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# Chapter 2

## Installation

This chapter outlines the physical installation and network connection for the 9300 series Routing Switches.

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**WARNING:** The procedures in this manual are for qualified personnel.

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### Unpacking a System

To unpack a system, refer to the printed *Quick Start Guide* shipped with your Routing Switch.

### Package Contents


For a list of included parts, please refer to the *Read Me First* document shipped with your HP device.

### General Requirements


To manage a Routing Switch, you need the following items for serial connection to the device:

- A management station, such as a PC running a terminal emulation application.
- A straight-through EIA/TIA DB-9 serial cable (F/F), which is provided with your ProCurve Routing Switch.

Use the serial connection to perform basic configuration tasks including assigning an IP address and network mask to the system. This information is required for managing the system using the Web management interface or using the CLI through Telnet.



## WARNING



**9304M Exceeds 40 lbs. (18.1 kg)**  
**9308M Exceeds 55 lbs. (24.9 kg)**

**9315M Exceeds 80 lbs. (35 kg) without modules and power supplies installed. To avoid personal injury, reduce weight of chassis by removing all modules and power supplies from chassis prior to lifting or moving.**

**When handling, two or more people are required.**

**WARNING:** Do not use the extraction handles on the power supply units to lift or carry the 9300 series Routing Switch. The power supply extraction handles are not intended to support the weight of the system and must never be used to lift or move the chassis.

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## Installation Procedures

### Summary

Follow the steps listed below to install your Routing Switch. Details for each of the steps highlighted below are provided in the rest of this chapter.

1. **Preparing the installation site (page 2-4).** Ensure that the physical environment that will host the Routing Switch has the proper cabling and ventilation.
2. **Installing (or Removing) Optional Modules (page 2-4).** There are several optional modules designed for any of the module slots on the 9300 series Routing Switches. Depending on where you will install the Routing Switch, it may be easier to install the modules first. However, the modules are “hot swappable”, and can be installed or removed after the Routing Switch is mounted and powered-on.

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**NOTE:** If you are installing a second Redundant Management module, see “Using Redundant Management Modules” on page 3-1 for complete installation, configuration, and management instructions for this module.

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3. **(Optional) Installing (or Removing) Redundant Power Supplies (page 2-8).** The 9304M can hold one or two power supplies. The 9308M and 9315M can hold up to four power supplies. If you have a power supply to install, it may be easier to install it before mounting the Routing Switch, although the power supplies are “hot swappable”, and can be installed or removed after the Routing Switch is mounted and powered-on.

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**CAUTION:** Remove the power cord from a power supply before you install it in or remove it from the Routing Switch. Otherwise, damage to the power supply or the Routing Switch could result. (The Routing Switch can be running while a power supply is being installed or removed, *but the power supply itself should not be connected to a power source.*)

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4. **Verifying Proper Operation (page 2-12).** Verify that the system and module LEDs are registering the proper LED state after power-on of the system.
5. **Attaching a PC or Terminal (page 2-13).** A terminal or PC serial port connection is all that is required to support configuration on the Routing Switch.
6. **Assign a Permanent Password (page 2-15).** No default password is assigned to HP devices. For additional access security, assign a password.
7. **Assign Permanent IP Addresses (page 2-17).** Before attaching equipment to the device, assign an interface IP address to the subnet on which it will be located. Initial IP address assignment is done using the Command Line Interface (CLI) with either a direct serial connection or using Telnet with a direct terminal-to-device LAN connection. The subsequent IP address assignments used with Routing Switches can be done via Telnet or the Web management interface.
8. **Mounting the Device (page 2-18).** ProCurve Routing Switches support both desktop and rack-mount installation.
9. **Connecting Power to the Device (page 2-20).** Once the device is physically installed, plug the device into a nearby power source in keeping with regulatory requirements outlined in this manual.
10. **Connecting Network Devices (page 2-20).** Once the device is powered on and IP addresses are assigned, the device is ready to accept network equipment.

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**CAUTION:** Use the CESD grounding tap (provided by HP) before connecting Category 5 or better UTP copper networking cables.

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11. **Verifying Proper Connections (page 2-23).** Test IP connectivity to other devices by pinging them and tracing routes.
12. **Managing the device (page 2-24).** Continue configuring the device using the CLI or the Web management interface.
13. **Swapping Modules (page 2-33).** If you are removing a module and placing a module of another type in its slot, you need to reconfigure the chassis slot for the module.

## Installation Precautions

Follow these precautions when installing a ProCurve Routing Switch:

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**WARNING:** All fiber-optic interfaces use Class 1M Lasers.

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**WARNING:** The 9304M chassis exceeds 40 lbs. (18 kg), or 47.7 lbs.(21.6 kg) when fully populated with modules and power supplies. Also, the 9308M chassis exceeds 55 lbs. (24.9 kg) or 69.1 lbs. (31.3 kg) when fully populated with modules and power supplies. **TWO OR MORE PEOPLE ARE REQUIRED WHEN LIFTING, HANDLING, OR MOUNTING THESE ROUTING SWITCHES.**

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**WARNING:** The 9315M chassis exceeds 80 lbs (35 kg.) without modules and power supplies installed. To avoid personal injury, reduce weight of chassis by removing all modules and power supplies from chassis prior to lifting or moving. **TWO OR MORE PEOPLE ARE REQUIRED WHEN LIFTING, HANDLING, OR MOUNTING THIS ROUTING SWITCH.**

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**WARNING:** Do not lift the 15-slot chassis using the lifting handles unless the chassis is empty. **TO REDUCE WEIGHT, REMOVE THE POWER SUPPLIES AND INTERFACE MODULES BEFORE LIFTING THE CHASSIS.**

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**WARNING:** Do not use the extraction handles on the power supply units to lift or carry the Routing Switch. The power supply extraction handles are not intended to support the weight of the system and must never be used to lift or move the chassis.

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**WARNING:** The rack or cabinet housing the Routing Switch should be adequately secured to prevent it from becoming unstable and/or falling over.

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**WARNING:** To increase rack stability, devices installed in a rack or cabinet should be mounted as low as possible, with the heaviest device at the bottom and progressively lighter devices installed above.

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**WARNING:** Make sure that the power source circuits are properly grounded, then use the power cord supplied with the device to connect it to the power source.

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If the installation requires a different power cord than the one supplied with the device, 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 device.

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### CAUTION:

- Note that the AC outlets should be near the Routing Switch, and should be easily accessible in case the Routing Switch must be powered off.
- Ensure that the device does not overload the power circuits, wiring, and over-current protection. To determine the possibility of overloading the supply circuits, add together the ampere ratings of all devices installed on the same circuit as the Routing Switch. Compare this total with the rating limit for the circuit. The maximum ampere ratings are usually printed on the devices, near their AC power connectors.

- Do not install the device in an environment where the operating ambient temperature might exceed 40 degrees C (104 degrees F).
  - Make sure the air flow around the front, sides, and back of the device is not restricted.
  - To provide additional safety and proper airflow to the device, make sure that slot cover plates are installed on all chassis slots that do not have either a module or power supply installed.
  - Disconnect the power cord(s) from all power sources to completely remove power from the device.
  - Never leave tools inside the Routing Switch.
  - When installing or removing a power supply, disconnect the power cord(s) from all power sources to completely remove power from the device.
  - Before connecting Category 5 or better UTP copper networking cables to a chassis module on the 9300 series, use the CESD grounding tap (shipped with the 9304M and 9308M and with chassis modules designed for UTP copper networking cables). See the *Cable Grounding Instructions* included with the CESD grounding tap. If you did not receive a CESD grounding tap kit (HP part number 5064-9974) with the above HP products, you can request one without charge from your HP Customer Care Center (CCC). To contact the CCC for your area, see the support and warranty booklet (*Support is as Close as the World Wide Web!*) shipped with your HP product. CCCs are also listed in the *HP ProCurve Networking Service and Support Guide* available at <http://www.procurve.com>. (Click on **Technical Support**, then **Support Services**.)
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## Preparing the Installation Site

### Cabling Infrastructure

Ensure that the proper cabling is installed in the site. Refer to the *Quick Start Guide* for a summary of supported cabling types and their specifications.

### Installation Location

Before installing the device, plan its location and orientation relative to other devices and equipment. Allow at least three inches (3") of space at the front of the device for the twisted-pair, fiber-optic and power cabling. Also, a minimum of three inches (3") of space should be allowed between the sides and the back of the device and walls or other obstructions.

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**NOTE:** Use at least two separate branch circuits for the power. This provides redundancy in case one of the circuits fails.

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## Installing (or Removing) Optional Modules

### Installing Modules

To install a module in the chassis, do the following:

1. Put on an ESD wrist strap and attach the copper tape to a metal surface (e.g. an equipment rack) to act as ground.

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**WARNING:** To avoid risk of shock, do not attach the copper tape to the air flow panel of the power supply.

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2. Remove the blank face plate from the slot in which the module is to be installed. Place the blank face plate in a safe place for future use.
  3. Remove the module from its packaging.
  4. Insert the module into the chassis slot and glide the card along the card guide until the card ejectors on the front of the module touch the chassis.
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**CAUTION:** To avoid hardware damage during installation, be careful to properly line up the edges of the module board with the guides built into the module slot on the chassis.

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**NOTE:** Modules for the 9308M and 9315M slide in vertically with the module label (e.g. ProCurve 9300) and port number 1 at the top (Figure 2.4). Modules for the 9304M slide in horizontally with the module label (e.g. ProCurve 9300) and port number 1 on the left (Figure 2.5).

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5. Push the ejectors toward the center of the module until they are flush with the front panel of the module. The module will be fully seated in the backplane.
  6. Tighten the two screws at either end of the module.
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**CAUTION:** If one or more of the slots remains unused, make sure that a slot cover plate is still attached over each unused slot for safe operation and proper system cooling.

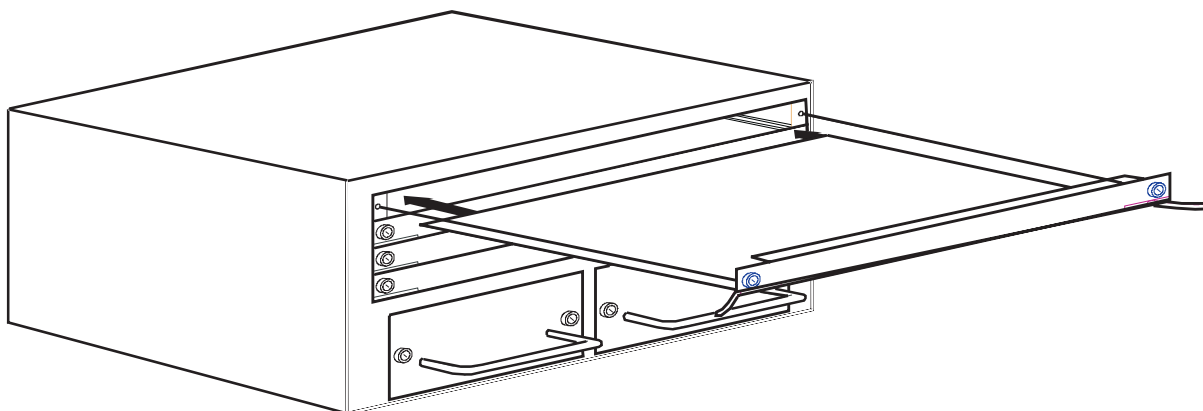
Use the CESD grounding tap (provided by HP) before connecting Category 5 or better UTP copper networking cables.

