



HP E3800 Switches

Installation and Getting Started Guide



Power over Ethernet

HP E3800 Switches

Installation and Getting Started Guide

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Applicable Products

HP E3800-24G-PoE+-2SFP+ Switch	J9573A
HP E3800-48G-PoE+-4SFP+ Switch	J9574A
HP E3800-24G-2SFP+ Switch	J9575A
HP E3800-48G-4SFP+ Switch	J9576A
HP E3800-24SFP-2SFP+ Switch	J9584A
HP E3800-24G-2XG Switch	J9585A
HP E3800-48G-4XG Switch	J9586A
HP E3800-24G-PoE+-2XG Switch	J9587A
HP E3800-48G-PoE+-4XG Switch	J9588A
HP E3800 4-Port Stacking Module	J9577A
HP E3800 0.5m Stacking Cable	J9578A
HP E3800 1m Stacking Cable	J9665A
HP E3800 3m Stacking Cable	J9579A
HP E3800 Switch Fan Tray	J9582A
HP X311 400W 100-240VAC to 12VDC PS	J9581A
HP X312 1000W 100-240VAC to 54VDC PS	J9580A
HP X410 E-Series 1U Universal Rack Mounting Kit	J9583A

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Introducing the E3800 Switches

The HP E3800 switches are multiport switches that can be used to build high-performance switched networks. These switches are store-and-forward devices offering low latency for high-speed networking. The E3800 switches also support a field-replaceable Redundant Power Supply and fan tray, Power over Ethernet (PoE/PoE+) technologies, and full network management capabilities.

In addition, the E3800 switches support the **HP FlexChassis Mesh** feature for stacking the switches. When E3800 Stacking Modules (J9577A) are installed in the switches, any combination of up to ten E3800 switches can be stacked together via high-speed backplane cables to form a single extended virtual switch. See [“Stacking Information and Topologies” on page 2-23](#), and the *E3800 Advanced Traffic Management Guide* for more stacking information.

These switches are described in this manual:

Non-PoE Switches

HP E3800-24G-2SFP+ Switch (J9575A)
HP E3800-48G-4SFP+ Switch (J9576A)
HP E3800-24SFP-2SFP+ Switch (J9584A)
HP E3800-24G-2XG Switch (J9585A)
HP E3800-48G-4XG Switch (J9586A)

PoE+ Switches

HP E3800-24G-PoE+-2SFP+ Switch (J9573A)
HP E3800-48G-PoE+-4SFP+ Switch (J9574A)
HP E3800-24G-PoE+-2XG Switch (J9587A)
HP E3800-48G-PoE+-4XG Switch (J9588A)

This chapter describes these switches with the following information:

- Fronts of the switches:
 - Network Ports
 - Management Ports
 - LEDs
 - Buttons
- Backs of the switches:
 - Power Supplies and Power Connectors
 - Fan Tray
- HP E3800 Stacking Module
- Switch Features

Fronts of the Switches

PoE/PoE+ Switches

Figure 1-1. Front of the HP E3800-24G-PoE+-2SFP+ Switch

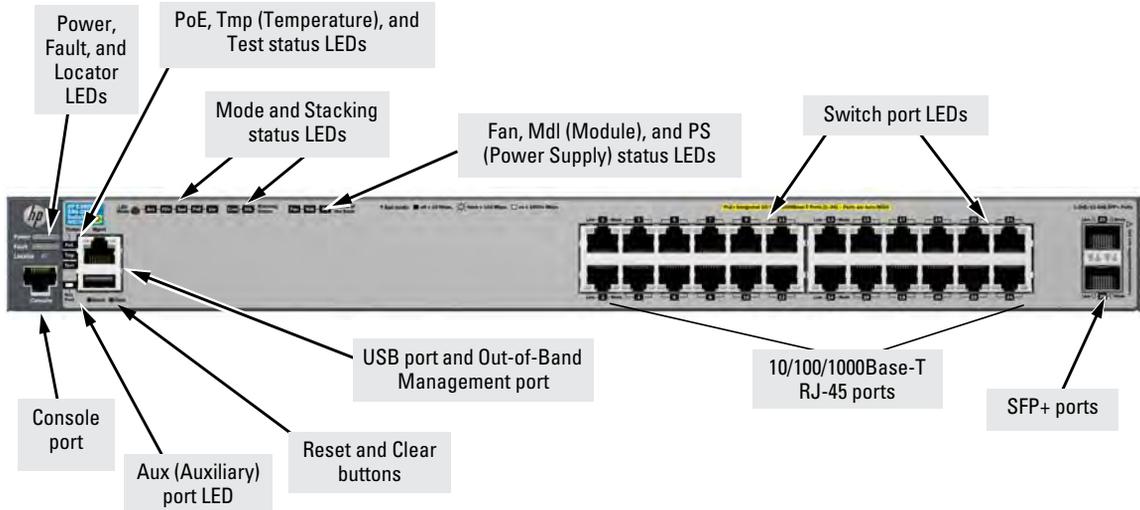


Figure 1-2. Front of the HP E3800-48G-PoE+-4SFP+ Switch

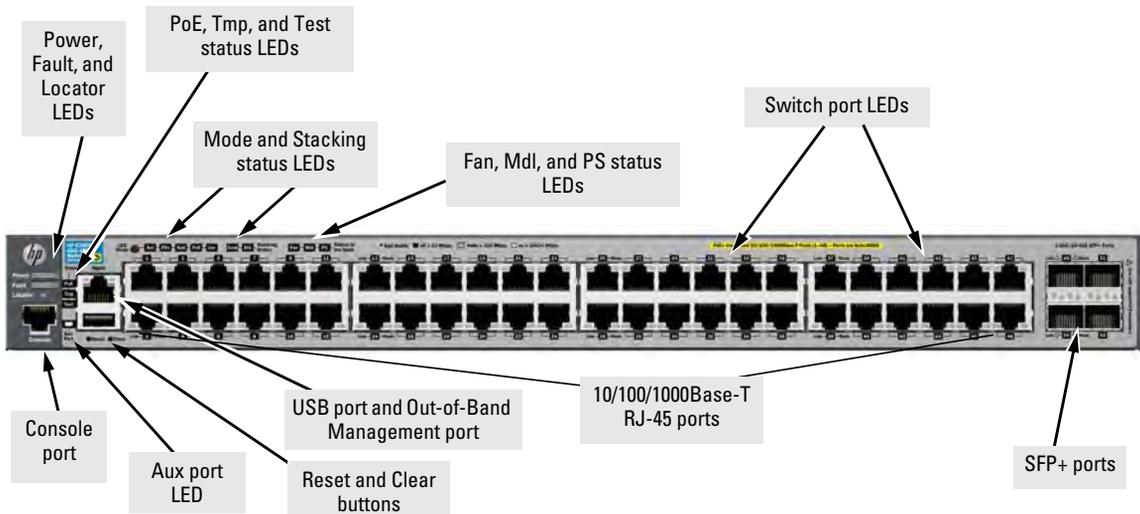


Figure 1-3. Front of the HP E3800-24G-PoE+-2XG Switch

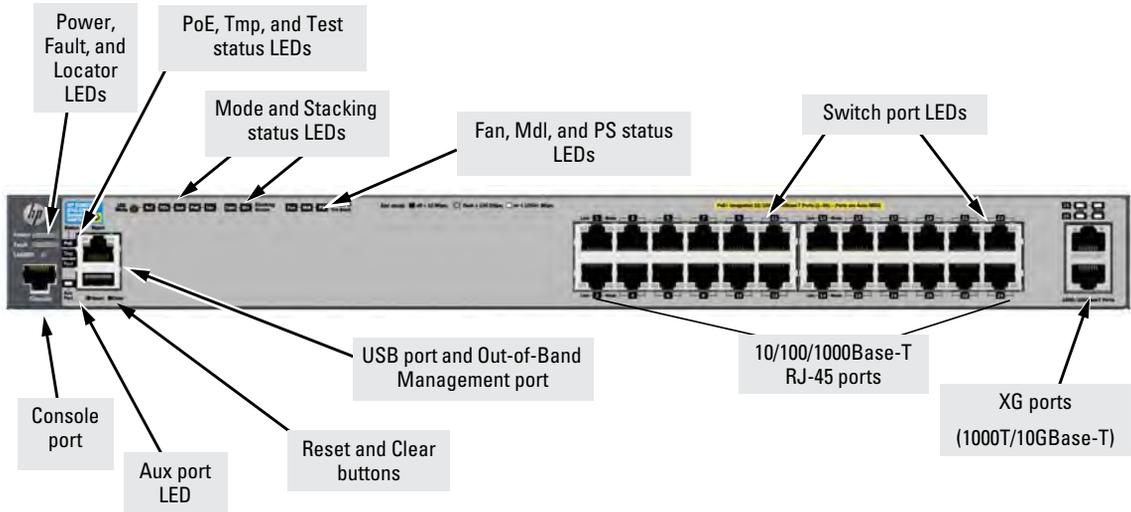
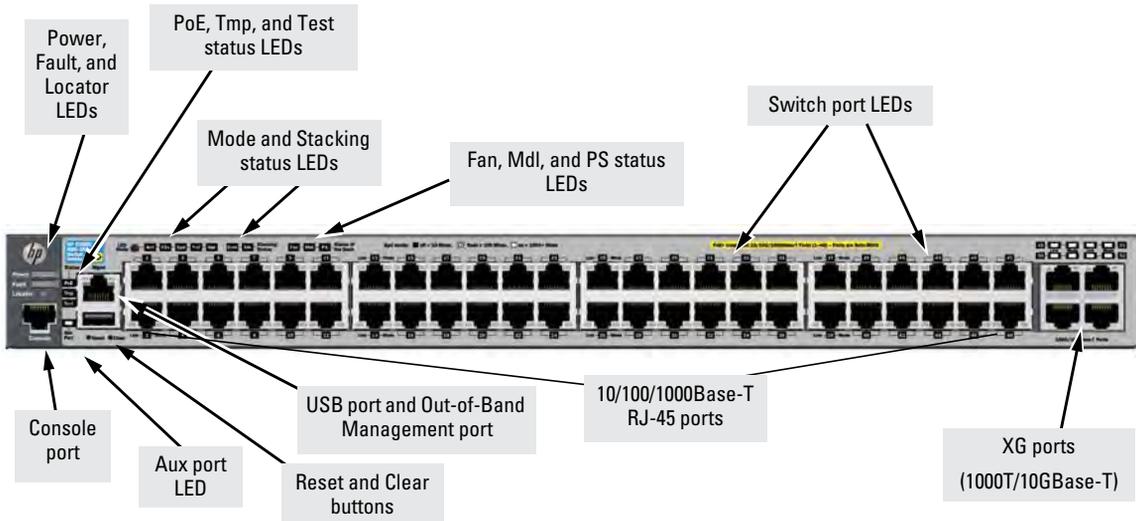


Figure 1-4. Front of the HP E3800-48G-PoE+-4XG Switch



Non-PoE Switches

Figure 1-5. Front of the HP E3800-24G-2SFP+ Switch

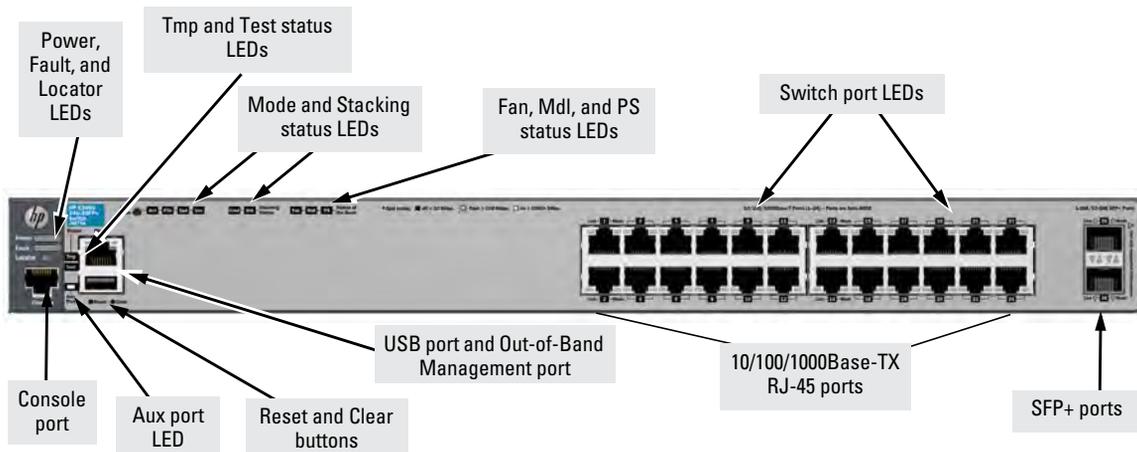


Figure 1-6. Front of the HP E3800-48G-4SFP+ Switch

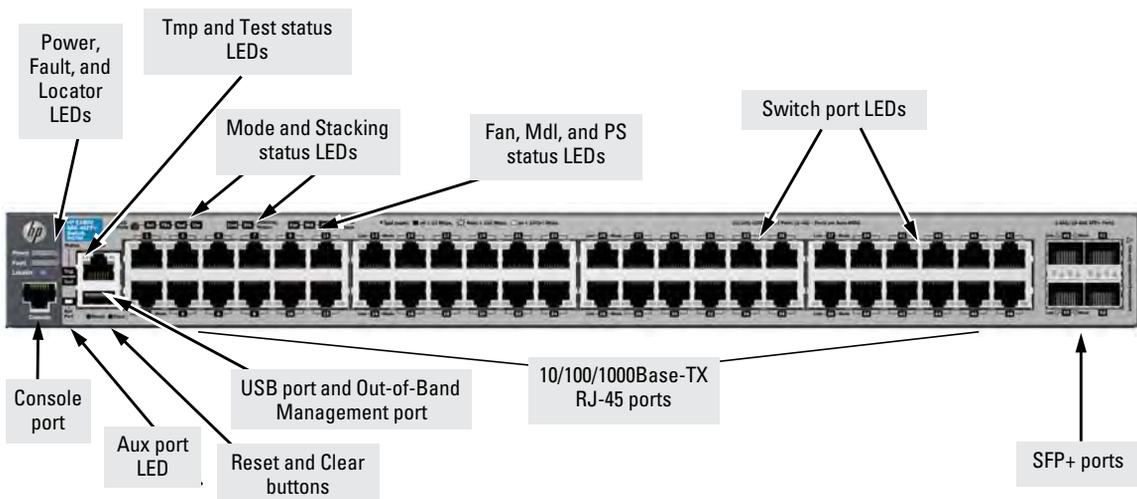


Figure 1-7. Front of the HP E3800-24G-2XG Switch

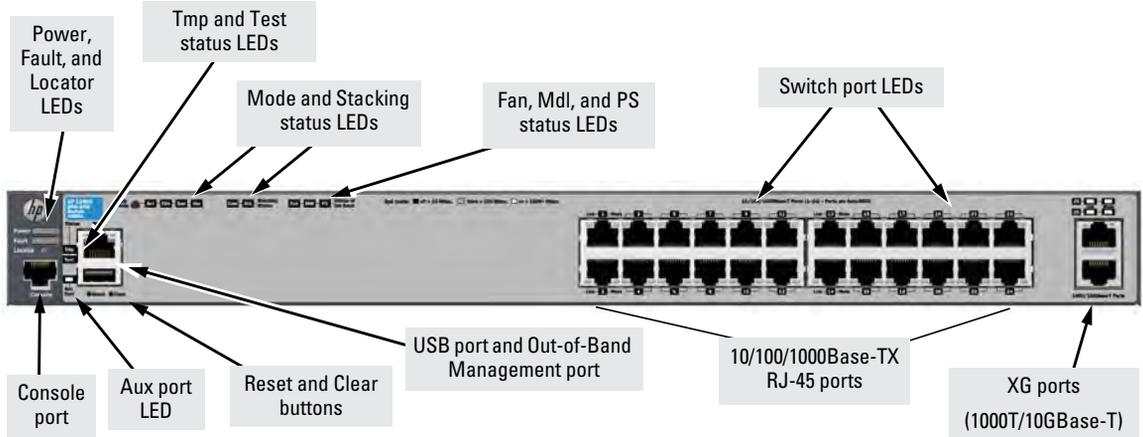


Figure 1-8. Front of the HP E3800-48G-4XG Switch

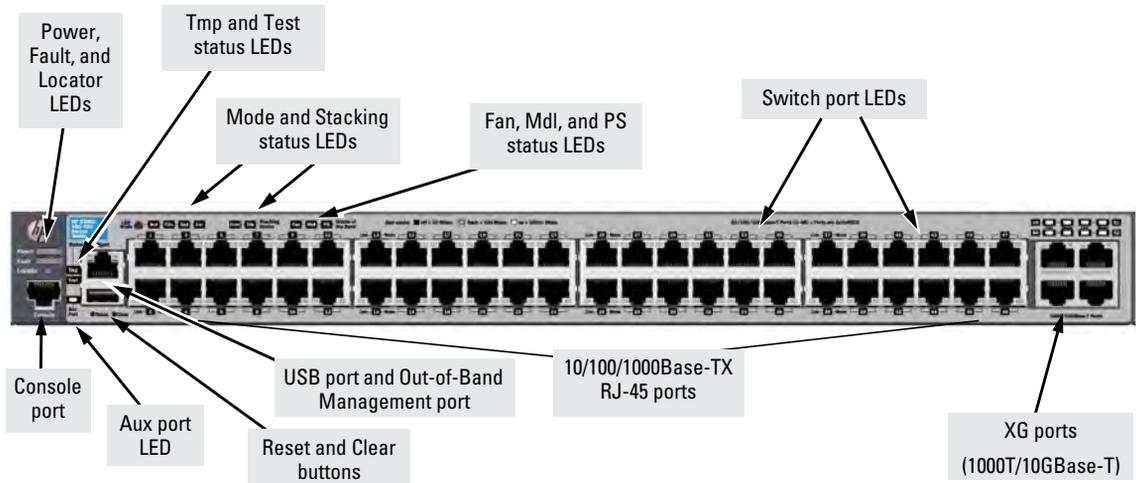
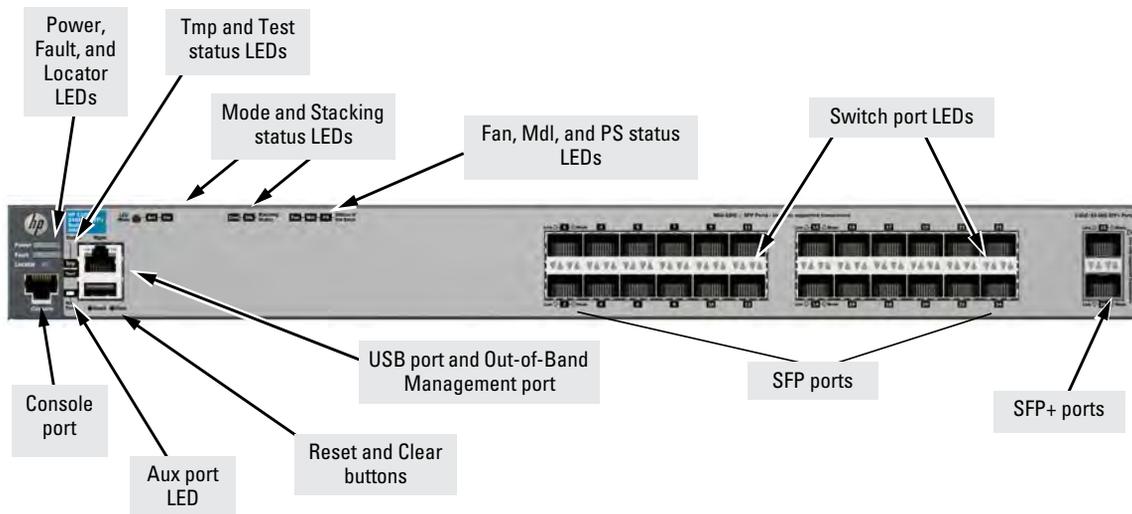


Figure 1-9. Front of the HP E3800-24SFP-2SFP+ Switch



Network Ports

Table 1-1. Network Ports

Product number	Model name	10/100/1000 non-PoE RJ-45 ports ¹	10/100/1000 PoE/PoE+ RJ-45 ports ¹	SFP ports	SFP+ ports ³	XG 100T/10GBase-T RJ-45 ports ¹
J9573A	E3800-24G-PoE+-2SFP+		24		2	
J9574A	E3800-48G-PoE+-4SFP+		48		4	
J9587A	E3800-24G-PoE+-2XG		24			2
J9588A	E3800-48G-PoE+-4XG		48			4
J9575A	E3800-24G-2SFP+	24			2	
J9576A	E3800-48G-4SFP+	48			4	
J9585A	E3800-24G-2XG	24				2
J9586A	E3800-48G-4XG	48				4
J9584A	E3800-24SFP-2SFP+			24 ²	2	

Notes:

¹ All RJ-45 ports support “Auto-MDIX”, which means you can use either straight-through or crossover twisted-pair cables to connect network devices to the switch.

