

Aruba 8320 Switch

Installation and Getting Started Guide



Part Number: 5200-3553
Published: December, 2017
Edition: 1

Notices

The information contained herein is subject to change without notice. The only warranties for Hewlett Packard Enterprise products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. Hewlett Packard Enterprise shall not be liable for technical or editorial errors or omissions contained herein.

Confidential computer software. Valid license from Hewlett Packard Enterprise required for possession, use, or copying. Consistent with FAR 12.211 and 12.212, Commercial Computer Software, Computer Software Documentation, and Technical Data for Commercial Items are licensed to the U.S. Government under vendor's standard commercial license.

Links to third-party websites take you outside the Hewlett Packard Enterprise website. Hewlett Packard Enterprise has no control over and is not responsible for information outside the Hewlett Packard Enterprise website.

Applicable products

Aruba 8320 48p 10G SFP/SFP+ and 6p 40G QSFP+ with X472 5 Fans 2 Power Supply Switch Bundle JL479A

Related publications

- *Aruba 8320 Switch Quick Setup Guide and Safety/Regulatory Information*
- *ArubaOS-Switch and ArubaOS-CX Transceiver Guide*

To view and download the above publications, visit the Hewlett Packard Enterprise Information Library at <http://www.hpe.com/networking/ResourceCenter>.

| | |
|--|-----------|
| Chapter 1 Introducing the Aruba 8320 Switch | 5 |
| Front of the switch | 6 |
| Back of the switch | 12 |
| Switch features | 14 |
| Chapter 2 Installing the switch | 15 |
| Included parts | 15 |
| Installation procedures | 16 |
| Installation precautions | 17 |
| 1. Prepare the installation site | 18 |
| 2. Mount the switch | 18 |
| 3. Install transceivers | 21 |
| 4. Connect the switch to a power source | 23 |
| 5. Connect a management console | 23 |
| 6. Connect the network cables | 25 |
| Chapter 3 Getting started with switch configuration | 27 |
| Recommended minimal configuration | 27 |
| Chapter 4 Replacing components | 30 |
| Replacing a power supply | 30 |
| Replacing a fan tray | 31 |
| Chapter 5 Troubleshooting | 32 |
| Basic troubleshooting tips | 32 |
| Diagnosing with the LEDs | 33 |
| Hardware diagnostic tests | 36 |
| Restoring the factory default configuration | 37 |
| Downloading new switch software | 37 |
| Hewlett Packard Enterprise Customer Support Services | 37 |
| Chapter 6 Specifications | 38 |
| Switch specifications | 38 |
| Standards | 40 |
| Chapter 7 Cabling and technology information | 41 |
| Cabling specifications | 41 |
| Technology distance specifications | 42 |
| Mode conditioning patch cord | 43 |
| Chapter 8 Support and other resources | 45 |
| Accessing Hewlett Packard Enterprise support | 45 |
| Before calling support | 45 |
| Accessing updates | 46 |

| | |
|------------------------------|----|
| Websites | 46 |
| Customer self repair | 47 |
| Remote support | 47 |
| Documentation feedback | 47 |

The Aruba 8320 switch is a multiport switch that can be used to build high-performance switched networks. The switch is a store-and-forward device offering low latency for high-speed networking. The Aruba 8320 switch also supports full network management capabilities.

This switch is described in this manual:

| Switch |
|---|
| Aruba 8320 48p 10G SFP/SFP+ and 6p 40G QSFP+ with X472 5 Fans 2 Power Supply Switch Bundle (JL479A) |

Accessories list:

| Accessory | |
|--------------|--|
| Power supply | Aruba X371 400W 100-240VAC Power Supply (JL480A) |
| Fan tray | Aruba X721 Front-to-Back Fan (JL481A) |
| Rack kit | Aruba X472 2-Post Rack Kit (JL482A) |

This chapter describes this switch with the following information:

- Front of the switch:
 - Network ports
 - Console port
 - Out-of-band management (OOBM)
 - LEDs
 - Reset button
- Back of the switch:
 - Power supplies and connectors
 - Fan modules
- Switch features
 - Hardware features
 - Software features
 - Management software

Front of the switch

Figure 1: Front of the Aruba 8320 switch

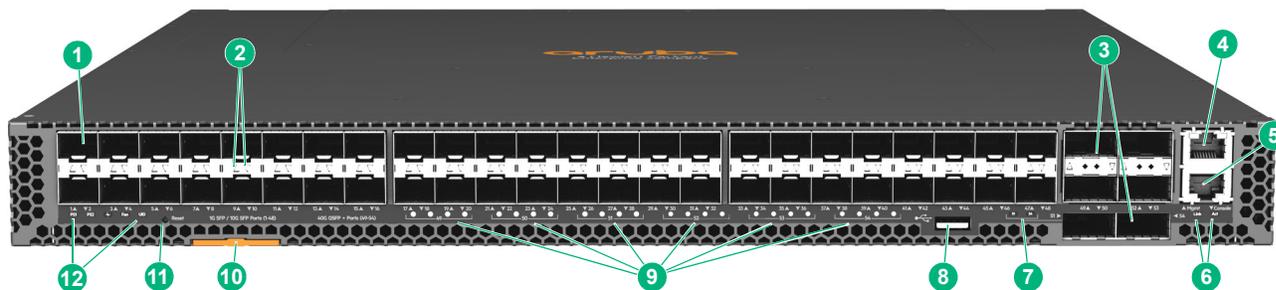


Table 1: Front of the Aruba 8320 switch labels and descriptions

| Label | Description |
|-------|--|
| 1 | SFP+ ports |
| 2 | SFP+ port LEDs |
| 3 | QSFP+ ports |
| 4 | 10/100/1000Base-T RJ-45 Out-of-Band Management (OOBM) port |
| 5 | RJ-45 serial console port |
| 6 | Management port LEDs |
| 7 | QSFP+ ports 51 and 54 LEDs |
| 8 | USB auxiliary port |
| 9 | QSFP+ port LEDs |
| 10 | Asset tag |
| 11 | Reset button |
| 12 | Power 1 and 2, Global Status, Unit Identification, and Fan LED |

Network ports

Table 2: Network ports

| Product number | Model name | 10/100/1000 non-PoE RJ-45 ports | SFP+ ports ¹ | QSFP+ ports |
|--|--|---------------------------------|-------------------------|-------------|
| JL479A | Aruba 8320 48p 10G SFP/SFP+ and 6p 40G QSFP+ with X472 5 Fans 2 Power Supply Switch Bundle | – | 48 | 6 |
| Notes: | | | | |
| ¹ SFP+ ports support 1G SFP, and 10G SFP+ transceivers. | | | | |

This product also supports optional network connectivity:

Table 3: *Optional network connectivity, speeds and technologies*

| Speed | Technology | Cabling | Transceiver form-factor and connector ¹ | | |
|-----------|----------------------|----------------------------------|--|----------------|------------------|
| | | | SFP ("mini-GBIC") Connector | SFP+ connector | QSFP+ connector |
| 1000 Mbps | 1000-T | Copper (twisted-pair) | RJ-45 | – | – |
| | 1000-SX | Fiber (multimode) | LC ² | – | – |
| | 1000-LX | Fiber (multimode or single mode) | LC | – | – |
| | 1000-LH | Fiber (single mode) | LC | – | – |
| | 1000-BX | Fiber (single mode) | LC | – | – |
| 10 Gbps | 10-Gig Direct Attach | Copper (twinaxial) | – | – | – |
| | 10-Gig SR | Fiber (multimode) | – | LC | – |
| | 10-Gig LR | Fiber (single mode) | – | LC | – |
| | 10-Gig ER | Fiber (single mode) | – | LC | – |
| 40 Gbps | 40-Gig Direct Attach | Copper (twinaxial) | – | – | – |
| | 40-Gig SR4 | Fiber (multimode) | – | – | MPO ³ |
| | 40-Gig ESR4 | Fiber (multimode) | – | – | MPO |
| | 40-Gig LR4 | Fiber (single mode) | – | – | LC |

¹ For supported transceivers, visit <http://www.hpe.com/support/manuals>.

- In the first textbox, type **J4858** (for Gigabit information), or **J8436** (for 10-Gigabit information).
- Select any of the products that display in the dropdown list and click on **Show Selected Items**.
- Select **Support Center**. Then click on **Manuals**, followed by **View All** to find the **Transceiver Support Matrix**.

For technical details of cabling and technologies, see [Cabling and technology information](#).

For more information, see the *ArubaOS-Switch Transceiver Guide* at: <http://www.hpe.com/support/manuals>.

² The Lucent Connector (LC) is a small form factor fiber optic connector.

³ The Multifiber Push On (MPO) connector is a 12-fiber optical connector.

Management ports

Console port

There is one RJ-45 serial console port on the switch. This port is used to connect a console to the switch by using an RJ-45 serial cable. A DB9-to-RJ-45 console cable can be ordered from HPE: JL448A, Aruba X2C2 RJ45 to DB9 Console Cable.

For more information on the console connection, see [Connect a management console](#). The console can be a PC or workstation running a VT-100 terminal emulator, or a VT-100 terminal.

Out-of-band management (OOBM) port

This RJ-45 port is used to connect a dedicated management network to the switch. To use it, connect an RJ-45 network cable to the management port to manage the switch through SSH from a remote PC or a UNIX workstation.

To use this port, see [Enabling out-of-band management on the management port](#).

A networked out-of-band connection through the management port allows you to manage data network switches from a physically and logically separate management network.

For more information, see the *Basic Operation Guide* and the *Management and Configuration Guide* for your switch at www.hpe.com/support/manuals. For information on the HPE IMC (Intelligent Management Center), contact your HPE/Aruba representative. For information on Aruba AirWave, go to www.arubanetworks.com/products/networking/management/airwave.

Auxiliary (Aux) port

An auxiliary port for processing a USB command file or downloading switch software code. This port uses a USB Type A connector, but does not comply with all USB protocols and standards.

Switch and port LEDs on the front of the switch

- Table 5 on page 9 describes the switch chassis LEDs.
- Table 7 on page 10 describes the switch port LEDs and their different behaviors.

Figure 2: Chassis LEDs

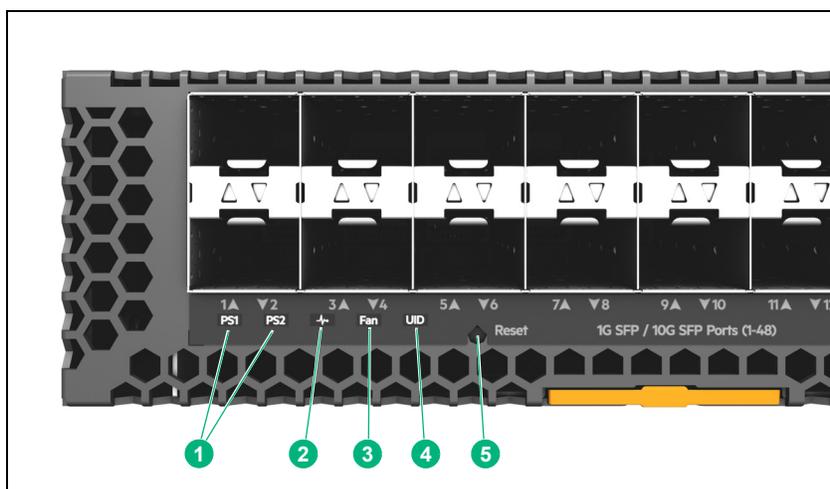


Table 4: Chassis LED labels

| Label | Description |
|-------|-------------------|
| 1 | Power supply LEDs |

Table 4: Chassis LED labels

| Label | Description |
|-------|-------------------------|
| 2 | Global status LED |
| 3 | Fan LED |
| 4 | Unit identification LED |
| 5 | Reset button |

Table 5: Chassis LED behavior

| Chassis LEDs | Function | State | Meaning |
|---------------|--------------------------------------|-------------------|---|
| PS1/PS2 | Power supply status | On green | Power supply is installed and operating normally. |
| | | Slow flash amber | Fault detected for installed power supply. |
| | | Off | Power supply is not installed or not receiving power. |
| Fan | Fan tray status | On green | System fans are operating normally. |
| | | Slow flash amber | One or more system fans has a fault, or the minimum number of fans are not installed. |
| Global Status | Internal power status of the switch. | On green | The switch has passed self-test and is powered up normally. |
| | Self-test status | Slow flash green* | The switch self-test and initialization are in progress after the switch has been power cycled or reset. The switch is not operational until this LED stops blinking green. |
| | Switch/port fault status | Slow flash amber* | A fault or self-test failure has occurred on the switch, one of the switch ports, OOBM port, USB port, console port, power supplies, or a fan. The Status LED for the component with the fault will flash simultaneously. |
| | | On amber | If this LED is on amber for a prolonged time, the switch has encountered a fatal hardware failure, or has failed its self-test. |
| | | Off | The unit is not receiving power. |

Table 5: Chassis LED behavior (Continued)

| Chassis LEDs | Function | State | Meaning |
|---------------------------|--|-------------------|---|
| UID (Unit Identification) | The Unit Identification LED is used to help you to identify a particular unit in a rack or collection of products. | On or slow flash* | The "LED locator on" command allows you to blink or turn on the LED. The default is 30 minutes. |
| | | Off | LED will turn off after the timeout period has expired. |

* The slow blink behavior is an on/off cycle once every 1.6 seconds, approximately.

