



## Installing the Supervisor in the Cisco cBR Chassis

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# Installing the Supervisor in the Cisco cBR Chassis

This section provides information on installing the Supervisor.

Check if your hardware might have a supervisor card. For supervisor cards that are shipped as a spare module, the supervisor card bootflash would be empty. Ensure that you manually copy the image on the bootflash to avoid issues while booting.



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**Note** Any time a physical Online Insertion/Removal (OIR) is performed, the removed module must be left out 30-60 seconds before re-inserting it in the cBR-8 chassis.

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## Installing the Supervisor 160G

### Installing the Supervisor PIC in the Cisco cBR Chassis

Perform this procedure to install the following PICs:

- Supervisor PIC
- Blank PIC for the Supervisor

#### Before you begin



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**Warning** If you are adding a new Supervisor PIC or upgrading the existing Supervisor PICs, ensure that the power modules installed in the chassis are adequate to support the Supervisor PICs.

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- Attach an ESD-preventive wrist strap to your wrist and connect the other end to the grounding lug connected to the chassis.
- Be aware of the weight and size of the equipment. Handle it with care.

#### Restrictions

- If you are using a single Supervisor, you must install the Supervisor PIC in the slot corresponding to the Supervisor Card.



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**Note** In the Cisco cBR-8 router,

- Slot 4/1 for the Supervisor PIC corresponds to slot SUP0 for the Supervisor Card.
- Slot 5/1 for the Supervisor PIC corresponds to slot SUP1 for the Supervisor Card.

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#### Required Tools and Equipment

- ESD-preventive wrist strap

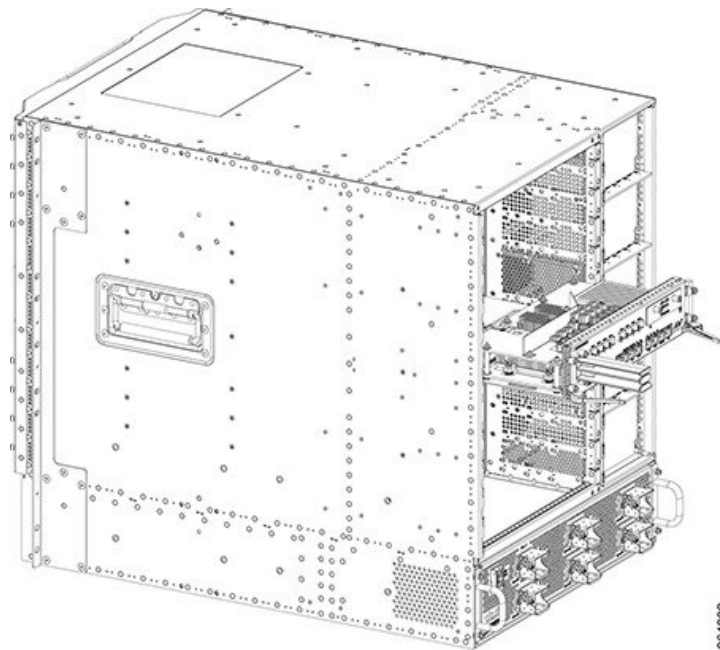
- Supervisor PIC or blank PIC for the Supervisor
- 3/16" flat-blade torque screwdriver

## Procedure

- Step 1** Grasp the faceplate of the PIC with one hand and place your other hand under the PIC to support its weight.
- Step 2** Carefully align the PIC with the plastic guides in the slot.
- Step 3** Slide the PIC into the slot applying even pressure using both your hands until it is within an inch of full insertion.
- Step 4** Open the ejector levers and fully insert the PIC into the slot applying even pressure on both sides until it mates with the midplane connectors.

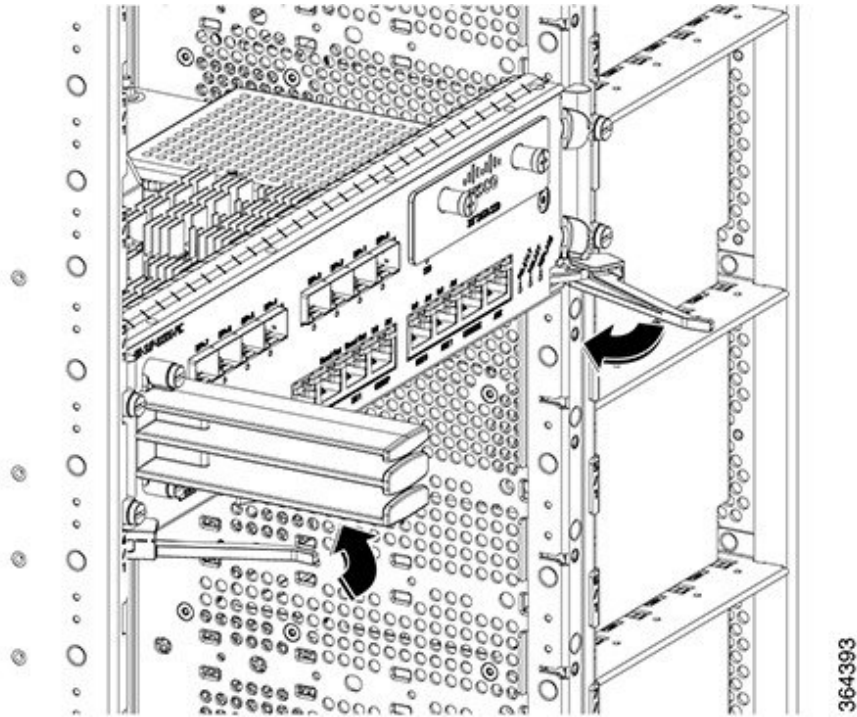
**Caution** To prevent damage to the midplane connectors, do not use excessive force when inserting the PIC into the slot.

**Figure 1: Inserting the Supervisor PIC into the Chassis**



- Step 5** Simultaneously pivot both the ejector levers towards each other until they cannot be pivoted any further.

**Figure 2: Closing the Ejector Levers on the Supervisor PIC**



**Step 6** Tighten the four captive screws using a 3/16" flat-blade torque screwdriver with a torque of 6-8 in-lb (0.68-0.90 Nm) to secure the PIC.

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#### **What to do next**

- If you are using a single Supervisor PIC, [install a blank PIC for the Supervisor](#) in the empty slot.
- [Install the Supervisor PIC cable management bracket](#) (recommended).
- [Install the Supervisor Card](#) (if not already installed).

## **Installing the Supervisor PIC Cable Management Bracket**

The Supervisor PIC cable management bracket is shipped separately in the chassis accessory kit. It has a smaller slot for fiber-optic cables and a larger slot for the RJ-45 cables.

#### **Before you begin**

- Attach an ESD-preventive wrist strap to your wrist and connect the other end to the grounding lug connected to the chassis.
- [Install the Supervisor PIC](#) (recommended).

#### **Required Tools and Equipment**

- ESD-preventive wrist strap
- Supervisor PIC

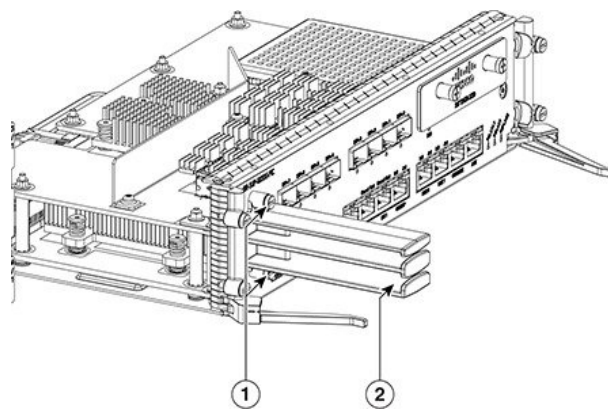
- Supervisor PIC cable management bracket
- 3/16" flat-blade torque screwdriver

## Procedure

**Step 1** Align the captive screws on the Supervisor PIC cable management bracket with the mounting holes on the Supervisor PIC.

**Important** Ensure that the upper slot in the cable management bracket is the smaller slot for fiber-optic cables and the lower slot is the larger slot for RJ-45 cables.

*Figure 3: Installing the Supervisor PIC Cable Management Bracket*



1	Captive screws	2	Supervisor PIC cable management bracket
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**Step 2** Tighten the captive screws using a 3/16" flat-blade torque screwdriver with a torque of 6-8 in-lb (0.68-0.90 Nm) to secure the Supervisor PIC cable management bracket.

## What to do next

- [Install the chassis-mounted fiber/cable routing guide](#) (if not already installed).
- [Route the Supervisor PIC cables through the Supervisor PIC cable management bracket and chassis-mounted fiber/cable routing guide.](#)

## Installing the SFP+ Modules in the Supervisor PIC

### Before you begin



**Caution** Do not install or remove the SFP+ module with fiber-optic cables still attached to it. Doing so may damage cables, cable connectors, or the optical interfaces and may interfere with the SFP+ module latching properly into its socket connector. Disconnect all cables before removing or installing an SFP transceiver module.

- Attach an ESD-preventive wrist strap to your wrist and connect the other end to the grounding lug connected to the chassis.
- You must use the supported SFP+ modules. The following SFP+ modules are supported on the Supervisor PIC:
  - SFP-10G-SR
  - SFP-10G-LR
  - SFP-10G-ER
  - SFP-10G-ZR
  - SFP-10G-LRM

**Required Tools and Equipment**

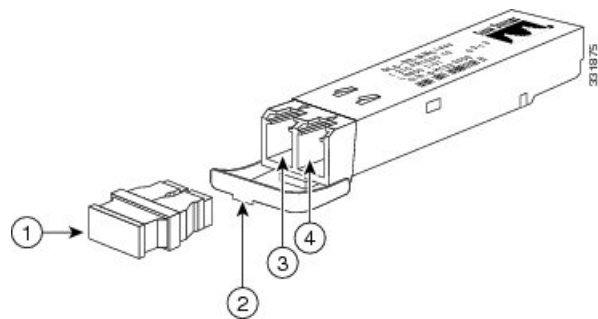
- ESD-preventive wrist strap
- SFP+ module

**Procedure**

**Step 1** Remove the SFP+ module from its protective packaging.

**Note** Do not remove the optical bore dust plugs.

*Figure 4: SFP+ Module with Dust Plugs*



1	Dust plug	3	Transmit bore
2	Bail clasp with clasp tab	4	Receive bore

**Step 2** Check the label on the SFP+ module to verify that you have the correct model for your network.

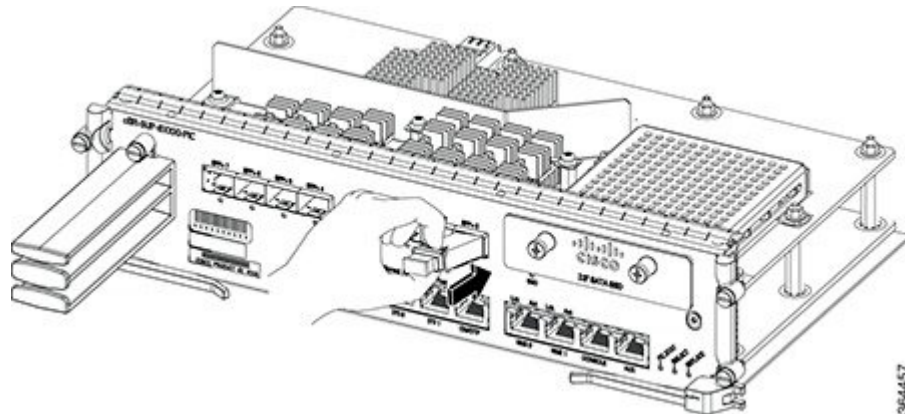
**Step 3** Find the send (TX) and receive (RX) markings that identify the top side of the SFP+ module.

**Note** On some SFP modules, the TX and RX marking might be replaced by arrowheads pointing from the SFP+ module connector (transmit direction or TX) and towards the connector (receive direction or RX).

**Step 4** Align the SFP+ module in front of the socket opening.

**Step 5** Carefully insert the SFP+ module into the socket until you feel the connector latch into place.

**Figure 5: Installing the SFP+ Module in the Supervisor PIC**



- Step 6** Press the SFP+ module into the slot firmly with your thumb until it is latched securely into the socket.
- Step 7** Repeat [Step 1, on page 6](#) to [Step 6, on page 7](#) for each SFP+ module.

#### What to do next

- Verify if the SFP+ module is seated and latched properly. Grasp the SFP+ module and try to remove it without releasing the latch. If the SFP+ module cannot be removed, it is installed and seated properly. If the SFP+ module can be removed, reinstall it.
- [Connect fiber-optic cable to the SFP+ port.](#)

## Installing the Supervisor Card in the Cisco cBR Chassis

Perform this procedure to install the following cards:

- Supervisor Card
- Blank card for the Supervisor

#### Before you begin



**Warning** If you are adding a new Supervisor Card or upgrading the existing Supervisor Cards, ensure that the power modules installed in the chassis are adequate to support the Supervisor Cards.

- Attach an ESD-preventive wrist strap to your wrist and connect the other end to the grounding lug connected to the chassis.
- [Install the Supervisor PIC](#) (recommended).
- Be aware of the weight and size of the equipment. Handle it with care.

#### Restrictions

- If you are using a single Supervisor, you must install the Supervisor Card in the slot corresponding to the Supervisor PIC.





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**Note** In the Cisco cBR-8 router,

- Slot 4/1 for the Supervisor PIC corresponds to slot SUP0 for the Supervisor Card.
  - Slot 5/1 for the Supervisor PIC corresponds to slot SUP1 for the Supervisor Card.
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### Required Tools and Equipment

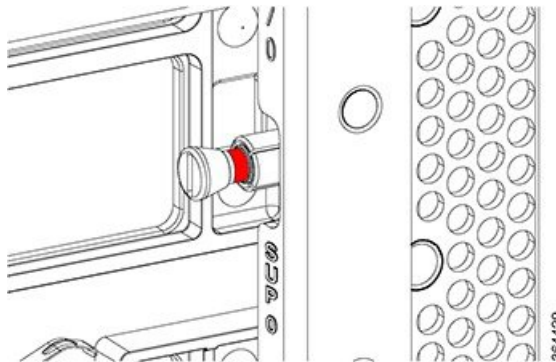
- ESD-preventive wrist strap
- Supervisor Card or blank card for the Supervisor
- 3/16" flat-blade torque screwdriver

### Procedure

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**Step 1** Loosen the captive screws on the appropriate slot using a 3/16" flat-blade torque screwdriver until the red bands are visible on the captive screws.

