# 5120 Series Installation Guide

## Setup, Configuration, and Best Practices

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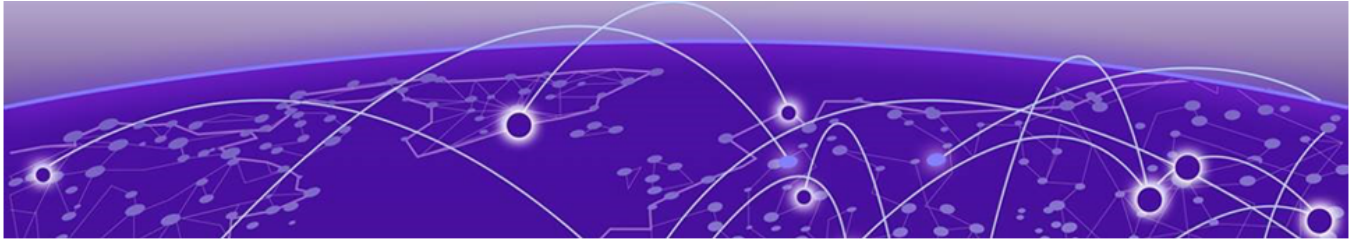

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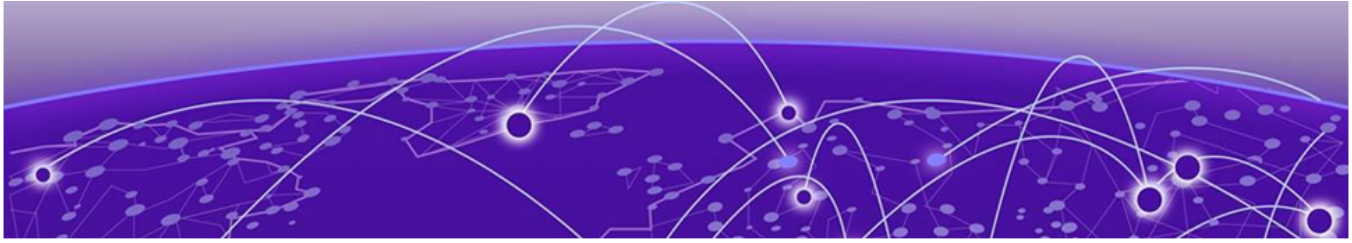

# Abstract

The 5120 Series Installation Guide provides detailed procedures for deploying Extreme Networks 5120 Series switches, including models 5120-44X-4Y-2C, 5120-24X-4Y, and 5120-24XT-4Y. These switches support high-density 10GbE and 25GbE SFP+/SFP28 ports, with select models offering 100GbE QSFP28 uplinks and stacking capabilities. Installation instructions cover rack mounting using two-post or four-post configurations, integration of hot-swappable fan modules (XN-FAN-005-F/R) and 550W AC power supplies (XN-ACPWR-550W-FB-A/BF-A), and adherence to airflow directionality for thermal compliance. Stacking is implemented via native V100 stacking ports using SFP28 or QSFP28 interfaces, supporting up to eight nodes in a ring topology with slot-based logical addressing and redundancy through primary/backup node roles. Management interfaces include RJ45 and Micro-B USB console ports, 100/1000BASE-T out-of-band Ethernet, and Bluetooth pairing via USB Type A. The guide also specifies environmental tolerances (0–50°C, up to 3000m altitude), EMI/EMC compliance, and structured cabling standards. System diagnostics are supported through LED indicators for port speed, stack status, fan health, and power supply state. Configuration workflows include IP address assignment for the management VLAN, Switch Engine OS onboarding, and stack initialization using Easy Setup or CLI-based role election. This resource is intended for network engineers with foundational knowledge of Ethernet switching, SNMP, and Layer 2/3 protocols.

# Introduction to the 5120 Series Installation Guide

This guide is intended for use by network administrators responsible for installing and setting up network equipment. It assumes a basic working knowledge of:

- Local area networks (LANs)
- Ethernet concepts
- Ethernet switching and bridging concepts
- Routing concepts
- Simple Network Management Protocol (SNMP)
- Basic equipment installation procedures

See the *Switch Engine User Guide* and the *Switch Engine Command References* for your version of the Switch Engine operating system for information about configuring Extreme Networks switches.

Read the following topics to learn about:

- The meanings of text formats used in this document.
- Where you can find additional information and help.
- How to reach us with questions and comments.

**Note**
If the information in an installation note or release note shipped with your Extreme Networks equipment differs from the information in this guide, follow the installation or release note.

## Text Conventions

Unless otherwise noted, information in this document applies to all supported environments for the products in question. Exceptions, like command keywords associated with a specific software version, are identified in the text.

When a feature, function, or operation pertains to a specific hardware product, the product name is used. When features, functions, and operations are the same across an entire product family, such as Extreme Networks switches or routers, the product is referred to as *the switch* or *the router*.

**Table 1: Notes and warnings**

| Icon | Notice type | Alerts you to... |
|---|---|---|
|  | Tip | Helpful tips and notices for using the product |
|  | Note | Useful information or instructions |
|  | Important | Important features or instructions |
|  | Caution | Risk of personal injury, system damage, or loss of data |
|  | Warning | Risk of severe personal injury |

**Table 2: Text**

| Convention | Description |
|---|---|
| `screen displays` | This typeface indicates command syntax, or represents information as it is displayed on the screen. |
| The words *enter* and *type* | When you see the word *enter* in this guide, you must type something, and then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says *type*. |
| **Key** names | Key names are written in boldface, for example **Ctrl** or **Esc**. If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press **Ctrl**+**Alt**+**Del** |
| *Words in italicized type* | Italics emphasize a point or denote new terms at the place where they are defined in the text. Italics are also used when referring to publication titles. |
| *NEW!* | New information. In a PDF, this is searchable text. |

**Table 3: Command syntax**

| Convention | Description |
|---|---|
| **bold** text | Bold text indicates command names, keywords, and command options. |
| *italic* text | Italic text indicates variable content. |

**Table 3: Command syntax (continued)**

| Convention | Description |
|---|---|
| [ ] | Syntax components displayed within square brackets are optional.<br>Default responses to system prompts are enclosed in square brackets. |
| { **x** \| **y** \| **z** } | A choice of required parameters is enclosed in curly brackets separated by vertical bars. You must select one of the options. |
| **x** \| **y** | A vertical bar separates mutually exclusive elements. |
| < > | Nonprinting characters, such as passwords, are enclosed in angle brackets. |
| ... | Repeat the previous element, for example, *member*[*member*...]. |
| \ | In command examples, the backslash indicates a “soft” line break. When a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash. |

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### The Hub

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- Your Extreme Networks service contract number, or serial numbers for all involved Extreme Networks products
- A description of the failure
- A description of any actions already taken to resolve the problem
- A description of your network environment (such as layout, cable type, other relevant environmental information)
- Network load at the time of trouble (if known)
- The device history (for example, if you have returned the device before, or if this is a recurring problem)
- Any related RMA (Return Material Authorization) numbers

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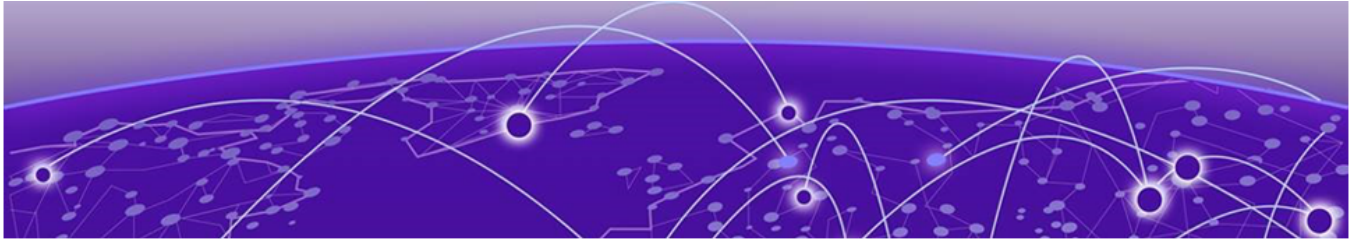


# Overview



5120 Series switches provide basic 10Gb Ethernet connectivity to end devices and edge stacks like video encoders/decoders and other IoT devices. The twenty-four (24) port copper and twenty-four (24) port fiber switch models provide 4x25Gb fixed uplinks. The forty-eight (48) port switch models provide 2x100Gb fixed uplinks along with 4x25Gb ports. These switches can be deployed to aggregate edge stacks while providing high speed uplinks to upstream L3 switches/routers. The 5120 Series switches can stack between themselves using the 2 x 25Gb ports or the 2 x 100Gb ports.

## Management

Each switch can be flexibly managed though the cloud, the network, or the command-line interface (CLI), either remotely or locally. The switch supports any of the following management methods:

- ExtremeCloud IQ through the cloud or over the network.
- an out-of-band management network connected to the Ethernet management port on the switch.
- a laptop connected directly to the Ethernet management port on the switch through an Ethernet cable.
- a terminal connected to the RJ45 serial console port on the switch.
- a PC or laptop connected to the Micro-B USB console port on the switch.
- a mobile device or a laptop using Bluetooth with a Bluetooth dongle connected to the USB Type A port on the switch.

For more information about switch management, see Manage Your Switch.

**Note**
There is also a Type A USB 2.0 port labeled USB on the front panel that can host removable devices like flash drives.

## Cooling

Each switch is cooled by hot-swappable internal fan modules. 5120 Series switches support both front-to-back and back-to-front airflow for switch cooling. Fan module slots are located on the rear panel of the switch. Fans are ordered separately

for base models 5120-44X-4Y-2C, 5120-44X-4Y-2C-TAA, 5120-24X-4Y, 5120-24X-4Y-TAA, 5120-24XT-4Y, and 5120-24XT-4Y-TAA. Fans are included with other models.

For more information about the fan modules used in the switch, see Fans Modules for Use with Your Switch on page 23.

## Power Supplies

Each switch supports up to two hot-swappable internal modular AC power supplies that provide enough power for the needs of the switch. Power supply slots are located in the rear of the switch. Power supplies are ordered separately for base models 5120-44X-4Y-2C, 5120-44X-4Y-2C-TAA, 5120-24X-4Y, 5120-24X-4Y-TAA, 5120-24XT-4Y, and 5120-24XT-4Y-TAA. Power supplies are included with other models.

For more information about the power supplies used in the switch, see Power Supplies for Use with Your Switch on page 25.

## Stacking Ports

Each switch comes equipped with two stacking ports, also referred to as Universal Ethernet ports. When running Switch Engine, these ports can be used in either stacking mode or Ethernet mode. When in stacking mode, up to eight systems can be stacked using qualified direct attach cables or optical transceivers.

**Note**
The 5120 Series switches can only stack with themselves.

Stacking cables are ordered separately.

For more information about stacking ports, see Universal Ethernet Ports on page 22.

For information about optical modules, see the Extreme Optics website.

For more information about stacking, see Build Stacks on page 27.

## Operating Temperatures

All 5120 Series switch models support an operating range from 0°C (32°F) to 50°C (122°F) up to 3000 m (10,000 ft), with front-to-back and back-to-front airflow.

## Feature Licensing

5120 Series switches support Unified Licensing. There are two methods of acquiring feature licenses: manual or through ExtremeCloud IQ™ (XIQ).

For Switch Engine licensing, see the *Feature License Requirements* for your version of the Switch Engine operating system.

For XIQ licensing, see *ExtremeCloud IQ*.

## 5120-44X-4Y-2C Switch Features

The 5120-44X-4Y-2C switch includes the following models:

**5120-44X-4Y-2C**

The 5120-44X-4Y-2C base switch includes two unpopulated modular power supply slots and six unpopulated fan slots. Fan modules and power supply modules must be ordered separately.

**5120-44X-4Y-2C-AC-F**

The 5120-44X-4Y-2C-AC-F switch includes one AC power supply module, one unpopulated modular power supply slot, and six fan modules. Airflow for both the fan modules and the powers supply modules is front-to-back.

**5120-44X-4Y-2C-AC-R**

The 5120-44X-4Y-2C-AC-R switch includes one AC power supply module, one unpopulated modular power supply slot, and six fan modules. Airflow for both the fan modules and the powers supply modules is back-to-front.

**5120-44X-4Y-2C-TAA**

The 5120-44X-4Y-2C-TAA base switch includes two unpopulated modular power supply slots and six unpopulated fan slots. Fan modules and power supply modules must be ordered separately. The 5120-44X-4Y-2C-TAA base switch is TAA compliant.

**5120-44X-4Y-2C-AC-F-TAA**

The 5120-44X-4Y-2C-AC-F-TAA switch includes one AC power supply module, one unpopulated modular power supply slot, and six fan modules. Airflow for both the fan modules and the powers supply modules is front-to-back. The 5120-44X-4Y-2C-AC-F-TAA switch is TAA compliant.

The front panel of the switch includes:

**1** = 44 x 1Gb/10Gb SFP+ ports (ports 1 through 12 support 100Mbps)
**2** = 4 x 1Gb/10Gb/25Gb SFP28 Universal/stacking ports
**3** = Micro-B USB serial console port
**4** = System LEDs
**5** = Mode button
**6** = USB Type A port
**7** = RJ-45 serial console port
**8** = 100/1000BASE-T out-of-band management port
**9** = 2 x 100Gb QSFP28 uplink/stacking ports

**Note**
Half-duplex is not supported.

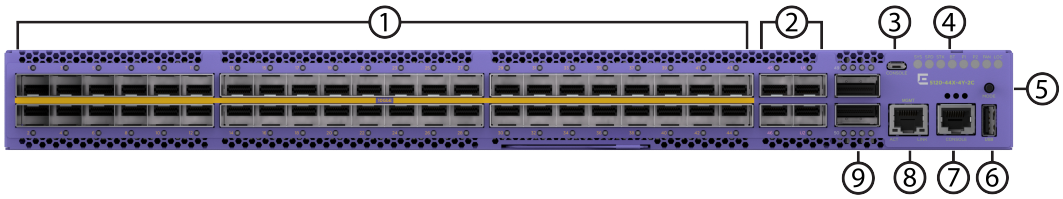



**Figure 1: 5120-44X-4Y-2C Front Panel**

The rear panel of the switch includes:

**1 =** 2 x Modular AC power supplies
**2 =** Grounding lug
**3 =** 6 x Fan modules

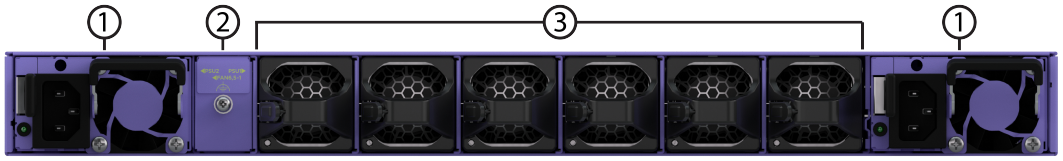



**Figure 2: 5120-44X-4Y-2C Rear Panel**

## 5120-24X-4Y Switch Features

The 5120-24X-4Y switch includes the following models:

**5120-24X-4Y**

The 5120-24X-4Y base switch includes two unpopulated modular power supply slots and four unpopulated fan slots. Fan modules and power supply modules must be ordered separately.

**5120-24X-4Y-AC-F**

The 5120-24X-4Y-AC-F switch includes one modular AC power supply, one unpopulated modular power supply slot, and four fan modules. Airflow for both the fan modules and the powers supply modules is front-to-back.

**5120-24X-4Y-AC-R**

The 5120-24X-4Y-AC-R switch includes one modular AC power supply, one unpopulated modular power supply slot, and four fan modules. Airflow for both the fan modules and the powers supply modules is back-to-front.

**5120-24X-4Y-TAA**

The 5120-24X-4Y-TAA base switch includes two unpopulated modular power supply slots and four unpopulated fan slots. Fan modules and power supply modules must be ordered separately. The 5120-24X-4Y-TAA base switch is TAA compliant.

**5120-24X-4Y-AC-F-TAA**

The 5120-24X-4Y-AC-F-TAA switch includes one modular AC power supply, one unpopulated modular power supply slot, and four fan modules. Airflow for both the fan modules and the powers supply modules is front-to-back. The 5120-24X-4Y-AC-F-TAA switch is TAA compliant.

The front panel of the switch includes:

**1** = 24 x 1Gb/10Gb SFP+ ports (ports 1 through 12 support 100Mbps)
**2** = 4 x 1Gb/10Gb/25Gb SFP28 Universal/stacking ports
**3** = Micro-B USB serial console port
**4** = System LEDs
**5** = Mode button
**6** = USB Type A port
**7** = RJ-45 serial console port
**8** = 100/1000BASE-T out-of-band management port

**Note**
Half-duplex is not supported.

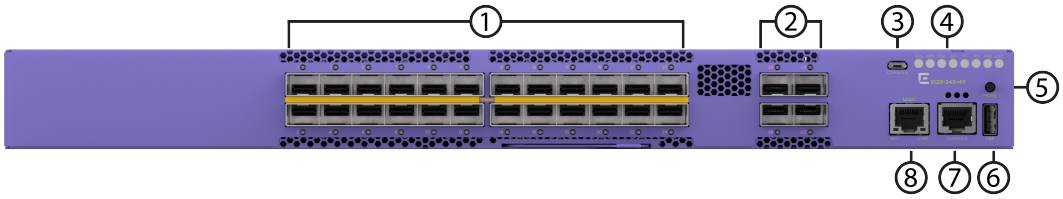



**Figure 3: 5120-24X-4Y Front Panel**

The rear panel of the switch includes:

**1** = 2 x Modular AC power supplies
**2** = Grounding lug
**3** = 4 x Fan modules
**4** = 2 x Filler panels

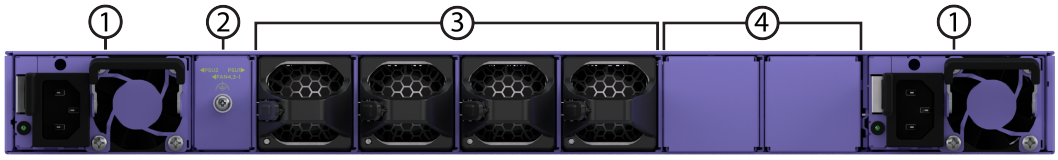



**Figure 4: 5120-24X-4Y Rear Panel**

## 5120-24XT-4Y Switch Features

The 5120-24XT-4Y switch includes the following models:

**5120-24XT-4Y**

The 5120-24XT-4Y base switch includes two unpopulated modular power supply slots and four unpopulated fan slots. Fan modules and power supply modules must be ordered separately.

**5120-24XT-4Y-AC-F**

The 5120-24XT-4Y-AC-F switch includes one modular AC power supply, one unpopulated modular power supply slot, and four fan modules. Airflow for both the fan modules and the powers supply modules is front-to-back.

**5120-24XT-4Y-AC-R**

The 5120-24XT-4Y-AC-R switch includes one modular AC power supply, one unpopulated modular power supply slot, and four fan modules. Airflow for both the fan modules and the powers supply modules is back-to-front.

### 5120-24XT-4Y-TAA

The 5120-24XT-4Y-TAA base switch includes two unpopulated modular power supply slots and four unpopulated fan slots. Fan modules and power supply modules must be ordered separately. The 5120-24XT-4Y-TAA base switch is TAA compliant.