² SFP ports support 1G SFP transceivers. J9584A SFP ports also support 100 Mb (100-FX and 100-BX) transceivers.

³ SFP+ ports support 1G SFP and 10G SFP+ transceivers.

These products also support optional network connectivity:

Table 1-2. Optional Network Connectivity, Speeds and Technologies

			Transceiver Form-Factor and Connector ¹	
Speed	Technology	Cabling	SFP ("mini-GBIC") Connector	SFP+ Connector
100 Mbps	100-FX	Fiber (multimode)	LC	
	100-BX	Fiber (single mode)	LC	
1 Gbps	1000-T	Copper (twisted-pair)	RJ-45	
	1000-SX	Fiber (multimode)	LC	
	1000-LX	Fiber (multimode or single mode)	LC	
	1000-LH	Fiber (single mode)	LC	
	1000-BX	Fiber (single mode)	LC	
10 Gbps	10-Gig Direct Attach	Copper (twinaxial)		Not Applicable
	10-Gig SR	Fiber (multimode)		LC
	10-Gig LRM	Fiber (multimode)		LC
	10-Gig LR	Fiber (single mode)		LC
	10-Gig ER	Fiber (single mode)		LC

¹ For supported transceivers, visit www.hp.com/networking/support.

- In the first textbox, type **J4858** (for 100-Mb and Gigabit information), or **J8436** (for 10-Gigabit information).
- Select any of the products that display in the dropdown list.
- Select **Product support information**. Then click on **Manuals** and find the **Transceiver Support Matrix**.

For technical details of cabling and technologies see "Cabling and Technology Information" in the appendices.

Management Ports

Console Port

This port is used to connect a console to the switch by using the serial cable supplied with the switch. This connection is described under “9. (Optional) Connect a Management console” on page 2-18 in chapter 2, “Installing the Switch.” The console can be a PC or workstation running a VT-100 terminal emulator, or a VT-100 terminal.

Out-of-Band Management (OOBM) Port

This RJ-45 port is used to connect a dedicated management network to the switch.

Auxiliary (Aux) Port

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

Switch and Port LEDs

- Table 1-3 describes the switch and port LEDs and their operation for standalone E3800 switches.
- Table 1-4 describes the operation of the LEDs when the switches are stacked. It includes descriptions of all stacking-related LEDs including those for Module Status and Stacking Status.

Table 1-3. Standalone Switch and Port LED Behavior

Switch LEDs	State	Meaning
Power (green)	On Off	The switch is receiving power. The switch is NOT receiving power.
Fault (orange)	Off Blink orange* On	The normal state; indicates there are no fault conditions on the switch. A fault has occurred on the switch, one of the switch ports, module in the rear of the switch, or the fan. The Status LED for the component with the fault will blink simultaneously. On briefly after the switch is powered on or reset, at the beginning of switch self test. If this LED is on for a prolonged time, the switch has encountered a fatal hardware failure, or has failed its self test. See chapter 4, "Troubleshooting" for more information.
Locator (blue)	On Blinking Off	The Locator LED is used to help you identify a specific in your network equipment installation. The LED can be set to be on solid or to blink, and for a specified number of minutes (1-1440). The default is 30 minutes. Use the command "chassislocate" to control this LED.

Switch LEDs	State	Meaning
Test (green/ orange)	Off	The normal operational state; the switch is not undergoing self test.
	On	The switch self test and initialization are in progress after the switch has been power cycled or reset. The switch is not operational until this LED goes off. The Self Test LED also comes on briefly when you “hot swap” a mini-GBIC into the switch; the mini-GBIC is self tested when it is hot swapped.
	Blink orange*	A component of the switch has failed its self test. The status LED for that component, for example the Fan LED, and the switch Fault LED will blink simultaneously.
Port LEDs (green/ orange - Link and Mode)	Link	<p>For non-PoE or PoE-disabled ports: Displays port link information:</p> <ul style="list-style-type: none"> • On – The port is enabled and receiving a link indication from the connected device. • Off – The port has no active network cable connected, or is not receiving link beat or sufficient light (fiber-optic port). Otherwise, the port may have been disabled through the switch console, the web browser interface, or network management. • Blinking orange* – The corresponding port has failed its self test. Blinks simultaneously with the switch Fault LED. <p>For PoE-enabled ports, see the LED mode information for PoE mode below.</p>
	Mode	<p>The operation of the port Mode LED is controlled by the LED Mode select button, and the current setting is indicated by the LED Mode indicator LEDs near the button. Press the button to step from one view mode to the next. The default view is Activity (Act).</p> <p>If the Save Power LED feature has been enabled on the switch (savepower led command), then that becomes the default view - all port LEDs are Off when the switch is operating according to that feature.</p>

Introducing the E3800 Switches
Fronts of the Switches

Switch LEDs	State	Meaning
LED Mode View (green)	Act	Indicates the port LEDs are displaying network activity information.
	FDx	Indicates port Mode LEDs are lit for ports in Full Duplex Mode. Off indicates half duplex.
	Spd	Indicates the port Mode LEDs are displaying the connection speed at which each port is operating. Each port Mode LED then indicates one of the following: <ul style="list-style-type: none"> Off – the port is operating at 10 Mbps. Blinking** – the port is operating at 100 Mbps. On – the port is operating at 1000 Mbps.
	PoE [‡]	Indicates that the port Link and Mode LEDs are displaying PoE information as follows: <ul style="list-style-type: none"> Link On – PoE is enabled on the port. Link Off – PoE is disabled on the port. Link Blink orange** – the port has an error or the port is denied power due to insufficient power. Mode On – the port is providing PoE power. Mode Off – the port is not providing PoE power.
	Usr	When stacking is enabled, this mode is used to display the member ID of the individual switch via the port Mode LEDs (for member 1, one LED is lit; for member 2, two LEDs are lit, and so on), and to indicate which switch is the Standby (Cmd LED will blink).
	Save Power	This mode is indicated by ALL the mode indicator LEDs being Off. This display occurs only if the switch has been configured with the savepower led command. See the <i>Management and Configuration Guide</i> for more information on that command.
PS (Power Supply Status green/orange)	On	Normal operation. Power supply is connected and operating correctly.
	Blink orange*	A redundant power supply is installed but not connected (the switch Fault LED will not blink simultaneously). Or, a power supply is connected but has experienced a fault (the switch Fault LED will be blinking simultaneously).
	Off [†]	Power supply is not connected or is not installed.
Fan Status (green/orange)	On	Normal operation, all fans are OK.
	Blink orange*	One of the unit's fans has failed. The switch Fault LED will be blinking simultaneously.
PoE Status (green/Orange) [‡]	On	When the switch is ready to start supplying PoE power.
	Off [†]	Should be off only during the boot process.
	Blink orange*	A port has a internal hardware failure. The switch Fault LED will be blinking simultaneously.
	Fast blink orange**	A port is denied PoE power or is detecting an external PD fault.

Switch LEDs	State	Meaning
Tmp (green/ Orange)	On	Switch temperature is normal.
	Fast blink orange**	An over temperature condition has been detected.
Aux Port (green)		Used for processing a USB command file or downloading switch software code.
<p>* The blinking behavior is an on/off cycle once every 1.6 seconds, approximately.</p> <p>** The fast blinking behavior is an on/off cycle once every 0.5 seconds, approximately.</p> <p>† If the Save Power LED feature is configured for the switch (savepower led command), then all LEDs except the Power LED may be off.</p> <p>‡ Applies only to E3800 switches that support PoE/PoE+.</p>		

Table 1-4. Stacking-Related Switch and Port LED Behavior

Switch LEDs	State	Meaning
LED Mode indicator (green)		For switches in a stack, the LED mode indications are the same as for standalone switches (see Table 1-3), but all the switches in the stack are coordinated and all show the same LED mode. See the Stacking Note under “LED Mode Select Button and Indicator LEDs” on page 1-13.
Mdl (Module Status, green/orange)	On	A Stacking Module is installed into the expansion slot and is operating correctly.
	Blink orange*	Stacking Module is plugged into module slot but has experienced a fault, or the module stacking cable is not connected correctly or has experienced a fault.
	Fast blink orange**	The Stacking Module has been installed while the switch was powered on (hot swapped) and the switch needs to be rebooted to support the module.
	Off†	A Stacking Module is not installed into the module slot.
Stacking Status (green/orange)	Cmd on	This switch is a Commander of a stack.
	Cmd blink green	This switch is becoming a Commander of a stack, or if Usr LED mode is selected, indicates which switch is the Standby in the stack.
	Cmd off†	The switch is not the Commander of the stack.
	Stk on	The switch is a member of a stack.
	Stk blink green	The switch is joining a stack.
	Stk blink orange*	A stacking cable is disconnected or faulty, or is connected to a failed or powered off switch. The Mdl LED may also be blinking orange simultaneously.
	Stk off†	Stacking has been disabled.
<p>* The blinking behavior is an on/off cycle once every 1.6 seconds, approximately. ** The fast blinking behavior is an on/off cycle once every 0.5 seconds, approximately. † If the Save Power LED feature is configured for the switch (savepower led command), then all LEDs except the Power LED may be off.</p>		

LED Mode Select Button and Indicator LEDs

The operation of the Mode LED is controlled by the LED Mode select button, and the current setting is indicated by the LED Mode indicator LEDs near the button. Press the button to step from one view mode to the next. See the LED information in Table 1-3 on page 1-8 for standalone switches, and in Table 1-4 on page 1-12 for stacked switches.

Stacking Notes:

- For E3800 switches that are in a stack, the Mode select button on every switch in the stack controls the LED mode for *all* the switches in the stack.
 - If there is a combination of PoE/PoE+ switches and non-PoE switches in the stack, when any of the Mode select buttons is pressed to put the stack into PoE mode, the non-PoE switches indicate *no* PoE support by not illuminating any of the Mode indicator LEDs or any of the port LEDs.
 - If any of the switches in the stack are configured with the **Save Power LED** feature, then the default LED Mode for the whole stack becomes the Save Power display (all LED Mode indicator LEDs are off), but *only* the stack members on which that feature is configured display the other characteristics of that feature (all LEDs Off except for the Power LED).
-

Figure 1-10. Example of Indicator LEDs on a non-PoE E3800 Switch



Figure 1-11. Example of Indicator LEDs on a PoE/PoE+ E3800 Switch



Reset and Clear Buttons

The Reset and Clear buttons are located behind the front panel (to protect them from being pushed accidentally) and are accessible through small holes in the lower left corner of the front panel. Use pointed objects, such as unbent paper clips, to push them.

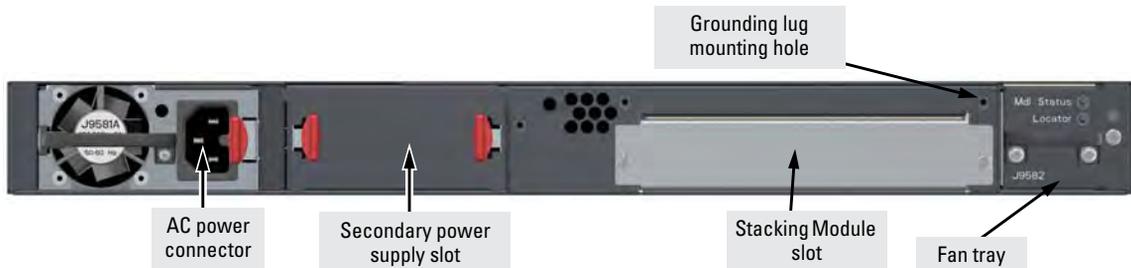
The Reset and Clear buttons are used singly or in combination, as follows:

To accomplish this:	Do this:	This will happen:
Soft Reset (Standalone switch)	Press and release the Reset button	The switch operating system is cleared gracefully (such as data transfer completion, temporary error conditions are cleared), then reboots and runs self tests.
Hard Reset (Standalone switch)	Press and hold the Reset button for more than 5 seconds (until all LEDs turn on), then release.	The switch reboots, similar to a power cycle. A hard reset is used, for example, when the switch CPU is in an unknown state or not responding.
Soft Reset (Stacked switch)	Press and release the Reset button	Same as a standalone switch, except: <ul style="list-style-type: none"> • If the Commander, the Standby switch will become Commander. • If the Standby, a new Standby will be elected.
Hard Reset (Stacked switch)	Press and hold the Reset button for more than 5 seconds (until all LEDs turn on), then release.	Same as a standalone switch, except: <ul style="list-style-type: none"> • If the Commander, the Standby switch will become Commander. • If the Standby, a new Standby will be elected.
Delete console and management access passwords	Press Clear for at least one second, but not longer than five seconds.	The switch deletes all access passwords.
Restore the factory default configuration	<ol style="list-style-type: none"> 1. Press Clear and Reset simultaneously. 2. While continuing to press Clear, release Reset. 3. When the Test LED begins blinking (after approximately 25 seconds), release Clear. 	The switch removes all configuration changes, restores the factory default configuration, and runs self test.
<p>Note: These buttons are provided for your convenience. If you are concerned with switch security though, you should make sure that the switch is installed in a secure location, such as a locked wiring closet. You can also disable these buttons by using the front-panel-security command. See the <i>E3800 Management and Configuration Guide</i> for a description of that command.</p>		

Backs of the Switches

The backs of all the E3800 switches are the same.

Figure 1-12. Back of the HP E3800 Switch



Power Supplies

There are two power supplies that can be installed into the E3800 switches:

- **HP X311 400W 100-240VAC to 12VDC PS (J9581A)** – a 400 watt power supply for the Non-PoE switches. The 400 watt power supply does not provide any PoE power. The 400 watt power supply is keyed such that it will not fit into the PoE+ switches.
- **HP X312 1000W 100-240VAC to 54VDC PS (J9580A)** – a 1000/700 watt power supply for the PoE+ switches. The 1000/700 watt power supply provides PoE/PoE+ power. The 1000/700 watt power supply is keyed such that it will not fit into the Non-PoE switches. When supplied with 110 V, the power supply runs at a max of 700 W and when supplied with 220 V, the power supply runs at a max of 1000 W.

For more power supply information see [page 2-17](#).

Power Connector

The E3800 switches do not have a power switch; they are powered on when connected to an active AC power source. These switches automatically adjust to any voltage between 100-127 or 200-240 volts and either 50 or 60 Hz. There are no voltage range settings required.

Module Slot

Each of the E3800 switches has one module slot that can accept the HP E3800 Stacking Module that provides high-speed connectivity to other E3800 switches. Only the E3800 switches support this module.

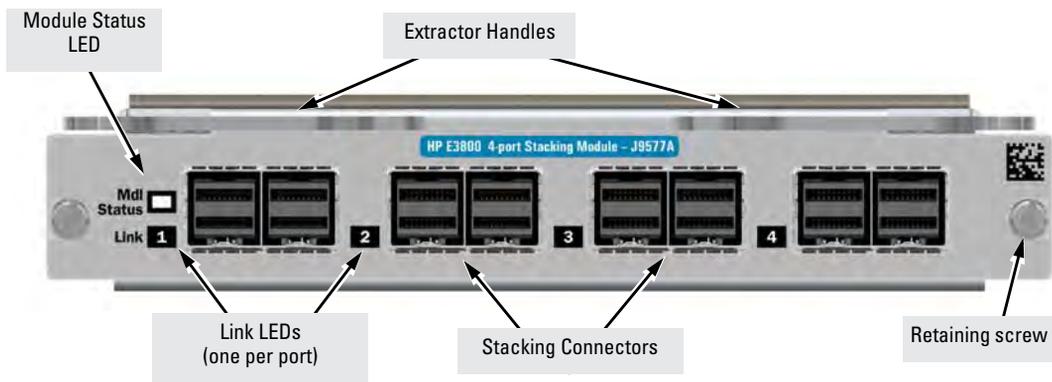
Fan Tray

The E3800 switches have a field-replaceable fan tray. If necessary, the fan can be replaced while the switch is operating. For more information, see “Replacing the Fan Tray” on page 4-2.

HP E3800 Stacking Module

The HP E3800 4-port Stacking Module (J9577A) is a component you can add to an HP E3800 Switch to provide high-speed stacking connections to other E3800 switches. See “Stacking Information and Topologies” on page 2-23, and the *E3800 Advanced Traffic Management Guide* for more information about stacking configuration and operation.

Figure 1-13. Front of E3800 4-Port Stacking Module



The HP E3800 4-Port Stacking Module J9577A has the following features:

- Four stacking connectors for connecting the E3800 switch to other E3800s in a stacked topology (chain, ring, or mesh). Any of these available stacking cables can be used for these connections:
 - HP E3800 0.5m Stacking Cable (J9578A)
 - HP E3800 1m Stacking Cable (J9665A)
 - HP E3800 3m Stacking Cable (J9579A)
- LEDs, described in [Table 1-14](#).

Stacking Module LEDs

The following LEDs are located on the E3800 Stacking Module bulkhead. These LEDs are only viewable in the rear of the switch on the module itself.

Figure 1-14. Stacking Module LEDs

Name	Mode	Description
Stacking LEDs per module		
Module Status (green/orange) (Replicated on the switch front as the Mdl LED.)	On	Stacking module is installed into the module slot and is operating correctly.
	Off	Stacking module is not installed into the module slot.
	Blink orange	<ul style="list-style-type: none"> If the LED is blinking simultaneously with the switch Fault LED, then the Stacking Module is installed into the module slot but has experienced a fault. If the LED is blinking without the switch Fault LED, a stacking cable is not connected correctly at its other end, or it is connected to a switch that is powered off. <p>The module was installed while the switch was powered on.</p>
	Fast blink orange	<p>The module was installed while the switch was powered on. The switch must be rebooted to support the module.</p>
Stacking Module LEDs per port		
Link (green/orange)	On	The port is enabled and receiving a link indication from the connected switch.
	Off	The port has no active stacking cable connected, is not receiving the link indication, or the port may have been disabled through the switch console, the web browser interface, or network management interface.
	Blinking orange	<ul style="list-style-type: none"> If the LED is blinking simultaneously with the switch Fault LED, the corresponding port has failed its self test. The module status LEDs (on the module and front of the switch will also be blinking). If the LED is blinking without the switch Fault LED, then the switch detects the stacking cable but the cable is not getting is not connected correctly at the other switch, or the cable may be faulty, or there is

Switch Features

The features of the E3800 Switches include:

- Combinations of fixed 10/100/1000-T and 10-Gigabit ports, and SFP/SFP+ ports, as described under “Network Ports” on page 1-6.
- Selected switch models feature XG ports that are compliant with IEEE 802.3an standards and provide 1000-T and 10GBase-T connectivity. See the appendices for cabling recommendations and requirements.
- One module slot is provided in the back of the switches to support a stacking module to provide connectivity to other E3800 switches with stacking modules. See “Stacking Information and Topologies” on page 2-23, the *E3800 Advanced Traffic Management Guide* for more information about stacking.
- Power over Ethernet (PoE+) operation—the E3800-24G-2SFP+-PoE+ and E3800-48G-4SFP+-PoE+ switches are IEEE 802.3at standard compliant and provide up to 30 W per port to power IP phones, wireless access points, web cameras, and more. For more information, see the *HP Power over Ethernet (PoE/PoE+) Planning and Implementation Guide* which is on the HP Web site, www.hp.com/networking/support.

