

# HP 3600 v2 Switch Series

## Installation Guide

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# Product overview

The HP 3600 v2 Switch Series includes the models in [Table 1](#).

**Table 1 Models in the HP 3600 v2 Switch Series**

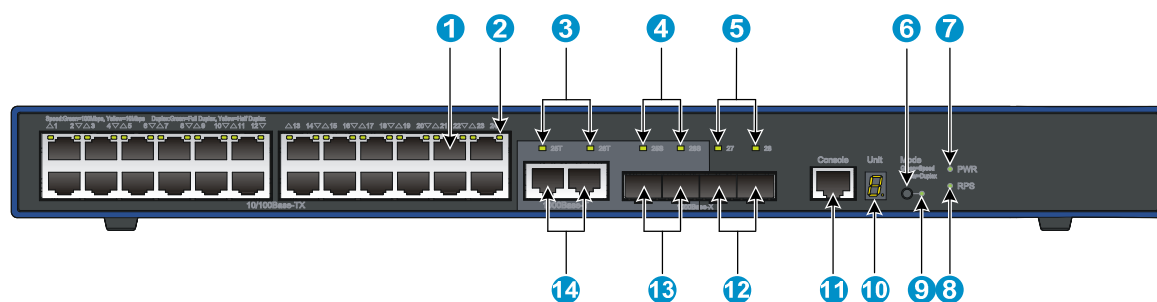
| Sub-series | Product code  | HP description            | RMN          |
|------------|---------------|---------------------------|--------------|
| 3600 v2 EI | JG299A        | 3600-24 v2 EI Switch      | BJNGA-AD0009 |
|            | JG300A        | 3600-48 v2 EI Switch      | BJNGA-AD0010 |
|            | JG301A/JG301B | 3600-24-PoE+ v2 EI Switch | BJNGA-AD0011 |
|            | JG302A/JG302B | 3600-48-PoE+ v2 EI Switch | BJNGA-AD0012 |
|            | JG303A        | 3600-24-SFP v2 EI Switch  | BJNGA-AD0013 |
| 3600 v2 SI | JG304A        | 3600-24 v2 SI Switch      | BJNGA-AD0014 |
|            | JG305A        | 3600-48 v2 SI Switch      | BJNGA-AD0015 |
|            | JG306A/JG306B | 3600-24-PoE+ v2 SI Switch | BJNGA-AD0011 |
|            | JG307A/JG307B | 3600-48-PoE+ v2 SI Switch | BJNGA-AD0012 |

## ! IMPORTANT:

For regulatory identification purposes, every 3600v2 switch is assigned a regulatory model number (RMN). These regulatory numbers should not be confused with the marketing name HP 3600v2, or product codes.

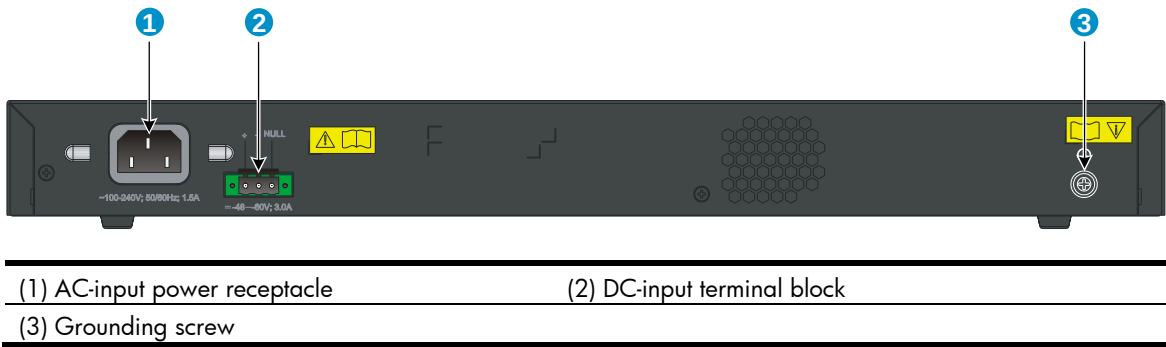
## 3600-24 v2 EI Switch panel views

**Figure 1 3600-24 v2 EI front panel**



|                                              |                                     |
|----------------------------------------------|-------------------------------------|
| (1) 10/100Base-TX auto-sensing Ethernet port | (2) 10/100Base-TX Ethernet port LED |
| (3) 1000Base-T Ethernet combo port LED       | (4) 1000Base-X SFP combo port LED   |
| (5) 1000Base-X SFP port LED                  | (6) Port LED mode switching button  |
| (7) System status LED (PWR)                  | (8) DC power LED (RPS)              |
| (9) Port mode LED                            | (10) Seven-segment LED              |
| (11) Console port                            | (12) 1000Base-X SFP port            |
| (13) 1000Base-X SFP combo port               | (14) 1000Base-T Ethernet combo port |

Figure 2 3600-24 v2 EI rear panel



# 3600-24 v2 SI Switch panel views

Figure 3 3600-24 v2 SI front panel

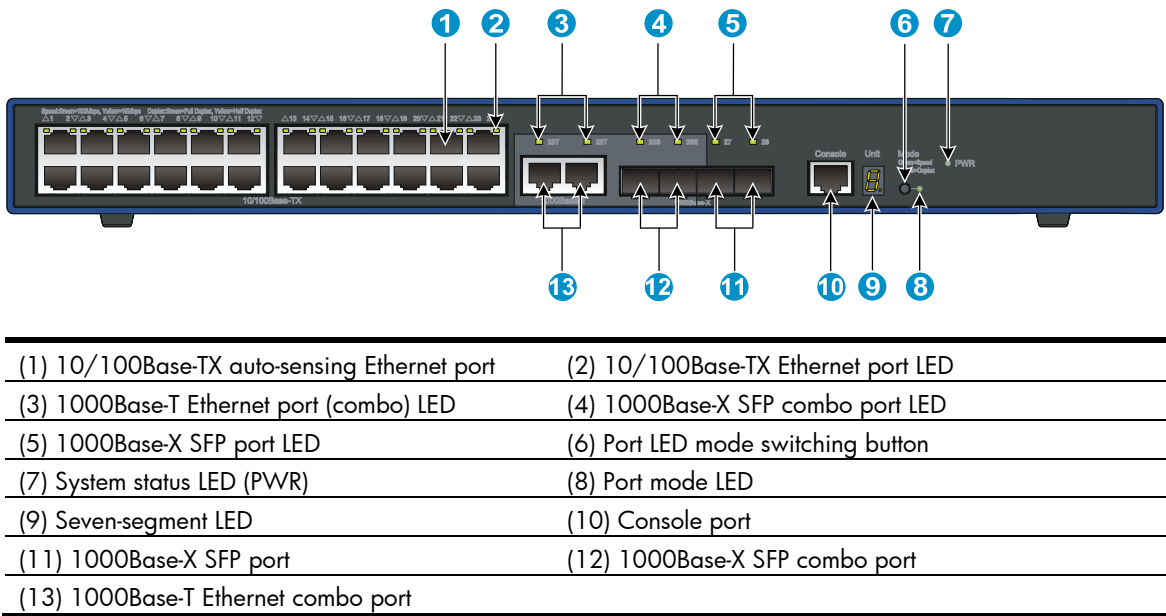


Figure 4 3600-24 v2 SI rear panel



# 3600-48 v2 EI Switch panel views

Figure 5 3600-48 v2 EI front panel



|                                              |                                     |
|----------------------------------------------|-------------------------------------|
| (1) 10/100Base-TX auto-sensing Ethernet port | (2) 10/100Base-TX Ethernet port LED |
| (3) 1000Base-X SFP combo port                | (4) 1000Base-X SFP combo port LED   |
| (5) 1000Base-X SFP port                      | (6) 1000Base-X SFP port LED         |
| (7) Seven-segment LED                        | (8) System status LED (PWR)         |
| (9) DC power module status LED (RPS)         | (10) Port mode LED (Mode)           |
| (11) Port LED mode switching button          | (12) Console port                   |
| (13) 1000Base-T Ethernet port LED            | (14) 1000Base-T Ethernet port       |

Figure 6 3600-48 v2 EI rear panel



|                               |                             |
|-------------------------------|-----------------------------|
| (1) AC-input power receptacle | (2) DC-input terminal block |
| (3) Grounding screw           |                             |

# 3600-48 v2 SI Switch panel views

Figure 7 3600-48 v2 SI front panel



|                                              |                                     |
|----------------------------------------------|-------------------------------------|
| (1) 10/100Base-TX auto-sensing Ethernet port | (2) 10/100Base-TX Ethernet port LED |
| (3) 1000Base-X SFP combo port                | (4) 1000Base-X SFP combo port LED   |
| (5) 1000Base-X SFP port                      | (6) 1000Base-X SFP port LED         |
| (7) Seven-segment LED                        | (8) System status LED (PWR)         |
| (9) Port mode LED (Mode)                     | (10) Port LED mode switching button |
| (11) Console port                            | (12) 1000Base-T Ethernet port LED   |
| (13) 1000Base-T Ethernet port                |                                     |

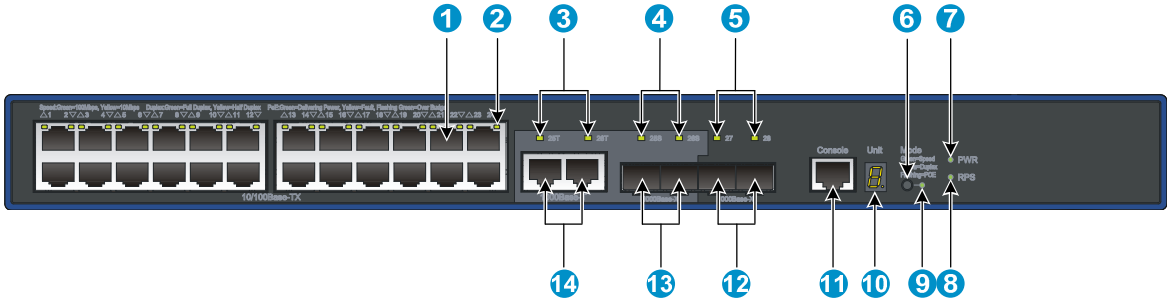
Figure 8 3600-48 v2 SI rear panel



|                               |                     |
|-------------------------------|---------------------|
| (1) AC-input power receptacle | (2) Grounding screw |
|-------------------------------|---------------------|

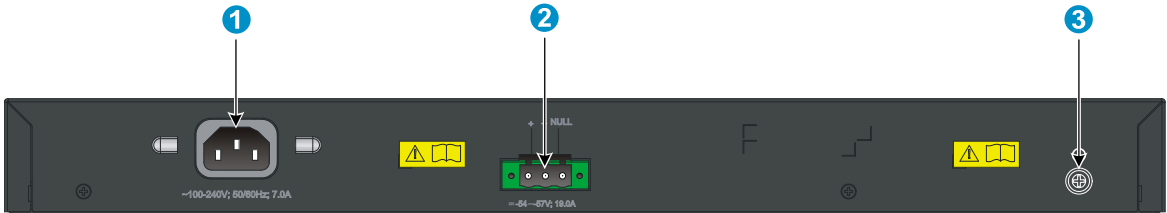
# 3600-24-PoE+ v2 EI Switch/3600-24-PoE+ v2 SI Switch panel views

Figure 9 3600-24-PoE+ v2 EI Switch/3600-24-PoE+ v2 SI front panel



|                                              |                                      |
|----------------------------------------------|--------------------------------------|
| (1) 10/100Base-TX auto-sensing Ethernet port | (2) 10/100Base-TX Ethernet port LED  |
| (3) 1000Base-T Ethernet combo port LED       | (4) 1000Base-X SFP combo port LED    |
| (5) 1000Base-X SFP port LED                  | (6) Port LED mode switching button   |
| (7) System status LED (PWR)                  | (8) DC power module status LED (RPS) |
| (9) Port mode LED                            | (10) Seven-segment LED               |
| (11) Console port                            | (12) 1000Base-X SFP port             |
| (13) 1000Base-X SFP combo port               | (14) 1000Base-T Ethernet combo port  |

Figure 10 3600-24-PoE+ v2 EI Switch/3600-24-PoE+ v2 SI rear panel



|                               |                             |
|-------------------------------|-----------------------------|
| (1) AC-input power receptacle | (2) DC-input terminal block |
| (3) Grounding screw           |                             |

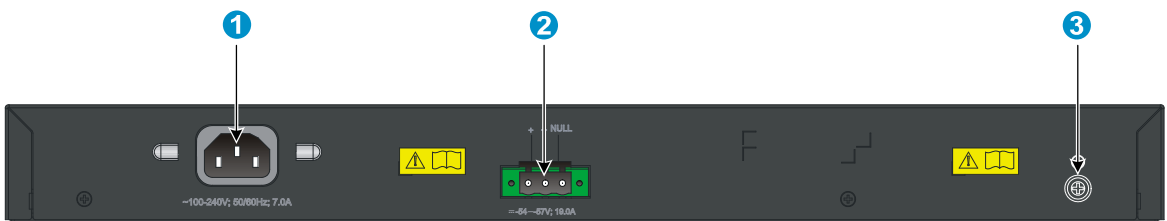
# 3600-48-PoE+ v2 EI Switch/3600-48-PoE+ v2 SI Switch panel views

Figure 11 3600-48-PoE+ v2 EI Switch/3600-48-PoE+ v2 SI front panel



|                                              |                                     |
|----------------------------------------------|-------------------------------------|
| (1) 10/100Base-TX auto-sensing Ethernet port | (2) 10/100Base-TX Ethernet port LED |
| (3) 1000Base-X SFP combo port                | (4) 1000Base-X SFP combo port LED   |
| (5) 1000Base-X SFP port                      | (6) 1000Base-X SFP port LED         |
| (7) Seven-segment LED                        | (8) System status LED (PWR)         |
| (9) DC power module status LED (RPS)         | (10) Port mode LED (Mode)           |
| (11) Port LED mode switching button          | (12) Console port                   |
| (13) 1000Base-T Ethernet port LED            | (14) 1000Base-T Ethernet port       |

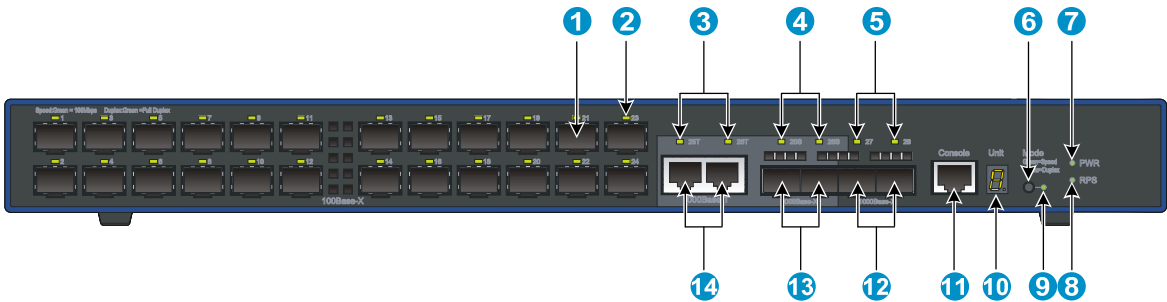
Figure 12 3600-48-PoE+ v2 EI Switch/3600-48-PoE+ v2 SI rear panel



|                               |                             |
|-------------------------------|-----------------------------|
| (1) AC-input power receptacle | (2) DC-input terminal block |
| (3) Grounding screw           |                             |

# 3600-24-SFP v2 EI Switch panel views

Figure 13 3600-24-SFP v2 EI front panel



|                                        |                                     |
|----------------------------------------|-------------------------------------|
| (1) 100Base-X SFP port                 | (2) 100Base-X SFP port LED          |
| (3) 1000Base-T Ethernet combo port LED | (4) 1000Base-X SFP combo port LED   |
| (5) 1000Base-X SFP port LED            | (6) Port LED mode switching button  |
| (7) System status LED (PWR)            | (8) DC power LED (RPS)              |
| (9) Port mode LED                      | (10) Seven-segment LED              |
| (11) Console port                      | (12) 1000Base-X SFP port            |
| (13) 1000Base-X SFP combo port         | (14) 1000Base-T Ethernet combo port |

Figure 14 3600-24-SFP v2 EI rear panel



|                               |                             |
|-------------------------------|-----------------------------|
| (1) AC-input power receptacle | (2) DC-input terminal block |
| (3) Grounding screw           |                             |

---

# Preparing for installation

## Safety recommendations

To avoid any equipment damage or bodily injury caused by improper use, read the following safety recommendations before installation. Note that the recommendations do not cover every possible hazardous condition.