### 5120-24XT-4Y-AC-F-TAA

The 5120-24XT-4Y-AC-F-TAA switch includes one modular AC power supply, one unpopulated modular power supply slot, and four fan modules. Airflow for both the fan modules and the powers supply modules is front-to-back. The 5120-24XT-4Y-AC-F-TAA switch is TAA compliant.

The front panel of the switch includes:

**1** = 24 x 1Gb/10Gb SFP+ ports
**2** = 4 x 1Gb/10Gb/25Gb SFP28 Universal/stacking ports
**3** = Micro-B USB serial console port
**4** = System LEDs
**5** = Mode button
**6** = USB Type A port
**7** = RJ-45 serial console port
**8** = 100/1000BASE-T out-of-band management port

**Note**
Half-duplex is not supported.

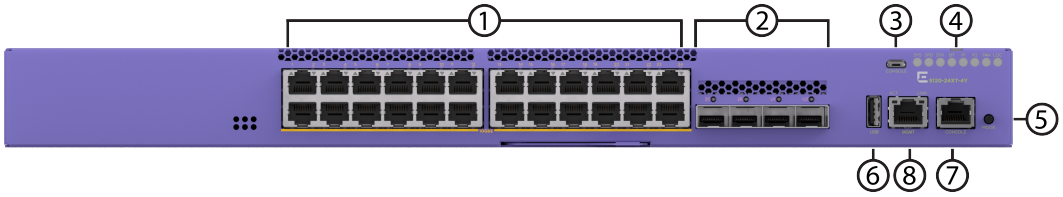



**Figure 5: 5120-24XT-4Y Front Panel**

The rear panel of the switch includes:

**1** = 2 x Modular AC power supplies
**2** = Grounding lug
**3** = 4 x Fan modules
**4** = 2 x Filler panels

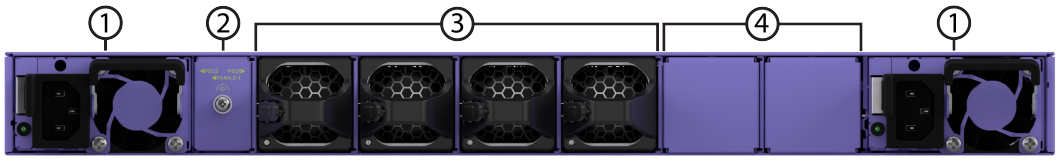



**Figure 6: 5120-24XT-4Y Rear Panel**

# Port Partitioning

On some Extreme Networks switch models, you can configure QSFP28 ports either as single ports or as multiple, partitioned ports. In a partitioned port, with appropriate cabling, the original physical port can accommodate multiple data lanes at lower bandwidths.

The following partitioning options are available:

| Switch Model | Port Bandwidth | Port Partitions |
|---|---|---|
| 5120-44X-4Y-2C (all models) QSFP28 | 100 Gb | All QSFP28 ports with one of the following:<br>• Four 10 Gb ports<br>• Four 25 Gb ports<br>• One 100 Gb port |

For information about configuring partitioned ports, see the *Switch Engine Command References* for your version of the Switch Engine operating system.

# Manage Your Switch

The switch supports flexible management through the following methods.

### ExtremeCloud IQ

The switch can be managed by ExtremeCloud IQ from the cloud or on-site. ExtremeCloud IQ provides native cloud management for access points, switches, and SD-WAN. For more information, see ExtremeCloud IQ.

### RJ45 serial console port

The RJ45 serial console port on the switch enables you to connect a terminal to the switch and perform local management. The switch can be accessed as needed through the CLI. The RJ45 serial console port is located on the front panel of the switch.

### Ethernet management port

The Ethernet management port provides dedicated remote access to the switch using TCP/IP. The switch uses the Ethernet management port only for host operation, not for switching or routing. The port can be used to connect the system to an out-of-band (OOB) management network for administration.

Alternatively, the Ethernet management port can be used to connect a laptop directly to the switch through an Ethernet cable to view and locally manage the switch configuration.

The Ethernet management port is located on the front panel of the switch. It supports 100/1000 Mbps speeds.

### Micro-B USB console port

The Micro-B USB console port located on the front panel of the switch can be used to connect a PC or a laptop. If the Micro-B USB console port is connected, it is selected over the RJ45 serial console port. The Micro-B USB console port disconnects when the switch is rebooted. You can re-connect the port if needed. When the Micro-B USB console is active, the RJ45 console is locked and no message is echoed to RJ45 console.

**Note**
Using a Micro-USB Type B to USB Type A cable, connect the Micro-USB Type B end to the switch, and the USB Type A end to a laptop or PC and complete the driver installation steps.

### Bluetooth

A Bluetooth dongle can be used to connect mobile devices or laptops to the switch. The Bluetooth dongle is connected to the USB 2.0 Type A port on the front of the switch. A long press of the Mode button when in any mode other than STK

mode initiates Bluetooth pairing. Bluetooth is enabled by default. The switch has a Bluetooth LED that blinks green while pairing is in progress, and then becomes solid green when Bluetooth is connected.

# Universal Ethernet Ports

The Universal Ethernet ports, or stacking ports, are located on the front panel of the switch and are labeled U1 and U2. These ports can be used with Switch Engine as stacking ports, or as Ethernet ports with Switch Engine and Fabric Engine in non-fabric mode (Fabric Engine does not support stacking).

The Universal Ethernet ports operate as Ethernet ports by default. Use the commands

```
configure stacking-support stack-ports all selection native V100
enable stacking-support
```

to set the U1 and U2 ports in stacking mode.

When used as Ethernet ports, the U1 and U2 ports support data rates of 25Gbs using SFP28 optics. Models 5120-44X-4Y-2C, 5120-44X-4Y-2C-AC-F, 5120-44X-4Y-2C-AC-R, 5120-44X-4Y-2C-TAA, and 5120-44X-4Y-2C-AC-F-TAA support data rates of 100Gbps on the QSFP28 ports 49 and 50.

For information on switch stacking, see Build Stacks on page 27.

# Fans Modules for Use with Your Switch

Fan Modules on page 24

The 5120 Series switch is designed to run with hot-swappable internal fan modules that provide the cooling needed for the switch to operate. 5120-44X-4Y-2C models can include up to six redundant, hot-swappable fan modules. 5120-24X-4Y and 5120-24XT-4Y models can include up to four redundant, hot-swappable fan modules. The fan modules in the switch chassis can be removed and replaced without special tools. The device can continue operating during the replacement (hot-swap).

Switch fans are not responsible for cooling the power supplies; power supplies have integrated cooling fans that operate independently of the switch fan. All installed fan modules must blow air in the same direction and must match the airflow direction of the installed power supplies.

## Precautions Specific to Fan Modules

**Warning**
Be careful not to accidently insert your fingers into the fan tray while removing it from the chassis. The fan may still be spinning at a high speed.

**Caution**
Disassembling any part of the power supply and fan assembly voids the warranty and regulatory certifications. There are no user-serviceable parts inside the power supply and fan assembly.

**Note**
Ensure that the airflow direction of the power supply unit matches that of the installed fan tray. Fan modules with a red latch provide front-to-back airflow and fan modules with a blue latch provide back-to-front airflow.

**Caution**
If you do not install a fan module or a power supply in a slot, you must keep the slot filler panel in place. If you run the chassis with an uncovered slot, the system will overheat.

## Fan Modules

Two fan module options, with front-to-back or back-to-front airflow, are available for 5120 Series switch models:

- Part number XN-FAN-005-F provides front-to-back airflow for switch cooling.
- Part number XN-FAN-005-R provides back-to-front airflow for switch cooling.

Fans are ordered separately for base models 5120-44X-4Y-2C, 5120-44X-4Y-2C-TAA, 5120-24X-4Y, 5120-24X-4Y-TAA, 5120-24XT-4Y, and 5120-24XT-4Y-TAA. Fans are included with other models.

For information on installing or replacing a fan module, see Replace Fan Modules on page 70.

LEDs on the fan module provide information on the unit's operational status. See Monitor the Switch on page 72 for details.

# Power Supplies for Use with Your Switch

550 W AC Power Supplies on page 26

The 5120 Series switch is designed to run with one replaceable 550 W internal AC power supply module that provides all of the power needed for the switch to operate. You can install a second 550 W AC power supply module for redundancy. You can remove and replace a power supply module (hot-swap) without interrupting the switch's operation as long as there is a functional 550 W AC power supply module in the switch.

The power supplies have integrated cooling fans that operate independently of the switch fans and provide either front-to-back or back-to-front airflow for power supply cooling. All installed power supplies must blow air in the same direction (front-to-back or back-to-front) and must match the airflow direction of the installed fan modules.

## Precautions Specific to Power Supply Modules

**Warning**
Make sure you use a power cord displaying the mark of the safety agency that defines the regulations for power cords in your country. The mark is your assurance that the power cord can be used safely with the device.

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

**Caution**
Disassembling any part of the power supply and fan assembly voids the warranty and regulatory certifications. There are no user-serviceable parts inside the power supply and fan assembly.

**Note**
Ensure that the airflow direction of the power supply unit matches that of the installed fan tray. The power supplies and fan trays are clearly labeled with a block arrow that indicates the airflow direction.

**Caution**
If you do not install a fan module or a power supply in a slot, you must keep the slot filler panel in place. If you run the chassis with an uncovered slot, the system will overheat.

## 550 W AC Power Supplies

Two 550 W AC power supply options, with front-to-back or back-to-front airflow, are available for 5120 Series switch models:

- 550 W AC power supply - front-to-back airflow (part no. XN-ACPWR-550W-FB-A)
- 550 W AC power supply - back-to-front airflow (part no. XN-ACPWR-550W-BF-A)

Power supplies are ordered separately for base models 5120-44X-4Y-2C, 5120-44X-4Y-2C-TAA, 5120-24X-4Y, 5120-24X-4Y-TAA, 5120-24XT-4Y, and 5120-24XT-4Y-TAA. Power supplies are included with other models.

The 550 W AC power supply has a (C14) power inlet that requires a (C13) power cord.

**Note**
AC power input cords are not provided with AC power supplies. You can order an appropriate cord from Extreme Networks or from your local supplier. The power cord must meet the requirements listed in Power Cord Requirements for AC-Powered Switches and AC Power Supplies on page 83.

For information on installing or replacing an AC power supply, see Replace an Internal 550W AC Power Supply on page 69.

LEDs on the 550 W AC power supply provide information on the unit's operational status. See 550 W AC Power Supply LEDs on page 75 for details.

# Build Stacks



A stack consists of a group of up to eight switches that are connected to form a ring. The stack offers the combined port capacity of the individual switches; it operates as if it were a single switch, making network administration easier.

Stacking is facilitated by the SummitStack-V feature – part of the Switch Engine Basic License features.

This topic describes the supported configurations for stacking switches, the considerations for planning a stack, and the steps for setting up the hardware. Read this chapter before installing the switches that will make up the stack.

Refer to the "Stacking" chapter in the *Switch Engine User Guide* for your version of the Switch Engine operating system for information about configuring a stack, maintaining the stack configuration, and troubleshooting.

## Introduction to Stacking

When stacking switches, the stack operates as if it were a single switch with a single IP address and a single point of authentication. One switch – called the primary switch – is responsible for running network protocols and managing the stack. The primary runs Switch Engine software and maintains all the software tables for all the switches in the stack.

All switches in the stack, including the primary switch, are called nodes. Figure 7 shows four nodes in a stack, connected to each other by SummitStack cables.

All connections between stack ports must be directly between switches. A stacking connection cannot pass through a third device, for example a Virtual Port Extender or an LRM/MACsec Adapter.

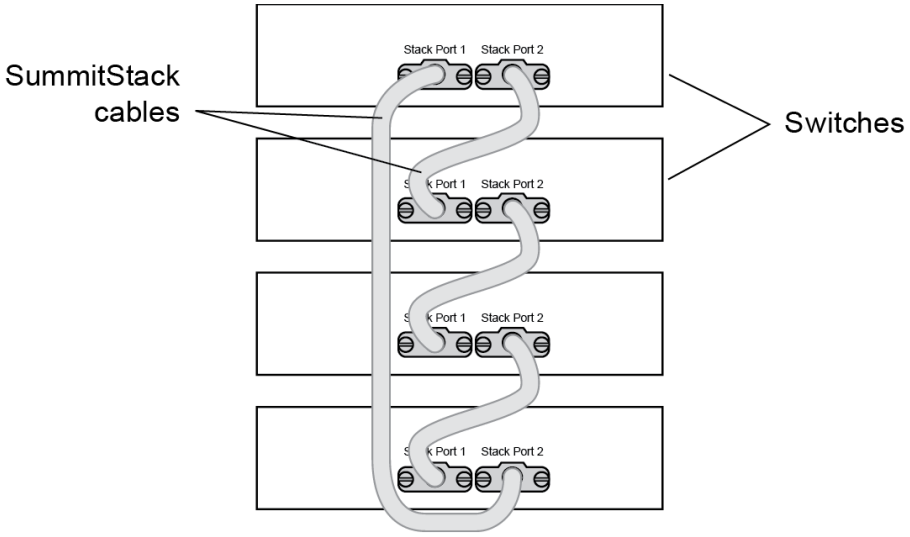



**Figure 7: Switches Connected to Form a Stack**

Using the SummitStack feature—part of the Switch Engine Edge/Base license—a stack can combine switches from different series, provided that every switch in the stack:

- Runs in the same partition (primary or secondary).
- Runs the same version of Switch Engine.
- Includes support for stacking.

See Combine Switches from Different Series on page 39 for information about which switch series can be combined to form a stack.

The following topics introduce you to the basic principles of stacking and provide recommendations for creating stacks.

More information to answer your questions about stacking and help you plan your configuration is available on the Extreme Networks GTAC Knowledge Base.

## Build Basic Stacks

A stack can be created in either of two ways:

- In *native stacking*, switches are connected using either designated Ethernet data ports or dedicated stacking connectors.
- In *alternate stacking*, switches are connected using an alternate pair of Ethernet data ports that have been configured for stacking. These ports are located either on the switch itself or on option cards installed on either the front or the rear of the switch.

The 5120 Series supports native stacking but does not support alternate stacking.

When planning and building your stack, be sure to follow port compatibility and cabling recommendations as described in this chapter.

*Slot Numbers in Stacks*

A switch stack can be thought of as a virtual chassis. Each switch (node) operates as if it were occupying a slot in a chassis and is controlled by the primary. The high-speed stacking links function like the backplane links of a chassis.

Each switch in the stack is assigned a “slot number” during the initial software configuration of the stack. Starting at the switch with the console connection, numbers are assigned in numerical order following the physical path of the connected stacking cables. For example, if you follow the cabling recommendations presented in Connect the Switches to Form the Stack Ring on page 41 and configure a vertical stack from the console on the switch at the top of the physical stack, the switches will be assigned slot numbers 1 through 8 from the top down.

The top half of the number blinks if the switch is the primary, and the bottom half blinks if it is the backup. If the LED is steadily lit, the switch is a standby. If the LED is off the switch is not configured as a member of a stack.

The Mode button is used to cycle through three display modes for the port LEDs. After two presses of the Mode button, the port LEDs will enter the STK Display Mode, indicated by the STK LED. STK mode is used to indicate slot presence and slot number via the first eight port LEDs.

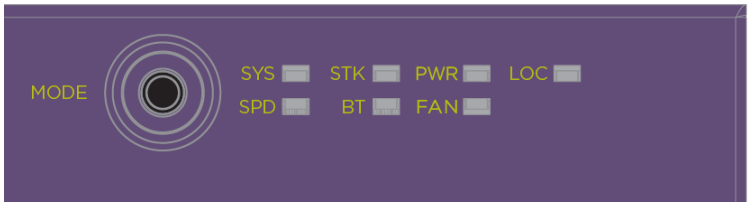



**Figure 8: Mode Button with STK LED Example**

The LED is steady green if the link is OK, blinking green if traffic is present, and off if no signal is present.

A quick way to verify that the cable connections match the software configuration is to check the stack number indicator on each switch. If the slot numbers do not line up in the order you arranged the switches, this might indicate that the stacking cable setup differs from what you intended when you configured the software. In this case, reconnect the cables in the correct order and perform the software configuration again.

*Primary/Backup Switch Redundancy*

When your stack is operational, one switch is the primary switch, responsible for running network protocols and managing the stack.

To provide recovery in case of a break in the stack connections, you can configure redundancy by designating a backup switch to take over as primary if the primary switch fails. When you perform the initial software configuration of the stack, the “easy setup” configuration option automatically configures redundancy, with slot 1 as the primary and slot 2 as the backup. You can also configure additional switches as “primary-capable,” meaning they can become a stack primary in case the initial backup switch fails.

**Note**
5120 Series switches can only be stacked with themselves. One switch is as capable as the other.

## SummitStack Topologies

Figure 9 presents a graphical representation of a stack and some of the terms that describe stack conditions.

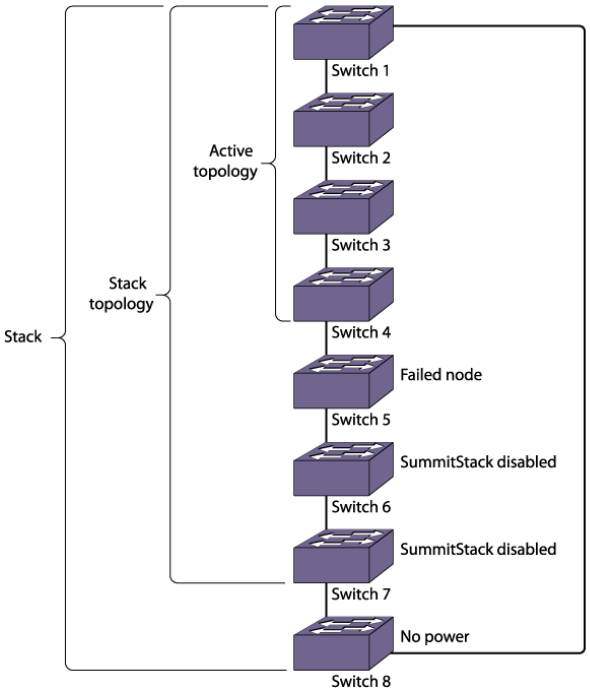



**Figure 9: Example of a Stack, Showing the Active Topology and the Stack Topology**

A stack is the collection of all switches, or nodes, that are cabled together to form one virtual switch using the Switch Engine SummitStack feature.

The maximum cable length supported between switches depends on the types of switches in your stack, the installed option cards, and the configured stacking ports.

A stack topology is the set of contiguous nodes that are powered up and communicating with each other. In the example shown, Switch 8 is not part of the stack topology because it is not powered up.

An active topology is the set of contiguous nodes that are active. An active node is powered up, is configured for stack operation, and is communicating with the other active nodes.

Switch 5 in the example has failed, stacking is disabled on Switches 6 and 7, and Switch 8 has no power. As a result, the active topology includes Switches 1 through 4 only.

For more information about SummitStack terminology, see SummitStack Terms on page 34.

*Ring Topology: Recommended for Stacking*

SummitStack nodes should be connected to each other in a ring topology. In a ring topology, one link is used to connect to a node and the other link is used to connect to another node. The result forms a physical ring connection. This topology is highly recommended for normal operation.

Figure 10 represents a maximal ring topology of eight active nodes.