The switches support 802.3af and 802.3at standard devices and some pre-standard PoE devices. For a list of these devices, see the FAQs (Frequently Asked Questions) for your switch model. PoE is disabled by default and must be enable for use. (For instructions, see the *Management and Configuration Guide* for your switch at www.hp.com/networking/support.

- The option to have one or two internal power supplies.

A second power supply may support redundant power or additional PoE+ power. If one of the internal power supplies fails, the second power supply will immediately provide power necessary to keep the switch running, including PoE+ power on an allocated basis.

If maximum PoE+ power is being used on the 48 port PoE+ switch, the second power supply is needed for PoE+ power and in this case there is no PoE power redundancy, however system power will always be maintained. On a power supply failure, the system will drop PoE power on ports based on user priority, to maintain system power. For more information on the power supplies see [page 1-15](#)

- Plug-and-play networking—all ports are enabled—just connect the network cables to active network devices and your switched network is operational.

- Auto MDI/MDI-X on all twisted-pair ports (10/100/1000 and 10GBase-T), meaning that **all connections can be made using straight-through twisted-pair cables**. Cross-over cables are not required, although they will also work. The pin operation of each port is automatically adjusted for the attached device: if the switch detects that another switch or hub is connected to the port, it configures the port as MDI; if the switch detects that an end-node device is connected to the port, it configures the port as MDI-X. (See the appendices for recommended or required cabling.)
 - Automatic learning of the network addresses in each switch's 8000-address forwarding table, (with configurable address aging value).
 - Automatically negotiated full-duplex operation for the 10/100/1000 RJ-45 ports when connected to other auto-negotiating devices—the SFP/SFP+ ports always operate at full duplex.
 - Easy management of the switch through several available interfaces:
 - **console interface**—a full featured, easy to use, VT-100 terminal interface for out-of-band switch management (through the console port or Management network ports) or in-band Telnet access to the switch.
 - **Web browser interface**—an easy to use built-in graphical interface that can be accessed from common web browsers.
 - **HP Professional Management Center (PMC)**—an SNMP-based, graphical network management tool that you can use to manage your entire network. This product is included with your new switch.
 - Support for the Spanning Tree Protocol to eliminate network loops.
 - Support for up to 2048 IEEE 802.1Q-compliant VLANs so you can divide the attached end nodes into logical groupings that fit your business needs.
 - Support for many advanced features to enhance network performance—for a description, see the *E3800 Management and Configuration Guide* at www.hp.com/networking/support.
 - Ability to update the switch software. Software updates are routinely available from HP.
 - An auxiliary port (USB Type A connector) for processing a USB command file and updating switch software.
 - Low power operation:
 - Ports on a switch or stack member may be set to operate at reduced power.
 - Port status LEDs may be turned off.
- RJ-45 ports will operate at reduced power if the port is not connected (link partner is not detected).

Introducing the E3800 Switches
Switch Features

Installing the Switch

The HP E3800 switches come with an accessory kit that includes the brackets for mounting the switch in a standard 19-inch telco rack, in an equipment cabinet, and with rubber feet that can be attached so the switch can be securely located on a horizontal surface. The brackets are designed to allow mounting the switch in a variety of locations and orientations. For other mounting options contact your local HP authorized network reseller or HP representative. This chapter shows how to install the switch.

Caution

If the switch is to be shipped in a rack, it can be mounted and shipped in any four post rack using HP X410 E-Series 1U Universal Rack Mounting Kit (J9583A). Optionally, it can also be mounted in an HP 10K rack using the HP 1U RK MT SWITCH 10K ALL rail kit, part number 356578-B21 and shelf kit AB469A, HP rx 16/26 Factory Rackmount Shelf Kit (both kits must be used, otherwise you will void the warranty).

Included Parts

The HP E3800 switches have the following components shipped with them:

- *HP Switch Quick Setup Guide*
- *Switch Safety and Regulatory* sheet
- Warranty notice
- *General Safety and Regulatory* booklet
- Console cable
- Accessory kit

(5069-5705) for Non-PoE+ E3800 switches	(5066-0651) for PoE+ E3800 switches
two mounting brackets	two mounting brackets
eight 8-mm M4 screws to attach the mounting brackets to the switch	eight 8-mm M4 screws to attach the mounting brackets to the switch
four 5/8-inch number 12-24 screws to attach the switch to a rack	four 5/8-inch number 12-24 screws to attach the switch to a rack
four rubber feet	four rubber feet

- Power cord, one of the following

Region	All 3800 Switches
Australia/New Zealand	8121-0857
China	8120-1034
Continental Europe	8120-5336
Denmark	8120-5340
Japan	8120-5342
Switzerland	8120-5339
United Kingdom/Hong Kong/Singapore	8120-5334
United States/Canada/Mexico	8121-0973
South Africa and India	8120-5341
Argentina	8120-8375
Brazil	8121-1132
Thailand	8121-0671
Chile	8120-8389
Taiwan	8121-0967
Israel	8121-1009
India	8120-5341

Japan Power Cord Warning

製品には、同梱された電源コードをお使い下さい。
同梱された電源コードは、他の製品では使用出来ません。

Installation Procedures

Summary

1. **Prepare the installation site** ([page 2-5](#)). Ensure the physical environment is properly prepared, including having the correct network cabling ready to connect to the switch and having an appropriate location for the switch. See [page 2-4](#) for some installation precautions.

Note

For steps 2 and 3 below, if an E3800 switch is powered on for the first time without a stacking module installed, stacking will be disabled and that will be saved in the switch's running configuration. For more information, see “[Stacking Information and Topologies](#)” on [page 2-23](#).

2. **Verify the switch passes self test** ([page 2-6](#)). Plug the switch into a power source and observe that the LEDs on the switch's front panel indicate correct switch operation. When self test is complete, unplug the switch.

3. **(Optional) Install the module** (page 2-8).
4. **Mount the switch** (page 2-10). The Switch can be mounted in a 19-inch telco rack, in an equipment cabinet, or on a horizontal surface.
5. **(Optional) Install the stacking cables** (page 2-14). If you have installed the module, you can now install up to four stacking cables and connect them to other switches in the desired stacking topology.
6. **(Optional) Install or remove SFP transceivers (mini-GBICs)** (page 2-15). The switch has either two or four slots for installing mini-GBICs. Depending on where the switch is mounted, it may be easier to install the mini-GBICs first. Mini-GBICs (SFP transceivers), can be installed or removed while the switch is powered on.
7. **Connect the switch to a power source** (page 2-16). Once the switch is mounted, plug it into the nearby main power source.
8. **(Optional) Install a second power supply** (page 2-17). You may wish to use a second power supply with the switch to support redundant power or added PoE+ power.
9. **(Optional) Connect a Management console** (page 2-18). You may wish to modify the switch's configuration, for example, to configure an IP address so it can be managed using a web browser, from an SNMP network management station, or through a Telnet session. Configuration changes can be made easily by using the included console cable to connect a PC to the switch's console port.
10. **Connect the network cables** (page 2-21). Using the appropriate network cables, connect the network devices to the switch ports.

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

Installation Precautions:

Follow these precautions when installing the E3800 switches.

WARNING

- **The rack or cabinet should be adequately secured to prevent it from becoming unstable and/or falling over.**
- **Devices installed in a rack or cabinet should be mounted as low as possible, with the heaviest devices at the bottom and progressively lighter devices installed above.**
- **Neither the Right or Left sides of the switch can be placed downward. (That is, the right or left side of the unit while facing the front.)**

Caution

- If the switch is to be shipped in a rack, it can be mounted and shipped in many four post racks using HP X410 E-Series 1U Universal Rack Mounting Kit (J9583A).
- Ensure the power source circuits are properly grounded, then use the power cord supplied with the switch to connect it to the power source.
- If your installation requires a different power cord than the one supplied with the switch and power supply, be sure the cord is adequately sized for the switch's current requirements. In addition, be sure to use a power cord displaying the mark of the safety agency that defines the regulations for power cords in your country. The mark is your assurance that the power cord can be used safely with the switch and power supply.
- When installing the switch, the AC outlet should be near the switch and should be easily accessible in case the switch must be powered off.
- Ensure the switch does not overload the power circuits, wiring, and over-current protection. To determine the possibility of overloading the supply circuits, add together the ampere ratings of all devices installed on the same circuit as the switch and compare the total with the rating limit for the circuit. The maximum ampere ratings are usually printed on the devices near the AC power connectors.
- For safe operation, proper switch cooling, and reduction of electromagnetic emissions, ensure that a slot cover is installed on any unused module or power supply slot.
- Do not install the switch in an environment where the operating ambient temperature might exceed 55°C (131°F). If you are installing any transceivers the operating ambient temperature should not exceed 45°C (113°F).
- Ensure the air flow around the sides and back of the switch is not restricted.

1. Prepare the Installation Site

Cabling Infrastructure - Ensure the cabling infrastructure meets the necessary network specifications. See “[Cabling and Technology Information](#)” in the appendices for more information.

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

- In the front of the switch, leave at least 7.6 cm (3 inches) of space for the twisted-pair and fiber-optic cabling.
- In the back of the switch, leave at least 3.8 cm (1 1/2 inches) of space for the power cord. If you are stacking the switches, you will need 20 to 23 cm (approximately 8 to 9 inches), depending on the lengths of the stacking cables being used.
- On the sides of the switch, leave at least 7.6 cm (3 inches) for cooling, except if the switch is installed in an open EIA/TIA rack.

Figure 2-1. Air flow direction of the E3800 switches



2. Verify the Switch Boots Correctly

Note

For steps 2 and 3, if an E3800 switch is powered on for the first time without a stacking module installed, stacking will be disabled and that will be saved in the switch's running configuration. For more information, see [“Stacking Information and Topologies”](#) on page 2-23.

Before installing the switch in its network location, you should first verify it is working properly by plugging it into a power source and verifying that it boots correctly.

1. Connect the power cord supplied with the switch to the power connector on the back of the switch, and then into a properly grounded electrical outlet.

Figure 2-2. Connecting the power cord



Note

The E3800 switches do not have a power switch. They are powered on when the power cord is connected to the switch and to a power source. For safety, the power outlet should be located near the switch installation.

The switch automatically adjusts to any voltage between 100-127 and 200-240 volts and either 50 or 60 Hz. No voltage range settings are required.

If your installation requires a different power cord than the one supplied with the switch, be sure to use a power cord displaying the mark of the safety agency that defines the regulations for power cords in your country. The mark is your assurance that the power cord can be used safely with the switch.

2. Check the LEDs on the switch as described below.

Figure 2-3. Example of an HP E3800 24-port non-PoE switch

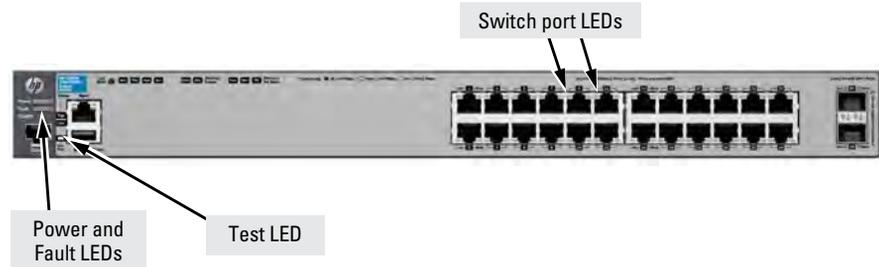
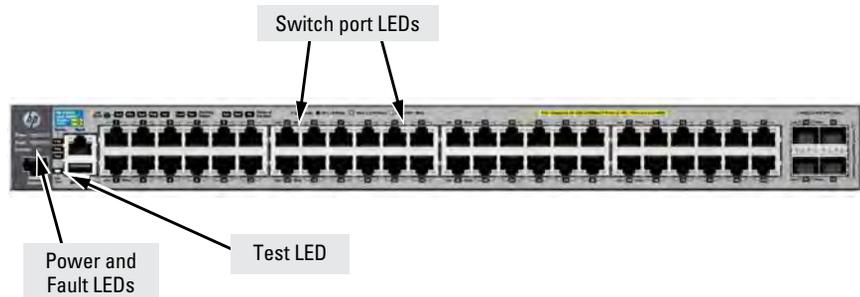


Figure 2-4. Example of an HP E3800-48-port PoE+ switch



When the switch is powered on, it performs its diagnostic self test and initialization. This boot process takes approximately 50 seconds to complete.

LED Behavior:

During the switch boot:

- The **Power**, **Fault**, **Test**, and **Locator** LEDs, other Status LEDs, Mode indicator LEDs, and port LEDs are on for most of the duration of the test.
- Most of the LEDs go off and may turn on again during phases of the boot.

When the switch boots successfully, Status LEDs display:

- **Power** and **Tmp** LEDs (and the **PoE** LED for PoE+ switches) remain on.
- **Fault**, **Test**, and **Locator** LEDs are off.
- Other status LEDs may be on or off depending on the switch configuration and the hardware installed.

- The port LEDs on the front of the switch go into their normal operational mode:
 - If the ports are connected to active network devices, the port Link LEDs are on, and the port Mode LEDs behave according to the LED Mode selected. In the default LED mode (Act), the LEDs should be flickering to show network traffic.
 - If the ports are not connected to active network devices, the LEDs will stay off.

If the LED display is different than what is described above, especially if the **Fault** and **Test** LEDs stay on for more than 60 seconds or they start blinking, then the switch boot has not completed correctly. Refer to chapter 5, “Troubleshooting” for diagnostic help.

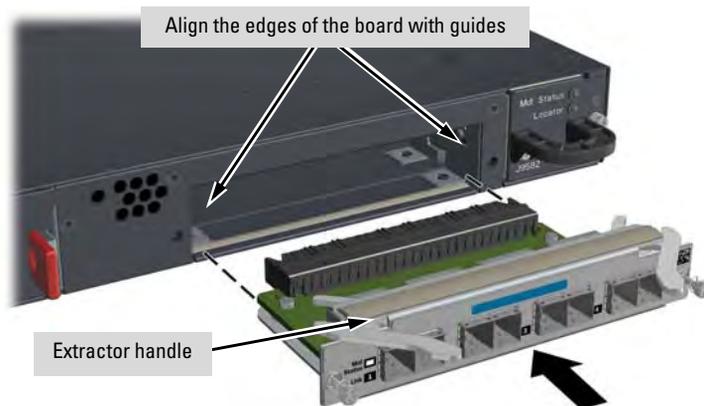
3. (Optional) Install the Stacking Module

Note

Hot swapping the Stacking Module is *not* supported. If a module is installed with the switch powered on, self-test of the module will not occur, the **Mdi** LED on the front of the switch and the **Module Status** LED on the module will blink orange. The switch must be reset or power cycled for the module to function. Only insert or remove a module during scheduled downtime with the switch powered off.

1. Remove the cover plate.
2. Insert the module aligning with the guides in the slot.
3. Once the contacts have engaged, use the extractor handles to seat the module completely.
4. Tighten the captive screws until they are snug – do not overtighten them.

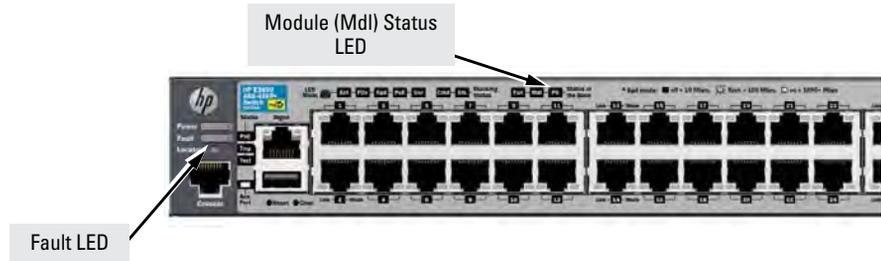
Figure 2-5. Installing the module



Verifying the Module is Installed Correctly

Observe the Module Status (**Mdl**) and Fault LEDs on the front of the switch to verify the module is installed properly.

Figure 2-6. Location of Module Status LEDs



If the module is installed properly and the switch is powered on, the module undergoes a self test that takes a few seconds. You can use the LEDs to determine that the module is installed properly and has passed the self test, as described in the “LED Behavior” table below.

Table 2-1. Stacking Module LED Behavior

LED	Display for a Properly Installed Module
Mdl LED on the front of the switch and Module Status LED on the module	The LED goes ON as soon as the module is installed and the switch is powered on, and stays ON steadily.
Fault	OFF normal state, no fault condition exist.
Link (for each stacking port on the module)	If stacking cables are connected to the module and to a Stacking Module on another powered on E3800 switch, the LED goes ON to indicate the stacking port is enabled, connected, and detects a signal from the attached switch.

4. Mount the Switch

After the switch passes self test, the switch is ready to be mounted in a stable location. The E3800 switches can be mounted in these ways:

- in a rack or cabinet
- on a horizontal surface

For other mounting options contact your local HP authorized network reseller or HP representative.

Rack or Cabinet Mounting

These switches are designed to be mounted in any EIA-standard 2-post 19-inch telco rack or 4-post communication equipment cabinet.

WARNING

For safe operation, please read the mounting precautions on [page 2-4](#), before mounting a switch.

Equipment Cabinet Note

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

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

Rack Mounting the E3800 switch in a 2-post rack

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

Figure 2-7. Attaching the mounting brackets to the switch



Note

The mounting brackets have multiple mounting holes and can be rotated allowing for a wide variety of mounting options. These include mounting the switch so its front face is flush with the face of the rack as shown in the illustration, or mounting it in a more balanced position.

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

Figure 2-8. Mounting the switch in a rack



Rack Mounting the E3800 switch in a 4-post rack

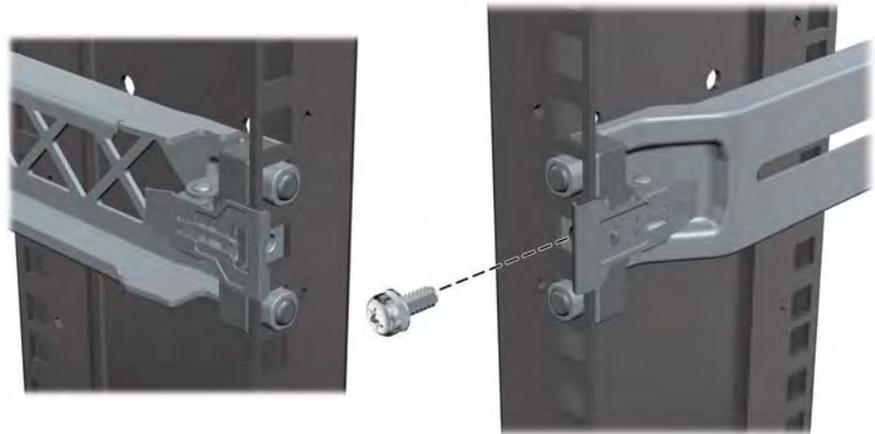
1. Using the (J9583A) HP X410 E-Series 1U Universal Rack Mounting Kit, use a #1 Phillips (cross-head) screwdriver and attach the slider brackets to the switch with the included 8-mm M4 screws.

Figure 2-9. Attaching the rail kit slider brackets to the switch



2. Install the rails in the rack.

Figure 2-10. Installing the rails



3. Installing the switch into the rails.

Figure 2-11. Installing the switch



Horizontal Surface Mounting

Place the switch on a table or other horizontal surface. The switch comes with rubber feet in the accessory kit that can be used to help keep the switch from sliding on the surface.

Attach the rubber feet to the four corners on the bottom of the switch within the embossed angled lines. Use a sturdy surface in an uncluttered area. You may want to secure the networking cables and switch power cord to the table leg or other part of the surface structure to help prevent tripping over the cords.

Caution

Make sure the air flow is not restricted around the sides and back of the switch.

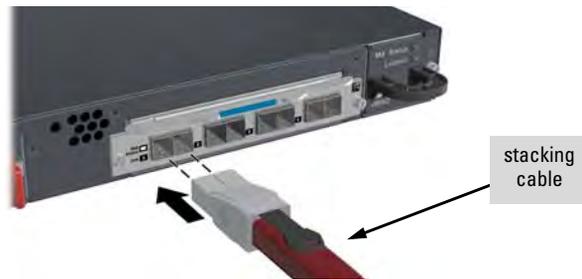
5. (Optional) Install Stacking Cables

Note

Hot swapping stacking cables is supported. You can install or remove a stacking cable with the switch powered on.