- Before cleaning the switch, unplug all power cords from the switch. Do not clean the switch with wet cloth or liquid.
- Do not place the switch near water or in a damp environment. Prevent water or moisture from entering the switch chassis.
- Do not place the switch on an unstable case or desk. The switch might be severely damaged in case of a fall.
- Ensure proper ventilation of the equipment room and keep the air inlet and outlet vents of the switch free of obstruction.
- Connect the yellow-green protection grounding cable before power-on.
- Make sure that the operating voltage is in the required range.
- To avoid electrical shocks, do not open the chassis while the switch is operating or when the switch is just powered off.
- When replacing transceiver modules, wear an ESD-preventive wrist strap to avoid damaging the units.

## Examining the installation site

The HP 3600 v2 Switch Series must be used indoors. You can mount the switch in a rack or on a workbench, but make sure:

- Adequate clearance is reserved at the air inlet and exhaust vents for ventilation.
- The rack or workbench has a good ventilation system.
- The rack is sturdy enough to support the switch and its accessories.
- The rack or workbench is well earthed.

To ensure normal operation and long service life of your switch, install it in an environment that meets the requirements described in the following subsections.

## Temperature/humidity

Maintain appropriate temperature and humidity in the equipment room.

- Lasting high relative humidity can cause poor insulation, electricity creepage, mechanical property change of materials, and metal corrosion.

- Lasting low relative humidity can cause washer contraction and ESD and bring problems including loose captive screws and circuit failure.
- High temperature can accelerate the aging of insulation materials and significantly lower the reliability and lifespan of the switch.

For the temperature and humidity requirements of different switch models, see “[Environmental specifications](#)”.

## Cleanness

Dust buildup on the chassis may result in electrostatic adsorption, which causes poor contact of metal components and contact points, especially when indoor relative humidity is low. In the worst case, electrostatic adsorption can cause communication failure.

**Table 2 Dust concentration limit in the equipment room**

| Substance                          | Concentration limit (particles/m <sup>3</sup> )                        |
|------------------------------------|------------------------------------------------------------------------|
| Dust                               | $\leq 3 \times 10^4$ (no visible dust on the tabletop over three days) |
| <b>NOTE:</b>                       |                                                                        |
| Dust diameter $\geq 5 \mu\text{m}$ |                                                                        |

The equipment room must also meet strict limits on salts, acids, and sulfides to eliminate corrosion and premature aging of components, as shown in [Table 3](#).

**Table 3 Harmful gas limits in the equipment room**

| Gas              | Maximum concentration (mg/m <sup>3</sup> ) |
|------------------|--------------------------------------------|
| SO <sub>2</sub>  | 0.2                                        |
| H <sub>2</sub> S | 0.006                                      |
| NH <sub>3</sub>  | 0.05                                       |
| Cl <sub>2</sub>  | 0.01                                       |

## EMI

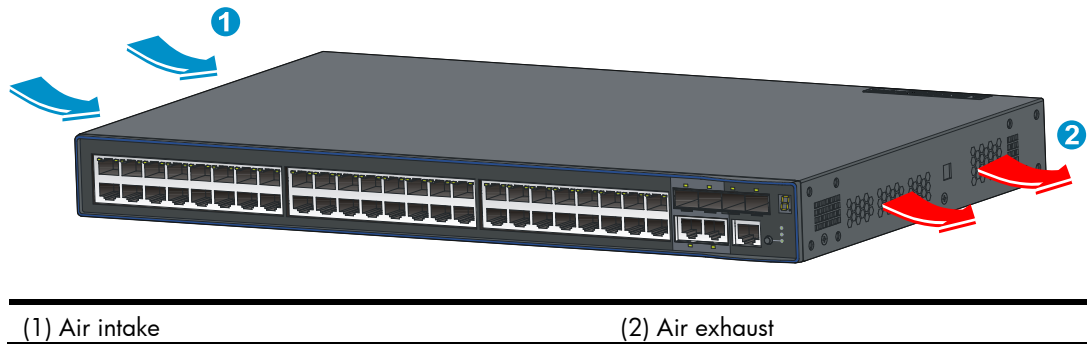
All electromagnetic interference (EMI) sources, from outside or inside of the switch and application system, adversely affect the switch in a conduction pattern of capacitance coupling, inductance coupling, electromagnetic wave radiation, or common impedance (including the grounding system) coupling. To prevent EMI, take the following actions:

- If AC power is used, use a single-phase three-wire power receptacle with protection earth (PE) to filter interference from the power grid.
- Keep the switch far away from radio transmitting stations, radar stations, and high-frequency devices.
- Use electromagnetic shielding, for example, shielded interface cables, when necessary.
- Route interface cables only indoors to prevent signal ports from getting damaged by overvoltage or overcurrent caused by lightning strikes.

## Cooling requirements

The built-in fans in the 3600 v2 switches blow air from the left to the right of the chassis for heat dissipation, as shown in Figure 15.

**Figure 15 Airflow through the 3600 v2 switches**



For adequate heat dissipation, plan the installation site according to the airflow of your switch, and adhere to the following requirements:

- Leave a clearance of at least 10 cm (3.94 in) around the air intake and exhaust vents.
- Consider the heat dissipation of the installation site when determining air-conditioning requirements to ensure that cool air can enter the switch.
- Make sure the hot air generated by equipment at the bottom of the rack is not drawn in the intake of the equipment above.
- The installation site has a good cooling system.

## Laser safety

The 3600 v2 switches are Class 1 laser devices.

### CAUTION:

Do not stare into any fiber port when the switch has power. The laser light emitted from the optical fiber may hurt your eyes.

## Installation tools

- Flat-blade screwdriver
- Phillips screwdriver
- ESD-preventive wrist strap

All these installation tools are user supplied.

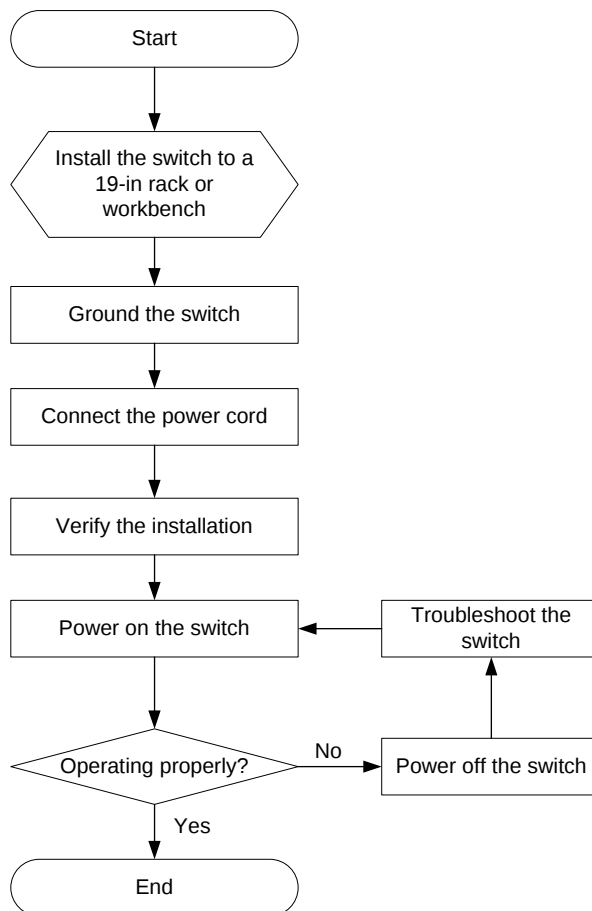
# Installing the switch



## WARNING!

Keep the tamper-proof seal on a mounting screw on the chassis cover intact, and if you want to open the chassis, contact your local HP agent for permission. Otherwise, HP shall not be liable for any consequence caused thereby.

**Figure 16 Hardware installation flow**



## Installing the switch in a 19-inch rack

The 3600 v2 switch is available with one pair of mounting brackets, as shown in [Figure 17](#).

# Mounting bracket kit

Figure 17 Mounting bracket kit



## Attaching the mounting brackets to the chassis

The 3600 v2 switch provides one front mounting position and one rear mounting position. You can install the mounting brackets as needed.

1. Wear an ESD-preventive wrist strap, and make sure that the wrist strap makes good skin contact and is well grounded.
2. Align one mounting bracket with the screw holes in the front-mounting position ([Figure 18](#)) or the rear-mounting position ([Figure 19](#)).
3. Use M4 screws (supplied with the switch) to fix the mounting bracket to the switch chassis.
4. Repeat the proceeding steps to attach the other mounting bracket to the chassis.

Figure 18 1U mounting bracket front mounting position

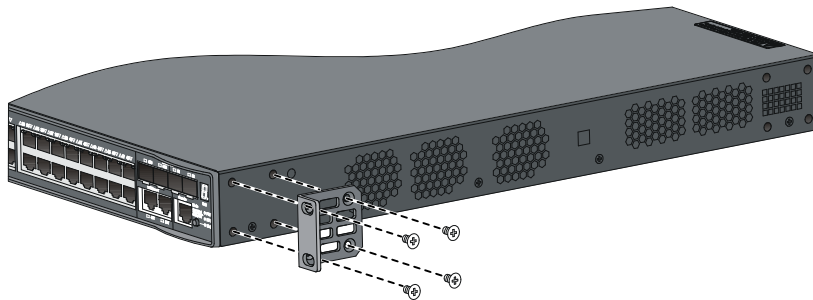
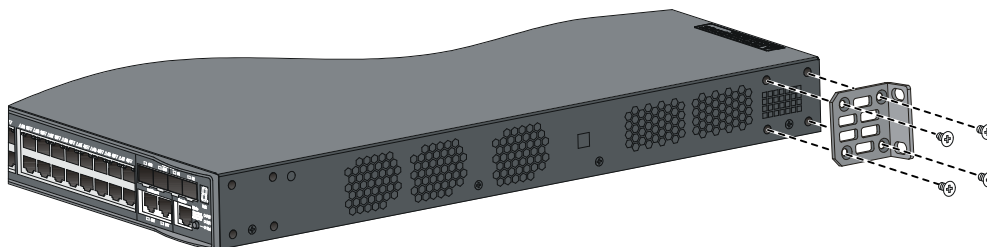


Figure 19 1U mounting bracket rear mounting position

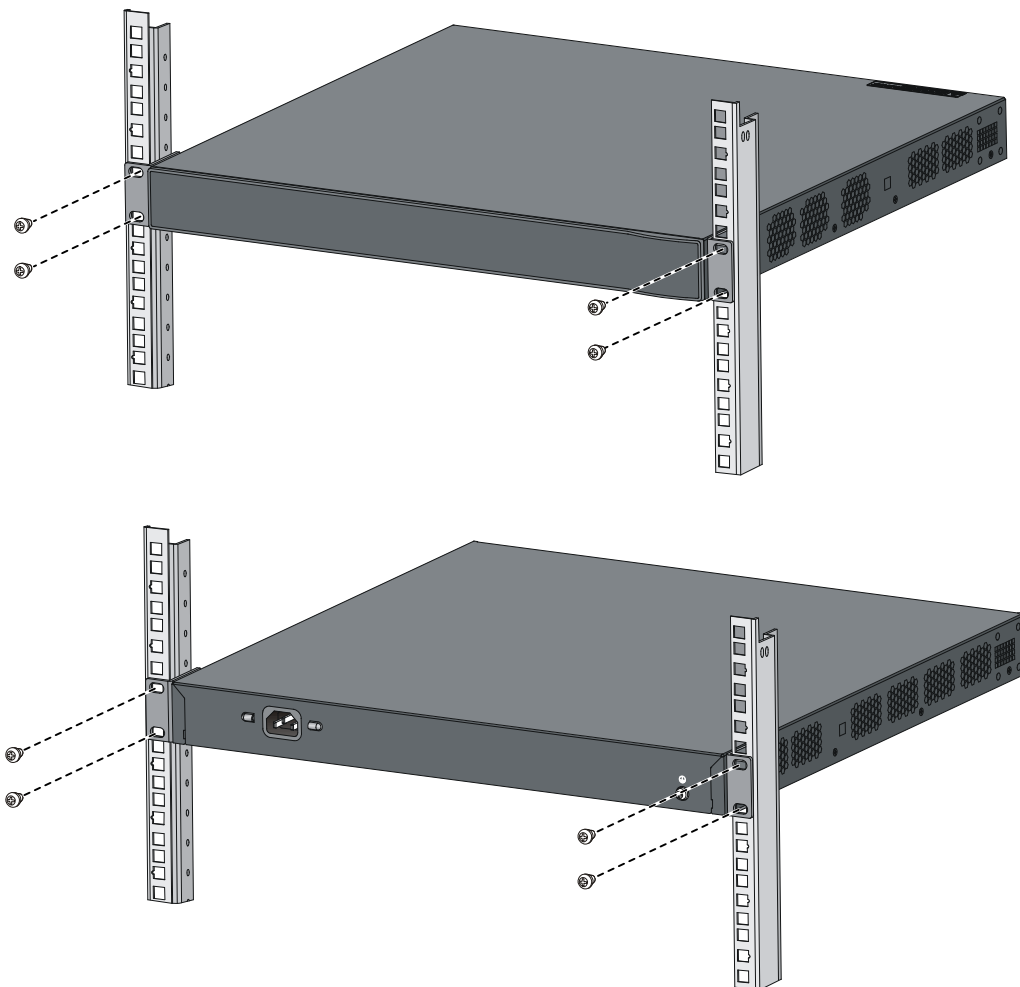


## Rack-mounting an 3600 v2 switch

This installation task requires two persons. To mount the switch in a rack:

1. Wear an ESD-preventive wrist strap and make sure it makes good skin contact and is well grounded.
2. Check that the mounting brackets have been securely attached to the switch chassis.
3. Install cage nuts (user-supplied) in the mounting holes in the rack posts.
4. One person holds the switch chassis and aligns the mounting brackets with the mounting holes in the rack posts, and the other person fixes the mounting brackets with anti-rust screws (user-supplied) to the rack.
5. Check that the switch chassis is horizontal and tighten the screws.