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**NOTE:** If installing a module into a slot *previously occupied by a different type of module*, you must use the CLI to configure the new module (with the CLI command, **module** <slot-num> <module-type>) and then use the **write memory** command to save the configuration and the **reload** command to reset the Routing Switch. Refer to "Swapping Modules" on page 2-33. If the slot has never contained a module or you are swapping in exactly the same type of module, you do not need to enter these commands.

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**Figure 2.1** Installing a Module



## Removing Modules

To remove a module from the chassis, do the following:

1. Put on an ESD wrist strap and attach the copper tape to a metal surface (e.g. an equipment rack) to act as ground.

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**WARNING:** To avoid risk of shock, do not attach the copper tape to the air flow panel of the power supply.

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2. Loosen the two screws on the module.
  3. Pull the card ejectors towards you, and away from the module front panel. The card will unseat from the backplane.
  4. Pull the module out of the chassis and place in an anti-static bag for storage.
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5. Cover the slot with the blank face plate that shipped with the chassis.

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**CAUTION:** If you remove a module and do not replace it, cover the slot opening with one of the blank plates you received with the Routing Switch to provide additional safety and airflow for the system.

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**NOTE:** Modules can be installed and removed when the unit is powered on (hot swap). There is no need to power the system down. You do not need to change the slot's configuration unless you plan to insert a different type of module. Refer to "Swapping Modules" on page 2-33.

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## Installing and Removing (Optional) Mini-GBICs

This section provides installation information for the following HP ProCurve Mini-GBIC products:

- J4858A ProCurve Gigabit-SX Mini-GBIC or J4858B ProCurve Gigabit-SX Mini-GBIC with an LC connector: Supports multi-mode fiber; LC connector.
- J4859A ProCurve Gigabit-LX Mini-GBIC or J4859B ProCurve Gigabit-LX Mini-GBIC with an LC connector: Supports single-mode and multi-mode fiber; LC connector. Multi-Mode LX supports a shorter distance than single-mode LX.
- J4860A ProCurve Gigabit LH Mini-GBIC or J4860B ProCurve Gigabit-LH with an LC connector: Supports single-mode fiber; LC connector.
- J8177B ProCurve 1000Base-T Mini-GBIC with an RJ-45 connector.

You can install any combination of the above mini-GBICs in the ProCurve 9300 mini-GBIC modules. See "Cable Length" on page 2-21 for cabling information.

### Software Version and Management Module Requirement

All the ProCurve mini-GBICs listed above are supported on the current version of boot code (07.06.05) and software (07.8.00a). However, the J8177B 1000Base-T mini-GBIC is supported only in EP modules.

### Installing or Removing a Mini-GBIC

#### To install a mini-GBIC:

1. Put on an electrostatic discharge (ESD) wrist strap and attach the copper tape to a metal surface (such as an equipment rack) to act as ground.
2. Remove the mini-GBIC from its protective packaging.
3. Gently insert the mini-GBIC into the slot on the front panel of the module until the mini-GBIC clicks into place. The mini-GBICs are keyed to prevent incorrect insertion. A tab on the bottom of the mini-GBIC locks the mini-GBIC to the front panel of the module.
4. Remove the protective covering from the port connectors and store the covering for future use.
5. Insert the interface cable.

#### To remove a mini-GBIC:

1. Put on an ESD wrist strap and attach the copper tape to a metal surface (such as an equipment rack) to act as ground.
2. Disconnect the interface cable from the mini-GBIC.
3. Insert the protective covering into the port connectors.
4. Do one of the following:
  - If the mini-GBIC has a bail, swing the bail out, and then gently pull on it to slide the mini-GBIC out of the module.

- If the mini-GBIC has a movable collar, push the collar in towards the front panel of the routing switch and then gently pull on the mini-GBIC to slide it out of the module.
5. Pull the mini-GBIC out of the module.
  6. Store the mini-GBIC in a safe, static-free place.

## Installation Notes

### 1000Base-SX Ports

The 1000Base-SX mini-GBIC ports operate in full-duplex mode and support multi-mode fiber cabling through LC connectors. A 1000Base-SX mini-GBIC port must be connected to another 1000Base-SX port. Connection to a 1000Base-LX port or a 1000Base-LH port is not supported.

### 1000Base-LX Ports

The 1000Base-LX mini-GBIC ports operate in full-duplex mode and support both single-mode fiber (SMF) and multi-mode fiber (MMF) cabling through LC connectors. A 1000Base-LX mini-GBIC port must be connected to another 1000Base-LX port. Connection to a 1000Base-SX port or a 1000Base-LH port is not supported.

### 1000Base-LH Ports

The 1000Base-LH mini-GBIC ports operate in full-duplex mode and supports single-mode fiber (SMF) cabling through LC connectors. A 1000Base-LH mini-GBIC port must be connected to another 1000Base-LH port. Connection to a 1000Base-LX or 1000Base-SX mini-GBIC port is not supported.

## Software Support for Mini-GBIC Ports

Hewlett-Packard offers and supports only mini-GBICs that include an HP label (product numbers J4858A/B, J4859A/B, J4860A/B, and J8177B) for use with ProCurve 9300 Mini-GBIC Module. Use of other brands of mini-GBICs or the use of HP mini-GBICs in non-HP devices is not supported.

## Removing and Installing XENPAK Optics

You can remove a XENPAK optic from a 10 Gigabit Ethernet module and replace it with a new one while the HP device is powered on and running.

Before performing either of these tasks, have the following on hand:

- An electrostatic discharge (ESD) wrist strap

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**WARNING:** For safety reasons, the ESD wrist strap provided with your product contains a series limiting resistor. If a replacement ESD strap is used, make certain that it contains a series limiting resistor with at least 1M $\Omega$  of resistance. Also, make certain the strap is not connected to any internal part of your ProCurve chassis.

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- The protective covering that you removed from the port connectors when you initially installed the XENPAK optic
- The new XENPAK optic (if you are installing one)
- A small flathead screwdriver

## Removing a XENPAK Optic

To remove a XENPAK optic from a 10 Gigabit Ethernet module, do the following:

1. Put on the ESD wrist strap and attach the copper tape to a metal surface (such as an equipment rack) to act as ground.
2. Disconnect the two fiber cable connectors from the port connectors.
3. Insert the protective covering into the port connectors.

4. Using the flathead screwdriver if necessary, loosen the two thumbscrews on the ends of the XENPAK optic.
5. Pull the XENPAK optic out of the port, and place it in an anti-static bag for storage if desired.

### Installing a XENPAK Optic

To install a XENPAK optic in a 10 Gigabit Ethernet module, do the following:

1. Put on the ESD wrist strap and attach the copper tape to a metal surface (such as an equipment rack) to act as ground.
2. Remove the new XENPAK optic from its protective packaging.
3. Gently insert the the XENPAK optic into the module until it clicks into place. The XENPAK optics are keyed to prevent incorrect insertion.

Secure the XENPAK optic by tightening the two thumb-screws. If desired, you can further tighten the thumb-screws using the flathead screwdriver.

### Software Support for XENPAK Optics

Hewlett-Packard offers and supports only XENPAK optics that include an HP label (product number J8173A, J8175A, or J8176A) for use with the J8174A HP ProCurve 9300 XENPAK module. Use of other brands of optics or the use of HP-labeled XENPAK optics in non-HP device is not supported.

## Cleaning the Fiber Optic Connectors

To avoid problems with the connection between the fiber-optic module connectors and the fiber cable connectors, HP strongly recommends cleaning both connectors each time you disconnect and reconnect them. In particular, dust can accumulate in the connectors and cause problems such as reducing the optic launch power.

To clean the fiber cable connectors, HP recommends using a fiber-optic reel-type cleaner. You can purchase this type of cleaner from the following Web site:

[http://www.fisfiber.com/fisfiber.com/Home\\_Page.asp](http://www.fisfiber.com/fisfiber.com/Home_Page.asp)

To clean the fiber-optic module connectors, HP recommends using a product that dispenses dust-free air, such as Micro-Blast. You can purchase such a product from the following Web site:

<http://www.microcare.com/product/solvents/PS-50.html>.

When cleaning a fiber-optic module connector, do not use unfiltered air from an air compressor, cotton swabs, or other types of swab applicators. These types of products may leave lint or dust in the connector.

Also, when not using a fiber-optic module connector, make sure to keep the protective covering on.

## Installing (or Removing) Redundant Power Supplies

### Determining Power Supply Status

If you are replacing a power supply that has failed and you are not sure which supply has failed, enter the following command at any CLI command prompt:

```
ProCurveRS# show chassis
```



This command displays status information for the fans and the power supplies. The power supplies are numbered in the display. The power supply numbers correspond to the following positions. These positions assume you are facing the front of the chassis, not the rear.

**Table 2.1: Power Supply Positions in HP ProCurve 9300 Devices**

Product	Power Supply 1 Position	Power Supply 2 Position	Power Supply 3 Position	Power Supply 4 Position
9304M	left side	right side	n/a	n/a
9308M	bottom	second from bottom	second from top	top
9315M	left side	second left	second right	right side

## Installing Power Supplies

To install a power supply in the chassis, do the following:

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**CAUTION:** Install the J4147A Power Supply only in the 9308M (J4138A) and 9304M (J4139A) Routing Switch chassis. Install the J4875A Power Supply only in the 9315M (J4875A) Routing Switch. The J4147A and J4875A Power Supplies are not interchangeable.

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**CAUTION:** Power supplies are hot swappable but they should be disconnected from AC power before being installed or removed. That is, the Routing Switch can be running while a power supply is being installed or removed, but the power supply itself *should not be connected* to a power source. Otherwise, damage to the power supply or the Routing Switch could result.

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1. Use a screwdriver to remove the blank power supply face plate. This will expose the empty power supply slot.
2. Remove the power supply from its packaging; or, if the power supply is connected to a power source, remove the power cable.
3. Holding the bar on the front panel of the power supply, insert the power supply into the empty power supply slot using the module guides provided on either side of the compartment.

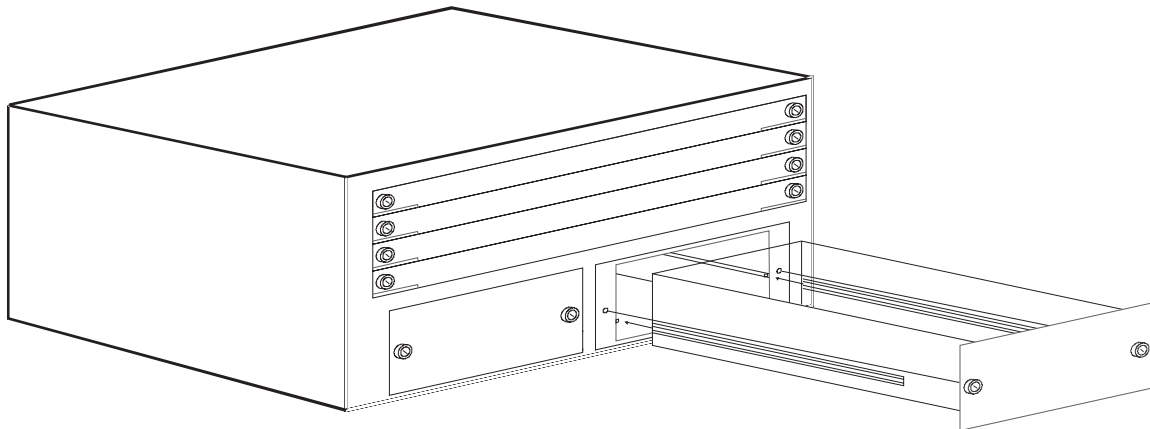
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**CAUTION:** Carefully follow the mechanical guides on each side of the power supply slot and make sure the power supply is properly inserted in the guides. Never insert the power supply upside down.

