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FC16-64 Port Blade

QuickStart Guide

Supporting Brocade DCX 8510-4 and DCX 8510-8 with Fabric OS 7.3.0 and above

BROCADE

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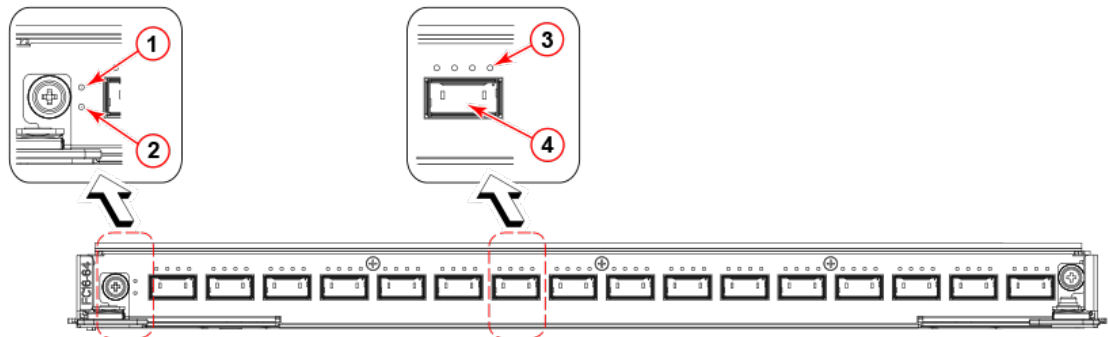
FC16-64 port blade

The Brocade FC16-64 Fibre Channel port blade contains 64 ports supporting 4-, 8-, and 16-Gbps port speeds. The blade also supports port-based in-flight encryption/decryption and compression/decompression when it is configured as an inter-switch link (ISL). The FC16-64 port blade is compatible with the Brocade DCX 8510-4 and Brocade DCX 8510-8. The FC16-64 port blade requires Fabric OS v7.3.0 or later to run in these chassis.

The FC16-64 port blade enables high density SAN configurations supporting up to 256 16-Gbps external ports in a single Brocade DCX 8510-4 chassis, and 512 16-Gbps external ports in a single Brocade DCX 8510-8 chassis. The trunking technology allows you to group up to eight ports to create high performance 128-Gbps ISL trunks between switches.

The following figure identifies the FC16-64 blade ports and LED indicators:

FIGURE 1 FC16-64 port blade



1. Blade status LED
2. Blade power LED
3. Port status LED for FC port 36
4. QSFP port 9; FC ports 36-39 (right to left)

The ports are numbered from 0 through 63 from right to left in the Brocade DCX 8510-4, and bottom to top in the Brocade DCX 8510-8. The trunking port groups are 0-7, 8-15, 16-23, 24-31, 32-39, 40-47, 48-55, and 56-63.

QSFP transceiver

The FC16-64 port blade supports only Quad-SFP (QSFP) ports where a single MTP connector supports up to four channels or ports. Thus, QSFP allows for simplified cable management and, at the same time, supports high density SAN solutions. The QSFP transceivers differ from standard SFP+ or mSFP transceivers. Cables with MTP/MPO connectors are required to use the QSFP transceivers. The cables can be identified by the special connector at the QSFP end and the cables are of different diameter (2.5×6.4 mm) than the standard LC-LC cables.