- a. Slide in the stacking cable connector until it clicks into place. Pull on the cable connector (not the tab) to make sure that it is fully latched.

Figure 2-12. Installing a stacking cable



- b. Connect the other end of the cable to a Stacking Module in another E3800 switch. See [page 2-23](#) for connectivity.

Note

When switch power is on, and one end of the stacking cable is inserted the Link and Mdl LEDs blink orange until the other end is connected to another switch stacking module. The LEDs turn solid green when the cable is fully seated at both ends and a link is established. For more stacking LED information, see [Table 1-4 on page 1-12](#).

To remove the stacking cable pull the tab on the stacking cable connector straight out.

6. (Optional) Install Transceivers

You can install or remove transceivers from the slots on the front of the switch without having to power off the switch.

Notes

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

Caution

Use only supported genuine HP transceivers with your switch. Non-HP transceivers are not supported, and their use may result in product malfunction. Should you require additional HP transceivers, contact your HP Sales and Service Office or authorized dealer.

Installing the transceivers:

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

WARNING

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

Figure 2-13. Installing a transceiver.



Removing the transceiver:

Note

Always disconnect the network cable from the transceiver before removing it from the switch.

Depending on when the transceiver was purchased, it may have either of three different release mechanisms: a plastic tab on the bottom of the transceiver, a plastic collar around the transceiver, or a wire bail.

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

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

7. Connect the Switch to a Power Source

1. Plug the included power cord into the switch's power connector and into a nearby AC power source. See [Figure 2-2 on page 2-6](#).
2. Re-check the LEDs during self test. See "LED Behavior" on [page 2-7](#).

Stacking Note

If you are stacking your E3800 switches, then the first switch you should power on is the switch that you want to be the stack Commander. The second switch that you power on should be the one that you want to be the stack Standby. For the other switches in the stack, their member ID will be determined by the order in which they are booted. For more information, see "[Stacking Information and Topologies](#)" on [page 2-23](#).

8. (Optional) Install a Second Power Supply

There are two types of power supplies that can be installed:

- **HP 400W Power Supply**, (J9581A, HP X311 400W 100-240VAC to 12VDC PS) used with the non-PoE switches and is keyed so that it cannot be used in the PoE/PoE+ switches.

The 400 W power supply provides power to operate the switch. Installing a second power supply can provide power to the switch in case the initial power supply fails. If the power supplies are plugged into different AC power sources, then redundant power can be supplied in case of loss of one of the AC power sources.

- **HP 1000W / 700W PoE+ Power Supply**, (J9580A, HP X312 1000W 100-240VAC to 54VDC PS) used with the PoE/PoE+ switches and is keyed so that it cannot be used in the non-PoE switches.

The 1000 W power supply provides two types of power to the PoE/PoE+ switches:

- The 1000 W power supply provides power to operate the switch. Installing a second power supply can provide power to the switch in case the initial power supply fails. If the power supplies are plugged into different AC power sources, then redundant power can be supplied in case of loss of one of the AC power sources.
- Power-over-Ethernet (PoE/PoE+) power. The power supplies, supply PoE/PoE+ power to the switch. Should one of the power supplies fail, the second power supply will supply the needed PoE/PoE+ power to continue PoE operation. For the 48 port switches, the second power supply's PoE/PoE+ power is additional power made available to the switch's ports.

For further information regarding the power supply's PoE/PoE+ capabilities, see the *HP Power over Ethernet (PoE/PoE+) Planning and Implementation Guide*, on the HP Web site at www.hp.com/networking/support.

PoE/PoE+ Operation

It is important to understand the PoE/PoE+ power requirements of the switches because if the PoE/PoE+ power is not planned and implemented correctly the end devices connected to the switch ports may not receive power if an internal switch PoE/PoE+ power supply should fail.

For further information regarding the PoE/PoE+ capabilities, see the *HP Power over Ethernet (PoE/PoE+) Planning and Implementation Guide*, on the HP Web site at www.hp.com/networking/support.

9. (Optional) Connect a Management console

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

- Monitor switch and port status and observe network activity statistics.
- Modify the switch's configuration to optimize switch performance, enhance network traffic control, and improve network security.
- Read the event log and access diagnostic tools to help in troubleshooting.
- Download new software to the switch.
- Add passwords to control access to the switch from the console, web browser interface, and network management stations.

After you install and power up the Switch, you must use the console port connection to minimally configure the switch with an IP address and subnet mask before you can use a networked (in-band or out-of-band) connection to manage the switch. The minimal switch configuration is described in “Minimal Configuration Through the Out-of-Band Console Connection” on [page 3-2](#).

To connect a console to the switch, use the console cable shipped with the switch and connect a PC or VT-100 terminal to the Console serial port. The PC or terminal then functions as a management console connected directly to the switch.

You can use the Console port only for out-of-band management; it cannot be used for a Telnet connection.

Configuring the Management Console

To set up a console to manage the switch through the Console port connection:

1. Configure the PC terminal emulator as a DEC VT-100 (ANSI) terminal or use a VT-100 terminal.
2. Configure the terminal with the following settings:
 - A baud rate from 1200 to 115200 (the switch senses the speed)
 - 8 data bits, 1 stop bit, no parity, and flow control set to Xon/Xoff
 - For the Windows Terminal program, disable (uncheck) the “Use Function, Arrow, and Ctrl Keys for Windows” option.
 - For the Hilgraeve HyperTerminal program, select the “Terminal keys” option for the “Function, Arrow, and Ctrl Keys act as” parameter.

If you use a management console with different configuration settings, be sure to reconfigure the settings on both the terminal and the switch in the following order so that both configurations are compatible:

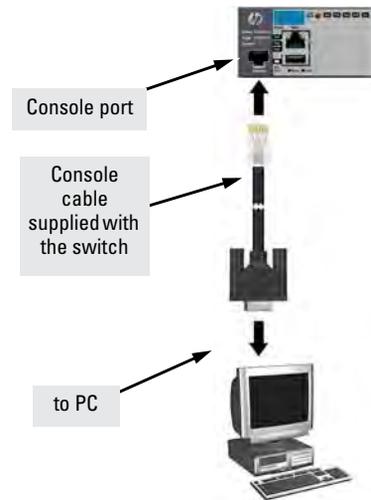
1. Reconfigure the switch and save the new settings.
2. Reconfigure the terminal and save the new settings.
3. Reboot the switch and re-establish the console session.

Setting Up a Console Connection

To access the Switch through an Console port (out-of-band) connection, follow these steps:

1. Configure the management console as described in [“Configuring the Management Console”](#).
2. For a direct console connection, connect the PC or terminal to the Console serial port using the console cable shipped with the switch:
 - A DB9-to-RJ45 adapter is shipped with the Switch.
3. Power on the management console (terminal or PC). If you are using a PC, start the PC terminal program.
4. For a direct console connection through the Console port:
 - a. Press **Enter** two or three times to display the copyright page and the message “Press any key to continue”.
 - b. Press any key to display the switch console command (CLI) prompt; for example: **HP E3800#**
 - c. Continue the console session to configure the switch by following the procedure in “Minimal Configuration Through the Out-of-Band Console Connection” on page 3-2.

Figure 2-14. Connecting a console cable



Important

You must use the out-of-band console connection to minimally configure the switch with an IP address and subnet mask before you can use an in-band or out-of-band networked connection to manage the switch. Continue with [“Minimal Configuration Through the Console Port Connection”](#) on page 3-2 for more information.

Console Cable Pinouts

The console cable has an RJ-45 plug on one end and a DB-9 female connector on the other end. [Table 2-2](#) describes the mapping of the RJ-45 to DB-9 pins.

Figure 2-15. RJ-45 to DB-9 pinouts

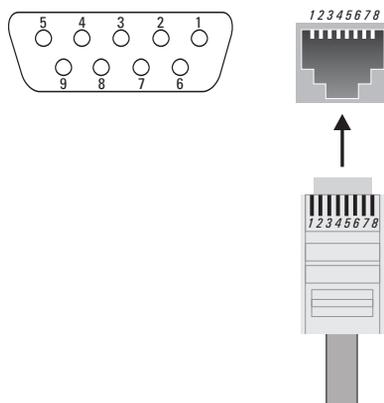


Table 2-2. Mapping of RJ-45 to DB-9

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

10. Connect the Network Cables

Connect the network cables, described under “Cabling Infrastructure” (page 2-5), from the network devices or your patch panels to the fixed RJ-45 ports on the switch or to any transceivers installed in the switch.

Using the RJ-45 Connectors

To connect:

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

If the Link LED does *not* go on when the network cable is connected to the port, see “*Diagnosing with the LEDs*” on page 5-4, in chapter 5, “Troubleshooting”.

To disconnect:

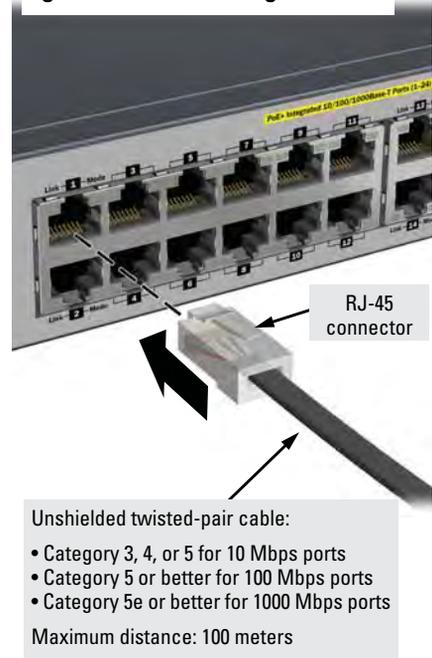
Press the small tab on the plug and pull the plug out of the jack.

Connecting Cables to Transceivers

If you have any transceivers installed in the switch, the type of network connections you will need to use depends on the type of transceivers installed.

For transceiver ports, and in general for all the switch ports, when a network cable from an active network device is connected to the port, the Link LED for that port should go on. If the Link LED does *not* go on when the network cable is connected to the port, see “*Diagnosing with the LEDs*” on page 5-4 in chapter 5, “Troubleshooting”.

Figure 2-16. Connecting an RJ-45



Connecting a fiber cable

To connect:

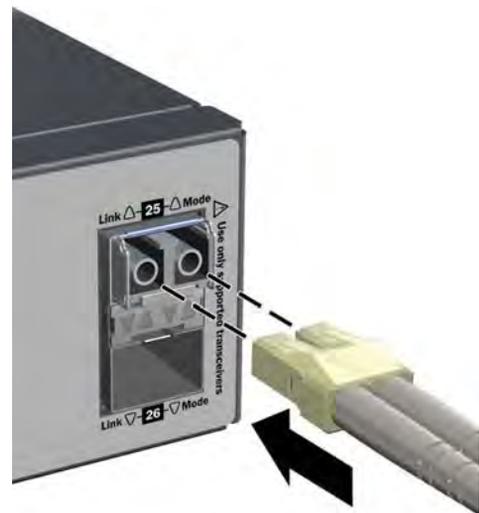
1. Remove the dust covers from the cable connectors and the port.
2. Aligning the notches on the cable connectors with the slots of the port, press the cable connector into the port until it snaps into place.

If the Link LED does *not* go on when the network cable is connected to the port, see [“Diagnosing with the LEDs”](#) on page 5-4, in chapter 5, “Troubleshooting”.

To disconnect:

Pull the cable connector straight out.

Figure 2-17. Connecting fiber optic cable



Stacking Information and Topologies

The E3800 switches support the **HP FlexChassis Mesh** feature for stacking the switches. When E3800 Stacking Modules (J9577A) are installed in the switches, any combination of up to ten E3800 switches can be stacked together via high-speed backplane cables to form a single extended virtual switch. The stacking topologies supported depend on the number of switches being stacked.

The stacking cables and connections operate independently of any layer 2 or layer 3 network protocols and features, including Spanning Tree. When multiple switches are stacked, they behave as a single, virtual switch with additional network ports being supplied by the stack members.

Note

If an E3800 switch is powered on for the first time without a stacking module installed, stacking will be disabled and that will be saved in the switch's running configuration. Subsequently, after a stacking module has been installed, stacking must be enabled through the console (CLI) command **stacking enable**.

To set up a stack of E3800 switches, you should:

1. Power off all switches that are going to be stacked.
2. Install Stacking Modules in the switches, and connect the stacking cables to create your stacking topology.
3. Power-on each switch, one at a time. The first switch that you should power on is the one that you want to be the Commander of the stack. The second one will become the stack Standby. For the other stack members, their Member ID is determined by the sequence in which they are booted.

There are additional methods for creating your E3800 stack. For configuration options and other information on stacking, see “Stack Management” chapter in the *E3800 Advanced Traffic Management Guide*.

The supported stacking topologies include the following:

- Chain
- Ring
- Mesh

Chain Topologies

Up to 10 switches may be stacked in an open-ended chain with single cables between each pair of switches.

Note

Chain topologies are not recommended because a single failure (switch, stacking module, or cable) will cause switch-to-switch communication failures between switches that are located on opposite sides of the failure. Unless the failure is the switch or stacking module is at the very end of the chain, two stack fragments are formed as a result. One of the fragments becomes inactive to make sure that network topology and protocol rules are not violated by the creation of two virtual switches. For the inactive fragment, the switches remain powered on and create a separate stack, but all of network ports on the switches in the inactive fragment become disabled and do not pass network traffic.

For more information and recovery procedures, see the “Stack Management” chapter in the *E3800 Advanced Traffic Management Guide*.

A typical chain topology is illustrated in Figure 2-18.

Figure 2-18. Typical chain topology



Cable connection examples for stacked chains are illustrated in Figure 2-19.

Figure 2-19. Cable connection examples for chain topologies

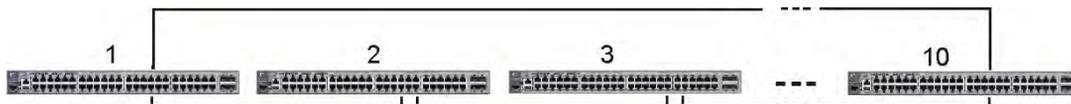
2-switch chain	<p>A photograph showing two switches stacked vertically. A red Ethernet cable is plugged into the top switch's SFP port and the bottom switch's SFP port, connecting them in a chain topology.</p>
3-switch chain	<p>A photograph showing three switches stacked vertically. Red Ethernet cables connect the top switch to the middle switch, and the middle switch to the bottom switch, forming a chain.</p>
5-switch chain	<p>A photograph showing five switches stacked vertically. Red Ethernet cables connect the top switch to the second, the second to the third, the third to the fourth, and the fourth to the fifth, forming a chain.</p>

Ring Topologies

Up to 10 switches may also be connected in closed ring topologies. Ring topologies afford some protection from a single failure because communications between the switches continues, in a direction away from the failure.

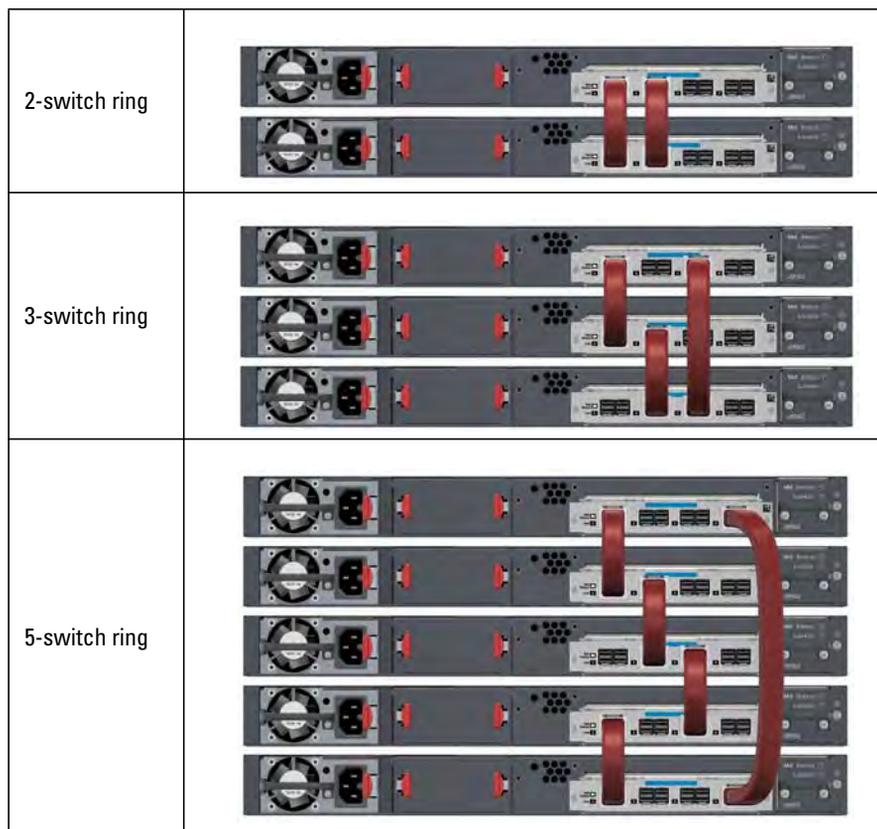
A typical ring topology is illustrated in Figure 2-20.

Figure 2-20. Typical ring topology



Cable connection examples for stacked rings are illustrated in Figure 2-21.

Figure 2-21. Cable connection examples for ring topologies



Mesh Topologies

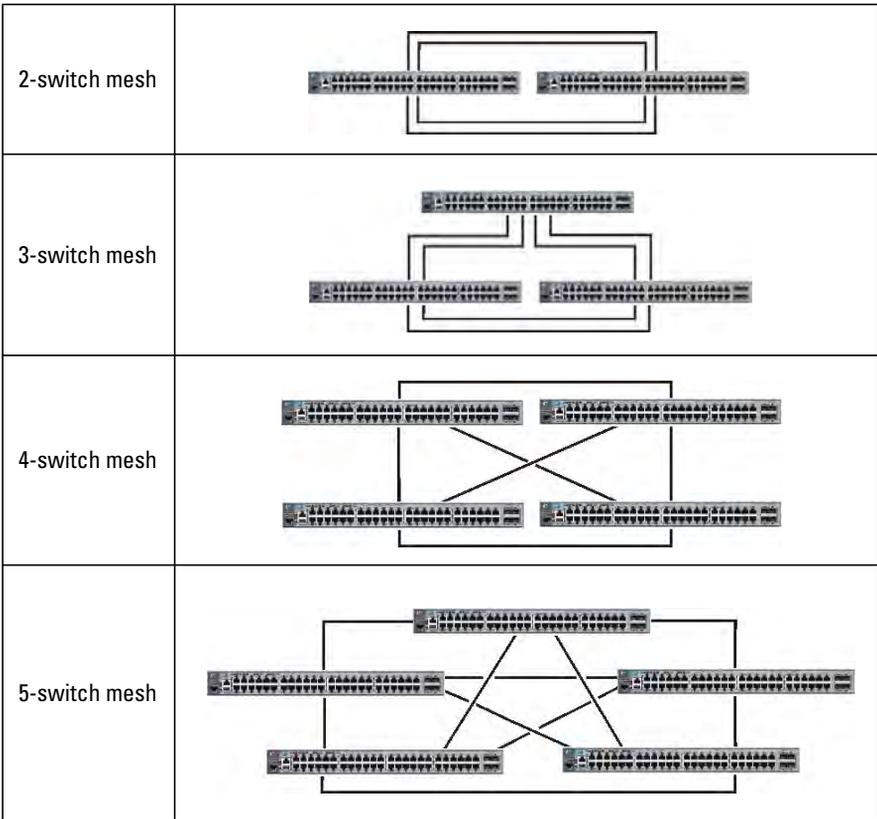
Two to five switches may be stacked using mesh topologies.

In mesh topologies, every switch in the stack is connected to every other switch in the stack. Hence, with four stacking ports on the Stacking Module, the maximum number of switches that can be meshed together is limited to five.

Mesh topologies provide the most protection from stacking failures because communications can be rerouted through multiple paths.