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4. Continue to slide the power supply towards the back of the chassis until the two metal rods and the connector make contact with the back connector. Then push the power supply until the front panel of the power supply is flush with the rest of the chassis.
5. Use a screwdriver to tighten the two screws on either side of the power supply.
6. Connect the power cord to the front of the power supply.
7. Connect the power plug into an outlet.

**Figure 2.2** Installing a Power Supply



## Removing Power Supplies

To remove a power supply module from the chassis, do the following:

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**CAUTION:** Power supplies are hot swappable but they should be disconnected from AC power before being installed or removed. That is, the Routing Switch can be running while a power supply is being installed or removed, but the power supply itself *should not be connected* to a power source. Otherwise, damage to the power supply or the Routing Switch could result.

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1. Unplug the power supply AC power cord from the outlet.
2. Disconnect the power cord from the power supply.
3. Use a screwdriver to loosen the screws on either side of the power supply.
4. Holding the bar on the front panel of the power supply, pull outward, disconnecting the power supply from the backplane.
5. Continue to pull the power supply until it is removed from the chassis.
6. Place the power supply in an anti-static bag for storage.
7. Cover the power supply slot with the blank power supply cover that came with the device.
8. Use a screwdriver to tighten the screws.

Figure 2.3 Example of the front panel of an 9315M Routing Switch

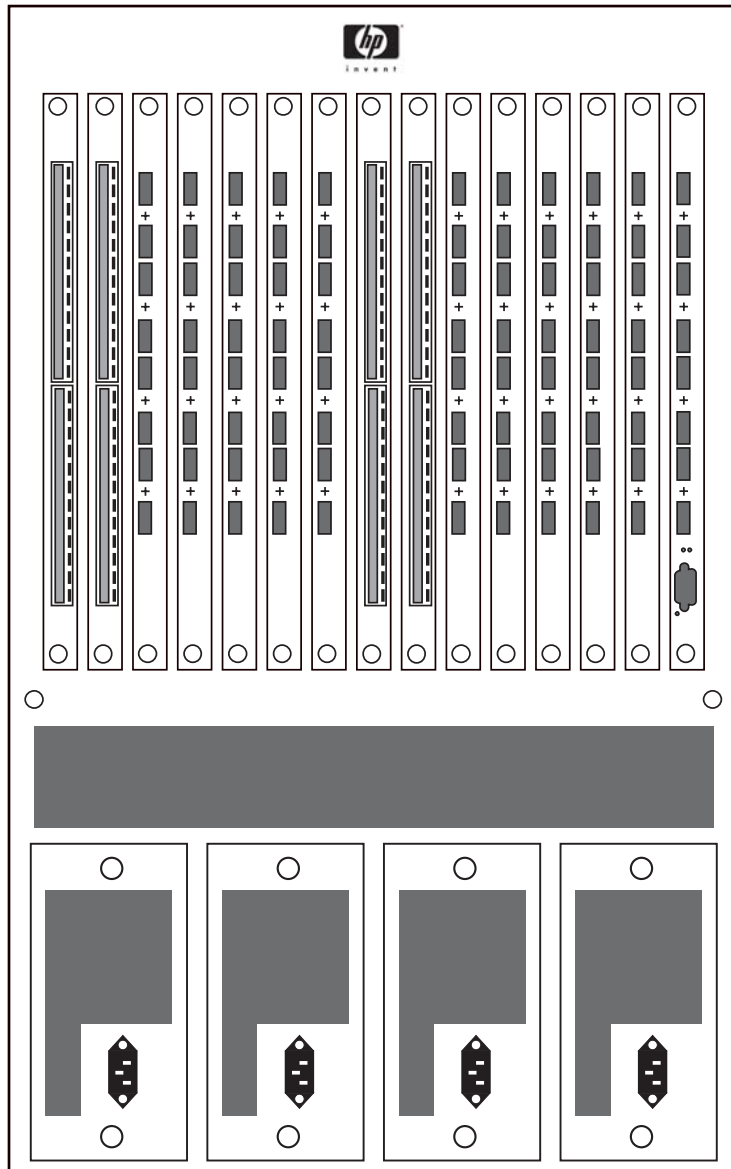


Figure 2.4 Example of the front panel of an 9308M Routing Switch

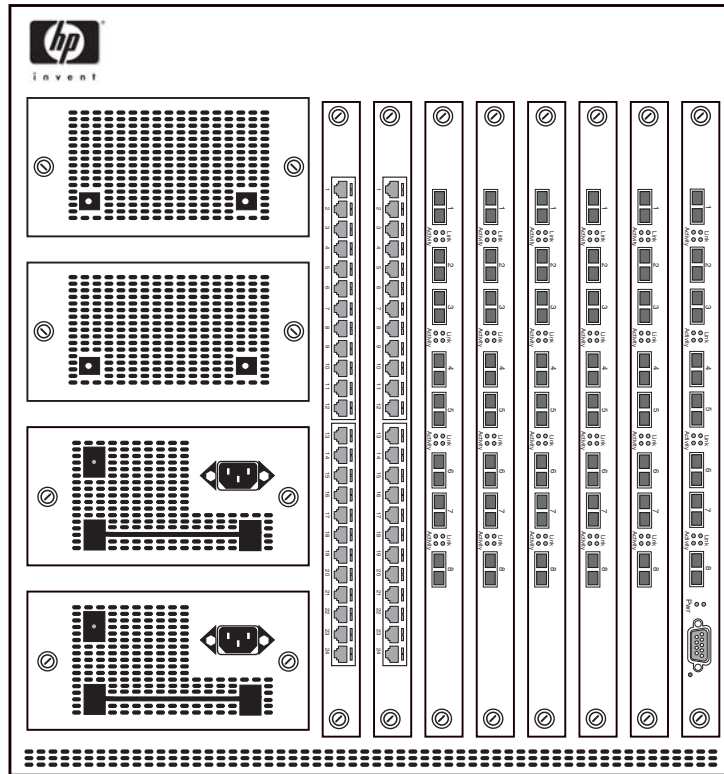
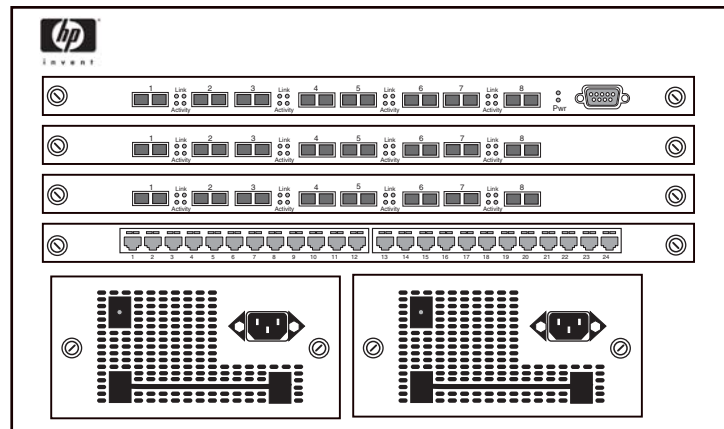


Figure 2.5 Example of the front panel of an 9304M Routing Switch



## Verifying Proper Operation

After you have installed any modules or redundant power supplies, but before mounting the routing switch in its network location, you should first verify that it is working properly by plugging it into a power source and verifying that it passes its self test.

**NOTE:** If your device has more than one power supply installed, repeat this procedure for each power supply.

1. Connect the power cord supplied with the device to the power connector found on the power supply on the front of the device.

2. Insert the other end into a properly grounded electrical outlet.

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**NOTE:** The devices do not have power switches. They are powered on when the power cord is connected to the device and to a power source.

If your installation requires a different power cord than that supplied with the device, be sure to obtain 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 device.

3. Verify proper operation by observing the LEDs. Make sure the LED on each power supply is a solid green. Also make sure that some of the port LEDs on each module momentarily light up. The LEDs indicate that the device is performing diagnostics. After the diagnostics are complete, the LEDs will be dark except for the ones that are attached by cables to other devices. If the links on these cables are good and the connected device is powered on, the link LEDs will light.

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**NOTE:** If all of the LEDs on a module do not light up during the diagnostics, this does not indicate an error. Only some of the LEDs are lighted during the diagnostics.

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For more details on specific LED conditions after system start-up, refer to the *Quick Start Guide*.

## Attaching a PC or Terminal

To assign an IP address, you must have access to the Command Line Interface (CLI). The CLI is a text-based interface that can be accessed through a direct serial connection to the device and through Telnet connections. The CLI is described in detail in the *Command Line Interface Reference for ProCurve 9300/9400 Series Routing Switches*.

You need to assign a permanent IP address using the CLI. You can access the CLI by attaching a serial cable to the Console port. After you assign an IP address, you can access the system through Telnet or the Web management interface.

### Attaching a PC or Terminal Using a Serial Port

**To attach a management station using the serial port:**

1. Connect a PC or terminal to the serial port of the system via the (serial) console cable. The serial port is a male DB-9 connector. Generally, a PC port will require a cable with a female DB-9 connector. Terminal connections will vary, requiring either a DB-9 or DB-25 connector, male or female.

A console cable is provided with your Routing Switch. Cable pin-outs and signalling for the serial port are shown in Figure 2.6 and Figure 2.7.

2. If you are using a PC for a terminal, run a terminal emulation program on the PC.
3. Set the terminal or PC terminal emulation program to the parameters shown below:
  - Baud: 9600 bps
  - Data bits: 8
  - Parity: None
  - Stop bits: 1
  - Flow control: None

### Attaching a PC or Terminal Using a Direct LAN Connection

To attach a management station using a direct LAN connection:

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**NOTE:** Use this procedure if you are unable to make the serial connection described above.

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### Important! Cable Grounding Instructions

HP provides a cable-grounding kit for use with 9304M/9308M/9315M chassis modules designed for UTP copper networking cable connections. Use this grounding kit to help prevent ESD damage to your Routing Switch components when connecting cables to the modules.

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**CAUTION:** Before connecting Category 5 or better UTP copper networking cables to a chassis module on the 9300 series, use the CESD grounding tap (shipped with the 9304M/9308M/9315M and with chassis modules designed for UTP copper networking cables). See the *Cable Grounding Instructions* included with the CESD grounding tap. If you did not receive a CESD grounding tap kit (HP part number 5064-9974) with the above HP products, you can request one without charge from your HP Customer Care Center (CCC). To contact the CCC for your area, see the support and warranty booklet (*Support is as Close as the World Wide Web!*) shipped with your HP product. CCCs are also listed in the *HP ProCurve Networking Service and Support Guide* available at <http://www.procurve.com>. (Click on **Technical Support**, then **Support Services**.)