*Figure 6: Loosening the Captive Screws on the Supervisor Card*



**Step 2** Pull the spring-loaded ejectors on the card until they release and are perpendicular to the faceplate.

**Step 3** Grasp the faceplate of the card with one hand and place your other hand under the card to support its weight.

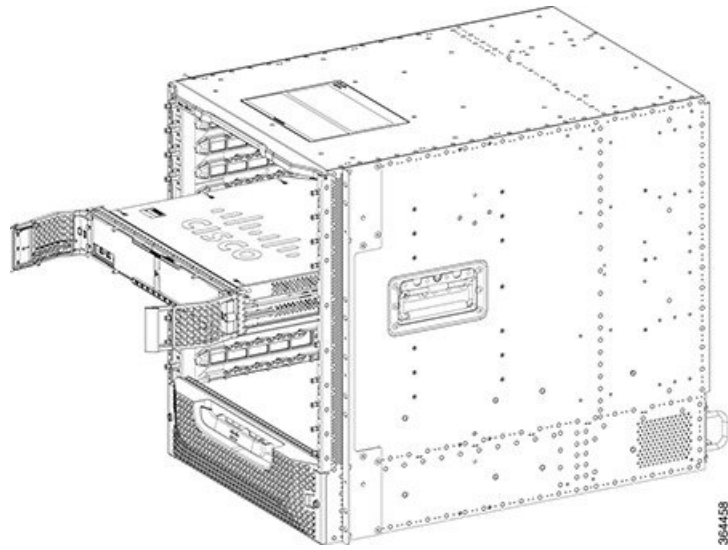
**Step 4** Carefully align the support rails on the card with the rails in the appropriate slot.

**Step 5** Slide and push the card into the slot applying even pressure using both your hands until it mates with its midplane connectors.

**Caution** To prevent damage to the midplane connector, do not use excessive force when inserting the card into the slot.

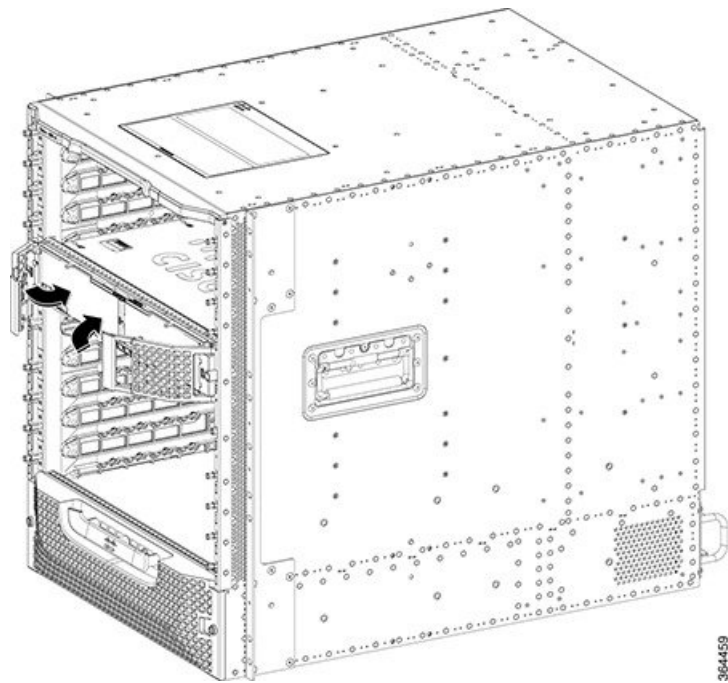


**Figure 7: Inserting the Supervisor Card into the Chassis**

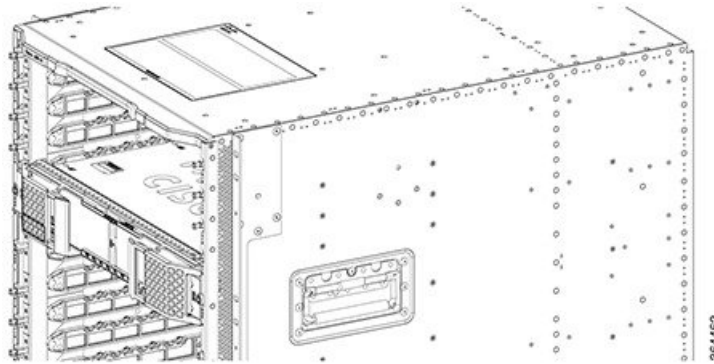


**Step 6** Simultaneously pivot both the spring-loaded ejectors towards the faceplate until they make contact with the faceplate.

**Figure 8: Closing the Spring-Loaded Ejectors on the Supervisor Card**



**Figure 9: Closed and Secured Spring-Loaded Ejectors on the Supervisor Card**



- Step 7** Tighten the two captive screws using a 3/16" flat-blade torque screwdriver with a torque of 10-12 lb-in (1.12-1.36 Nm) to secure the card.
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#### What to do next

- If you are using a single Supervisor Card, [install a blank card for the Supervisor](#) in the empty slot.
- [Connect memory stick or flash drive to use the USB port](#) (if required).
- [Connect cable to use the console port](#) (if required).

## Using the SFP+ Ports on the Supervisor PIC

#### Before you begin

- [Install the Supervisor PIC.](#)
- [Install the SFP+ module in the Supervisor PIC](#)
- [Install the Supervisor Card.](#)
- Do not remove the protective dust plugs on the unplugged fiber-optic cable connectors and the SFP+ optical bores until you are ready to make a connection.

#### Required Tools and Equipment

- Fiber-optic cable with the LC connector

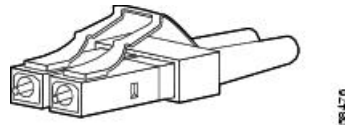
#### Procedure

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- Step 1** Remove the dust plugs from the network interface cable LC connectors. Save the dust plugs for future use.
- Step 2** [Inspect and clean the LC connector end-faces.](#)
- Step 3** Remove the dust plug from the SFP+ module optical bores on the Supervisor PIC.
- Step 4** Immediately connect the fiber-optic cable with cable LC connector to the SFP+ port.

**Important** Grasp the LC connector housing to connect the fiber-optic cable to the SFP+ ports.

*Figure 10: LC fiber-optic connector*



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### What to do next

Route the fiber-optic cables through the Supervisor PIC cable management bracket and chassis-mounted fiber/cable routing guide.

## Using the DTI Ports on the Supervisor PIC

### Before you begin

- [Install the Supervisor PIC.](#)
- [Install the Supervisor Card.](#)

### Required Tools and Equipment

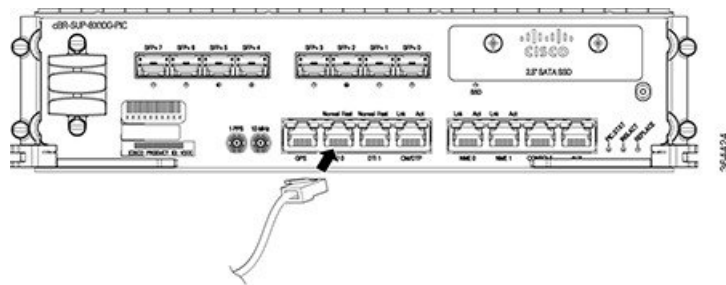
- RJ-45 cable
- Clock source (DTI server)

### Procedure

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**Step 1** Connect one end of the RJ-45 cable to the DTI port on the Supervisor PIC.

*Figure 11: DTI Port Connection on the Supervisor PIC*



**Step 2** Connect the other end of the RJ-45 cable to the DTI server as a reference clock source.

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### What to do next

Route the RJ-45 cable through the Supervisor PIC cable management bracket and chassis-mounted fiber/cable routing guide.

## Using the NME Ports on the Supervisor PIC

### Before you begin

- [Install the Supervisor PIC.](#)
- [Install the Supervisor Card.](#)

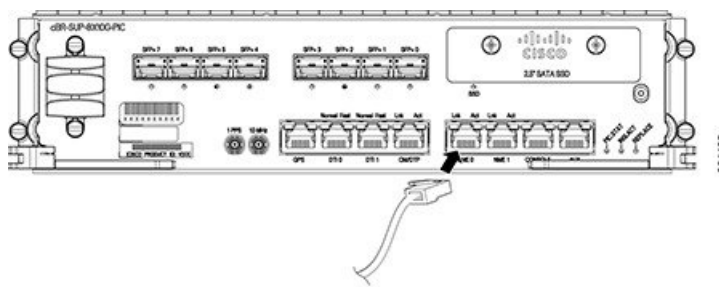
### Required Tools and Equipment

- RJ-45 cable
- Switch

### Procedure

**Step 1** Connect one end of the RJ-45 cable to the NME port on the Supervisor PIC.

*Figure 12: NME Port Connection on the Supervisor PIC*



**Step 2** Connect the other end of the RJ-45 cable to a switch.

### What to do next

[Route the RJ-45 cable through the Supervisor PIC cable management bracket and chassis-mounted fiber/cable routing guide.](#)

## Using the Console Port on the Supervisor PIC

The console port provides local administrative access to the router and its command-line interface (CLI).

### Before you begin

- [Install the Supervisor PIC.](#)
- [Install the Supervisor Card.](#)

### Restrictions

- Each Supervisor PIC must have a console port connection when running a redundant configuration in the chassis.

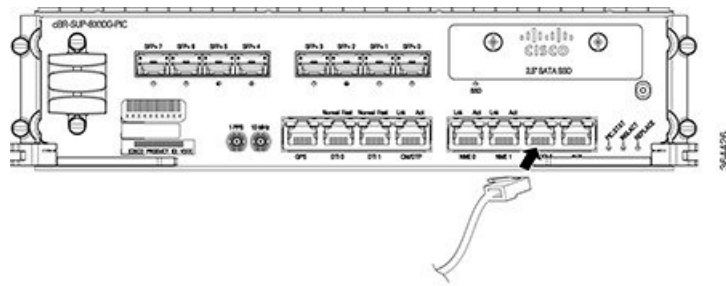
### Required Tools and Equipment

- RJ-45 cable
- RJ-45-to-DB-9 adapter
- PC or terminal

## Procedure

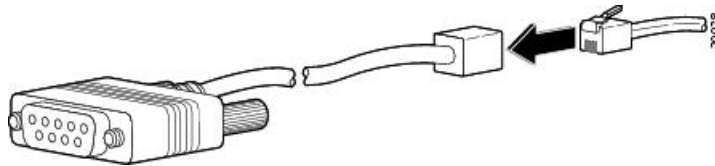
**Step 1** Connect one end of the RJ-45 cable to the console port on the Supervisor PIC.

**Figure 13: Console Port Connection on the Supervisor PIC**



**Step 2** Connect the other end of the RJ-45 cable to the RJ-45-to-DB-9 adapter.

**Figure 14: Connecting an RJ-45-to-DB-9 Adapter**



**Step 3** Connect the RJ-45-to-DB-9 adapter to the appropriate serial port on the PC or terminal.

**Step 4** Power up the PC or terminal.

**Step 5** Configure the PC terminal emulation software or the terminal with the following settings:

- 9600 baud
- 8 data bits
- No parity generation or checking
- 1 stop bit
- No flow control

## What to do next

- Route the cable through the Supervisor PIC cable management bracket and chassis-mounted fiber/cable routing guide.
- Connect a terminal server to the auxiliary port (if required).

## Using the Auxiliary Port on the Supervisor PIC

The auxiliary port provides a connection for a terminal server to allow remote access to the router and its command-line interface (CLI).

### Before you begin

- [Install the Supervisor PIC.](#)
- [Install the Supervisor Card.](#)

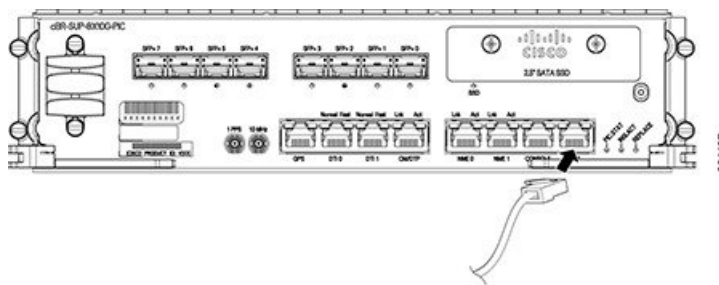
### Required Tools and Equipment

- RJ-45 cable
- RJ-45-to-DB-9 adapter
- Terminal server

### Procedure

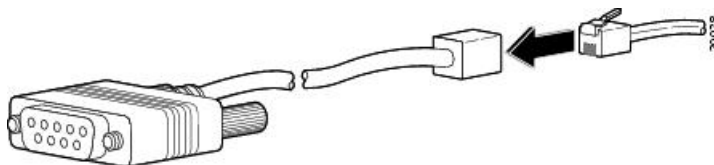
**Step 1** Connect one end of the RJ-45 cable to the auxiliary port on the Supervisor PIC.

*Figure 15: Auxiliary Port Connection on the Supervisor PIC*



**Step 2** Connect the other end of the RJ-45 cable to the RJ-45-to-DB-9 adapter.

*Figure 16: Connecting an RJ-45-to-DB-9 Adapter*



**Step 3** Connect the RJ-45-to-DB-9 adapter to the appropriate serial port on the terminal server.

### What to do next

[Route the cable through the Supervisor PIC cable management bracket and chassis-mounted fiber/cable routing guide.](#)

## Cable Management for the Supervisor PIC in the Cisco cBR Chassis

The following accessories are used for routing the cables connected to the Supervisor PIC:

- Supervisor PIC cable management bracket
- Chassis-mounted cable strap-down clips
- Chassis-mounted snap-on plastic fiber/cable routing guides

Use the upper cable management bracket and fiber/cable routing guides for routing the cables connected to the upper Supervisor PIC and the lower cable management bracket and fiber/cable routing guide for routing the cables connected to the lower Supervisor PIC.

The strap-down clips have multiple uses. They can be used:

- to strap down cable bundles or conduit (there are multiple tie down points on each strap-down clip)
- as a base for two snap-on plastic fiber/cable routing guides

### Before you begin

- [Install the Supervisor PIC.](#)
- [Install the Supervisor PIC cable management bracket.](#)
- [Install the chassis-mounted cable strap-down clips and attach the snap-on plastic fiber/cable routing guides](#), as necessary based on the cable routing preference.
- Connect the cables to the appropriate ports on the Supervisor PIC.