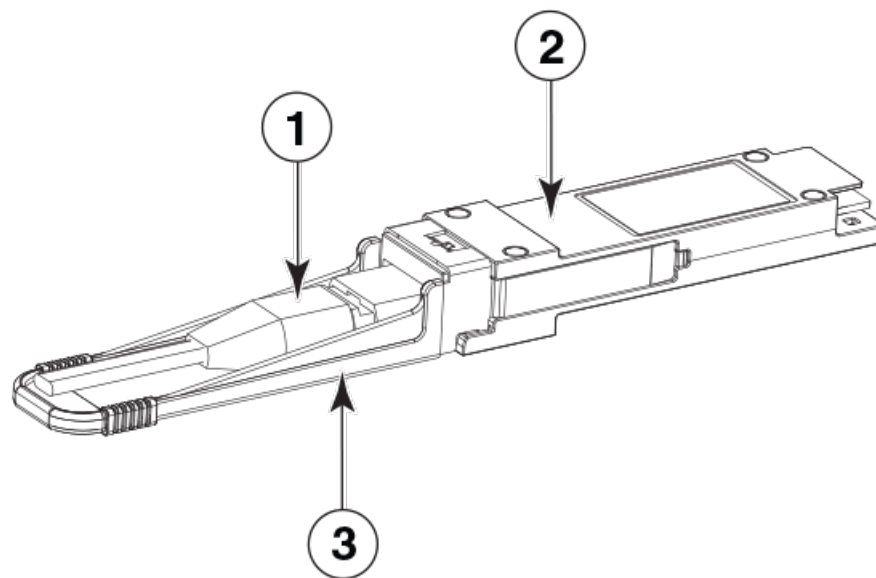


CAUTION

DO not use the standard SFP+ or mSFP optical transceivers with the FC16-64 port blade. They do not fit correctly and can cause damage to the ports, cage connectors, and transceivers. Do not force standard LC or mSFP connectors into the QSFP transceivers. This could result in damage to both the connector and the cable.

The following figure shows the QSFP transceiver and the connector.

FIGURE 2 QSFP transceiver



1. QSFP MTP connector
2. QSFP transceiver
3. Transceiver pull tab

Qualified transceivers for the FC16-64 port blade and the core blades

The following table shows the qualified transceivers for the FC16-64 port blade and the core blades.

TABLE 1 Qualified transceivers for FC16-64 port blade and the core blades

Brocade part number	Part type	Cable length	Port speeds	Supported blades
57-1000294-01	QSFP transceiver	100 m OM4	Auto-negotiable 4-, 8-, and 16-Gbps	FC16-64
57-1000267-01	QSFP transceiver	100 m OM4	Only fixed 16-Gbps	CR16-4/8
57-0000090-01	QSFP transceiver	50 m OM3		

NOTE

The QSFP transceivers supported on FC16-64 port blade are not interchangeable with QSFP transceivers supported on the core blades.

Cable types supported on the FC16-64 port blade

The FC16-64 port blade supports simplified cable management using QSFP cables. Each QSFP cable has four links internally that run at 16-Gbps speed and the cables come in specific predetermined fixed lengths.

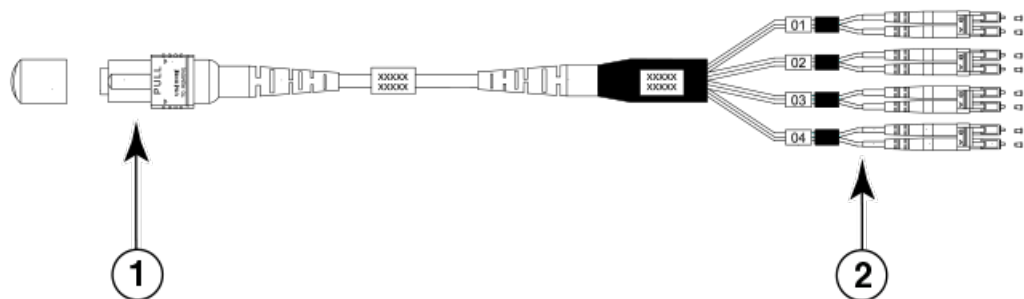
The FC16-64 port blade supports the following types of cables:

FIGURE 3 QSFP to QSFP standard cables



1. QSFP MTP connector

FIGURE 4 QSFP-SFP/LC Break-out/Split-out cables



1. QSFP MTP connector
2. SFP+ LC connectors

With the support for breakout cables, each port can be in a different mode. Inside the single physical QSFP port, individual ports can be configured as an E_Port, F_Port or EX_Port. Also, each internal port inside a single physical QSFP can be part of different Logical Switches.

With the support for breakout cables, trunking can be enabled on ports in a QSFP port group, with ports connected through breakout cables at the other end.

Installing the FC16-64

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Before you begin

Be sure to establish a naming or numbering scheme before you begin attaching cables. Each cable should have a unique designation and should be labeled accordingly. You should also record this information separately for future reference and troubleshooting. If you are using break-out cables, remember to label appropriately that you know which ends are being connected. Refer to the serial numbers on the break-out side of the cables for proper identification of individual channels or ports.