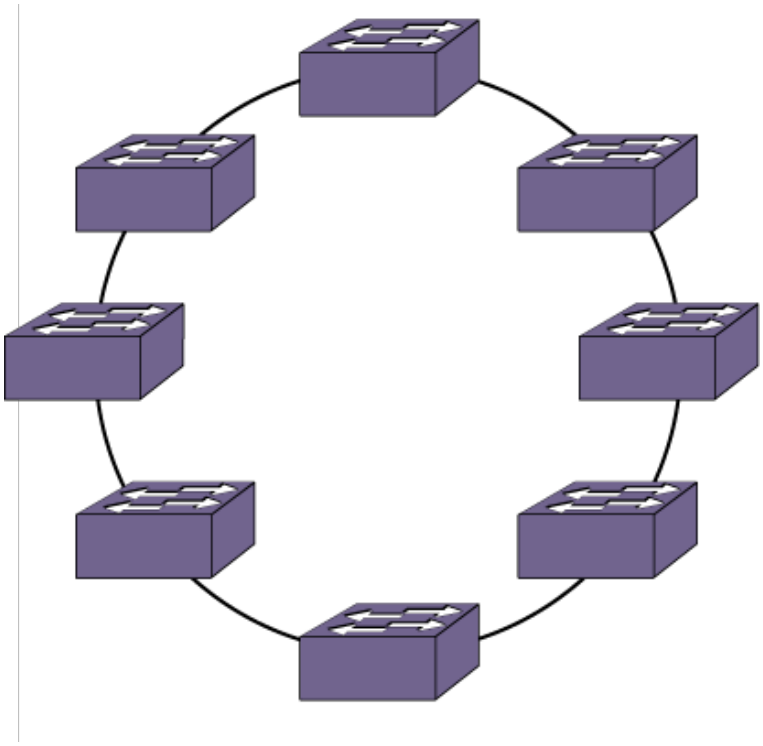


**Figure 10: Graphical Representation of a Ring Topology**

Figure 11 shows what the same ring topology would look in actual practice. Each switch in the rack is connected to the switch above it and the switch below it. To complete the ring, a longer cable connects Switch 1 with Switch 8.

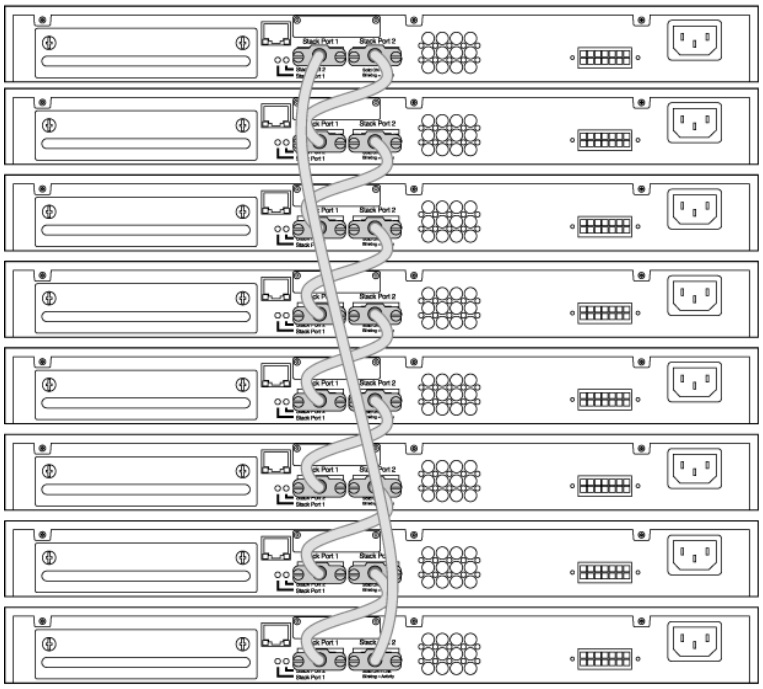


**Figure 11: Switches Connected to Each Other in a Ring Topology**

Note that, while a physical ring connection may be present, a ring active topology exists only when all nodes in the stack are active.

*Daisy Chain Topology: Not Recommended for Stacking*

Stackable switches can be connected in a daisy-chain topology. This is a ring topology with one of the links disconnected, inoperative, or disabled. A daisy chain can be created when a link fails or a node reboots in a ring topology, but the daisy chain topology is not recommended for normal operation.

Connect your stack nodes in a ring topology, not a daisy-chain topology, for normal operation.

In Figure 12, the nodes delineated as the active topology are operating in a daisy-chain configuration, even though there is physically a ring connection in the stack.

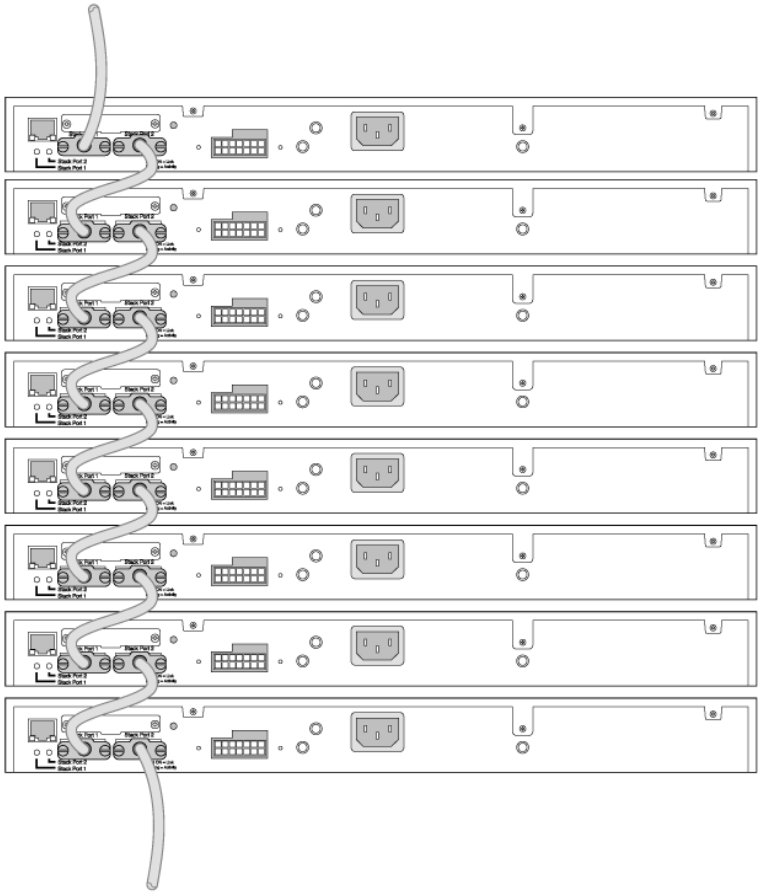


**Figure 12: Daisy Chain Topology**

You might need to use a daisy chain topology while adding a new node, removing a node, or joining two stacks.

If you are using a daisy chain topology, the possibility of a dual primary condition increases. Before you create a daisy chain topology, read "Managing a Dual Primary Situation" in the *Switch Engine User Guide* for your version of the Switch Engine operating system.

## SummitStack Terms

Table 4 describes the terms used for the SummitStack feature. These terms are listed in the recommended reading sequence.

**Table 4: List of Stacking Terms**

| Term | Description |
|---|---|
| Stackable switch | An Extreme Networks switch that provides two stacking ports and can participate in a stack. |
| Stacking port | A physical interface of a stackable switch that is used to allow the connection of a stacking link. Stacking ports are point-to-point links that are dedicated for the purpose of forming a stack. |
| Native stacking | A stacking configuration in which stack members are connected using either designated Ethernet data ports or dedicated stacking connectors. |
| Alternate stacking | A stacking configuration in which stack members are connected using an alternate pair of Ethernet data ports that have been configured for stacking. These ports are located either on the switch itself or on option cards installed on the rear of the switch. |
| Stacking link | A cable that connects a stacking port of one stackable switch to a stacking port of another stackable switch, plus the stacking ports themselves. |
| Node | A switch that runs the Switch Engine operating system and is part of a stack. Synonymous with *stackable switch*. |
| Stack | A set of stackable switches and their connected stacking links made with the intentions that: (1) all switches are reachable through their common connections; (2) a single stackable switch can manage the entire stack; and (3) configurable entities such as VLANs and link trunk groups can have members on multiple stackable switches. A stack consists of all connected nodes regardless of the state of the nodes. |
| Stack topology | A contiguously connected set of nodes in a stack that are currently communicating with one another. All nodes that appear in the `show stacking` command display are present in the stack topology. |
| Stack path | A data path that is formed over the stacking links for the purpose of determining the set of nodes that are present in the stack topology and their locations in the stack. Every node is always present in a stack path whether or not stacking is enabled on the node. |
| Control path | A data path that is formed over the stacking links that is dedicated to carrying control traffic, such as commands to program hardware or software image data for software upgrade. A node must join the control path to fully operate in the stack. A node that is disabled for stacking does not join the control path, but does communicate over the stack path. |

**Table 4: List of Stacking Terms (continued)**

| Term | Description |
|---|---|
| Active node | A node that has joined the control path. The active node can forward the control path messages or can process them. It can also forward data traffic. Only an active node can appear as a card inserted into a slot when the `show slot {slot {detail} \| detail }` command is executed on the primary node of the stack. |
| Active topology | A contiguous set of active nodes in a stack topology plus the set of stacking links that connect them. When an active topology consists of more than one node, each node in the active topology is directly and physically connected to at least one other node in the active topology. Thus, the active topology is a set of physically contiguous active nodes within a stack topology. |
| Candidate node | A node that is a potential member of an active topology, or an active node that is already a member of an active topology. A candidate node may or may not be an active mode – that is, it may or may not have joined the control path. |
| Node role | The role that each active node plays in the stack – either primary, backup, or standby. |
| Primary node | The node that is elected as the primary node in the stack. The primary node runs all of the configured control protocols such as OSPF (Open Shortest Path First), RIP (Routing Information Protocol), Spanning Tree, and EAPS (Extreme Automatic Protection Switching).<br>The primary node controls all of its own data ports as well as all data ports on the backup and standby nodes. To accomplish this, the primary node issues specific programming commands over the control path to the backup and standby nodes. |
| Backup node | The node assigned to take over the role of primary if the primary node fails. The primary node keeps the backup node's databases synchronized with its own databases in preparation for such an event.<br>If and when the primary node fails, the backup node becomes the primary node and begins operating with the databases it has previously received. In this way, all other nodes in the stack can continue operating. |
| Standby node | A node that is prepared to become a backup node in the event that the backup node becomes the primary node. When a backup node becomes a primary node, the new primary node synchronizes all of its databases to the new backup node.<br>When a node operates in a standby role, most databases are not synchronized – except those few that directly relate to hardware programming. |

**Table 4: List of Stacking Terms (continued)**

| Term | Description |
|---|---|
| Acquired node | A standby or backup node that is acquired by a primary node. This means that the primary node has used its databases to program the hardware of the standby or backup node. The standby or backup node has acted as a hardware programming proxy, accepting the instructions of the primary node to do so. An acquired backup node maintains the databases needed to reflect why the hardware is programmed as it is. However, a standby node does not. An acquired node can be re-acquired (without a reboot) by the backup node only when the backup node becomes the primary node, and only when both the backup and standby nodes were already acquired by the same primary node at the time of its failure. |
| Data ports | The set of ports on a stackable switch that are available for connection to your data networks. Such ports can be members of a user-configured VLAN or trunk group. They can be used for Layer 2 and 3 forwarding of user data traffic, for mirroring, or other features you can configure. Data ports are different from stacking ports. |
| Failover | The process of changing the backup node to the primary node when the original primary node has failed. When a primary node fails, if a backup node is present, and if that node has completed its initial synchronization with the primary node, then the backup node assumes the role of primary node. The standby nodes continue their operation and their data ports do not fail. |
| Hitless failover | A failover in which all data ports in the stack, except those of the failing primary node, continue normal operation when the primary node fails. |
| Node address | The unique MAC address that is factory-assigned to each node. |
| Node role election | The process that determines the role for each node. The election takes place during initial stack startup and elects one primary node and one backup node. An election also takes place after a primary node failover, when a new backup node is elected from the remaining standby nodes. |
| Node role election priority | A priority assigned to each node, to be used in node role election. The node with the highest node role election priority during a role election becomes the primary node. The node with the second highest node role election priority becomes the backup. |
| Operational node | A node that has achieved operational state as a card in a slot. The operational state can be displayed using the `show slot {slot {detail} \| detail }`command. |
| System uptime | The amount of time that has passed since the last node role election. You can display the system uptime by entering the `show switch {detail }` command on the primary node. |

**Table 4: List of Stacking Terms (continued)**

| Term | Description |
|---|---|
| Stack segment | A collection of nodes that form a stack topology. The term is useful when a stack is severed. Each severed portion of the stack is referred to as a stack segment. |
| Stack state | A state assigned by the stack to a node. You can display the stack state by entering the `show stacking` command. |
| Easy Setup | A procedure that automatically configures the essential stacking parameters on every node for initial stack deployment, and then automatically reboots the stack to put the parameters into effect.<br>The choice to run Easy Setup is offered when you run the `enable stacking {`**`node-address`** *`node-address`*`}` command and the essential stacking parameters are unconfigured or inconsistent. It can also be invoked directly by running the `configure stacking easy-setup` command. |

# Plan to Create Your Stack

Use the information in the following topics to plan the physical makeup of your stack – switches, versatile interface modules (VIMs), and cables – and the stacking protocols you will use. Included are:

- Guidelines and other information for each switch model in your stack
- Considerations for combining different switch models in a stack
- Information about stacking cables

## Enable and Disable the Stacking Support Option

The stacking-support option is enabled by default for many switch and option card configurations. However, some configurations require you to enable the stacking-support option before a switch can participate in a stack.

To enable stacking-support, issue the

```
configure stacking-support stack-ports all selection native V100
enable stacking-support
```

commands. You must enable stacking-support individually for every switch in the stack that does not have stacking support enabled by default.

## Recommendations for Placing Switches for Stacked Operation

For best results in a SummitStack configuration, follow these recommendations for physically situating your equipment:

- Use the shortest possible stacking cables to connect the switches in the stack. This reduces the likelihood that the stacking cables might accidentally be damaged or disconnected.
- When possible, place all switches for the stack in the same rack or in adjacent racks. This facilitates using shorter stacking cables.

- The primary switch, or node, is the switch through which you will perform the initial stack configuration, using the console port. For simplicity and ease of connecting the stacking cables, plan to designate the top switch in a vertical physical stack as the primary switch. If switches are installed in several adjacent racks, place the primary switch at one end of the row.
- Physically locate the intended primary and backup nodes adjacent to each other, and plan to connect these nodes to each other directly so that Switch Engine application synchronization traffic is localized to a single stack link.
- On the primary node, connect the Ethernet management port to your management network.
- To provide management access to the stack in case of a failure in the primary switch, connect all switches that will participate in redundancy to your management network using the Ethernet management port on each switch.
- Use stacking cables to interconnect the stack nodes into a ring topology (see Ring Topology: Recommended for Stacking on page 31). Include only the nodes that you expect to be active in the stack.

Follow the recommendations in Recommendations for Configuring Stacks on page 38 to configure the software for your stack.

The recommended procedures for installing and interconnecting a stack are found in Set up the Physical Stack on page 41.

## Recommendations for Configuring Stacks

When deploying a new stack, follow these recommendations for configuring the software:

- Plan to use the stack as if it were a single multi-slot switch. You need to decide the number and type of stackable switches in the stack and how the stack ports will be connected to the network.
- You can physically connect the stack to your networks before the nodes are configured. However, the default configuration on a switch in non-stacking mode assumes a default untagged VLAN that contains all switch ports. When first powered on, the switch acts as a Layer 2 switch, possibly resulting in network loops.
- Make sure all nodes support the SummitStack feature and are running the same Switch Engine software version. (See the *Licensing Guide* for your version of the Switch Engine operating system.) To view the Switch Engine software version on a node, restart the node and run the command:

  ```
  show version {detail | process name | images {partition partition}
  {slot slot_number} } .
  ```

  If any node does not have the right version, install the correct version on that node. Use the same image partition on all nodes. After stacking is enabled, images can be upgraded from the stack only if the same image is selected on all nodes.
- If you intend to deploy new units that might be part of a stack in the future, turn on stacking mode during initial deployment to avoid the need for a future restart. The only disadvantages of stacking mode are the loss of QoS (quality of service) profile

QP7 and the reservation of some of the packet buffer space for stacking control traffic.

- You can configure the stack by logging into the primary node or any of the other nodes.
- If the primary-capable stackable switches have different purchased license levels, you might need to configure license level restrictions on some nodes before those nodes can join the stack. See the *Switch Engine User Guide* for your version of the Switch Engine operating system for more information about managing licenses.
- If the stack supports any feature pack license (such as MPLS or Direct Attach), that feature pack license must be installed on all primary-capable nodes to support that feature and to prevent traffic interruption if a failover event occurs.
- Most stacking specific configurations are effective only after a restart. However, most non-stacking configuration commands take effect immediately and require no restart.
- A basic stack configuration can be achieved by using the Easy Setup procedure, as described in the *Switch Engine User Guide* for your version of the Switch Engine operating system.
- If EAPS, Spanning Tree, or any Layer 2 redundancy protocol is not running on the network, make sure that your network connections do not form a network loop.

Follow the recommendations in Recommendations for Placing Switches for Stacked Operation on page 37 for physically situating your equipment.

## Combine Switches from Different Series

5120 Series switches can only stack with themselves and support data rates of 25Gbps using the Native V100 stacking method with SFP28 cables.

## Select Stacking Cables

Stacking connections using the native stacking ports require stacking cables that are specific to the type of stacking port. These cables are available from Extreme Networks in lengths from 0.5 meter to 40 meters.

**Note**
For the most recent information about available cables, contact your Extreme Networks sales representative or refer to the Extreme Optics website.

**Caution**
Use of non-recommended cables or optics could cause stack instability.

## Use the Extreme Stacking Tool

The Extreme Stacking Tool provides an easy way to plan your stack. As you select various switch models and stacking methods, the tool shows you:

- What switch models can be stacked together and which cannot.
- Statistics showing the routing options that are available with every stack combination.
- Recommendations about which switches should be the primary and backup nodes.
- Information about the supported versions of Switch Engine for every combination.

To use the Stacking Tool, follow these steps.

1. Open the Stacking Tool (https://stackingtool.extremenetworks.com/StackingTool/) in a web browser.

   **Note**
   The Stacking Tool is also available in the Support Tools section of the Extreme Portal.

2. Find a switch model in the **Switches** column.

   Each switch model is represented by a rectangle, as shown in the example in the following figure.ach switch model is represented by a rectangle, as shown in the example in the following figure.


**Figure 13: 5120 Switch Shown in the Stacking Tool**

   **Tip**
   Select a rectangle to display more information about the switch model and the VIMs (if any) that it can use for stacking.

3. Drag the rectangle to the first slot in the Stack column in the middle of the page.

   To the right of the Stack column, the tool displays statistics about available routes, supported software versions, and primary/backup recommendations.

   **Tip**
   If you do not see statistics and other information, select the arrow (> symbol) to the immediate right of the Stack column.

4. Use the tool in any of the following ways:
   - Select other switches and drag them to the slots in the stacking column.
   - To remove a switch from the stack, drag it away from the stacking column.

   Whenever you add or remove a switch from the stack, the statistics and recommendations update automatically.

In addition to statistics and recommendations, colors in the display show whether the selected switch models and stacking methods are compatible.