### Required Tools and Equipment

- Cable ties

### Procedure

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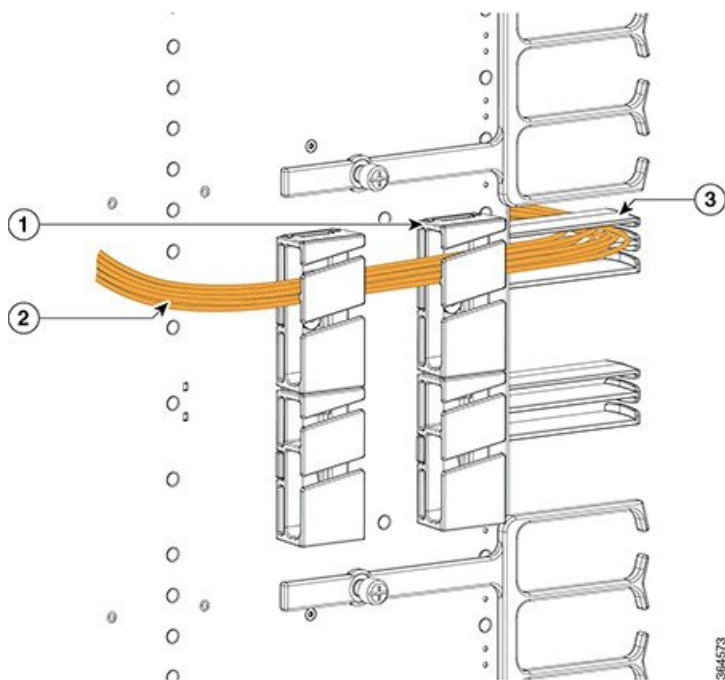
**Step 1** Perform the following for the fiber-optic cables connected to the Supervisor PIC:

- If you are using a chassis-mounted snap-on plastic fiber/cable routing guide, route the fiber-optic cables through the upper slot of the snap-on plastic fiber/cable routing guide and then through the upper slot of the Supervisor PIC cable management bracket. Secure the cable bundle using cable ties.
- If you are using a chassis-mounted cable strap-down clip without the snap-on plastic fiber/cable routing guide, route the fiber-optic cables through the upper slot of the Supervisor PIC cable management bracket. Secure the cable bundle to the upper tie down point on the strap-down clip using a cable tie.

The following figures illustrate the possible cable routing options for the fiber-optic cables connected to the Supervisor PIC:

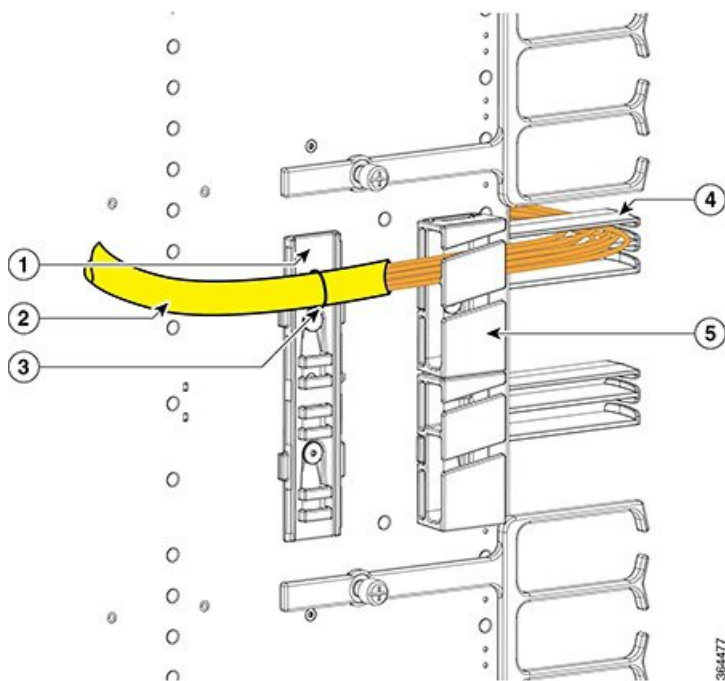


**Figure 17: Routing the Fiber-Optic Cables Connected to the Supervisor PIC—Option 1**



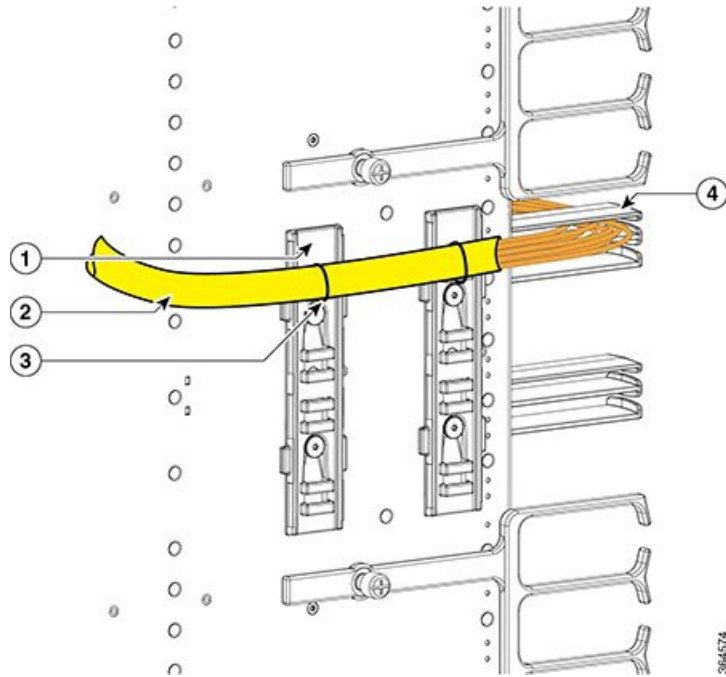
1	Snap-on plastic fiber/cable routing guides	3	Supervisor PIC cable management bracket
2	Fiber-optic cable bundle		—

**Figure 18: Routing the Fiber-Optic Cables Connected to the Supervisor PIC—Option 2**



1	Strap-down clips	4	Supervisor PIC cable management bracket
2	Fiber-optic cable bundle in flexible conduit	5	Snap-on plastic fiber/cable routing guides
3	Cable tie		—

**Figure 19: Routing the Fiber-Optic Cables Connected to the Supervisor PIC—Option 3**



1	Strap-down clip	3	Cable tie
2	Fiber-optic cable bundle in flexible conduit	4	Supervisor PIC cable management bracket

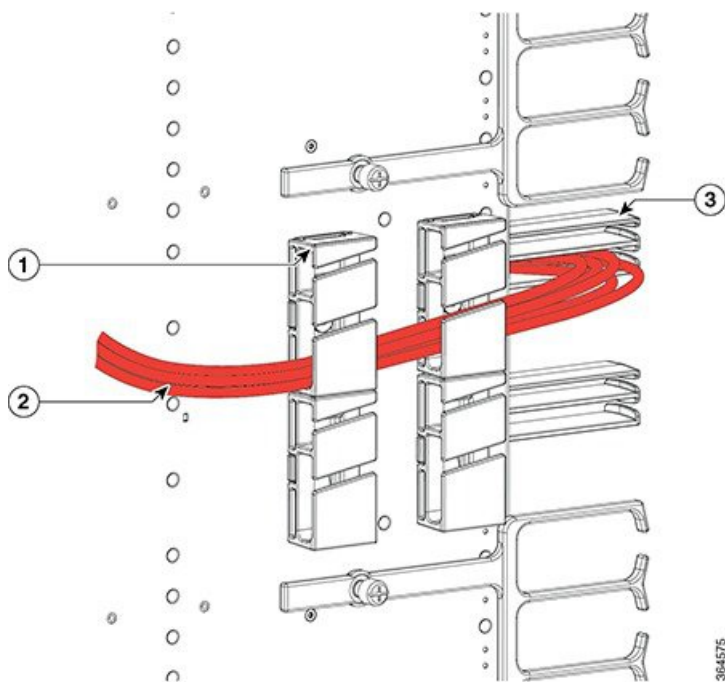
## Step 2

Perform the following for the RJ-45 cables connected to the Supervisor PIC:

- If you are using a chassis-mounted snap-on plastic fiber/cable routing guide, route the RJ-45 cables through the lower slot of the snap-on plastic fiber/cable routing guide and then through the lower slot of the Supervisor PIC cable management bracket. Secure the cable bundle using cable ties.
- If you are using a chassis-mounted cable strap-down clip without the snap-on plastic fiber/cable routing guide, route the RJ-45 cables through the lower slot of the Supervisor PIC cable management bracket. Secure the cable bundle to the lower tie down point on the strap-down clip using a cable tie.

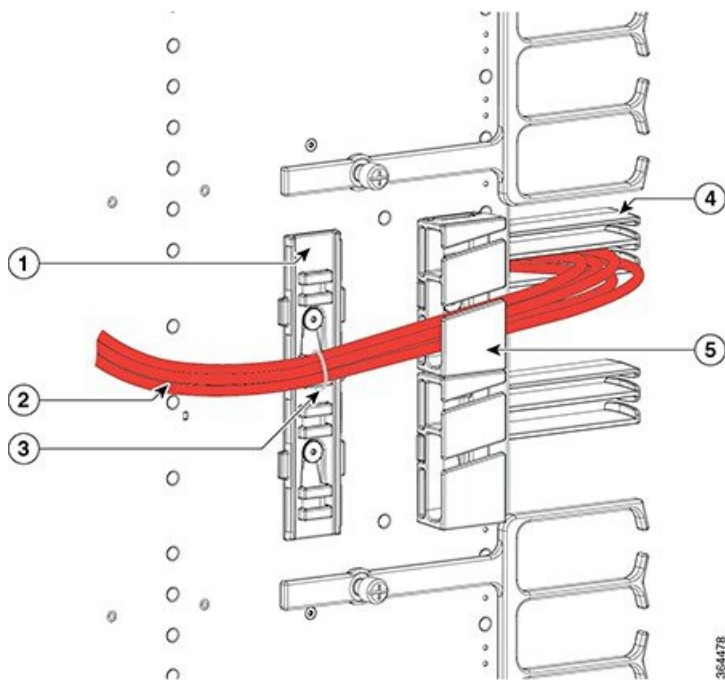
The following figures illustrate the possible cable routing options for the RJ-45 cables connected to the Supervisor PIC:

**Figure 20: Routing the RJ-45 Cables Connected to the Supervisor PIC—Option 1**



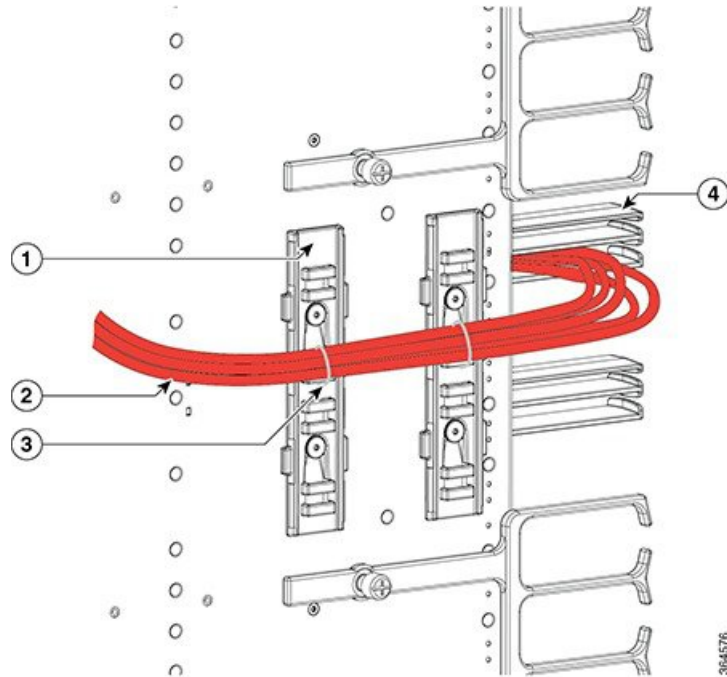
1	Snap-on plastic fiber/cable routing guides	3	Supervisor PIC cable management bracket
2	RJ-45 cable bundle		—

**Figure 21: Routing the RJ-45 Cables Connected to the Supervisor PIC—Option 2**



1	Strap-down clip	4	Supervisor PIC cable management bracket
2	RJ-45 cable bundle	5	Snap-on plastic fiber/cable routing guides
3	Cable tie		—

**Figure 22: Routing the RJ-45 Cables Connected to the Supervisor PIC—Option 3**



1	Strap-down clips	3	Cable ties
2	RJ-45 cable bundle	4	Supervisor PIC cable management bracket

**Step 3** Repeat [Step 1, on page 15](#) and [Step 2, on page 17](#) for the cables connected to the each Supervisor PIC.

## Using the USB Port on the Supervisor Card

### Before you begin

- [Install the Supervisor PIC.](#)
- [Install the Supervisor Card.](#)

### Restrictions

The USB ports on the Supervisor Card are used for temporary connections. For all permanent connections, you must use the ports on the Supervisor PIC.

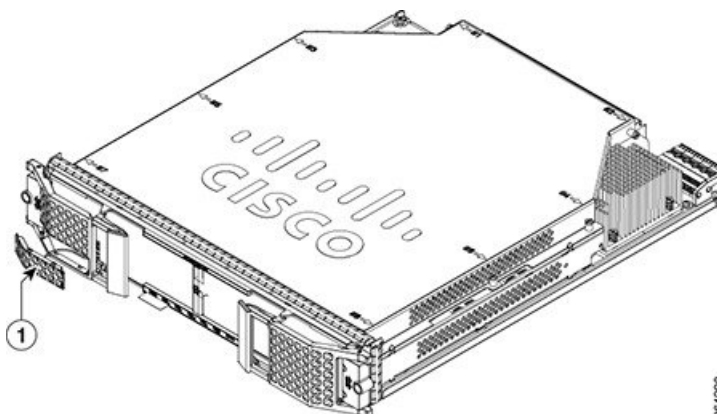
### Required Tools and Equipment

- Memory stick or flash drive

## Procedure

- Step 1** Open the tethered I/O door on the Supervisor Card by pulling on the left edge of the door until the door is released from the spring-loaded ejector.

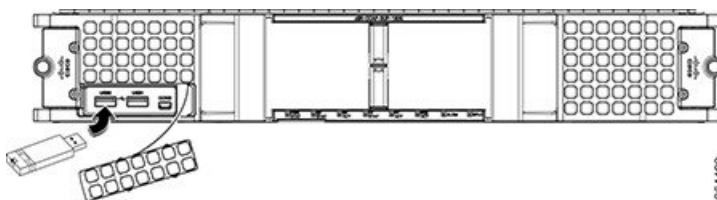
*Figure 23: Opening the Tethered I/O Door on the Supervisor Card*



1	Tethered I/O door		—
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- Step 2** Connect the memory stick or flash drive to the USB port on the Supervisor Card.

