



# Connecting the Switch to the Network

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## Guidelines for Connecting Ports

You can use C Form-factor Pluggable (CFP), Quad Small Form-Factor Pluggable (QSFP+, QSFP28, or QSFP-DD), or Small Form-Factor Pluggable (SFP, SFP+ or SFP28) transceivers or RJ-45 connectors to connect the ports on the line cards to other network devices.

For information about the transceivers currently being used with the switch, 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 switch, remove the cable from the transceiver.

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

- Wear an ESD-preventative wrist strap that is connected to an earth ground whenever handling transceivers. The switch 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 switch 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.



**Warning** **Statement 1051**—Laser Radiation

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

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**Warning** **Statement 1055**—Class 1/1M Laser

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



**Warning** **Statement 1056**—Unterminated Fiber Cable

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.

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## Connecting a Console to the Switch

Before you create a network management connection for the switch or connect the switch to the network, you must create a local management connection through a console terminal. And then configure an IP address for the switch. 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 switch 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.



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**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 switch and computer possible during setup and configuration.

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### Before you begin

- The switch 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 and DB9F/RJ-45 adapter are provided in the switch accessory kit.
  - Network cabling is routed to the location of the installed switch.

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**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 switch.

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.

If the console or modem cannot use an RJ-45 connection, use the DB-9F/RJ-45F PC terminal adapter, found in the accessory kit for the switch. Alternatively, you can use an RJ-45/DSUB F/F or RJ-45/DSUB RP adapter, but you must provide those adapters.

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### What to do next

You are ready to create the initial switch configuration (see [Creating the Initial Switch Configuration, on page 4](#)).

## Connecting the Management Interface

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



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**Note** In a dual supervisor switch, you can ensure that the active supervisor module is always connected to the network by connecting the management interface on both supervisor modules to the network (that is, you can perform this task for each supervisor module). No matter which supervisor module is active, the switch automatically has a management interface that is running and accessible from the network.

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**Caution** To prevent an IP address conflict, do not connect the management port until the initial configuration is complete. For more information, see [Creating the Initial Switch Configuration, on page 4](#).

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### Before you begin

You must have completed the initial switch configuration (see [Creating the Initial Switch Configuration, on page 4](#)).

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- Step 1** Connect a modular, RJ-45, UTP cable to the MGMT ETH port on the supervisor module.
- Step 2** Route the cable through the central slot in the cable management system.
- Step 3** Connect the other end of the cable to a 10/100/1000 Ethernet port on a network device.
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### What to do next

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

## Creating the Initial Switch Configuration

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

When you initially power up the switch, it boots up and asks you a series of questions to configure the switch. To connect the switch 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 as described in the *Cisco Nexus 9000 Series NX-OS Fundamentals Configuration Guide*.



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

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### Before you begin

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

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- Step 1** Power up the switch by connecting each installed power supply to a power source.
- 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 switch, and the software asks you to specify a password to use with the switch.
- Step 2** Enter a new password to use for this switch.
- 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
- 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.
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**What to do next**

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

## Connecting Interface Ports

You can connect BASE-T (copper) and optical interface ports on line cards with other devices for connectivity to the network.

### Connecting a BASE-T Port to the Network

You can connect a line-card BASE-T (copper) port to another device on the network using a copper network interface cable with RJ-45 connectors on either end.

**Before you begin**

- Follow the ESD-preventative protocol, such as wearing a grounded ESD wrist strap, whenever handling electronic components.
- You must have BASE-T ports available for connection on a line card that is installed on the switch.
- You must have BASE-T ports available on another networked device, which can be another switch.

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**Step 1** Route the copper interface cable from the other networking device to the switch. At the switch, route the cable through the cable management slot next to the line card that you are connecting.

**Step 2** Insert the RJ-45 connector for the new interface cable into the appropriate port on the line card.

Check the port LED to be sure that it turns on and turns green.