Figure 3: Port LEDs

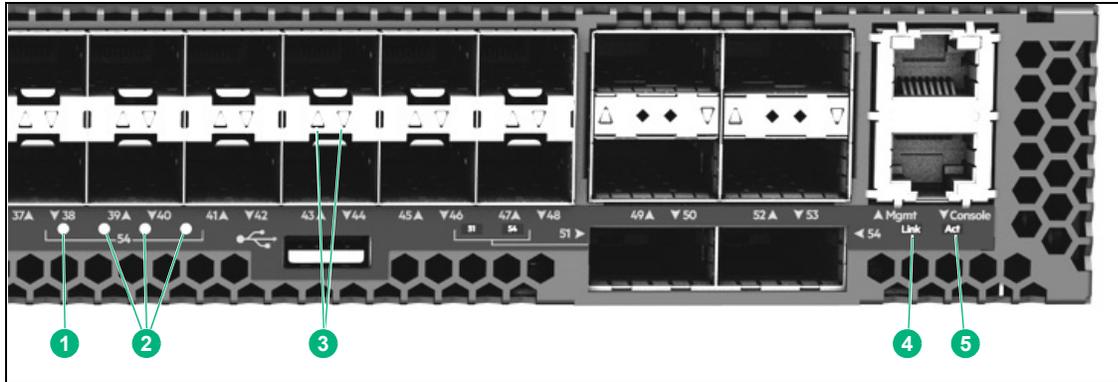


Table 6: Port LED labels

| Label | Description |
|-------|--|
| 1 | QSFP+ port lane 1 LED |
| 2 | QSFP+ port lanes 2, 3, and 4 LEDs |
| 3 | SFP+ port LEDs |
| 4 | Out-of-band management port Link LED |
| 5 | Out-of-band management port Act (activity) LED |

Table 7: Port LED behavior

| Chassis LEDs | Function | State | Meaning |
|----------------|--|-------------------|--|
| SFP+ port LEDs | To display link and activity information for the port. | On/Flashing green | Shows a valid link at 1 Gbps or 10 Gbps. Flashing indicates port activity. |
| | | Flashing amber | Indicates an unsupported transceiver or a port failure. |

Table 7: Port LED behavior (Continued)

| Chassis LEDs | Function | State | Meaning |
|--------------------------|--|-------------------|---|
| QSFP+ port 40G LED | To display link and activity information for the port. | On/Flashing green | Shows a valid link at 40 Gbps. Flashing indicates port activity. |
| | | Off | When the Global Status LED is flashing, indicates an unsupported transceiver or a port failure. |
| Management port Link LED | To display link information for the port. | On green | Shows a valid link. |
| Management port Act LED | To display activity information for the port. | Flashing green | Flashing indicates port activity. |

Reset button

The Reset button is recessed from the front panel (to protect it from being pushed accidentally) and is accessible through a small hole on the front panel. Use a pointed object, such as an unbent paper clip, to push the button.

The Reset button is used as follows:

| To accomplish this: | Do this: | This will happen: |
|---|---|---|
| Soft Reset | Press and release the Reset button | The switch operating system is cleared gracefully (such as data transfer completion, temporary error conditions are cleared), and then reboots. |
| Hard Reset | Press and hold the Reset button for more than 3 seconds, then release. | The switch reboots, similar to a power cycle. A hard reset is used, for example, when the switch CPU is in an unknown state or not responding. |
| Restore the factory default configuration | Press and hold the Reset button for more than 5 seconds (until all LEDs turn on), then release. | The switch removes all configuration changes, and restores the factory default configuration. |
| <p>Note: The Reset button is provided for your convenience. If you are concerned with switch security, make sure that the switch is installed in a secure location, such as a locked wiring closet.</p> | | |

Back of the switch

The back of the switch includes two power supply units and five fan trays.

Figure 4: Back of the Aruba 8320 switch

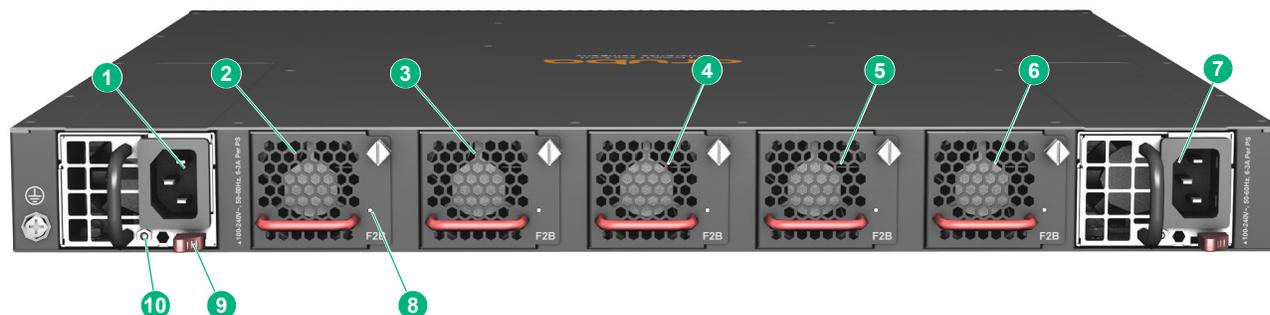


Table 8: Back of the Aruba 8320 switch labels and descriptions

| Label | Description |
|-------|-------------------------------------|
| 1 | AC power connector / power supply 2 |
| 2 | Fan tray 5 |
| 3 | Fan tray 4 |
| 4 | Fan tray 3 |
| 5 | Fan tray 2 |
| 6 | Fan tray 1 |
| 7 | AC power connector / power supply 1 |
| 8 | Fan tray status LED |
| 9 | Power supply release latch |
| 10 | Power supply status LED |

Power supplies

The Aruba 8320 switch does not have a power switch; it is powered on when at least one installed power supply is connected to an active AC power source. The power supplies automatically adjust to any voltage between 100-127 and 200-240 volts and either 50 or 60 Hz. There are no voltage range settings required.



Never insert or remove a power supply while the power cord is connected. Verify that cord has been disconnected from the power supply before installation or removal.

The Aruba 8320 switch power supplies adapt electrical power for use with the switch. The chassis has two slots that can hold individual power supplies to support load sharing, redundancy, and fault tolerance. One power supply is available for use with the Aruba 8320 switch:

Aruba X371 400W 100-240VAC Power Supply (JL480A)

The Aruba 8320 switch is shipped with two hot-swappable, field-replaceable, AC power supplies. Each power supply has a country-specific power cord for connection to an AC power outlet. The switch can operate with one active power supply.

Power supply status LED

Table 9: Power supply LED behavior

| Power supply LED | Function | State | Meaning |
|------------------|---------------------------------|----------|---|
| Status LED | To display power supply status. | On green | The power supply is operating normally. |
| | | On amber | The power supply is in standby mode with AC power connected. Or, if the Global Status LED is also flashing, indicates a failure. |
| | | Off | AC power is not connected to the power supply or it is in protection mode due to a voltage, current, thermal, or short-circuit condition. |

Load Sharing

Load sharing occurs when two power supplies are installed in the switch and turned on. Load sharing divides the total power load of the switch among both power supplies. Since the power supplies work together, the effective power capacity of the switch is increased with the additional power supply.

Redundancy

With power redundancy, the Aruba 8320 switch can continue normal operation even when one power supply fails or is powered off. When two power supplies are installed, if one becomes unavailable (fails, or is powered off or removed) the remaining power supply provides full power for the device.

Hot Swapping

Hot swapping allows you to replace one failed power supply while the other provides full power. This makes it unnecessary to shut down the switch during the replacement procedure.

Fan Trays

The Aruba 8320 switch is equipped with five field-replaceable, hot-swappable fan trays. Each fan tray features individual fans that pull air through the chassis from the front through to the rear. The switch can tolerate the failure of a single fan tray while maintaining a safe operating temperature.



The Aruba 8320 switch is not compatible with fan trays from other Aruba hardware platforms.

Fan tray status LED

Table 10: Fan tray LED behavior

| Fan tray LED | Function | State | Meaning |
|--------------|-----------------------------|----------|--|
| Status LED | To display fan tray status. | On green | The fan tray is operating normally. |
| | | On red | The fan tray has an error or has failed. |

Switch features

The features of the Aruba 8320 switch includes:

- Combinations of fixed QSFP+ and SFP+ ports, as described under **Network ports**.
- For secure environment, all ports are disabled by default.
- The option to have one or two power supplies: A second power supply supports redundant system power. If one of the power supplies fails, the second power supply immediately provides the power necessary to keep the switch running.
- The SFP+ and QSFP+ ports always operate at full duplex.
- Easy management of the switch through several available interfaces:
 - **Command line interface**—A full featured, easy to use, VT-100 terminal interface for out-of-band switch management.
 - **Web browser interface**—An easy to use built-in graphical interface that can be accessed from common web browsers.
 - **Aruba AirWave**—A powerful and easy-to-use network operations system that manages wired and wireless infrastructures. For more information, go to www.arubanetworks.com/products/networking/management/airwave.
 - **IMC (Intelligent Management Center)**—An SNMP-based, graphical network management tool that you can use to manage your entire network. Free trials of IMC can be downloaded at <http://www.hpe.com/networking/imc>.
- Support for the Spanning Tree Protocol to eliminate network loops.
- Support for up to 4096 IEEE 802.1Q-compliant VLANs so you can divide the attached end nodes into logical groupings that fit your business needs.
- Support for many advanced features to enhance network performance. For a description, see the *Aruba 8320 Management and Configuration Guide* at www.hpe.com/support/manuals.
- To download product updates, go to either of the following:
 - Hewlett Packard Enterprise Support Center **Get connected with updates** page: www.hpe.com/support/e-updates
 - HPE Networking Software: www.hpe.com/networking/software
 - To view and update your entitlements, and to link your contracts and warranties with your profile, go to the Hewlett Packard Enterprise Support Center **More Information on Access to Support Materials** page: www.hpe.com/support/AccessToSupportMaterials

This chapter shows how to install the switch. The Aruba 8320 switch comes with an accessory kit that includes the brackets for mounting the switch in a standard 19-inch telco rack, or in an equipment cabinet.



The Aruba 8320 switch can also be mounted in any four post rack using the Aruba X474 4-Post Rackmount Bracket Kit (JL483A).