**Figure 20 Mount an 3600 v2 switch in a rack**



## Mounting the switch on a workbench

If a standard 19-inch rack is not available, you can place an 3600 v2 switch on a clean, flat workbench, as follows:

1. Check that the workbench is sturdy and well grounded.

2. Place the switch with bottom up, and clean the round holes in the chassis bottom with dry cloth.
3. Attach the rubber feet to the four round holes in the chassis bottom.
4. Place the switch with upside up on the workbench.

---

⚠ **IMPORTANT:**

- Ensure good ventilation and 10 cm (3.9 in) of clearance around the chassis for heat dissipation.
  - Avoid placing heavy objects on the switch.
- 

## Grounding the switch

---

⚠ **WARNING!**

Correctly connecting the switch grounding cable is crucial to lightning protection and EMI protection.

---

**NOTE:**

The power and grounding terminals in this section are for illustration only.

---

The power input end of the switch has a noise filter, whose central ground is directly connected to the chassis to form the chassis ground (commonly known as PGND). You must securely connect this chassis ground to the earth so the faradism and leakage electricity can be safely released to the earth to minimize EMI susceptibility of the switch.

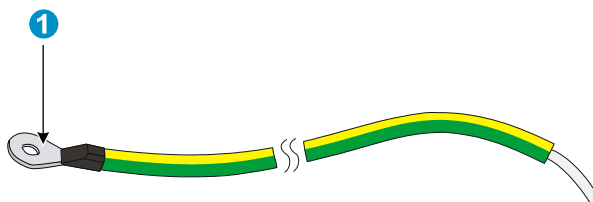
You can ground the switch in one of the following ways, depending on the grounding conditions available at the installation site:

- Grounding the switch with a grounding strip
- Grounding the switch by using the AC power cord
- Grounding the switch with a grounding conductor buried in the earth ground

## Grounding cable

The 3600 v2 Switch Series is provided with a yellow-green grounding cable. One end of the cable has an OT terminal, and the other end is naked and soldered, as shown in [Figure 21](#).

**Figure 21** Grounding cable



---

(1) OT terminal of the grounding cable

---

## Grounding the switch with a grounding strip

When a grounding strip is available at the installation site, connect the grounding cable to the grounding strip.

### ⚠ CAUTION:

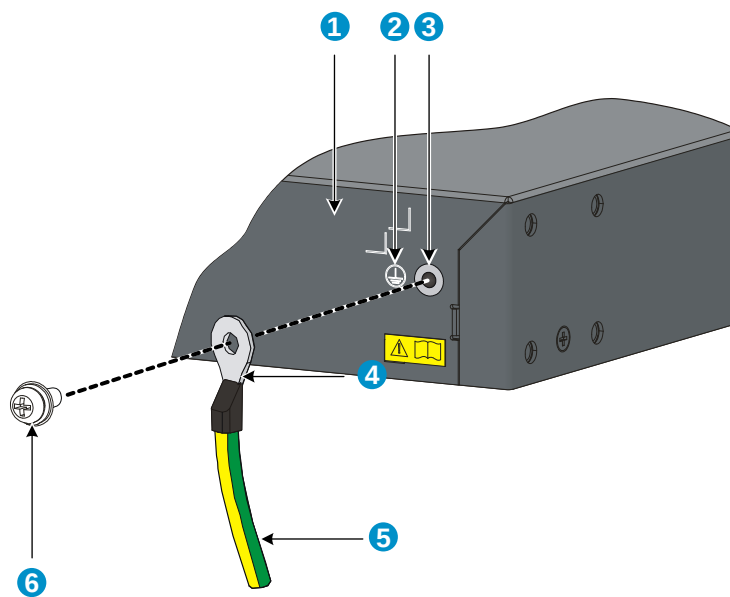
- The supplied grounding cable of the 3600 v2 Switch Series does not have an auxiliary OT terminal.
- Connect the grounding cable to the earthing system in the equipment room. Do not connect it to a fire main or lightning rod.

### Connecting the grounding cable to the switch

Follow these steps to connect the grounding cable:

1. Remove the grounding screw on the rear panel of the switch chassis.
2. Attach the grounding screw to the OT terminal of the grounding cable.
3. Use a screwdriver to fasten the grounding screw into the grounding screw hole.

**Figure 22 Connect the grounding cable to the grounding hole of switch**



|                        |                     |
|------------------------|---------------------|
| (1) Chassis rear panel | (2) Grounding sign  |
| (3) Grounding hole     | (4) OT terminal     |
| (5) Grounding cable    | (6) Grounding screw |

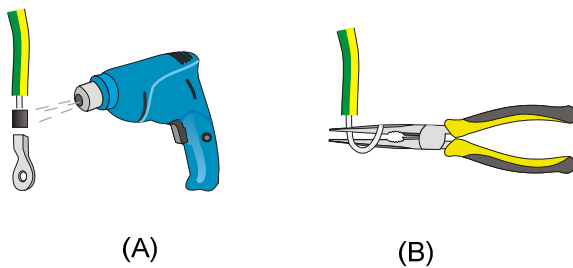
### Connecting the grounding cable to a grounding strip

Follow these steps to connect the grounding cable to a grounding strip:

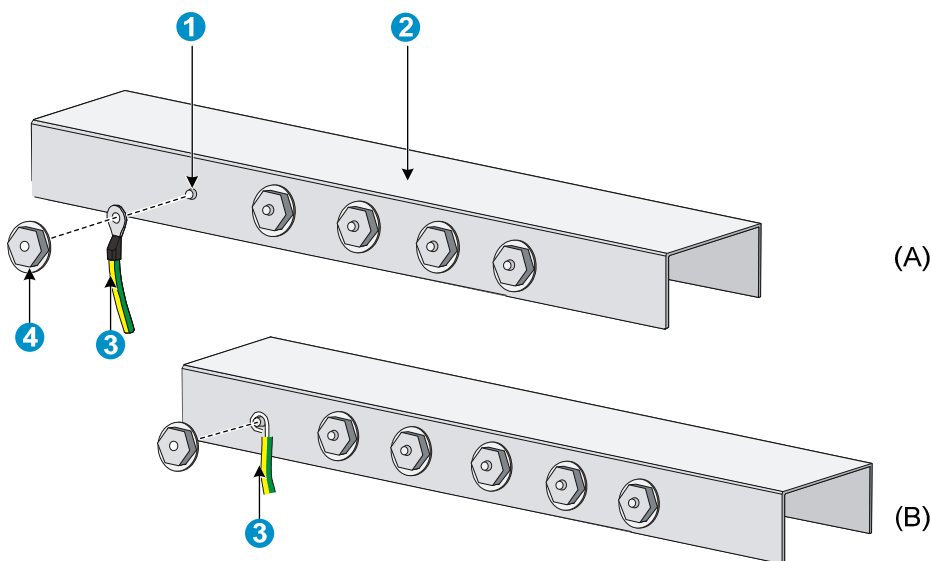
1. Remove the hex nut from the grounding strip.
2. Cut the grounding cable to a proper length according to the distance between the switch and the grounding strip.
3. Make the connector on the grounding cable:

- If you have an OT terminal, follow callout A in [Figure 23](#) to make the connector: Peel 5 mm (0.20 in) of insulation sheath by using a wire stripper, and then insert the naked metal part through the insulation covering into the end of the OT terminal. Secure the metal part of the cable to the OT terminal with a crimper, and then cover it with the insulation covering. Then heat the insulation covering with a blower to make it completely cover the metal part.
  - If you do not have an OT terminal, follow callout B in [Figure 23](#) to make the connector: Peel the insulation sheath by an appropriate length by using a wire stripper, and then bend the naked metal part.
4. Connect the made connector to the grounding post of the grounding strip, and then fasten it with a hex nut, as shown in [Figure 24](#).

**Figure 23 Make the grounding cable connector**



**Figure 24 Connect the grounding cable to a grounding strip**



|                     |                     |
|---------------------|---------------------|
| (1) Grounding post  | (2) Grounding strip |
| (3) Grounding cable | (4) Hex nut         |

## Grounding the switch by using the AC power cord

If the installation site has no grounding strips, you can ground an AC-powered switch through the protective earth (PE) wire of the power cord, but must make sure:

- The power cord has a PE terminal.

- The ground contact in the power outlet is securely connected to the ground in the power distribution room or on the AC transformer side.
- The power cord is securely connected to the power outlet.

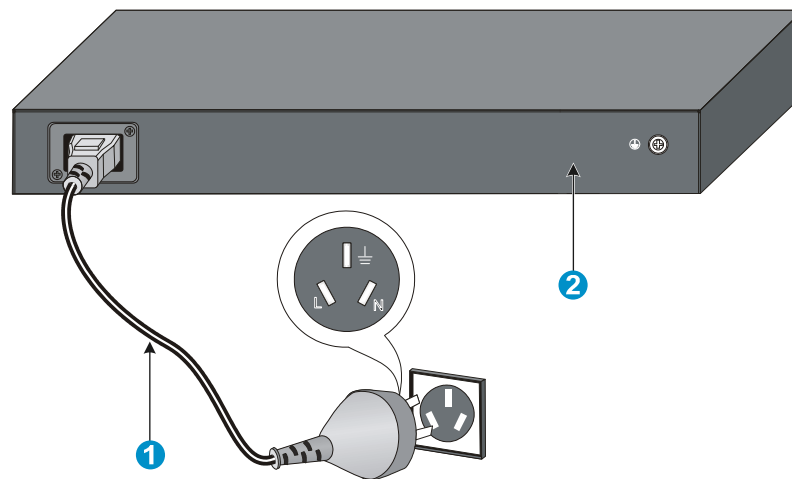
---

**NOTE:**

If the ground contact in the power outlet is not connected to the ground, report the problem and reconstruct the grounding system.

---

**Figure 25 Ground through the PE wire of the AC power supply**



---

(1) Three-wire AC power cable

(2) Chassis rear panel

---

## Grounding the switch with a grounding conductor buried in the earth ground

If the installation site has no grounding strips, but earth ground is available, hammer a 0.5 m (1.64 ft) or longer angle iron or steel tube into the earth ground to serve as a grounding conductor.

The dimensions of the angle iron must be at least 50 × 50 × 5 mm (1.97 × 1.97 × 0.20 in). The steel tube must be zinc-coated and its wall thickness must be at least 3.5 mm (0.14 in).

Weld the yellow-green grounding cable to the angel iron or steel tube and treat the joint for corrosion protection.

Figure 26 Ground the switch by burying the grounding conductor into the earth ground



|                     |                         |                       |
|---------------------|-------------------------|-----------------------|
| (1) Grounding screw | (2) Grounding cable     | (3) Earth             |
| (4) Joint           | (5) Grounding conductor | (6) Cassis rear panel |

## Connecting the power cord



### CAUTION:

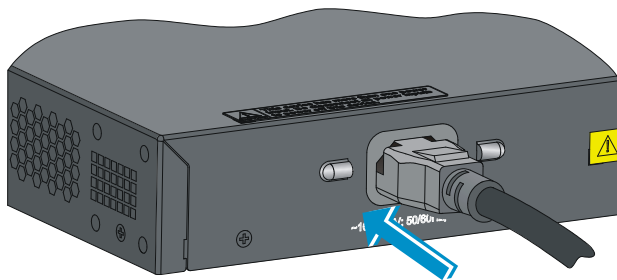
Before powering on the switch, you must connect the power cord and make sure the switch is well grounded.

## Connecting an AC power cord

Follow these steps to connect an AC power cord:

1. Wear an ESD-preventive wrist strap, and make sure the wrist strap makes good skin contact and is well grounded.
2. Insert the plug of the AC power cord into the AC power receptacle (see [Figure 27](#)).
3. Connect the other end of the AC power cord to the AC power source.
4. Check the power LED (PWR) on the front panel. If the LED is on, the power cord is properly connected.

Figure 27 Connect the AC power cord



## Connecting a DC power cord

---

### NOTE:

- The 3600-24 v2 SI Switch and 3600-48 v2 SI Switch do not support DC power supply.
  - No DC power cord is supplied with the 3600 v2 Switch Series.
- 

The 3600 v2 Switch Series provides DC power input.

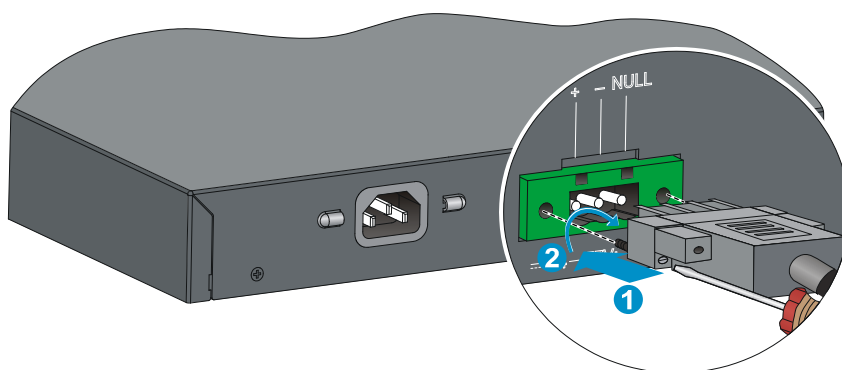
- Non PoE switches (3600-24 v2 EI Switch, 3600-48 v2 EI Switch, and 3600-24-SFP v2 EI Switch) can be powered by the –48VDC power supply in the equipment room.
- PoE switches (3600-24-PoE+ v2 EI Switch, 3600-24-PoE+ v2 SI Switch, 3600-48-PoE+ v2 EI Switch, and 3600-48-PoE+ v2 SI Switch) can be powered by an RPS power source.