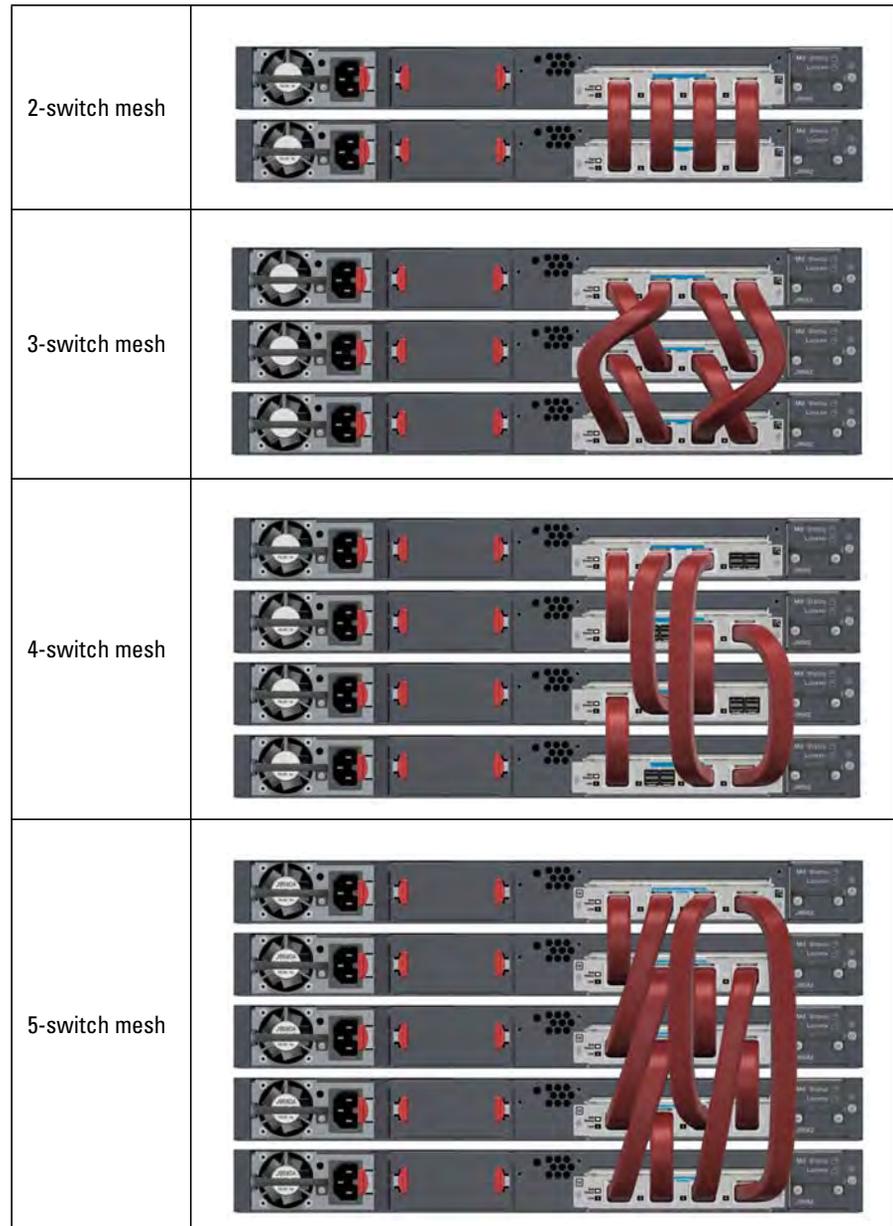
Typical mesh topologies are illustrated in Figure 2-22.

Figure 2-22. Meshed Topologies



Cable connection examples for stacked redundant and meshed topologies are illustrated in Figure 2-23.

Figure 2-23. Cable connection examples for Redundant and Meshed Topologies

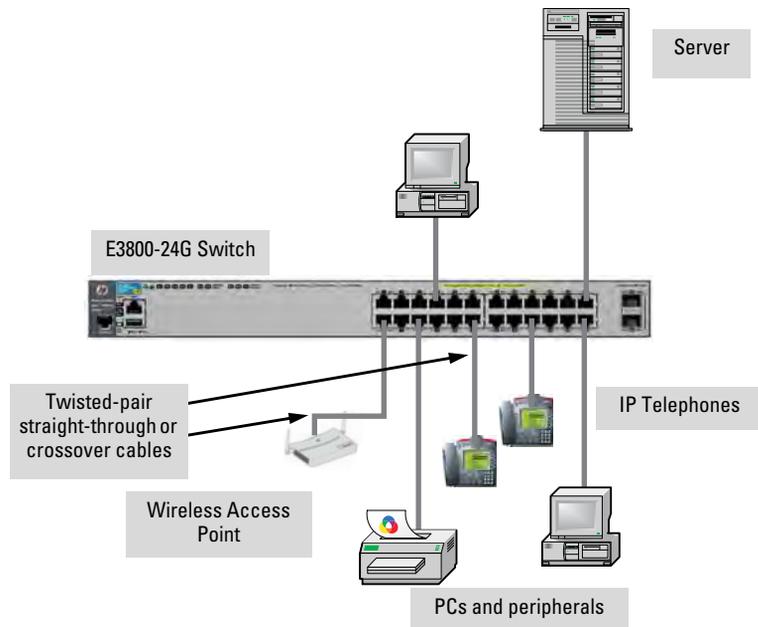


Sample Network Topologies

This section shows a few sample network topologies in which the switch is implemented. For more topology information, visit the product's Web site at www.hp.com/networking/support.

The switch is designed to be used primarily as a desktop switch to which end nodes, printers and other peripherals, and servers are directly connected, as shown in the following illustration. Notice that the end node devices are connected to the switch by straight-through or crossover twisted-pair cables. Either cable type can be used because of the "IEEE Auto MDI/MDI-X" features on the switch.

Figure 2-24. Example as a Desktop Switch Implementing PoE/PoE+

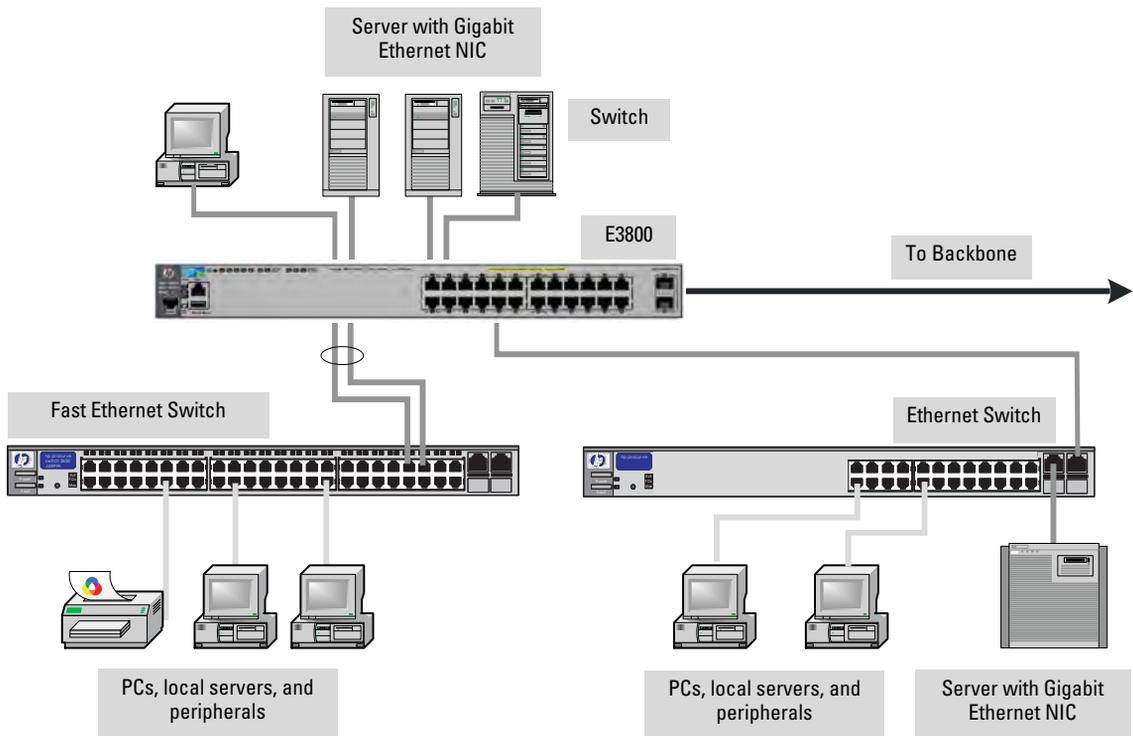


This illustration is an example of the switch being configured to supply PoE/PoE+ power to end devices such as IP telephones and wireless access points (WAPs).

As shown in Figure 2-18 the IP telephones can be connected in line, that is, between the switch and the end device, in this case a PC. The IP telephones in this illustration have two ports, one in and one out. Therefore the phone receives voice and power from the switch, and the PC can send and receive data through the phone to the switch.

The end node devices are connected to the switch by straight-through or crossover twisted-pair cables. Either cable type can be used because of the “IEEE Auto MDI/MDI-X” features on the switch.

Figure 2-25. Example as a Segment Switch



The Switch also works well as a segment switch. That is, with its high performance, it can be used for interconnecting network segments – simply connect the network hubs that form those segments to the switch, or you can also connect other switches.

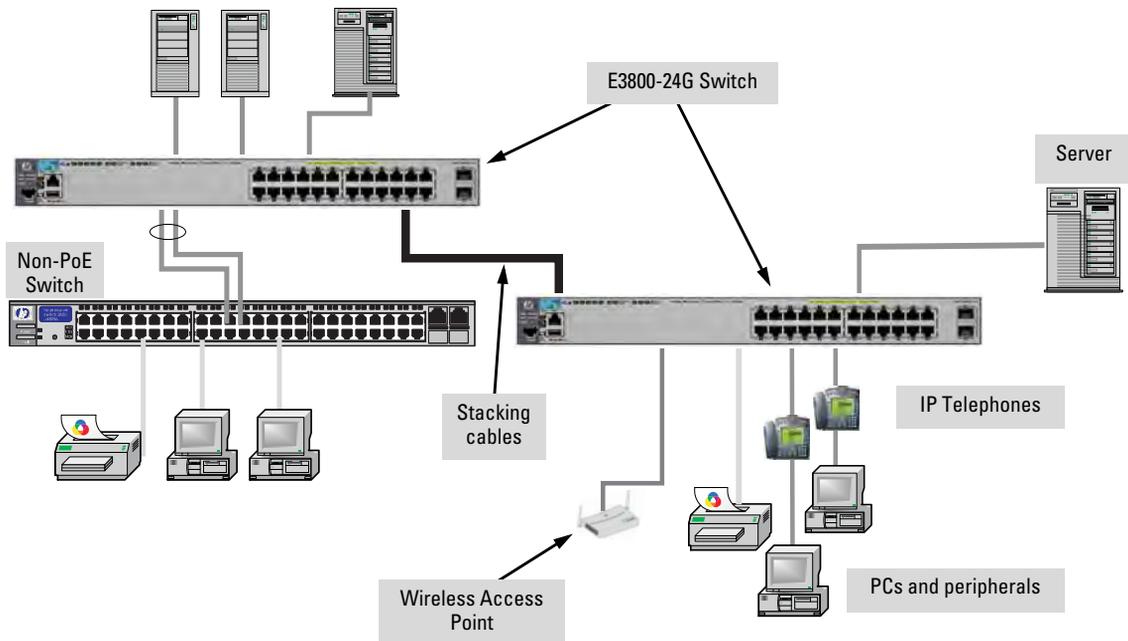
In the illustration above, two “Fast” Ethernet hubs with PCs, printers, and local servers attached, are both connected to a Switch. The devices attached to the two hubs can now communicate with each other through the switch. They can also all communicate with the server that is connected to a 1000Base-T port on the switch.

Because the Switch has the “IEEE Auto MDI/MDI-X” features, the connections between the switch and the hubs, and between the switch and end nodes or servers can be through category 5 straight-through or crossover twisted-pair cable.

Category 3 or 4 cable can also be used if the connection is 10 Mbps only. In all cases, the device ports must be configured to auto negotiate the link characteristics for this feature to work.

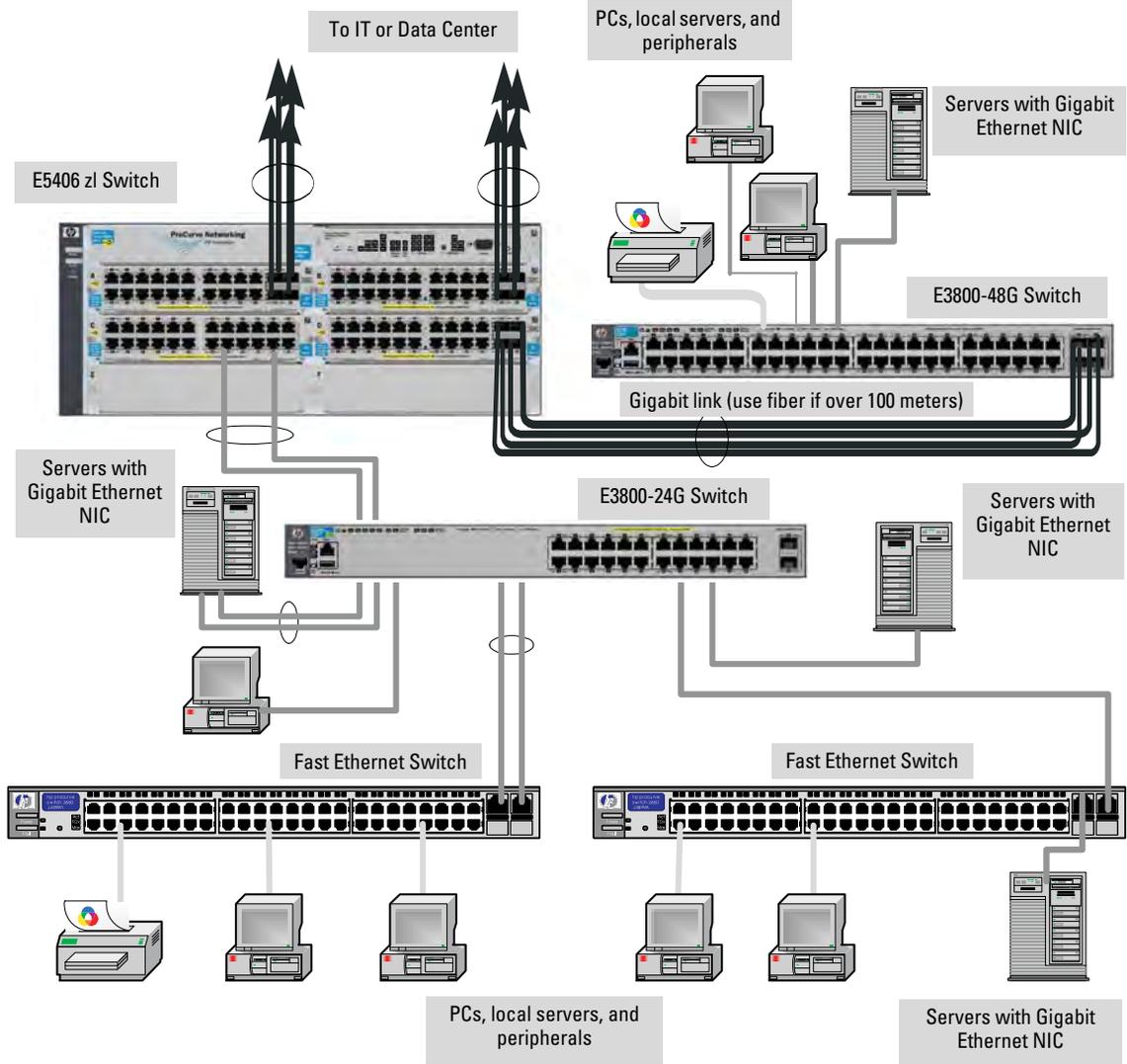
The switch, in turn, can be connected to a network backbone through fiber-optic cabling connected to a Gigabit-SX, -LX, or -LH transceiver installed in the switch. Now, all the devices on these network segments can access other network resources that are connected elsewhere on the network backbone.

Figure 2-26. Example as a Segment Switch Implementing PoE/PoE+



As shown in Figure 2-20, the IP telephones have been inserted in between the E3800-PoE+ switch and the PCs, and a WAP has been connected to the E3800-PoE+ switch. Only devices directly connected to the PoE+ switches can receive PoE/PoE+ power. Devices connected to a non-PoE+ switch cannot receive PoE/PoE+ power.

Figure 2-27. Example of connecting to a Backbone Switch



The simpler desktop and segment networks shown in the previous two examples can easily be combined and expanded. For example, you could use an HP E5406 zl Switch to interconnect each of your smaller switched workgroups to form a larger switched network. All the devices in this network can communicate with each other. With a Gigabit-SX Module, for example, in the E5406 zl Switch, the entire switched topology could be connected to a campus backbone, as shown in Figure 2-21.

Note

In the Backbone Switch illustration, the 1000 Mbps fiber-optic connection between the E3800 Switch and the E5406 zl Switch is by way of a Gigabit-SX transceiver installed in the E3800 Switch and connected to a Gigabit-SX Module in the E5406 zl Switch.

Installing the Switch
Sample Network Topologies

Getting Started With Switch Configuration

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

For more information on using the switch console and the other switch management interfaces: the web browser interface and the SNMP management tool, HP ProCurve Manager, please see the *Management and Configuration Guide*, which is on the HP Web site at www.hp.com/networking/support.

Recommended Minimal Configuration

In the factory default configuration, the switch has no IP (Internet Protocol) address and subnet mask, and no passwords. In this state, it can be managed only through a direct console connection.

To manage the switch through a networked (in-band data port or out-of-band management port) connection, you must first configure the switch with an IP address and subnet mask compatible with your network.

Also, you should configure a Manager password to control access privileges from the console and web browser interface. Other parameters in the Switch Setup screen can be left at their default settings or you can configure them with new values.

You can configure many other switch features through the switch's console interface to:

- Optimize switch performance
- Enhance control of network traffic
- Improve network security
- Enable stacking.

Getting Started With Switch Configuration

Minimal Configuration Through the Console Port Connection

After you configure an IP address on the switch, you can manage these features more conveniently in any of the following ways:

- A remote Telnet session
- A web browser interface
- An SNMP network management station running a network management program, such as ProCurve Manager.

For a list of switch features available with and without an IP address, refer to “How IP Addressing Affects Switch Operation” in the *Management and Configuration Guide* on the HP Web site.

For more information on IP addressing, refer to “IP Configuration” in the *Management and Configuration Guide*.

Note

By default, the switch is configured to acquire an IP address configuration from a DHCP or Bootp server. To use DHCP/Bootp instead of the manual configuration method described in “Minimal Configuration Through the Out-of-Band Console Connection”, see “DHCP/Bootp Operation” in the *Management and Configuration Guide* on the HP Web site.

Minimal Configuration Through the Console Port Connection

The quickest and easiest way to minimally configure the switch for networked management and password protection is to use the direct (out-of-band) connection through the console port to start a console session and access the Switch Setup screen.

1. Configure a management console as described in [“Configuring the Management Console” on page 2- 18](#).
2. Set up a console connection through the Console port by following the procedure described in [“Setting Up a Console Connection” on page 2- 19](#). The E3800 command-line prompt should be displayed on the console screen, typically with the switch model number; for example: **HP E3800#**
3. At the prompt, enter the **setup** command to display the Switch Setup screen. The following illustration shows the Setup screen with the default settings.

Figure 3-1. Example CLI switch setup screen

```

HP E3800-48G-POE+-4SFP+ Switch                               1-May-2000 15:12:40
----- CONSOLE - MANAGER MODE -----
Switch Setup

System Name : HP E3800-48G-POE+-4SFP+ Switch
System Contact :
Manager Password :
Confirm Password :
Logon Default : CLI                               Time Zone [0] : 0
Community Name : public                           Spanning Tree Enabled [No] : No
Default Gateway :
Time Sync Method [None] : TIMEP
TimeP Mode [Disabled] : Disabled

IP Config [Manual] : DHCP/Bootp

IP Address : 192.168.1.1
Subnet Mask : 255.255.255.0
Actions->  Cancel      Edit      Save      Help

Enter System Name - up to 25 characters.
Use arrow keys to change field selection, <Space> to toggle field choices,
and <Enter> to go to Actions.