*Figure 24: Connecting the USB Drive to the USB Port*



## Using the Console Port on the Supervisor Card

### Before you begin

- [Install the Supervisor PIC.](#)
- [Install the Supervisor Card.](#)

### Restrictions

- When running a redundant configuration in the chassis, each Supervisor Card or Supervisor PIC must have a console port connection.
- The console port on the Supervisor Card is for temporary connections. For permanent console connection, you must use the port on the Supervisor PIC.

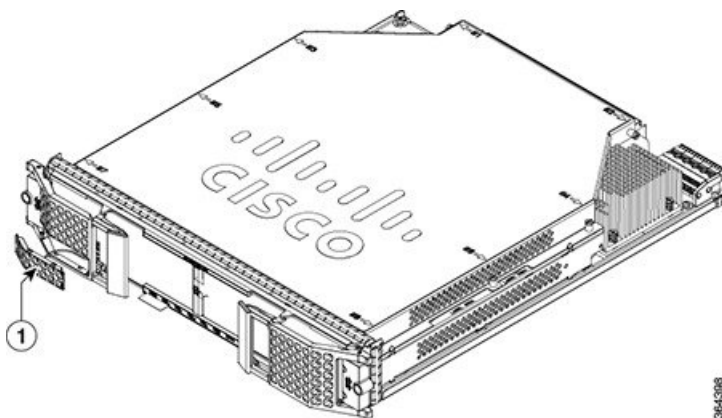
## Required Tools and Equipment

- Console cable (with mini type-B USB connector on one end, and a type-A USB connector on the other end)
- Exar XR21V1410 UART with USB interface
- Cable with type-A USB connector on one end and DB-9 connector on the other end
- PC or terminal

## Procedure

- Step 1** Open the tethered I/O door on the Supervisor Card by pulling on the left edge of the door until the door is released from the spring-loaded ejector.

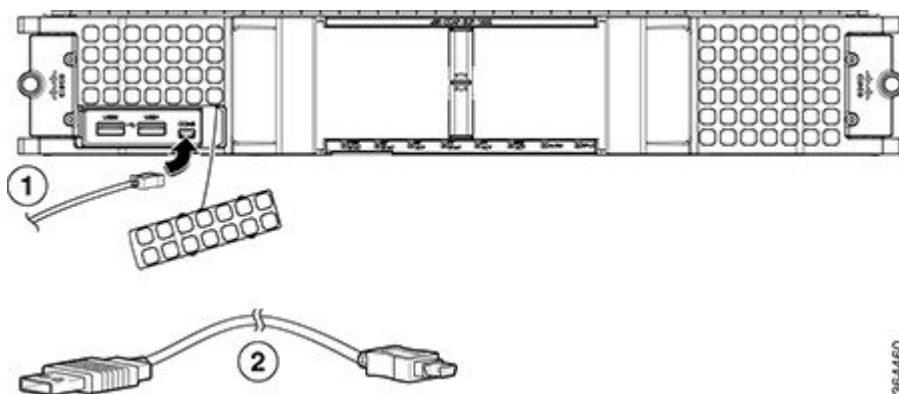
**Figure 25: Opening the Tethered I/O Door on the Supervisor Card**



1	Tethered I/O door		—
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- Step 2** Connect the mini type-B USB connector of the console cable to the console port on the Supervisor Card.

**Figure 26: Console Port Connection on the Supervisor Card**



1	Mini type-B USB connector	2	Console cable (with mini type-B USB connector on one end, and a type-A USB connector on the other end)
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- Step 3** Connect the type-A USB connector of the console cable to the Exar XR21V1410 UART with USB interface.
- Step 4** Connect the Exar XR21V1410 UART to the appropriate serial port on the PC or terminal using a cable with type-A USB connector on one end and DB-9 connector on the other end.
- Step 5** Power up the PC or terminal.
- Step 6** Configure the PC terminal emulation software or the terminal with the following settings:
- 9600 baud
  - 8 data bits
  - No parity generation or checking
  - 1 stop bit
  - No flow control

## Installing the Supervisor 250G

### Installing the Supervisor PIC in the Cisco cBR Chassis

Perform this procedure to install the following PICs:

- Supervisor PIC
- Blank PIC for the Supervisor



**Note** Do not support mix use of 250G and 160G SUP and SUP-PIC.

#### Before you begin



**Warning** If you are adding a new Supervisor PIC or upgrading the existing Supervisor PICs, ensure that the power modules installed in the chassis are adequate to support the Supervisor PICs.

- Attach an ESD-preventive wrist strap to your wrist and connect the other end to the grounding lug connected to the chassis.
- Be aware of the weight and size of the equipment. Handle it with care.

#### Restrictions

- If you are using a single Supervisor, you must install the Supervisor PIC in the slot corresponding to the Supervisor Card.





**Note** In the Cisco cBR-8 router,

- Slot 4/1 for the Supervisor PIC corresponds to slot SUP0 for the Supervisor Card.
- Slot 5/1 for the Supervisor PIC corresponds to slot SUP1 for the Supervisor Card.

### Required Tools and Equipment

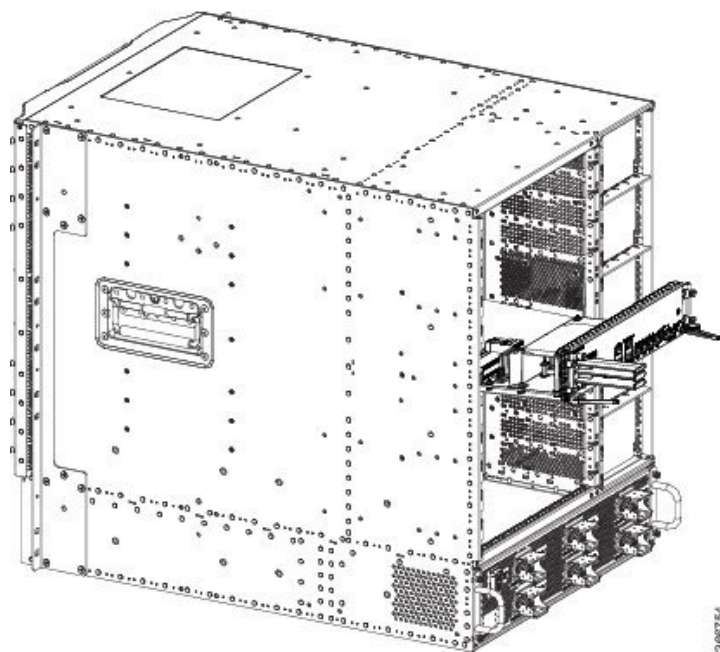
- ESD-preventive wrist strap
- Supervisor PIC or blank PIC for the Supervisor
- 3/16" flat-blade torque screwdriver

### Procedure

- Step 1** Grasp the faceplate of the PIC with one hand and place your other hand under the PIC to support its weight.
- Step 2** Carefully align the PIC with the plastic guides in the slot.
- Step 3** Slide the PIC into the slot applying even pressure using both your hands until it is within an inch of full insertion.
- Step 4** Open the ejector levers and fully insert the PIC into the slot applying even pressure on both sides until it mates with the midplane connectors.

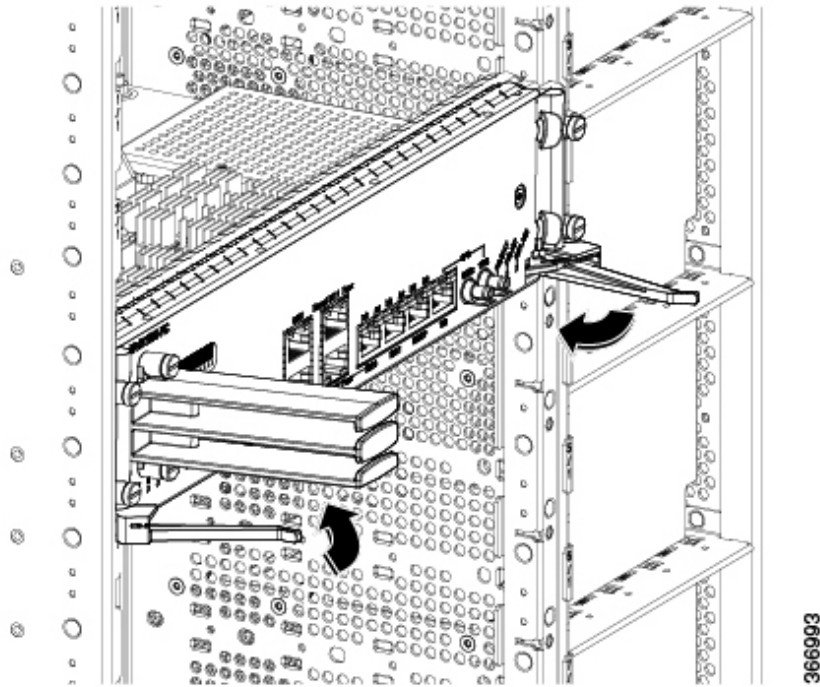
**Caution** To prevent damage to the midplane connectors, do not use excessive force when inserting the PIC into the slot.

**Figure 27: Inserting the Supervisor PIC into the Chassis**



- Step 5** Simultaneously pivot both the ejector levers towards each other until they cannot be pivoted any further.

**Figure 28: Closing the Ejector Levers on the Supervisor PIC**



- Step 6** Tighten the four captive screws using a 3/16" flat-blade torque screwdriver with a torque of 6-8 in-lb (0.68-0.90 Nm) to secure the PIC.
- 

#### **What to do next**

- If you are using a single Supervisor PIC, [install a blank PIC for the Supervisor](#) in the empty slot.
- [Install the Supervisor PIC cable management bracket](#) (recommended).
- [Install the Supervisor Card](#) (if not already installed).

## **Installing the Supervisor PIC Cable Management Bracket**

The Supervisor PIC cable management bracket is shipped separately in the chassis accessory kit. It has a smaller slot for fiber-optic cables and a larger slot for the RJ-45 cables.

#### **Before you begin**

- Attach an ESD-preventive wrist strap to your wrist and connect the other end to the grounding lug connected to the chassis.
- [Install the Supervisor PIC](#) (recommended).

#### **Required Tools and Equipment**

- ESD-preventive wrist strap

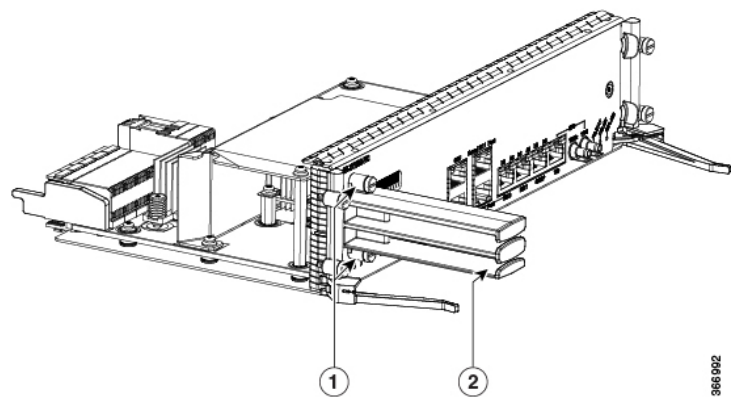
- Supervisor PIC
- Supervisor PIC cable management bracket
- 3/16" flat-blade torque screwdriver

**Procedure**

- Step 1**

Align the captive screws on the Supervisor PIC cable management bracket with the mounting holes on the Supervisor PIC.
- Important** Ensure that the lower slot in the cable management bracket is the smaller slot for fiber-optic cables and the upper slot is the larger slot for RJ-45 cables.

*Figure 29: Installing the Supervisor PIC Cable Management Bracket*



1	Captive screws	2	Supervisor PIC cable management bracket
---	----------------	---	---

- Step 2**

Tighten the captive screws using a 3/16" flat-blade torque screwdriver with a torque of 6-8 in-lb (0.68-0.90 Nm) to secure the Supervisor PIC cable management bracket.

**What to do next**

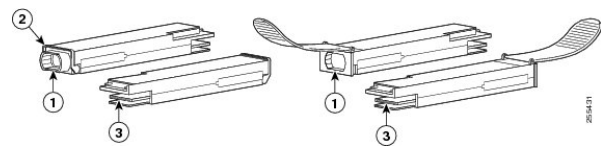
- [Install the chassis-mounted fiber/cable routing guide](#) (if not already installed).
- [Route the Supervisor PIC cables through the Supervisor PIC cable management bracket and chassis-mounted fiber/cable routing guide.](#)

## Installing the QSFP+ or QSFP28 Transceiver Modules in the Supervisor PIC

The 40-Gigabit (GE) QSFP+ and 100 Gigabit (QSFP28) transceiver module is a hot-swappable, parallel fiber-optical module with four independent optical transmit and receive channels. These channels can terminate in another 40-Gigabit QSFP+ transceiver, or the channels can be broken out to four separate 10-Gigabit SFP+ transceivers. The QSFP+ transceiver module connects the electrical circuitry of the system with an optical external network.

The following figure shows the 40-Gigabit optical QSFP+ transceiver. The transceiver is used primarily in short reach applications in switches, routers, and data center equipment where it provides higher density than SFP+ modules. The 100-Gigabit optical QSFP28 transceiver is similar to the 40-Gigabit optical QSFP transceiver.

Figure 30: 40-Gigabit QSFP+ Transceiver Module (Optical)



1	40GBASE QSFP+ transceiver body	3	Electrical connection to the module circuitry
2	Bail-clasp latch		

The QSFP+ or QSFP28 transceiver module can have either a bail-clasp latch or a pull-tab latch. Installation procedures for both types of latches are provided.

Before you begin



**Caution** Do not install or remove the QSFP28 module with fiber-optic cables still attached to it. Doing so may damage cables, cable connectors, or the optical interfaces and may interfere with the QSFP28 module latching properly into its socket connector. Disconnect all cables before removing or installing an QSFP28 module.



**Caution** The QSFP+ or QSFP28 transceiver module is a static-sensitive device. Always use an ESD wrist strap or similar individual grounding device when handling QSFP+ or QSFP28 transceiver modules or coming into contact with system modules.