The procedures for connecting a –48 VDC power source in the equipment room and an RPS power source are similar.

Follow these steps to connect a DC power cord:

1. Wear an ESD-preventive wrist strap and make sure it makes good skin contact and is well grounded.
2. Keep the upside of the DC plug on top and plug it in the DC receptacle (see callout 1 in [Figure 28](#)). (If you plug it upside down, the insertion is not smooth because of the specific structure design of the DC receptacle and the DC plug.)
3. Use a flat-blade screwdriver to fix the two screws on the DC plug to secure the plug to the DC receptacle (see callout 2 in [Figure 28](#)).
4. Connect the other end of the DC power cord to the –48 VDC power source in the equipment room or the RPS power source.
5. Check the power LED (PWR) on the front panel. If the LED is on, the power cord is properly connected. If you also connect an AC power cord to the switch, check the RPS LED to confirm the RPS input status.

**Figure 28 Connect a DC power cord to the switch**



### CAUTION:

Pay attention to the positive (+) and negative (-) marks on the power cord to avoid connection mistakes.

---

# Verifying the installation

After you complete the installation, verify that:

- There is enough space for heat dissipation around the switch, and the rack or workbench is stable.
- The grounding cable is securely connected.
- The correct power source is used.
- The power cords are properly connected.
- All the interface cables are cabled indoors. If any cable is routed outdoors, verify that the socket strip with lightning protection and lightning arresters for network ports have been properly connected.

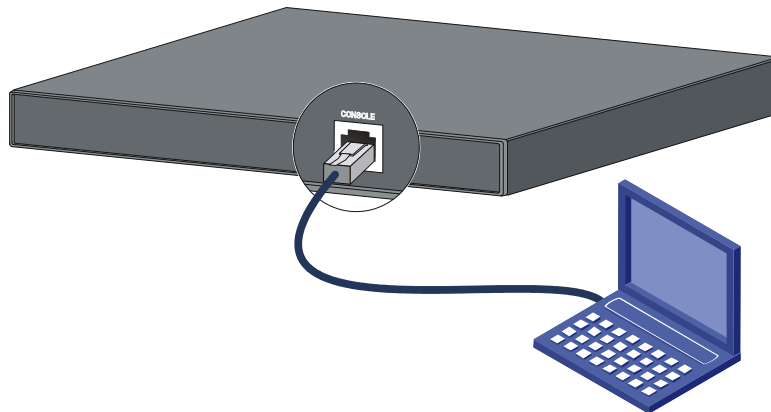
---

# Accessing the switch for the first time

## Setting up the configuration environment

The first time you access the switch you must use a console cable to connect a console terminal, for example, a PC, to the console port on the switch.

**Figure 29 Connect the console port to a terminal**

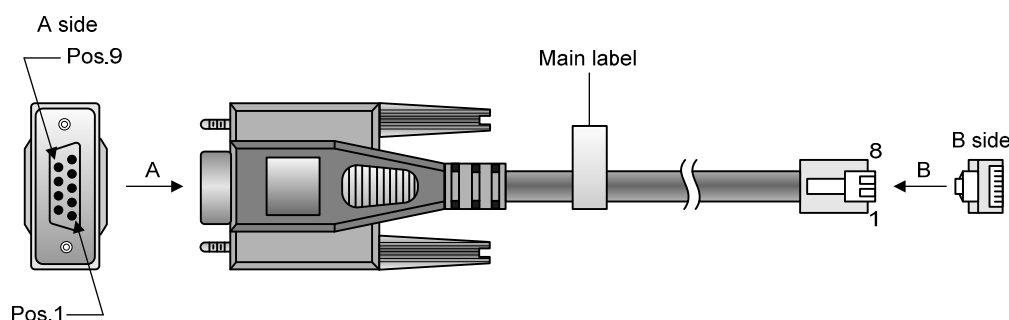


## Connecting the console cable

### Console cable

A console cable is an 8-core shielded cable, with a crimped RJ-45 connector at one end for connecting to the console port of the switch, and a DB-9 female connector at the other end for connecting to the serial port on the console terminal.

**Figure 30 Console cable**



## Connection procedure

To connect a terminal, for example, a PC, to the switch:

1. Plug the DB-9 female connector of the console cable to the serial port of the PC.

2. Connect the RJ-45 connector to the console port of the switch.



#### **WARNING!**

- Identify the mark on the console port to ensure that you are connecting to the correct port.
- The serial ports on PCs do not support hot swapping. If the switch has been powered on, connect the console cable to the PC before connecting to the switch, and when you disconnect the cable, first disconnect from the switch.

## Setting terminal parameters

To configure and manage the switch, you must run a terminal emulator program on the console terminal.

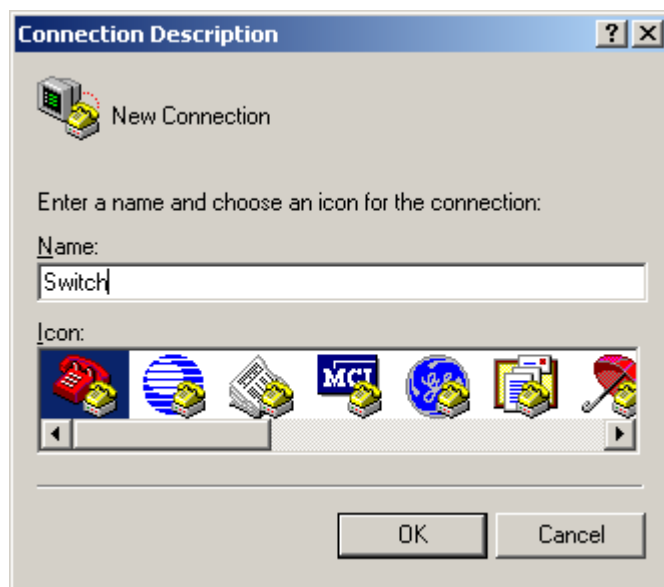
The following are the required terminal settings:

- Bits per second—9,600
- Data bits—8
- Parity—None
- Stop bits—1
- Flow control—None
- Emulation—VT100

To set terminal parameters, for example, on a Windows XP HyperTerminal:

1. Select **Start > All Programs > Accessories > Communications > HyperTerminal**.  
The **Connection Description** dialog box appears.
2. Enter the name of the new connection in the **Name** field and click **OK**.

**Figure 31 Connection description**



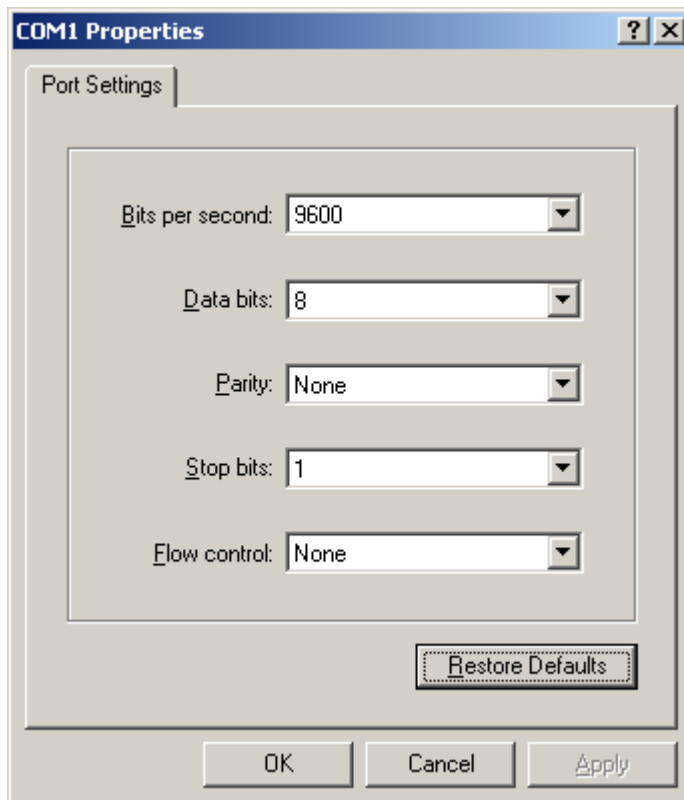
3. Select the serial port to be used from the **Connect using** list, and click **OK**.

**Figure 32 Set the serial port used by the HyperTerminal connection**



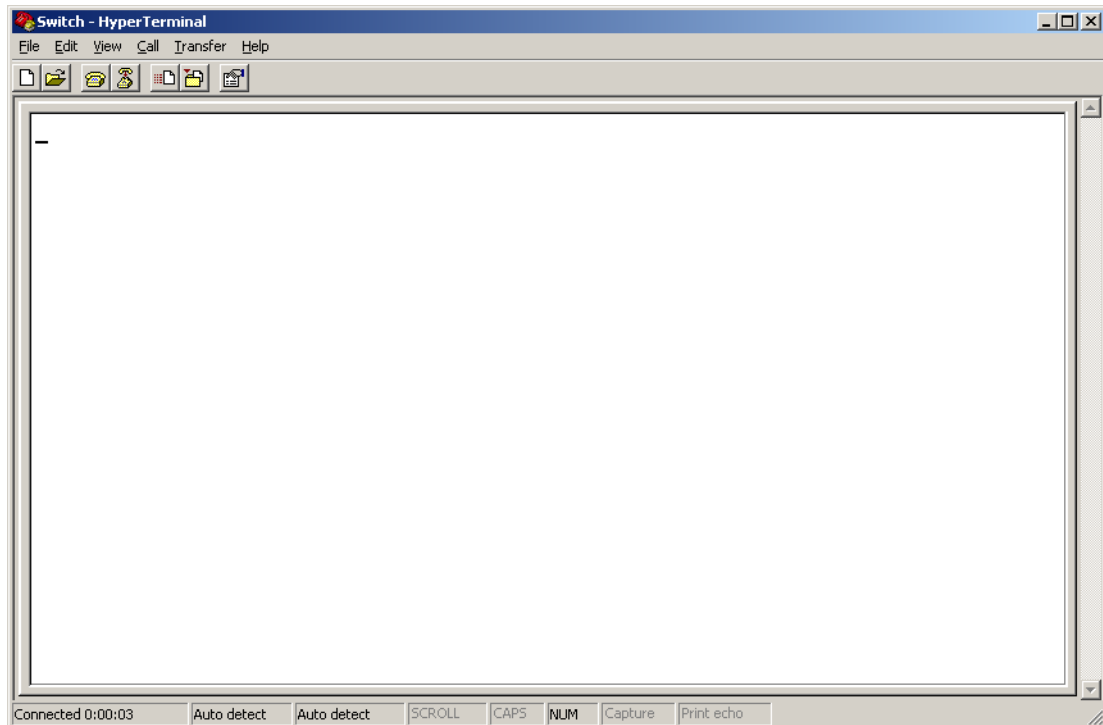
4. Set **Bits per second** to **9600**, **Data bits** to **8**, **Parity** to **None**, **Stop bits** to **1**, and **Flow control** to **None**, and click **OK**.

**Figure 33 Set the serial port parameters**



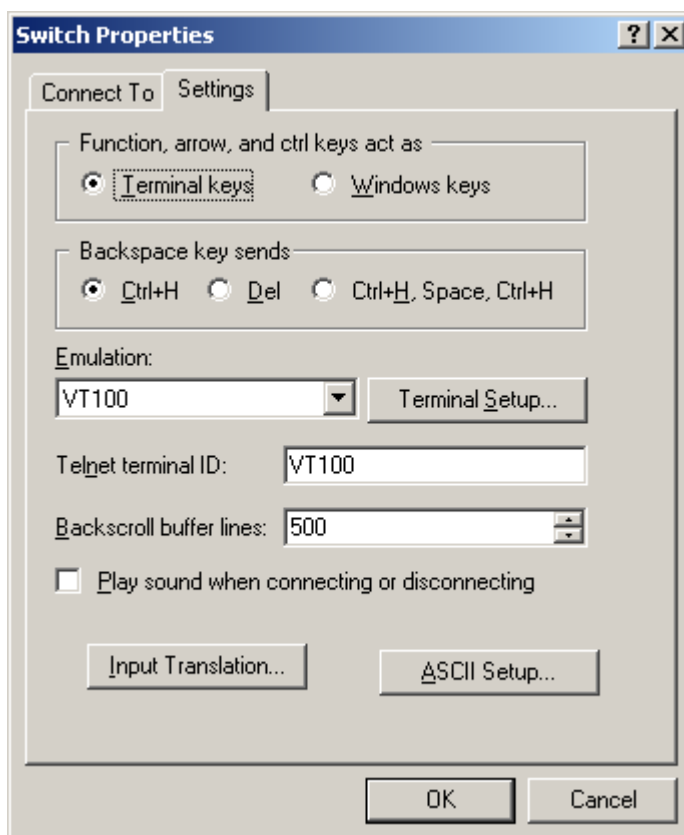
5. Select **File > Properties** in the HyperTerminal window.

Figure 34 HyperTerminal window



6. On the **Settings** tab, set the emulation to **VT100** and click **OK**.

Figure 35 Set terminal emulation in Switch Properties dialog box



# Powering on the switch

## Checking before power-on

Before powering on the switch, verify that:

- The power cord is properly connected.
- The power supply voltage meets the requirement of the switch.
- The console cable is properly connected; the terminal or PC used for configuration has been started; and the configuration parameters have been set.

## Powering on the switch

The 3600 v2 switches have the same Boot ROM display style. This document uses the Boot ROM output on an 3600-48-PoE+ v2 EI switch as an example:

Starting.....

```
*****
*
*          HP 3600-48-PoE+ v2 EI Switch  BOOTROM, Version 105      *
*
*****
```

Copyright (c) 2010-2011 Hewlett-Packard Development Company, L.P.

```
Creation Date       : Jan 13 2011, 16:39:15
CPU Clock Speed    : 600MHz
Memory Size        : 256MB
Flash Size         : 128MB
CPLD Version       : 001
PCB Version        : Ver.B
Mac Address        : 000fe2100000
```

Press Ctrl-B to enter Extended Boot menu...0

Press **Ctrl + B** at the prompt within one second to access the Boot menu, or wait for the system to automatically start up.