```

4. Use the **Tab** key to select the **Manager Password** field and enter a manager password of up to 16 characters.
5. Tab to the **IP Config (DHCP/Bootp)** field and use the Space bar to select the **Manual** option.
6. Tab to the **IP Address** field and enter the IP address that is compatible with your network.
7. Tab to the **Subnet Mask** field and enter the subnet mask for your network.
8. Press **Enter**, then **S** (for **Save**).

The following fields are displayed in the Setup screen. For more information on these fields, see the *Management and Configuration Guide*, which is on the HP Web site at www.hp.com/networking/support.

Parameter	Default	
System Name	blank	Optional; up to 25 characters, including spaces
System Contact	blank	Optional; up to 48 characters, including spaces
Manager Password	blank	Recommended; up to 16 characters (no blank spaces)
Logon Default	CLI	The default setting selects the command line interface for console access. The alternative is the menu interface.
Time Zone	0 (none)	Optional; 1440 to -1440. The number of minutes your location is to the West (-) or East (+) of GMT.

Getting Started With Switch Configuration

Where to Go From Here: Networked Connections

Parameter	Default	
Community Name	public	Default setting recommended.
Spanning Tree Enabled	No	Default setting recommended unless STP is already running on your network or the switch will be used in complex network topologies.
Default Gateway	blank	Optional; Enter the IP address of the next-hop gateway node if network traffic needs to be able to reach off-subnet destinations.
Time Sync Method	None	Optional; The protocol the switch uses to acquire a time signal. The options are SNTP and TimeP.
TimeP Mode	Disabled	Optional; The method the switch uses to acquire the TimeP server address.
IP Config (DHCP/Bootp)	DHCP/Bootp	Set to Manual unless a DHCP/Bootp server is used on your network to configure IP addressing.
IP Address	xxx.xxx.xxx.xxx	Recommended; If you set IP Config to Manual, then enter an IP address compatible with your network.
Note: The IP address and subnet mask assigned for the switch must be compatible with the IP addressing used in your network.		
Subnet Mask	xxx.xxx.xxx.xxx	Recommended; If you entered an IP address, then enter a subnet mask compatible with your network.
Stacking	Stacking is enabled by default, but if the switch was powered on for the first time and a stacking module is not installed, it becomes disabled and that configuration change is saved in the switch's running configuration. In that case, for the stacking feature to operate, stacking must first be enabled. From the config context in the CLI, enter the command stacking enable .	

Where to Go From Here: Networked Connections

After the Switch is configured with a Manager password, IP address, and subnet mask, you can manage the switch from a networked connection, such as:

- PC equipped with Telnet (see “Starting a Telnet Session” on [page 3-6](#)).
- Web browser interface (see “Starting a Web Browser Session on [page 3-6](#)).
- SNMP-based network management station using a tool such as ProCurve Manager.

For more information on these management interfaces and all the features that you can configure on the switch, refer to the *Management and Configuration Guide* for your switch on the HP Web site.

The following types of networked connections are supported on an E3800 Switch:

- Out-of-band networked connection through the dedicated Management port

To use: Connect an RJ-45 network cable to the **Mgmt** port to manage a E3800 Switch through Telnet from a remote PC or UNIX workstation.

To use this port, the switch must have an IP address. IP settings can be configured through a Console port connection (see “[Minimal Configuration Through the Console Port Connection](#)” on page 3-2) or automatically from a DHCP/Bootp server.

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

For more information, refer to the “Network Out-of-Band Management (OOBM)” appendix in the *Management and Configuration Guide* at www.hp.com/networking/support.

- In-band networked connection through a data port on the switch

To use: Connect a PC or UNIX workstation with a VT-100 terminal emulator directly to a switch data port. Then access the switch via Telnet from the workstation

To use Telnet, the switch must have an IP address. IP settings can be configured through a Console port connection (see “[Minimal Configuration Through the Console Port Connection](#)” on page 3-2) or automatically from a DHCP/Bootp server.

For more information on in-band and out-of-band networked connections for switch management, refer to “[Using the IP Address for Remote Switch Management](#)” on page 3-6 and the *Management and Configuration Guide* for your switch at www.hp.com/networking/support.

Management Sessions

An E3800 Switch can simultaneously support one out-of-band serial console session through the Console port and up to six in-band Telnet/TCP (networked) sessions through data ports on the switch.

Using the IP Address for Remote Switch Management

The switch's IP address can be used to manage the switch from any PC on the same or on a different subnet as the switch. In a networked (in-band or out-of-band) connection, you can use a Telnet session or a standard web browser to manage the switch.

Starting a Telnet Session

To access the switch through a Telnet session, follow these steps:

1. Make sure the switch is configured with an IP address and that the switch is reachable from the PC that is running the Telnet session (for example, by using a Ping command to the switch's IP address).
2. Start the Telnet program on a PC that is on the same subnet as the switch and connect to the switch's IP address.
3. You will see the copyright page and the message "Press any key to continue". Press a key, and you will then see the switch console command (CLI) prompt, for example:

```
HP E3800#
```

Enter **help** or **?** to see a list of commands that can be executed at the prompt. Entering any command followed by **help** provides more detailed context help information about the command. Entering any command followed by **?** displays a list of options that are available at that point in the command entry.

Starting a Web Browser Session

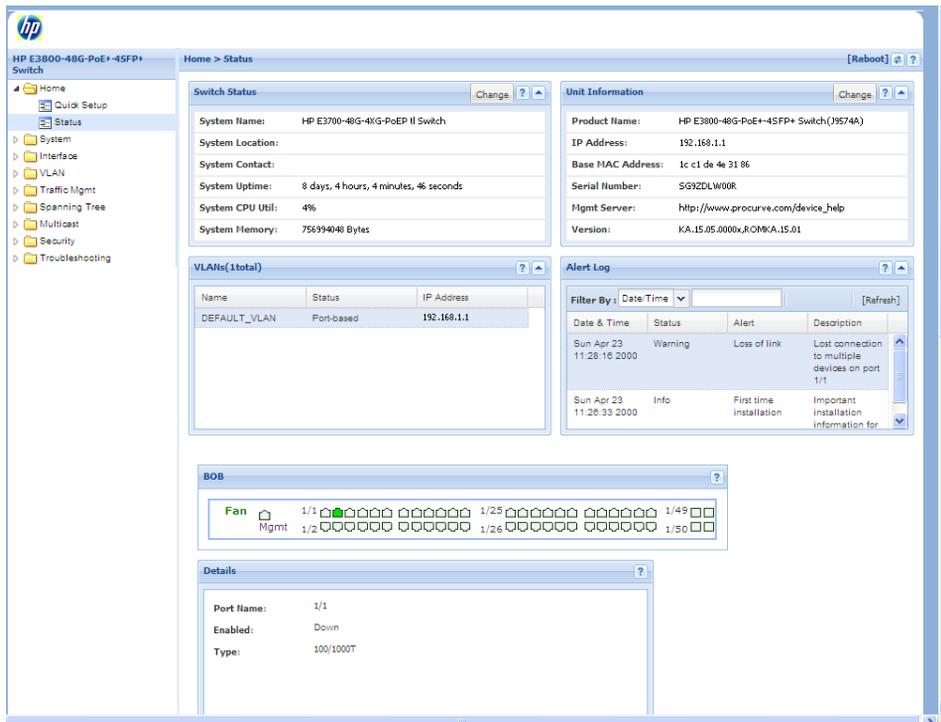
The E3800 Switch can be managed through a graphical interface that you can access from any PC or workstation on the network by running a web browser and typing in the switch's IP address as the URL. No additional software installation is required to make this interface available; it is included in the switch's onboard software.

The minimum operating systems, Web browsers, and Java support required to manage the switch through the browser interface are listed in the following table:

Operating System	Internet Explorer	Java Version
Windows 2000 SP4	5.5 SP2, 6.0 SP1	1.3.1_12 and 1.4.2_05
Windows XP SP1a	6.0 SP1	1.3.1_12 and 1.4.2_05
Windows Server 2003	6.0 SP1	1.3.1_12 and 1.4.2_05

The following illustration shows a typical web browser interface screen.

Figure 3-2. Web browser interface screen



For more information on using the web browser interface, see the *Management and Configuration Guide*, which is on the HP Web site at www.hp.com/networking/support.

An extensive help system is also available for the web browser interface. To access the help system though, the subnet on which the switch is installed must have access to the internet, or ProCurve Manager needs to be installed on a network management station that is on the subnet.

Replacing Components

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

- Fan tray (see [page 4-2](#))
- Power Supply (see [page 4-3](#))
- Stacking Module (see)

Hot Swapping

- The fan tray can be hot swapped. The switch does not need to be powered off to replace the fan tray. However, it needs to be done quickly before the switch overheats (within 3 minutes).
- The stacking module is *not* hot swappable. The switch must be powered off before installing or replacing the module.

Caution

The HP E3800 switches and its components are sensitive to static discharge. Use an antistatic wrist strap and observe all static precautions when replacing components.

Caution

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

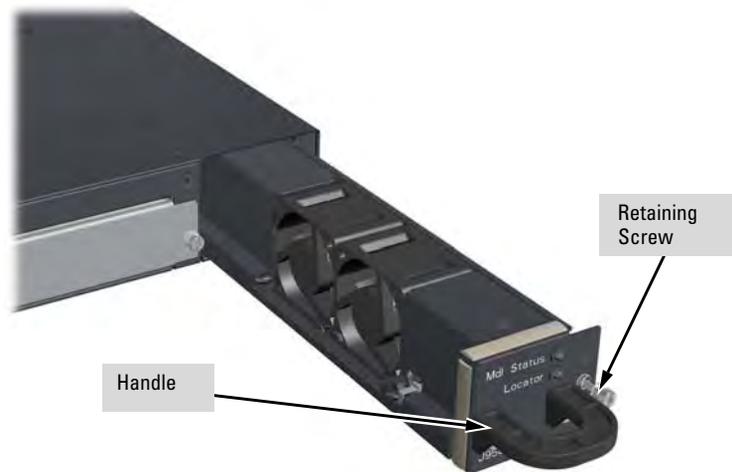
Replacing the Fan Tray

The fan tray is hot swappable. Replacing the fan tray can be done with the switch powered on. When a fan fails the Fan Status LED on the switch will blink simultaneously with the switch Fault LED. In this case, the entire fan tray needs to be replaced. Individual fans cannot be replaced.

To replace a fan tray:

1. Remove the new fan tray assembly from it's packaging.
1. Unscrew the retaining screw of the failed fan tray.
2. Holding the handle, pull the failed fan tray assembly straight out.
3. Insert the new fan tray assembly fully. The face plate of the fan tray will be flush with the back face of the switch.
4. Engage the retaining screws and tighten. Be sure to not over tighten the screw.

Figure 4-1. Fan tray retaining screw and handle



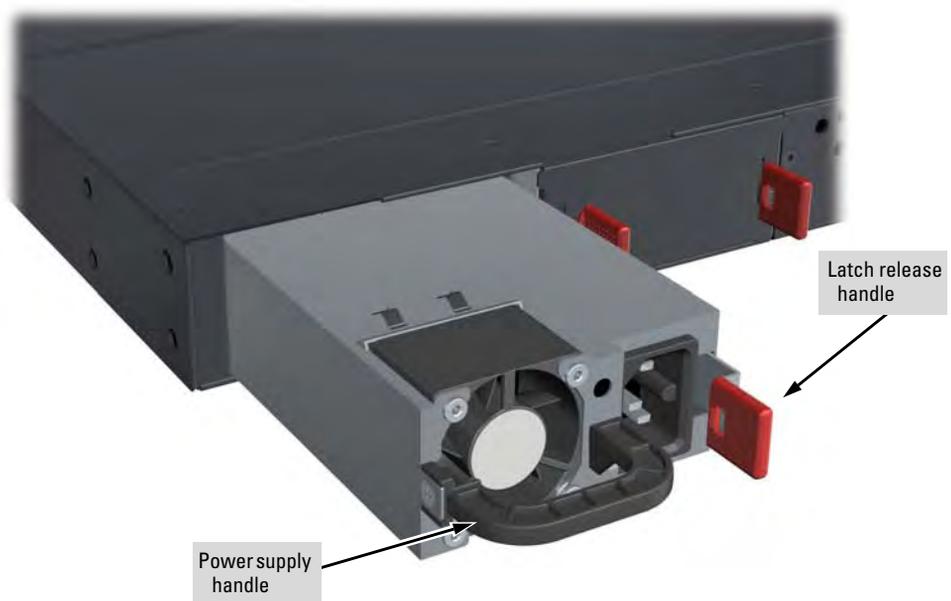
Replacing the Power Supply

If the E3800 switch is configured with redundant power supplies, the switch will not suffer any loss of traffic or performance if a power supply fails. Replace the failed component as soon as possible. The PS (Power Supply) LED will blink simultaneously with the switch Fault LED indicating a power supply has failed.

To remove an AC power supply:

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

Figure 4-2. Replacing a failed power supply



3. Insert the new power supply. Slide it in all the way in until the locking mechanism locks.

Replacing the Stacking Module

The E3800 Stacking Module is *not* hot swappable. The switch must be powered off before replacing the module. When a stacking module fails, the Module Status (Mdl) LED on the front of the switch and the Module Status LED on the module will blink orange simultaneously with the switch Fault LED. In this case, the stacking module needs to be replaced.

To replace a stacking module:

1. Power off the switch for which the stacking module needs to be replaced.
1. Remove the new stacking module from its packaging, being careful to not touch any of the circuitry on the board.
2. Disconnect the stacking cables from the failed module. You do not need to disconnect the cables from the switches at the other ends of the cables.
3. Unscrew the two retaining screws on the module.
2. Pull the two extractor handles toward you and outward until they stop and then pull the module straight out.
3. Insert the new stacking module fully into the slot as shown in [Figure 2-5 on page 2-8](#). The face plate of the module will be flush with the back face of the switch.
4. Close the two extractor handles all the way until they stop.
5. Engage the retaining screws and tighten them. Be sure to not over tighten the screws.
6. Power on the switch and make sure the module passes its self test. See [Table 2-1 on page 2-9](#) for the module LED behavior that indicates correct installation.

Troubleshooting

This chapter describes how to troubleshoot your switch. This document describes troubleshooting mostly from a hardware perspective. You can perform more in-depth troubleshooting on the switch using the software tools available with the switch, including the full-featured console interface, the built-in web browser interface, and HP Professional Management Center (HP PMC), the SNMP-based network management tool. For more information, see the chapter “Troubleshooting” in the *E3800 Management and Configuration Guide*, which is on the HP Web site at www.hp.com/networking/support. You may want to bookmark this Web page for easy access in the future.

This chapter describes the following:

- Basic Troubleshooting Tips (page 5-2)
 - Diagnosing with the LEDs (page 5-4)
 - Proactive Networking Tools (page 5-11)
 - Hardware Diagnostic Tests (page 5-12)
 - Restoring the Factory Default Configuration (page 5-14)
 - Downloading New Switch Software (page 5-15)
 - HP Customer Support Services (page 5-15)
-

Basic Troubleshooting Tips

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

- **Connecting to devices that have a fixed full-duplex configuration.** The RJ-45 ports are configured as “Auto”. That is, when connecting to attached devices, the switch will operate in one of two ways to determine the link speed and the communication mode (half duplex or full duplex):
 - If the connected device is also configured to Auto, the switch will automatically negotiate both link speed and communication mode.
 - If the connected device has a fixed configuration, for example 100 Mbps, at half or full duplex, the switch will automatically sense the link speed, but will default to a communication mode of *half duplex*.

Because the switch behaves in this way (*in compliance with the IEEE 802.3 standard*), if a device connected to the switch has a fixed configuration at *full duplex*, the device will not connect correctly to the switch. The result will be high error rates and very inefficient communications between the switch and the device.

Make sure that all devices connected to the switch are configured to auto negotiate, or are configured to connect at half duplex (all hubs are configured this way, for example).

- **Faulty or loose cables.** Look for loose or obviously faulty connections. If they appear to be OK, make sure the connections are snug. If that does not correct the problem, try a different cable.
- **Non-standard cables.** Non-standard and miswired cables may cause network collisions and other network problems, and can seriously impair network performance. Use a new correctly-wired cable or compare your cable to the cable in appendix B, “Cables and Connectors” for pinouts and correct cable wiring. A category 5 cable tester is a recommended tool for every 100Base-TX and 1000Base-T network installation.
- **Improper Network Topologies.** It is important to make sure you have a valid network topology. Common topology faults include excessive cable length and excessive repeater delays between end nodes. If you have network problems after recent changes to the network, change back to the previous topology. If you no longer experience the problems, the new topology is probably at fault. Sample topologies are shown at the end of chapter 2 in this book, and some topology configuration guidelines can be found online at the HP Web site, www.hp.com/networking/support.

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

For your switch, if you wish to build redundant paths between important nodes in your network to provide some fault tolerance, you should enable **Spanning Tree Protocol** support on the switch. This ensures only one of the redundant paths is active at any time, thus avoiding data path loops. Spanning Tree can be enabled through the switch console, the web browser interface, or HP ProCurve Manager.

The E3800 switches also support **Trunking**, which allows multiple network cables to be used for a single network connection without causing a data path loop. For more information on Spanning Tree and Trunking, see the *Management and Configuration Guide* for your switch at www.hp.com/networking/support.

- **Check the port configuration.** A port on your switch may not be operating as you expect because it has been put into a “blocking” state by Spanning Tree, GVRP (automatic VLANs), or LACP (automatic trunking). (Note that the normal operation of the Spanning Tree, GVRP, and LACP features may put the port in a blocking state.) Or, the port just may have been configured as disabled through software.

Use the switch console to determine the port’s configuration and verify that there is not an improper or undesired configuration of any of the switch features that may be affecting the port. For more information, see the *Management and Configuration Guide* for your switch at www.hp.com/networking/support.

Diagnosing with the LEDs

- Table 5-1 shows LED patterns on the switch that indicate switch problem conditions.
 - Table 5-2 shows LED patterns on the switches and on stacking modules in a stack that indicate stack-related problem conditions.
1. Check in the tables for the LED pattern you see on your switch and stacking module.
 2. Refer to the corresponding diagnostic tip on the next few pages.

Table 5-1. Switch LED Error Indicators

LED Pattern Indicating Problems								See Diag Tips
Power	Fault	Power Supply	Tmp Status	Test	PoE Status	Fan Status	Port Link LED	
off with power cord plugged in	*	*	*	*	*	*	*	1
on	prolonged on	*	*	prolonged on	*	*	*	2
on	blink orange [†]	*	*	blink orange [†]	*	*	*	3
on	blink orange [†]	*	*	off	*	blink orange [†]	*	4
on	blink orange [†]	*	*	blink orange [†]	*	*	blink orange [†]	5
on	off	*	*	off	*	*	off with cable connected	6
on	off	*	*	off	*	*	on, but no activity on the port	7
on	blink orange [†]	blink orange [†]	*	*	*	*	*	8
on	blink orange [†]	*	blink orange [†]	*	*	*	*	9
on	blink orange [†]	*	*	*	blink orange [†]	*	*	10
on	off	blink orange [†]	*	*	*	*	*	11

* This LED is not important for the diagnosis.
[†] The blinking behavior is an on/off cycle once every 1.6 seconds, approximately.