ESD precautions

The Brocade DCX Backbone series contains ESD-sensitive field-replaceable units (FRUs). When working with any FRU, use correct electrostatic discharge (ESD) procedures.

- Wear a wrist grounding strap connected to chassis ground or a bench ground.
- Store ESD-sensitive components in antistatic packaging.

Time required for installation tasks

- Installing a single FC16-64 in a chassis should take less than five minutes.
- Refer to the documentation accompanying any patch panels for the approximate time to install and pre-cable the panels.
- Attaching cables, bundling and routing them, and attaching the cables to the patch panel for one FC16-64 should take approximately 40 minutes, depending on experience and the ability to work with cable connections.

Items required

You should have the following items before you start installing FC16-64 port blade:

- FC16-64 port blades (as many as ordered)
- Sufficient number of QSFP transceivers to fill the FC16-64 blades.
- Velcro® strips
- QSFP to QSFP cables (if necessary, to be used as inter-switch links (ISLs) or MTP patch panels)
- QSFP-LC patch cables (if necessary, to be used with LC patch panels)
- Phillips screwdriver

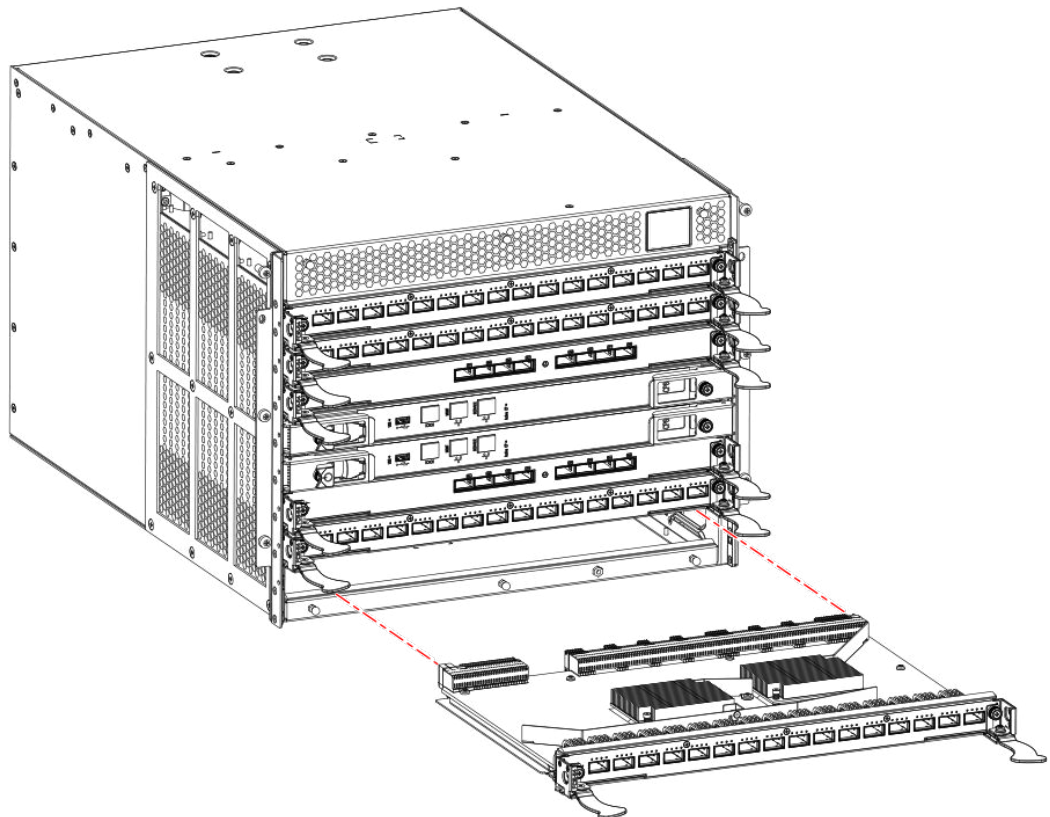
Installing the blade in the chassis

Complete the following steps to install the port blade in the chassis.