Included parts

The Aruba 8320 switch has the following components shipped with it:

- *Aruba Switch Quick Setup Guide and Safety/Regulatory Information*
- Switch Safety and Regulatory sheet
- Warranty notice
- General Safety and Regulatory booklet
- JL482A Aruba X472 2-Post Rackmount Bracket Kit

| Part number | Count | Included items |
|-------------|-------|---------------------------------|
| 5200-3899 | 2 | Rack mount brackets |
| | 8 | Small screws; bracket-to-switch |
| | 4 | Large screws; bracket-to-rack |

- There are two warranty documents. One is the HPN warranty and the other is the EG warranty.
 - 5998-5984 Warranty Statement and Software License
 - 703828-025 EG Safety, Compliance, and Warranty Information
- Power cord, one of the following

| | | | |
|--------------------------------|-----------|---------------------------------|-----------|
| Argentina | 8121-0729 | Israel | 8121-1004 |
| Australia/New Zealand | 8121-0837 | Japan | 8121-1143 |
| Brazil | 8121-1071 | Switzerland | 8121-0738 |
| Chile | 8121-0735 | South Africa | 8121-0737 |
| China | 8121-0943 | Taiwan | 8121-0964 |
| Continental Europe/South Korea | 8121-0731 | Philippines/Thailand | 8121-0734 |
| Denmark | 8121-0733 | UK/Hong Kong/Singapore/Malaysia | 8121-0739 |
| India | 8121-0564 | US/Canada/Mexico | 8121-1141 |

Installation procedures

Summary

1. **Prepare the installation site (page 18).** Ensure the physical environment into which you will be installing the switch is properly prepared, including having the correct network cabling ready to connect to the switch and having an appropriate location for the switch. See **Installation precautions** for some guidelines on avoiding personal injury or product damage when installing your switch.
2. **Mount the switch (page 18).** The switch can be mounted in a 19-inch telco rack or in an equipment cabinet.
3. **(Optional) Install SFP/SFP+ transceivers (page 21).** The switch has slots for installing SFP/SFP+ and QSFP+ transceivers. Depending on where you install the switch, it may be easier to install the transceivers first. Transceivers can be hot swapped—they can be installed or removed while the switch is powered on.
4. **Connect power to the switch (page 23).** Once the switch is mounted, plug it into the main power source.
5. **Connect a management console to the switch (page 23).** You may want to modify the switch's configuration, so it can be managed using a Web browser or through an SSH session. Configuration changes can be made by using a console cable to connect a PC to the switch's console port.
6. **Connect the network devices (page 25).** Using the appropriate network cables, connect the network devices to the switch ports.

At this point, your switch is fully installed. See the rest of this chapter if you need more detailed information on any of these installation steps.

Installation precautions

To avoid personal injury or product damage when installing your switch, read the installation precautions and guidelines below.



-
- Do not mount the switch on a wall, on or under a table, or on or under any other horizontal surface.
 - Mount devices installed in a rack or cabinet as low as possible. Put the heaviest devices at the bottom and progressively lighter devices installed above.
 - To prevent the rack or cabinet from becoming unstable and/or falling over, ensure that it is adequately secured.
-



-
- Ensure the power source circuits are properly grounded. Then connect the switch to the power source by using the power cord supplied with the switch.
 - If your installation requires a different power cord than the one supplied with the switch and power supply, be sure the cord is adequately sized for the switch's current requirements. In addition, be sure to use a power cord displaying the mark of the safety agency that defines the regulations for power cords in your country. The mark is your assurance that the power cord can be used safely with the switch and power supply.
 - When installing the switch, the AC outlet should be near the switch and be easily accessible in case the switch must be powered off.
 - Do not install the switch in an environment where the operating ambient temperature exceeds its specification. (See the **Environmental Operating Temperature** information.)
 - Ensure that the switch does not overload the power circuits, wiring, and over-current protection. To determine the possibility of overloading the supply circuits, add the ampere ratings of all devices installed on the same circuit as the switch. Then compare the total with the rating limit for the circuit. The maximum ampere ratings are usually printed on the devices near the AC power connectors.
 - Ensure that the air flow around the switch is not restricted. Leave at least 3 inches (7.6 cm) for cooling.
-



If a power supply must be removed, and then reinstalled, wait at least 5 seconds before reinstallation. Otherwise, damage to the switch may occur.

The power supply needs this time to bleed off any retained power.

1. Prepare the installation site

Cabling Infrastructure - Ensure the cabling infrastructure meets the necessary network specifications. See chapter 7, **Cabling and technology information** for more information:

Installation Location - Before installing the switch, plan its location and orientation relative to other devices and equipment:

- In the front of the switch, leave at least 3 inches (7.6 cm) of space for the twisted-pair and fiber-optic cabling.
- In the back of the switch, leave at least 3 inches (7.6 cm) of space for the power cord.
- On the sides of the switch, leave at least 3 inches (7.6 cm) for cooling.

2. Mount the switch

Mounting an Aruba 8320 switch

The supported mounting options for the Aruba 8320 switch includes:

- Two-post rack mount (JL482A; included)
- Four-post rack mount (JL483A; sold separately)

Two-post rack mount option:

The switch is designed to be mounted in any EIA-standard 19-inch telco rack or communication equipment cabinet using the Aruba X472 2-Post Rackmount Bracket Kit(JL482A; included).

The mounting brackets must only be attached for mid-mounting the switch in a two-post rack. Secure the rack in accordance with the manufacturer's safety guidelines.



For safe operation, please read the mounting precautions in **Installation precautions**, before mounting a switch.



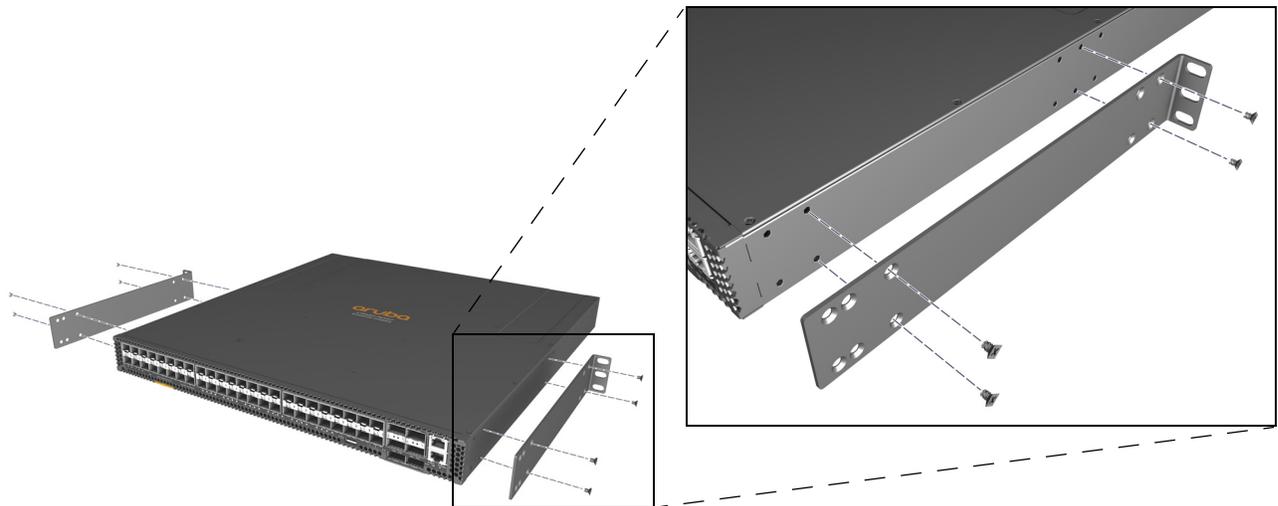
The 12-24 screws supplied with the switch are the correct threading for standard EIA/TIA open 19-inch racks. If installing the switch in an equipment cabinet such as a server cabinet, use the clips and screws that came with the cabinet in place of the 12-24 screws that are supplied with the switch.

Complete step 1, and plan which four holes you will be using in the cabinet and install all four clips. Then proceed to step 2.

1. Use a #1 Phillips (cross-head) screwdriver and attach the mounting brackets to the switch with the included eight 8-mm M4 screws.

The brackets must only be attached for mid-mounting the switch in a two-post rack. Ensure the holes in the bracket are aligned with the correct holes in the switch, as per the diagram.

Figure 5: Attaching two-post mounting brackets to the switch



For safe reliable installation, only use the screws provided in the accessory kit to attach the mounting brackets to the switch.

2. Hold the switch with attached brackets up to the rack, move it vertically until rack holes line up with the bracket holes, and then insert and tighten the four number 12-24 screws holding the brackets to the rack.

Figure 6: Mounting the switch in a two-post rack



Four-post rack mount option:

The Aruba 8320 switch can be mounted in four-post racks and cabinets by using the Aruba X474 4-Post Rackmount Bracket Kit (JL483A); sold separately.

The JL483A Aruba X474 4-Post Rackmount Bracket Kit includes these items:

- two front-post brackets
- two rear-post brackets with adjustable ears
- twenty 8-mm M4 screws
- eight 5/8-inch number 12-24 screws

- two rear bracket ear position-locking screws

The brackets must only be attached for front-flush mounting the switch in a four-post rack. Secure the rack in accordance with the manufacturer's safety guidelines.



For safe operation, please read the mounting precautions in [Installation precautions](#), before mounting a switch.

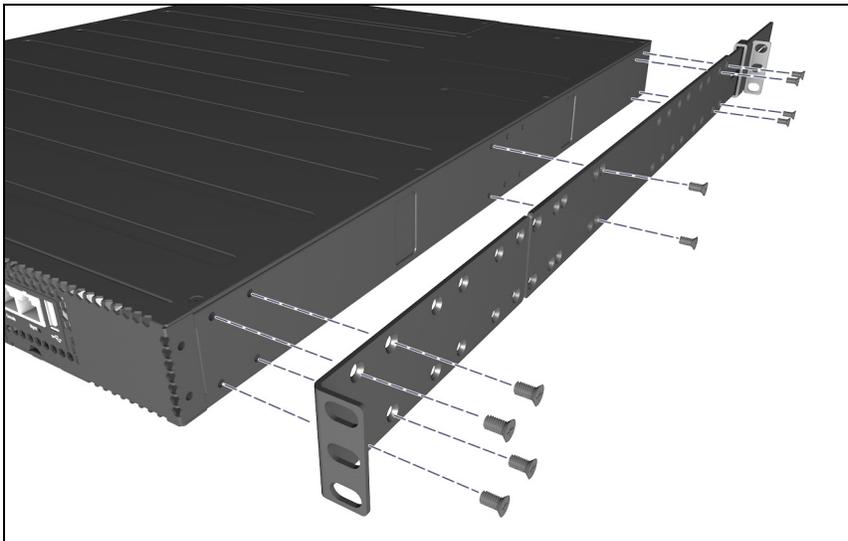


The 12-24 screws supplied with the switch are the correct threading for standard EIA/TIA open 19-inch racks. If installing the switch in an equipment cabinet such as a server cabinet, use the clips and screws that came with the cabinet in place of the 12-24 screws that are supplied with the switch.

Complete step 1, and plan which holes you will be using in the cabinet and install all four clips. Then proceed to step 2.

1. Use a #1 Phillips (cross-head) screwdriver and attach the front- and rear-post rack mount brackets to the switch with the included 8-mm M4 screws.

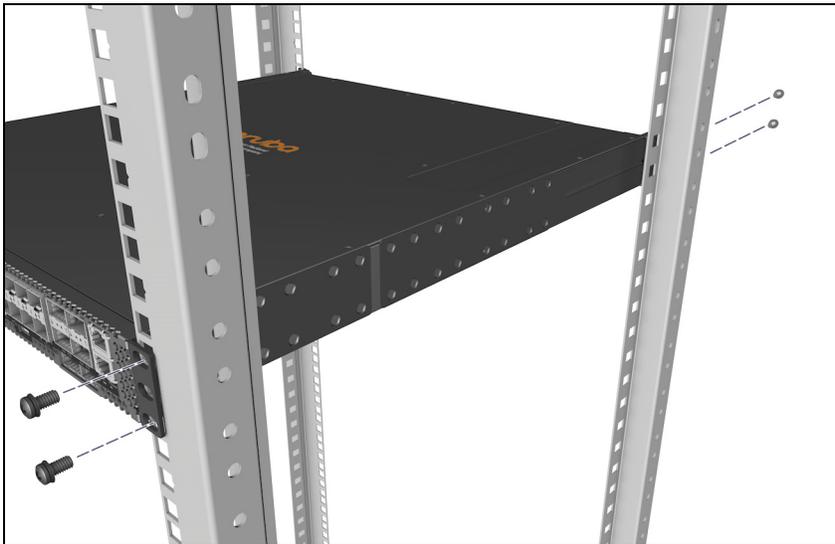
Figure 7: Attaching four-post mounting brackets to the switch



For safe reliable installation, only use the screws provided in the accessory kit to attach the mounting brackets to the switch.