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### Disconnecting a BASE-T Port from the Network

You can disconnect a BASE-T (copper) port from the network by removing a copper network interface cable with RJ-45 connectors from the line card interface port.

**Before you begin**

Follow the ESD-preventative protocol, such as wearing a grounded ESD wrist strap, whenever handling electronic components.

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**Step 1** Remove the RJ-45 connector from the interface port that you are disconnecting on the line card.

The port LED turns off.

**Step 2** (Optional) You can remove the interface cable from the device on the other end of the cable.

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## Connecting an Optical Port to the Network

Depending on the type line card that you are using, you can use a 1-Gigabit SFP, 10-Gigabit SFP+, 25-Gigabit SFP28, 40-Gigabit QSFP+, 100-Gigabit CFP2, QSFP28, or QSFP-DD transceivers. Some of these transceivers work with fiber-optic cables that you attach to the transceivers and other transceivers work with preattached copper cables. To prolong the life of detachable transceivers, install the transceivers before installing the fiber-optic cable in the transceivers.



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**Note** The N9K-X9536PQ line card supports your use of SFP and SFP+ transceivers in QSFP+ ports when using a QSFP-to-SFP adapter, such as the CVS-QSFP-SFP10G adapter.

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**Caution** Removing and installing a transceiver can shorten its useful life. Do not remove and insert transceivers more often than is necessary. We recommend that you disconnect cables before installing or removing transceivers to prevent damage to the cable or transceiver.

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**Step 1** If there is a protective cover for the port that you are connecting, remove the protective covering.

**Step 2** For the transceiver that you are inserting into a port, do the following:

- a) If the transceiver is connected to an optical cable, remove the cable from the transceiver.
- b) Insert the transceiver into the open port.
- c) If using an optical cable, insert the optical cable into the installed transceiver.

**Step 3** To install the other end of the cable into another device, do the following:

- a) If the transceiver is connected to an optical cable, remove the cable from the transceiver.
  - b) Insert the transceiver into the open port.
  - c) If using an optical cable, insert the optical cable into the installed transceiver.
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## Disconnecting Optical Ports from the Network

When removing fiber-optic transceivers, you must remove the fiber-optic cables from a transceiver before removing the transceiver from the port.

## Optic Transceiver Removal Using the Optics Extraction Tool

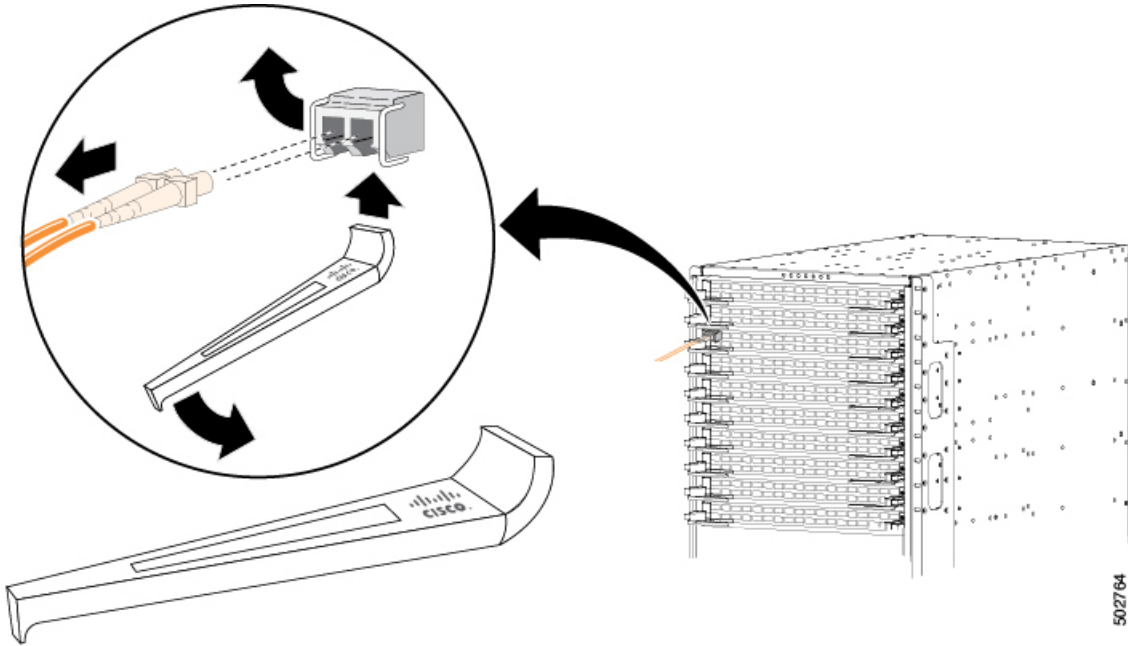
You use both ends of the optics extraction tool in this procedure. You use the wide end for releasing the bale latch, and the narrow end for removing the transceiver module.