- Attach an ESD-preventive wrist strap to your wrist and connect the other end to the grounding lug connected to the chassis.
- You must use the supported QSFP28 modules. The following QSFP28 modules are supported on the Supervisor PIC:
  - QSFP-100G-SR4-S
  - QSFP-100G-LR4-S
  - QSFP-40G-SR4 with breakout cable
  - QSFP-4x10G-LR-S with breakout cable
  - QSFP-100G-SM-SR



**Note** If the QSFP-100G-SM-SR module is used in the SUP 250 PIC card, the cBR-8 router chassis ambient temperature must be limited to 54°C at sea level.

Required Tools and Equipment

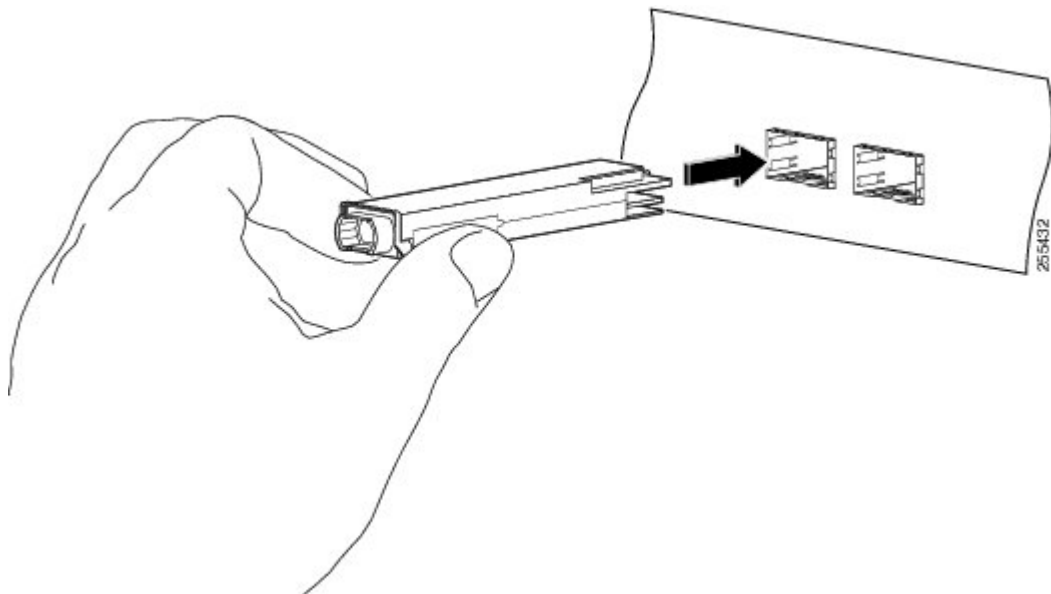
- Wrist strap or other personal grounding device to prevent ESD occurrences.

- Antistatic mat or antistatic foam to set the transceiver on.
- Fiber-optic end-face cleaning tools and inspection equipment.

## Procedure

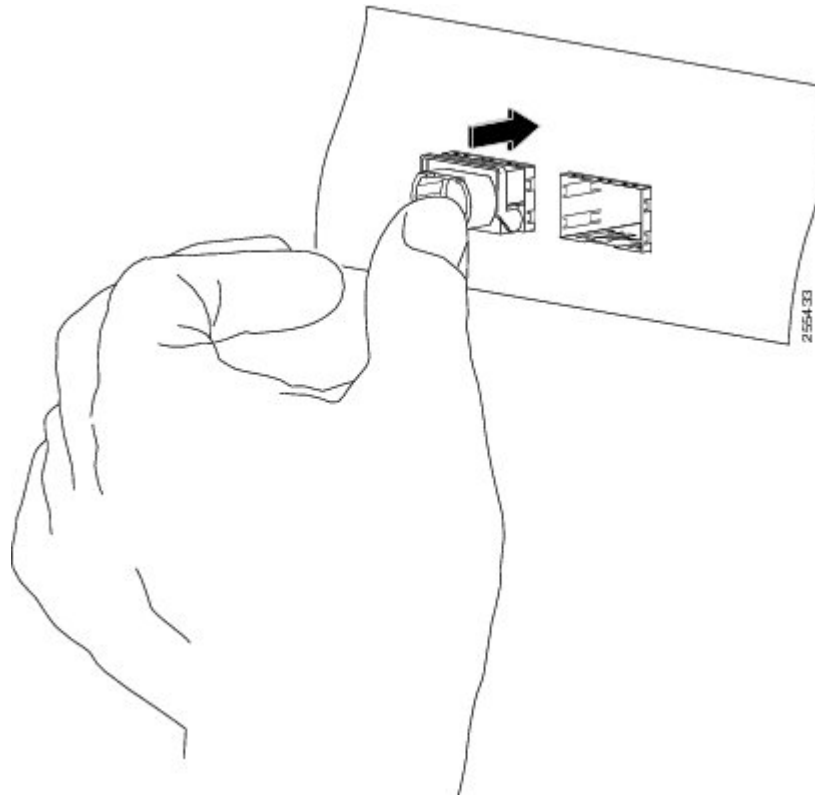
- 
- Step 1** Attach an ESD wrist strap to yourself and a properly grounded point on the chassis or the rack.
- Step 2** Remove the QSFP+ or QSFP28 transceiver module from its protective packaging.
- Step 3** Check the label on the QSFP+ or QSFP28 transceiver module body to verify that you have the correct model for your network.
- Step 4** For optical QSFP+ or QSFP28 transceiver modules, remove the optical bore dust plug and set it aside.
- Step 5** For QSFP+ or QSFP28 transceiver modules equipped with a pull-tab, hold the transceiver so that the identifier label is on the top.
- Step 6** For QSFP+ or QSFP28 transceiver modules equipped with a bail-clasp latch, keep the bail-clasp aligned in a vertical position.
- Step 7** Align the QSFP+ or QSFP28 transceiver module in front of the module's transceiver socket opening and carefully slide the QSFP+ or QSFP28 transceiver into the socket until the transceiver makes contact with the socket electrical connector (see the figure below).

**Figure 31: Installing the 40-Gigabit QSFP+ or 100-Gigabit QSFP28 Transceiver Module (Optical Transceiver Equipped with a Bail-Clasp Latch Shown)**



- Step 8** Press firmly on the front of the QSFP+ or QSFP28 transceiver module with your thumb to fully seat the transceiver in the module's transceiver socket (see the below figure).
- Caution** If the latch is not fully engaged, you might accidentally disconnect the QSFP+ or QSFP28 transceiver module.

**Figure 32: Seating the 40-Gigabit QSFP+ or 100-Gigabit QSFP28 Transceiver Module (Optical Transceiver Equipped with a Bail-Clasp Latch Shown)**



**Step 9** For optical QSFP+ or QSFP28 transceiver modules, reinstall the dust plug into the QSFP+ or QSFP28 transceivers optical bore until you are ready to attach the network interface cable. Do not remove the dust plug until you are ready to attach the network interface cable.

---

#### **What to do next**

- Verify if the QSFP+ or QSFP28 module is seated and latched properly. Grasp the QSFP+ or QSFP28 module and try to remove it without releasing the latch. If the QSFP+ or QSFP28 module cannot be removed, it is installed and seated properly. If the QSFP+ or QSFP28 module can be removed, reinstall it.
- [Connect fiber-optic cable to the QSFP+ or QSFP28 port.](#)

## **Installing the Supervisor Card in the Cisco cBR Chassis**

Perform this procedure to install the following cards:

- Supervisor Card
- Blank card for the Supervisor

## Before you begin



**Warning** If you are adding a new Supervisor Card or upgrading the existing Supervisor Cards, ensure that the power modules installed in the chassis are adequate to support the Supervisor Cards.

- Attach an ESD-preventive wrist strap to your wrist and connect the other end to the grounding lug connected to the chassis.
- [Install the Supervisor PIC](#) (recommended).
- Be aware of the weight and size of the equipment. Handle it with care.

## Restrictions

- If you are using a single Supervisor, you must install the Supervisor Card in the slot corresponding to the Supervisor PIC.



**Note** In the Cisco cBR-8 router,

- Slot 4/1 for the Supervisor PIC corresponds to slot SUP0 for the Supervisor Card.
- Slot 5/1 for the Supervisor PIC corresponds to slot SUP1 for the Supervisor Card.

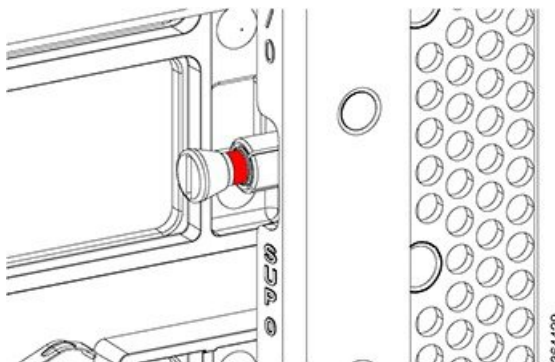
## Required Tools and Equipment

- ESD-preventive wrist strap
- Supervisor Card or blank card for the Supervisor
- 3/16" flat-blade torque screwdriver

## Procedure

**Step 1** Loosen the captive screws on the appropriate slot using a 3/16" flat-blade torque screwdriver until the red bands are visible on the captive screws.

**Figure 33: Loosening the Captive Screws on the Supervisor Card**

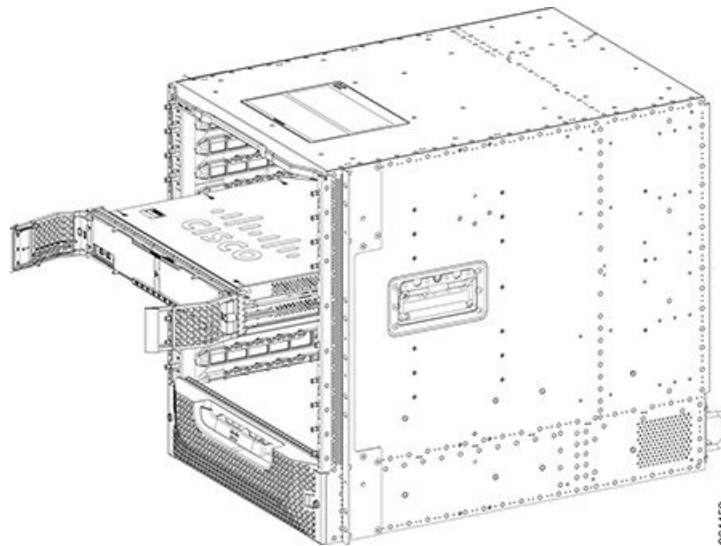


**Step 2** Pull the spring-loaded ejectors on the card until they release and are perpendicular to the faceplate.



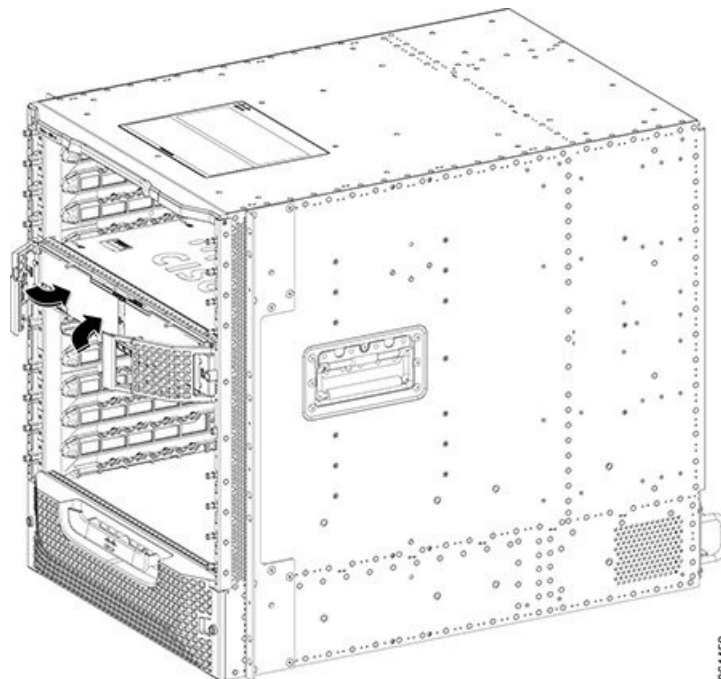
- Step 3** Grasp the faceplate of the card with one hand and place your other hand under the card to support its weight.
- Step 4** Carefully align the support rails on the card with the rails in the appropriate slot.
- Step 5** Slide and push the card into the slot applying even pressure using both your hands until it mates with its midplane connectors.
- Caution** To prevent damage to the midplane connector, do not use excessive force when inserting the card into the slot.

**Figure 34: Inserting the Supervisor Card into the Chassis**

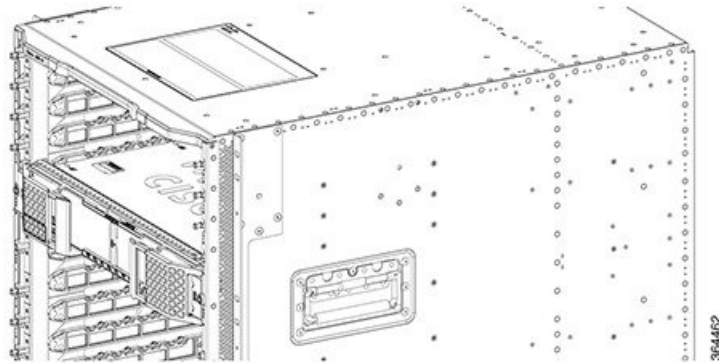


- Step 6** Simultaneously pivot both the spring-loaded ejectors towards the faceplate until they make contact with the faceplate.

**Figure 35: Closing the Spring-Loaded Ejectors on the Supervisor Card**



**Figure 36: Closed and Secured Spring-Loaded Ejectors on the Supervisor Card**



- Step 7** Tighten the two captive screws using a 3/16" flat-blade torque screwdriver with a torque of 10-12 lb-in (1.12-1.36 Nm) to secure the card.
- 

#### What to do next

- If you are using a single Supervisor Card, [install a blank card for the Supervisor](#) in the empty slot.
- [Connect memory stick or flash drive to use the USB port](#) (if required).
- [Connect cable to use the console port](#) (if required).

## Attaching the Optical Network Cable

#### Before you begin

- [Install the Supervisor PIC.](#)
- [Install the QSFP+ or QSFP28 module in the Supervisor PIC](#)
- [Install the Supervisor Card.](#)

Before removing the dust plugs and making any optical connections, follow these guidelines:

- Keep the protective dust plugs installed in the unplugged fiber-optic cable connectors and in the transceiver optical bores until you are ready to make a connection.
- Inspect and clean the MPO connector end faces just before you make any connections.
- Grasp the MPO connector only by the housing to plug or unplug a fiber-optic cable.