1. Ensure that all packing material have been removed from the blade.
2. Orient the blade so that the ports are at the front of the chassis and the flat side of the blade is at the bottom when installing in the DCX 8510-4. Orient the blade with the flat side on the left when installing in the DCX 8510-8

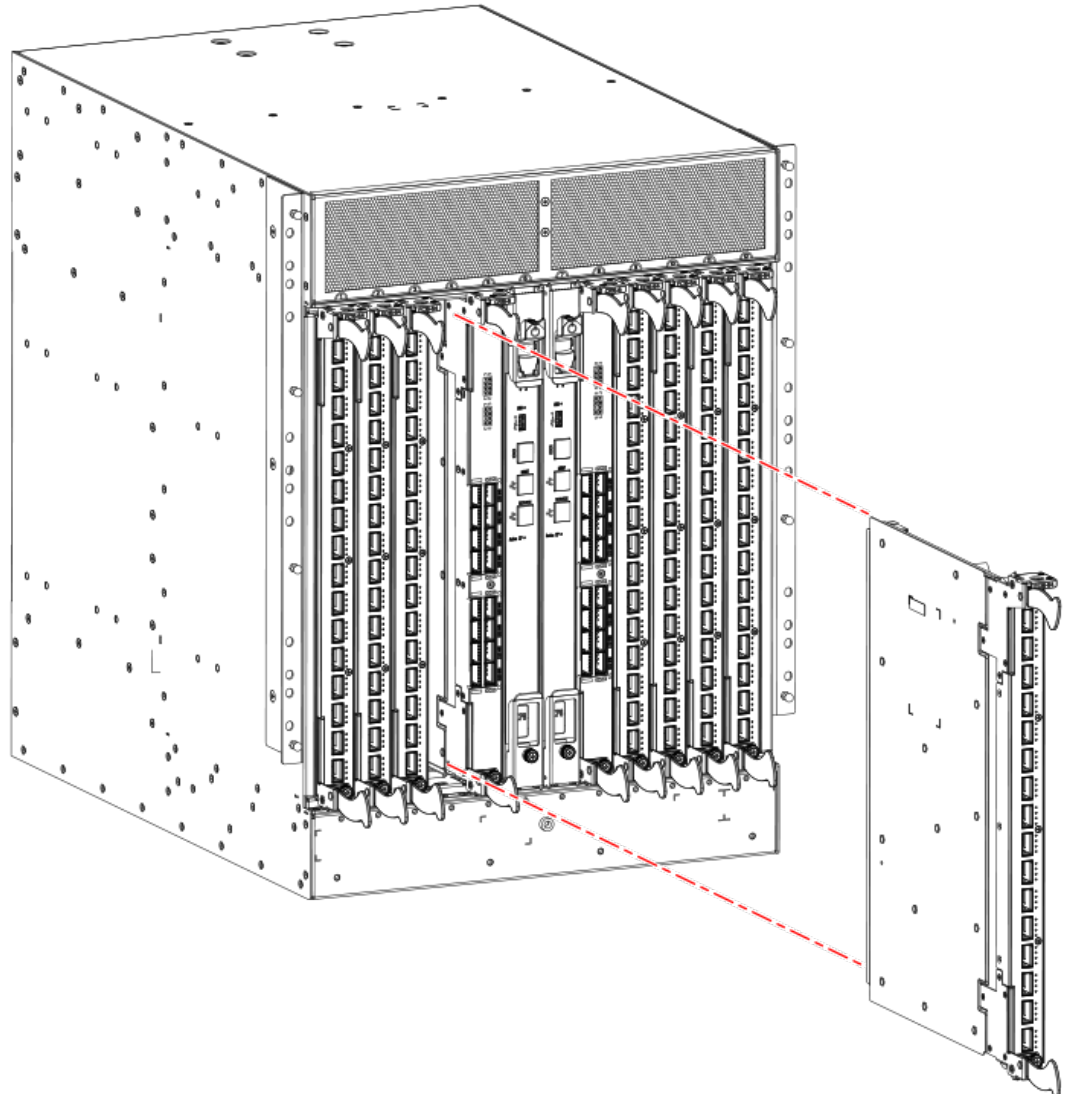
For an example of how a blade needs to be oriented in 8510-4 chassis, refer to the following illustration.