---

### NOTE:

- The system has two startup modes: normal startup and fast startup. The normal startup mode requires a little longer time than the fast startup mode because of more self-test operations.
  - By default, the system starts up in fast mode and the waiting time is one second. If you set the startup mode to normal, the waiting time is five seconds. The following section describes the setting of the startup mode.
- 

- If you press **Ctrl + B** within one second, the system displays the following information:

Please input BootRom password:

Enter the Boot ROM password (the initial password is null). Then the system displays the Boot ROM menu.

## BOOT MENU

1. Download application file to flash
2. Select application file to boot
3. Display all files in flash
4. Delete file from flash
5. Modify BootRom password
6. Enter BootRom upgrade menu
7. Skip current system configuration
8. Set BootRom password recovery
9. Set switch startup mode
0. Reboot

Enter your choice(0-9):

**Table 4 Description on the fields**

| Item                                  | Description                                                                                                                                                                                        |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Download application file to flash | Download a software package file to the Flash memory.                                                                                                                                              |
| 2. Select application file to boot    | Select the software package file to boot.                                                                                                                                                          |
| 3. Display all files in flash         | Display all files in the Flash memory                                                                                                                                                              |
| 4. Delete file from flash             | Delete files from the Flash memory                                                                                                                                                                 |
| 5. Modify BootRom password            | Modify the Boot ROM password                                                                                                                                                                       |
| 6. Enter BootRom upgrade menu         | Access the Boot ROM update menu.                                                                                                                                                                   |
| 7. Skip current system configuration  | Start the switch with the factory default configuration. This is a one-time operation and does not take effect at the next reboot. You use this option when you forget the console login password. |
| 8. Set BootRom password recovery      | Disable or enable the Boot ROM password recovery function. By default, Boot ROM recovery is enabled. You can disable this function to protect system security.                                     |
| 9. Set switch startup mode            | Set the startup mode of the switch to normal (full) mode or fast mode, as described in " <a href="#">Changing the startup mode.</a> "                                                              |
| 0. Reboot                             | Restart the switch                                                                                                                                                                                 |

- If you perform no operation or press a key other than **Ctrl + B** within one second, once the remaining waiting time becomes zero, the system begins to automatically start up and the following information is displayed:

```
Starting to get the main application file--flash:/3600_v2.app!.....
.....
.....
....
The main application file is self-decompressing.....
.....
.....
.....
.....
.....
```

```
.....
.....
.....
.....
.....
.....
.....Done!
System is starting...
Startup configuration file does not exist.
It will take a long time to get configuration file, please wait...
Retrieving configuration file failed!
User interface aux0 is available.
```

Press ENTER to get started.

Press **Enter** at the prompt, and you can configure the switch when the prompt <HP> appears.

---

**NOTE:**

When the switch boots for the first time, it automatically obtains the configuration file through the DHCP server. If it fails to obtain the configuration file, it boots with the default configuration.

---

## Changing the startup mode

By default, the system starts up in fast boot mode. To change the boot mode to **normal**, press **Ctrl + B** within one second to enter the Boot ROM menu:

### BOOT MENU

1. Download application file to flash
2. Select application file to boot
3. Display all files in flash
4. Delete file from flash
5. Modify BootRom password
6. Enter BootRom upgrade menu
7. Skip current system configuration
8. Set BootRom password recovery
9. Set switch startup mode
0. Reboot

Enter your choice(0-9):

Enter **9**. The system prompts you to change the startup mode:

The current mode is fast startup mode!

Are you sure you want to change it to full startup mode? Yes or No(Y/N)

Enter **Y**. The system displays the following information:

Setting startup mode...done!

## BOOT MENU

1. Download application file to flash
2. Select application file to boot
3. Display all files in flash
4. Delete file from flash
5. Modify BootRom password
6. Enter BootRom upgrade menu
7. Skip current system configuration
8. Set BootRom password recovery
9. Set switch startup mode
0. Reboot

Enter your choice(0-9):

Enter **0**. The system reboots in normal startup mode and displays the following information:  
Starting.....

```
*****
*
*          HP 3600-48-PoE+ v2 EI Switch  BOOTROM, Version 105          *
*
*****
Copyright (c) 2010-2011 Hewlett-Packard Development Company, L.P.
```

```
Creation Date       : Jan 13 2011, 16:39:15
CPU Clock Speed     : 600MHz
Memory Size        : 256MB
Flash Size         : 128MB
CPLD Version       : 001
PCB Version        : Ver.B
Mac Address        : 000fe2100000
```

Press Ctrl-B to enter Extended Boot menu...0

In normal startup mode, the waiting time is five seconds. If you press **Ctrl + B** within five seconds, the Boot ROM menu is displayed. If you perform no operation or press a key other than **Ctrl + B** within five seconds, the system begins to automatically start up and the following information is displayed:

Starting to get the main application file--flash:/3600\_v2.app!.....

.....  
.....  
....

The main application file is self-decompressing.....

.....  
.....  
.....  
.....  
.....  
.....

```
.....
.....
.....
.....
.....
.....Done!
System is starting...
    Board checking.....LSJ252TPA
    SDRAM fast selftest.....OK!
    Flash fast selftest.....OK!
    CPLD selftest.....OK!
    Switch chip selftest.....OK!
    PHY selftest.....OK!
    Please check leds.....FINISHED!
User interface aux0 is available.
```

Press ENTER to get started.

Press **Enter** at the prompt, and you can configure the switch when the prompt <HP> appears.

---

**NOTE:**

For more information about the configuration commands and command line interface, see the *HP 3600 v2 Switch Series Configuration Guides* and the *HP 3600 v2 Switch Series Command References*.

---

---

# Setting up an IRF fabric

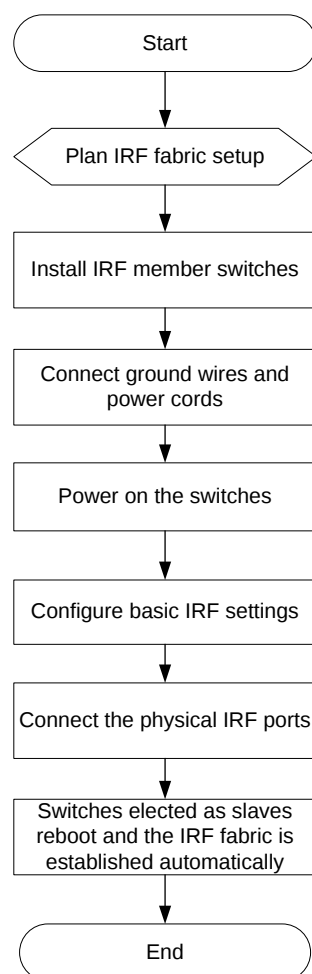
You can use HP Intelligent Resilient Framework (IRF) technology to connect and virtualize 3600 v2 switches into a virtual switch called an “IRF fabric” or “IRF virtual device” for flattened network topology, and high availability, scalability, and manageability.

This chapter includes these sections:

- [IRF fabric setup flowchart](#)
- [Planning IRF fabric setup](#)
- [Configuring basic IRF settings](#)
- [Connecting the physical IRF ports](#)
- [Accessing the IRF fabric to verify the configuration](#)

## IRF fabric setup flowchart

**Figure 36** IRF fabric setup flowchart



Follow these steps to set up an IRF fabric:

| Step                                    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Plan IRF fabric setup                | Plan the installation site and IRF fabric setup parameters. Complete the following tasks: <ul style="list-style-type: none"><li>• <a href="#">Planning IRF fabric size and the installation site</a></li><li>• <a href="#">Identifying the master switch and planning IRF member IDs</a></li><li>• <a href="#">Planning IRF topology and connections</a></li><li>• <a href="#">Identifying physical IRF ports on the member switches</a></li><li>• <a href="#">Planning the cabling scheme</a></li></ul> |
| 2. Install IRF member switches          | See <a href="#">“Installing the switch in a 19-inch rack”</a> or <a href="#">“Mounting the switch on a workbench.”</a>                                                                                                                                                                                                                                                                                                                                                                                   |
| 3. Connect ground wires and power cords | See <a href="#">“Grounding the switch”</a> and <a href="#">“Connecting the power cord.”</a>                                                                                                                                                                                                                                                                                                                                                                                                              |
| 4. Power on the switches                | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 5. Configure basic IRF settings         | For more information about IRF, see the <i>HP 3600 v2 Switch Series IRF Configuration Guide</i> .                                                                                                                                                                                                                                                                                                                                                                                                        |
| 6. Connect the physical IRF ports       | Connect physical IRF ports on switches. Use Ethernet cables, SFP transceiver modules, and fibers to connect ports over a long distance, or use SFP IRF modules to connect ports over a short distance.<br><br>All switches except the master switch automatically reboot, and the IRF fabric is established.                                                                                                                                                                                             |

## Planning IRF fabric setup

### Planning IRF fabric size and the installation site

Choose 3600 v2 switch models and identify the number of required IRF member switches, depending on the user density and upstream bandwidth requirements. The switching capacity of an IRF fabric equals the total switching capacities of all member switches.

Plan the installation site depending on your network solution, as follows:

- Place all IRF member switches in one rack for centralized high-density access.
- Distribute the IRF member switches in different racks for dispersed access.

---

#### NOTE:

An IRF fabric can have up to nine 3600 v2 switches. As your business grows, you can plug an 3600 v2 switch into an IRF fabric to increase the switching capacity without any topology change or replacement.

---

### Identifying the master switch and planning IRF member IDs

Determine which switch you want to use as the master for managing all member switches in the IRF fabric. An IRF fabric has only one master switch. You configure and manage all member switches in the IRF fabric at the command line interface of the master switch.

---

**NOTE:**

IRF member switches will automatically elect a master. You can affect the election result by assigning a high member priority to the intended master switch. For more information about master election, see the *HP 3600 v2 Switch Series IRF Configuration Guide*.

---

Prepare an IRF member ID assignment scheme. An IRF fabric uses member IDs to uniquely identify and manage its members, and you must assign each IRF member switch a unique member ID.

## Planning IRF topology and connections

You can create an IRF fabric in daisy chain topology, or more reliably, ring topology. In ring topology, the failure of one IRF link does not cause the IRF fabric to split as in daisy chain topology. Rather, the IRF fabric changes to a daisy chain topology without interrupting network services.

You connect the IRF member switches through IRF ports. An IRF port is a logical interface for the internal connection between IRF member switches. Each IRF member switch has two IRF ports: IRF-port 1 and IRF-port 2. An IRF port is activated when you bind a physical port to it.

When connecting IRF member switches, you must connect the physical ports of IRF-port1 on one switch to the physical ports of IRF-port2 on its neighbor switch.

The 3600 v2 switches can provide IRF connections through the GE Ethernet ports and GE SFP ports, and you can bind several GE ports to an IRF port for increased bandwidth and availability.

---

**NOTE:**

- Figure 37 and Figure 38 show the topologies for an IRF fabric made up of three 3600-48 v2 SI Switch.
  - The IRF port connections in the two figures are for illustration only, and more connection methods are available.
- 

**Figure 37 IRF fabric in daisy chain topology**

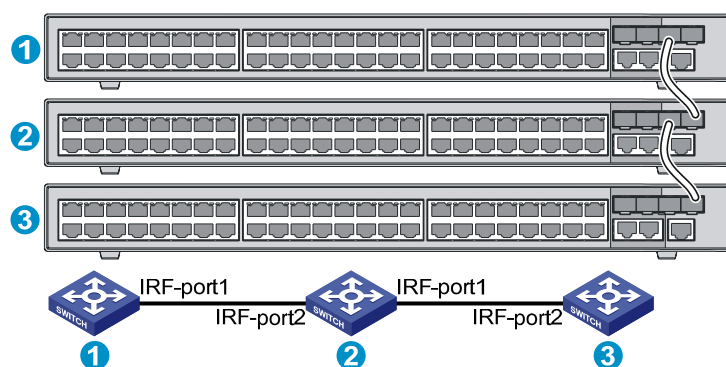
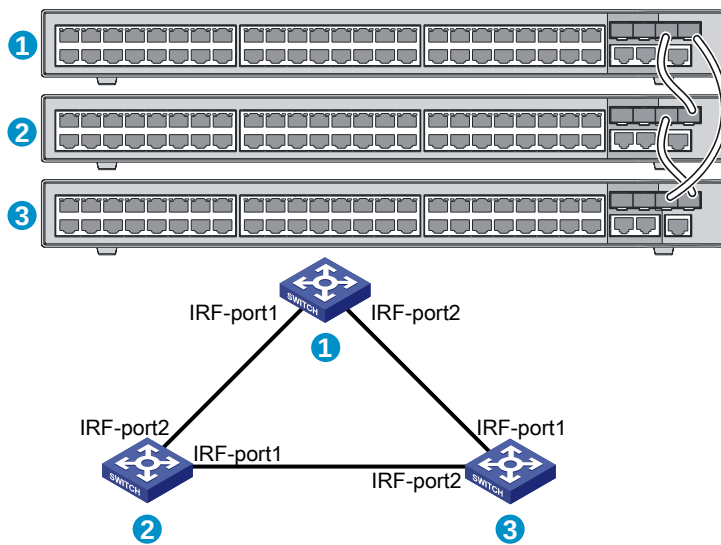


Figure 38 IRF fabric in ring topology



## Identifying physical IRF ports on the member switches

Identify the physical IRF ports on the member switches according to your topology and connection scheme.

When using a combo interface for IRF connection, configure the fiber or copper port of the combo interface as active. For how to configure the combo interface state, see the *HP 3600 v2 Switch Series Layer 2—LAN Switching Configuration Guide*.

## Planning the cabling scheme

Use GE Ethernet twisted pairs, SFP IRF modules or SFP transceiver modules, and fibers to connect the IRF member switches. If the IRF member switches are far away from one another, choose GE Ethernet twisted pairs or the SFP transceiver modules with optical fibers. If the IRF member switches are all in one rack, choose SFP IRF modules.

Table 12 lists the SFP transceiver modules and SFP IRF modules available for IRF connections.

The following subsections describe several IRF connection schemes and use SFP IRF modules or SFP transceiver modules with optical cables for example. All these schemes use a ring topology.

### Connecting the IRF member switches in one rack

---

#### NOTE:

This example uses nine switches.

---

You can connect the IRF member switches in one rack (see Figure 39), and Figure 40 shows the IRF fabric topology.