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1. Directly connect the LAN port on a Telnet-capable terminal device such as a laptop or desktop PC to port 1 in slot 1.
2. Configure the terminal device with an IP address and subnet mask that assigns the terminal to the same subnet as the Routing Switch's IP address for port 1, slot 1.
3. From the DOS prompt, enter **telnet** <ip-addr> to access the Routing Switch CLI, where <ip-addr> is the IP address for the Routing Switch port.

When you establish the serial connection to the device, press Enter to display the CLI prompt for your Routing Switch. For example:

```
HP9304>
```

```
HP9308>
```

```
HP9315>
```

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**NOTE:** For simplicity, CLI examples for the routing switches generally show the command prompt "HP9300". This command prompt represents either the 9300 series unless otherwise noted.

---

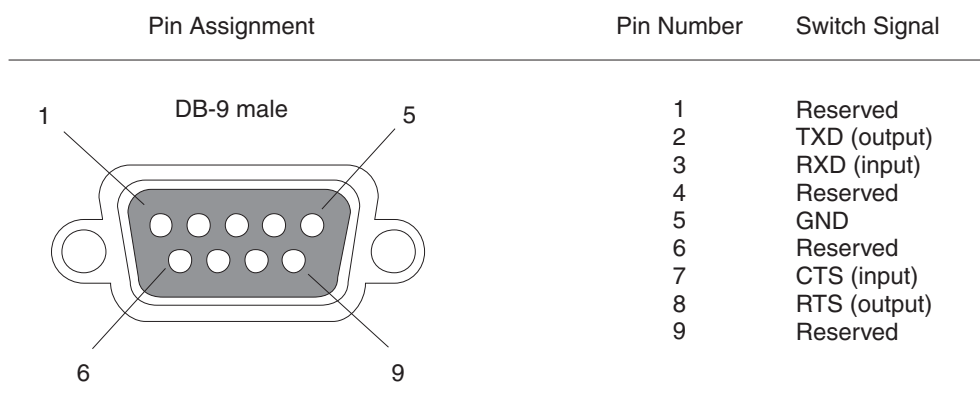
If you see one of these prompts, you are now connected to the system and can proceed to "Assigning a Permanent Password" on page 2-15.

You can customize the prompt by changing the system name. See "Entering System Administration Information" on page 6-3.

If you do not see one of these prompts:

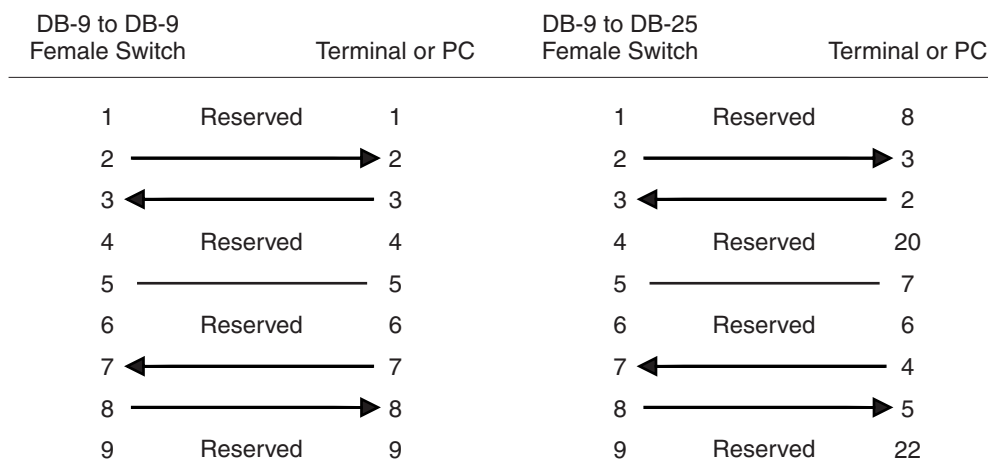
1. Make sure the cable is securely connected to your PC and to the HP device.
2. Check the settings in your terminal emulation program. In addition to the session settings listed above, make sure the terminal emulation session is running on the same serial port you attached to the HP device.

The EIA/TIA 232 serial communication port serves as a connection point for management by a PC or SNMP workstation. ProCurve Routing Switches come with a standard male DB-9 connector, shown in Figure 2.6.

**Figure 2.6** Serial port pin and signalling details

Most PC serial ports also require a cable with a female DB-9 connector. Terminal connections will vary, requiring either a DB-9 or DB-25 connector, male or female. Serial cable options between a ProCurve Routing Switch and a PC terminal are shown in Figure 2.7.

**NOTE:** As indicated in Figure 2.6 and Figure 2.7, some of the wires should not be connected. If you do connect the wires that are labeled “Reserved”, you might get unexpected results with some terminals.

**Figure 2.7** Serial port signal directions

## Assigning a Permanent Password

CLI access does not require a password by default. If you want to configure a password, you must use the CLI. A password cannot be assigned through the Web management interface.

The CLI contains the following access levels:

- **User EXEC level** – The level you enter when you first start a CLI session. At this level, you can view some system information but you cannot configure system or port parameters.
- **Privileged EXEC level** – This level is also called the Enable level and can be secured by a password. You can perform tasks such as manage files on the flash module, save the system configuration to flash, and clear caches at this level.
- **CONFIG level** – The configuration level. This level lets you configure the system’s IP address and configure

switching and routing features. To access the CONFIG mode, you must already be logged into the Privileged level of the EXEC mode.

By default, there are no CLI passwords. To secure CLI access, you must assign passwords.

---

**NOTE:** You must use the CLI to assign a password. You cannot assign a password using the Web management interface or an SNMP network management application.

---

You can set the following levels of Enable passwords:

- Super User – Allows complete read-and-write access to the system. This is generally for system administrators and is the only password level that allows you to configure passwords. *You must set a super user password before you can set other types of passwords.*
- Port Configuration – Allows read-and-write access for specific ports but not for global (system-wide) parameters.
- Read Only – Allows access to the Privileged EXEC mode and CONFIG mode but only with read access.

## How To Assign a Password

When you first connect to the CLI, you are at the User EXEC level of the CLI. This is the first level of the CLI. The next level is the Privileged EXEC level. You need to get to the global CONFIG level of the CONFIG command structure to assign a permanent password.

To reach the global CONFIG level and assign passwords, use the following steps:

1. At the opening prompt, enter the following command to go from the User EXEC level to the Privileged EXEC level:

```
ProCurveRS> enable
```

2. Access the configuration level of the CLI by entering the following command:

```
ProCurveRS# configure terminal          Privileged EXEC Level
ProCurveRS(config)#                    Global CONFIG Level
```

3. To set the super-user password:

```
ProCurveRS(config)# enable super-user-password <string>
```

---

**NOTE:** You must set a super-user password before you can set other types of passwords.

---

4. To set the port-configuration and read-only passwords:

```
ProCurveRS(config)# enable read-only-password <string>
ProCurveRS(config)# enable port-config-password <string>
```

## How to Recover From a Lost Password

Recovery from a lost password requires direct access to the serial port and a system reset of the device.

---

**NOTE:** You can perform this procedure only from the CLI.

---

To recover from a lost password:

1. Start a CLI session over the serial interface to the device.
2. Reboot the device.
3. While the system is booting, before the initial system prompt appears, enter **b** to enter the boot monitor mode.
4. Enter **no password** at the prompt. This command cannot be abbreviated. This command will cause the device to bypass the system password check.



5. Enter **boot system flash primary**.
6. After the console prompt reappears, assign a new password.

## Assign a Permanent IP Address

Before attaching a ProCurve Routing Switch to your network, you must assign an interface IP address to the subnet on which the Routing Switch will be located. For subsequent addresses, you also can use the CLI through Telnet or use the Web management interface.

Using a serial connection is the recommended method for assigning the first IP address on a Routing Switch. (You also can use Telnet with a direct, terminal-to-device LAN connection if necessary—see “Attaching a PC or Terminal Using a Direct LAN Connection” on page 2-13.)

On the 9300 series, you can configure up to 24 IP interfaces on each port, virtual interface, and loopback interface. See “Displaying and Modifying System Parameter Default Settings” on page 6-43.

The following procedure shows how to add an IP address and mask to a Routing Switch port.

1. At the opening CLI prompt, enter **enable**.  

```
ProCurveRS> enable
```
2. If you are prompted for the password you created in “Assigning a Permanent Password” on page 2-15, enter the password.

---

**CAUTION:** Use Step 3 only for new systems. If you enter this command on a system you have already configured, the command erases the configuration. If you accidentally do erase the configuration on a configured system, enter the **write memory** command to save the running configuration to the startup-config file.

---

3. For new systems only, enter the following command at the Privileged EXEC level prompt (for example, ProCurveRS#), then press Enter. This command erases the factory test configuration if still present:

```
ProCurveRS# erase startup-config
```

4. Access the configuration level of the CLI by entering the following command:

```
ProCurveRS# configure terminal           Privileged EXEC Level
ProCurveRS(config)#                     Global CONFIG Level
```

5. Set the IP and mask addresses.

```
ProCurveRS(config)# int e 1/5
ProCurveRS(config-if-1/5)# ip address 192.22.3.44 255.255.255.0
```

---

**NOTE:** You can use the syntax, **ip address** <ip-addr> /<mask-bits> if you know the subnet mask length. In the above example, you could enter **ip address 192.22.3.44/24**.

---

**Syntax:** enable [<password>]

**Syntax:** configure terminal

**Syntax:** [no] ip address <ip-addr> <ip-mask> [secondary]

or

**Syntax:** [no] ip address <ip-addr>/<mask-bits> [secondary]

Use the **secondary** parameter if you have already configured an IP address within the same subnet on the interface.

## Mounting the Device

The ProCurve Routing Switches can be installed on a desktop or in a rack.

---

**WARNING:** The 9304M chassis exceeds 40 lbs. (18 kg), or 47.7 lbs.(21.6 kg) when fully populated with modules and power supplies. Also, the 9308M chassis exceeds 55 lbs. (24.9 kg) or 69.1 lbs. (31.3 kg) when fully populated with modules and power supplies. **TWO OR MORE PEOPLE ARE REQUIRED WHEN LIFTING, HANDLING, OR MOUNTING THESE ROUTING SWITCHES.**

---

---

**WARNING:** The 9315M chassis exceeds 80 lbs (35 kg.) without modules and power supplies installed. To avoid personal injury, reduce weight of chassis by removing all modules and power supplies from chassis prior to lifting or moving. **TWO OR MORE PEOPLE ARE REQUIRED WHEN LIFTING, HANDLING, OR MOUNTING THIS ROUTING SWITCH.**

---

---

**WARNING:** Do not lift the 15-slot chassis using the lifting handles unless the chassis is empty. **TO REDUCE WEIGHT, REMOVE THE POWER SUPPLIES AND INTERFACE MODULES BEFORE LIFTING THE CHASSIS.**

---

---

**WARNING:** Do not use the extraction handles on the power supply units to lift or carry the Routing Switch. The power supply extraction handles are not intended to support the weight of the system and must never be used to lift or move the chassis.