FIGURE 5 Insertion of the FC16-64 port blade in DCX 8510-4



For an example of how a blade needs to be oriented in 8510-8 chassis, refer to the following illustration.

FIGURE 6 Insertion of the FC16-64 port blade in DCX 8510-8



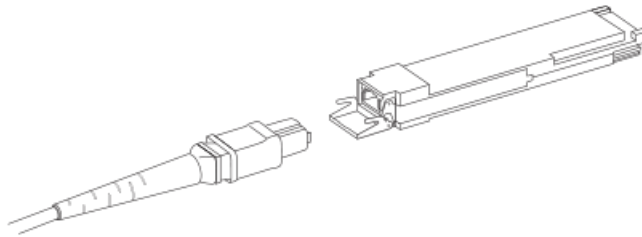
3. Adjust the ejectors to the open position by rotating them toward the center of the blade, align the flat side of the blade inside the upper and lower rail guides in the slot, and slide the blade into the slot until it is firmly seated.
4. Close the ejectors by rotating them away from the center of the blade.
5. Tighten the thumbscrews using the Phillips screwdriver.

Attaching cables to the blade

To attach the QSFP connector end of the QSFP cable to the FC16-64 blade, complete the following steps.

1. Remove the protective caps on the QSFP transceiver and the QSFP connector on the cable.
2. If the transceiver was not pre-installed, grasp the bail of the QSFP transceiver and push the transceiver into the port until it is firmly seated and the latching mechanism clicks. The transceiver is keyed to fit into the port with the correct orientation. If a transceiver does not slide in easily, ensure that it is correctly oriented. The Status LED blinks amber upon initial installation, and then displays a steady amber.

FIGURE 7 Insertion of MTP/MPO connector to the QSFP transceiver



3. Grasp the QSFP connector end of the cable by the rubber housing and push it into the transceiver until it is firmly seated. The cable housing is keyed to fit into the transceiver with correct orientation. The status LED displays steady amber until both ends of the cable are inserted and the link is established. When the link is fully established, the LED displays steady green.
4. Repeat steps 1 to 3 to attach all the cables to the blade.

Bundling and routing cables

When you have cabled an entire FC16-64 port blade, complete the following steps to organize and route the optical cables.