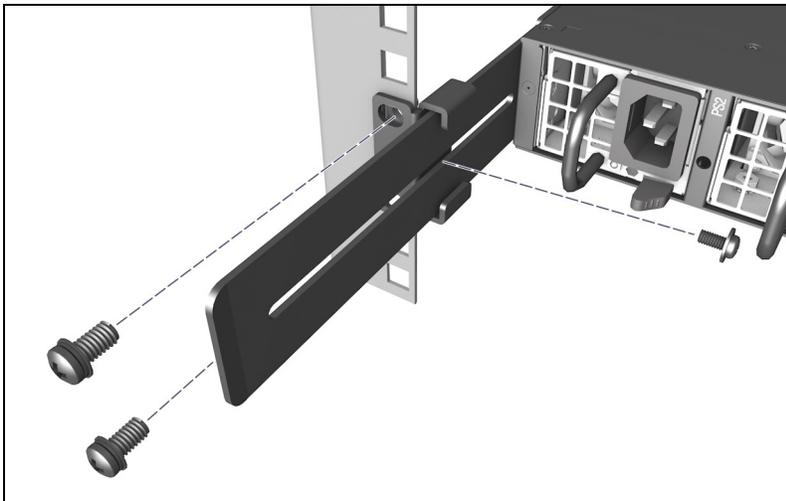
2. For the rear-post brackets, use an additional two 8-mm M4 screws to secure the bracket at the mid-point on the side of the switch.
3. Hold the switch with attached brackets up to the rack, move it vertically until rack holes line up with the front-post bracket holes, and then insert and tighten the four number 12-24 screws holding the brackets to the rack.

Figure 8: *Mounting the switch in a four-post rack*



4. Adjust the rear-post bracket ears to fit the depth of the rack.
5. Secure the rear-post brackets to the rack rear posts using four number 12-24 screws.
6. Lock the position of the rear-post bracket ears using the included position-locking screws.

Figure 9: *Locking the position of rear-post brackets*



3. Install transceivers

You can install or remove a transceiver from an SFP+/QSFP+ slot without having to power off the switch.



- The transceivers operate only at full duplex. Half duplex operation is not supported.
- Ensure the network cable is NOT connected when you install or remove a transceiver.



Use only supported genuine Aruba SFP/SFP+/QSFP+ transceivers with your switch. Non-Aruba SFP/SFP+/QSFP+ transceivers are not supported, and their use may result in product malfunction. Should you require additional transceivers, contact your Aruba sales representative or an authorized reseller. The following resources can help you to find transceiver support information for your switch model:

- See the *ArubaOS-Switch and ArubaOS-CX Transceiver Guide* in the Hewlett Packard Enterprise Information Library at <http://www.hpe.com/support/manuals>.
 - See the supported transceivers information in the QuickSpecs for your switch model at <http://www.hpe.com/support/manuals>, along with minimum software versions to support the listed transceivers:
 1. Select **Switches**.
 2. Select **Aruba Switches**.
 3. Select a switch model.
 4. Select **Product Details**.
 5. Select an option under QuickSpecs.
-

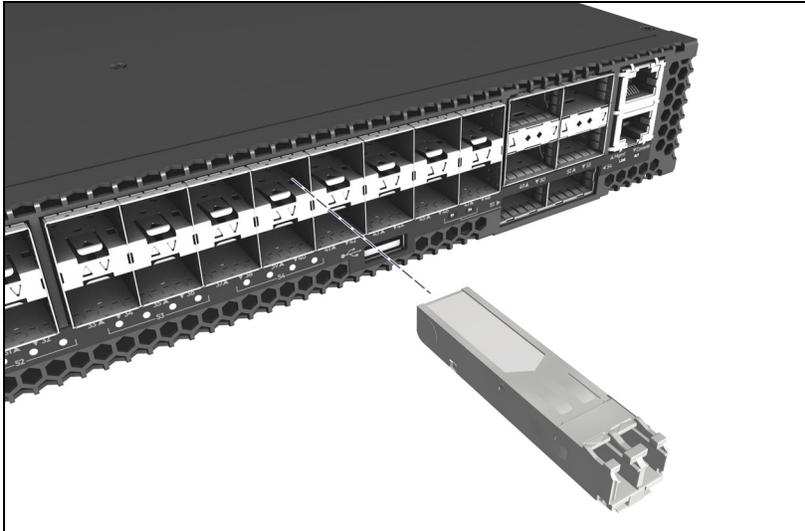
Installing transceivers:

Hold the transceiver by its sides and gently insert it into either of the slots on the switch until it clicks into place. When a transceiver is inserted the switch authenticates it. This can take 1-3 seconds, with the worst case being 5 seconds. If the transceiver is removed before the authentication completes a self test failure will be reported.



The fiber Aruba transceivers are Class 1 laser devices. Avoid direct eye exposure to the beam coming from the transmit port.

Figure 10: *Installing a transceiver*



Removing transceivers:

Depending on when the transceiver was purchased, it may have either of three different release mechanisms:

- A plastic tab on the bottom of the transceiver
- A plastic collar around the transceiver
- A wire bail

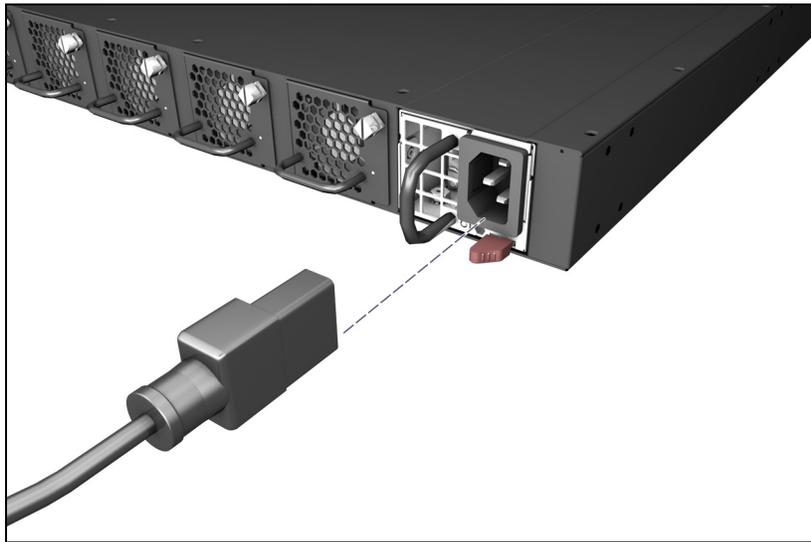
To remove the transceivers that have the plastic tab or plastic collar, push the tab or collar toward the switch until the transceiver releases from the switch (it will move outward slightly), then pull it from the slot.

To remove the transceivers that have the wire bail, lower the bail until it is approximately horizontal, and then using the bail, pull the transceiver from the slot.

4. Connect the switch to a power source

1. If a power supply is not already installed in the switch, install at least one power supply. (See the *Aruba Switch Power Supply Quick Setup Guide and Safety/Regulatory Information* document shipped with your power supply units.) The Aruba 8320 switch uses any of the following power supplies:
 - Aruba X371 400W 100-240VAC Power Supply (JL480A)
2. Plug the included power cord into the power supply's power connector and into a nearby AC power source.

Figure 11: Connecting a power cord to the switch



3. Check the LEDs. See [Switch and port LEDs on the front of the switch](#).



One power supply provides power to operate the switch. Installing a second power supply can provide power to the switch in case the initial power supply fails. If the power supplies are plugged into different AC power sources, redundant power can be supplied in case of loss of one of the AC power sources.

5. Connect a management console

The Aruba 8320 switch has a full-featured, easy to use console interface for performing switch management tasks, including the following:

- Enabling switch ports (ports are disabled by default).
- Monitoring switch and port status and observing network activity statistics.
- Modifying the switch's configuration to optimize switch performance, enhancing network traffic control, and improving network security.
- Reading the event log and accessing diagnostic tools to help in troubleshooting.
- Downloading new software to the switch.
- Adding passwords to control access to the switch from the console, Web browser interface, and network management stations.

The console can be accessed through these methods:

- **Out-of-band serial:** Use a serial cable (not included) for connecting a workstation running suitable VT-100 terminal emulation software directly to the switch's RJ-45 Console Port. A DB9-to-RJ-45 console cable can be ordered from HPE: JL448A, Aruba X2C2 RJ45 to DB9 Console Cable.
- **Out-of-band network:** Access the console using SSH from a PC or UNIX station on the network running suitable VT-100 terminal emulation software. For more information, see chapter 3, **Getting started with switch configuration**.

The switch can simultaneously support one console session through the Console Port and multiple network SSH sessions.

Terminal configuration

To connect a console to the switch, configure the PC terminal emulator as a DEC VT-100 (ANSI) terminal or use a VT-100 terminal, and configure either one to operate with these settings:

- A baud rate of 115200.
- 8 data bits, 1 stop bit, no parity, and flow control set to off.
- For the Windows Terminal program, also disable (uncheck) the "Use Function, Arrow, and Ctrl Keys for Windows" option.
- For the Hilgraeve HyperTerminal program, select the "Terminal keys" option for the "Function, arrow, and ctrl keys act as" parameter.

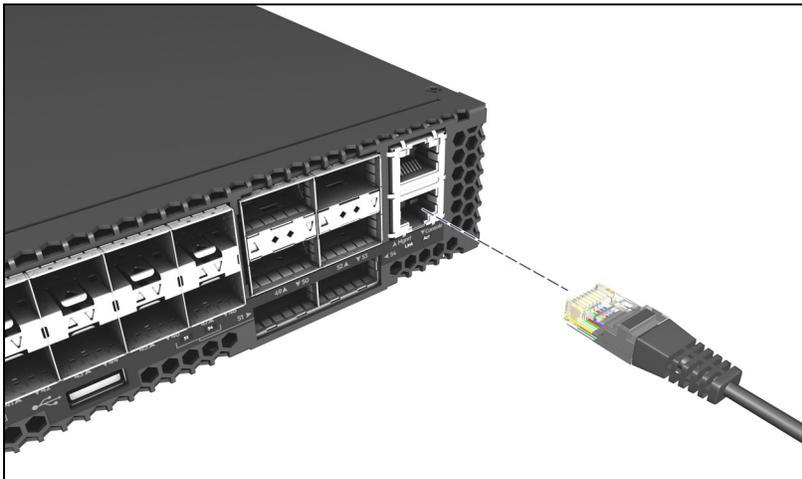
If you want to operate the console using a different configuration, make sure you change the settings on both the terminal and on the switch so they are compatible. Change the switch settings first, then change the terminal settings, then reboot the switch and reestablish the console session.

Direct console access

To connect a console to the switch, follow these steps:

1. Connect the PC or terminal to the switch's Console Port using a console cable (JL448A; sold separately).

Figure 12: *Connecting a console cable*



2. Turn on the terminal or PC's power and, if using a PC, start the PC terminal program.
3. Press **[Enter]** two or three times. When prompted to log in specify **admin**. When prompted for the password, press **[Enter]**. (By default, no password is defined.)

You are placed into the manager command context, which is identified by the prompt: `switch#`. For example:

```
login as: admin
Password:
```

switch#

If you want to continue with console management of the switch at this time, see chapter 3, **Getting started with switch configuration** for some basic configuration steps. For more detailed information, refer to the *Basic Operation Guide* and the *Management and Configuration Guide*, which are on the Hewlett Packard Enterprise Web site at www.hpe.com/support/manuals.

Console cable pinouts

The Aruba X2C2 RJ45 to DB9 Console Cable (JL448A) has an RJ-45 plug on one end and a DB-9 female connector on the other end. **Table 11** describes the mapping of the RJ-45 to DB-9 pins.