---

---

**WARNING:** Make sure the rack or cabinet housing the Routing Switch is adequately secured to prevent it from becoming unstable and/or falling over.

---

---

**WARNING:** To increase rack stability, mount the devices you install in a rack or cabinet as low as possible, with the heaviest device at the bottom and progressively lighter devices installed above.

---

### Desktop Installation

1. Set the device on a flat desktop, table, or shelf. Use a sturdy surface in an uncluttered area. You may want to secure the networking cables and power cord to the table legs or other part of the surface structure to help prevent people from tripping over them.
2. Make sure that adequate ventilation is provided for the system—a minimum of three inches (3") clearance is recommended on all sides.

---

**NOTE:** Make sure the air flow is unrestricted around the front, sides, and back of the Routing Switch.


---

3. Proceed to “Connecting Power to the Device” on page 2-20.

## Rack Mount Installation

**NOTE:** You need a #2 Phillips-head screwdriver for installation.

# ! WARNING



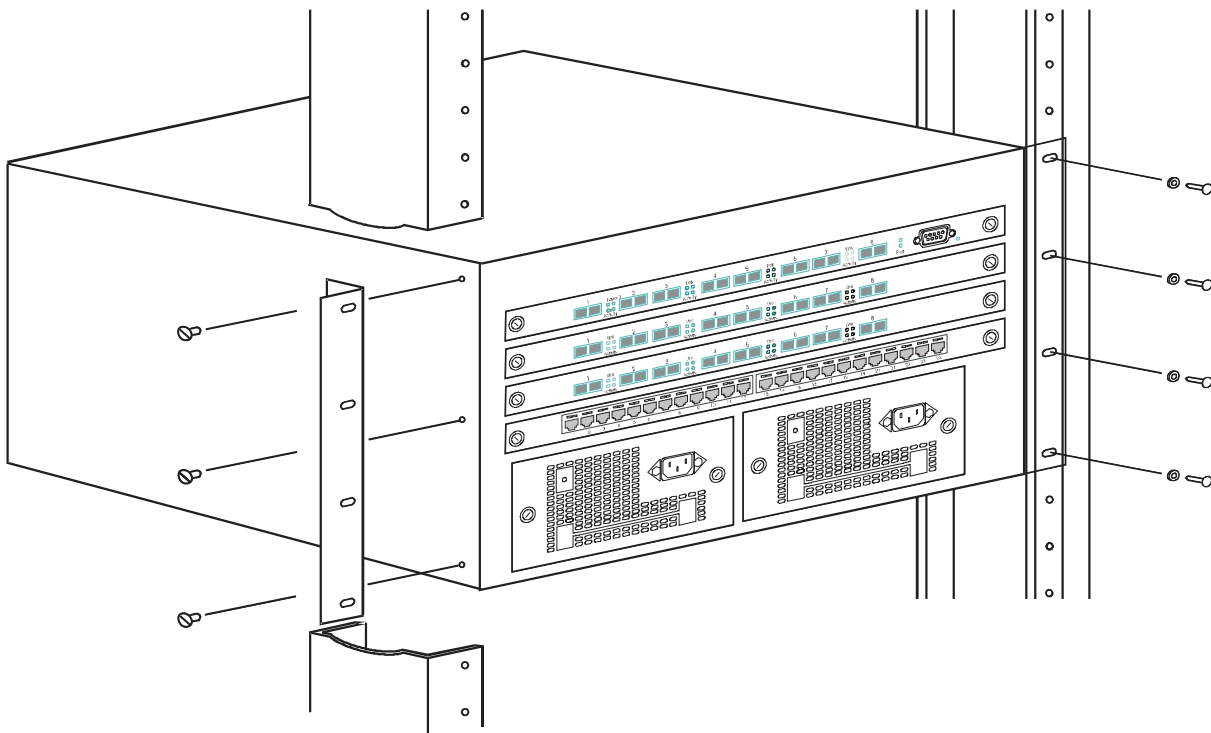
**9304M Exceeds 40 lbs. (18.1 kg)**  
**9308M Exceeds 55 lbs. (24.9 kg)**

**9315M Exceeds 80 lbs. (35 kg) without modules and power supplies installed. To avoid personal injury, reduce weight of chassis by removing all modules and power supplies from chassis prior to lifting or moving.**

**When handling, two or more people are required.**

1. Remove the rack mount kit from the shipping carton. There will be two L-shaped mounting brackets and mounting screws.
2. Attach the mounting brackets to the sides of the routing switch as illustrated in Figure 2.8.
3. Attach the system in the rack as illustrated in Figure 2.8.
4. Proceed to "Connecting Power to the Device" on page 2-20.

**Figure 2.8** Installing an 9304M Routing Switch in a rack mount



## Connecting Power to the Device

With physical installation of the Routing Switch complete, it is now time to power up the system and connect the network devices.

---

### CAUTION:

- There is no separate on/off power switch for the device. The device is powered on when the power cord is connected to a power supply and to a power source. To turn the system off, simply unplug the power cord(s).
  - The power sockets should be installed near the device and should be easily accessible.
  - If your installation requires a different power cord than the one supplied with the device, 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 system.
  - For additional warnings and cautions, refer to the "Installation Precautions" on page 2-3.
- 

**NOTE:** When you power on a Routing Switch that requires multiple power supplies, make sure you apply power to all the supplies (or at least the minimum number of supplies required for your configuration) at the same time. Otherwise, the device either will not boot at all, or will boot and then repeatedly display a warning message stating that you need to add more power supplies.

---

1. Ensure that all modules and power supplies are properly inserted, and that no module slots or power supply slots are uncovered.

---

**WARNING:** Electrical shock hazard. Never allow any part of your body to be inside the chassis when the device is connected to a power source or to the network.

---

2. Remove the power cord from the shipping package.
3. Attach the AC power cord to the AC connector on the front panel of the Routing Switch. If more than one power supply is installed, attach a power cord for each power supply.
4. Insert the power cord plug(s) into the appropriate outlet(s).

## Connecting Network Devices

ProCurve Routing Switches can support connections to other vendors' Routing Switches and hubs as well as to other ProCurve Routing Switches and hubs.

### Important! Cable Grounding Instructions

HP provides a cable-grounding kit for use with 9300 series chassis modules designed for UTP copper networking cable connections. Use this grounding kit to help prevent ESD damage to your Routing Switch components when connecting cables to the modules.

---

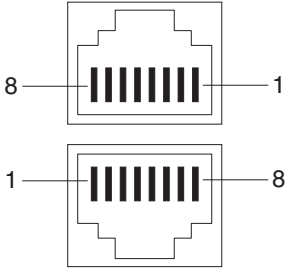
**CAUTION:** Before connecting Category 5 or better UTP copper networking cables to a chassis module on the 9304M or 9308M, use the CESD grounding tap (shipped with the 9300 series and with chassis modules designed for UTP copper networking cables). See the *Cable Grounding Instructions* included with the CESD grounding tap. If you did not receive a CESD grounding tap kit (HP part number 5064-9974) with the above HP products, you can request one without charge from your HP Customer Care Center (CCC). To contact the CCC for your area, see the support and warranty booklet (*Support is as Close as the World Wide Web!*) shipped with your HP product. CCCs are also listed in the *HP ProCurve Networking Service and Support Guide* available at <http://www.hp.com/go/hpprocurve>. (Click on **Technical Support**, then **Support Services**.)

---

## Connectors

- 10/100BaseTX ports come with RJ45 jacks for standard unshielded twisted pair (UTP/Category 5) cable connections.
- 100BaseFX ports come equipped with MT-RJ connectors.
- 1000BaseSX ports come equipped with SC connectors.
- 1000BaseLX ports come equipped with SC connectors.
- 1000BaseT ports come equipped with RJ-45 connectors.

**Figure 2.9 Pin assignment and signalling for 10/100BaseTX and 1000BaseT ports**

Pin Assignment	10BaseT		100BaseTX and 1000BaseT	
	Pin Number	MDI-X ports	Pin Number	MDI-X ports
	1	RD+	1	RD+
	2	RD-	2	RD-
	3	TD+	3	TD+
	4	Not used	4	CMT
	5	Not used	5	CMT
	6	TD-	6	TD-
	7	Not used	7	CMT
	8	Not used	8	CMT

## Cable Length

- 1000BaseT: Cable length should not exceed 100 meters.
- 100BaseTX: Cable length should not exceed 100 meters.
- 100BaseFX: Cable length should not exceed 2 kilometers.
- 1000BaseSX: Cable length should not exceed 550 meters when operating with multi-mode cabling.
- 1000BaseLX:
  - Cable length of 2 – 440 meters is supported on 62.5  $\mu\text{m}$  multi-mode fiber (MMF) cabling.
  - Cable length of 2 – 550 meters is supported on 50  $\mu\text{m}$  multi-mode fiber (MMF) cabling.
  - Cable length of 2 – 5000 meters is supported on 9  $\mu\text{m}$  single-mode fiber (SMF) cabling.

**Table 2.2: Cable length summary table**

	Fiber Type	Core Diameter (microns)	Modal Bandwidth (MHz/km)	Minimum Range (meters)
1000BaseSX	MMF	62.5	160	2 – 200 <sup>a</sup>
	MMF	62.5	200	2 – 275 <sup>b</sup>
	MMF	50	400	2 – 500
	MMF	50	500	2 – 550 <sup>c</sup>

**Table 2.2: Cable length summary table**

	Fiber Type	Core Diameter (microns)	Modal Bandwidth (MHz/km)	Minimum Range (meters)
1000BaseLX	MMF	62.5	500	2 – 550
	MMF	50	400	2 – 550
	MMF	50	500	2 – 550
	SMF	9	n/a	2 – 5000

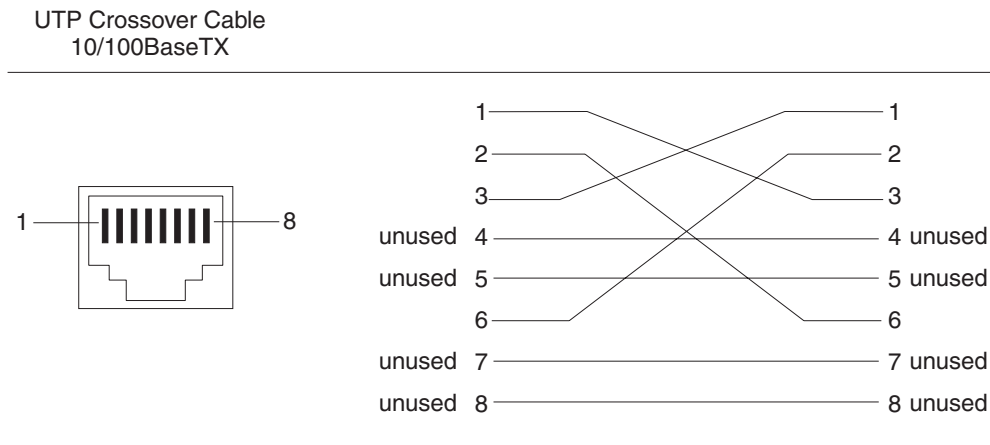
- a. The TIA 568 building wiring standard specifies 160/500 MHz/km MMF (Multi-mode Fiber).
- b. The international ISO/IEC 11801 building wiring standard specifies 200/500 MHz\*km MMF.
- c. The ANSI Fibre Channel specification specifies 500/500 MHz/km 50 micron MMF and 500/500 MHz\*km fiber has been proposed for addition to ISO/IEC 11801.