---

**Note** 40-Gigabit QSFP+ or QSFP28 transceiver modules are keyed to prevent incorrect insertion.

---

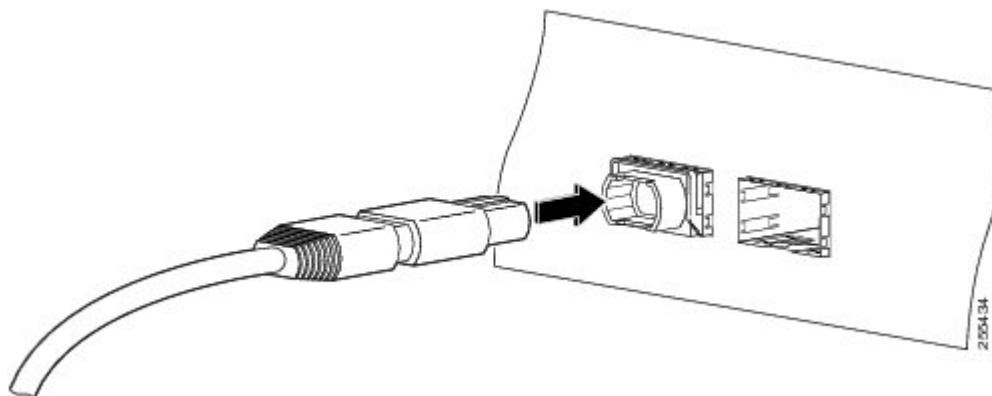


**Note** The multiple-fiber push-on (MPO) connectors on the optical QSFP+ or QSFP28 transceivers support network interface cables with either physical contact (PC) or ultra-physical contact (UPC) flat polished face types. The MPO connectors on the optical QSFP+ or QSFP28 transceivers do not support network interface cables with an angle-polished contact (APC) face type.

## Procedure

- Step 1** Remove the dust plugs from the optical network interface cable MPO connectors. Save the dust plugs for future use.
- Step 2** Inspect and clean the MPO connector's fiber-optic end faces.
- Step 3** Remove the dust plugs from the QSFP+ or QSFP28 transceiver module optical bores.
- Step 4** Immediately attach the network interface cable MPO connectors to the QSFP+ or QSFP28 transceiver module (see the figure below).

*Figure 37: Cabling a 40-Gigabit QSFP+ or QSFP28 Transceiver Module*



## What to do next

Route the fiber-optic cables through the Supervisor PIC cable management bracket and chassis-mounted fiber/cable routing guide.

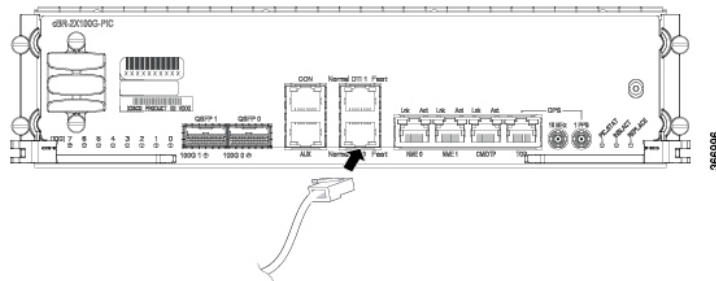
## Using the DTI Ports on the Supervisor PIC

### Before you begin

- [Install the Supervisor PIC.](#)
- [Install the Supervisor Card.](#)

### Required Tools and Equipment

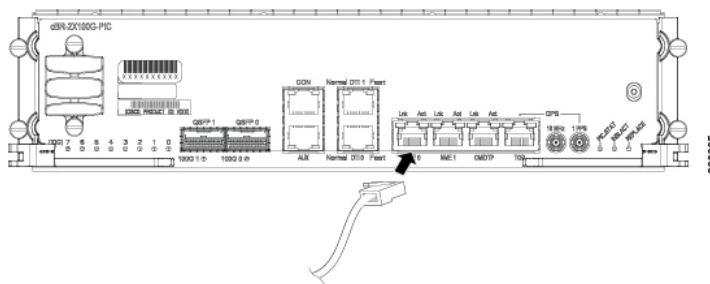
- RJ-45 cable
- Clock source (DTI server)



- Install the Supervisor PIC.
- Install the Supervisor Card.

- RJ-45 cable
- Switch

**Figure 39: NME Port Connection on the Supervisor PIC**



**Step 2** Connect the other end of the RJ-45 cable to a switch.

---

### What to do next

Route the RJ-45 cable through the Supervisor PIC cable management bracket and chassis-mounted fiber/cable routing guide.

## Using the Console Port on the Supervisor PIC

The console port provides local administrative access to the router and its command-line interface (CLI).

### Before you begin

- [Install the Supervisor PIC.](#)
- [Install the Supervisor Card.](#)

### Restrictions

- Each Supervisor PIC must have a console port connection when running a redundant configuration in the chassis.

### Required Tools and Equipment

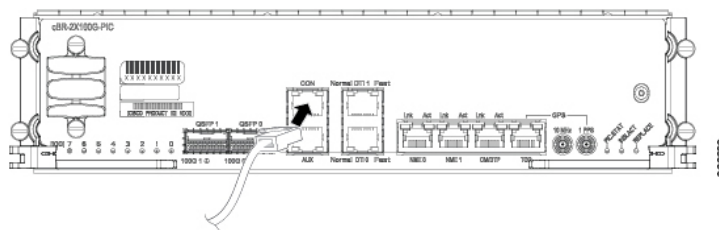
- RJ-45 cable
- RJ-45-to-DB-9 adapter
- PC or terminal

### Procedure

---

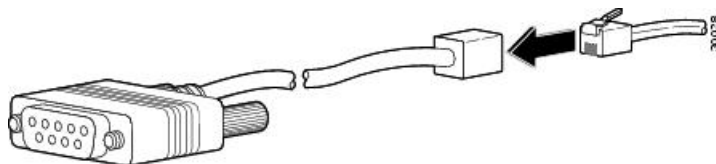
**Step 1** Connect one end of the RJ-45 cable to the console port on the Supervisor PIC.

**Figure 40: Console Port Connection on the Supervisor PIC**



**Step 2** Connect the other end of the RJ-45 cable to the RJ-45-to-DB-9 adapter.

**Figure 41: Connecting an RJ-45-to-DB-9 Adapter**



**Step 3** Connect the RJ-45-to-DB-9 adapter to the appropriate serial port on the PC or terminal.

**Step 4** Power up the PC or terminal.

**Step 5** Configure the PC terminal emulation software or the terminal with the following settings:

- 9600 baud
- 8 data bits
- No parity generation or checking
- 1 stop bit
- No flow control

## What to do next

- Route the cable through the Supervisor PIC cable management bracket and chassis-mounted fiber/cable routing guide.
- Connect a terminal server to the auxiliary port (if required).

## Using the Auxiliary Port on the Supervisor PIC

The auxiliary port provides a connection for a terminal server to allow remote access to the router and its command-line interface (CLI).

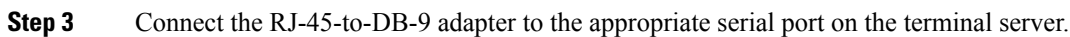
## Before you begin

- Install the Supervisor PIC.
- Install the Supervisor Card.

## Required Tools and Equipment

- ## Procedure

**Figure 42: Auxiliary Port Connection on the Supervisor PIC**



## 36



- to strap down cable bundles or conduit (there are multiple tie down points on each strap-down clip)
- as a base for two snap-on plastic fiber/cable routing guides

### Before you begin

- [Install the Supervisor PIC.](#)
- [Install the Supervisor PIC cable management bracket.](#)
- [Install the chassis-mounted cable strap-down clips and attach the snap-on plastic fiber/cable routing guides](#), as necessary based on the cable routing preference.
- Connect the cables to the appropriate ports on the Supervisor PIC.

### Required Tools and Equipment

- Cable ties

### Procedure

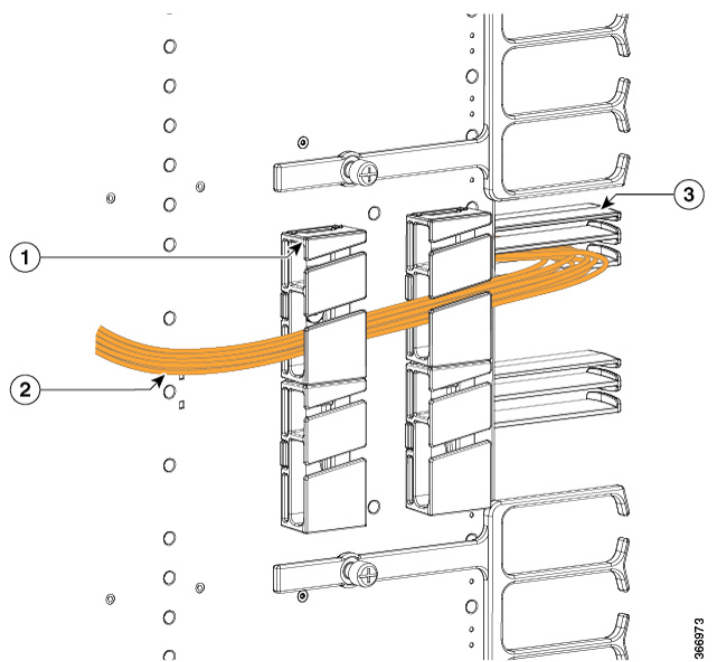
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**Step 1** Perform the following for the fiber-optic cables connected to the Supervisor PIC:

- If you are using a chassis-mounted snap-on plastic fiber/cable routing guide, route the fiber-optic cables through the upper slot of the snap-on plastic fiber/cable routing guide and then through the upper slot of the Supervisor PIC cable management bracket. Secure the cable bundle using cable ties.
- If you are using a chassis-mounted cable strap-down clip without the snap-on plastic fiber/cable routing guide, route the fiber-optic cables through the upper slot of the Supervisor PIC cable management bracket. Secure the cable bundle to the upper tie down point on the strap-down clip using a cable tie.

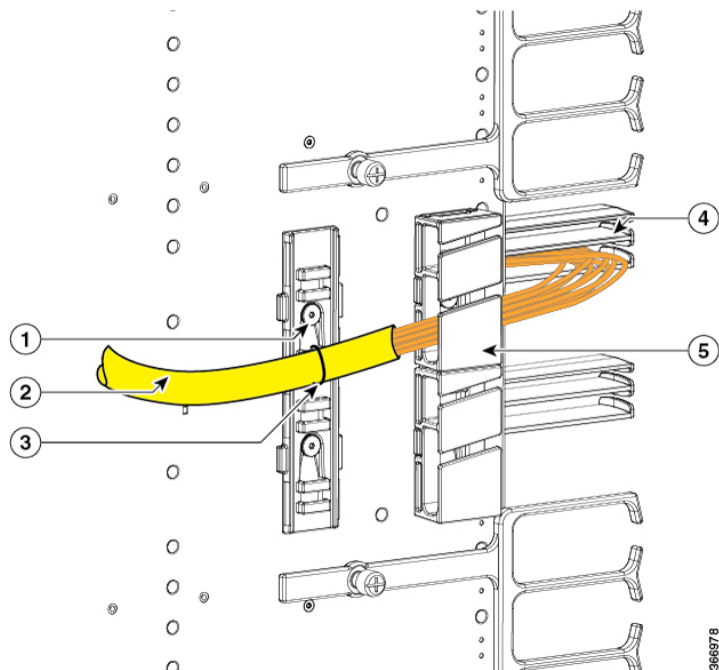
The following figures illustrate the possible cable routing options for the fiber-optic cables connected to the Supervisor PIC:

Figure 44: Routing the Fiber-Optic Cables Connected to the Supervisor PIC—Option 1



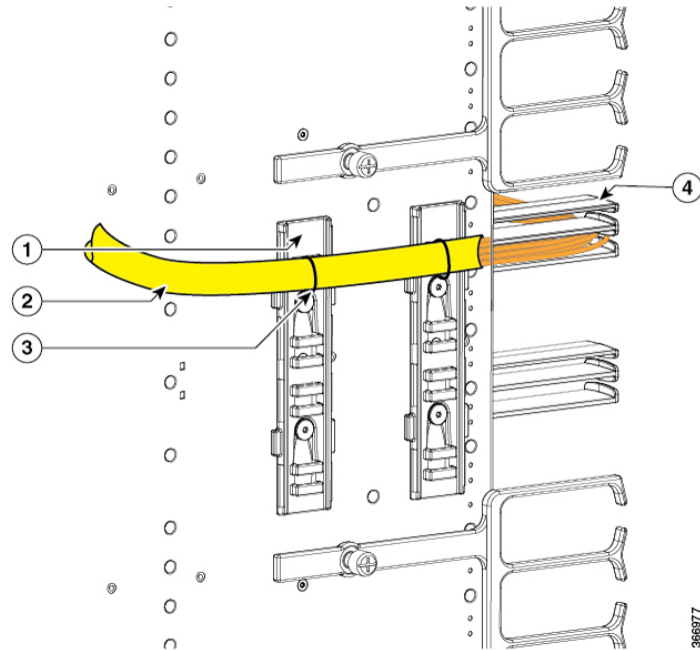
1	Snap-on plastic fiber/cable routing guides	3	Supervisor PIC cable management bracket
2	Fiber-optic cable bundle		—

Figure 45: Routing the Fiber-Optic Cables Connected to the Supervisor PIC—Option 2



1	Strap-down clips	4	Supervisor PIC cable management bracket
2	Fiber-optic cable bundle in flexible conduit	5	Snap-on plastic fiber/cable routing guides
3	Cable tie		—

**Figure 46: Routing the Fiber-Optic Cables Connected to the Supervisor PIC—Option 3**



1	Strap-down clip	3	Cable tie
2	Fiber-optic cable bundle in flexible conduit	4	Supervisor PIC cable management bracket

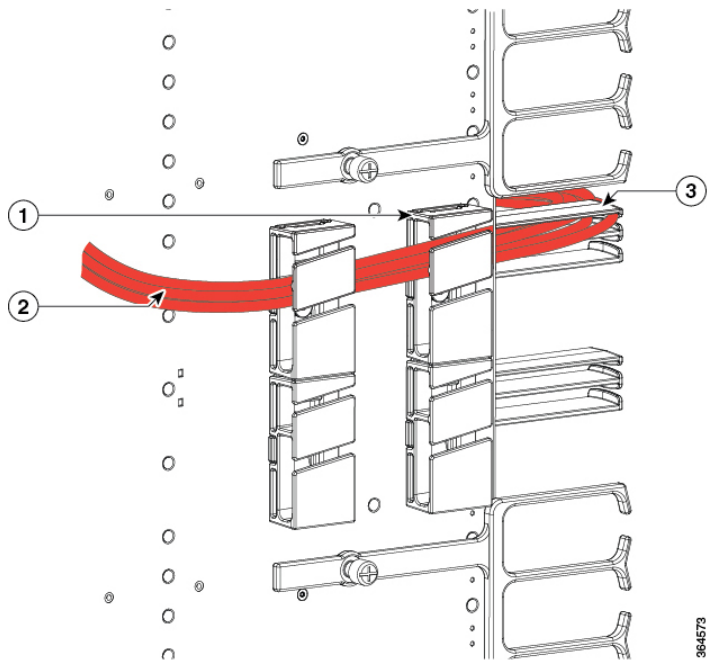
## Step 2

Perform the following for the RJ-45 cables connected to the Supervisor PIC:

- If you are using a chassis-mounted snap-on plastic fiber/cable routing guide, route the RJ-45 cables through the lower slot of the snap-on plastic fiber/cable routing guide and then through the lower slot of the Supervisor PIC cable management bracket. Secure the cable bundle using cable ties.
- If you are using a chassis-mounted cable strap-down clip without the snap-on plastic fiber/cable routing guide, route the RJ-45 cables through the lower slot of the Supervisor PIC cable management bracket. Secure the cable bundle to the lower tie down point on the strap-down clip using a cable tie.

