# Connecting the Fabric Interconnect

This chapter contains the following topics:



## Overview of Network Connections

After you install the fabric interconnect in a rack and power it up, you are ready to make the following network connections:

- Console connection—This is a direct local management connection that you use to initially configure the fabric interconnect. You must make this connection first to initially configure the fabric interconnect and determine its IP address, which is needed for the other connections.
- Management connection—After you complete the initial configuration using a console, you can make this connection to manage all future fabric interconnect configurations.
- Uplink and downlink interface connections—These are connections to hosts and servers in the network.

Each of these connection types is explained in one of the sections that follow.

**Note** When running cables in overhead or subfloor cable trays, we strongly recommend that you locate power cables and other potential noise sources as far away as practical from network cabling that terminates on Cisco equipment. In situations where long parallel cable runs cannot be separated by at least 3.3 feet (1 meter), we recommend that you shield any potential noise sources by housing them in a grounded metallic conduit.

# Connecting a Console to the Fabric Interconnect

Before you create a network management connection for the fabric interconnect or connect the fabric interconnect to the network, you must create a local management connection through a console terminal. And then configure an IP address for the fabric interconnect. You can use the console to perform the following functions, each of which can be performed through the management interface after you make that connection:

- Configure the fabric interconnect using the command-line interface (CLI).
- Monitor network statistics and errors.
- Configure Simple Network Management Protocol (SNMP) agent parameters.
- Download software updates.

You make this local management connection between the asynchronous serial port on a supervisor module and a console device capable of asynchronous transmission. Typically, you can use a computer terminal as the console device. On the supervisor modules, you use the console serial port.

**Note** Before you can connect the console port to a computer terminal, make sure that the computer terminal supports VT100 terminal emulation. The terminal emulation software makes communication between the fabric interconnect and computer possible during setup and configuration.

### Before you begin

- The fabric interconnect must be fully installed in its rack, which is connected to a power source, and grounded.
- The necessary cabling for the console, management, and network connections must be available.
  - An RJ-45 rollover cable provided in the fabric interconnect accessory kit.
  - Network cabling is routed to the location of the installed fabric interconnect.

### Procedure

**Step 1** Configure the console device to match the following default port characteristics:

- 9600 baud
- 8 data bits
- 1 stop bit
- No parity

**Step 2** Connect an RJ-45 rollover cable to the console port on the fabric interconnect.

You can find this cable in the accessory kit.

**Step 3** Route the RJ-45 rollover cable to the console or modem.

**Step 4** Connect the other end of the RJ-45 rollover cable to the console or to a modem.

# Uplink Connections

The uplink ports (49 through 64) support either uplink to network or storage peer devices as follows:

- For 100-Gigabit Ethernet, use a QSFP28 transceiver in an uplink port (recommended).
- For 40-Gigabit Ethernet, use a QSFP+ transceiver in an uplink port.
- For 25-Gigabit Ethernet, use a QSA28 transceiver in an uplink port.
- For 10 Gigabit-Ethernet, use a QSFP-to-SFP adapter (QSA) and an SFP+ transceiver in an uplink port.

For a list of transceivers and cables used by this fabric interconnect for uplink connections, see http://www.cisco.com/c/en/us/support/interfaces-modules/transceiver-modules/products-device-support-tables-list.html.

## Statement 1051—Laser Radiation

**Warning** Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.

# Creating the Initial Configuration

You assign an IP address to the fabric interconnect management interface so that you can then connect the fabric interconnect to the network.

When you initially power up the fabric interconnect, it boots up and asks you a series of questions to configure the fabric interconnect. To connect the fabric interconnect to the network, you can use the default choices for each configuration except the IP address, which you must provide. You can perform the other configurations later through a supported Cisco management platform, such as Cisco Intersight.

**Note** Know the unique name that is needed to identify the fabric interconnect among the devices in the network.

### Before you begin

- A console device must be connected with the fabric interconnect.
- The fabric interconnect must be connected to a power source.
- Determine the IP address and the netmask that is needed for the Management (Mgmt0) interface.

### Procedure

**Step 1** Power up the fabric interconnect by connecting each installed power supply to an AC circuit.

If you are using the combined or power-supply (*n*+1) power mode, connect all the power supplies to the same AC circuit. If you are using the input-source (*n*+*n*) power mode, connect half of the power supplies to one AC circuit. And connect the other half of the power supplies to another AC circuit.

The Input and Output LEDs on each power supply light up (green) when the power supply units are sending power to the fabric interconnect, and the software asks you to specify a password to use with the fabric interconnect.

**Step 2** Enter a new password to use for this fabric interconnect.

The software checks the security strength of your password and rejects your password if it is not considered to be a strong password. To increase the security strength of your password, make sure that it adheres to the following guidelines:

- At least eight characters
- Minimizes or avoids the use of consecutive characters (such as "abcd").
- Minimizes or avoids repeating characters (such as "aaabbb").
- Does not contain recognizable words from the dictionary.
- Does not contain proper names.
- Contains both uppercase and lowercase characters
- Contains numbers and letters

Examples of strong passwords include the following:

- If2CoM18
- 2004AsdfLkj30
- Cb1955S21

**Note**
Clear text passwords cannot include the dollar sign ($) special character.

**Tip**
If a password is trivial (such as a short, easy-to-decipher password), the software will reject your password configuration. Be sure to configure a strong password as explained in this step. Passwords are case-sensitive.

If you enter a strong password, the software asks you to confirm the password.

**Step 3** Enter the same password again.

If you enter the same password, the software accepts the password and begins asking a series of configuration questions.