Figure 39 Connect the IRF member switches in one rack

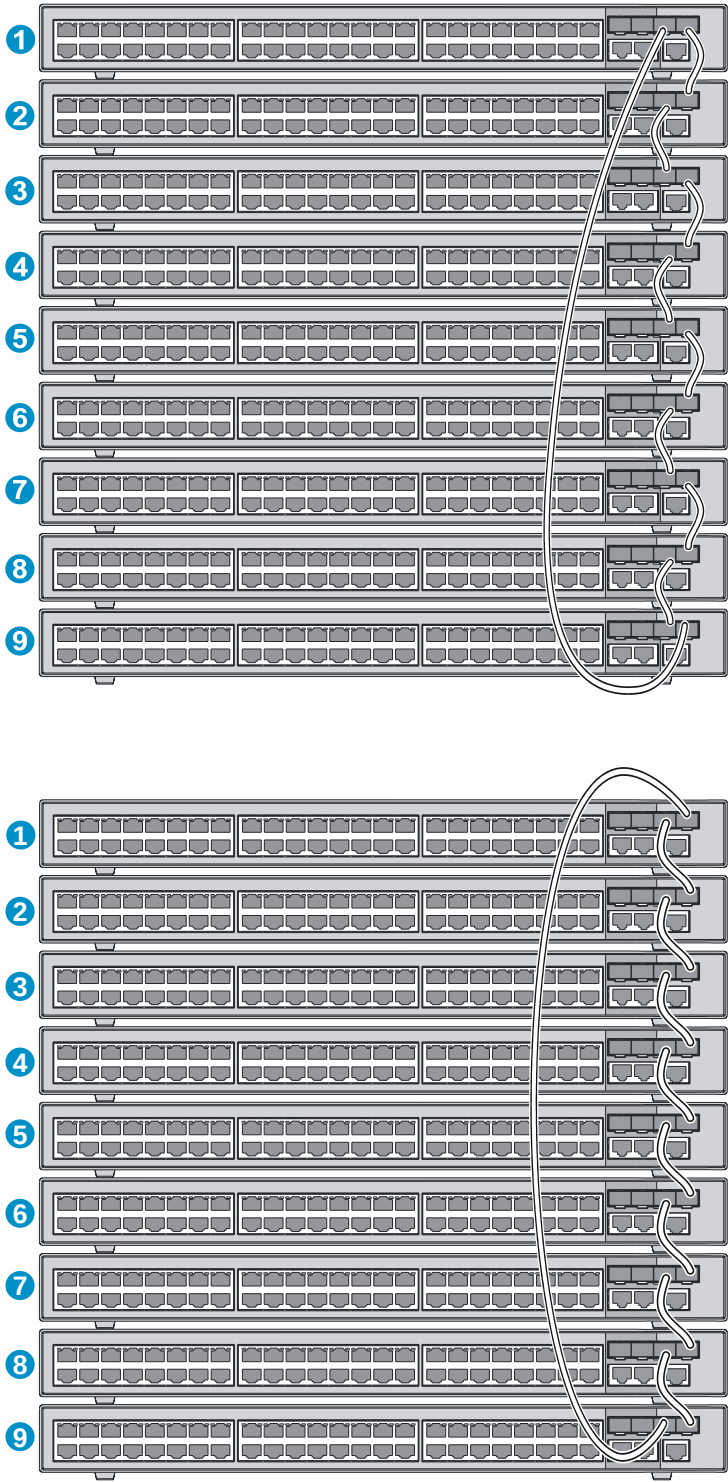
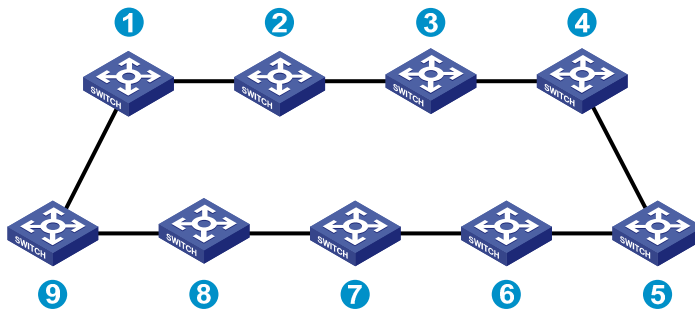


Figure 40 IRF fabric topology



## Connecting the IRF member switches in different racks

---

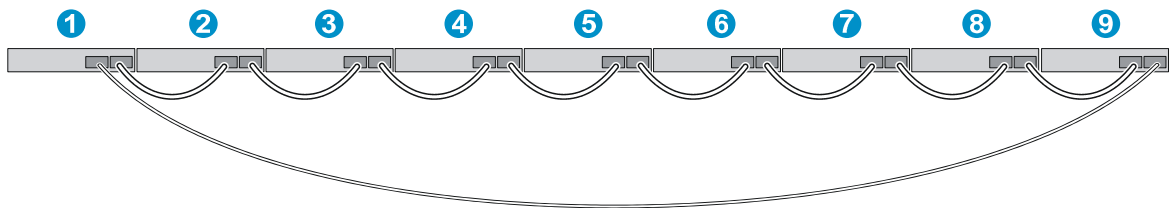
### NOTE:

This example uses nine switches.

---

You can install IRF member switches in different racks side by side. Figure 41 shows an example for connecting nine IRF member switches in different racks, and Figure 40 shows the IRF fabric topology.

Figure 41 Connect the IRF member switches in different racks



## Configuring basic IRF settings

After you install the IRF member switches, power on the switches, and log in to each IRF member switch (see the *HP 3600 v2 Switch Series Fundamentals Configuration Guide*) to configure their member IDs, member priorities, and IRF port bindings.

Follow these guidelines when you configure the switches:

- Assign the master switch higher member priority than any other switch.
- Bind physical ports to IRF port 1 on one switch and to IRF port 2 on the other switch. You perform IRF port binding before or after connecting IRF physical ports depending on the software release.
- Execute the **display irf configuration** command to verify the basic IRF settings.

For more information about configuring basic IRF settings, see the *HP 3600 v2 Switch Series IRF Configuration Guide*.

## Connecting the physical IRF ports

Connect IRF member switches with GE Ethernet cables, SFP IRF modules or SFP transceiver modules, and fibers as planned.

---

**NOTE:**

Wear an ESD-preventive wrist strap when you connect SFP IRF modules or SFP transceiver modules and fibers. For how to connect them, see the *SFP/SFP+/XFP Transceiver Modules Installation Guide*.

---

## Accessing the IRF fabric to verify the configuration

When you are finished configuring basic IRF settings and connecting IRF ports, follow these steps to verify the basic functionality of the IRF fabric:

1. Log in to the IRF fabric through the console port of any member switch.
2. Create a Layer 3 interface, assign it an IP address, and make sure that the IRF fabric and the remote network management station can reach each other.
3. Use Telnet, web or SNMP to access the IRF fabric from the network management station. (See the *HP 3600 v2 Switch Series Fundamentals Configuration Guide*.)
4. Check that you can manage all member switches as if they were one node.
5. Display the running status of the IRF fabric by using the commands in [Table 5](#).

**Table 5 Display and maintain IRF configuration and running status**

| To do ...                                                                 | Use the command...               |
|---------------------------------------------------------------------------|----------------------------------|
| Display information about the IRF fabric                                  | <b>display irf</b>               |
| Display all members' configurations that take effect after switch reboots | <b>display irf configuration</b> |
| Display topology information about the IRF fabric                         | <b>display irf topology</b>      |

---

**NOTE:**

To avoid IP address collision and network problems, configure at least one multi-active detection (MAD) mechanism to detect the presence of multiple identical IRF fabrics and handle collisions. For more information about MAD detection, see the *HP 3600 v2 Switch Series IRF Configuration Guide*.

---

---

# Maintenance and troubleshooting

## Password loss

### Console login password loss

If you forget the console login password, enter the Boot ROM menu:

BOOT MENU

1. Download application file to flash
2. Select application file to boot
3. Display all files in flash
4. Delete file from flash
5. Modify BootRom password
6. Enter BootRom upgrade menu
7. Skip current system configuration
8. Set BootRom password recovery
9. Set switch startup mode
0. Reboot

Enter your choice(0-9):

Enter **7** and restart the switch. The switch reboots with empty configuration, and you can log in through the console port without entering the password to check the configuration file for the user password.

### Boot ROM password loss

Contact your sales agent for help.

## Power system failure

The 3600 v2 Switch Series (except the 3600-24 v2 SI Switch and 3600-48 v2 SI Switch) provides two fixed power inputs. You can use both of the power inputs for redundancy or one power input, as needed.

- The 3600-24 v2 SI Switch and 3600-48 v2 SI Switch support only AC power supply.
- Other models support AC power supply, DC power supply, or both.

The switch uses the system status LED (PWR) on the front panel and the DC power status LED (RPS) to show how the power system of the switch is operating.

**Table 6 3600 v2 Switch Series power status LED description**

| LED               | LED mark | Status | Description                      |
|-------------------|----------|--------|----------------------------------|
| System status LED | PWR      | Off    | The switch has been powered off. |

| LED                 | LED mark | Status        | Description                                                                                 |
|---------------------|----------|---------------|---------------------------------------------------------------------------------------------|
| DC power status LED | RPS      | Steady yellow | The DC input is normal, and the AC power receptacle has an input error or is not connected. |
|                     |          | Off           | No DC power input                                                                           |

### AC or RPS input

If your switch is AC powered or DC powered, look at the system status LED to identify a power failure. If the system status LED is off, a power supply failure has occurred. Check the following items:

- The power cord is well connected to the switch, and the AC or DC receptacle on the switch and the AC or DC power receptacle are normal.
- The external AC power supply system, -48 VDC power source in the equipment room, or RPS power supply system are operating properly.
- The operating temperature of the switch is normal, and the power module has good ventilation (over-temperature can cause a power module to stop working and enter the protection state).

### Concurrent AC and RPS inputs

If your switch adopts both AC and DC power supplies, check the status of each input by referring to the PWR LED and RPS LED. If the switch is concurrently powered by an AC and a DC power supply, look at the system status LED and DC status LED to identify an AC or DC input failure.

1. The system LED is off, the AC power supply and the DC power supply both have an input failure.

Check the following items:

- The power cord is correctly connected, the AC or DC power receptacle of the switch is operational, and the power socket is normal.
  - The external AC/-48 VDC/RPS power supply system is operating properly.
  - The switch is well connected to the external power system.
  - The operating temperature of the switch is normal, and the power module has good ventilation (over-temperature can cause the power module to stop working and enter the protection state).
2. The system status LED is on but the RPS status LED is steady yellow, an AC input failure has occurred.

Check the following items:

- The AC power cord is well connected to the switch, and the AC receptacle on the switch and the AC power receptacle are normal.
  - The AC external power supply system is normal.
3. If the system status LED is on but the RPS status LED is off, an RPS input failure has occurred.

Check the following items:

- The power cord is correctly connected, the DC power receptacle of the switch is operational, and the power socket is normal.
- The external -48 VDC/RPS power supply system is operating properly.
- The switch is well connected to the external power supply.

---

**NOTE:**

If the problem persists, contact the HP technical support for help.

---

## Fan failure

You can look at the system status LED and the seven-segment LED of an 3600 v2 switch to identify a fan failure. If both LEDs are behaving as described in [Table 7](#), a fan failure occurs.

**Table 7 LED behaviors for fan failure**

| LED               | Mark | State                                                                                                                           |
|-------------------|------|---------------------------------------------------------------------------------------------------------------------------------|
| System status LED | PWR  | Steady red                                                                                                                      |
| Seven-segment LED | Unit | The LED displays <b>F</b> for fan failure.<br> |

The 3600 v2 Switch Series uses fixed fans. If a fixed fan failure occurs, you cannot solve the problem yourself. Contact your sales agent or service engineer.

---

**NOTE:**

To ensure the normal operation of the switch, contact the local sales agent or service engineer as soon as possible when a fixed fan failure occurs.

---

## Configuration terminal problems

If the configuration environment setup is correct, the configuration terminal displays booting information when the switch is powered on. If the setup is incorrect, the configuration terminal would display nothing or garbled text.

### No terminal display

If the configuration terminal displays nothing when the switch is powered on, check that:

- The power supply is normal.
- The console cable is properly connected.
- The console cable has no problem and the terminal settings are correct.

### Garbled terminal display

If terminal display is garbled, check that the following settings are configured for the terminal, for example, HyperTerminal:

- Baud rate—9,600
- Data bits—8
- Parity—none
- Stop bits—1
- Flow control—none

- Emulation—VT100

# Appendix A Technical specifications

## Physical specifications

### Chassis dimensions and weights

| Chassis                   | Dimensions (H × W × D)                        | Weight             |
|---------------------------|-----------------------------------------------|--------------------|
| 3600-24 v2 EI Switch      | 43.6 × 440 × 260 mm (1.72 × 17.32 × 10.24 in) | < 5 kg (11.02 lb)  |
| 3600-48 v2 EI Switch      | 43.6 × 440 × 260 mm (1.72 × 17.32 × 10.24 in) | < 5 kg (11.02 lb)  |
| 3600-24-SFP v2 EI Switch  | 43.6 × 440 × 260 mm (1.72 × 17.32 × 10.24 in) | < 5 kg (11.02 lb)  |
| 3600-24-PoE+ v2 EI Switch | 43.6 × 440 × 420 mm (1.72 × 17.32 × 16.54 in) | < 10 kg (22.05 lb) |
| 3600-48-PoE+ v2 EI Switch | 43.6 × 440 × 420 mm (1.72 × 17.32 × 16.54 in) | < 10 kg (22.05 lb) |
| 3600-24 v2 SI Switch      | 43.6 × 440 × 260 mm (1.72 × 17.32 × 10.24 in) | < 5 kg (11.02 lb)  |
| 3600-48 v2 SI Switch      | 43.6 × 440 × 260 mm (1.72 × 17.32 × 10.24 in) | < 5 kg (11.02 lb)  |
| 3600-24-PoE+ v2 SI Switch | 43.6 × 440 × 420 mm (1.72 × 17.32 × 16.54 in) | < 10 kg (22.05 lb) |
| 3600-48-PoE+ v2 SI Switch | 43.6 × 440 × 420 mm (1.72 × 17.32 × 16.54 in) | < 10 kg (22.05 lb) |