**Table 5: Colors in the Stacking Tool Display**

| Color | Meaning |
|---|---|
| Green | Compatible and preferred |
| Blue | Compatible |
| Yellow | Incompatible with the selected primary node |
| Red | Incompatible |

## Set up the Physical Stack

After you have installed the individual switches (see Install Your Switch on page 59), follow these steps to create the physical stack.

1. Connect the switches that will form the stack.See Connect the Switches to Form the Stack Ring on page 41.
2. Connect the switches to your management network. See Connect Your Stack to the Management Network on page 44.

After setting up and connecting the switches, perform software configuration for the stack. See "Configuring a New Stack" in the *Switch Engine User Guide* for your version of the Switch Engine operating system.

### Connect the Switches to Form the Stack Ring

After you have installed the individual switches, connect them together using the stacking cables.

The examples in this section show cable connections and the recommended order for connecting ports to facilitate the easy setup configuration.

In general, it is best to connect Stack Port 2 on one switch to Stack Port 1 on the switch with the next higher slot number. Although you can connect the switches in any order, connecting them as shown in these examples will produce better predictability and easier software configuration.

All connections between stack ports must be directly between switches. A stacking connection cannot pass through a third device, for example a Virtual Port Extender or an LRM/MACsec Adapter.

It is essential to create an unbroken data path through all the switches in the stack.

#### *Examples of Valid Stacking Configurations*

The examples in the following sections show various physical stacking arrangements: all switches in a single rack, switches in two adjacent racks, and switches at the tops of several racks in a row.

### Example: Basic Stack with Four Switches

This example shows a stack of four switches in a single rack.

The slot numbers presume a console connection to the switch at the top of the physical stack.

Figure 14 shows cable connections for a 4-node stack using SummitStack 40G cables to connect switches with integrated SummitStack ports.

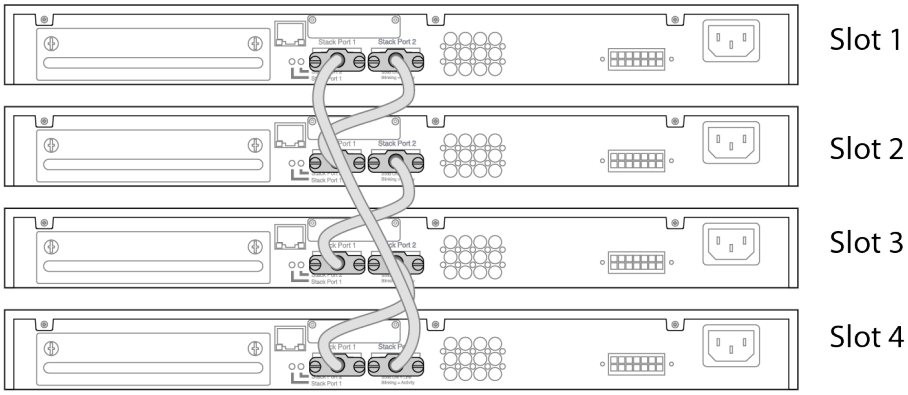



**Figure 14: SummitStack Cable Connections Using Four Switches with Integrated SummitStack Ports**

Table 6 lists the recommended order for connecting the stacking ports in this example.

**Table 6: Basic Stack with Four Switches: Connections**

| Connect this slot and port . . . | | . . . To this slot and port | |
|---|---|---|---|
| Slot 1 | Stack Port 2 | Slot 2 | Stack Port 1 |
| Slot 2 | Stack Port 2 | Slot 3 | Stack Port 1 |
| Slot 3 | Stack Port 2 | Slot 4 | Stack Port 1 |
| Slot 4 | Stack Port 2 | Slot 1 | Stack Port 1 |

### Example: Basic Stack with Eight Switches

Figure 15 shows cable connections for an 8-node stack using SummitStack 40G cables to connect switches with integrated SummitStack ports.


**Figure 15: SummitStack Cable Connections Using Eight Switches with Integrated SummitStack Ports**

Table 7 lists the recommended order for connecting the stacking ports in this example.

**Table 7: Basic Stack with Eight Switches: Connections**

| Connect this slot and port . . . | | . . . To this slot and port | |
|---|---|---|---|
| Slot 1 | Stack Port 2 | Slot 2 | Stack Port 1 |
| Slot 2 | Stack Port 2 | Slot 3 | Stack Port 1 |
| Slot 3 | Stack Port 2 | Slot 4 | Stack Port 1 |
| Slot 4 | Stack Port 2 | Slot 5 | Stack Port 1 |
| Slot 5 | Stack Port 2 | Slot 6 | Stack Port 1 |
| Slot 6 | Stack Port 2 | Slot 7 | Stack Port 1 |
| Slot 7 | Stack Port 2 | Slot 8 | Stack Port 1 |
| Slot 8 | Stack Port 2 | Slot 1 | Stack Port 1 |

### Example: Stacked Switches across Several Racks

Figure 16 shows five switches installed at the tops of five adjacent racks. To accommodate the shortest possible cables, immediately adjacent switches are not always connected together. Port 2 on one switch is connected to Port 1 on the next connected switch. If the easy setup feature is used to configure the stack parameters, the assigned slot numbers will be as shown in the figure.

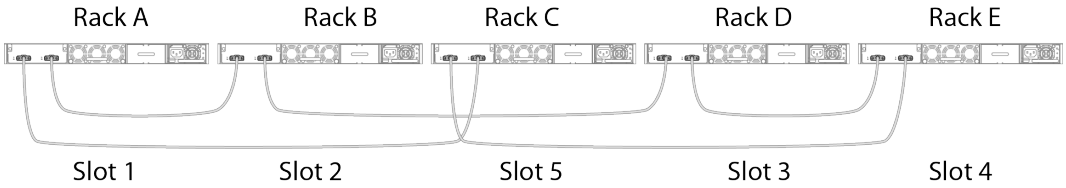



**Figure 16: Top-of-Rack Stack Installation**

Table 8 lists the recommended order for connecting the stacking ports in this example.

**Table 8: Stacked Switches across Several Racks: Connections**

| Connect this slot and port . . . | | | . . . To this slot and port | | |
|---|---|---|---|---|---|
| Slot 1 | Rack A | Port 2 | Slot 2 | Rack B | Port 1 |
| Slot 2 | Rack B | Port 2 | Slot 3 | Rack D | Port 1 |
| Slot 3 | Rack D | Port 2 | Slot 4 | Rack E | Port 1 |
| Slot 4 | Rack E | Port 2 | Slot 5 | Rack C | Port 1 |
| Slot 5 | Rack C | Port 2 | Slot 1 | (Rack A | Port 1 |

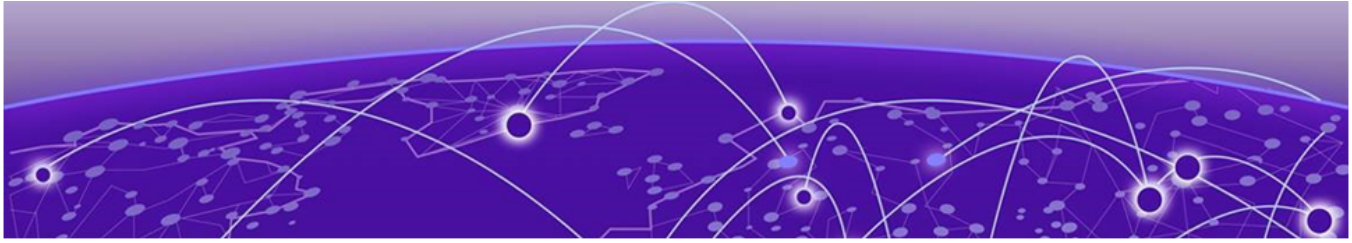
## Connect Your Stack to the Management Network

Before you can configure Switch Engine for a new stack, your management console must be connected to at least one switch in the stack.

Connect your management console to a serial console port or the Ethernet management console port on the switch that will become the stack primary node. If you plan to configure redundancy, connect to the console ports of all switches in the stack that will be primary-capable.

If you followed the cabling examples in Connect the Switches to Form the Stack Ring on page 41, and if you use the Easy Setup configuration procedure, only slots 1 and 2 can become the primary node. However, you can connect all switch management ports in the stack if you choose to do so. There is an alternate IP address configuration that will enable you to log in directly to each switch in the stack through its Ethernet management port.

See the *Switch Engine User's Guide* for your version of Switch Engine for instructions to perform the software configuration for your stack.



# Site Preparation



By carefully planning your site, you can maximize the performance of your existing network and ensure that it is ready to migrate to future networking technologies.

The information in this chapter is intended for the system administrator, network equipment technician, network manager, or facilities manager responsible for installing and managing the network hardware. The chapter assumes a working knowledge of local area network (LAN) operations, and a familiarity with communications protocols that are used on interconnected LANs.

Only qualified service personnel should install, maintain, or remove a switch, chassis, or its components. Qualified service personnel have had appropriate technical training and experience that is necessary to be aware of the hazards to which they are exposed when performing a task and of measures to minimize the danger to themselves or other people.

**Note**
Before installing or removing any components of the system, and before carrying out any maintenance procedures, read the safety information in the Technical Specifications on page 76 topic.

## Plan Your Site

To install your equipment successfully, you should plan the site carefully. The site planning process has three major parts:

1. Meeting site requirements.

   The physical installation site must meet the following requirements for a safe and successful installation:

   - Building and electrical code requirements
   - Environmental, safety, and thermal requirements for the equipment you plan to install
   - Equipment rack requirements

2. Evaluating and meeting cable requirements.

   After examining your physical site and verifying that all environment requirements are met, evaluate and compare your existing cable plant with the requirements of the Extreme Networks equipment to determine if you need to install new cables.
3. Meeting power requirements.

   To run your equipment safely, you must meet the specific power requirements for each switch and external power supply unit installed in the system.

   For power specifications of the switches, see the specific switch listings in Technical Specifications on page 76.

# Operating Environment Requirements

Verify that your site meets all environmental and safety requirements.

Virtually all areas of the United States are regulated by building codes and standards. During the early planning stages of installing or modifying your network, it is important that you develop a thorough understanding of the regulations that pertain to your location and industry.

## Meet Building and Electrical Codes

Building and electrical codes vary depending on your location. Comply with all code specifications when planning your site and installing cable. This section lists resources for obtaining additional information.

For information about major building codes, consult the following organization:

International Code Council (ICC)
5203 Leesburg Pike
Falls Church, VA 22041 USA
www.iccsafe.org

The organizations listed in Table 9 are authorities on electrical codes.

**Table 9: Authorities on Electrical Codes**

| Organization | Address | Web Site URL |
|---|---|---|
| National Electrical Code (NEC) Classification (USA only)<br>Recognized authority on safe electrical wiring. Federal, state, and local governments use NEC standards to establish their own laws, ordinances, and codes on wiring specifications. The NEC classification is published by the National Fire Protection Association (NFPA). | NFPA<br>1 Batterymarch Park<br>Quincy, MA 02169<br>USA | www.nfpa.org/ |
| Underwriters' Laboratory (UL)<br>Independent research and testing laboratory. UL evaluates the performance and capability of electrical wiring and equipment to determine whether they meet certain safety standards when properly used. Acceptance is usually indicated by the words "UL Approved" or "UL Listed." | UL<br>333 Pfingsten Road<br>Northbrook, IL 60062<br>USA | www.ul.com |
| National Electrical Manufacturing Association (NEMA) (USA only)<br>Organization of electrical product manufacturers. Members develop consensus standards for cables, wiring, and electrical components. | NEMA<br>1300 N. 17th Street<br>Rosslyn, VA 22209<br>USA | www.nema.org |
| Electronic Components Industry Association (ECIA)<br>Trade association that develops technical standards, disseminates marketing data, and maintains contact with government agencies in matters relating to the electronics industry. | ECIA<br>111 Alderman Drive<br>Suite 400<br>Alpharetta, GA 30005<br>USA | www.ecianow.org |
| Federal Communications Commission (FCC) (USA only)<br>Commission that regulates all interstate and foreign electrical communication systems that originate in the United States according to the Communications Act of1934. The FCC regulates all U.S. telephone and cable systems. | FCC<br>445 12th Street S.W.<br>Washington, DC 20554<br>USA | www.fcc.gov |

## Set Up the Wiring Closet

Be aware of the following recommendations for your wiring closet:

- Make sure that your system is easily accessible for installation and service. See Rack Specifications and Recommendations on page 49 for more information.
- Use appropriate AC or DC power, power distribution, and grounding for your specific installation.

- Use a vinyl floor covering in your wiring closet. (Concrete floors accumulate dust, and carpets can cause static electricity.)
- Prevent unauthorized access to wiring closets by providing door locks. Install the equipment in a secured, enclosed, and restricted access location, ensuring that only qualified service personnel have access to the equipment.
- Provide adequate overhead lighting for easy maintenance.
- Be sure that each wiring closet has a suitable ground. All equipment racks and equipment installed in the closet should be grounded.
- Be sure that all system environmental requirements are met, such as ambient temperature and humidity.

**Note**
Consult an electrical contractor for commercial building and wiring specifications.

## Control the Temperature

Extreme Networks equipment generates a significant amount of heat. It is essential that you provide a temperature-controlled environment for both performance and safety.

Install the equipment only in a temperature- and humidity-controlled indoor area that is free of airborne materials that can conduct electricity. Too much humidity can cause a fire. Too little humidity can produce electrical shock and fire.

Observe these additional thermal recommendations for the location where you plan to install your equipment:

- Ensure that the ventilation in the wiring closet is adequate to maintain a temperature below the maximum operating temperature for the equipment..
- Install a reliable air conditioning and ventilation system.
- Keep the ventilation in the wiring closet running during non-business hours; otherwise, the equipment can overheat.
- Maintain a storage temperature between -40°C (-40°F) and 70°C (158°F).

Table 10 summarizes the behavior of Extreme Networks switches when they experience high operating temperatures.

Safeguards are built into all Extreme Networks switches and power supply units to minimize the risk of fire.

**Table 10: Thermal Shutdown and Restart Behavior**

| Switch Model(s) | Behavior |
|---|---|
| All models | When internal system temperatures exceed the thermal shutdown temperature limit (typically about 20°C higher than normal system operating temperatures), the system's power supplies are turned off and the switch shuts down. The system remains in the OFF state until the system has sufficient time to cool and the internal thermal sensor measures a temperature lower than the maximum specified ambient temperature, at which time the system restarts automatically.<br>Alternately, you can restart the system by removing and then restoring all line power to the system. The internal sensor must still measure a system temperature that is lower than the maximum specified ambient temperature, so recovery might not be immediate. |

## Control the Humidity Level

To maximize equipment life, keep operating humidity between 50% and 70% relative humidity (non-condensing) during typical operation.

The equipment can operate between 5% and 95% relative humidity (non-condensing) for short intervals.

## Protect Your System from ESD (Electrostatic Discharge)

Your system must be protected from static electricity or ESD. Take the following measures to ensure optimum system performance:

- Remove materials that can cause electrostatic generation (such as synthetic resins) from the wiring closet.

  Check the appropriateness of floor mats and flooring.
- Connect metal chassis, conduit, and other metals to ground using dedicated grounding lines.
- Use electrostatically safe equipment.

  If you are working with pluggable interface modules, wear an ESD-preventive wrist strap and connect the metal end to a grounded equipment rack or other source of ground.

# Rack Specifications and Recommendations

Racks should conform to conventional standards.

In the United States, use EIA Standard RS-310C: Racks, Panels, and Associated Equipment. In countries other than the United States, use IEC Standard 297. In addition,

verify that your rack meets the basic mechanical, space, and earthquake requirements that are described in this section.

## Mechanical Recommendations for the Rack

Use equipment racks that meet the following mechanical recommendations:

- Use an open style, 19-inch rack to facilitate easy maintenance and to provide proper ventilation.
- Use a rack made of steel or aluminum.
- The rack should use the universal mounting rail hole pattern that is identified in IEC Standard 297.
- The rack should have designated earth grounding connections (typically on the base).
- The rack must meet earthquake safety requirements equal to that of the installed chassis.
- The mounting holes should be flush with the rails to accommodate the chassis.
- The rack should support approximately 270 kg (600 lb).

## Ground the Rack

The rack must be properly grounded.

Use a rack grounding kit and a ground conductor that is carried back to earth or to another suitable building ground.

At a minimum, follow these guidelines to ground equipment racks to the earth ground:

- CAD weld appropriate wire terminals to building I-beams or earth ground rods.
- For a DC-powered switch, use a minimum 14 AWG stranded copper wire for grounding.

  AC-powered switches do not need separate chassis grounding.
- Position the earth ground as close to the equipment rack as possible to maintain the shortest wiring distance possible.
- Use a ground impedance tester or micro-ohm meter to test the quality of earth ground connection at the chassis. This will ensure good grounding between the chassis, rack, and earth ground.

**Note**
Because building codes vary worldwide, consult an electrical contractor to ensure proper equipment grounding for your specific installation.

## Provide Adequate Space for the Rack

Provide enough space in front of and behind the switch so that you can service it easily.

Allow a minimum of 48 inches (122 cm) in front of the rack and 30 inches (76 cm) behind the rack. When using a relay (two-post) rack, provide a minimum of 24 inches (61 cm) of space behind the mounted equipment. Extra room on each side is optional.

**Warning**
Extreme Networks switches do not have a switch for turning power to the unit on and off. For systems using an AC power supply, power to the switch is disconnected by removing the wall plug from the electrical outlet.

Be sure that cables and other equipment do not block the switch's air intake or outflow.

Depending on other conditions in the equipment room, it may be possible to install the switches closer to each other; consult your Extreme Networks Customer Support representative for guidance.

## Secure the Rack

The rack should be attached to the wiring closet floor with 9.5 mm (3/8 in) lag screws or equivalent hardware. The floor under the rack should be level within 5 mm (3/16 in). Use a floor-leveling cement compound if necessary or bolt the racks to the floor as shown.

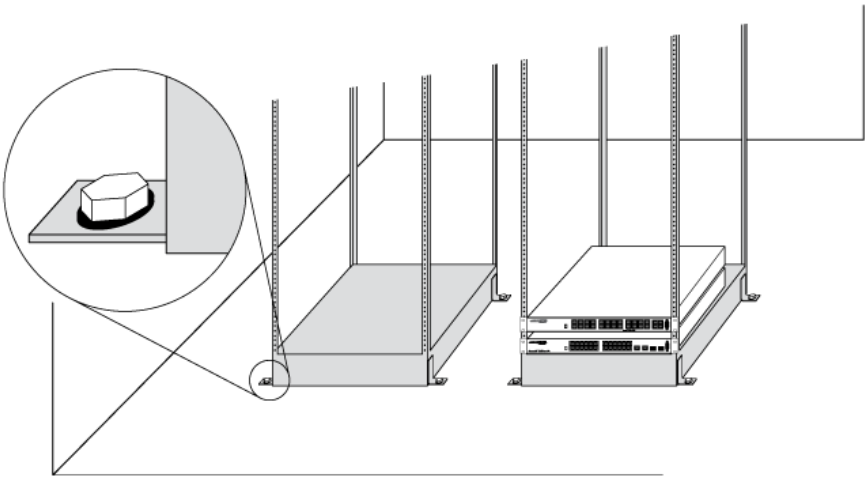


**Figure 17: Properly Secured Rack**

Brace open equipment racks if the channel thickness is less than 6.4 mm (1/4 in).

