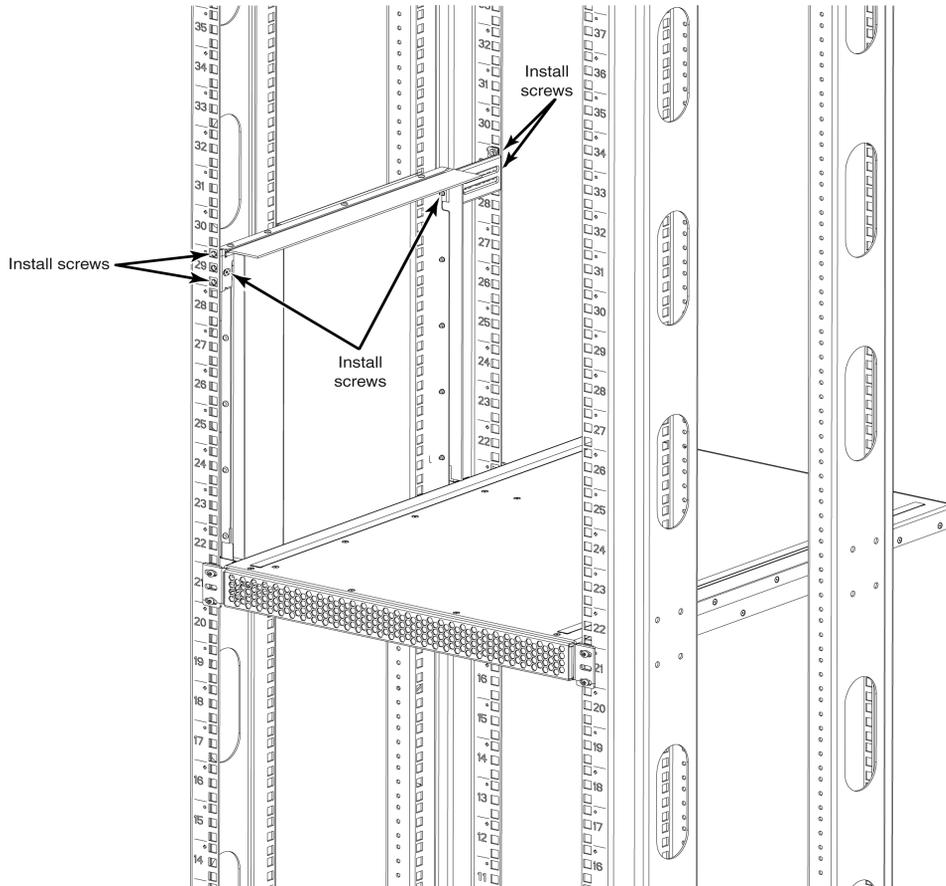
Figure 49   Securing top rail in cabinet

Install ED-DCX-4S-B in cabinet

1. Ensure that the door is removed from the port side of the ED-DCX-4S-B.

2. Use a lift to raise the chassis to the correct level.

⚠ **CAUTION**

Use safe lifting practices when moving the product. (If applicable, lock the wheels of the lift.

3. If applicable, lock the wheels of the lift.

4. Carefully lift the ED-DCX-4S-B and slide it into the cabinet.

5. Secure the ED-DCX-4S-B to the cabinet with six 10-32 screws with washers, three screws on each side (Figure 50 on page 212). Tighten screws according to specifications under "Torque requirements" on page 204.

Note: Screws, clip nuts, and retainer nuts for securing the DCX-4S-B to the equipment rack are included in the hardware accessory kit.
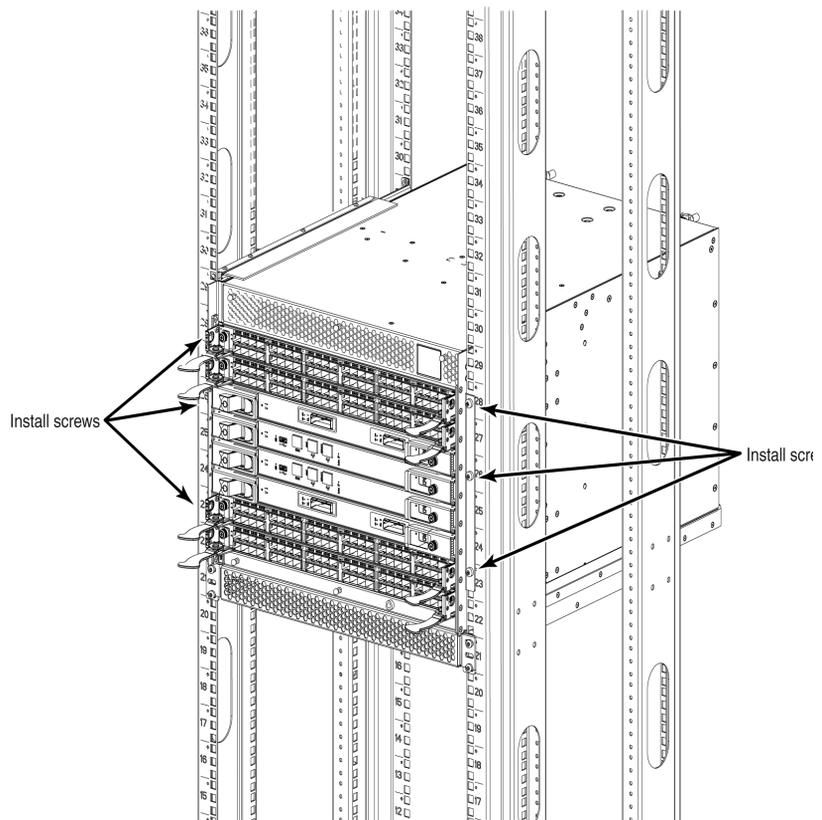
Figure 50   **ED-DCX-4S-B with 18 to 24 in. (45.72 to 60.96 cm) Port-Side Exhaust Kit installed in cabinet**

> **Note:** For rails with round holes, use the clip nuts on the front rails for securing 10-32 screws. For rails with square holes, use the retainer nuts (H and I in Figure 44 on page 204). Also refer to Figure 49 on page 211.

6. Install the ED-DCX-4S-B door and required cable management system. Refer to "RRP: Chassis door" on page 87 and "RRP: Vertical cable management finger assemblies" on page 90.