## Ports

| Item                         | 3600-24 v2 EI Switch | 3600-48 v2 EI Switch | 3600-24-SFP v2 EI Switch | 3600-24 v2 SI Switch | 3600-48 v2 SI Switch | 3600-24-PoE+ v2 EI Switch/<br>3600-24-PoE+ v2 SI Switch | 3600-48-PoE+ v2 EI Switch/<br>3600-48-PoE+ v2 SI Switch |
|------------------------------|----------------------|----------------------|--------------------------|----------------------|----------------------|---------------------------------------------------------|---------------------------------------------------------|
| Console ports                | 1, front panel       | 1, front panel       | 1, front panel           | 1, front panel       | 1, front panel       | 1, front panel                                          | 1, front panel                                          |
| 10/100Base-TX Ethernet ports | 24                   | 48                   | N/A                      | 24                   | 48                   | 24, PoE                                                 | 48, PoE                                                 |
| 1000Base-T Ethernet ports    | 2                    | 2                    | 2                        | 2                    | 2                    | 2                                                       | 2                                                       |

| Item                 | 3600-24 v2 EI Switch                                                       | 3600-48 v2 EI Switch                                                       | 3600-24-SFP v2 EI Switch                                                   | 3600-24 v2 SI Switch                                                       | 3600-48 v2 SI Switch                                                       | 3600-24-PoE+ v2 EI Switch/<br>3600-24-PoE+ v2 SI Switch                    | 3600-48-PoE+ v2 EI Switch/<br>3600-48-PoE+ v2 SI Switch                    |
|----------------------|----------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------------------------------------------------------------|
| 100Base-X SFP ports  | N/A                                                                        | N/A                                                                        | 24                                                                         | N/A                                                                        | N/A                                                                        | N/A                                                                        | N/A                                                                        |
| 1000Base-X SFP ports | 4, including 2 combo fiber ports paired with two 1000Base-T Ethernet ports | 4, including 2 combo fiber ports paired with two 1000Base-T Ethernet ports | 4, including 2 combo fiber ports paired with two 1000Base-T Ethernet ports | 4, including 2 combo fiber ports paired with two 1000Base-T Ethernet ports | 4, including 2 combo fiber ports paired with two 1000Base-T Ethernet ports | 4, including 2 combo fiber ports paired with two 1000Base-T Ethernet ports | 4, including 2 combo fiber ports paired with two 1000Base-T Ethernet ports |

## Environmental specifications

| Chassis     | Operating temperature       | Relative humidity        | Fire resistance compliance               |
|-------------|-----------------------------|--------------------------|------------------------------------------|
| All chassis | 0°C to 50°C (32°F to 122°F) | 5% to 95%, noncondensing | UL60950-1, EN60950-1, IEC60950-1, GB4943 |

## Power specifications

### AC-input power specifications

| Chassis                  | AC-input voltage                                                                                    | Min power consumption | Max power consumption |
|--------------------------|-----------------------------------------------------------------------------------------------------|-----------------------|-----------------------|
| 3600-24 v2 EI Switch     | Rated voltage:<br>100 VAC to 240 VAC, 50 or 60 Hz<br>Max voltage:<br>90 VAC to 264 VAC, 47 or 63 Hz | 22 W                  | 31 W                  |
| 3600-48 v2 EI Switch     | Rated voltage:<br>100 VAC to 240 VAC, 50 or 60 Hz<br>Max voltage:<br>90 VAC to 264 VAC, 47 or 63 Hz | 32 W                  | 43 W                  |
| 3600-24-SFP v2 EI Switch | Rated voltage:<br>100 VAC to 240 VAC, 50 or 60 Hz<br>Max voltage:<br>90 VAC to 264 VAC, 47 or 63 Hz | 26 W                  | 60 W                  |

| Chassis                   | AC-input voltage                                                                                    | Min power consumption | Max power consumption        |
|---------------------------|-----------------------------------------------------------------------------------------------------|-----------------------|------------------------------|
| 3600-24-PoE+ v2 EI Switch | Rated voltage:<br>100 VAC to 240 VAC, 50 or 60 Hz<br>Max voltage:<br>90 VAC to 264 VAC, 47 or 63 Hz | 33 W                  | 465 W (370 W for PoE output) |
| 3600-48-PoE+ v2 EI Switch | Rated voltage:<br>100 VAC to 240 VAC, 50 or 60 Hz<br>Max voltage:<br>90 VAC to 264 VAC, 47 or 63 Hz | 44 W                  | 440 W (320 W for PoE output) |
| 3600-24 v2 SI Switch      | Rated voltage:<br>100 VAC to 240 VAC, 50 or 60 Hz<br>Max voltage:<br>90 VAC to 264 VAC, 47 or 63 Hz | 17 W                  | 26 W                         |
| 3600-48 v2 SI Switch      | Rated voltage:<br>100 VAC to 240 VAC, 50 or 60 Hz<br>Max voltage:<br>90 VAC to 264 VAC, 47 or 63 Hz | 30 W                  | 41 W                         |
| 3600-24-PoE+ v2 SI Switch | Rated voltage:<br>100 VAC to 240 VAC, 50 or 60 Hz<br>Max voltage:<br>90 VAC to 264 VAC, 47 or 63 Hz | 33 W                  | 465 W (370 W for PoE output) |
| 3600-48-PoE+ v2 SI Switch | Rated voltage:<br>100 VAC to 240 VAC, 50 or 60 Hz<br>Max voltage:<br>90 VAC to 264 VAC, 47 or 63 Hz | 44 W                  | 440 W (320 W for PoE output) |

## DC-input power specifications

| Chassis                  | DC-input rated voltage                                                     | Min power consumption | Max power consumption |
|--------------------------|----------------------------------------------------------------------------|-----------------------|-----------------------|
| 3600-24 v2 EI Switch     | Rated voltage:<br>–48 VDC to –60 VDC<br>Max voltage:<br>–36 VDC to –72 VDC | 22 W                  | 31 W                  |
| 3600-48 v2 EI Switch     | Rated voltage:<br>–48 VDC to –60 VDC<br>Max voltage:<br>–36 VDC to –72 VDC | 32 W                  | 43 W                  |
| 3600-24-SFP v2 EI Switch | Rated voltage:<br>–48 VDC to –60 VDC<br>Max voltage:<br>–36 VDC to –72 VDC | 26 W                  | 60 W                  |

## RPS DC-input power specifications

| Chassis                   | DC-input rated voltage | Min power consumption | Max power consumption        |
|---------------------------|------------------------|-----------------------|------------------------------|
| 3600-24-PoE+ v2 EI Switch | –54 VDC to –57 VDC     | 33 W                  | 795 W (720 W for PoE output) |
| 3600-48-PoE+ v2 EI Switch | –54 VDC to –57 VDC     | 44 W                  | 820 W (720 W for PoE output) |
| 3600-24-PoE+ v2 SI Switch | –54 VDC to –57 VDC     | 33 W                  | 795 W (720 W for PoE output) |
| 3600-48-PoE+ v2 SI Switch | –54 VDC to –57 VDC     | 44 W                  | 820 W (720 W for PoE output) |

---

# Appendix B Ports and LEDs

## Ports

### Console port

Every 3600 v2 switch provides one console port on the front panel.

**Table 8 Console port specifications**

| Item                   | Specification                                                                                                                                                                                                                       |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connector type         | RJ-45                                                                                                                                                                                                                               |
| Compliant standard     | EIA/TIA-232                                                                                                                                                                                                                         |
| Transmission baud rate | 9600 bps (default) to 115200 bps                                                                                                                                                                                                    |
| Services               | <ul style="list-style-type: none"><li>• Provides connection to an ASCII terminal.</li><li>• Provides connection to the serial port of a local or remote (through a pair of modems) PC running terminal emulation program.</li></ul> |

### 10/100Base-TX Ethernet port

**Table 9 10/100Base-TX Ethernet port specifications**

| Item                      | Specification                                                                                                                                                   |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connector type            | RJ-45                                                                                                                                                           |
| Interface attributes      | <ul style="list-style-type: none"><li>• 10 Mbps, half duplex/full duplex</li><li>• 100Mbps, half duplex/full duplex</li><li>• MDI/MDI-X, auto-sensing</li></ul> |
| Max transmission distance | 100 m (328.1 ft)                                                                                                                                                |
| Transmission medium       | Category-5 (or above) twisted pair cable                                                                                                                        |
| Standards                 | IEEE 802.3u                                                                                                                                                     |

### 1000Base-T Ethernet port

**Table 10 1000Base-T Ethernet port specifications**

| Item | Specification |
|------|---------------|
|------|---------------|

| Item                      | Specification                                                                                                |
|---------------------------|--------------------------------------------------------------------------------------------------------------|
| Connector type            | RJ-45                                                                                                        |
| Interface attributes      | <ul style="list-style-type: none"> <li>• 1000Mbps, full duplex</li> <li>• MDI/MDI-X, auto-sensing</li> </ul> |
| Max transmission distance | 100 m (328.1 ft)                                                                                             |
| Transmission medium       | Category-5 (or above) twisted pair cable                                                                     |
| Standards                 | IEEE 802.3u                                                                                                  |

## 100Base-X SFP port

The 3600-24-SFP v2 EI Switch provides 24 100Base-X SFP ports, and you can install the 100 Mbps SFP transceiver modules in [Table 11](#) in the ports.

**Table 11 100 Mbps SFP transceiver modules available for the 3600 v2 Switch Series**

| Product code | Module description                      | Central wavelength (in nm) | Fiber diameter (in $\mu\text{m}$ ) | Max transmission distance |
|--------------|-----------------------------------------|----------------------------|------------------------------------|---------------------------|
| JD102B       | HP X110 100M SFP LC FX transceiver      | 1310                       | 62.5/125                           | 2 km (1.24 miles)         |
| JD120B       | HP X110 100M SFP LC LX transceiver      | 1310                       | 9/125                              | 15 km (9.32 miles)        |
| JD090A       | HP X110 100M SFP LC LH40 transceiver    | 1310                       | 9/125                              | 40 km (24.86 miles)       |
| JD091A       | HP X110 100M SFP LC LH80 transceiver    | 1550                       | 9/125                              | 80 km (49.71 miles)       |
| JD100A       | HP X115 100M SFP LC BX 10-U transceiver | TX: 1310<br>RX: 1550       | 9/125                              | 15 km (9.32 miles)        |
| JD101A       | HP X115 100M SFP LC BX 10-D transceiver | TX: 1550<br>RX: 1310       | 9/125                              | 15 km (9.32 miles)        |

### **IMPORTANT:**

You must use the HP X115 100M SFP LC BX 10-U transceiver (JD100A) and the HP X115 100M SFP LC BX 10-D transceiver (JD101A) in pairs.

## 1000Base-X SFP port

Every 3600 v2 switch has four 1000Base-X SFP ports, including two combo ports paired with two 1000Base-T Ethernet ports, on the front panel. [Table 12](#) lists the 1000Base-X SFP transceiver modules available for the 3600 v2 Switch Series.

**Table 12 1000Base-X SFP transceiver modules available for the 3600 v2 Switch Series**

| Product Code | Module description                        | Central wavelength (in nm) | Cable/fiber diameter (in $\mu\text{m}$ ) | Multimode fiber modal bandwidth (MHz $\times$ km) | Max transmission distance |
|--------------|-------------------------------------------|----------------------------|------------------------------------------|---------------------------------------------------|---------------------------|
| JD118B       | HP X120 1G SFP LC SX transceiver          | 850                        | 50/125                                   | 500                                               | 550 m (1804.46 ft)        |
|              |                                           |                            |                                          | 400                                               | 500 m (1640.42 ft)        |
|              |                                           |                            | 62.5/125                                 | 200                                               | 275 m (902.23 ft)         |
|              |                                           |                            |                                          | 160                                               | 220 m (721.78 ft)         |
| JD119B       | HP X120 1G SFP LC LX transceiver          | 1310                       | 9/125                                    | N/A                                               | 10 km (6.21 miles)        |
| JD061A       | HP X125 1G SFP LC LH40 1310nm transceiver | 1310                       | 9/125                                    | N/A                                               | 40 km (24.86 miles)       |
| JD062A       | HP X120 1G SFP LC LH40 1550nm transceiver | 1550                       | 9/125                                    | N/A                                               | 40 km (24.86 miles)       |
| JD063B       | HP X125 1G SFP LC LH70 Transceiver        | 1550                       | 9/125                                    | N/A                                               | 70 km (43.50 miles)       |
| JD098B       | HP X120 1G SFP LC BX 10-U transceiver     | TX: 1310<br>RX: 1490       | 9/125                                    | N/A                                               | 10 km (6.21 miles)        |
| JD099B       | HP X120 1G SFP LC BX 10-D transceiver     | TX: 1490<br>RX: 1310       | 9/125                                    | N/A                                               | 10 km (6.21 miles)        |
| JD324A       | HP 3600 Switch SFP Stacking Kit           | N/A                        | UTP/STP                                  | N/A                                               | 1.5 m (4.92 ft.)          |
| JD089B       | HP X120 1G SFP RJ45 T Transceiver         | N/A                        | Category-5 twisted pair                  | N/A                                               | 100 m (328.08 ft)         |

**! IMPORTANT:**

You must use the HP X120 1G SFP LC BX 10-U transceiver (JD098B) and the HP X120 1G SFP LC BX 10-D transceiver (JD099B) in pairs.

**NOTE:**

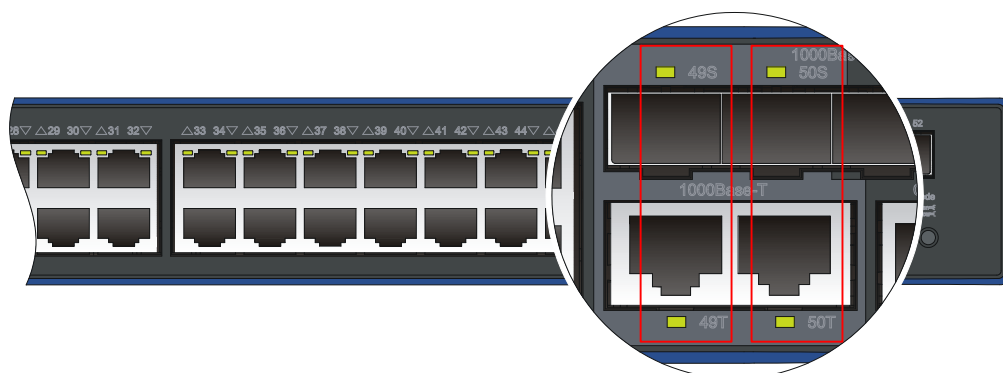
- To guarantee the functionality of the SFP ports, always use HP SFP transceiver modules on the HP 3600 v2 Switch Series.
- The SFP transceiver modules available for this switch series are subject to change over time. For the most up-to-date list of SFP transceiver modules, consult your HP sales representative or technical support engineer.
- For the SFP transceiver module specifications, see the *HP A-Series Switches Transceiver Modules User Guide*.
- For how to install or remove an SFP module, see the *SFP/SFP+/XFP Transceiver Modules Installation Guide*.