Diagnostic Tips:

Tip	Problem	Solution
1	The switch is not plugged into an active AC power source, or the switch's power supply may have failed. The switch will not power up if the top is off.	<ol style="list-style-type: none"> 1. Verify the power cord is plugged into an active power source and to the switch. Make sure these connections are snug. 2. Try power cycling the switch by unplugging and plugging the power cord back in. 3. If the Power LED is still not on, verify that the AC power source works by plugging another device into the outlet. Or try plugging the switch into a different outlet or try a different power cord. <p>If the power source and power cord are OK and this condition persists, the switch power supply may have failed. Call your HP authorized LAN dealer, or use the electronic support services from HP to get assistance. See "HP Customer Support Services" on page 5-15.</p>
2	A switch hardware failure has occurred. All the LEDs will stay on indefinitely.	<p>Try power cycling the switch. If the fault indication reoccurs, the switch may have failed. Call your HP authorized LAN dealer, or use the electronic support services from HP to get assistance. See "HP Customer Support Services" on page 5-15.</p>
3	The switch has experienced a software failure during self test.	<ol style="list-style-type: none"> 1. Try resetting the switch by pressing the Reset button on the front of the switch, or by power cycling the switch. 2. If the fault indication reoccurs, attach a console to the switch (as indicated in chapter 2) and configure it to operate at 9600 baud. Then, reset the switch. Messages should appear on the console screen and in the console log identifying the error condition. You can view the console log at that point by selecting it from the console Main Menu. <p>If necessary to resolve the problem, contact your HP authorized LAN dealer, or use the electronic support services from HP to get assistance. See "HP Customer Support Services" on page 5-15.</p>
4	One or more of the switch cooling fans may have failed.	<p>Try disconnecting power from the switch and wait a few moments. Then reconnect the power to the switch and check the LEDs again. If the error indication reoccurs, one or more of the fans has failed. The switch has four fans and may continue to operate under this condition if the ambient temperature does not exceed normal room temperature, but for best operation, the fan tray should be replaced. See Chapter 4 "Replacing Components" for more information on how to replace the fan tray.</p>
5	The network port for which the LED is blinking has experienced a self test or initialization failure.	<p>Try power cycling the switch. If the fault indication reoccurs, the switch port may have failed. Call your HP authorized LAN dealer, or use the electronic support services from HP to get assistance. See "HP Customer Support Services" on page 5-15.</p> <p>If the port is a pluggable SFP/SFP+ unit, verify it is one of the pluggables supported by the switch. Unsupported pluggables will be identified with this fault condition. Caution: Use only supported genuine HP transceivers with your switch.</p> <p>To verify the port has failed, try removing and reinstalling the SFP/SFP+. You can do that without having to power off the switch. If the port fault indication reoccurs, you will have to replace the SFP/SFP+ unit.</p>

Tip	Problem	Solution
6	The network connection is not working properly.	<p>Try the following procedures:</p> <ul style="list-style-type: none">• For the indicated port, verify both ends of the cabling, at the switch and the connected device, are connected properly.• Verify the connected device and switch are both powered <i>on</i> and operating correctly.• Verify you have used the correct cable type for the connection:<ul style="list-style-type: none">– For twisted-pair connections to the fixed 10/100 or 10/100/1000 ports, if the port is configured to “Auto” (auto negotiate), either straight-through or crossover cables can be used because of the switch’s “HP Auto-MDIX” feature and the Auto MDI/MDI-X feature of the 10/100/1000-T port. Note: If the switch port configuration is changed to one of the fixed configuration options (for example, 100 Mbps/Full Duplex), then the port operates as MDI-X only and you must use the correct type of cable for the connection. In general, for connecting an end node (MDI port) to the switch, use straight-through cable; for connecting to MDI-X ports on hubs, other switches, and routers, use crossover cable.– For fiber-optic connections, verify the transmit port on the switch is connected to the receive port on the connected device, and the switch receive port is connected to the transmit port on the connected device.• For 1000Base-T connections, verify that the network cabling complies with the IEEE 802.3ab standard. the cable should be installed according to the ANSI/TIA/EIA-568-A-5 specifications. Cable testing should comply with the stated limitations for Attenuation, Near-End Crosstalk, Far-End Crosstalk, Equal-Level Far-End Crosstalk (ELFEXT), Multiple Disturber ELFEXT, and Return Loss. The cable verification process must include all patch cables from any end devices, including the switch, to any patch panels in the cabling path.• Verify the port has not been disabled through a switch configuration change. You can use the console interface, or, if you have configured an IP address on the switch, use the web browser interface, or ProCurve Manager network management software to determine the state of the port and re-enable the port if necessary.• Verify the switch port configuration matches the configuration of the attached device. For example, if the switch port is configured as “Auto”, the port on the attached device also MUST be configured as “Auto”. Depending on the port type, twisted-pair or fiber-optic, if the configurations don’t match, the results could be a very unreliable connection, or no link at all.• If the other procedures don’t resolve the problem, try using a different port or a different cable.

Tip	Problem	Solution
7	<p>The port may be improperly configured, or the port may be in a “blocking” state by the normal operation of the Spanning Tree, LACP, or IGMP features.</p>	<p>Use the switch console to see if the port is part of a dynamic trunk (through the LACP feature) or to see if Spanning Tree is enabled on the switch, and to see if the port may have been put into a “blocking” state by those features. The show lacp command displays the port status for the LACP feature; the show spanning-tree command displays the port status for Spanning Tree.</p> <p>Also check the Port Status screen using the show interfaces command to see if the port has been configured as “disabled”.</p> <p>Other switch features that may affect the port operation include VLANs and IGMP. Use the switch console to see how the port is configured for these features.</p> <p>For software troubleshooting tips, see the chapter “Troubleshooting” in the <i>Management and Configuration Guide</i> for your switch at www.hp.com/networking/support.</p> <p>Make sure also, the device at the other end of the connection is indicating a good link to the switch. If it is not, the problem may be with the cabling between the devices or the connectors on the cable.</p>
8	<p>A redundant power supply has experienced a fault.</p>	<p>(At least one power supply must be operating properly.) Check the power supply to make sure it is plugged in to an active power source. If this is ok but the LEDs are still blinking, the power supply may have failed. Try unplugging and then replugging the power supply. If the fault light is still blinking, replace the power supply.</p>
9	<p>The switch has overheated.</p>	<p>Check to ensure the fans are functioning correctly.</p>
10	<p>The port may have an internal hardware failure, or the port may be denied PoE power or detecting an external PD fault.</p>	<p>Check the port for a hardware failure, this may require a reboot of the switch. Check the port for correct PoE configuration and check for PoE allocation. Also check the external PD for a fault.</p>
11	<p>A redundant power supply is not connected to an active AC power source.</p>	<p>(At least one power supply must be operating properly.) Connect the unplugged power supply to an AC power source, using a supported power cord for your country/region.</p>

Table 5-2. Stacked Switch and Stacking Module LED Error Indicators

LED Pattern Indicating Problems						See Diag Tips
Fault	Cmd	Stk	Mdi Status **	Module Port Link LEDs	Switch Port LEDs	
off	off	off	on	off	*	1
off	off	off	blink orange [†]	off	*	2
off	see tip 2	on off	blink orange [†]	blink orange [†]	*	3
blink orange [†]	see tip 3	off	blink orange [†]	off	*	4
off	on	blink orange [†]	*	*	*	5
off	on	blink orange [†]	*	*	all off	6
off	*	blink orange [†]	blink orange [†]	blink orange [†]	*	7
off	off	blink orange [†]	on	on	*	8

* This LED is not important for the diagnosis.
[†] The blinking behavior is an on/off cycle once every 1.6 seconds, approximately.
**** The Mdi LED is on the switch front. It is replicated by the Mdi Status LED on the stacking module itself.**

Diagnostic Tips for Stack Errors:

Tip	Problem	Solution
1	Stacking is disabled on the switch.	<ol style="list-style-type: none"> 1. Connect a console cable to the switch and establish a console session, as described in “9. (Optional) Connect a Management console” on page 2-18 2. From the CLI config context, enter the command stacking enable. 3. Recheck the switch LEDs to confirm that the switch has now correctly joined the stack: <ul style="list-style-type: none"> – Stk LED is blinking green (indicates joining the stack) or on solid green (indicates has joined the stack). – Cmd LED may be on green if the switch has been elected as the stack Commander. – Mdl (module status) LEDs on the switch front and on the stacking module are on green. – Link LEDs for the stacking module ports are on green.
2	The Stacking Module was installed in the switch while the switch was powered on. Hot install is not supported.	<p>Reset or power cycle the switch to reboot it. After rebooting, the module will be correctly recognized and supported by the switch, and will be operational.</p> <p>When installing or removing the Stacking Module, the switch should be powered off.</p>
3	<p>One of these problems exists:</p> <ul style="list-style-type: none"> • The stacking cable connected to the stacking port on which the Link LED is blinking orange is not connected at the far end. • A stacking link failure has occurred on a link that was functioning: <ul style="list-style-type: none"> – the switch at the other end of the stacking cable has been powered off – The stacking feature is disabled on the switch at the other end of the stacking cable – the stacking module or switch at the other end of the stacking link has failed – the stacking cable is faulty 	<p>Make sure that the stacking cable is fully connected at both ends of the link.</p> <p>If an equipment failure has occurred, see the LEDs on the device at the other end of the connection.</p> <p>If this error occurred on an operational stack, it could result in changes to the stack configuration including election of a new stack Commander, and possibly a new Standby. See the Stack Management chapter in the <i>E3800 Advance Traffic Management Guide</i> for more information.</p> <p>If necessary to resolve the problem, contact your HP authorized LAN dealer, or use the electronic support services from HP to get assistance. See “HP Customer Support Services” on page 5-15.</p>

Troubleshooting
Diagnosing with the LEDs

Tip	Problem	Solution
4	<p>The stacking module on this switch has experienced a failure.</p> <p>The Test LED on the front of the switch may also be blinking orange simultaneously.</p>	<ol style="list-style-type: none"> 1. Try resetting the switch by pressing the Reset button on the front of the switch, or by power cycling the switch. 2. If the fault indication reoccurs, the stacking module may have to be replaced. <p>This error could result in changes to the stack configuration including election of a new stack Commander, and possibly a new Standby. See the Stack Management chapter in the <i>E3800 Advance Traffic Management Guide</i> for more information.</p> <p>If necessary to resolve the problem, contact your HP authorized LAN dealer, or use the electronic support services from HP to get assistance. See “HP Customer Support Services” on page 5-15.</p>
5	<p>A stack link failure has occurred in a chain topology and multiple stack fragments have been created. Each fragment will elect a Commander, so there will be multiple switches with the Cmd LED on.</p>	<p>Repair the cause of the stack link failure and reconnect the switches in their original topology so that the switches can reform the original stack.</p>
6	<p>A stack link failure has occurred in a chain topology and multiple stack fragments have been created.</p> <p>One of the fragments has been made inactive according to the rules of the stack operation. All the network ports on the switches in the inactive fragment are disabled. As a result, all the port LEDs are off for those switches.</p>	<p>Repair the cause of the stack link failure so that the switches can reform the original stack.</p>
7	<p>You have tried to merge two stacks that have different Stack IDs – they were not previously part of the same stack.</p> <p>This is not allowed by the stack operation rules.</p>	<ol style="list-style-type: none"> 1. Select one of the stacks as the one to retain. 2. For the switches in the other stack, erase their stacking configuration by issuing the following config-level CLI command to each switch: <pre>HP Switch(config)# stacking factory-reset</pre> <p>This erases the complete startup configuration for each switch, including the stacking configuration.</p> 3. Add the switches to the stack as described in the Stack Management chapter in the <i>E3800 Advanced Traffic Management Guide</i>.
8	<p>You have tried to add an eleventh switch to a stack. A maximum of ten switches can be stacked together.</p>	<p>Disconnect the eleventh switch from the stack.</p>

Proactive Networking

The HP E3800 switches have built-in management capabilities that proactively help you manage your network, they include:

- finding and helping you fix the most common network error conditions (for example, faulty network cabling, and non-standard network topologies)
- informing you of the problem with clear, easy-to-understand messages
- recommending network configuration changes to enhance the performance of your network

The following interfaces provide tests, indicators, and an event log that can be used to monitor the switch and its network connections and to help you take advantage of these proactive networking features:

- HP Professional Management Center (HP PMC) - an SNMP-based network management tool that is included with your switch.
- A graphical web browser interface that you can use to manage your switch from a PC running a supported web browser, for example Microsoft Internet Explorer, and Netscape Communicator.
- A full-featured easy-to-use console interface that you can access by connecting a standard terminal or PC running a terminal emulator to the switch's console port. The cable to make that connection is provided with your switch. The console interface is also accessible through a Telnet connection.

For more information on using these software tools to diagnose and manage your switch, see the “Troubleshooting” chapter in the *Management and Configuration Guide* for your switch at www.hp.com/networking/support.

Hardware Diagnostic Tests

Testing the Switch by Resetting It

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

- unplug and plug in the power cord (power cycling)
- press the Reset button on the front of the switch

Power cycling the switch and pressing the Reset button both cause the switch to perform its power-on self test, which almost always will resolve any temporary operational problems. These reset processes also cause any network traffic counters to be reset to zero, and cause the System Up Time timer to reset to zero.

Checking the Switch LEDs

The self test passes if the Fault and Self Test LEDs on the front of the switch go off after approximately 50 seconds. If these LEDs stay on longer than 60 seconds or begin blinking, there may be a problem with the switch.

See “Diagnosing With the LEDs” on [page 5-4](#) for information on interpreting the LED patterns and LED behaviors in chapter one.

Checking Console Messages

Useful diagnostic messages may be displayed on the console screen when the switch is reset. As described in chapter 2 under step 7, “Connect a Console to the Switch”, connect a PC running a VT-100 terminal emulator program or a standard VT-100 terminal to the switch’s Console Port and configure it to run at 9600 baud, and with the other terminal communication settings shown on [page 2-18](#). Then, when you reset the switch, note the messages that are displayed. Additionally, you can check the switch event log, which can be accessed from the console using the **show log** command, or from the console Main Menu.

Testing Twisted-Pair Cabling

Network cables that fail to provide a link or provide an unreliable link between the switch and the connected network device may not be compatible with the IEEE 802.3 Type 10Base-T, 100Base-TX, or 1000Base-T standards. The twisted-pair cables attached to the Switch must be compatible with the appropriate standards. To verify your cable is compatible with these standards, use a qualified cable test device.

Testing Switch-to-Device Network Communications

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

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

These tests can be performed through the switch console interface from a terminal connected to the switch or through a Telnet connection, or from the switch's web browser interface. For more information, see the *Management and Configuration Guide* for your switch at www.hp.com/networking/support.

These tests can also be performed from an SNMP network management station running a program that can manage the switch, for example, ProCurve Manager.

Testing End-to-End Network Communications

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

Restoring the Factory Default Configuration

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

Note

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

If the switch has a valid configuration, and you are restoring the factory default settings for a reason other than configuration problems, you should save the switch configuration prior to performing the factory default reset. Then, after the reset and resolution of the original problem, you can restore the saved configuration to the switch. For both the save and restore processes, you can use the console **copy** command. For more information on this command, see the *Management and Configuration Guide* for your switch at www.hp.com/networking/support.

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

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

1. Using pointed objects, simultaneously press both the Reset and Clear buttons on the front of the switch.
2. Continue to press the Clear button while releasing the Reset button.
3. When the Test LED begins to blink, release the Clear button. It takes approximately 25 seconds before the Test LED will begin to blink.

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

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

For stacked switches, reset stacking configurations to factory defaults. by executing the **stacking factory-reset** command.

Downloading New Switch Software

Software Updates can be downloaded to the switch through several methods. Switch software updates are available at www.hp.com/networking/support.

For more information, see the *Management and Configuration Guide* for your switch on the HP Web site.

HP Customer Support Services

If you are still having trouble with your product, Hewlett-Packard offers support 24 hours a day, seven days a week through the use of a number of automated electronic services. HP provides up-to-date customer care, support and warranty information at www.hp.com/networking/support.

Additionally, your HP authorized network reseller can provide you with assistance, both with services that they offer and with services offered by HP.

Before Calling Support

Before calling your networking dealer or HP Support, to make the support process most efficient, you first should have retrieved the following information:

Information Item	Information Location
<ul style="list-style-type: none">product identification, including mini-GBICs	the front of the switch and on labels on the mini-GBICs
<ul style="list-style-type: none">details about the switch's status including the software (OS) version, a copy of the switch configuration, a copy of the switch Event Log, and a copy of the switch status and counters information	switch console: show tech command
<ul style="list-style-type: none">copy of your network topology map, including network addresses assigned to the relevant devices	your network records

Specifications

Switch Specifications

Physical

Product	Weight	Width	Depth	Height
E3800-24G-PoE+-2SFP+ Switch (J9573A)	7.2 kg (15.90 lb)	442.5 mm (17.4 in)	430 mm (16.9 in) 467 mm (18.4 in) ¹	43 mm (1.7 in)
E3800-48G-PoE+-4SFP+ Switch (J9574A)	7.6 kg (16.85 lb)			
E3800-24G-PoE+-2XG Switch (J9587A)	7.5 kg (16.45 lb)			
E3800-48G-PoE+-4XG Switch (J9588A)	7.8 kg (17.25 lb)			
E3800-24G-2SFP+ Switch (J9575A)	6.9 kg (15.25 lb)			
E3800-48G-4SFP+ Switch (J9576A)	7.3 kg (16.00 lb)			
E3800-24SFP-2SFP+ Switch (J9584A)	7.3 kg (16.00 lb)			
E3800-24G-2XG Switch (J9585A)	7.2kg (15.80 lb)			
E3800-48G-4XG Switch (J9586A)	7.4 kg (16.35 lb)			

¹ Includes fan tray and power supply handles, which extend from the back of the switch chassis.

Electrical

	E3800 PoE+ Switches (J9573A, J9574A, J9587A, J9588A)	E3800 Non-PoE+ Switches (J9575A, J9576A, J9584A, J9585A, J9586A)
Electrical		
AC voltage:	100-127 VAC / 200-240 VAC	100 - 240 VAC
Maximum current:	9.4A / 7.8A	6A - 3A
Frequency range:	50 / 60 Hz	50 / 60 Hz
	The switch automatically adjusts to any voltage between 100-127 VAC and 200-240 VAC, and either 50 or 60 Hz.	The switch automatically adjusts to any voltage between 100-240 VAC and either 50 or 60 Hz.

Environmental

	HP E3800 Switches
Environmental	
Operating Temperature ¹ :	0°C to 55°C (32°F to 131°F)
Relative Humidity:	15% to 95% at 40°C (104°F) non-condensing
Non-Operating Temperature:	-40°C to 70°C (-40°F to 158°F)
Non-Operating Relative Humidity:	15% to 90% at 65°C (149°F)
Maximum Operating Altitude:	3.0 km (10,000 ft)
Non-Operating Altitude:	4.6 km (15,000 ft)

¹ If you are installing any transceivers the operating ambient temperature should not exceed 45°C (113°F).