### Before you begin

Ensure that before you handle any switch components, you are wearing a grounded electrostatic discharge (ESD) strap. To ground the strap, attach it directly to earth ground or to a grounded rack or chassis. There must be a metal-to-metal connection to earth ground.

**Step 1** Remove the fiber-optic cables from the transceiver module before removing the transceiver module.

**Step 2** Use the wide side of the optics extraction tool to release the bale latch (see the following image).



**Step 3** Use the narrow end of the optics extraction tool to carefully remove the transceiver module (see the following

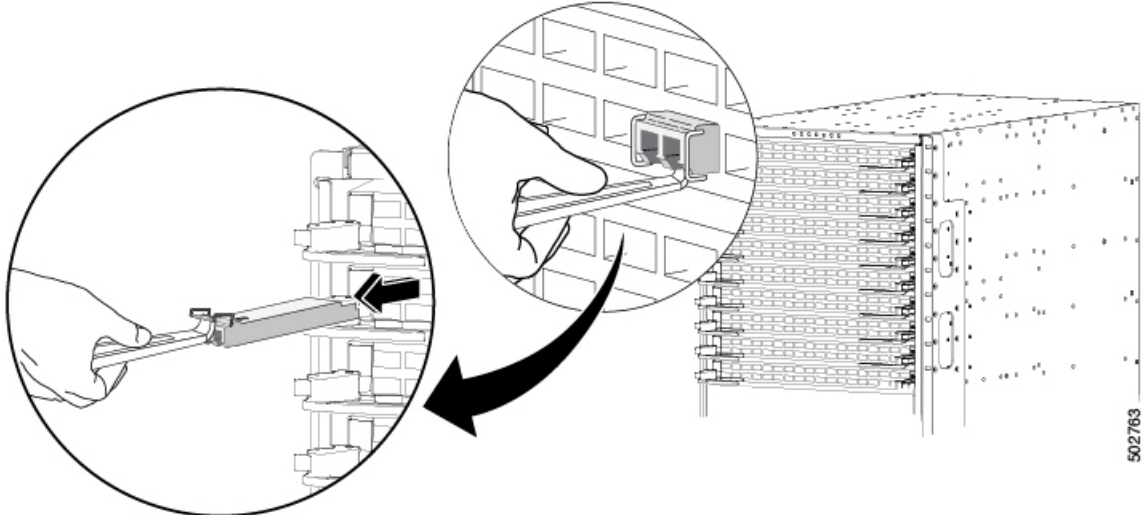


image).

**Step 4** Place the transceiver module in an antistatic bag or other protective environment.



## Maintaining Transceivers and Optical Cables

Transceivers and fiber-optic cables must be kept 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 the following 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.



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**Note** If cable length is more than 5 meters, Auto Negotiation is not supported.

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**Note** The N9K-X9436PQ, N9K-X9564PX, and N9K-X9564TX line cards do not support Link Training.

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