**Step 4** Until you are asked for an IP address, you can enter the default configuration for each question.

Repeat this step for each question until you are asked for the Mgmt0 IPv4 address.

**Step 5** Enter the IP address for the management interface.

The software asks for the Mgmt0 IPv4 netmask.

**Step 6** Enter a network mask for the management interface.

The software asks if you need to edit the configuration.

**Step 7** Enter **no** not to edit the configuration.

The software asks if you need to save the configuration.

**Step 8** Enter **yes** to save the configuration.

### What to do next

You can now set up the management interface for each supervisor module on the fabric interconnect.

# Setting Up the Management Interface

The management port (MGMT ETH) provides out-of-band management, which enables you to use the command-line interface (CLI) to manage the fabric interconnect by its IP address. This port uses a 10/100/1000 Ethernet connection with an RJ-45 interface.

### Before you begin

The fabric interconnect must be powered on.

### Procedure

**Step 1** Connect the management cable into the management port on the fabric interconnect. For shorter connections, you can use a cable with RJ-45 connectors. For longer connections, you can use an optical cable with SFP transceivers (LH or SX type).

**Note**
Use only one of these management ports—the fabric interconnect does not support the use of both management ports.

**Step 2** Connect the other end of the cable to a 10/100/1000 Ethernet port on a network device.

### What to do next

You are ready to connect the interface ports on each of the line cards to the network.

# Connecting to Host Servers

To determine which transceivers and cables are supported by this fabric interconnect, see http://www.cisco.com/c/en/us/support/interfaces-modules/transceiver-modules/products-device-support-tables-list.html.

To see the transceiver specifications and installation information, see http://www.cisco.com/c/en/us/support/interfaces-modules/transceiver-modules/products-installation-guides-list.html.

# Guidelines for Connecting Ports

For information about the transceivers currently being used with the fabric interconnect, use the **show inventory all** command.

Prevent damage to the fiber-optic cables that can separate from their cables. Keep the transceivers disconnected from their fiber-optic cables when installing the transceiver in the line card. Before removing such a transceiver from the fabric interconnect, remove the cable from the transceiver.

To maximize the effectiveness and life of your transceivers and optical cables:

- Wear an ESD-preventative wrist strap that is connected to an earth ground whenever handling transceivers. The fabric interconnect is typically grounded during installation and provides an ESD port to which you can connect your wrist strap.
- Do not remove and insert a transceiver more often than is necessary. Repeated removals and insertions can shorten its useful life.
- Keep the transceivers and fiber-optic cables clean and dust free to maintain high signal accuracy and to prevent damage to the connectors. Contamination causes increased attenuation (loss of light), and should be kept below 0.35 dB.
  - Clean these parts before installation to prevent dust from scratching the fiber-optic cable ends.
  - Clean the connectors regularly; the required frequency of cleaning depends upon the environment. In addition, clean connectors if they are exposed to dust or accidentally touched. Both wet and dry cleaning techniques can be effective; refer to your site's fiber-optic connection cleaning procedures.
  - Do not touch the ends of connectors. Touching the ends can leave fingerprints and cause other contamination.
- Inspect routinely for dust and damage. If you suspect damage, clean and then inspect fiber ends under a microscope to determine if damage has occurred.
- To minimize the chance of damaging transceivers when installing them, slide them gently into their fabric interconnect slots. Never force transceivers all the way into the slots. If the transceiver stops part way into the slot, it might be upside down. Remove the transceiver before turning it over and reinstalling it. If positioned correctly, the transceiver slides all the way into the slot and clicks when fully installed.

## Statement 1051—Laser Radiation

**Warning** Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.

## Statement 1055—Class 1/1M Laser

**Warning** Invisible laser radiation is present. Do not expose to users of telescopic optics. This applies to Class 1/1M laser products.


## Statement 1056—Unterminated Fiber Cable

**Warning** Invisible laser radiation may be emitted from the end of the unterminated fiber cable or connector. Do not view directly with optical instruments. Viewing the laser output with certain optical instruments, for example, eye loupes, magnifiers, and microscopes, within a distance of 100 mm, may pose an eye hazard.

| Fiber Type and Core Diameter (μm) | Wavelength (nm) | Maximum Power (mW) | Beam Divergence (rad) |
|---|---|---|---|
| SM 11 | 1200-1400 | 39-50 | 0.1-0.11 |
| MM 62.5 | 1200-1400 | 150 | 0.18 NA |
| MM 50 | 1200-1400 | 135 | 0.17 NA |
| SM 11 | 1400-1600 | 112-145 | 0.11-0.13 |

# Maintaining Transceivers and Optical Cables

Keep transceivers and fiber-optic cables clean and dust free to maintain high signal accuracy and prevent damage to the connectors. Contamination increases attenuation (loss of light) and should be below 0.35 dB.

Consider these maintenance guidelines:

- Transceivers are static sensitive. To prevent ESD damage, wear an ESD-preventative wrist strap that is connected to the grounded chassis.
- Do not remove and insert a transceiver more often than is necessary. Repeated removals and insertions can shorten its useful life.
- Keep all optical connections covered when not in use. Clean them before using to prevent dust from scratching the fiber-optic cable ends.
- Do not touch the ends of connectors. Touching the ends can leave fingerprints and cause other contamination.
- Clean the connectors regularly; the required frequency of cleaning depends upon the environment. In addition, clean connectors if they are exposed to dust or accidentally touched. Both wet and dry cleaning techniques can be effective; refer to the fiber-optic connection cleaning procedures for your site.

- Inspect routinely for dust and damage. If you suspect damage, clean and then inspect fiber ends under a microscope to determine if damage has occurred.