# Evaluate and Meet Cable Requirements

Use professional consultants for site planning and cabling.

The Building Industry Consulting Service International (BICSI) Registered Communications Distribution Designer (RCDD), which is globally recognized as a standard in site planning and cabling, can be used.

For information, visit www.bicsi.org.

## Label Cables and Keep Accurate Records

A reliable cable labeling system is essential when planning and installing a network.

Keeping accurate records helps you to:

- Relocate devices easily.
- Make changes quickly.
- Isolate faults in the distribution system.
- Locate the opposite end of any cable.
- Know the types of network devices that your cabling infrastructure can support.

Follow these guidelines when setting up a cable labeling system suitable for your installation:

- Identify cables by securely attaching labels to all cable ends.
- Assign a unique block of sequential numbers to the group of cables that run between each pair of wiring closets.
- Assign a unique identification number to each equipment rack.
- Identify all wiring closets by labeling the front panel of your Extreme Networks equipment and other hardware.
- Keep accurate and current cable identification records.
- Post records near each equipment rack. For each cable drop, include information about the cable source, destination, and jumper location.

## Install Cable

When you connect cable to your network equipment, keep the following things in mind.

- Examine cable for cuts, bends, and nicks.
- Support cable using a cable manager that is mounted above connectors to avoid unnecessary weight on the cable bundles.
- Use cable managers to route cable bundles to the left and right of the network equipment to maximize accessibility to the connectors.
- Provide enough slack, approximately 5 to 7.5 cm (2 to 3 in), to provide proper strain relief as shown in Figure 18 on page 53.
- Bundle cable using hook-and-loop straps to avoid injuring cables.
- If you build your own cable, be sure that connectors are properly crimped.
- When installing a patch panel using twisted pair wiring, untwist no more than 2.5 cm (1 in) of the cable to avoid radio frequency (RF) interference.
- Discharge the RJ45 Ethernet cable before plugging it into a port on the switch.

**Caution**
Unshielded twisted pair (UTP) cable can build up electrostatic charges when being pulled into a new installation. Before connecting any category 5 UTP cable to the switch, discharge ESD from the cable by plugging the RJ45 connector into a LAN static discharge device or use an equivalent method.

- Use plenum-rated cable when it is necessary for safety and fire rating requirements. Consult your local building codes to determine when it is appropriate to use plenum-rated cable, or refer to IEC standard 850.
- Keep all ports and connectors free of dust.

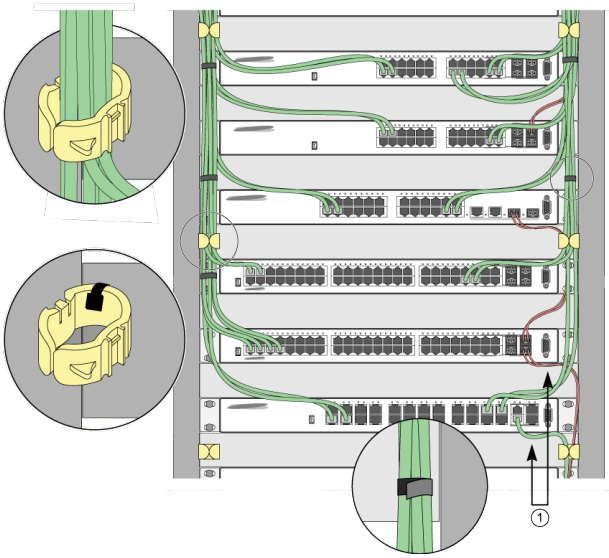



**Figure 18: Properly Installed and Bundled Cable**

**1 =** Ensure adequate slack and bend radius

*Handle Fiber Optic Cable*

Fiber optic cable must be handled carefully during installation.

Every cable has a minimum bend radius, and fibers will be damaged if the cables are bent too sharply. It is also important not to stretch the cable during installation. Ensure that the bend radius for fiber optic cables is equal to at least 5 cm (2 in) for each 90-degree turn as shown in Figure 19.

**Note**
Kinks and sharp bends can destroy or impair the cable's ability to convey light pulses accurately from one end of the cable to the other. Use care in dressing the optical fiber cables: provide satisfactory strain relief to support the cable and maintain an adequate bend radius at all cable turns, particularly where the cable connects to the I/O module.

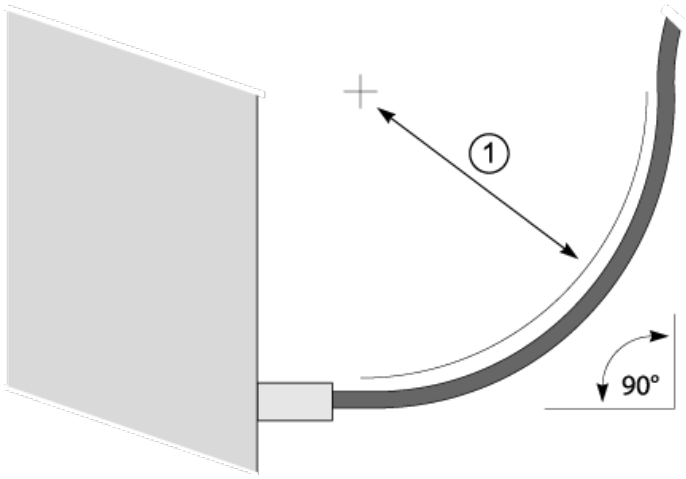



**Figure 19: Bend Radius for Fiber Optic Cable**
1 = Minimum 5 cm (2 in) radius in 90° bend

*Cable Distances and Types*

Refer to the Extreme Optics website for descriptions of optics and cables, as well as a complete list of supported cable lengths, and a list of the cable types that are compatible with your equipment.

## Use RJ45 Connector Jackets

Use RJ45 cable with connector jackets that are flush with the connector or that have connectors with a no-snag feature.

Using cable with jackets that are wider than the connectors can cause:

- Connectors that are not properly aligned with the port.
- Crowded cable installation, which can cause connectors to pop out of the port.

Figure 20 shows examples of recommended and non-recommended connector jacket types.

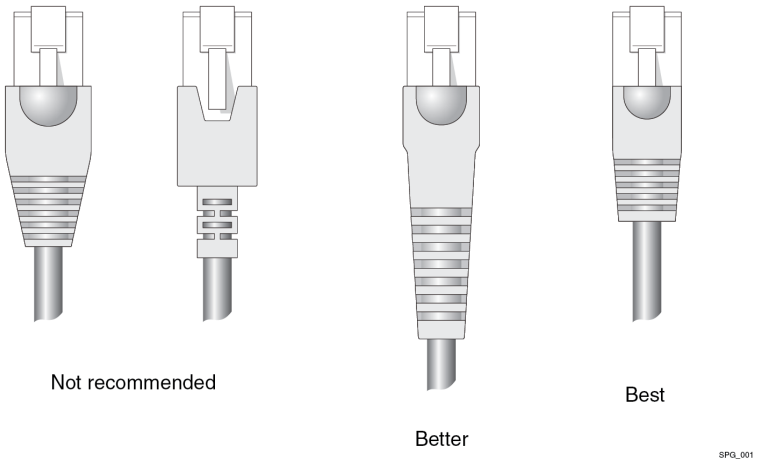



**Figure 20: RJ45 Connector Jacket Types**

### Prevent Radio Frequency Interference (RFI)

If you use UTP cabling in an installation, take precautions to avoid radio frequency (RF) interference.

RF interference can cause degradation of signal quality, and, in an Ethernet network environment, can cause excessive collisions, loss of link status, or other physical layer problems that can lead to poor performance or loss of communication.

To prevent RF interference, avoid the following situations:

- Attaching UTP cable to AC power cables
- Routing UTP cable near antennas, such as a ham radio antenna
- Routing UTP cable near equipment that could exhibit RF interference, such as ARC welding equipment
- Routing UTP cable near electrical motors that contain coils
- Routing UTP cable near air conditioner units
- Routing UTP cable near electrical transformers

In areas or applications where these situations cannot be avoided, use fiber optic cabling or shielded twisted pair cabling.

## Meet Power Requirements

Observe the following requirements and precautions for powering your hardware.

### Requirements for PoE Devices

When connecting PoE devices to a PoE switch, all connections between the PoE device and the switch must remain within the same building and use a low-voltage power distribution system per IEEE 802.3af.

### Power Supply Requirements

Follow these recommendations when you plan power supply connections for your equipment:

- Place the equipment in an area that accommodates the power consumption and component heat dissipation specifications.
- Be sure that your power supply meets the site DC power or AC power requirements of the network equipment.
- When you connect power to installed equipment, do not make this connection through an extension cord or power strip.
- If your switch includes more than one power supply, connect each power supply to a different, independent power source.

If a power source fails, it will affect only the switch power supply to which it is connected. If all switch power supplies are connected to a single power source, the entire switch is vulnerable to a power source failure.

- In regions that are susceptible to electrical storms, the best practice is to plug your system into a surge suppressor.

For detailed power specifications for your equipment, see Technical Specifications on page 76.

## Power Cord Requirements

Most Extreme Networks switches do not ship with power cords. Visit www.extremenetworks.com/product/powercords/ for information on selecting and purchasing the correct power cords for use with specific Extreme Networks equipment. The web page provides specifications for power cords in each country so that you can purchase cords locally.

## UPS (Uninterruptible Power Supply) Requirements

A UPS (uninterruptible power supply) is a device that sits between a power supply (such as a wall outlet) and a device (such as a switch) to prevent outages, sags, surges, and bad harmonics from adversely affecting the performance of the device.

A UPS traditionally can perform the following functions:

- Absorb relatively small power surges.
- Smooth out noisy power sources.
- Continue to provide power to equipment during line sags.
- Provide power for a period of time after a blackout has occurred.

In addition, some UPS devices or UPS-plus-software combinations provide the following functions:

- Automatically shut down equipment during long power outages.
- Monitor and log power supply status.
- Display the voltage (current draw) of the equipment.
- Restart equipment after a long power outage.
- Display the voltage currently on the line.
- Provide alarms on certain error conditions.
- Provide short-circuit protection.

### *Select a UPS*

To determine UPS requirements for your switch, answer these questions:

- What are the amperage requirements?
- What is the longest potential time period that the UPS would be required to supply backup power?

- Where will the UPS be installed?
- What is the maximum transition time that the installation will allow? (See Provide a Suitable UPS Transition Time on page 57.)

**Note**
Use a UPS that provides online protection.

*Calculate Volt-Amperage Requirements*

To determine the size of UPS that you need:

1. Locate the voltage and amperage requirements for each piece of equipment.

   These numbers are usually found on a sticker on the back or bottom of your equipment.
2. Multiply the numbers together to get Volt-Amperes (VA):

   VA = Volts x Amperes
3. Add the VA from all the pieces of equipment together to find the total VA requirement.

To determine the minimum volt-amperage requirements for your UPS, add 30% to the total.

*Provide a Suitable UPS Transition Time*

*UPS transition time* is the time required for the UPS to change from providing AC power derived from the utility (or mains) supply to providing AC power derived from the battery backup. UPS transition time is sometimes called *UPS transfer time*.

UPS transition times vary between UPS models and implementations, but shorter transition times are preferred. For Extreme Networks stacking products, a UPS transition time of 20 milliseconds or less ensures optimum performance and minimizes service interruptions.

For high-availability and fault-tolerant installations in which the switches use redundant power supply units (PSUs), ensure that each PSU in a switch is connected to a different UPS and that each UPS is powered by an independent AC supply. This will prevent service interruptions when a power source is lost, or when a UPS unit fails. (Note that a single, appropriately sized UPS can power PSUs in multiple switches. The recommendation is simply that for any given switch, the two PSUs should be connected to different UPS units.)

## Follow Applicable Industry Standards

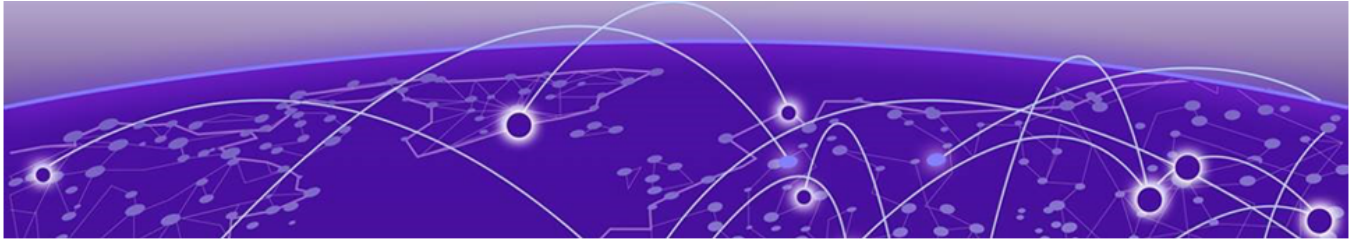
Always follow applicable industry standards.

For more information, see the following ANSI/TIA/EIA standards:

- ANSI/TIA/EIA-568-A—the six subsystems of a structured cabling system
- ANSI/TIA/EIA-569-A—design considerations

- ANSI/TIA/EIA-606—cabling system administration
- ANSI/TIA/EIA-607—commercial building grounding and bonding requirements

You can access these standards at: or .



# Install Your Switch



Before you attempt to install or remove an Extreme Networks switch, read the precautions in Safety Considerations for Installation on page 59.

Extreme Networks switches fit into standard 19-inch equipment racks.

The installation process includes the following tasks:

1. Prepare to install the switch. See What You Will Need for the Installation on page 60.
2. Install the switch in the rack. See Attach the Switch to a Rack or Cabinet on page 60.
3. Install optional components: optical transceivers and cables. See the instructions in Install Optional Components on page 63.
4. If your switch does not come with an installed internal power supply, install one or two power supplies. See Install Internal Power Supplies on page 62.
5. Connect network interface cables. See Connect Network Interface Cables on page 63.
6. Power up the switch. See Turn on the Switch on page 64.
7. Perform initial network connection and configuration. See Activate and Verify the Switch on page 65.

## Safety Considerations for Installation

Read the information in this chapter thoroughly before you attempt to install or remove an Extreme Networks switch.

Ensure that proper ESD (electrostatic discharge) controls are in use before switch maintenance is performed. This includes but is not limited to wrist straps that are grounded to the switch housing and earth grounds.

**Warning**
Connect the chassis ground wire **before** you connect any power cables.
Disconnect the ground wire **after** you disconnect all power cables.

Take care to load the equipment rack so that it is not top-heavy. Start installing equipment at the bottom of the rack and work up.

Do not cover vents that would restrict airflow.

## What You Will Need for the Installation

Ensure that you have followed the guidance in Site Preparation on page 45, and ensure that you have the appropriate people and tools on hand.

Installing Extreme Networks switches is easiest when there are two people to maneuver the switch and attach mounting hardware.

Provide enough space in front of and behind the switch so that you can service it easily. Ensure that a minimum of 122 cm (48 in) in front of the rack and 76 cm (30 in) behind the rack.

If your switch has internal power supplies, make sure they have the same airflow direction as the fans in the switch.

Check the *Quick Reference Guide* for your switch model to see what hardware is provided in the switch packaging.

## Attach the Switch to a Rack or Cabinet

You can install any 5120 Series switch in a standard 19-inch equipment rack, using the included two-post rack mount kit (XN-2P-RMKIT-014). The rack mount kit supports both flush-mounting and mid-mounting. The switch can be installed in either of the following ways:

- Four-post rack
- Two-post rack

The rack mount kit contains an instruction sheet, along with the following components:

- Mounting ears (2 count)
- Mounting ear screws (12 count)
- Rack screws (6 count)

When installing the 5120 Series switch in a four-post rack, just the two front posts are used for forward mounting or the two back posts are used for rear mounting. This procedure uses a two-post mounting kit, which accommodates rack posts 3 inches or 6 inches wide, and a four-post rack.

Take care to load the rack so that it is not top-heavy. Start installing equipment at the bottom and work up.

1. Attach a mounting bracket to each side of the switch, using the screws provided. You can attach the bracket at the front of the switch to flush-mount, aligning the mounting bracket so that the flange (ear) faces the front of the switch. You can attach the bracket at the middle of the switch to mid-mount, aligning the mounting bracket so that the flange (ear) faces the rear of the switch.

   The following figures illustrate how to attach the mounting ears for two common mounting options.