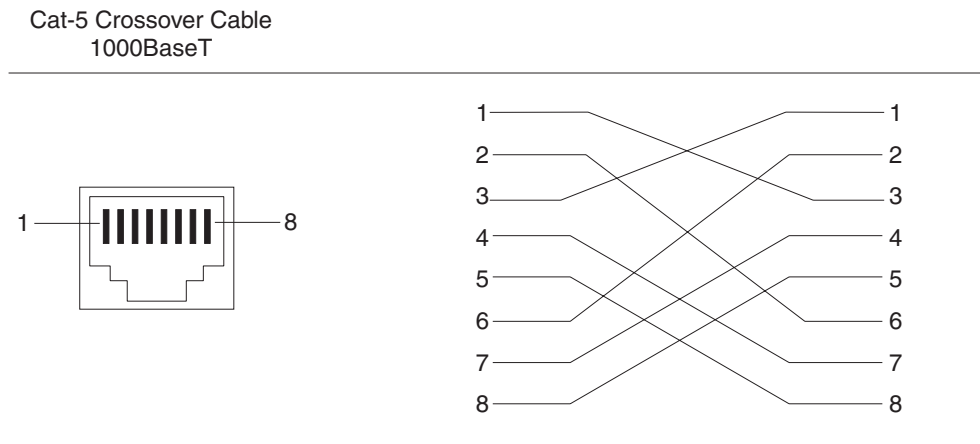
**NOTE:** Cable installation and network configuration will affect overall transmission capability. The numbers provided above represent the accepted recommendations of the various standards. For network-specific recommendations, consult your local HP reseller or system engineer.

### Connecting to Other Switches, Routing Switches, and Ethernet Hubs

For connections to Ethernet hubs, a 10/100BaseTX or 1000BaseT switch, or another ProCurve Routing Switch, a crossover cable is required (Figure 2.10 or Figure 2.11). If the hub is equipped with an uplink port, it will require a straight-through cable instead of a crossover cable.

**Figure 2.10 UTP crossover cable for 10/100BaseTX**



**Figure 2.11 UTP crossover cable for 1000BaseT**

**NOTE:** The 802.3ab standard calls for automatic negotiation of the connection between two 1000BaseT ports. Consequently, a crossover cable may not be required; a straight-through cable may work as well.

## Connecting to Workstations, Servers or Routing Switches

Straight-through UTP cabling is required for direct UTP attachment to workstations, servers, or Routing Switches via network interface cards (NICs).

Fiber cabling with SC connectors is required for direct attachment to Gigabit NICs and Routing Switches.

## Troubleshooting Network Connections

- For the indicated port, verify that both ends of the cabling, at the Routing Switch and the connected device, are snug.
- Verify the connected device and the Routing Switch are both powered on and operating correctly.
- Verify that you have used the correct cable type for the connection:
  - For twisted-pair connections to an end node, use straight-through cabling.
  - For fiber-optic connections, verify that the transmit port on the Routing Switch is connected to the receive port on the connected device, and that the receive port on Routing Switch is connected to the transmit port on the connected device.
- Verify that the port has not been disabled through a configuration change. You can use the CLI or if you have configured an IP address on the Routing Switch, you can use the Web management interface.
- If the other procedures don't resolve the problem, try using a different port or a different cable.

## Verifying Proper Connections

After you install the network cables, you can test network connectivity to other devices by pinging those devices. You also can perform trace routes.

### Pinging an IP Address

To verify that an HP device can reach another device through the network, enter a command such as the following at any level of the CLI on the HP device:

```
ProCurveRS> ping 192.33.4.7
```

**Syntax:** ping <ip addr> | <hostname> [source <ip addr>] [count <num>] [timeout <msec>] [ttl <num>] [size <byte>] [quiet] [numeric] [no-fragment] [verify] [data <1-to-4 byte hex>] [brief]

See the *Command Line Interface Reference for ProCurve 9300/9400 Series Routing Switches* for information about its parameters.

---

**NOTE:** If you address the ping to the IP broadcast address, the device lists the first four responses to the ping.

---

## Tracing a Route

To determine the path through which an HP device can reach another device, enter a command such as the following at any level of the CLI on the HP device:

```
ProCurveRS> traceroute 192.33.4.7
```

**Syntax:** traceroute <host-ip-addr> [maxttl <value>] [minttl <value>] [numeric] [timeout <value>] [source-ip <ip addr>]

The CLI displays trace route information for each hop as soon as the information is received. Traceroute requests display all responses to a given TTL. In addition, if there are multiple equal-cost routes to the destination, the HP device displays up to three responses by default. See the *Command Line Interface Reference for ProCurve 9300/9400 Series Routing Switches* for information about the command syntax.

## Managing the Device

You can manage an HP device using the following applications:

- Command Line Interface (CLI) – a text-based interface accessible through a direct serial connection or a Telnet session.
- Web management interface – A GUI-based management interface accessible through an HTTP (web browser) connection.
- SNMP network management application – An application such as HP ProCurve Manager for Routing Switches & Hubs or HP OpenView.

## Logging on Through the CLI

Once an IP address is assigned to an interface on the ProCurve Routing Switch, you can access the CLI either through the direct serial connection to the device or through a local or remote Telnet session.

You can initiate a local Telnet or SNMP connection by attaching a straight-through RJ-45 cable to a port and specifying the assigned management station IP address.

The commands in the CLI are organized into the following levels:

- User EXEC level – Lets you display information and perform basic tasks such as pings and traceroutes.
- Privileged EXEC level – Lets you use the same commands as those at the User EXEC level plus configuration commands that do not require saving the changes to the system-config file.
- CONFIG level – Lets you make configuration changes to the device. To save the changes across reboots, you need to save them to the system-config file. The CONFIG level contains sub-levels for individual ports, for VLANs, for routing protocols, and other configuration areas.

---

**NOTE:** By default, any user who can open a serial or Telnet connection to the HP device can access all these CLI levels. To secure access, you can configure Enable passwords or local user accounts, and you can configure the device to use a RADIUS or TACACS/TACACS+ server for authentication. See the *Security Guide for ProCurve 9300/9400 Series Routing Switches*.

---



## On-Line Help

To display a list of available commands or command options, enter “?” or press Tab. If you have not entered part of a command at the command prompt, all the commands supported at the current CLI level are listed. If you enter part of a command, then enter “?” or press Tab, the CLI lists the options you can enter at this point in the command string.

If you enter an invalid command followed by ?, a message appears indicating the command was unrecognized. For example:

```
ProCurveRS(config)# router ip
Unrecognized command
```

## Command Completion

The CLI supports command completion, so you do not need to enter the entire name of a command or option. As long as you enter enough characters of the command or option name to avoid ambiguity with other commands or options, the CLI understands what you are typing.

## Scroll Control

By default, the CLI uses a page mode to paginate displays that are longer than the number of rows in your terminal emulation window. For example, if you display a list of all the commands at the global CONFIG level but your terminal emulation window does not have enough rows to display them all at once, the page mode stops the display and lists your choices for continuing the display.

Here is an example:

```
aaa
all-client
appletalk
arp
boot
some lines omitted for brevity...

ipx
lock-address
logging
mac
--More--, next page: Space, next line: Return key, quit: Control-c
```

The software provides the following scrolling options:

- Press the Space bar to display the next page (one screen at a time).
- Press the Return or Enter key to display the next line (one line at a time).
- Press CTRL + C to cancel the display.

## Line Editing Commands

The CLI supports the following line editing commands. To enter a line-editing command, use the CTRL-key combination for the command by pressing and holding the CTRL key, then pressing the letter associated with the command.

**Table 2.3: CLI Line Editing Commands**

Ctrl-Key Combination	Description
Ctrl-A	Moves to the first character on the command line.
Ctrl-B	Moves the cursor back one character.

**Table 2.3: CLI Line Editing Commands (Continued)**

Ctrl-Key Combination	Description
Ctrl-C	Escapes and terminates command prompts and ongoing tasks (such as lengthy displays), and displays a fresh command prompt.
Ctrl-D	Deletes the character at the cursor.
Ctrl-E	Moves to the end of the current command line.
Ctrl-F	Moves the cursor forward one character.
Ctrl-K	Deletes all characters from the cursor to the end of the command line.
Ctrl-L; Ctrl-R	Repeats the current command line on a new line.
Ctrl-N	Enters the next command line in the history buffer.
Ctrl-P	Enters the previous command line in the history buffer.
Ctrl-U; Ctrl-X	Deletes all characters from the cursor to the beginning of the command line.
Ctrl-W	Deletes the last word you typed.
Ctrl-Z	Moves from any CONFIG level of the CLI to the Privileged EXEC level; at the Privileged EXEC level, moves to the User EXEC level.

For a complete list of CLI commands and syntax information for each command, see the *Command Line Interface Reference for ProCurve 9300/9400 Series Routing Switches*.

## Searching and Filtering Output from CLI Commands

You can filter CLI output from **show** commands and at the --More-- prompt. You can search for individual characters, strings, or construct complex regular expressions to filter the output.

### Searching and Filtering Output from show commands

You can filter output from **show** commands to display lines containing a specified string, lines that do not contain a specified string, or output starting with a line containing a specified string. The search string is a regular expression consisting of a single character or string of characters. You can use special characters to construct complex regular expressions. See “Using Special Characters in Regular Expressions” on page 2-29 for information on special characters used with regular expressions.

#### Displaying Lines Containing a Specified String

The following command filters the output of the **show interface** command for port 3/11 so it displays only lines containing the word “Internet”. This command can be used to display the IP address of the interface.

```
ProCurveRS# show interface e 3/11 | include Internet
  Internet address is 192.168.1.11/24, MTU 1500 bytes, encapsulation ethernet
```

**Syntax:** <show-command> | include <regular-expression>

---

**NOTE:** The vertical bar ( | ) is part of the command.

---

Note that the regular expression specified as the search string is case sensitive. In the example above, a search string of “Internet” would match the line containing the IP address, but a search string of “internet” would not.