## Combo interface

A combo interface has one fiber SFP port and one 1000Base-T copper Ethernet port. These two ports share one port number and cannot work simultaneously. When you activate one port, the other port automatically shuts down.

On the front panel of an 3600 v2 switch, the copper combo ports are marked in the *port number + T* format, and the fiber SFP combo ports are marked in the *port number + S* format. Figure 42 uses the 3600-48 v2 SI Switch front panel as an example.

**Figure 42 Identify the combo ports on the 3600-48 v2 SI Switch front panel**



## LEDs

**Table 13 LEDs at a glance**

| LED                             | Availability                                                               |
|---------------------------------|----------------------------------------------------------------------------|
| System status LED               | Entire series                                                              |
| DC power LED                    | PoE-capable 3600 v2 SI switches (model suffix PWR-SI), 3600 v2 EI switches |
| Port mode LED                   | Entire series                                                              |
| Seven-segment LED               | Entire series                                                              |
| 10/100Base-TX Ethernet port LED | Entire series                                                              |
| 1000Base-T Ethernet port LED    | Entire series                                                              |
| 100Base-X SFP port LED          | 3600-24-SFP v2 EI Switch                                                   |
| 1000Base-X SFP port LED         | Entire series                                                              |

## System status LED

The system status LED shows the operating status of the switch.

**Table 14 System status LED description**

| LED | Status                 | Description                                         |
|-----|------------------------|-----------------------------------------------------|
| PWR | Steady green           | The switch is operating properly.                   |
|     | Flashing green (1 Hz)  | The switch is performing power-on self test (POST). |
|     | Steady red             | POST has failed.                                    |
|     | Flashing yellow (1 Hz) | Some ports have failed to pass POST.                |
|     | Off                    | The switch is powered off.                          |

## DC power LED

### NOTE:

This LED is not available on the 3600-24 v2 SI Switch and 3600-48 v2 SI Switch switches.

The DC power LED shows the DC power and AC power supplying status.

**Table 15 DC power LED description**

| LED | Status        | Description                                                                                                  |
|-----|---------------|--------------------------------------------------------------------------------------------------------------|
| RPS | Steady green  | Both DC power input and AC power input are normal.                                                           |
|     | Steady yellow | DC power input is normal but AC power input is experiencing a problem or disconnected from the power source. |
|     | Off           | The DC input is not connected.                                                                               |

## Port mode LED

The port mode LED indicates the type of information that the port LEDs are showing.

You can use the port LED mode switching button to change the type of displayed port information.

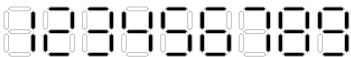
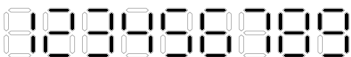
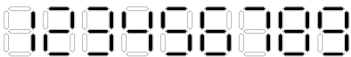
**Table 16 Port mode LED description**

| LED  | Status                                                  | Description                                                            |
|------|---------------------------------------------------------|------------------------------------------------------------------------|
| Mode | Steady green                                            | The port LEDs are showing port rates.                                  |
|      | Flashing green (1 Hz) (available only for PoE switches) | The port LEDs are showing the status of PoE power supply on the ports. |
|      | Steady yellow                                           | The port LEDs are showing duplex modes.                                |

## Seven-segment LED

The seven-segment LED, together with the system status LED, shows detailed system operating information (see [Table 17](#)).

**Table 17 Seven-segment LED description (I)**

| LED  | Status                  |                                                                                                                                             | Description                                                          |
|------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
|      | System status LED (SYS) | Seven-segment (Unit) LED                                                                                                                    |                                                                      |
| Unit | Flashing green          | <p>The LED displays numbers one by one.</p>                | POST is running, and the LED displays the ongoing test item ID.      |
|      | Flashing red            | <p>The LED displays flashing numbers.</p>                  | POST has failed, and the LED flashes the ID of the failed test item. |
|      | Flashing green          | <p>A bar rotates clockwise around the LED.</p>             | Software is loading.                                                 |
|      | Steady red              | <p>The LED displays a flashing <b>F</b> character.</p>     | The switch is experiencing a fan failure.                            |
|      | Steady red              | <p>The LED displays a flashing <b>t</b> character.</p>   | The switch is in an over-temperature condition.                      |
|      |                         | <p>The LED displays a capital <b>C</b> character.</p>    | The switch is the command switch in a cluster.                       |
|      | Steady green            | <p>The LED displays an <b>S</b> character.</p>           | The switch is a member switch in a cluster.                          |
|      |                         | <p>The LED displays a lowercase <b>c</b> character.</p>  | The switch is a candidate switch for a cluster.                      |
|      |                         | <p>The LED displays a number.</p>                        | The member ID of the switch.                                         |

On the 3600-24-PoE+ v2 EI Switch, 3600-48-PoE+ v2 EI Switch, 3600-24-PoE+ v2 SI Switch or 3600-48-PoE+ v2 SI Switch, the seven-segment LED can also show the total PoE output power as a percentage of the maximum PoE output power that the switch can supply (see [Table 18](#)).

**Table 18 Seven-segment LED description (II)**

| LED  | Status                           |                   |                                                                                                                             | Description                                                                                                                                                                                        |
|------|----------------------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | Port mode LED                    | System status LED | Seven-segment (Unit) LED                                                                                                    |                                                                                                                                                                                                    |
| Unit | Flashing green (1 Hz) (PoE mode) | Steady green      | <p>The LED displays different signs.</p>  | <p>For example, the  sign indicates that the switch is outputting 0 to 20% of the maximum PoE output power.</p> |

## 10/100Base-TX Ethernet port LED

Each 10/100Base-TX auto-sensing Ethernet port has a status LED to show port operating status and activities. The port mode LED shows the type of port status information (for example, port rate or duplex mode) that the port status LEDs are showing. You can use the port status LED mode switching button to change the type of displayed port information.

**Table 19 10/100Base-TX auto-sensing Ethernet port LED description**

| Status                                                            |                        | Description                                                                                                                 |
|-------------------------------------------------------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Port mode LED                                                     | Port status LED        |                                                                                                                             |
| Steady green (rate mode)                                          | Steady green           | The port is operating at 100 Mbps. The port status LED fast flashes when the port is sending or receiving data.             |
|                                                                   | Steady yellow          | The port is operating at 10 Mbps. The port status LED fast flashes when the port is sending or receiving data.              |
|                                                                   | Flashing yellow (3 Hz) | POST has failed on the port.                                                                                                |
|                                                                   | Off                    | No link is present on the port.                                                                                             |
| Flashing green (1 Hz) (PoE mode, available only for PoE switches) | Steady green           | PoE power supply is normal.                                                                                                 |
|                                                                   | Flashing green (1 Hz)  | The device attached to the port requires power higher than the maximum or currently available PoE output power on the port. |
|                                                                   | Steady yellow          | The port is not outputting power because it is connected to a non-PD device.<br>The port is experiencing a PoE failure.     |
|                                                                   | Flashing yellow (3 Hz) | POST has failed on the port.                                                                                                |
|                                                                   | Off                    | The port is not supplying PoE power.                                                                                        |
| Steady yellow (duplex mode)                                       | Steady green           | The port is operating in full duplex mode. The port status LED fast flashes when the port is sending or receiving data.     |
|                                                                   | Steady yellow          | The port is operating in half duplex mode. The port status LED fast flashes when the port is sending or receiving data.     |
|                                                                   | Flashing yellow (3 Hz) | POST has failed on the port.                                                                                                |
|                                                                   | Off                    | No link is present on the port.                                                                                             |

## 1000Base-T Ethernet port LED

The 1000Base-T Ethernet ports are PoE incapable and work only at 1000 Mbps in full duplex mode. Their port LEDs are irrelevant to the port mode LED.

**Table 20 1000Base-T Ethernet port LED description**

| Port status LED        | Description                                                                                                                   |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Steady green           | The port is operating at 1000 Mbps in full duplex mode. The port LED fast flashes when the port is sending or receiving data. |
| Flashing yellow (3 Hz) | POST has failed on the port.                                                                                                  |
| Off                    | No link is present on the port.                                                                                               |

## 100Base-X SFP port LED

Each 100Base-X SFP port has a status LED to show port operating status and activities. The port mode LED shows the type of port status information (for example, port rate or duplex mode) that the port status LEDs are showing. You can use the port status LED mode switching button to change the type of displayed port information.

**Table 21 100Base-X SFP port LED description**

| Status                      |                        | Description                                                                                                             |
|-----------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Port mode LED               | Port status LED        |                                                                                                                         |
| Steady green (rate mode)    | Steady green           | The port is operating at 100 Mbps. The port status LED fast flashes when the port is sending or receiving data.         |
|                             | Flashing yellow (3 Hz) | POST has failed on the port.                                                                                            |
|                             | Off                    | No link is present on the port.                                                                                         |
| Steady yellow (duplex mode) | Steady green           | The port is operating in full duplex mode. The port status LED fast flashes when the port is sending or receiving data. |
|                             | Flashing yellow (3 Hz) | POST has failed on the port.                                                                                            |
|                             | Off                    | No link is present on the port.                                                                                         |

## 1000Base-X SFP port LED

Each 1000Base-X SFP port has a status LED to show port operating status and activities. The port mode LED shows the type of port status information (for example, port rate or duplex mode) that the port status LEDs are showing. You can use the port status LED mode switching button to change the type of displayed port information.

**Table 22 1000Base-X SFP port LED description**

| <b>Status</b>               |                        | <b>Description</b>                                                                                                      |
|-----------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Port mode LED</b>        | <b>Port status LED</b> |                                                                                                                         |
| Steady green (rate mode)    | Steady green           | The port is operating at 1000 Mbps. The port status LED fast flashes when the port is sending or receiving data.        |
|                             | Flashing yellow (3 Hz) | POST has failed on the port.                                                                                            |
|                             | Off                    | No link is present on the port.                                                                                         |
| Steady yellow (duplex mode) | Steady green           | The port is operating in full duplex mode. The port status LED fast flashes when the port is sending or receiving data. |
|                             | Flashing yellow (3 Hz) | POST has failed on the port.                                                                                            |
|                             | Off                    | No link is present on the port.                                                                                         |

---

# Support and other resources

## Contacting HP

For worldwide technical support information, see the HP support website:

<http://www.hp.com/support>

Before contacting HP, collect the following information:

- Product model names and numbers
- Technical support registration number (if applicable)
- Product serial numbers
- Error messages
- Operating system type and revision level
- Detailed questions

## Subscription service

HP recommends that you register your product at the Subscriber's Choice for Business website:

<http://www.hp.com/go/wwalerts>

After registering, you will receive email notification of product enhancements, new driver versions, firmware updates, and other product resources.

## Related information

### Documents

To find related documents, browse to the Manuals page of the HP Business Support Center website:

<http://www.hp.com/support/manuals>

- For related documentation, navigate to the Networking section, and select a networking category.
- For a complete list of acronyms and their definitions, see *HP FlexNetwork Technology Acronyms*.

### Websites

- HP.com <http://www.hp.com>
- HP Networking <http://www.hp.com/go/networking>

- HP manuals <http://www.hp.com/support/manuals>
- HP download drivers and software <http://www.hp.com/support/downloads>
- HP software depot <http://www.software.hp.com>
- HP Education <http://www.hp.com/learn>

## Conventions

This section describes the conventions used in this documentation set.

### Command conventions

| Convention        | Description                                                                                                                                              |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Boldface</b>   | <b>Bold</b> text represents commands and keywords that you enter literally as shown.                                                                     |
| <i>Italic</i>     | <i>Italic</i> text represents arguments that you replace with actual values.                                                                             |
| [ ]               | Square brackets enclose syntax choices (keywords or arguments) that are optional.                                                                        |
| { x   y   ... }   | Braces enclose a set of required syntax choices separated by vertical bars, from which you select one.                                                   |
| [ x   y   ... ]   | Square brackets enclose a set of optional syntax choices separated by vertical bars, from which you select one or none.                                  |
| { x   y   ... } * | Asterisk-marked braces enclose a set of required syntax choices separated by vertical bars, from which you select at least one.                          |
| [ x   y   ... ] * | Asterisk-marked square brackets enclose optional syntax choices separated by vertical bars, from which you select one choice, multiple choices, or none. |
| &<1-n>            | The argument or keyword and argument combination before the ampersand (&) sign can be entered 1 to n times.                                              |
| #                 | A line that starts with a pound (#) sign is comments.                                                                                                    |

### GUI conventions

| Convention      | Description                                                                                                                                  |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Boldface</b> | Window names, button names, field names, and menu items are in bold text. For example, the <b>New User</b> window appears; click <b>OK</b> . |
| >               | Multi-level menus are separated by angle brackets. For example, <b>File &gt; Create &gt; Folder</b> .                                        |

### Symbols

| Convention                                                                                           | Description                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <b>WARNING</b>   | An alert that calls attention to important information that if not understood or followed can result in personal injury.                                               |
|  <b>CAUTION</b>   | An alert that calls attention to important information that if not understood or followed can result in data loss, data corruption, or damage to hardware or software. |
|  <b>IMPORTANT</b> | An alert that calls attention to essential information.                                                                                                                |
| NOTE                                                                                                 | An alert that contains additional or supplementary information.                                                                                                        |
|  <b>TIP</b>       | An alert that provides helpful information.                                                                                                                            |

## Network topology icons

|                                                                                   |                                                                                                                                            |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
|  | Represents a generic network device, such as a router, switch, or firewall.                                                                |
|  | Represents a routing-capable device, such as a router or Layer 3 switch.                                                                   |
|  | Represents a generic switch, such as a Layer 2 or Layer 3 switch, or a router that supports Layer 2 forwarding and other Layer 2 features. |
|  | Represents an access controller, a unified wired-WLAN module, or the switching engine on a unified wired-WLAN switch.                      |
|  | Represents an access point.                                                                                                                |
|  | Represents a security product, such as a firewall, a UTM, or a load-balancing or security card that is installed in a device.              |
|  | Represents a security card, such as a firewall card, a load-balancing card, or a NetStream card.                                           |

## Port numbering in examples

The port numbers in this document are for illustration only and might be unavailable on your device.

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