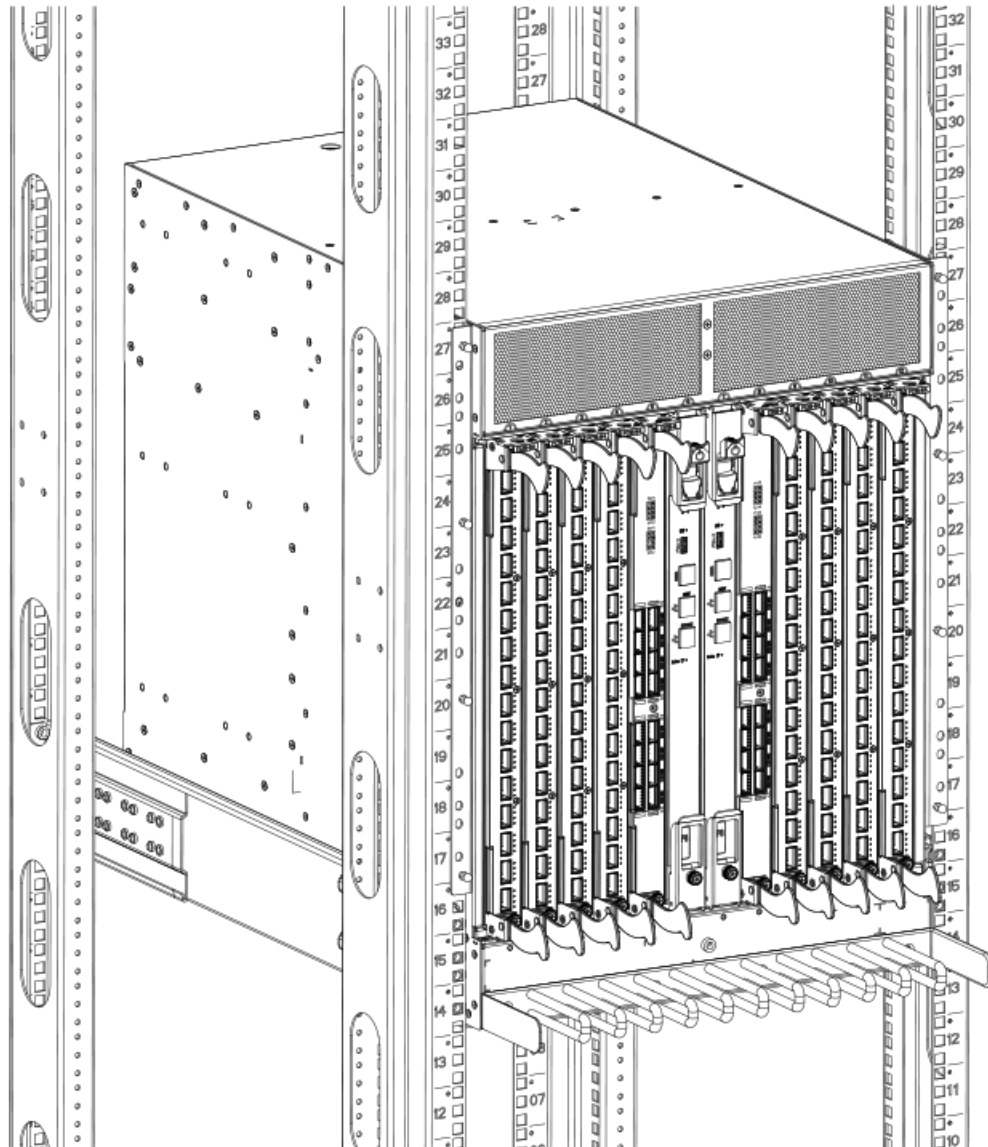
NOTE

Do not use plastic zip ties or metal tie wraps as these can be overtightened and damage the optical cables.

1. Bundle the cables together with Velcro strips.
2. Route the bundle of cables through the cable management comb and dress the cables to the side of the rack.

For the DCX 8510-8, the cable management combs are mounted to the bottom of the chassis. You need to route the cables towards the bottom and then bundle them together for each FC16-64 port blade.