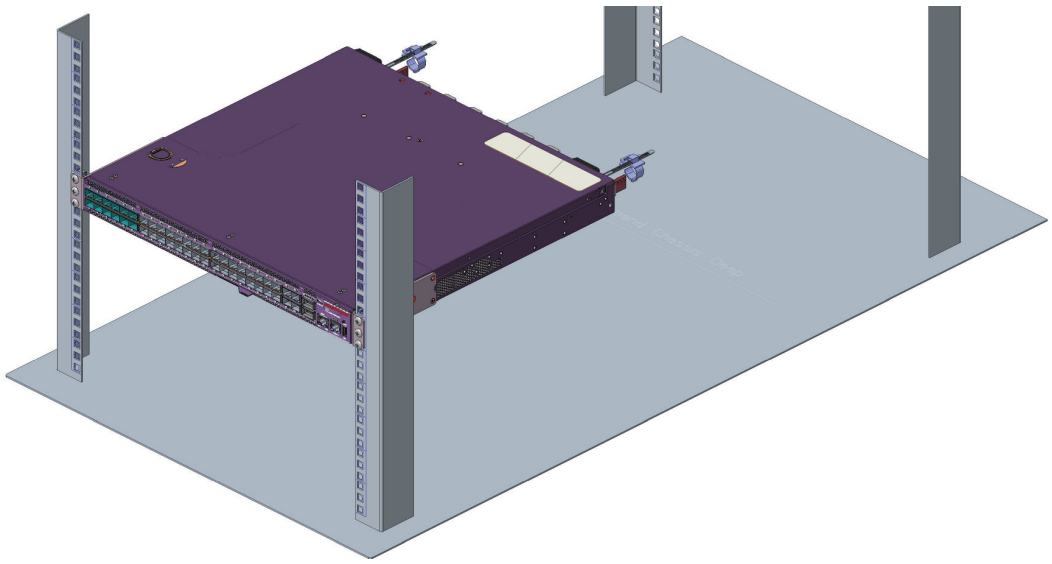


**Figure 21: Flush-Mount: Attaching the Mounting Brackets**

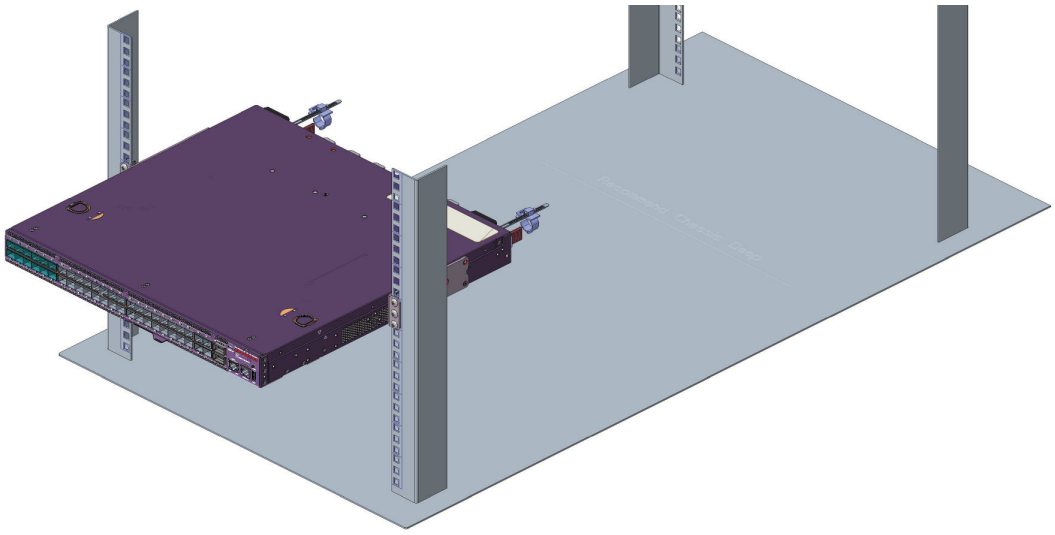


**Figure 22: Mid-Mount: Attaching the Mounting Brackets**

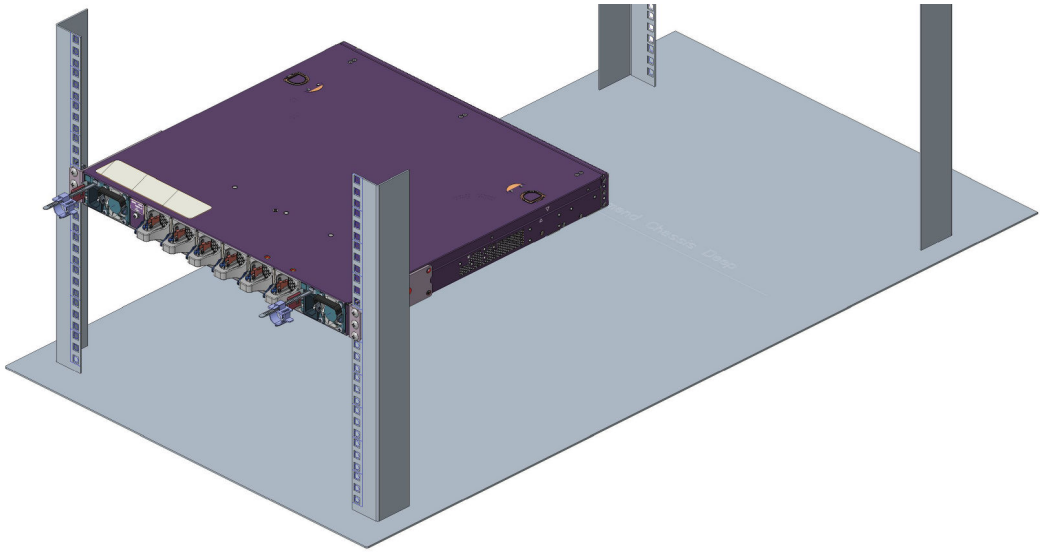


**Figure 23: Rear Flush-Mount: Attaching the Mounting Brackets**

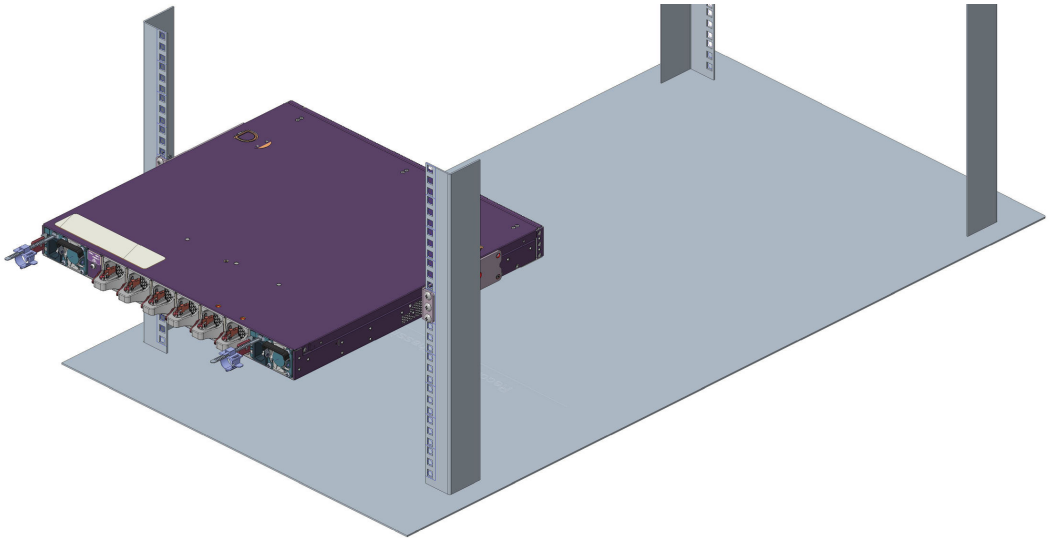


**Figure 24: Rear Mid-Mount: Attaching the Mounting Brackets**

2. With the mounting brackets attached, position the switch between the vertical rack rails of the 19-inch rack.
3. Fasten the switch securely to the rack rails using four rack screws (provided). Ensure that the threaded length of the screws is within 4 to 5 cm. The switch can be mounted to the two front posts or the two rear posts as shown.

## Install Internal Power Supplies

If your device does not come with an installed internal power supply, you can install one or two power supplies. All installed power supplies must blow air in the same direction

(front-to-back or back-to-front) and must match the airflow direction of the installed fan modules.

- If the power supply has a **red** tab, the airflow is front-to-back. Use a power supply labeled **Air Out**.
- If the power supply has a **blue** tab, the airflow is back-to-front. Use a power supply labeled **Air In**.

The following 550 W internal AC power supplies (PSUs) are available for the switch:

- Part number XN-ACPWR-550W-FB-A provides front-to-back airflow for cooling and 550 W AC power.
- Part number XN-ACPWR-550W-BF-A provides back-to-front airflow for cooling and 550 W AC power.

For installation instructions, see Replace Internal Power Supplies on page 68.

## Install Optional Components

After the switch is secured to the rack, install optional components.

Extreme Networks switches support the use of pluggable transceivers and cables in the SFP, SFP+, SFP28, QSFP+, and QSFP28 formats.

For a list of the optical components supported with Extreme Networks devices, see the Extreme Optics website.

### Pluggable Transceiver Modules

Extreme Networks offers several optical transceiver modules for transmitting and receiving data over optical fiber rather than through electrical wires.

### Optical Cables

Direct-attach copper and fiber cables provide connections between populated SFP, SFP+, SFP28, QSFP+, and QSFP28 ports.

## Connect Network Interface Cables

Use the appropriate type of cable to connect the ports of your switch to another switch or router.

Working carefully, one port at a time, do the following:

1. Verify that you have identified the correct cable for the port.
2. Use an alcohol wipe or other appropriate cleaning agent to clean the cable connectors; make sure they are free of dust, oil, and other contaminants.
3. If you are using optical fiber cable, align the transmit (Tx) and receive (Rx) connectors with the correct corresponding connectors on the switch or the I/O module.

4. Press the cable connectors into their mating connectors on the switch or I/O module until the cable connector is firmly seated.
5. Repeat the preceding steps for the remaining cables on this or other switches or I/O modules.
6. Dress and secure the cable bundle to provide appropriate strain relief and protection against bends and kinks.

# Turn on the Switch

Use the following instructions to turn on the switch

## Connect AC Power

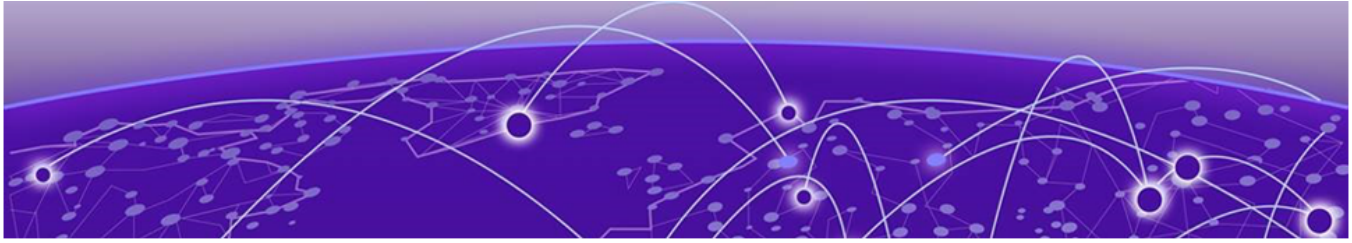
An AC power cord is not included with the AC power supply. You can purchase AC power cords for use in the US and Canada from Extreme Networks or from your local supplier. The cord must meet the requirements listed in Power Cord Requirements for AC-Powered Switches and AC Power Supplies on page 83.

To turn on the switch, connect one end of the power cord to the AC power input socket on the device and connect the other end to an AC power outlet.

**Note**
The switch does not have a power button, so connecting the power cable at both ends turns the switch on. The grounding connection in the power receptacle and in the power cord properly ground the power supply and extend that grounding to the switch.

If the PSU LEDs do not turn green, refer to 550 W AC Power Supply LEDs on page 75 for troubleshooting information.

When the PSU LED has turned green, follow the instructions in Activate and Verify the Switch on page 65.



# Activate and Verify the Switch



After you have installed your Extreme Networks switch in the rack, installed all required and and optional components, connected network cables, and powered the switch on, use the instructions in the following topics to configure the software on the switch and prepare it for use.

## Connect to a Management Console

Connect each switch's serial console interface (an RJ45 jack) to a PC or terminal. The PC or terminal serves as the *management console*, used to monitor and configure the switch.

The default communication protocol settings for the serial console interface are:

- Baud rate: 115200
- Data bits: 8
- Stop bit: 1
- Parity: None

## Log In for the First Time on Switch Engine

Onboard your switch with ExtremeCloud™. Log in or create your XIQ administrator account in order to select your switch operating system with XIQ at https://extremecloudiq.com

Switch Engine is the default operating system. If you want to run Fabric Engine, see Change the Switch OS via the Bootloader Menu or Change the Switch OS via the Startup Menu.

Before logging in, verify that the switch LEDs are on (solid green or blinking green) and that it is connected to a management console as described in Connect to a Management Console on page 65.

To perform the initial login and complete initial configuration tasks, follow these steps.

1. Use a terminal emulator such as PuTTY or TeraTerm, connect to the switch using the serial port connection. You can also connect to the switch via telnet or SSH.

Be sure that your serial connection is set properly:

- Baud rate: Baud rate: 115200
- Data bits: 8
- Stop bit: 1

2. At the management console, press **[Enter]** one or more times until you see the login prompt.
3. At the login prompt, log in using the default user name `admin`.

   For example:

   ```
   login: admin
   ```

   **Note**
   For the initial password, simply press **[Enter]**.

   When you have successfully logged on to the system, the command line prompt displays the system name (for example, `5120-44X-4Y-SwitchEngine#`) in its prompt. You are logged in with administrator privileges, which gives you access to all switch functions.
4. Respond to the screen prompts to configure the level of security you need.

   **Note**
   For more information about logging in to the switch and configuring switch management access, see the *Switch Engine User Guide* for your version of the Switch Engine operating system.
5. Enter `show version`.

   The switch serial number is displayed, as highlighted in the following example. Make a note of this number for future reference.

   ```
   Transit.3 # show version
   Switch : 801212-00-02 HT022442Q-40022 Rev 02 BootROM: 4.7.0.2    IMG: 33.3.0.336
   ```

## Configure the Switch's IP Address for the Management VLAN

You can configure the switch's IP address for the management virtual LAN (VLAN).

**Note**
The management port is part of the mgmt VLAN. This VLAN membership cannot be changed.

Log in to the management console, connect to the switch, and follow these steps.

1. Assign a name, IP address, and default subnetwork mask for the VLAN as shown in the following example:

   ```
   configure vlan vlan_name ipaddress nn.nn.nn.nn 255.255.255.0
   ```

   Your changes take effect immediately.

2. Enter `save` to save your configuration changes so that they will be in effect after the next system reboot.

   **Note**
   For more information about saving configuration changes, see the *Switch Engine User Guide* for your version of the Switch Engine operating system.

The configuration is saved to the configuration database of the switch.

# Remove and Replace Components



Use the information in the following topics to remove or replace components.

## Remove a Device from a Two-Post Rack

Use the following instructions to remove a device from a two-post rack.

1. Disconnect the device from its power source or sources, then disconnect the ground, if there is a ground.
2. Remove all cables and transceivers.
3. Unscrew the mounting brackets from the rack while carefully supporting the weight of the device.
4. Tilt the device so that the brackets are clear of the rack posts, and carefully lift it out of the rack.

   If the device cannot be tilted (because other equipment is mounted directly above and below), remove one or two mounting brackets from the device and then slide the device out.

If you plan to use the device again later, store it with the mounting brackets attached.

## Replace Internal Power Supplies

For switches with replaceable power supplies, refer to the following information to replace the power supplies.

Images in this topic might show switches that are not identical to the ones you are using. However, the procedure for replacing an internal power supply is the same for all Extreme Networks switches.

**Note**
Read all of the information in this chapter thoroughly before attempting to replace a power supply.

## Pre-Installation Requirements

You need the following tools and materials to replace an AC power supply:

- Thermal protective gloves
- AC power cord, if you will not be re-using the cord from the removed power supply

## Airflow Direction Requirements

All installed power supplies must blow air in the same direction (front-to-back or back-to-front) and must match the airflow direction of the installed fan modules.

- If the power supply has a **red** tab, the airflow is front-to-back. Use a power supply labeled **Air Out**.
- If the power supply has a **blue** tab, the airflow is back-to-front. Use a power supply labeled **Air In**.

**Note**
The operating-system software cannot display the airflow direction.

## Replace an Internal 550W AC Power Supply

The switches have two bays for hot-swappable power supplies. In a switch with a redundant power configuration, you can replace one power supply without powering down the switch. All installed power supplies must blow air in the same direction and must match the airflow direction of the installed fan modules.

**Warning**
Be sure to disconnect all power cables before you disconnect the chassis ground wire.

**Warning**
Make sure that the AC power supply circuit is not overloaded. Use proper over-current protection, such as a circuit-breaker, to prevent over-current conditions.

1. Disconnect the AC power cord from the wall outlet and from the power supply.
2. If necessary, remove a blank panel from the back of the switch.
3. Note the orientation of the installed power supply, and the location of the latching tab at the right of the unit.
4. Verify that the new power supply's airflow direction (front-to-back or back-to-front) is compatible with the other installed power supply (if any) and with the installed fan modules.
5. Push the latching tab toward the power supply handle and pull outward on the handle to disengage the power supply internal connectors. See Figure 25.

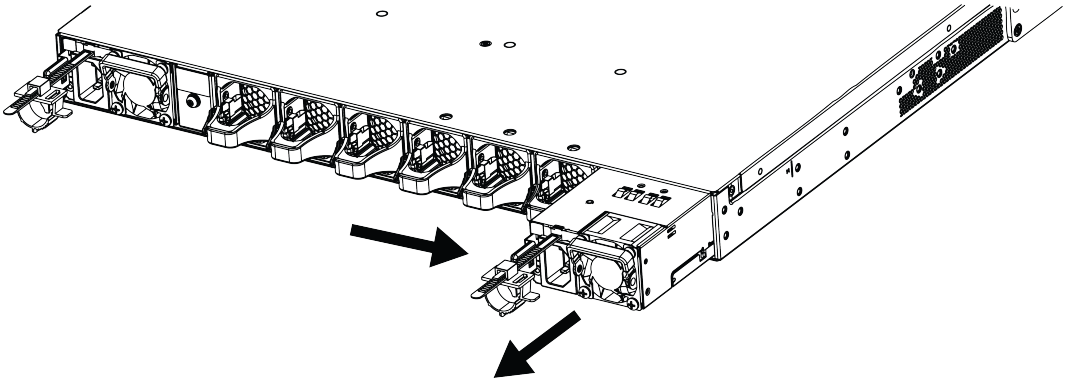


**Figure 25: Removing a 550 W AC Power Supply**

6. Carefully slide the power supply all the way into the power supply bay (see Figure 26).

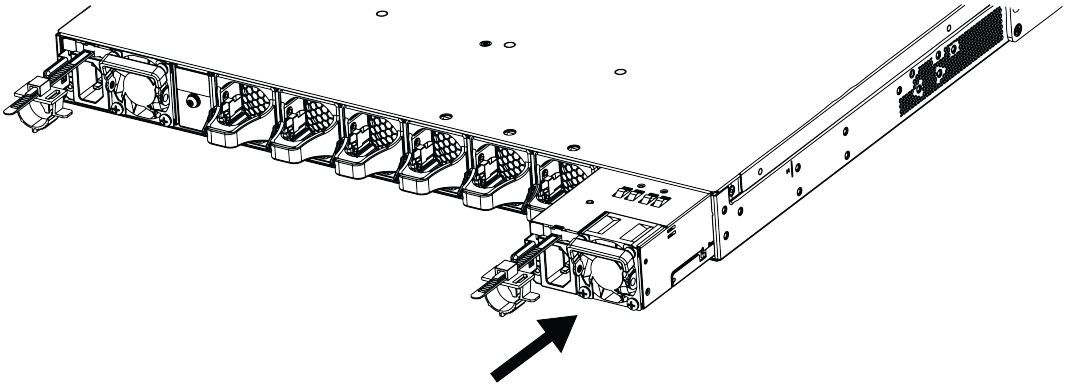


**Figure 26: Installing an 550 W AC Power Supply**

7. Push the power supply in until the latch snaps into place.

   Do not slam the power supply into the switch.

   **Note**
   If power supplies are not installed in both power supply bays, be sure to install a cover over the unoccupied bay. Unoccupied bays must always be covered to maintain proper system ventilation and EMI levels.

8. Connect the power cord to the power supply and to a grounded AC power outlet.

   **Warning**
   Always make sure that the source outlet is properly grounded before plugging the AC power cord into the AC power supply.

9. If the power supply is equipped with a power cord retainer, use the retainer to secure the power cord to the power supply.

## Replace Fan Modules

For switches with replaceable fan modules, refer to the following information to replace the fan modules.

Do not operate a chassis for more than a few minutes with a missing cooling module. To ensure internal chassis air pressure is maintained and to avoid loss of traffic due to modules overheating and shutting down, leave a failed cooling module installed until you have a replacement.

Images in this topic might show switches that are not identical to the ones you are using. However, the procedure for replacing a fan module is the same for all Extreme Networks switches.I

**Note**
Read all of the information in this chapter thoroughly before attempting to replace a fan module.

## Airflow Direction Requirements

You can replace fan modules as needed while the switch is operating ("hot swapping"). All installed fan modules must blow air in the same direction and must match the airflow direction of the installed power supplies.

- If the fan module has a **red** tab, the airflow is front-to-back. Use a fan module labeled **Air Out**.
- If the fan module has a **blue** tab, the airflow is back-to-front. Use a fan module labeled **Air In**.

Before you begin, have the replacement fan module on hand so that you can complete the replacement promptly. The switch can overheat if left without adequate cooling for an extended time.

## Replace a Fan Module

Use the following instructions to replace a fan module in the switch

1. Gently pull the tab (labeled **Air Out** or **Air In**) on the end of the fan module.

   The fan module is held in place by spring clips. As you pull, the clips will disengage and the fan will stop.
2. Slide the fan module out of the switch and set it aside.
3. Verify that the airflow direction on the replacement fan module matches that of the installed fan modules.

   Fans with front-to-back airflow have red tabs and are labeled **Air Out**.