### Displaying Lines That Do Not Contain a Specified String

The following command filters the output of the **show who** command so it displays only lines that do not contain the word “closed”. This command can be used to display open connections to the HP device.

```
ProCurveRS# show who | exclude closed
Console connections:
    established
    you are connecting to this session
    2 seconds in idle
Telnet connections (inbound):
  1    established, client ip address 192.168.9.37
      27 seconds in idle
Telnet connection (outbound):
SSH connections:
```

**Syntax:** <show-command> | exclude <regular-expression>

### Displaying Lines Starting with a Specified String

The following command filters the output of the **show who** command so it displays output starting with the first line that contains the word “SSH”. This command can be used to display information about SSH connections to the HP device.

```
ProCurveRS# show who | begin SSH
SSH connections:
  1    established, client ip address 192.168.9.210
      7 seconds in idle
  2    closed
  3    closed
  4    closed
  5    closed
```

**Syntax:** <show-command> | begin <regular-expression>

### Searching and Filtering Output at the --More-- Prompt

The --More-- prompt is displayed when output extends beyond a single page. From this prompt, you can press the Space bar to display the next page, the Return or Enter key to display the next line, or Ctrl-C or Q to cancel the display. In addition, you can search and filter output from this prompt. For example:

```
ProCurveRS# ?
append                Append one file to another
appletalk-ping        Ping AppleTalk node
attrib                Change flash card file attribute
boot                  Boot system from bootp/tftp server/flash image
cd                    Change flash card working slot or current directory
chdir                 Change flash card working slot or current directory
clear                 Clear table/statistics/keys
clock                 Set clock
configure             Enter configuration mode
copy                  Copy between flash, flash card, tftp, config/code
debug                 Enable debugging functions (see also 'undebug')
delete                Delete flash card files
dir                   List flash card files
disable               Disable a module before removing it
enable                Enable a disabled module
erase                  Erase image/configuration from flash
exit                  Exit Privileged mode
fastboot              Select fast-reload option
format                Format flash card
```

```
gignpa          Gigabit processor commands
hd              Display hex dump of flash card file
kill           Kill active CLI session
--More--, next page: Space, next line: Return key, quit: Control-c
```

At the --More-- prompt, you can press the forward slash key (/) and then enter a search string. The HP device displays output starting from the first line that contains the search string, similar to the **begin** option for **show** commands. For example:

```
--More--, next page: Space, next line: Return key, quit: Control-c
/telnet
```

The results of the search are displayed:

```
searching...
telnet          Telnet by name or IP address
temperature    temperature sensor commands
terminal       display syslog
traceroute     TraceRoute to IP node
undebug        Disable debugging functions (see also 'debug')
undeleter      Undelete flash card files
whois          WHOIS lookup
write          Write running configuration to flash or terminal
```

To display lines containing only a specified search string (similar to the **include** option for **show** commands) press the plus sign key (+) at the --More-- prompt and then enter the search string.

```
--More--, next page: Space, next line: Return key, quit: Control-c
+telnet
```

The filtered results are displayed:

```
filtering...
telnet          Telnet by name or IP address
```

To display lines that do not contain a specified search string (similar to the **exclude** option for **show** commands) press the minus sign key (-) at the --More-- prompt and then enter the search string.

```
--More--, next page: Space, next line: Return key, quit: Control-c
-telnet
```

The filtered results are displayed:

```
filtering...
sync-standby   Synchronize active and standby module
temperature    temperature sensor commands
terminal       display syslog
traceroute     TraceRoute to IP node
undebug        Disable debugging functions (see also 'debug')
undeleter      Undelete flash card files
whois          WHOIS lookup
write          Write running configuration to flash or terminal
```

As with the commands for filtering output from **show** commands, the search string is a regular expression consisting of a single character or string of characters. You can use special characters to construct complex regular expressions. See the next section for information on special characters used with regular expressions.

## Using Special Characters in Regular Expressions

You use a regular expression to specify a single character or multiple characters as a search string. In addition, you can include special characters that influence the way the software matches the output against the search string. These special characters are listed in the following table.

**Table 2.4: Special Characters for Regular Expressions**

Character	Operation
.	<p>The period matches on any single character, including a blank space.</p> <p>For example, the following regular expression matches “aaz”, “abz”, “acz”, and so on, but not just “az”:</p> <p>a.z</p>
*	<p>The asterisk matches on zero or more sequential instances of a pattern.</p> <p>For example, the following regular expression matches output that contains the string “abc”, followed by zero or more Xs:</p> <p>abcX*</p>
+	<p>The plus sign matches on one or more sequential instances of a pattern.</p> <p>For example, the following regular expression matches output that contains "de", followed by a sequence of “g”s, such as “deg”, “degg”, “deggg”, and so on:</p> <p>deg+</p>
?	<p>The question mark matches on zero occurrences or one occurrence of a pattern.</p> <p>For example, the following regular expression matches output that contains "dg" or "deg":</p> <p>de?g</p> <p><b>Note:</b> Normally when you type a question mark, the CLI lists the commands or options at that CLI level that begin with the character or string you entered. However, if you enter Ctrl-V and then type a question mark, the question mark is inserted into the command line, allowing you to use it as part of a regular expression.</p>
^	<p>A caret (when not used within brackets) matches on the beginning of an input string.</p> <p>For example, the following regular expression matches output that begins with “deg”:</p> <p>^deg</p>
\$	<p>A dollar sign matches on the end of an input string.</p> <p>For example, the following regular expression matches output that ends with “deg”:</p> <p>deg\$</p>

**Table 2.4: Special Characters for Regular Expressions (Continued)**

Character	Operation
_	<p>An underscore matches on one or more of the following:</p> <ul style="list-style-type: none"> <li>• , (comma)</li> <li>• { (left curly brace)</li> <li>• } (right curly brace)</li> <li>• ( (left parenthesis)</li> <li>• ) (right parenthesis)</li> <li>• The beginning of the input string</li> <li>• The end of the input string</li> <li>• A blank space</li> </ul> <p>For example, the following regular expression matches on "100" but not on "1002", "2100", and so on.</p> <p><code>_100_</code></p>
[ ]	<p>Square brackets enclose a range of single-character patterns.</p> <p>For example, the following regular expression matches output that contains "1", "2", "3", "4", or "5":</p> <p><code>[1-5]</code></p> <p>You can use the following expression symbols within the brackets. These symbols are allowed only inside the brackets.</p> <ul style="list-style-type: none"> <li>• ^ – The caret matches on any characters <b>except</b> the ones in the brackets. For example, the following regular expression matches output that does <b>not</b> contain "1", "2", "3", "4", or "5":</li> </ul> <p><code>[^1-5]</code></p> <ul style="list-style-type: none"> <li>• - The hyphen separates the beginning and ending of a range of characters. A match occurs if any of the characters within the range is present. See the example above.</li> </ul>
	<p>A vertical bar separates two alternative values or sets of values. The output can match one or the other value.</p> <p>For example, the following regular expression matches output that contains either "abc" or "defg":</p> <p><code>abc defg</code></p>
()	<p>Parentheses allow you to create complex expressions.</p> <p>For example, the following complex expression matches on "abc", "abcabc", or "defg", but not on "abcdefgdefg":</p> <p><code>((abc)+) ((defg)?)</code></p>

If you want to filter for a special character instead of using the special character as described in the table above, enter "\ (backslash) in front of the character. For example, to filter on output containing an asterisk, enter the asterisk portion of the regular expression as "\\*".

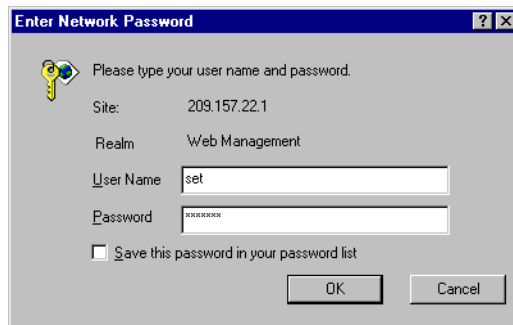
```
ProCurveRS# show ip route bgp | include \*
```

## Logging On Through the Web Management Interface

To use the Web management interface, open a web browser and enter the IP address of the HP device in the Location or Address field. The web browser contacts the HP device and displays a login dialog, as shown in Figure 2.12.

**NOTE:** If you are unable to connect with the Routing Switch through a Web browser due to a proxy problem, it may be necessary to set your Web browser to direct Internet access instead of using a proxy. For information on how to change a proxy setting, refer to the online help provided with your Web browser.

Figure 2.12 Web management interface login dialog



By default, you can use the user name “get” and the default read-only password “public” for read-only access. However, for read-write access, you must enter “set” for the user name, and enter a read-write community string that you have configured on the device for the password. There is no default read-write community string. You must add one. See the *Security Guide for ProCurve 9300/9400 Series Routing Switches*.

As an alternative to using the SNMP community strings to log in, you can configure the device to secure Web management access using local user accounts, a RADIUS authentication server, or a TACACS/TACACS+ server.

On the 9300 series, if you have configured a greeting banner (using the **banner motd** CLI command), a panel with the greeting is displayed first. Click on the Login link to proceed to the Login dialog. Here is an example of the greeting panel:



[Login]

## Using the Web Management Interface

When you log into a device, the System configuration panel is displayed. This panel allows you to enable or disable major system features. You can return to this panel from any other panel by selecting the [Home](#) link.

The [Site Map](#) link gives you a view of all available options on a single screen.

The left pane of the Web management interface window contains a “tree view,” similar to the one found in Windows Explorer. Configuration options are grouped into folders in the tree view. These folders, when expanded, reveal additional options. To expand a folder, click on the plus sign to the left of the folder icon.

You can configure the appearance of the Web management interface by using one of the following methods.

**USING THE CLI**

Using the CLI, you can modify the appearance of the Web management interface with the **web-management** command.

To cause the Web management interface to display the List view by default:

```
ProCurveRS(config)# web-management list-menu
```

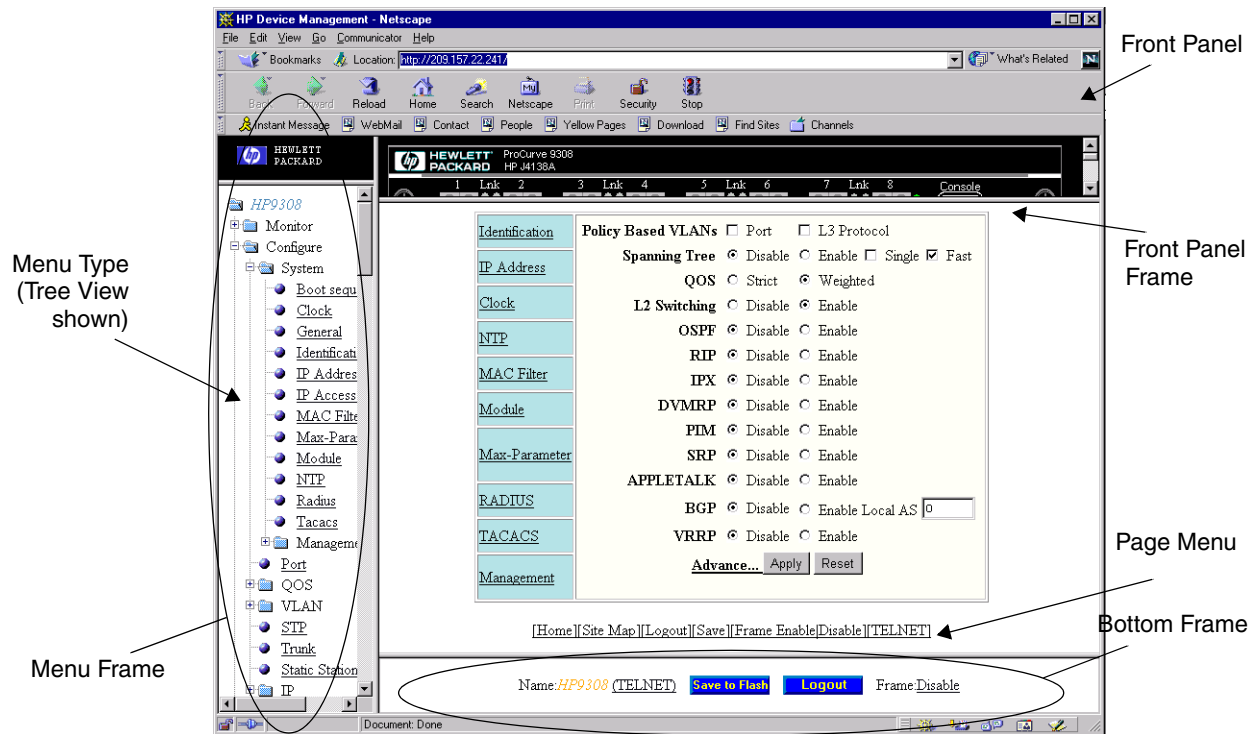
To disable the front panel frame:

```
ProCurveRS(config)# no web-management front-panel
```

When you save the configuration with the **write memory** command, the changes will take place the next time you start the Web management interface, or if you are currently running the Web management interface, the changes will take place when you click the Refresh button on your browser.