Acoustics

	Acoustics
E3800-24G-PoE+-2SFP+ Switch (J9573A)	Geraeuschemission LpA=33.7 dB am fiktiven Arbeitsplatz nach DIN 45635 T.19 Noise Emission LpA=33.7 dB at virtual workspace according to DIN 45635 T.19
E3800-48G-PoE+-4SFP+ Switch (J9574A)	Geraeuschemission LpA=41.2 dB am fiktiven Arbeitsplatz nach DIN 45635 T.19 Noise Emission LpA=41.2 dB at virtual workspace according to DIN 45635 T.19
E3800-24G-PoE+-2XG Switch (J9587A)	Geraeuschemission LpA=32.6 dB am fiktiven Arbeitsplatz nach DIN 45635 T.19 Noise Emission LpA=32.6 dB at virtual workspace according to DIN 45635 T.19
E3800-48G-PoE+-4XG Switch (J9588A)	Geraeuschemission LpA=41.5 dB am fiktiven Arbeitsplatz nach DIN 45635 T.19 Noise Emission LpA=41.5 dB at virtual workspace according to DIN 45635 T.19
E3800-24G-2SFP+ Switch (J9575A)	Geraeuschemission LpA=26.4 dB am fiktiven Arbeitsplatz nach DIN 45635 T.19 Noise Emission LpA=26.4 dB at virtual workspace according to DIN 45635 T.19
E3800-48G-4SFP+ Switch (J9576A)	Geraeuschemission LpA=25.4 dB am fiktiven Arbeitsplatz nach DIN 45635 T.19 Noise Emission LpA=25.4 dB at virtual workspace according to DIN 45635 T.19
E3800-24SFP-2SFP+ Switch (J9584A)	Geraeuschemission LpA=25.0 dB am fiktiven Arbeitsplatz nach DIN 45635 T.19 Noise Emission LpA=25.0 dB at virtual workspace according to DIN 45635 T.19
E3800-24G-2XG Switch (J9585A)	Geraeuschemission LpA=25.5 dB am fiktiven Arbeitsplatz nach DIN 45635 T.19 Noise Emission LpA=25.5 dB at virtual workspace according to DIN 45635 T.19
E3800-48G-4XG Switch (J9586A)	Geraeuschemission LpA=24.5 dB am fiktiven Arbeitsplatz nach DIN 45635 T.19 Noise Emission LpA=24.5 dB at virtual workspace according to DIN 45635 T.19

Safety

Complies with:

- EN60950-1
- CSA22.2 No. 60950-1
- UL60950-1
- IEC60950-1
- EN 62479:2010
- EN 60825-1:2007 / IEC 60825-1:2007 Class 1
- Class 1 Laser Products / Laser Klasse 1

Connectivity Standards

Table A-1. Technology Standards and Safety Compliance

Technology	Compatible with these IEEE standards	Laser safety information		
		EN/IEC standard compliance	SFP ("mini-GBIC") Lasers	SFP+ Lasers
10-T	IEEE 802.3 10BASE-T			
100-TX	IEEE 802.3u 100BASE-TX			
1000-T	IEEE 802.3ab 1000BASE-T			
10GBASE-T	IEEE 802.3an 10GBASE-T			
100-FX	IEEE 802.3u 100BASE-FX	EN/IEC 60825	Class 1 Laser Product Laser Klasse 1	
100-BX	IEEE 802.3ah 100BASE-BX10	EN/IEC 60825	Class 1 Laser Product Laser Klasse 1	
1000-SX	IEEE 802.3z 1000BASE-SX	EN/IEC 60825	Class 1 Laser Product Laser Klasse 1	
1000-LX	IEEE 802.3z 1000BASE-LX	EN/IEC 60825	Class 1 Laser Product Laser Klasse 1	
1000-LH	(not an IEEE standard)	EN/IEC 60825	Class 1 Laser Product Laser Klasse 1	
1000-BX	IEEE 802.3ah 1000BASE-BX10	EN/IEC 60825	Class 1 Laser Product Laser Klasse 1	

Table A-1. Technology Standards and Safety Compliance (Continued)

		Laser safety information		
Technology	Compatible with these IEEE standards	EN/IEC standard compliance	SFP ("mini-GBIC") Lasers	SFP+ Lasers
10-Gig Direct Attach	(not an IEEE standard)			
10-Gig SR	IEEE 802.3ae 10GBASE-SR	EN/IEC 60825		Class 1 Laser Product Laser Klasse 1
10-Gig LRM	IEEE 802.3aq 10GBASE-LRM	EN/IEC 60825		Class 1 Laser Product Laser Klasse 1
10-Gig LR	IEEE 802.3ae 10GBASE-LR	EN/IEC 60825		Class 1 Laser Product Laser Klasse 1
10-Gig ER	IEEE 802.3ae 10GBASE-ER	EN/IEC 60825		Class 1 Laser Product Laser Klasse 1

Stacking Module Specifications

Physical

Product	Weight	Width	Depth	Height
E3800 4-Port Stacking Module (J9577A)	0.159 kg (0.35 lb)	106.17 mm (4.18 in)	104.39 mm (4.11 in)	35.56 mm (1.40 in)

Environmental

Stacking Module	
Environmental	
Operating Temperature:	0°C to 55°C (32°F to 131°F)
Relative Humidity:	15% to 95% at 40°C (104°F) non-condensing
Non-Operating Temperature:	-40°C to 70°C (-40°F to 158°F)
Non-Operating Relative Humidity:	15% to 90% at 65°C (149°F)
Maximum Operating Altitude:	3.0 km (10,000 ft)
Non-Operating Altitude:	4.6 km (15,000 ft)

Cabling and Technology Information

This appendix includes switch connector information and network cable information for cables that should be used with the HP switches.

Note

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

Cabling Specifications

Table B-1. Cabling Specifications

Twisted-pair copper	10 Mbps Operation	Category 3, 4 or 5, 100-ohm unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable, complying with IEEE 802.3 10BASE-T specifications.
	100 Mbps Operation	Category 5, 100-ohm UTP or STP cable, complying with IEEE 802.3u 100BASE-TX specifications.
	1000 Mbps Operation	Category 5, 100-ohm 4-pair UTP or STP cable, complying with IEEE 802.3ab 1000BASE-T specifications—Category 5e or better is recommended. See Note on 1000BASE-T Cable Requirements below.
	10 Gbps Operation	Category 6 or 6A, 100-ohm 4-pair UTP cable, or Category 6A or 7, 100-ohm 4-pair STP cable, complying with IEEE 802.3an 10GBASE-T specifications. See Note on 10GBASE-T Cable Requirements below, and see Table B-2 for distances supported with each cable type.
Twinaxial copper	Direct attach cables	One-piece devices consisting of a cable with SFP+ connectors permanently attached to each end, complying with SFF 8431 SFP+ specifications.
Multimode fiber		62.5/125 μm or 50/125 μm (core/cladding) diameter, low metal content, graded index fiber-optic cables, complying with the ITU-T G.651 and ISO/IEC 793-2 Type A1b or A1a standards respectively. ¹
Single mode fiber		9/125 μm (core/cladding) diameter, low metal content fiber-optic cables, complying with the ITU-T G.652 and ISO/IEC 793-2 Type B1 standards.
¹ A mode conditioning patch cord may be needed for some Gigabit-LX and 10-Gigabit LRM installations. See “Mode Conditioning Patch Cord” on page B-4 for more information		

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

Because of the increased speed provided by 1000BASE-T (Gigabit-T), network cable quality is more important than for either 10BASE-T or 100BASE-TX. Cabling plants being used to carry 1000BASE-T networking must comply with the IEEE 802.3ab standards. In particular, the cabling must pass tests for Attenuation, Near-End Crosstalk (NEXT), and Far-End Crosstalk (FEXT). Additionally, unlike the cables for 100BASE-TX, the 1000BASE-T cables must pass tests for Equal-Level Far-End Crosstalk (ELFEXT) and Return Loss.

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

Note on 10GBASE-T Cable Requirements The Category 6 networking cables that work for 1000BASE-T connections may work for 10GBASE-T, as long as the distance is less than 55m and the cable installation has been tested for compliance to IEEE requirements. But, for the most robust connections, you should use cabling that complies with the Category 6A or Category 7 specifications, as described in the TIA-568-C (ANSI/TIA-568-C.2) and ISO/IEC 11801 standards. 10GBASE-T is a sophisticated technology that relies upon high quality cable installations. It is sensitive to Alien Near End Crosstalk (ANEXT) which can arrive upon the cable due to cables placed in close proximity to the data cables. It is recommended that cable dressing be done carefully and in compliance with recommendations in the TIA TSB-155A.

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

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

When testing your cabling, be sure to include the patch cables that connect the switch and other end devices to the patch panels on your site. The patch cables are frequently overlooked when testing cable and they must also comply with the cabling standards. For 10GBASE-T, Category 6 patch cables are sensitive to movement once link has been established, and could cause

link to drop if moved. Therefore, HP recommends using Category 6A patch cables, or using cable management options to tie down (dress) the Category 6 patch cables so they cannot move.

Technology Distance Specifications

Table B-2. Technology Distance Specifications

Technology	Supported cable type	Multimode fiber modal bandwidth	Supported distances
100-FX	multimode fiber	any	up to 2,000 meters
100-BX	single mode fiber	N/A	0.5 - 10,000 meters
1000-T	twisted-pair copper	N/A	up to 100 meters
10GBASE-T	twisted-pair copper	N/A	Cat 6 unshielded - up to 55 meters ¹ Cat 6 shielded - up to 100 meters ¹ Cat 6A unshielded - up to 100 meters Cat 6A shielded - up to 100 meters Cat 7 shielded - up to 100 meters
1000-SX	multimode fiber	160 MHz*km 200 MHz*km 400 MHz*km 500 MHz*km	2 - 220 meters 2 - 275 meters 2 - 500 meters 2 - 550 meters
1000-LX	multimode fiber single mode fiber	400 MHz*km 500 MHz*km N/A	2 - 550 meters 2 - 550 meters 2 - 10,000 meters
1000-LH	single mode fiber	N/A	10 - 70,000 meters ²
1000-BX	single mode fiber	N/A	0.5 - 10,000 meters
10-Gig Direct Attach	twinaxial copper	N/A	(various lengths offered)
10-Gig SR	multimode fiber	160 MHz*km 200 MHz*km 400 MHz*km 500 MHz*km 2000 MHz*km	2 - 26 meters 2 - 33 meters 2 - 66 meters 2 - 82 meters 2 - 300 meters
10-Gig LRM	multimode fiber	400 MHz*km 500 MHz*km	0.5 - 100 meters 0.5 - 220 meters

Table B-2. Technology Distance Specifications(Continued)

Technology	Supported cable type	Multimode fiber modal bandwidth	Supported distances
10-Gig LR	single mode fiber	N/A	2 - 10,000 meters
10-Gig ER	single mode fiber	N/A	2 - 40,000 meters

¹ Cat 6 cabling requires TIA TSB-155A testing for 500 MHz operation and ANEXT.
² For distances less than 20km, a 10dB attenuator must be used. For distances between 20km and 40km, a 5dB attenuator must be used. Attenuators can be purchased from most cable vendors.

Mode Conditioning Patch Cord

The following information applies to installations in which multimode fiber-optic cables are connected to a Gigabit-LX port or a 10-Gigabit LRM port. Multimode cable has a design characteristic called “Differential Mode Delay”, which requires the transmission signals be “conditioned” to compensate for the cable design and thus prevent resulting transmission errors.

Under certain circumstances, depending on the cable used and the lengths of the cable runs, an external Mode Conditioning Patch Cord may need to be installed between the Gigabit-LX or 10-Gigabit LRM transmitting device and the multimode network cable to provide the transmission conditioning. If you experience a high number of transmission errors on those ports, usually CRC or FCS errors, you may need to install one of these patch cords between the fiber-optic port in your switch and your multimode fiber-optic network cabling, at both ends of the network link.

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

Note

Most of the time, if you are using good quality graded-index multimode fiber cable that adheres to the standards listed in [Table B-1](#), there should not be a need to use mode conditioning patch cords in your network. This is especially true if the fiber runs in your network are relatively short.

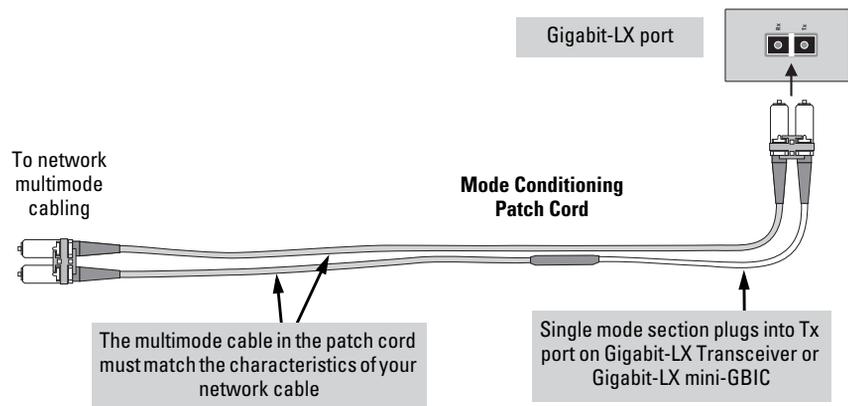
For 10-Gigabit LRM using OM3 cable (50 μm multimode @ 1500/500 MHz*km), a mode conditioning patch cord is not required. Other multimode cables may require mode conditioning patch cords to achieve the LRM maximum distances.

Installing the Patch Cord

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

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

Figure B-1. Example: Connecting a Mode Conditioning Patch Cord for Gigabit-LX



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

Twisted-Pair Cable/Connector Pin-Outs

Auto-MDIX Feature: The 10/100/1000-T ports support the IEEE 802.3ab standard, which includes the “Auto MDI/MDI-X” feature. In the default configuration, “Auto”, the ports on the Switch 3500 all automatically detect the type of port on the connected device and operate as either an MDI or MDI-X port, whichever is appropriate. So for any connection, a straight-through twisted-pair cable can be used – *you no longer have to use crossover cables*, although crossover cables can also be used for any of the connections.

If you connect a 3500 switch twisted-pair port to another switch or hub, which typically have MDI-X ports, the 3500 port automatically operates as an MDI port. If you connect it to an end node, such as a server or PC, which typically have MDI ports, the 3500 switch port operates as an MDI-X port. In all cases, you can use standard straight-through cables or crossover cables.

If you happen to use a correctly wired crossover cable, though, the switch will still be able to automatically detect the MDI/MDI-X operation and link correctly to the connected device.

Other Wiring Rules:

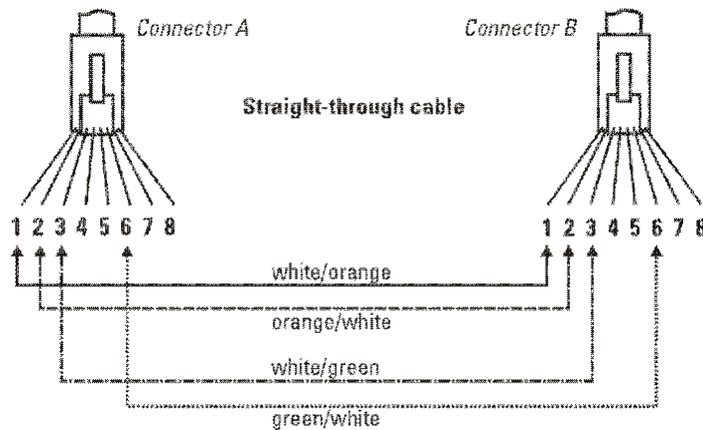
- All twisted-pair wires used for 10 Mbps, and 100 Mbps operation must be twisted through the entire length of the cable. The wiring sequence must conform to EIA/TIA 568-B (not USOC). See “Pin Assignments” later in this appendix for a listing of the signals used on each pin.
- For 1000Base-T connections, all four pairs of wires in the cable must be available for data transmission. See “[Note on 1000BASE-T Cable Requirements](#)” on page B-2 for more information on 1000Base-T cabling.
- For 10 Mbps connections to the ports, you can use Category 3, 4, or 5 unshielded twisted-pair cable, as supported by the IEEE 802.3 Type 10Base-T standard.
- For 100 Mbps connections to the ports, use 100-ohm Category 5 UTP or STP cable only, as supported by the IEEE 802.3u Type 100Base-TX standard.
- For 1000 Mbps connections, 100-ohm Category 5e or better cabling is recommended.

Straight-Through Twisted-Pair Cable for 10 Mbps or 100 Mbps Network Connections

Because of the HP Auto-MDIX operation of the 10/100 ports on the switch, for all network connections, to PCs, servers or other end nodes, or to hubs or other switches, you can use straight-through cables.

If any of these ports are given a fixed configuration, for example 100 Mbps/ Full Duplex, the ports operate as MDI-X ports, and straight-through cables must be then used for connections to PC NICs and other MDI ports.

Cable Diagram



Note

Pins 1 and 2 on connector “A” *must* be wired as a twisted pair to pins 1 and 2 on connector “B”.
 Pins 3 and 6 on connector “A” *must* be wired as a twisted pair to pins 3 and 6 on connector “B”.
 Pins 4, 5, 7, and 8 are not used in this application, although they may be wired in the cable.

Pin Assignments

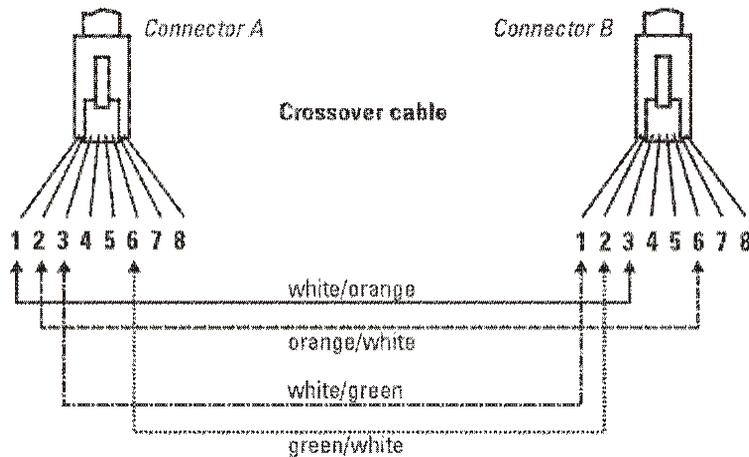
Switch End (MDI-X)		Computer, Transceiver, or Other End		
Signal	Pins	Pins	Signal	
receive +	1	←	1	transmit +
receive -	2	←	2	transmit -
transmit +	3	→	3	receive +
transmit -	6	→	6	receive -

Crossover Twisted-Pair Cable for 10 Mbps or 100 Mbps Network Connection

The HP Auto-MDIX operation of the 10/100 ports on the switch also allows you to use crossover cables for all network connections, to PCs, servers or other end nodes, or to hubs or other switches.

If any of these ports are given a fixed configuration, for example 100 Mbps/ Full Duplex, the ports operate as MDI-X ports, and crossover cables *must* be then used for connections to hubs or switches or other MDI-X network devices.

Cable Diagram



Note

Pins 1 and 2 on connector “A” *must* be wired as a twisted pair to pins 3 and 6 on connector “B”.

Pins 3 and 6 on connector “A” *must* be wired as a twisted pair to pins 1 and 2 on connector “B”.

Pins 4, 5, 7, and 8 are not used in this application, although they may be wired in the cable.

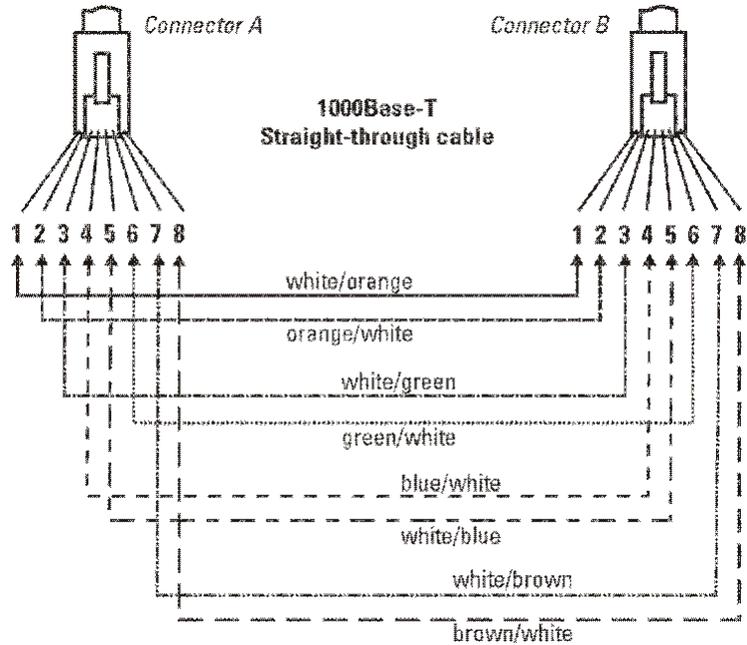
Pin Assignments

Switch End (MDI-X)		Hub or Switch Port, or Other MDI-X Port End	
Signal	Pins	Pins	Signal
receive +	1	6	transmit -
receive -	2	3	transmit +
transmit +	3	2	receive -
transmit -	6	1	receive +

Straight-Through Twisted-Pair Cable for 1000 Mbps Network Connections

1000Base-T connections require that all four pairs or wires be connected.

Cable Diagram



Note

Pins 1 and 2 on connector "A" *must* be wired as a twisted pair to pins 1 and 2 on connector "B".

Pins 3 and 6 on connector "A" *must* be wired as a twisted pair to pins 3 and 6 on connector "B".

Pins 4 and 5 on connector "A" *must* be wired as a twisted pair to pins 4 and 5 on connector "B".

Pins 7 and 8 on connector "A" *must* be wired as a twisted pair to pins 7 and 8 on connector "B".

Pin Assignments

For 1000Base-T operation, all four pairs of wires are used for both transmit and receive.

Cabling and Technology Information
Twisted-Pair Cable/Connector Pin-Outs

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