Figure 13: RJ-45 to DB-9 pinouts

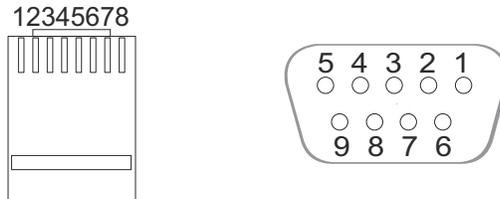


Table 11: Mapping of RJ-45 to DB-9

| RJ-45 (Signal reference from Chassis) | DB-9 (Signal reference from PC) | | |
|---------------------------------------|---------------------------------|---|-----|
| Reserved | 1 | 8 | CTS |
| Reserved | 2 | 6 | DSR |
| TXD | 3 | 2 | RXD |
| Reserved | 4 | 1 | DCD |
| GND | 5 | 5 | GND |
| RXD | 6 | 3 | TXD |
| Reserved | 7 | 4 | DTR |
| Reserved | 8 | 7 | RTS |
| - | - | 9 | RI |

6. Connect the network cables

Connect the network cables, described under “Cabling Infrastructure” (**1. Prepare the installation site**), from the network devices or your patch panels to the RJ-45 out-of-band management port on the switch or to any transceivers you have installed in the switch.

Using the RJ-45 out-of-band management port

If you plan to manage the switch from a dedicated management network, connect an RJ-45 network cable from the management network to the Mgmt port. The Mgmt port supports 10, 100, and 1000 Mbps connections.

To connect:

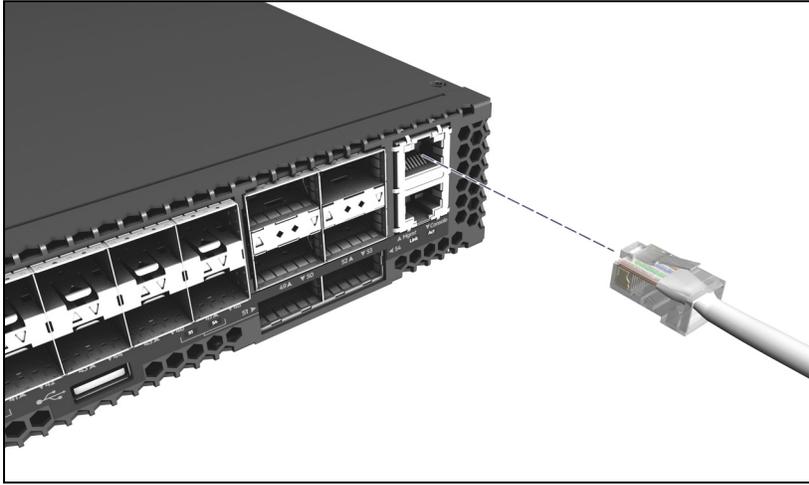
Push the RJ-45 plug into the RJ-45 port until the tab on the plug clicks into place. When power is on for the switch and for the connected device, the Link LED for the port should light to confirm a powered-on device (for example, an end node) is at the other end of the cable.

If the Link LED does *not* go on when the network cable is connected to the port, see [Diagnosing with the LEDs](#) in chapter 5, “Troubleshooting”.

To disconnect:

Press the small tab on the plug and pull the plug out of the port.

Figure 14: *Connecting an RJ-45*

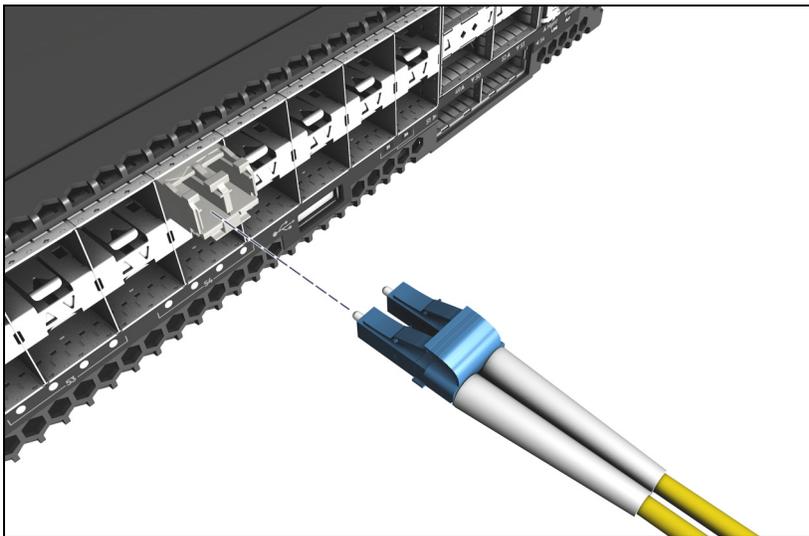


Connecting cables to SFP/SFP+/QSFP+ transceivers

If you have any transceivers installed in the switch, the type of network connections you will need to use depends on the type of transceivers installed. See chapter 6, [Cabling and technology information](#), for cabling information.

For transceiver ports, and in general for all the switch ports, a network cable from an active network device is connected to the port. If the port LED does not come on half-bright when the network cable is connected to the port, see [Diagnosing with the LEDs](#) in chapter 5, “Troubleshooting.”

Figure 15: *Connecting cable to a transceiver*



This chapter is a guide for using the console CLI to quickly assign an IP (Internet Protocol) address and subnet mask to the switch, set a Manager password, and, optionally, configure other basic features.

For more information on using the switch console, see the *Basic Operation Guide* and the *Management and Configuration Guide* for your switch at www.hpe.com/support/manuals. For information on the HPE IMC (Intelligent Management Center), contact your HPE/Aruba representative. For information on Aruba AirWave, go to www.arubanetworks.com/products/networking/management/airwave.

Recommended minimal configuration

In the factory default configuration, the switch is optimized for secure deployments. It has no IP (Internet Protocol) address and subnet mask, all network ports are administratively shut down, the OOBM port is shut down, remote management protocols are disabled, and there is a default admin user account with no password configured. To manage the switch via a networked connection attached to the out-of-band management port, you must first enable the port and configure the switch with an IP address and subnet mask compatible with your network. You must also configure a Manager password before enabling remote access methods such as SSH and the Web browser interface.

All switch port interfaces are disabled by default, you first need to enable all switch ports that you intend to use for network connections.

Many other features can be configured through the switch's console interface to optimize the switch's performance, to enhance your control of the network traffic, and to improve network security. Once an IP address has been configured on the switch, these features can be accessed more conveniently through a remote SSH session, through the switch's Web browser interface, and from an SNMP network management station running network management software. For a listing of switch features available with and without an IP address, refer to "How IP Addressing Affects Switch Operation" in the *Management and Configuration Guide*.

For more information on configuring IP addressing, refer to the *Basic Operation Guide* at www.hpe.com/support/manuals.



By default, the switch is configured to acquire an IP address configuration from a DHCP or Bootp server. To use DHCP/Bootp instead of the manual method described in this chapter, see "DHCP/Bootp Operation" in the *Management and Configuration Guide*.

Using the console CLI

The quickest and easiest way to minimally configure the switch for management and password protection in your network is to use a direct console connection to the switch and start a console session.

1. Using the method described in **Terminal configuration**, connect a terminal device to the switch and display the switch console command line interface (CLI) prompt (the default display).

The CLI prompt appears, for example:

```
switch#
```

2. Enter the command `config` to change to the global configuration context: `switch (config)#`. For example:

```
switch# config
switch(config)#
```

3. Define a password for the default **admin** account with the command `user admin password`. The local account password can contain up to 32 alphanumeric characters within the printable ASCII character-set. Spaces are not allowed. ASCII characters from hex 21 to hex 7E [`\x21-\x7E`] are allowed.

For example:

```
switch(config)# user admin password
Changing password for user admin
Enter password:*****
Confirm password:*****
```

4. Save the switch configuration changes by using the `copy` command.

```
switch# copy running-config startup-config
```

Enabling out-of-band management on the management port

The management port is disabled by default. Once enabled, it uses SSH to authenticate user logins and provided a secure connection for remote management. You must assign a password to the default **admin** account to enable SSH.

1. Enable the out-of-band management port using the following commands:

```
switch# configure
switch(config)# interface mgmt
switch(config-if-mgmt)# no shutdown
```

2. Enable the SSH server on the management VRF (`mgmt`) with the command `ssh server vrf mgmt`. By default, the SSH server will authenticate logins using the locally defined user accounts.

For example:

```
switch(config)# ssh server vrf mgmt
```

3. By default, management interface is set to operate as a DHCP client. If you prefer to use static addressing, define an IP address, default gateway, and DNS server with the commands `ip`, `default-gateway`, and `nameserver`.

For example, these commands set the management IP to 192.168.1.10 with a mask of 24 bits, the default gateway to 192.168.1.100, and the DNS server to 192.168.1.99:

```
switch(config)# interface mgmt
switch(config-if-mgmt)# ip static 192.168.1.10/24
switch(config-if-mgmt)# default-gateway 192.168.1.100
switch(config-if-mgmt)# nameserver 192.168.1.99
```

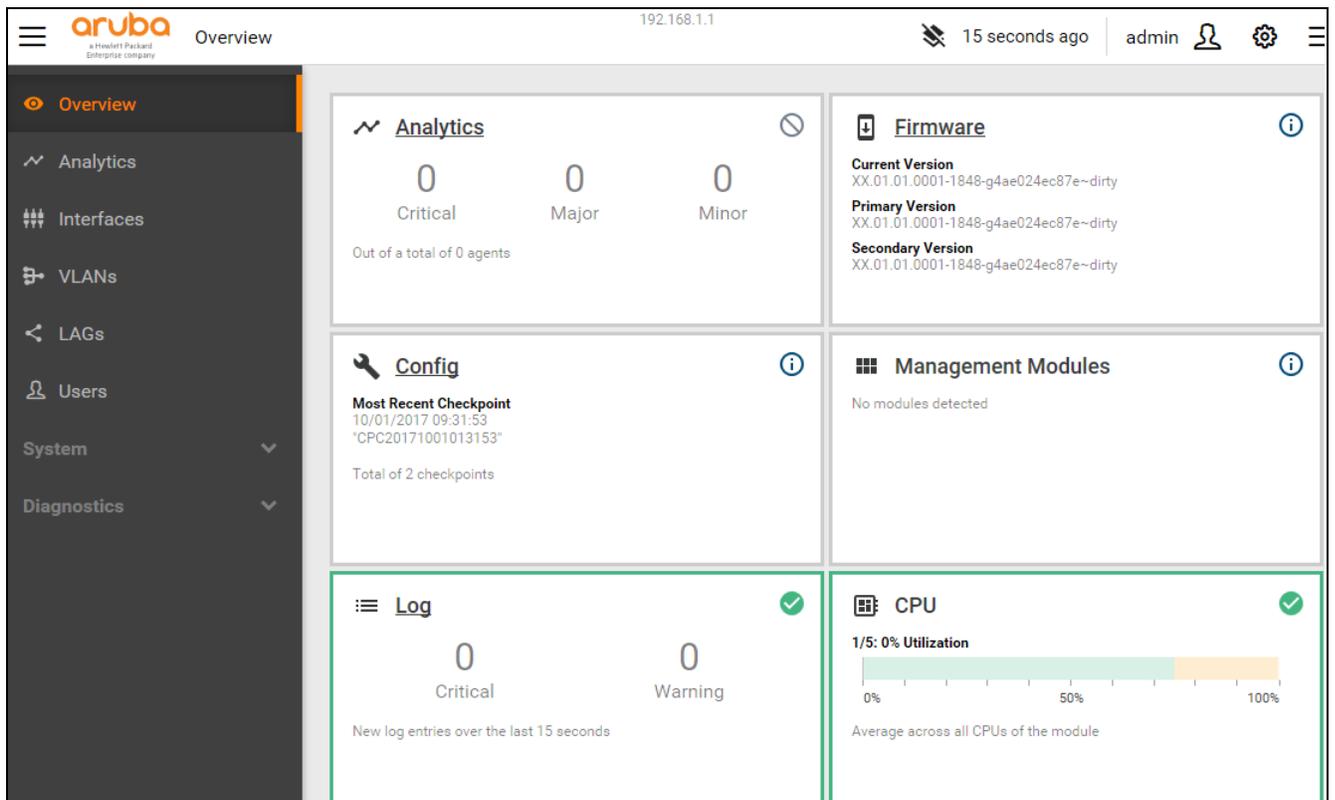
You can specify IPv6 addresses instead of IPV4 addresses if required by your network.