**USING THE WEB MANAGEMENT INTERFACE**

1. Click on the plus sign next to Configure in the tree view to expand the list of configuration options.
2. Click on the plus sign next to System in the tree view to expand the list of system configuration links.
3. Click on the plus sign next to Management in the tree view to expand the list of system management links.
4. Click on the Web Preference link to display the Web Management Preferences panel.
5. Enable or disable elements on the Web management interface by clicking on the appropriate radio buttons on the panel. The following figure identifies the elements you can change.



**NOTE:** The tree view is available when you use the Web management interface with Netscape 4.0 or higher or Internet Explorer 4.0 or higher browsers. If you use the Web management interface with an older browser, the Web management interface displays the List view only, and the Web Management Preferences panel does not include an option to display the tree view.

6. When you have finished, click the Apply button on the panel, then click the Refresh button on your browser to activate the changes.



7. To save the configuration, click the plus sign next to the Command folder, then click the [Save to Flash](#) link.

---

**NOTE:** The only changes that become permanent are the settings to the Menu Type and the Front Panel Frame. Any other elements you enable or disable will go back to their default settings the next time you start the Web management interface.

---

## Swapping Modules

### Removing the Old Module

To remove a non-management module, disable the module first before removing it. Disabling the module before removing it prevents a brief service interruption on other non-management modules. The brief interruption can be caused by the routing switch reinitializing other modules when you remove an enabled module.

---

**NOTE:** The **disable module** and **enable module** commands are not applicable to management modules. You do not need to disable a management module in software before removing it.

---

To disable a non-management module, enter a command such as the following at the Privileged EXEC level of the CLI:

```
ProCurveRS# disable module 3
```

This command disables the module in slot 3.

**Syntax:** disable module <slot-num>

The <slot-num> parameter specifies the slot number.

- Slots in a 4-slot chassis are numbered 1 – 4, from top to bottom.
- Slots in an 8-slot chassis are numbered 1 – 8, from left to right.
- Slots in a 15-slot chassis are numbered 1 – 15, from left to right.

---

**NOTE:** If you remove the module without first disabling it, the routing switch re-initializes the other modules in the chassis, causing a brief interruption in service after which normal operation resumes.

---

If you decide, after disabling a module, that you do not want to remove the module, re-enable the module using the following command:

```
ProCurveRS# enable module 3
```

**Syntax:** enable module <slot-num>

---

**NOTE:** You do not need to enable a module after inserting it in the chassis. The module is automatically enabled when you insert the module into a live chassis or when you power on the chassis.

---

---

**NOTE:** If you plan to replace a removed module with a different type of module, you must configure the slot for the module. To configure a slot for a module, use the **module** command at the global CONFIG level of the CLI. See “Installing the New Module” on page 2-33.

---

### Installing the New Module

Physically insert a module into a Routing Switch. Next, you need to enter the location and type of module in the software, unless you either reboot the device or are replacing one module with another of the same type.

Slots on the 9304M are numbered 1 – 4, from top to bottom.

Slots on the 9308M are numbered 1 – 8, from left to right.

Slots on the 9315M are numbered 1 – 15, from left to right.

**NOTE:** If the slot has never contained a module or you are swapping in exactly the same type of module, you do not need to use the **module** command. The slot requires configuration only if it has already been configured for another type of module.

*USING THE CLI*

To add a module to a Routing Switch:

```
ProCurveRS(config)# module 3 24-port-copper-module
```

**Syntax:** module <slot-num> <module-type>

The <slot-num> parameter indicates the Routing Switch slot number.

The <module-type> parameter can be one of the following. You can, of course, take advantage of the CLI's support for abbreviated command and parameter names. (For a list of <module-type>, refer to Table 2.5 on page 2-34.)

**NOTE:** Some module strings apply to more than one module. This is because the slot configuration does not differ based on the physical layer. For example, a slot does not distinguish between an 8-port LX Fiber module and 8-port SX Fiber module. However, the software does indicate the physical layer type when you display module information. For example, the output of the **show module** command indicates the physical layer types of each module.

**Table 2.5: 9300 Series Modules**

Module Type	Part Number and Description	Module String
EP Redundant Management Modules	<b>J4885A</b> HP ProCurve 9300 EP 8-Port Mini-GBIC Redundant Management Module	EP-8-port-mini-GBIC-management
EP Non-Management Modules	<b>J4881A</b> HP ProCurve 9300 EP 48-Port 10/100-TX RJ-45 Module	EP-48-port-10/100-TX-RJ45-module
	<b>J4889A</b> HP ProCurve 9300 EP 48-Port 10/100-TX Telco (RJ-21) Module	EP-48-port-10/100-TX-telco-module
	<b>J4894A</b> HP ProCurve 9300 EP 16-Port Mini-GBIC Module	EP-16-port-mini-GBIC-module
	<b>J4895A</b> HP ProCurve 9300 EP 16-Port 100/1000-T Module	EP-16-port-100/1000-T-module
	<b>J8178A</b> HP ProCurve 9300 EP 24-Port 100Base-FX Module	EP 24 Port 100Base-FX Module
Redundant Management modules (M2 and M4)	<b>J4845A</b> HP ProCurve 9300 GigLX Redundant Management Module (8-port)	8-port-gig-management-module <i>Discontinued</i>
	<b>J4846A</b> HP ProCurve 9300 GigSX Redundant Management Module (8-port)	8-port-gig-management-module <i>Discontinued</i>

Table 2.5: 9300 Series Modules (Continued)

Module Type	Part Number and Description	Module String
	<b>J4847A</b> HP ProCurve 9300 Redundant Management Module (0-port)	0-port-management-module <i>Discontinued</i>
	<b>J4857A</b> HP ProCurve 9300 Mini-GBIC Redundant Management Module (8-port)	8-port-gig-m4-management-module <i>Discontinued</i>
	<b>J4879A</b> HP ProCurve 9300 T-Flow Redundant Management Module (0-port)	— <i>Discontinued</i>
Management modules (M1) Supported only on the 9304M and 9308M.  (M1 modules are not supported on the HP 9315M.)	<b>J4141A</b> HP ProCurve 9300 10/100 Management Module (16-port)	16-port-copper-management-module <i>Discontinued</i>
	<b>J4144A</b> HP ProCurve 9300 Gigabit SX Management Module (8-port)	8-port-gig-management-module <i>Discontinued</i>
	<b>J4146A</b> HP ProCurve 9300 Gigabit 4LX/4SX Management Module (8-port)	8-port-gig-management-module <i>Discontinued</i>
Unmanaged Modules (Standard, non-EP)	<b>J4140A</b> HP ProCurve 9300 10/100 Module (24-port)	24-port-copper-module <i>Discontinued</i>
	<b>J4142A</b> HP ProCurve 9300 100Base FX Module (24-port MT-RJ)	24-port-100fx-module <i>Discontinued</i>
	<b>J4143A</b> HP ProCurve 9300 Gigabit SX Module (8-port)	8-port-gig-module <i>Discontinued</i>
	<b>J4145A</b> HP ProCurve 9300 Gigabit 4LX/4SX Module (8-port)	8-port-gig-module <i>Discontinued</i>
	<b>J4842A</b> ProCurve 9300 1000Base-T Module (8-port)	8-port-gig-copper-module <i>Discontinued</i>
	<b>J4844A</b> HP ProCurve 9300 GigLX Module (8-port)	8-port-gig-module <i>Discontinued</i>
	<b>J4856A</b> HP ProCurve 9300 Mini-GBIC Module (8-port)	8-port-gig-module <i>Discontinued</i>
10 Gigabit Ethernet Modules (Unmanaged, supported with both Standard and EP Management Modules)	<b>J4891A</b> HP ProCurve 9300 1-port 10 Gb Module	1-port-10Gig-module <i>Discontinued</i>
	<b>J8174A</b> HP ProCurve 9300 2-port 10 Gb Module	2-port-10Gig-module

**USING THE WEB MANAGEMENT INTERFACE**

To configure a chassis slot for a module:

1. Log on to the device using a valid user name and password for read-write access. The System configuration panel is displayed.
2. Click on the [Module](#) link to display the Module panel, as shown in the following example.

**Module**

Slot	Module	Status	Ports	Starting MAC	
1	8 Port Gig Management Module	OK	8	00e0.52f0.4f00	Delete
2	None				Delete
3	24 Port Copper Module	OK	24	00e0.52f0.4f40	Delete
4	24 Port Copper Module	OK	24	00e0.52f0.4f60	Delete
5	None				Delete
6	None				Delete
7	None				Delete
8	None				Delete

[\[Add Module\]](#)

[\[Home\]](#) [\[Site Map\]](#) [\[Logout\]](#) [\[Save\]](#) [\[Frame Enable\]](#) [\[Disable\]](#) [\[TELNET\]](#)

3. Click the [Add Module](#) link to display the following panel.

**Module**

<b>Slot:</b>	1
<b>Module Type:</b>	8-port-gig-module

[\[Show\]](#)

[\[Home\]](#) [\[Site Map\]](#) [\[Logout\]](#) [\[Save\]](#) [\[Frame Enable\]](#) [\[Disable\]](#) [\[TELNET\]](#)

4. Select slot number from the Slot pulldown menu.
  - Slots on the 9304M are numbered 1 – 4, from top to bottom.
  - Slots on the 9308M are numbered 1 – 8, from left to right.
  - Slots on the 9315M are numbered 1 – 15, from left to right.
5. Select the module type from the Module Type pulldown menu.
6. Click the Add button to save the change to the device's running-config file.

7. Select the [Save](#) link at the bottom of the dialog. Select Yes when prompted to save the configuration change to the startup-config file on the device's flash memory.

## Next Steps

Once the initial installation steps are completed, you can proceed with enabling routing protocols and configuring specific features on the Routing Switches as described in "Configuring Basic Features" on page 6-1.

Configuration details for all routing protocols and advanced VLAN features can be found in the *Advanced Configuration and Management Guide for ProCurve 9300/9400 Series Routing Switches*.