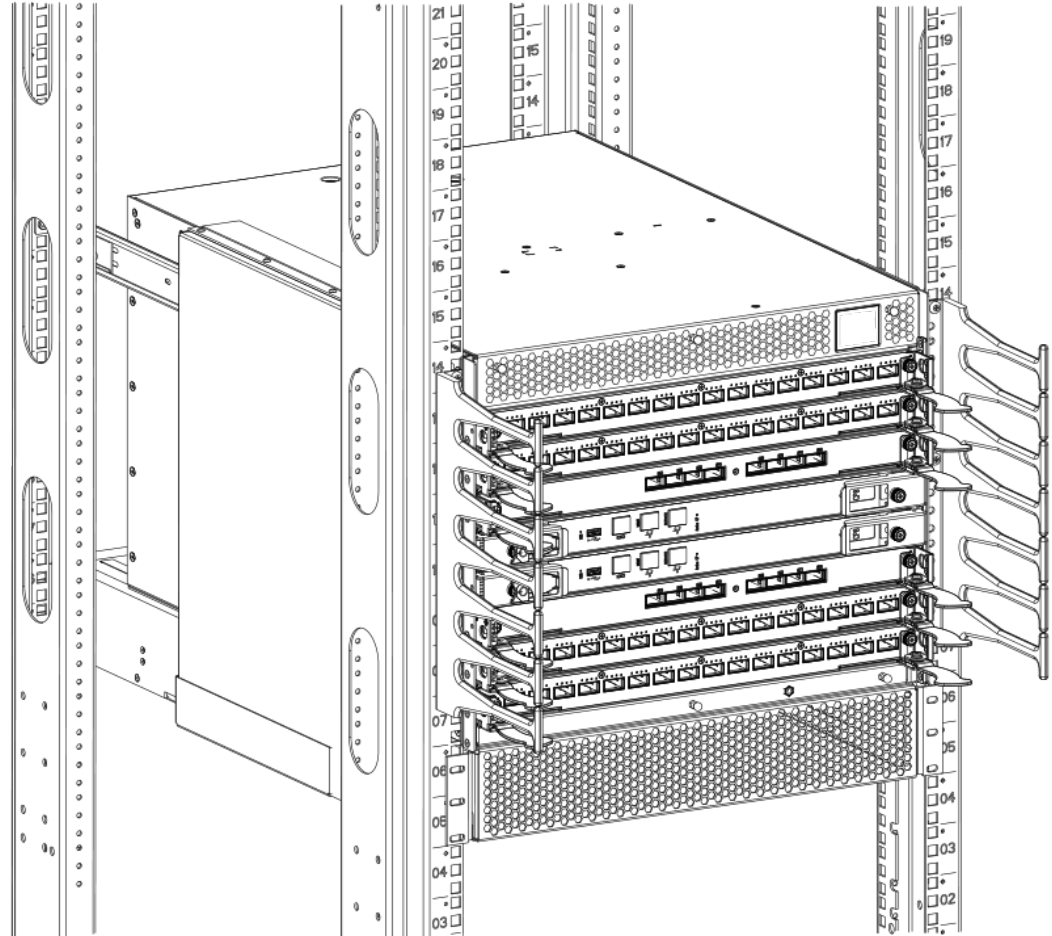
FIGURE 8 Cable routing in DCX 8510-8



For the DCX 8510-4, the cable management fingers are mounted to the sides of the chassis, making the task of bundling and routing the cables in two directions. You can group the cables on

the left of a FC16-64 port blade to the left cable management finger, and those in the right to the right cable management finger.

FIGURE 9 Cable routing in DCX 8510-4



Attaching cables to the patch panels

You can use three types of patch panels to connect FC16-64 port blades to other devices.

- MTP to MTP patch panels (requires MTP-MTP QSFP cables)
- MTP to LC patch panels (requires MTP-MTP QSFP cables and LC-LC cables)
- LC to LC patch panels (requires MTP-LC QSFP breakout cables and LC-LC cables)

The following section describes the procedure for LC-LC patch panel with MTP-LC breakout/split cables connected to the FC16-64 port blade:

To connect the cables to the patch panels, complete the following steps. You should have one 72-port LC-LC patch panel for each FC16-64 port blade. Eight ports in each patch panel will not be used. Remember to keep all the ports properly documented and labeled. Because the patch panel tray slides out for access, be sure to leave enough slack in the cabling to accommodate this movement.

1. Install the patch panel in the rack. See the directions accompanying the patch panel for detailed mounting instructions. Leave a one rack unit gap between the bottom of a DCX 8510-8 chassis and the first patch panel to allow for bending of the optical cables after they pass through the cable management comb. If you mount the patch panels above the chassis, leave a one rack unit gap below a chassis for bending the cables after they pass through the cable management comb.
2. Route the patch cables from the FC16-64 blades into the front of each patch panel shelf. Each patch panel has three shelves. When you slide the tray out from the front of the rack, the top two shelves can rotate upward to facilitate access.
3. Remove the protective caps on the ends of the MTP/LC connectors of the patch cables.
4. Insert the connector from the FC16-64 port blade into the front receptacles of the patch panel until the latching mechanism clicks. Repeat until all cables have been inserted into the patch panel.
5. Route the cables from other devices through the rear of the patch panel and then slide the panel out to the front. Be sure these cables have been labeled and bundled properly.
6. Insert the connector from the other devices into the back side of the patch panel. Repeat until all cables have been inserted into the back of the patch panel.
7. Slide the patch panel back into the rack.

Attaching cables to the patch panels

Additional documentation

For more information, refer to the following documents:

- *DCX 8510-8 Backbone Hardware Reference Manual*
- *DCX 8510-8 Backbone QuickStart Guide*
- *DCX 8510-4 Backbone Hardware Reference Manual*
- *DCX 8510-4 Backbone QuickStart Guide*

Additional documentation