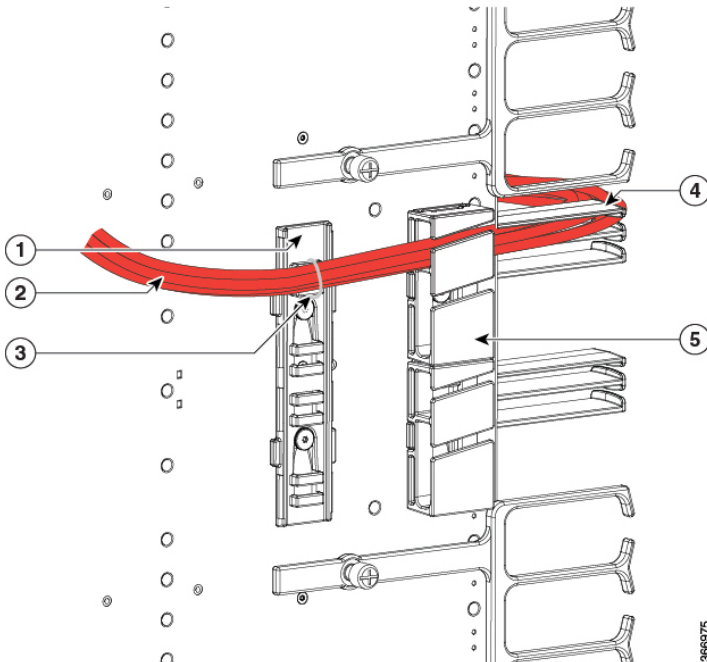
The following figures illustrate the possible cable routing options for the RJ-45 cables connected to the Supervisor PIC:

Figure 47: Routing the RJ-45 Cables Connected to the Supervisor PIC—Option 1



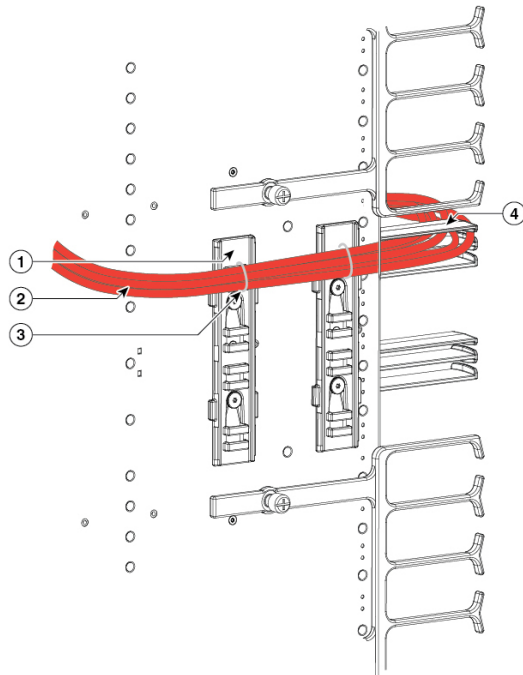
1	Snap-on plastic fiber/cable routing guides	3	Supervisor PIC cable management bracket
2	RJ-45 cable bundle		—

Figure 48: Routing the RJ-45 Cables Connected to the Supervisor PIC—Option 2



1	Strap-down clip	4	Supervisor PIC cable management bracket
2	RJ-45 cable bundle	5	Snap-on plastic fiber/cable routing guides
3	Cable tie		—

**Figure 49: Routing the RJ-45 Cables Connected to the Supervisor PIC—Option 3**



1	Strap-down clips	3	Cable ties
2	RJ-45 cable bundle	4	Supervisor PIC cable management bracket

**Step 3** Repeat [Step 1, on page 15](#) and [Step 2, on page 17](#) for the cables connected to the each Supervisor PIC.

## Using the USB Port on the Supervisor Card

### Before you begin

- [Install the Supervisor PIC.](#)
- [Install the Supervisor Card.](#)

### Restrictions

The USB ports on the Supervisor Card are used for temporary connections. For all permanent connections, you must use the ports on the Supervisor PIC.

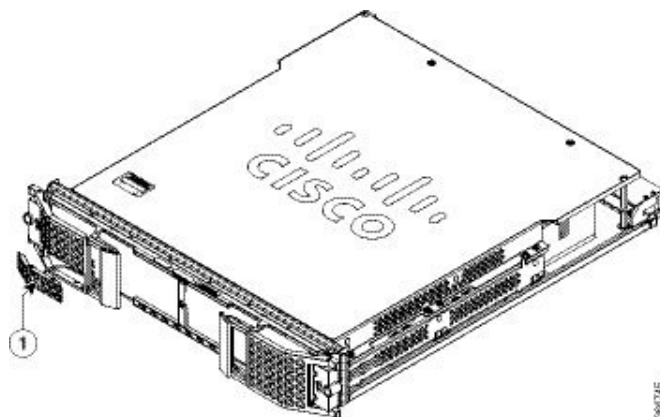
### Required Tools and Equipment

- Memory stick or flash drive

## Procedure

- Step 1** Open the tethered I/O door on the Supervisor Card by pulling on the left edge of the door until the door is released from the spring-loaded ejector.

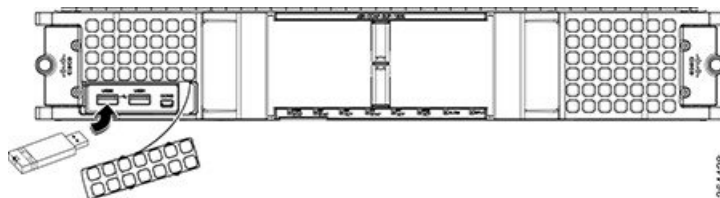
*Figure 50: Opening the Tethered I/O Door on the Supervisor Card*



1	Tethered I/O door		—
---	-------------------	--	---

- Step 2** Connect the memory stick or flash drive to the USB port on the Supervisor Card.

*Figure 51: Connecting the USB Drive to the USB Port*



## Using the Console Port on the Supervisor Card

### Before you begin

- [Install the Supervisor PIC.](#)
- [Install the Supervisor Card.](#)

### Restrictions

- When running a redundant configuration in the chassis, each Supervisor Card or Supervisor PIC must have a console port connection.
- The console port on the Supervisor Card is for temporary connections. For permanent console connection, you must use the port on the Supervisor PIC.

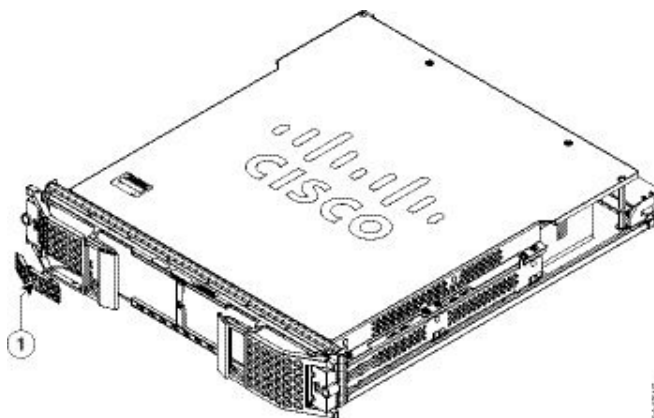
## Required Tools and Equipment

- Console cable (with mini type-B USB connector on one end, and a type-A USB connector on the other end)
- Exar XR21V1410 UART with USB interface
- Cable with type-A USB connector on one end and DB-9 connector on the other end
- PC or terminal

## Procedure

**Step 1** Open the tethered I/O door on the Supervisor Card by pulling on the left edge of the door until the door is released from the spring-loaded ejector.

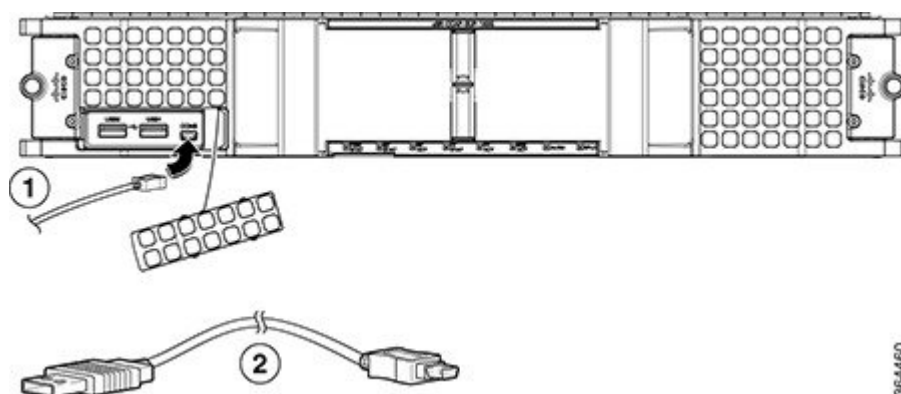
**Figure 52: Opening the Tethered I/O Door on the Supervisor Card**



1	Tethered I/O door		—
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**Step 2** Connect the mini type-B USB connector of the console cable to the console port on the Supervisor Card.

**Figure 53: Console Port Connection on the Supervisor Card**



1	Mini type-B USB connector	2	Console cable (with mini type-B USB connector on one end, and a type-A USB connector on the other end)
---	---------------------------	---	--

- Step 3** Connect the type-A USB connector of the console cable to the Exar XR21V1410 UART with USB interface.
- Step 4** Connect the Exar XR21V1410 UART to the appropriate serial port on the PC or terminal using a cable with type-A USB connector on one end and DB-9 connector on the other end.
- Step 5** Power up the PC or terminal.
- Step 6** Configure the PC terminal emulation software or the terminal with the following settings:
- 9600 baud
  - 8 data bits
  - No parity generation or checking
  - 1 stop bit
  - No flow control

## Swap Supervisor 160G to Supervisor 250G 10GE Mode

### Backup the Configuration and IOS Code

#### Procedure

**Step 1** Insert the Cisco certified eUSB disk into the USB0 on the active SUP160 board.

**Step 2** Edit the configuration follow the steps below:

Please note that on SUP250, all 10G and 100G interfaces are visible regardless of whether the related QSFP module is inserted or not. The backhaul interface numbering scheme on SUP250 is different from SUP160, shown as below:

	100GE interface	10GE interface
SUP4	Hu4/1/0 ~ Hu4/1/1	Te4/1/2 ~ Te4/1/9
SUP5	Hu5/1/0 ~ Hu5/1/1	Te5/1/2 ~ Te5/1/9

Therefore, we recommend the user to copy the SUP160 configuration out to the server and edit the SUP160 configuration manually before copy back to the SUP250.

a) Replace the card type **sup-pic-8x10g** with **sup-pic-2x100g-8x10g** on both card 4/1 and 5/1.

```
card 0/0 cBR-CCAP-LC-40G r-phy
card 1/0 cBR-CCAP-LC-40G r-phy
card 2/0 cBR-CCAP-LC-40G
card 3/0 cBR-CCAP-LC-40G
card 4/1 sup-pic-2x100g-8x10g
card 5/1 sup-pic-2x100g-8x10g
card 6/0 cBR-CCAP-LC-40G
card 7/0 cBR-CCAP-LC-40G
```



```
card 8/0 cBR-CCAP-LC-40G r-phy
card 9/0 cBR-CCAP-LC-40G r-phy
```

- b) Relocate the backhaul related configuration based on the numbering scheme listed in the above chart. The mappings are Ten4/1/0 – Ten 4/1/7 (SUP160) as Ten4/1/2 – Ten4/1/9 (SUP250), Ten5/1/0 – Ten5/1/7 (SUP160) as Ten5/1/2 – Ten5/1/9 (SUP250).

- c) Modify the bootvar to the correct value.

```
boot system bootflash:<image_name>
```

- d) Save the configuration as a sup250.txt file.

**Step 3** Copy the sup250.txt into eUSB.

**Step 4** Copy the IOS image into eUSB.

```
copy ftp://<username>:<password>@<server ip>/dir/<image_name>
```

**Step 5** Execute md5 check for IOS image.

```
verify /md5 usb0:<image_name>
```

---

## Swap the Supervisor

### Procedure

---

**Step 1** Power off the cbr-8 chassis.

**Step 2** Loosen the hook screw on the active SUP and pull out the SUP160 board from the chassis.

**Step 3** Loosen the hook screw on the standby SUP and pull out the SUP160 board from the chassis.

**Step 4** Label the cables connected to the active SUP PIC, then pull out all the cables from the SUP PIC. Loosen the hook screw on the active SUP PIC and pull out the SUP160 PIC from the chassis.

**Step 5** Label the cables connected to the standby SUP PIC, then pull out all the cables from the SUP PIC. Loosen the hook screw on the standby SUP PIC and pull out the SUP160 PIC from the chassis.