4. Log out of the switch with the commands `end` and `exit`.
5. Use an Ethernet cable to connect the management port to your network.
6. Use an Ethernet cable to connect your computer to the same network.
7. Start your SSH client software and configure a new session using the address assigned to the management port in step 2. You should now be able to establish a connection to the management port using SSH client software. When prompted, login with the **admin** account.
8. The switch can also be managed through a web browser interface using the address assigned to the management port in step 2. Use the command `https-server` to enable the web server and set the access mode, and then establish a connection to the management port using a web browser.

```
switch(config)# https-server vrf mgmt
switch(config)# https-server rest access-mode read-write
```

When prompted, login with the **admin** account.

Figure 16: Web browser interface home page



Where to go from here

The above procedure configures your switch with a Manager password, IP address, and subnet mask. As a result, with the proper network connections, you can now manage the switch from a PC equipped with SSH and/or a web browser interface.

Some basic information on managing your switch is included in the next section. For more information on the console, web browser, and SNMP management interfaces and all the features that can be configured on the switch, see the *Basic Operation Guide* and the *Management and Configuration Guide* at www.hpe.com/support/manuals.

Software updates

See [Accessing updates](#).

To recover from a lost manager password:

If you cannot start a console session at the manager level because of a lost Manager password, you can clear all passwords and user names by getting physical access to the switch and pressing and holding the Reset button for more than 5 seconds. See [Reset button](#).

This chapter shows you how to remove and install the following components:

- Power supply
- Fan tray

The power supplies and fan trays are hot swappable. You do not need to power off the switch before installing or replacing a power supply or fan tray.

The Aruba 8320 switch and its components are sensitive to static discharge. Use an antistatic wrist strap and observe all static precautions when replacing components.

If a power supply must be removed and then reinstalled, wait at least 5 seconds before reinstallation. Otherwise, damage to the switch may occur. The power supply needs this time to bleed off any retained power.

Replacing a power supply

If the Aruba 8320 switch is configured with a redundant power supply, the switch will not suffer any loss of traffic or performance if a power supply fails. To maintain system redundancy, a failed power supply should be replaced as soon as possible. The PS1 or PS2 LED will be on amber and flash simultaneously with the switch Global Status LED indicating a power supply has failed.

One power supply is available for use with the switch: Aruba X371 400W 100-240VAC Power Supply (JL480A)

To remove a power supply:

1. Remove the AC power cable from the failed power supply's connector.
2. Grasping the handle of the failed power supply, release the locking mechanism by squeezing the latch handle while removing the failed power supply.

Figure 17: Replacing a failed power supply

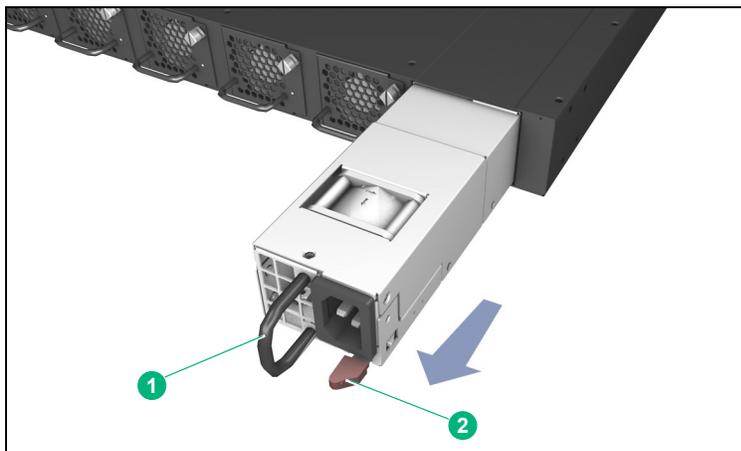


Table 12: Replacing a failed power supply labels and descriptions

| Label | Description |
|-------|---------------------|
| 1 | Power supply handle |
| 2 | Release latch |

3. Insert the new power supply. Slide it in all the way in until the locking mechanism clicks into place.
4. Connect the AC power cable to the new power supply's connector.

Replacing a fan tray

The Aruba 8320 switch is equipped with five field-replaceable, hot-swappable fan trays. The switch can tolerate the failure of a single fan tray while maintaining a safe operating temperature. To maintain system redundancy, a failed fan tray should be replaced as soon as possible. The Fan LED will be on amber and blink simultaneously with the switch Global Status LED indicating a fan tray has failed.

One fan tray is available for use with the switch: Aruba X721 Front-to-Back Fan (JL481A)



The Aruba 8320 switch is not compatible with fan trays from other Aruba hardware platforms.

To replace a fan tray:

1. Identify the failed fan tray by its status LED. The fan tray LED will be on amber.
2. Remove the new fan tray from its packaging, being careful to not touch any of the circuitry on the board.
3. Loosen the retaining screw on the fan tray.
4. Grasping the handle of the failed fan tray, pull it straight out to remove it from its slot.
5. Insert the new fan tray fully into the slot so that its face plate is flush with the back face of the switch. If the switch is connected to an AC power source, the fan tray should immediately start running.
6. Engage the retaining screw and tighten it. Be sure to not over-tighten the screw.

Figure 18: *Replacing a failed fan tray*

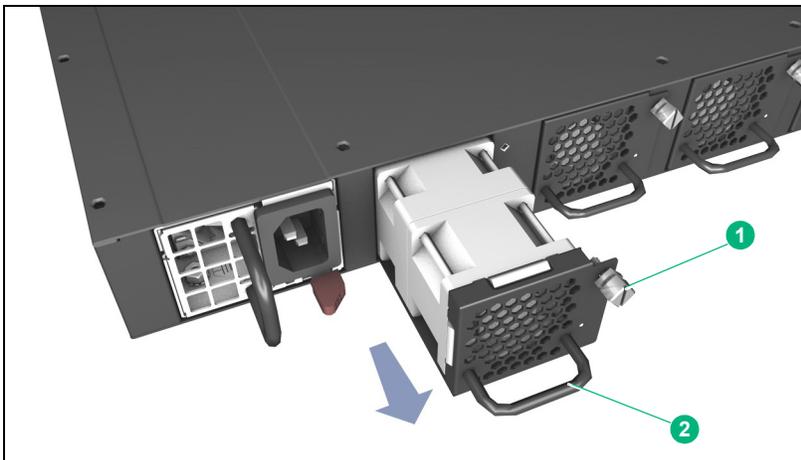


Table 13: *Replacing a failed fan tray labels and descriptions*

| Label | Description |
|-------|--------------------------|
| 1 | Fan tray retaining screw |
| 2 | Fan tray handle |

This chapter describes how to troubleshoot your switch. This document describes troubleshooting mostly from a hardware perspective. You can perform more in-depth troubleshooting on these devices using the software tools available with the switches, including the full-featured console interface, the built-in web browser interface, and IMC, the SNMP-based network management tool, or Aruba AirWave. For more information, see the chapter “Troubleshooting” in the *Management and Configuration Guide*, which is on the Hewlett Packard Enterprise website at www.hpe.com/support/manuals.

This chapter describes the following:

- Basic troubleshooting tips (see [Basic troubleshooting tips](#))
- Diagnosing with the LEDs (see [Diagnosing with the LEDs](#))
- Hardware diagnostic tests (see [Hardware diagnostic tests](#))
- Restoring the factory default configuration (see [Restoring the factory default configuration](#))
- Downloading new software to the switch (see [Downloading new switch software](#))
- Hewlett Packard Enterprise Customer Support Services (see [Hewlett Packard Enterprise Customer Support Services](#))

Basic troubleshooting tips

Most problems are caused by the following situations. Check for these items first when starting your troubleshooting:

- **Faulty or loose cables.** Look for loose or obviously faulty connections. If the cables appear to be OK, make sure the connections are snug. If that does not correct the problem, try a different cable.
- **Non-standard cables.** Non-standard and miswired cables may cause network collisions and other network problems, and can seriously impair network performance. Use a new correctly-wired cable or compare your cable to the cable in chapter 7, [Cabling and technology information](#) for pinouts and correct cable wiring. A category 5 cable tester is a recommended tool for every 100BASE-TX and 1000BASE-T network installation.
- **Improper network topologies.** It is important to make sure you have a valid network topology. Common topology faults include excessive cable length and excessive repeater delays between end nodes. If you have network problems after recent changes to the network, change back to the previous topology. If you no longer experience the problems, the new topology is probably at fault.

In addition, you should make sure that your network topology contains **no data path loops**. Between any two end nodes, there should be only one active cabling path at any time. Data path loops can cause broadcast storms that will severely impact your network performance.

For your switch, if you want to build redundant paths between important nodes in your network to provide some fault tolerance, you should enable **Spanning Tree Protocol** support on the switch. This ensures that only one of the redundant paths is active at any time, thus avoiding data path loops. Spanning Tree can be enabled through the switch console or the web browser interface. For more information on Spanning Tree, see the *Advanced Traffic Management Guide* for your switch at www.hpe.com/support/manuals.

Diagnosing with the LEDs

Table 14 shows LED patterns on the switch that indicate problem conditions for general switch operation troubleshooting.

LED patterns for general switch troubleshooting

1. Check in the table for the LED pattern you see on your switch.
2. Refer to the corresponding diagnostic tip on the next few pages.

Table 14: LED error indicators

| LED Pattern Indicating Problems | | |
|---------------------------------|---------------------------------------|----------------|
| Global Status | Port LED | Diagnostic Tip |
| Off with power cord plugged in | – | 1 |
| Solid amber | – | 2 |
| Slow flash amber | – | 3 |
| Slow flash amber | Slow flash amber ¹ | 4 |
| Solid green | Off with cable connected | 5 |
| Solid green | On, but the port is not communicating | 6 |

¹ The flashing behavior is an on/off cycle once every 1.6 seconds, approximately.