   Fans with back-to-front airflow have blue tabs and are labeled **Air In**.
4. Carefully slide the replacement fan module into the switch.

   Push until the fan module snaps into place. The fan will automatically start to operate.

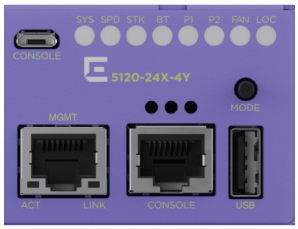
# Monitor the Switch



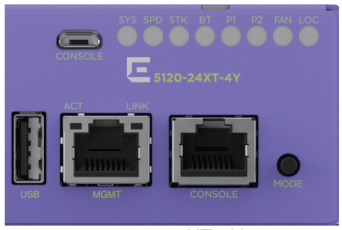
The following topics help you monitor the status of the switch as it is running.

## System Status LEDs

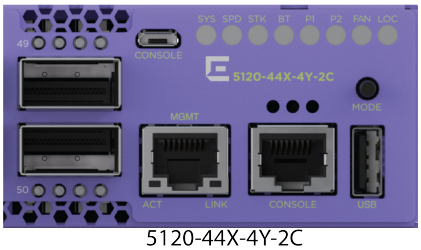
System status LEDs are located on the front of the switch. The following figure shows the status LEDs for 5120 Series switches:



5120-24X-4Y



5120-24XT-4Y



5120-44X-4Y-2C

5120 Series front panel port LEDs, as described in the following table:

**Table 11: 5120 Series Port LEDs**

| LED | Color/State | Port State |
|---|---|---|
| SYStem status LED (Legacy MGMT function) | Slow Blinking Green | POST Passed, normal operation, blinks on standalone switch, stack primary and backup nodes in a stack; off for standby nodes in a stack |
| | Blinking Green | POST in progress |
| | Blinking Amber | POST failed or overheat |
| PSU status LEDs P1/P2 | Solid Green | Normal operation |
| | Off | Not present |
| | Blinking Amber | Input or output power failure |
| Speed status (SPD), Stacking status (STK) | SPD Solid Green | Speed mode |
| | STK Solid Green | Stacking mode |
| | All Off | Normal mode |

**Table 11: 5120 Series Port LEDs (continued)**

| LED | Color/State | Port State |
|---|---|---|
| Fan status LED | Solid Green | Normal operation |
| | Blinking Amber | Fan failure |
| Bluetooth Status LED (BT) | Blinking Green | Bluetooth pairing in progress |
| | Solid Green | Bluetooth connected |
| | Off | Bluetooth not connected |
| Locator LED (LOC) | Blinking Blue | Locator function |

Port LEDs can display in three different modes: SYS (the default mode), SPD (speed) and STK (stacking). The Mode button cycles through the three display modes. In the default SYS mode, SPD and STK are off. The port LEDs enter SPD display mode, indicated by the SPD LED, after pressing the Mode button one time. SPD mode helps to determine the operational speed of a port. The port LEDs enter the STK display mode, indicated by the STK LED, after pressing the Mode button a second time. STK mode is used to indicate slot presence and slot number through the first eight port LEDs. SPD and STK display modes expire after 30 seconds, and the display mode reverts back to the default SYS mode. A long press of the Mode button when in any mode other than STK mode initiates Bluetooth pairing.

The Mode button also supports the instant stacking feature. To instantly stack switches, first ensure that the SPD/STK LED is on STK by pressing the Mode button until the LED is green. Press and hold the Mode button for at least five seconds, then release the Mode button after five seconds. The front panel port LEDs on the primary node flash in an alternating pattern followed by a delayed reboot of all of the switches. The LEDs flash for approximately 15 seconds prior to the reboot. After the reboot completes, the switches are stacked.

## Port LEDs in SPD Mode

SPD mode helps to determine the operational speed of a port.

| Color/State | Speed |
|---|---|
| Fast Blinking Green | 100Mbps |
| Solid Green | 1000Mbps |
| Slow Blinking Green | 10Gbps |
| Fast Blinking Green | 25Gbps |
| Fast blinking amber | 5Gbps |

## Port LEDs in STK Mode

STK mode indicates slot presence and slot number through the first eight port LEDs. Pressing the Mode button for 5 seconds when in STK mode initiates InstStack auto-stacking.

| Port 1-8 Color/State | Stacking Indication |
|---|---|
| Steady Green | Slot corresponding to the port number of the LED is present. |
| Blinking Green | This slot has the slot number corresponding to the port number of the blinking LED. |

## QSFP28 Port LEDs

Each QSFP28 port has four green LEDs. The following table describes the states for the LEDs.

| Port Configuration | LEDs | State | Description |
|---|---|---|---|
| 100 Gb or 40 Gb | 1st LED | Off | No link. |
| | | On | Link is active, but there is no activity. |
| | | Blinking | Link is active and there is activity. |
| | | All LEDs blinking (on 1 second, off 1 second) | Switch is beaconing. |
| 25 Gb or 10 Gb | All LEDs | Off | No link. |
| | | On | Link is active, but there is no activity. |
| | | Blinking | Link is active and there is activity. |
| | | All LEDs blinking (on 1 second, off 1 second) | Switch is beaconing. |

## Management Port LEDs

100/1000Base-T RJ-45 Management port on the front panel includes two LEDs located on each side of the RJ-45 port. The LED on the right side is labeled Link (for link status) and the LED on the left side is labeled Act (for port activity). The following table describes the meaning of the colors and states for the LEDs.

| Right-side LED | | State |
|---|---|---|
| Link | Solid Green | Link up |
| | Off | No link up or port disabled. |

| Right-side LED | | State |
|---|---|---|
| Left-side LED | | State |
| Act | Blinking Green | Packet transmitting or receiving. |
| | Off | No packet transmitting or receiving. |

### Locator LED

The blue LED labeled LOC on the front panel is the locator LED, which is controlled by using the following CLI commands:

```
[enable | disable] led locator
```

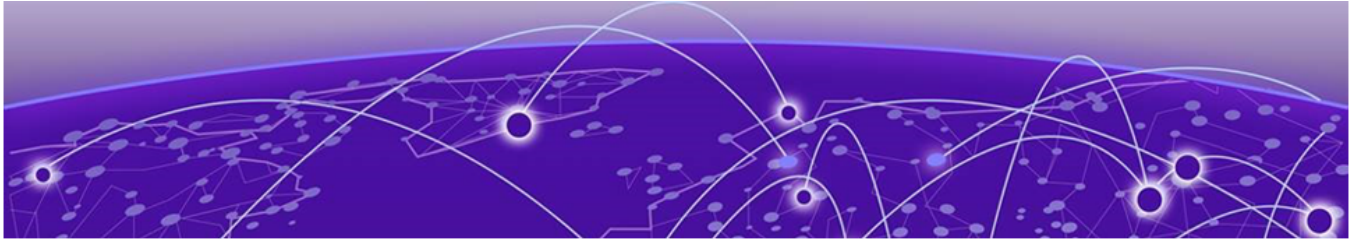
## 550 W AC Power Supply LEDs

The following table describes the meanings of the LEDs on the 550 W AC power supplies (part number XN-ACPWR-550W-FB-A or XN-ACPWR-550W-BF-A).

The LEDs are located on the end of the power supply unit, arranged vertically to the left of the power cord receptacle.

**Table 12: 550 W AC Power Supply Status Indications**

| LED Status | Meaning |
|---|---|
| Off | No AC power to all power supplies |
| Solid Green | Output ON and OK |
| 1Hz Blinking Green | AC present / Only 12VSB on (power supply off) or power supply in Smart on state |
| Solid Amber | AC cord unplugged or AC power lost; with a second power supply in parallel still with AC input power. |
| 1Hz Blinking Amber | Power supply warning events where the power supply continues to operate; high temp, high power, high current (12V), slow fan. |
| Solid Amber | Power supply critical event causing main output shutdown; failure, OTP, OCP, UVP, OVP, Fan Fail |
| 2 Hz Blinking Amber | Power supply firmware updating |



# Technical Specifications



This following topics contain technical specifications for the hardware products described in this document.

## 5120 Series Technical Specifications

The following table contains external interfaces and weights and dimensions information for 5120 Series switches.

## External Interfaces

| Switch Model | Interfaces |
|---|---|
| 5120-24X-4Y | • 24 x 100M*/1G/10GbE SFP+ ports<br>• 4 x 1/10/25GbE SFP28 ports (includes 2 stacking ports)<br>• 1 x Serial console port (RJ-45), 1 x USB Micro-B console port<br>• 1 x 100/1000BASE-T out-of-band management port<br>• 1 x USB A ports for management or external USB flash |
| 5120-24XT-4Y | • 24 x 100M*/1G/10GBASE-T ports<br>• 4 x 1/10/25GbE SFP28 ports (includes 2 stacking ports)<br>• 1 x Serial console port (RJ-45), 1 x USB Micro-B console port<br>• 1 x 100/1000BASE-T out-of-band management port<br>• 1 x USB A ports for management or external USB flash |
| 5120-44X-4Y-2C | • 44 x 100M*/1G/10GbE SFP+ ports<br>• 4 x 1/10/25GbE SFP28 ports (includes 2 stacking ports)<br>• 2 x Stacking/QSFP28 ports (unpopulated)<br>◦ 100GbE ports can be channelized as 4x25G or 4x10G ports<br>• 1 x Serial console port (RJ-45), 1 x USB Micro-B console port<br>• 1 x 100/1000BASE-T out-of-band management port<br>• 1 x USB A ports for management or external USB flash |

- * 100M support is available only on the first 12 ports of the switch with the 100Base-Fx transceiver (part number 10063).
- Half Duplex is not supported on any port.

## Weights and Dimensions

| Switch Model | Weight | Physical Dimensions |
|---|---|---|
| 5120-24X-4Y<br>(no PSU, no fans) | 5.79 kg (12.77 lb) | Height: 43.18 mm (1.7 in.)<br>Width: 440.4 mm (17.34 in.)<br>Depth: 433.32 mm (17.06 in.) |
| 5120-24X-4Y-AC-F<br>(1 PSU, 4 fans, F-B) | 7.1 kg (15.54 lb) | |
| 5120-24X-4Y-AC-R<br>(1 PSU, 4 fans, B-F) | | |
| 5120-24XT-4Y<br>(no PSU, no fans) | 5.89 kg (12.99 lb) | |
| 5120-24XT-4Y-AC-F<br>(1 PSU, 4 fans, F-B) | 7.15 kg (15.76 lb) | |
| 5120-24XT-4Y-AC-R<br>(1 PSU, 4 fans, B-F) | | |
| 5120-44X-4Y-2C<br>(no PSU, no fans) | 6.09 kg (13.43 lb) | |

| Switch Model | Weight | Physical Dimensions |
|---|---|---|
| 5120-44X-4Y-2C-AC-F (1 PSU, 4 fans, F-B) | 7.61 kg (16.77 lb) | |
| 5120-44X-4Y-2C-AC-R (1 PSU, 4 fans, B-F) | | |

## Weights and Dimensions of Accessories

| Part Number | Description | Weight | Physical Dimensions |
|---|---|---|---|
| XN-ACPWR-550W-FB-A (550W AC PSU) | 550 Watt AC Power Supply Module with front-to-back airflow | 12.47 kg (1.7 lb.) | Height: 39.1 mm (1.54 in.) Width: 73.7 mm (2.9 in.) Depth: 185.1 mm (7.29 in.) |
| XN-ACPWR-550W-BF-A (550W AC PSU) | 550 Watt AC Power Supply Module with back-to-front airflow | 12.56 kg (1.73 lb.) | Height: 39.1 mm (1.54 in.) Width: 73.7 mm (2.9 in.) Depth: 185.1 mm (7.29 in.) |
| XN-FAN-005-R (Fan module) | Fan module with back-to-front airflow | 0.13 kg (0.29 lb.) | Height: 40.1 mm (1.58 in.) Width: 40.1 mm (1.58 in.) Depth: 135.1 mm (5.32 in.) |
| XN-2P-RMKIT-014 (Rack mount kit) | Two-piece rack mount kit, usable with 2 post or 4 post racks | 0.29 kg (0.64 lb.) | Height: 40.1 mm (1.65 in.) Width: 40.1 mm (0.79 in.) Depth: 135.1 mm (5.4 in.) |

# Fan and Acoustic Noise

The following table contains fan and acoustic noise information for 5120 Series switches.

| Switch Model | Acoustic Information | |
|---|---|---|
| 5120-24X-4Y | Bystander Sound Pressure<br>• Typical F2B @35°C 50dB(A)<br>• Maximum F2B @50°C 55.8 dB(A)<br>• Typical B2F @35°C 58.6dB(A)<br>• Maximum B2F @50°C 62.6dB(A) | Sound Power<br>• Typical F2B @35°C 6.3B(A)<br>• Maximum F2B @50°C 6.7B(A)<br>• Typical B2F @35°C 6.1B(A)<br>• Maximum B2F @50°C 7.3B(A) |
| 5120-24XT-4Y | Bystander Sound Pressure<br>• Typical F2B @35°C 49.8dB(A)<br>• Maximum F2B @50°C 62.7dB(A)<br>• Typical B2F @35°C 48.5dB(A)<br>• Maximum B2F @50°C 77.1dB(A) | Sound Power<br>• Typical F2B @35°C 6.3B(A)<br>• Maximum F2B @50°C 7.4B(A)<br>• Typical B2F @35°C 6.1B(A)<br>• Maximum B2F @50°C 8.8B(A) |
| 5120-44X-4Y-2C | Bystander Sound Pressure<br>• Typical F2B @35°C 50.7dB(A)<br>• Maximum F2B @50°C 69.8dB(A)<br>• Typical B2F @35°C 50.2dB(A)<br>• Maximum B2F @50°C 79.8dB(A) | Sound Power<br>• Typical F2B @35°C 6.5B(A)<br>• Maximum F2B @50°C 8.1B(A)<br>• Typical B2F @35°C 6.2B(A)<br>• Maximum B2F @50°C 9.0B(A) |

**Typical:**

Single PSU, 75% loaded with 10G SR optics

Ambient Temperature 0°C to 35°C

Traffic @50% load on all ports

Target Bystander Sound Pressure: <55dB(A), <65dB(A) BTF

**Maximum:**

Dual PSU, 100% loaded with 10G SR optics

Ambient Temperature – Up to maximum operating temperature

Traffic @70% load on all ports

## CPU, Memory

The following table contains CPU and memory specifications for the 5120 Series switches.

| |
|---|
| 1.2 GHz dual-core Arm-53 CPU |
| 2 GB DDR3L ECC DRAM memory |
| 4 GB eMMC Flash Memory |
| 8 MB QSPI Flash |

## Mean Time Between Failures

The following table contains mean time between failures information for the 5120 Series switches.

| Model | PSU Details | Fan Details | MTBF at 25°C | MTBF at 50°C |
|---|---|---|---|---|
| 5120-24X-4Y | F-B, 1x AC 550W | F-B, 4x internal fans | 1,057,852 | 344,430 |
| | F-B, 2x AC 550W | F-B, 4x internal fans | 1,432,829 | 448,076 |
| | B-F, 1x AC 550W | B-F, 4x internal fans | 923,749 | 324,689 |
| | B-F, 2x AC 550W | B-F, 4x internal fans | 1,382,666 | 430,015 |
| 5120-24XT-4Y | F-B, 1x AC 550W | F-B, 4x internal fans | 958,112 | 306,966 |
| | F-B, 2x AC 550W | F-B, 4x internal fans | 1,255,764 | 386,681 |
| | B-F, 1x AC 550W | B-F, 4x internal fans | 861,174 | 300,718 |
| | B-F, 2x AC 550W | B-F, 4x internal fans | 1,246,792 | 388,954 |
| 5120-44X-4Y-2C | F-B, 1x AC 550W | F-B, 6x internal fans | 830,919 | 267,850 |
| | F-B, 2x AC 550W | F-B, 6x internal fans | 1,045,921 | 326,600 |
| | B-F, 1x AC 550W | B-F, 6x internal fans | 747,519 | 253,355 |
| | B-F, 2x AC 550W | B-F, 6x internal fans | 1,021,857 | 313,219 |

## Power Specifications

The following tables contain power supply specifications, power consumption, and heat dissipation information for 5120 Series switches.

### Power Supply Specifications

| | XN-ACPWR-550W-FB-A | XN-ACPWR-550W-BF-A |
|---|---|---|
| Voltage Input Range (Nominal) | 100VAC-127VAC / 200VAC-240VAC | 100VAC-127VAC / 200VAC-240VAC |
| Line Frequency Range | 47Hz to 63Hz | 47Hz to 63Hz |
| Power Supply Input Socket | IEC/EN 60320 C14 | IEC/EN 60320 C14 |
| Power Cord Input Plug | IEC/EN 60320 C13 | IEC/EN 60320 C13 |

## Minimum/Maximum Power Consumption and Heat Dissipation

| Switch Model | Minimum Power Consumption (W) | Minimum Heat Dissipation (BTU/hr) | Maximum Power Consumption (W) | Maximum Heat Dissipation (BTU/hr) |
|---|---|---|---|---|
| 5120-24X-4Y | 29.95 | 102.10 | 172.82 | 589.69 |
| 5120-24XT-4Y | 36.78 | 125.49 | 173.09 | 590.62 |
| 5120-44X-4Y-2C | 61.6 | 210.18 | 315.52 | 1076.60 |

# Environmental

### Environmental Specifications

EN/ETSI 300 019-2-1 v2.1.2 - Class 1.2 Storage

EN/ETSI 300 019-2-2 v2.3.1 - Class 2.3 Transportation

EN/ETSI 300 019-2-3 v2.1.2 - Class 3.1e Operational

EN/ETSI 300 753 (1997-10) - Acoustic Noise

ASTM D3580 Random Vibration Unpackaged 1.5 G

### Environmental Compliance

EU RoHS - 2011/65/EU

EU WEEE - 2012/19/EU

EU REACH - Regulation (EC) No 1907/2006 - Reporting

China RoHS - SJ/T 11363-2006

Taiwan RoHS - CNS 15663(2013.7)

### Environmental Operating Conditions

Temp: 0° C to 50° C (32° F to 122° F)

Humidity: 10% to 95% relative humidity, non-condensing

Altitude: 0 to 3,000 meters (9,850 feet)

Shock (half sine) 300 m/s2 (30G), 11ms, 3 axes, 6 shocks/axis

Random vibration: 3Hz to 500Hz at 1.5 G rms, Accelerations: 3Hz @ +10dB/Octave PSD 10Hz @ 0.006 PSD 500Hz @ 0.006 PSD

### Packaging and Storage Specifications

Temp: -40° C to 70° C (-40° F to 158° F)

Humidity: 10% to 95% relative humidity, non-condensing

Packaged Shock (half sine): 180 m/s2 (18 G), 3 axes, 100 shocks/axis

Packaged Vibration: 5Hz to 20Hz at .01 g2/Hz (PSD), 20Hz to 500Hz at –3 dB/Oct (PSD)

Packaged Random Vibration: 5Hz to 62Hz at velocity 5 mm/s, 62Hz to 500Hz at 0.2 G

Packaged Drop Height: 13 drops minimum on faces, sides, and corners at 42 inches (<10 kg box)

## Standards

### North American ITE

UL 60950-1
UL/CuL 62368-1 Listed
Complies with FCC 21CFR 1040.10 (U.S. Laser Safety)
CDRH Letter of Approval (US FDA Approval)
CAN/CSA 22.2 No. 60950-1, 62368-1

### European ITE

EN 62368-1
EN 60825-1 Class 1 (Lasers Safety)
2014/35/EU Low Voltage Directive

### International ITE

CB Report and Certificate per IEC 62368-1

## EMI/EMC Standards

### North American EMC for ITE

FCC CFR 47 Part 15 Class A (USA)

### European EMC Standards

EN 55035
EN 55032 Class A
EN 55011
EN 61000-3-2 (Harmonics)
EN 61000-3-3 (Flicker)
EN 300 386 (EMC Telecommunications)
2014/30/EU EMC Directive

### International EMC Certifications

CISPR 32, Class A (International Emissions)
AS/NZS CISPR32
CISPR 24 Class A (International Immunity)
IEC 61000-4-2/EN 61000-4-2 Electrostatic Discharge, 8kV Contact, 15 kV Air, Criteria B
IEC 61000-4-3 /EN 61000-4-3 Radiated Immunity 10V/m, Criteria A
IEC 61000-4-4/EN 61000-4-4 Transient Burst, 1 kV, Criteria AB
IEC 61000-4-5 /EN 61000-4-5 Surge, 2 kV L-L, 2 kV L-G, Level 3, Criteria B
IEC 61000-4-6 Conducted Immunity, 0.15-80MHz, 10V/m unmod. RMS, Criteria A
IEC/EN 61000-4-11 Power Dips & Interruptions, >30%, 25 periods, Criteria C

### Country Specific

VCCI Class A (Japan Emissions)
ACMA RCM (Australia Emissions)
CQC Mark (China)
KCC Mark, EMC Approval (Korea)

EAC Mark (Custom Union)
NRCS (South Africa)
BSMI Mark (Taiwan)
Anatel (Brazil)
NoM (Mexico)
TEC (India)

### IEEE 802.3 Media Access Standards

IEEE 802.3
IEEE802.3bz for operation at various rates
Serial port: RS232
USB 2.0
IC

## Power Cord Requirements for AC-Powered Switches and AC Power Supplies

An AC power cord is not included with the AC power supply.