**Step 6** Insert the SUP250 board into the slot 4 on the rear side of the chassis and tighten the hook screw.

**Step 7** Insert another SUP250 board into the slot 5 on the rear side of the chassis and tighten the hook screw.

**Step 8** Insert the SUP250 PIC into the slot 4 on the front side of the chassis and tighten the hook screw.

**Step 9** Insert another SUP250 PIC into the slot 5 on the front side of the chassis and tighten the hook screw.

**Step 10** Insert the 1-to-4 breakout fibers into the QSFP module on SUP in slot 4 and slot 5 respectively.

**Step 11** Connect all the cables into the new SUP250 PIC and SUP250 board on slot 4 and slot 5.

**Step 12** Power on the chassis.

**Step 13** Log in the active SUP via the active console port and log in the standby SUP via the standby console port, both boards should be in rommon mode. Send break and make sure the board is in rommon mode if it does not in rommon mode after boot up.

**Step 14** Insert the eUSB into the USB0 of the SUP in slot4, boot the SUP from rommon to IOS.

```
boot usb0:<image_name>
```

**Step 15** Once the SUP enter the IOS mode, copy the image from eUSB to bootflash on the SUP.

```
copy usb0:<image_name> bootflash:
```

**Step 16** Insert the eUSB into the USB0 of the SUP in slot 5, boot the SUP from rommon to IOS, Send break and make sure the board is in rommon mode if it does not in rommon mode after boot up.

```
boot usb0:<image_name>
```

**Step 17** Once the SUP enter the IOS mode, and SUP redundancy reach SSO mode, On active SUP, copy the image from eUSB to bootflash on the standby SUP.

```
copy stby-usb0:<image_name> stby-bootflash:
```

**Step 18** Copy pre-saved running configuration from eUSB to nvram.

```
copy usb0:sup250.txt startup-config
```

**Step 19** Pull out the eUSB.

**Step 20** Change the config-reg to 0x2102.

```
Router(config)# config-register 0x2102
```

**Step 21** Reload the system without saving the configuration on the active SUP.

```
reload
System configuration has been modified. Save? [yes/no]: no
```

**Step 22** Once the system enter the IOS mode, verify SUP redundancy reach SSO via below show command:

```
Router# show redundancy
Load for five secs: 41%/2%; one minute: 67%; five minutes: 70%
Time source is NTP, 11:34:45.548 CST Wed Sep 20 2017
Redundant System Information :
-----
Available system uptime = 4 days, 18 hours, 39 minutes
Switchovers system experienced = 2
Standby failures = 0
Last switchover reason = user forced
Hardware Mode = Duplex
Configured Redundancy Mode = sso
Operating Redundancy Mode = sso
Maintenance Mode = Disabled
Communications = Up
Current Processor Information :
-----
Active Location = slot 4
Current Software state = ACTIVE
Uptime in current state = 1 day, 23 hours, 59 minutes
Image Version = Cisco IOS Software [Fuji], cBR Software
(X86_64_LINUX_IOSD-UNIVERSALK9-M), Experimental Version
16.7.20171024:133607 [v167_throttle-/nobackup/mcgourtm/v167_throttle_ece2 103]
Copyright (c) 1986-2017 by Cisco Systems, Inc.
Compiled Tue 24-Oct-17 12:43 by mcgourtm
BOOT = bootflash:cbrsup-universalk9.BLD_V167_THROTTLE_LATEST_20171019_050605.SSA.bin,12;
CONFIG_FILE =
Configuration register = 0x2102
Peer Processor Information :
-----
Standby Location = slot 5
Current Software state = STANDBY HOT
Uptime in current state = 1 day, 23 hours, 49 minutes
Image Version = Cisco IOS Software [Fuji], cBR Software
(X86_64_LINUX_IOSD-UNIVERSALK9-M), Experimental Version
16.7.20171024:133607 [v167_throttle-/nobackup/mcgourtm/v167_throttle_ece2 103]
Copyright (c) 1986-2017 by Cisco Systems, Inc.
Compiled Tue 24-Oct-17 12:43 by mcgourtm
BOOT = bootflash:cbrsup-universalk9.2017-10-24_12.51_mcgourtm.SSA.bin,12
```

```
CONFIG_FILE =  
Configuration register = 0x2102
```

**Step 23** Verify the state of the 10GE backhaul interface links. If the 10GE backhaul interface links are administratively down, run the `no shutdown` command for the backhaul interfaces.

**Step 24** Save the configuration by running the `wr` command.

**Step 25** Save & backup current configuration.

```
copy running-config startup-config
```

**Step 26** Copy the configuration into bootflash for backup.

```
copy running-config bootflash:sup250.cfg  
copy running-config stby-bootflash:sup250.cfg
```

**Step 27** Check the WAN port connection by ping the peer device.

**Step 28** Check the system health and service with the following commands:

```
show version  
show platform  
show platform diag  
show environment  
show cable modem summary total  
show processes cpu sorted  
show logging
```

---

## Upgrade Supervisor 160G to Supervisor 250G 100GE Mode

### Backup the Configuration and IOS Code

#### Procedure

---

**Step 1** Insert the Cisco certified eUSB disk into the USB0 on the active SUP160 board.

**Step 2** Edit the configuration follow the steps below:

Please note that on SUP250, all 10G and 100G interfaces are visible regardless of whether the related QSFP module is inserted or not. The backhaul interface numbering scheme on SUP250 is different from SUP160, shown as below:

	100GE interface	10GE interface
SUP4	Hu4/1/0 ~ Hu4/1/1	Te4/1/2 ~ Te4/1/9
SUP5	Hu5/1/0 ~ Hu5/1/1	Te5/1/2 ~ Te5/1/9

Therefore, we recommend the user to copy the SUP160 configuration out to the server and edit the SUP160 configuration manually before copy back to the SUP250.

a) Replace the card type **sup-pic-8x10g** with **sup-pic-2x100g-8x10g** on both card 4/1 and 5/1.

```
card 0/0 cBR-CCAP-LC-40G  
card 1/0 cBR-CCAP-LC-40G  
card 2/0 cBR-CCAP-LC-40G  
card 3/0 cBR-CCAP-LC-40G
```

```

card 4/1 sup-pic-2x100g-8x10g
card 5/1 sup-pic-2x100g-8x10g
card 6/0 cBR-CCAP-LC-40G
card 7/0 cBR-CCAP-LC-40G
card 8/0 cBR-CCAP-LC-40G
card 9/0 cBR-CCAP-LC-40G

```

- b) Remove all TenGig interface configurations from file, for example:

```

interface TenGigabitEthernet4/1/0,
interface TenGigabitEthernet4/1/1,
interface TenGigabitEthernet4/1/2,
interface TenGigabitEthernet4/1/3,
interface TenGigabitEthernet4/1/4,
interface TenGigabitEthernet4/1/5,
interface TenGigabitEthernet4/1/6,
interface TenGigabitEthernet4/1/7,
interface TenGigabitEthernet5/1/0,
interface TenGigabitEthernet5/1/1,
interface TenGigabitEthernet5/1/2,
interface TenGigabitEthernet5/1/3,
interface TenGigabitEthernet5/1/4,
interface TenGigabitEthernet5/1/5,
interface TenGigabitEthernet5/1/6,
interface TenGigabitEthernet5/1/7,

```

- c) Add HundredGigE interfaces configuration based on the network topology, for example:

```

interface HundredGigE4/1/0
mtu 2000
no ip address
load-interval 30
plim qos input map ip dscp-based
plim qos input map ip dscp 40 queue strict-priority
plim qos input map mpls exp 5 queue strict-priority
cdp enable
service-policy output parent-egress-to-core
channel-group 10 mode active
end
interface HundredGigE4/1/1
mtu 2000
no ip address
load-interval 30
plim qos input map ip dscp-based
plim qos input map ip dscp 40 queue strict-priority
plim qos input map mpls exp 5 queue strict-priority
cdp enable
service-policy output parent-egress-to-core
channel-group 11 mode active
end
interface HundredGigE5/1/0
mtu 2000
no ip address
load-interval 30
plim qos input map ip dscp-based
plim qos input map ip dscp 40 queue strict-priority
plim qos input map mpls exp 5 queue strict-priority
cdp enable
service-policy output parent-egress-to-core
channel-group 10 mode active
end
interface HundredGigE5/1/1
mtu 2000
no ip address
load-interval 30

```

```

plim qos input map ip dscp-based
plim qos input map ip dscp 40 queue strict-priority
plim qos input map mpls exp 5 queue strict-priority
cdp enable
service-policy output parent-egress-to-core
channel-group 11 mode active
end

```

- d) Modify routing configuration, L2VPN configuration, passive interface configuration etc. as needed. For example. search for TenGigabitEthernet in previous configuration and replace with HundredGigE.
- e) Modify the bootvar to the correct value.

```
boot system bootflash:<image_name>
```

- f) Save the configuration as a sup250.txt file.

**Step 3** Copy the sup250.txt into eUSB.

**Step 4** Copy the IOS image into eUSB.

```
copy ftp://<username>:<password>@<server ip>/dir/<image_name>
```

**Step 5** Execute md5 check for IOS image.

```
verify /md5 usb0:<image_name>
```

## Swap the Supervisor

### Procedure

**Step 1** Power off the cbr-8 chassis.

**Step 2** Loosen the hook screw on the active SUP and pull out the SUP160 board from the chassis.

**Step 3** Loosen the hook screw on the standby SUP and pull out the SUP160 board from the chassis.

**Step 4** Label the cables connected to the active SUP PIC, then pull out all the cables from the SUP PIC. Loosen the hook screw on the active SUP PIC and pull out the SUP160 PIC from the chassis.

**Step 5** Label the cables connected to the standby SUP PIC, then pull out all the cables from the SUP PIC. Loosen the hook screw on the standby SUP PIC and pull out the SUP160 PIC from the chassis.

**Step 6** Insert the SUP250 board into the slot 4 on the rear side of the chassis and tighten the hook screw.

**Step 7** Insert another SUP250 board into the slot 5 on the rear side of the chassis and tighten the hook screw.

**Step 8** Insert the SUP250 PIC into the slot 4 on the front side of the chassis and tighten the hook screw.

**Step 9** Insert another SUP250 PIC into the slot 5 on the front side of the chassis and tighten the hook screw.

**Step 10** Connect the 100G QSFP on SUP slot 4 and slot 5 respectively.

**Step 11** Power on the chassis.

**Step 12** Log in the active SUP via the active console port and log in the standby SUP via the standby console port, both boards should be in rommon mode. Send break and make sure the board is in rommon mode if it does not in rommon mode after boot up.

**Note** If you see garbage, then check the baudrate and use speed 115200 or 9600.

**Step 13** Insert the eUSB into the USB0 of the SUP in slot4, boot the SUP from rommon to IOS.

```
boot usb0:<image_name>
```

- Step 14** Once the SUP enter the IOS mode, copy the image from eUSB to bootflash on the SUP.
- ```
copy usb0:<image_name> bootflash:
```
- Step 15** Insert the eUSB into the USB0 of the SUP in slot 5, boot the SUP from rommon to IOS, Send break and make sure the board is in rommon mode if it does not in rommon mode after boot up.
- ```
boot usb0:<image_name>
```
- Step 16** Once the SUP enter the IOS mode, and SUP redundancy reach SSO mode, On active SUP, copy the image from eUSB to bootflash on the standby SUP.
- ```
copy stby-usb0:<image_name> stby-bootflash:
```
- Step 17** Copy pre-saved running configuration from eUSB to nvram.
- ```
copy usb0:sup250.txt startup-config
```
- Step 18** Pull out the eUSB.
- Step 19** Change the config-reg to 0x2102.
- ```
Router(config)# config-register 0x2102
```
- Step 20** Reload the system without saving the configuration on the active SUP.
- ```
reload
System configuration has been modified. Save? [yes/no]: no
```
- Step 21** Once the system enter the IOS mode, verify SUP redundancy reach SSO via below show command:
- ```
Router# show redundancy
Load for five secs: 41%/2%; one minute: 67%; five minutes: 70%
Time source is NTP, 11:34:45.548 CST Wed Sep 20 2017
Redundant System Information :
-----
Available system uptime = 4 days, 18 hours, 39 minutes
Switchovers system experienced = 2
Standby failures = 0
Last switchover reason = user forced
Hardware Mode = Duplex
Configured Redundancy Mode = sso
Operating Redundancy Mode = sso
Maintenance Mode = Disabled
Communications = Up
Current Processor Information :
-----
Active Location = slot 4
Current Software state = ACTIVE
Uptime in current state = 1 day, 23 hours, 59 minutes
Image Version = Cisco IOS Software [Fuji], cBR Software
(X86_64_LINUX_IOSD-UNIVERSALK9-M), Experimental Version
16.7.20171024:133607 [v167_throttle-/nobackup/mcgourtm/v167_throttle_ece2 103]
Copyright (c) 1986-2017 by Cisco Systems, Inc.
Compiled Tue 24-Oct-17 12:43 by mcgourtm
BOOT = bootflash:cbrsup-universalk9.BLD_V167_THROTTLE_LATEST_20171019_050605.SSA.bin,12;
CONFIG_FILE =
Configuration register = 0x2102
Peer Processor Information :
-----
Standby Location = slot 5
Current Software state = STANDBY HOT
Uptime in current state = 1 day, 23 hours, 49 minutes
Image Version = Cisco IOS Software [Fuji], cBR Software
(X86_64_LINUX_IOSD-UNIVERSALK9-M), Experimental Version
```

```
16.7.20171024:133607 [v167_throttle-/nobackup/mcgourtm/v167_throttle_ece2 103]
Copyright (c) 1986-2017 by Cisco Systems, Inc.
Compiled Tue 24-Oct-17 12:43 by mcgourtm
BOOT = bootflash:cbrsup-universalk9.2017-10-24_12.51_mcgourtm.SSA.bin,12
CONFIG_FILE =
Configuration register = 0x2102
```

**Step 22** Verify the state of the 100GE backhaul interface links. If the 100GE backhaul interface links are administratively down, run the `no shutdown` command for the backhaul interfaces.

**Step 23** Save the configuration by running the `wr` command.

**Step 24** Save & backup current configuration.

```
copy running-config startup-config
```

**Step 25** Copy the configuration into bootflash for backup.

```
copy running-config bootflash:sup250.cfg
copy running-config stby-bootflash:sup250.cfg
```

**Step 26** Check the WAN port connection by ping the peer device.

**Step 27** Check the system health and service with the following commands:

```
show version
show platform
show platform diag
show environment
show cable modem summary total
show processes cpu sorted
show logging
```

---







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