Diagnostic tips:

| Tip | Problem | Solution |
|-----|---|---|
| 1 | The switch is not plugged into an active AC power source, or the switch's power supply may have failed. | Verify the power cord is plugged into an active power source and to the switch. Make sure these connections are snug. Try power cycling the switch by unplugging and plugging the power cord back in. If the Global Status LED is still not on, verify the AC power source works by plugging another device into the outlet. Or try plugging the switch into a different outlet or try a different power cord. If the power source and power cord are OK and this condition persists, the switch power supply may have failed. Call your Hewlett Packard Enterprise-authorized network reseller, or use the electronic support services from Hewlett Packard Enterprise to get assistance. |
| 2 | A switch hardware failure has occurred. All the LEDs will stay on indefinitely. | Try power cycling the switch. If the fault indication reoccurs, the switch may have failed. Call your Hewlett Packard Enterprise-authorized network reseller, or use the electronic support services from Hewlett Packard Enterprise to get assistance. |

| Tip | Problem | Solution |
|-----|---|--|
| 3 | <p>The switch has experienced a software failure during self test, or one of the switch cooling fans may have failed.</p> | <p>Try resetting the switch by pressing the Reset button on the front of the switch, or by power cycling the switch.</p> <p>If the fault indication reoccurs, attach a console to the switch (as indicated in chapter 2) and configure it to operate at 115200 baud. Then, reset the switch. Messages should appear on the console screen and in the console log identifying the error condition. You can view the console log at that point by typing “Show events” at the Manager command prompt (#).</p> <p>The error may indicate that one of the fans has failed. In switches with multiple fans the switch may continue to operate under this condition if the ambient temperature does not exceed normal room temperature, but for best operation, the failed fan tray should be replaced.</p> <p>If necessary to resolve the problem, contact your Hewlett Packard Enterprise-authorized network reseller, or use the electronic support services from Hewlett Packard Enterprise to get assistance.</p> |
| 4 | <p>The network port for which the LED is flashing has experienced a self test or initialization failure.</p> | <p>If the port is an SFP/SFP+/QSFP+ transceiver, verify that it is one of the transceivers supported by the switch. Unsupported transceivers will be identified with this fault condition. The supported transceivers are listed in Chapter 1, Introducing the Aruba 8320 Switch. The transceivers are also tested when they are “hot-swapped”—installed or changed while the switch is powered on.</p> <p>To verify the port has failed, remove and reinstall the transceiver without powering off the switch. If the port fault indication reoccurs, check the event log to see why the transceiver failed. You may have to replace the transceiver. Try power cycling the switch. Call your Hewlett Packard Enterprise-authorized network reseller, or use the electronic support services from Hewlett Packard Enterprise to get assistance.</p> |

| Tip | Problem | Solution |
|-----|---|---|
| 5 | The network connection is not working properly. | <p>Try the following procedures:</p> <p>For the indicated port, verify that both ends of the cabling, at the switch and the connected device, are connected properly.</p> <p>Verify the connected device and switch are both powered <i>on</i> and operating correctly.</p> <p>Verify you have used the correct cable type for the connection:</p> <p>For fiber-optic connections, verify the transmit port on the switch is connected to the receive port on the connected device, and the switch receive port is connected to the transmit port on the connected device.</p> <p>The cable verification process must include all patch cables from any end devices, including the switch, to any patch panels in the cabling path.</p> <p>Verify the port has not been disabled through a switch configuration change. You can use the console interface, or, if you have configured an IP address on the switch, use the Web browser interface to determine the state of the port and re-enable the port if necessary.</p> <p>Verify the switch port configuration matches the configuration of the attached device. For example, if the switch port is configured as “Full-duplex”, the port on the attached device also MUST be configured as “Full-duplex”. If the configurations don’t match, the results could be a very unreliable connection, or no link at all.</p> <p>If the other procedures don’t resolve the problem, try using a different port or a different cable.</p> |
| 6 | The port may be improperly configured, or the port may be in a “blocking” state by the normal operation of the Spanning Tree, LACP, or IGMP features. | <p>Use the switch console to see if the port is part of a dynamic trunk (through the LACP feature) or to see if Spanning Tree is enabled on the switch, and to see if the port may have been put into a “blocking” state by those features. The <code>show lacp interfaces</code> command displays the port status for the LACP feature; the <code>show spanning-tree</code> command displays the port status for Spanning Tree.</p> <p>Also check the Port Status screen using the <code>show interfaces</code> command to see if the port has been configured as “disabled”.</p> <p>Other switch features that may affect the port operation include VLANs and IGMP. Use the switch console to see how the port is configured for these features.</p> <p>For software troubleshooting tips, see the chapter “Troubleshooting” in the <i>Management and Configuration Guide</i>, which is on the Hewlett Packard Enterprise website at www.hpe.com/support/manuals.</p> <p>Ensure also, that the device at the other end of the connection is indicating a good link to the switch. If it is not, the problem may be with the cabling between the devices or the connectors on the cable.</p> |

Hardware diagnostic tests

Testing the switch by resetting it

If you believe the switch is not operating correctly, you can reset the switch to test its circuitry and operating code. To reset a switch, either:

- unplug and plug in the power cord (power cycling)
- press the Reset button on the front of the switch
- reboot the switch via the management console's `boot system` command.

Power cycling the switch and pressing the Reset button both cause the switch to reset. These reset processes also cause any network traffic counters to be reset to zero, and cause the System Up Time timer to reset to zero.

Checking the switch LEDs

See [Diagnosing with the LEDs](#) for information on interpreting the LED patterns.

Checking console messages

Useful diagnostic messages may be displayed on the console screen when the switch is reset. As described in chapter 2 under step 6, connect a PC running a VT-100 terminal emulator program to the switch's Console Port and configure it to run at 115200 baud, and with the other terminal communication settings shown in [Terminal configuration](#). Then, when you reset the switch, note the messages that are displayed. Additionally, you can check the switch event log, which can be accessed from the console using the `show events` command.

Testing switch-to-device network communications

You can perform the following communication tests to verify the network is operating correctly between the switch and any connected device that can respond correctly to the communication test.

- **Link Test**—a physical layer test that sends IEEE 802.2 test packets to any device identified by its MAC address
- **Ping Test**—a network layer test used on IP networks that sends test packets to any device identified by its IP address

These tests can be performed through the switch console interface from a terminal connected to the switch or through a Telnet connection, or from the switch's web browser interface. For more information, see the *Basic Operation Guide*, which is on the Hewlett Packard Enterprise website at www.hpe.com/support/manuals.

Testing end-to-end network communications

Both the switch and the cabling can be tested by running an end-to-end communications test—a test that sends known data from one network device to another through the switch. For example, if you have two PCs on the network that have LAN adapters between which you can run a link-level test or Ping test through the switch, you can use this test to verify that the entire communication path between the two PCs is functioning correctly. See your LAN adapter documentation for more information on running a link test or Ping test.

Restoring the factory default configuration

As part of your troubleshooting process on the switch, it may become necessary to return the switch configuration to the factory default settings. This clears any passwords, clears the console event log, resets the network counters to zero, and reboots the switch into its factory default configuration including deleting the IP address, if one is configured.



This process removes all switch configuration changes that you have made from the factory default settings. This includes, for example, configuration of VLANs, Spanning Tree, and LAGs. Returning the configuration of these features to their factory default settings (usually disabling them) may result in network connectivity issues.

If the switch has a valid configuration, and you are restoring the factory default settings for a reason other than configuration problems, you should save the switch configuration prior to performing the factory default reset. Then, after the reset and resolution of the original problem, you can restore the saved configuration to the switch.

You can restore the factory default configuration either on the switch itself, or through the switch console.

To execute the factory default reset on the switch, perform these steps:

1. Using a pointed object, press the Reset button on the front of the switch.
2. When the Global Status LED begins to fast flash orange (after approximately 5 seconds), release the Reset button.

The switch will then begin operating with its configuration restored to the factory default settings.

To restore the factory default configuration using the console, execute the `erase startup-config` command from the console command prompt.

Downloading new switch software

Software Updates can be downloaded to the switch through several methods. See [Accessing updates](#).

Hewlett Packard Enterprise Customer Support Services

If you are still having trouble with your product, see [Support and other resources](#).

Switch specifications

Physical

| Product | Width | Depth | Height | Weight |
|---|---------------------|---------------------|-------------------|--------------------|
| Aruba 8320 48p 10G SFP/SFP+ and 6p 40G QSFP+ with X472 5 Fans 2 Power Supply Switch Bundle (JL479A) | 44.25 cm (17.42 in) | 47.15 cm (18.56 in) | 4.40 cm (1.73 in) | 8.95 kg (19.73 lb) |

Electrical

| Product | AC Voltage | Maximum current | Frequency range |
|---|---------------|-----------------|-----------------|
| Aruba X371 400W 100-240VAC Power Supply (JL480A)* | 100-240 volts | 6 A - 3 A | 50-60 Hz |

* The power supply automatically adjusts to any voltage between 100-240 volts and either 50 or 60 Hz.

Power Consumption

| Product | Power consumption |
|---|------------------------------|
| Aruba 8320 48p 10G SFP/SFP+ and 6p 40G QSFP+ with X472 5 Fans 2 Power Supply Switch Bundle (JL479A) | Max: 357.37 W Idle: 267 W |
| Aruba X371 400W 100-240VAC Power Supply (JL480A) | Max: 400 W |
| Aruba X721 Front-to-Back Fan (JL481A) | Max: 18 W |

MTBF

| Product | MTBF |
|---|-----------------|
| Aruba 8320 48p 10G SFP/SFP+ and 6p 40G QSFP+ with X472 5 Fans 2 Power Supply Switch Bundle (JL479A) | 115,546 hours |
| Aruba X371 400W 100-240VAC Power Supply (JL480A) | 3,318,409 hours |
| Aruba X721 Front-to-Back Fan (JL481A) | 131,916 hours |

Environmental

| | Operating | Non-Operating |
|------------------------------------|--|---|
| Temperature | 0°C to 40°C (32°F to 104°F) up to 3.0 km (10,000 ft) | -40°C to 70°C (-40°F to 158°F) up to 4.6 km (15,000 ft) |
| Relative humidity (non-condensing) | 5% to 95% at 40°C (104°F) non-condensing | 5% to 95% at 65°C (149°F) |
| Maximum altitude | 3.0 km (10,000 ft)* | 4.6 Km (15,000 ft) |

* The operating maximum altitude should not exceed that of any accessory being connected to any Aruba 8320 switch.

Acoustics

| Switch Model | Acoustics |
|---|---|
| Aruba 8320 48p 10G SFP/SFP+ and 6p 40G QSFP+ with X472 5 Fans 2 Power Supply Switch Bundle (JL479A) | Sound Pressure (LpAm) (Bystander) 61.1 dB |

Safety

- EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013
- IEC 60950-1:2005 Ed.2; Am 1:2009+A2:2013
- UL 60950-1, CSA 22.2 No 60950-1
- EN 60825-1:2007 / IEC 60825-1:2007 Class 1

EMC

- EN 55032:2012, Class A
- EN 55024:2010
- EN 61000-3-2:2014, Class A
- EN 61000-3-3:2013
- FCC CFR 47 Part 15:2010, Class A

Immunity

- EN 55024:2010
- IEC 61000-4-2/3/4/5/6/8/11

RoHS

EN 50581:2012

Standards

Table 15: *Technology standards and safety compliance*

| Technology | Compatible with these IEEE standards | Laser safety information | |
|-------------|--------------------------------------|----------------------------|---|
| | | EN/IEC standard compliance | SFP Lasers |
| 1000BASE-T | IEEE 802.3ab 1000BASE-T | – | – |
| 1000BASE-SX | IEEE 802.3z 1000BASE-SX | EN/IEC 60825 | Class 1 Laser Product Laser Klasse 1 |
| 1000BASE-LX | IEEE 802.3z 1000BASE-LX | EN/IEC 60825 | Class 1 Laser Product Laser Klasse 1 |
| 1000BASE-LH | (not an IEEE standard) | EN/IEC 60825 | Class 1 Laser Product Laser Klasse 1 |
| 1000BASE-BX | IEEE 802.3ah 1000BASE-BX10 | EN/IEC 60825 | Class 1 Laser Product Laser Klasse 1 |

This chapter includes switch connector information and network cable information for cables that should be used with the Hewlett Packard Enterprise switches.



Incorrectly wired cabling is a common cause of problems for LAN communications. Hewlett Packard Enterprise recommends that you work with a qualified LAN cable installer for assistance with your cabling requirements.

Cabling specifications

Table 16: *Cabling specifications*

| | | |
|--|----------------------|--|
| Twisted-pair copper | 1000 Mbps Operation | Category 5, 100-ohm 4-pair UTP or STP cable, complying with IEEE 802.3ab 1000BASE-T specifications—Category 5e or better is recommended. See Note on 1000BASE-T cable requirements . |
| | 10 Gbps Operation | Category 6 or 6A, 100-ohm 4-pair UTP cable, or Category 6A or 7, 100-ohm 4-pair STP cable, complying with IEEE 802.3an 10GBASE-T specifications. See Note on 10GBASE-T cable requirements below, and see Technology distance specifications for distances supported with each cable type. |
| Twinaxial copper | Direct attach cables | One-piece devices consisting of a cable with SFP+ connectors permanently attached to each end, complying with SFF 8431 SFP+ specifications. |
| Multimode fiber | | 62.5/125 μm or 50/125 μm (core/cladding) diameter, low metal content, graded index fiber-optic cables, complying with the ITU-T G.651 and ISO/IEC 793-2 Type A1b or A1a standards respectively. ¹ |
| Single mode fiber | | 9/125 μm (core/cladding) diameter, low metal content fiber-optic cables, complying with the ITU-T G.652 and ISO/IEC 793-2 Type B1 standards. |
| ¹ A mode conditioning patch cord may be needed for some Gigabit-LX installations. See Mode conditioning patch cord for more information. | | |

Note on 1000BASE-T cable requirements

The Category 5 networking cables that work for 100BASE-TX connections should also work for 1000BASE-T, as long as all four-pairs are connected. But, for the most robust connections, you should use cabling that complies with the Category 5e specifications, as described in Addendum 5 to the TIA-568-A standard (ANSI/TIA/EIA-568-A-5).