Power cords used with AC-powered switches or AC power supplies must meet the following requirements:

- The power cord must be agency-certified for the country of use.
- The power cord must have an appropriate AC connector for connection to the switch or power supply. See the power supply documentation for the appropriate power cord.
- The power cord must have an appropriately rated and approved wall plug applicable to the country of installation.

For details about obtaining AC power cords for use in your country, refer to http://www.extremenetworks.com/product/powercords/.

## Console Connector Pinouts

Table 13 describes the pinouts for a DB-9 console plug connector.

**Table 13: Pinouts for the DB-9 Console Connector**

| Function | Pin Number | Direction |
|---|---|---|
| DCD (data carrier detect) | 1 | In |
| RXD (receive data) | 2 | In |
| TXD (transmit data) | 3 | Out |
| DTR (data terminal ready) | 4 | Out |
| GND (ground) | 5 | - |
| DSR (data set ready) | 6 | In |

**Table 13: Pinouts for the DB-9 Console Connector (continued)**

| Function | Pin Number | Direction |
|---|---|---|
| RTS (request to send) | 7 | Out |
| CTS (clear to send) | 8 | In |

Figure 27 shows the pinouts for a 9-pin to 25-pin (RS-232) null-modem cable.

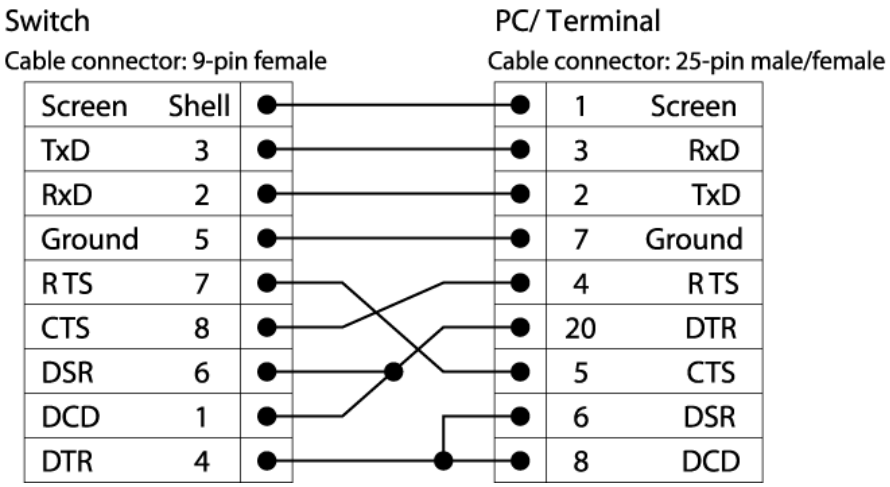



**Figure 27: Null-Modem Cable Pinouts**

Figure 28 shows the pinouts for a 9-pin to 9-pin (PC-AT) null-modem serial cable.

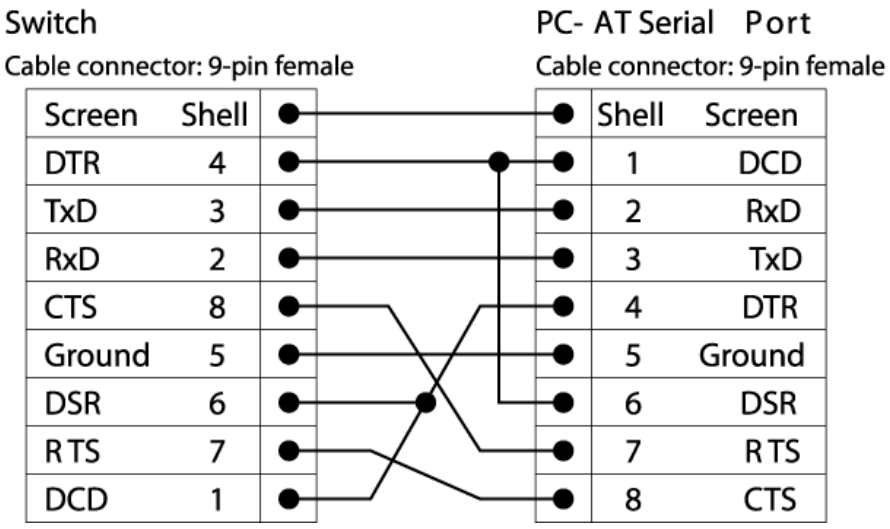



**Figure 28: PC-AT Serial Null-modem Cable Pinouts**

Table 14 shows the pinouts for the RJ45 console port on the ExtremeSwitching switches.

**Table 14: RJ45 Console Port on Switch**

| Function | Pin Number | Direction |
|---|---|---|
| RTS (request to send) | 1 | Out |
| DTR (data carrier detect) | 2 | Out |
| TXD (transmit data) | 3 | Out |
| GND (ground) | 4 | — |
| GND (ground) | 5 | — |
| RXD (receive data) | 6 | In |
| DSR (data set ready) | 7 | In |
| CTS (clear to send) | 8 | In |

Table 15 shows the pinouts for an RJ45-to-DB-9 adapter.

**Table 15: Pinouts for an RJ45 to DB-9 Adapter**

| Signal | RJ45 Pin | DB-9 Pin |
|---|---|---|
| CTS (clear to send) | 1 | 8 |
| DTR (data carrier detect) | 2 | 6 |
| TXD (transmit data) | 3 | 2 |
| GND (ground) | 4 | 5 |
| GND (ground) | 5 | 5 |
| RXD (receive data) | 6 | 3 |
| DSR (data set ready) | 7 | 4 |
| RTS (request to send) | 8 | 7 |

# Safety and Regulatory Information



**Note**
Read the following safety information thoroughly before installing Extreme Networks products. Failure to follow this safety information can lead to personal injury or damage to the equipment.

Only trained and qualified service personnel (as defined in IEC 60950-1 and AS/NZS 3260) should install, replace, or perform service to Extreme Networks switches and their components. Qualified personnel have read all related installation manuals, have the technical training and experience necessary to be aware of the hazards to which they are exposed in performing a task, and are aware of measures to minimize the danger to themselves or other persons.

If you are located in the United States, install the system in accordance with the U.S. National Electrical Code (NEC).

## Considerations Before Installing

Consider the following items before you install equipment.

- For equipment designed to operate in a typical Telco environment that is environmentally controlled, choose a site that has the following characteristics:
  - Temperature-controlled and humidity-controlled, such that the maximum ambient room temperature shall not exceed 50°C (122°F).
  - Clean and free from airborne materials that can conduct electricity.
  - Well ventilated and away from sources of heat including direct sunlight.
  - Away from sources of vibration or physical shock.
  - Isolated from strong electromagnetic fields produced by electrical devices.
- For equipment designed to be installed in environments that are not environmentally controlled, such as outdoor enclosures, see the product data sheet or for environmental conditions, temperature, and humidity.
- Establish at least 3 inches clearance on all sides for effective ventilation. Do not obstruct the air intake vent on the front, side, or rear ventilation grills. Locate the system away from heat sources.
- Make sure that your equipment is placed in an area that accommodates the power consumption and component heat dissipation specifications.
- Make sure that your power supplies meet the site DC power or AC power requirements of all the network equipment.
- Racks for Extreme Networks equipment must be permanently attached to the floor. Failure to stabilize the rack can cause the rack to tip over when the equipment is removed for servicing.
- Do not operate the system unless all modules, faceplates, front covers, and rear covers are in place. Blank faceplates and cover panels are required for the following functions:
  - Preventing exposure to hazardous voltages and currents inside the equipment
  - Containing electromagnetic interference (EMI) that might disrupt other equipment
  - Directing the flow of cooling air through the equipment
- Ultimate disposal of this product should be handled according to all national laws and regulations.

## General Safety Precautions

Follow these guidelines:

- Do not try to lift objects that you think are too heavy for you.
- When you install equipment in a rack, load heavier devices in the lower half of the rack first to avoid making the rack top-heavy.
- Use only tools and equipment that are in perfect condition. Do not use equipment with visible damage.
- Route cables in a manner that prevents possible damage to the cables and avoids causing accidents, such as tripping.

- Do not place a monitor or other objects on top of the equipment. The chassis cover is not designed to support weight.
- To reduce the risk of fire, use only #26 AWG or larger telecommunications line cord. Use only copper conductors.
- Do not work on the system or connect or disconnect cables during periods of lightning activity.
- This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor.

## Maintenance Safety

When you perform maintenance procedures on Extreme Networks equipment, follow these recommendations:

- Use only authorized accessories or components approved for use with this system. Failure to follow these instructions may damage the equipment or violate required safety and EMC regulations.
- This system contains no customer serviceable components. Do not attempt to repair a chassis, power supply, module, or other component. In the event of failure, return the defective unit to Extreme Networks for repair or replacement, unless otherwise instructed by an Extreme Networks representative.
- To remove power from the system, you must unplug all power cords from wall outlets. The power cord is the disconnect device to the main power source.
- Disconnect all power cords before working near power supplies, unless otherwise instructed by a product-specific maintenance procedure.
- Replace a power cord immediately if it shows any signs of damage.
- When you work with optical devices, power supplies, or other modular accessories, put on an ESD-preventive wrist strap to reduce the risk of electronic damage to the equipment. Connect the other end of the strap to an appropriate grounding point on the equipment rack or to an ESD jack on the chassis if one is provided. Leave the ESD-preventive wrist strap permanently attached to the equipment rack or chassis so that it is always available when you need to handle components that are sensitive to ESD.
- Install all cables in a manner that avoids strain. Use tie wraps or other strain relief devices.

## Fiber Optic Ports and Optical Safety

The following safety warnings apply to all optical devices used in Extreme Networks equipment that are removable or directly installed in an I/O module or chassis system.

Such devices include but are not limited to gigabit interface converters (GBICs), small form factor pluggable (SFP) modules (or mini-GBICs), QSFP+ modules, XENPAK transceivers, and XFP laser optic modules.

**Warning**

Laser optic modules become very hot after prolonged use. Take care when removing a laser optic module from the module or option card. If the laser optic module is too hot to touch, disengage the laser optic module and allow it to cool before removing it completely.

When working with laser optic modules, always take the precautions listed below to avoid exposure to hazardous radiation.

- Never look at the transmit LED/laser through a magnifying device while the transmit LED is powered on.
- Never look directly at a fiber port on the switch or at the ends of a fiber cable when they are powered on.
- Invisible laser radiation can occur when the connectors are open. Avoid direct eye exposure to the beam when optical connections are unplugged.
- Never alter, modify, or change an optical device in any way other than suggested in this document.

### GBIC, SFP (Mini-GBIC), QSFP+, XENPAK, and XFP Regulatory Compliance

Extreme Networks pluggable optical modules and direct-attach cables meet the following regulatory requirements:

- Class 1 or Class 1M Laser Product
- EN60825-1:2007 2nd Ed. or later, European standard
- FCC 21 CFR Chapter 1, Subchapter J in accordance with FDA & CDRH requirements
- Application of CE Mark in accordance with 2014/30/EU EMC Directive and the 2014/35/EU Low Voltage Directives
- UL and/or CSA registered component for North America
- 47 CFR Part 15, Class A when installed into Extreme products

## Cable Routing for LAN Systems

Extreme Networks equipment meets the requirements for LAN system equipment.

LAN systems are designed for intra-building installations; that is, cable runs between devices must be in the same building as the connected units, except under the conditions listed in the next paragraph.

As allowed in the USA by the National Electrical Code (NEC), this equipment can be connected between buildings if any one of the following conditions is true:

- Cable runs between buildings are less than 140 feet long.
- Cable runs between buildings are directly buried.

- Cable runs between buildings are in an underground conduit, where a continuous metallic cable shield or a continuous metallic conduit containing the cable is bonded to each building grounding electrode system.

**Caution**
Failure to follow these requirements for cable routing conditions may expose the user to electrical shock and expose the unit to damage that can cause errors.

**Warning**
The Ethernet ports of the equipment and its sub-assemblies are suitable only for intra-building connections (within the same building) or for connections to unexposed wiring or cabling. (See the conditions listed above.) The Ethernet ports of this equipment or its sub-assemblies must not be metallically connected to interfaces that connect to the outside plant (OSP) or its wiring. Ethernet interfaces are designed for use only as intra-building interfaces (described as Type 2 or Type 4 ports in GR-1089-CORE, Issue 6) and require isolation from the exposed OSP wiring. The addition of Primary Protectors is not sufficient protection to connect these interfaces metallically to OSP wiring.

## Install Power Supply Units and Connect Power

For the ratings and power input requirements of each power supply unit, see "Technical Specifications" or the data sheet for the power supply at www.extremenetworks.com.

**Warning**
Be sure to satisfy the requirements listed in this section when you install Extreme Networks power supplies or connect power.

When you install any power supply:

- Do not use excessive force when you insert a power supply into the bay.
- Do not attempt to open the power supply enclosure for any reason; the power supply does not contain user-serviceable parts. In the event of failure, return the defective power supply to Extreme Networks for repair or replacement.
- Do not put your hand into an open power supply bay when a power supply is not present.
- Before you work on equipment that is connected to power lines, remove all jewelry, including watches. Metal objects heat up when they are connected to power and ground and can cause serious burns or weld the metal object to the terminals.
- An electrical arc can occur when you connect or disconnect the power with power applied. This could cause an explosion in hazardous area installations. Be sure that power is removed from the device.
- When you install or replace equipment, always make the ground connection first and disconnect the ground connection last.

When you install DC power supplies or connect DC power:

- Extreme Networks DC power supplies do not have switches for turning the unit on and off. Make sure that the DC circuit is de-energized before connecting or disconnecting the DC power cord at the DC input power socket.
- Connect the system or power supply only to a DC power source that complies with the safety extra-low voltage (SELV) requirements in IEC 60950-based safety standards.

**Note**
Because building codes vary worldwide, consult an electrical contractor to ensure proper equipment grounding and power distribution for your specific installation and country.

**Warning**
Extreme Networks power supplies do not have switches for turning the unit on and off. Disconnect all power cords to remove power from the device. Make sure that these connections are easily accessible.

Extreme Networks alimentations n'ont pas de contact pour mettre l'appareil sous et hors tension. Débranchez tous les cordons d'alimentation pour couper l'alimentation de l'appareil. Assurez-vous que ces connexions sont facilement accessibles.

## Select Power Supply Cords

You can purchase a power cord for your product and for your specific country from your local Extreme Networks Channel Account Manager or Sales Manager, or you can purchase a cord from your local supplier. Requirements for the power cord are listed in the Technical Specifications for your product.

To locate a Sales Manager or Partner in your region, visit www.extremenetworks.com/partners/where-to-buy.

**Note**
This equipment is not intended to be directly powered by power distribution systems where phase-phase voltages exceed 240 VAC (2P+PE), such as those used in Norway, France, and other countries. For these applications, use a transformer to step down the voltage to < 240 VAC from phase-phase, or make a connection to a (P+N+PE) power distribution where voltages do not exceed 240 VAC.

All installations should confirm that the product is reliably grounded according to the country's local electrical codes.

## Battery Notice

**Warning**: This product contains a battery used to maintain product information. If the battery should need replacement it must be replaced by Service Personnel. Please contact Technical Support for assistance.

Risk of explosion if battery is replaced by an incorrect type. Dispose of expended battery in accordance with local disposal regulations.

**Attention**: Ce produit renferme une pile servant à conserver les renseignements sur le produit. Le cas échéant, faites remplacer la pile par le personnel du service de réparation. Veuillez communiquer avec l'assistance technique pour du soutien.

Il y a risque d'explosion si la pile est remplacée par un type de pile incorrect. Éliminez les piles usées en conformité aux règlements locaux d'élimination des piles.

## Battery Warning - Taiwan

警告

如果更換不正確之電池型式會有爆炸的風險,

請依製造商說明書處理用過之電池。

## EMC Warnings

### Taiwan BSMI Warning

警告:為避免電磁干擾,本產品不應安裝
或使用於住宅環境。

### China CQC Warning

警告:在居住环境中，运行此设备可能
会造成无线电干扰。

## Japan (VCCI Class A)

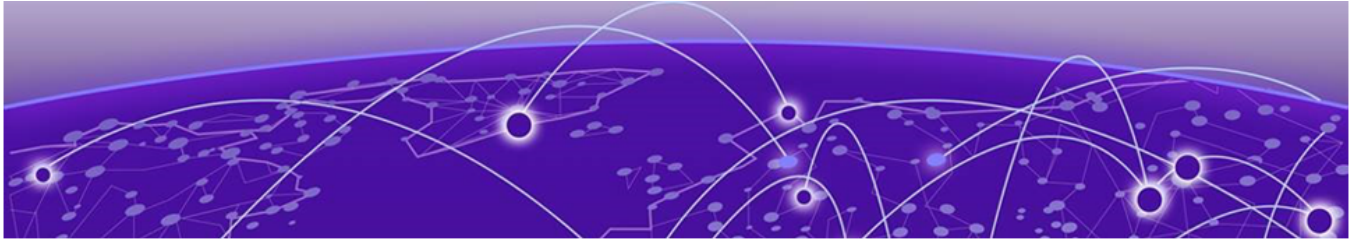
**Warning**

This is a Class A product based on the standard of the VCCI Council. If this equipment is used in a domestic environment, radio interference may occur, in which case the user may be required to take corrective actions.

この装置は、クラスA機器です。この装置を住宅環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI-A

## Korea EMC Statement

이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.



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