Because of the increased speed provided by 1000BASE-T (Gigabit-T), network cable quality is more important than for either 10BASE-T or 100BASE-TX. Cabling plants being used to carry 1000BASE-T networking must comply with the IEEE 802.3ab standards. In particular, the cabling must pass tests for Attenuation, Near-End

Crosstalk (NEXT), and Far-End Crosstalk (FEXT). Additionally, unlike the cables for 100BASE-TX, the 1000BASE-T cables must pass tests for Equal-Level Far-End Crosstalk (ELFEXT) and Return Loss.

When testing your cabling, be sure to include the patch cables that connect the switch and other end devices to the patch panels on your site. The patch cables are frequently overlooked when testing cable and they must also comply with the cabling standards.

Note on 10GBASE-T cable requirements

The Category 6 networking cables that work for 1000BASE-T connections may work for 10GBASE-T, as long as the distance is less than 55m and the cable installation has been tested for compliance to IEEE requirements. But, for the most robust connections, you should use cabling that complies with the Category 6A or Category 7 specifications, as described in the TIA-568-C (ANSI/TIA-568-C.2) and ISO/IEC 11801 standards. 10GBASE-T is a sophisticated technology that relies upon high quality cable installations. It is sensitive to Alien Near End

Crosstalk (ANEXT) which can arrive upon the cable due to cables placed in close proximity to the data cables. It is recommended that cable dressing be done carefully and in compliance with recommendations in the TIA TSB-155A.

Like 1000BASE-T, 10GBASE-T requires testing of all the crosstalk and return loss parameters described above, and also ANEXT.

In addition to ANEXT, 10GBASE-T is more sensitive to external electrical noise in the environment. It is recommended that radio transmitters and other sources of high frequency continuous wave radio frequency be kept away from LAN cables.

When testing your cabling, be sure to include the patch cables that connect the switch and other end devices to the patch panels on your site. The patch cables are frequently overlooked when testing cable and they must also comply with the cabling standards. For 10GBASE-T, Category 6 patch cables are sensitive to movement once link has been established, and could cause link to drop if moved. Therefore, Hewlett Packard Enterprise recommends using Category 6A patch cables, or using cable management options to tie down (dress) the Category 6 patch cables so they cannot move.

For Conducted and Radiated Immunity in accordance with EN55024, the Aruba switch is limited to Performance Criteria A with shielded cables (CAT6/6A).

Technology distance specifications

Table 17: *Technology distance specifications*

| Technology | Supported cable type | Multimode fiber modal bandwidth | Supported distances |
|-------------|----------------------|---------------------------------|---------------------------------|
| 1000BASE-T | twisted-pair copper | N/A | up to 100 meters |
| 1000BASE-SX | multimode fiber | 160 MHz*km | 2 - 220 meters |
| | | 200 MHz*km | 2 - 275 meters |
| | | 400 MHz*km | 2 - 500 meters |
| | | 500 MHz*km | 2 - 550 meters |
| 1000BASE-LX | multimode fiber | 400 MHz*km | 2 - 550 meters |
| | | 500 MHz*km | 2 - 550 meters |
| | single mode fiber | N/A | 2 - 10,000 meters |
| 1000BASE-LH | single mode fiber | N/A | 10 - 70,000 meters ¹ |
| 1000BASE-BX | single mode fiber | N/A | 0.5 - 10,000 meters |

Table 17: Technology distance specifications (Continued)

| Technology | Supported cable type | Multimode fiber modal bandwidth | Supported distances |
|----------------------------|----------------------|---|--|
| 10GBASE-CR (Direct Attach) | twinaxial copper | N/A | (various lengths offered) |
| 10GBASE-SR | multimode fiber | 160 MHz*km 200 MHz*km 400 MHz*km 500 MHz*km 2000 MHz*km | 2 - 26 meters 2 - 33 meters 2 - 66 meters 2 - 82 meters 2 - 300 meters |
| 10GBASE-LR | single mode fiber | N/A | 2 - 10,000 meters |
| 10GBASE-ER | single mode fiber | N/A | 2 - 40,000 meters |

¹ For distances less than 20km, a 10dB attenuator must be used. For distances between 20km and 40km, a 5dB attenuator must be used. Attenuators can be purchased from most cable vendors.

Mode conditioning patch cord

The following information applies to installations in which multimode fiber-optic cables are connected to a Gigabit-LX port. Multimode cable has a design characteristic called “Differential Mode Delay”, which requires the transmission signals be “conditioned” to compensate for the cable design and thus prevent resulting transmission errors.

Under certain circumstances, depending on the cable used and the lengths of the cable runs, an external Mode Conditioning Patch Cord may need to be installed between the Gigabit-LX transmitting device and the multimode network cable to provide the transmission conditioning. If you experience a high number of transmission errors on those ports, usually CRC or FCS errors, you may need to install one of these patch cords between the fiber-optic port in your switch and your multimode fiber-optic network cabling, at both ends of the network link.

The patch cord consists of a short length of single mode fiber cable coupled to graded-index multimode fiber cable on the transmit side, and only multimode cable on the receive side. The section of single mode fiber is connected in such a way that it minimizes the effects of the differential mode delay in the multimode cable.



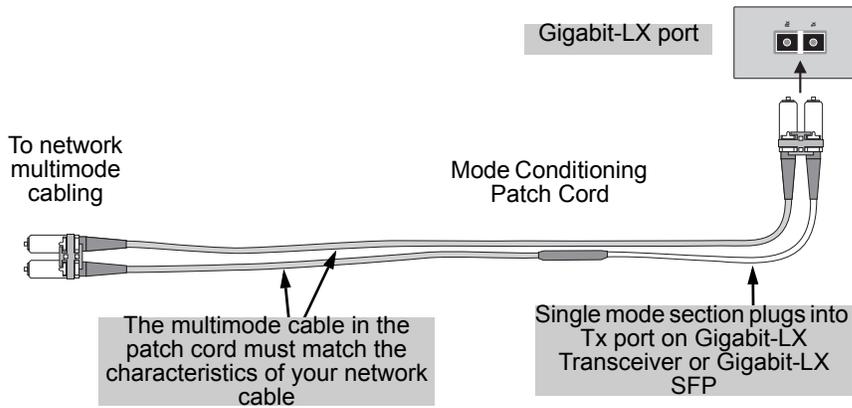
Most of the time, if you are using good quality graded-index multimode fiber cable that adheres to the standards listed in this appendix, there should not be a need to use mode conditioning patch cords in your network. This is especially true if the fiber runs in your network are relatively short.

Installing the patch cord

As shown in the illustration below, connect the patch cord to the transceiver with the section of single mode fiber plugged in to the Tx (transmit) port. Then, connect the other end of the patch cord to your network cabling patch panel, or directly to the network multimode fiber.

If you connect the patch cord directly to the network cabling, you may need to install a female-to-female adapter to allow the cables to be connected together.

Figure 19: Example: Connecting a mode conditioning patch cord for Gigabit-LX



Make sure you purchase a patch cord that has appropriate connectors on each end, and has multimode fibers that match the characteristics of the multimode fiber in your network. Most important, the core diameter of the multimode patch cord must match the core diameter of the multimode cable infrastructure (either 50 or 62.5 microns).

Accessing Hewlett Packard Enterprise support

- For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide Support website: www.hpe.com/assistance
- To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website: www.hpe.com/support/hpesc

Information to collect

- Technical support registration number (if applicable)
- Product name, model or version, and serial number
- Operating system name and version
- Firmware version
- Error messages
- Product-specific reports and logs
- Add-on products or components
- Third-party products or components

Hewlett Packard Enterprise offers support 24 hours a day, seven days a week through the use of a number of automated electronic services. Hewlett Packard Enterprise provides up-to-date customer care, support and warranty information at <http://www.hpe.com/networking/support>. Additionally, your Hewlett Packard Enterprise authorized network reseller can provide you with assistance, both with services that they offer and with services offered by Hewlett Packard Enterprise.

Before calling support

To make most efficient use of the support process, you must retrieve the following information before calling your authorized network reseller or Hewlett Packard Enterprise Support.

| Information item | Information location |
|---|--|
| <ul style="list-style-type: none"> • Product identification, including SFP/SFP+ transceivers | The front of the switch and on labels on the SFP/SFP+ transceivers |
| <ul style="list-style-type: none"> • Details about the switch's status including the software (OS) version, a copy of the switch configuration, a copy of the switch Event Log, and a copy of the switch status and counters information | Switch console: <code>show tech</code> command |
| <ul style="list-style-type: none"> • Copy of your network topology map, including network addresses assigned to the relevant devices | Your network records |

Accessing updates

- Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.
- To download product updates, go to either of the following:
- Hewlett Packard Enterprise Support Center's **Subscription Service/Support Alerts** page:
www.hpe.com/support/e-updates
- To view and update your entitlements, and to link your contracts, Care Packs, and warranties with your profile, go to the Hewlett Packard Enterprise Support Center **More Information on Access to HP Support Materials** page:
www.hpe.com/support/AccessToSupportMaterials



IMPORTANT: Access to some updates might require product entitlement when accessed through the Hewlett Packard Enterprise Support Center. You must have a Hewlett Packard Enterprise Passport set up with relevant entitlements.

- Software updates can be downloaded to the switch through several methods. Switch software updates are available at <http://www.hpe.com/networking/software>.
- For information on methods for downloading and installing software, see the *Basic Operation Guide* for your switch in the HPE Information Library at www.hpe.com/support/manuals.

Websites

| Website | Link |
|---|--|
| My Networking Support lookup tool | www.hpe.com/networking/support |
| Hewlett Packard Enterprise manuals | www.hpe.com/support/manuals |
| Hewlett Packard Enterprise Information Library | www.hpe.com/info/enterprise/docs |
| Hewlett Packard Enterprise Support Center | www.hpe.com/support/hpesc |
| Contact Hewlett Packard Enterprise Worldwide | www.hpe.com/assistance |
| Hewlett Packard Enterprise Support Center's Subscription Service/Support Alerts | www.hpe.com/support/e-updates |
| Software Download | www.hpe.com/networking/software |
| Customer Self Repair | www.hpe.com/support/selfrepair |
| Insight Remote Support | www.hpe.com/info/insightremotesupport/docs |
| Serviceguard Solutions for HP-UX | www.hpe.com/info/hpux-serviceguard-docs |

Customer self repair

Hewlett Packard Enterprise customer self repair (CSR) programs allow you to repair your product. If a CSR part needs to be replaced, it will be shipped directly to you so that you can install it at your convenience. Some parts do not qualify for CSR. Your Hewlett Packard Enterprise authorized service provider will determine whether a repair can be accomplished by CSR.

For more information about CSR, contact your local service provider or go to the CSR website:

www.hpe.com/support/selfrepair

Remote support

Remote support is available with supported devices as part of your warranty, Care Pack Service, or contractual support agreement. It provides intelligent event diagnosis, and automatic, secure submission of hardware event notifications to Hewlett Packard Enterprise, which will initiate a fast and accurate resolution based on your product's service level. Hewlett Packard Enterprise strongly recommends that you register your device for remote support.

For more information and device support details, go to the following website:

www.hpe.com/info/insightremotesupport/docs

Documentation feedback

Hewlett Packard Enterprise is committed to providing documentation that meets your needs. To help us improve the documentation, send any errors, suggestions, or comments to DocumentationFeedback ([**docsfeedback@hpe.com**](mailto:docsfeedback@hpe.com)). When submitting your feedback, include the document title, part number, edition, and publication date located on the front cover of the document. For online help content, include the product name, product version, help edition, and publication date located on the legal notices page.