



# ExtremeSwitching 5720 Series Hardware Installation Guide

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# Preface

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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.

## Audience

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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 32.1 User Guide](#) and the [Switch Engine 32.1 Command Reference Guide](#) for information about configuring Extreme Networks devices.



### 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

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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 ExtremeSwitching switches or SLX 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 <i>enter</i> and <i>type</i>	When you see the word <i>enter</i> 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 <i>type</i> .
<b>Key names</b>	Key names are written in boldface, for example <b>Ctrl</b> or <b>Esc</b> . If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press <b>Ctrl+Alt+Del</b>
<i>Words in italicized type</i>	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.
<b>NEW!</b>	New information. In a PDF, this is searchable text.

**Table 3: Command syntax**

Convention	Description
<b>bold text</b>	Bold text indicates command names, keywords, and command options.
<i>italic text</i>	Italic text indicates variable content.



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

Convention	Description
[ ]	Syntax components displayed within square brackets are optional. Default responses to system prompts are enclosed in square brackets.
{ <b>x</b>   <b>y</b>   <b>z</b> }	A choice of required parameters is enclosed in curly brackets separated by vertical bars. You must select one of the options.
<b>x</b>   <b>y</b>	A vertical bar separates mutually exclusive elements.
< >	Nonprinting characters, such as passwords, are enclosed in angle brackets.
...	Repeat the previous element, for example, <i>member[member...]</i> .
\	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.

## Documentation and Training

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Find Extreme Networks product information at the following locations:

[Current Product Documentation](#)

[Release Notes](#)

[Hardware and software compatibility](#) for Extreme Networks products

[Extreme Optics Compatibility](#)

[Other resources](#) such as white papers, data sheets, and case studies

Extreme Networks offers product training courses, both online and in person, as well as specialized certifications. For details, visit [www.extremenetworks.com/education/](http://www.extremenetworks.com/education/).

## Help and Support

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If you require assistance, contact Extreme Networks using one of the following methods:

### Extreme Portal

Search the GTAC (Global Technical Assistance Center) knowledge base; manage support cases and service contracts; download software; and obtain product licensing, training, and certifications.

### The Hub

A forum for Extreme Networks customers to connect with one another, answer questions, and share ideas and feedback. This community is monitored by Extreme Networks employees, but is not intended to replace specific guidance from GTAC.

### Call GTAC

For immediate support: (800) 998 2408 (toll-free in U.S. and Canada) or 1 (408) 579 2826. For the support phone number in your country, visit: [www.extremenetworks.com/support/contact](http://www.extremenetworks.com/support/contact)

Before contacting Extreme Networks for technical support, have the following information ready:

- 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

## Subscribe to Product Announcements

You can subscribe to email notifications for product and software release announcements, Field Notices, and Vulnerability Notices.

1. Go to [The Hub](#).
2. In the list of categories, expand the **Product Announcements** list.
3. Select a product for which you would like to receive notifications.
4. Select **Subscribe**.
5. To select additional products, return to the **Product Announcements** list and repeat steps 3 and 4.

You can modify your product selections or unsubscribe at any time.

## Send Feedback

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The Information Development team at Extreme Networks has made every effort to ensure that this document is accurate, complete, and easy to use. We strive to improve our documentation to help you in your work, so we want to hear from you. We welcome all feedback, but we especially want to know about:

- Content errors, or confusing or conflicting information.
- Improvements that would help you find relevant information.
- Broken links or usability issues.

To send feedback, do either of the following:

- Access the feedback form at <https://www.extremenetworks.com/documentation-feedback/>.
- Email us at [documentation@extremenetworks.com](mailto:documentation@extremenetworks.com).

Provide the publication title, part number, and as much detail as possible, including the topic heading and page number if applicable, as well as your suggestions for improvement.



# ExtremeSwitching 5720 Series Overview

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- [5720-24MW Switch Features](#) on page 14
- [5720-24MXW Switch Features](#) on page 15
- [5720-48MW Switch Features](#) on page 17
- [5720-48MXW Switch Features](#) on page 18

The ExtremeSwitching 5720 Series is a family of high-performance, feature-rich edge and aggregation switches. As a universal hardware platform, the 5720 Series offers a user-selectable choice of Extreme's flagship switch operating systems, Switch Engine and Fabric Engine. The 5720 Series includes 24- and 48-port 1/2.5/5 Multi-gig models, as well as 24- and 48-port 1/2.5/5/10 Multi-gig models. All models offer 90W PoE support, including *Perpetual PoE* and *Fast PoE*. The 5720 Series includes 10/25Gb and/or 100Gb modular uplink options for flexible linkage to other switches or devices.

## Management

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An RJ45 serial console port on the rear panel of the switch enables you to connect a terminal and perform local management. An Ethernet management port can be used to connect the system to an out-of-band management network for administration. Alternatively, you can use an Ethernet cable to connect this port directly to a laptop to view and locally manage the switch configuration. The Ethernet management port supports 10/100/1000 Mbps speeds.

There is one Micro-B USB console port on the front panel. If the Micro-B USB console port is connected, it will be selected over the RJ45 console port. The Micro-B USB console port will disconnect when the switch is rebooted. You can re-connect the port if needed. When the Micro-B USB console is active, any messages from the switch to the client terminal will be echoed to both the USB console and the rear panel RJ45 serial port; however, no user input will be accepted from the rear panel port.



### 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

There are also two USB 2.0 Type A ports: one on the front panel labeled USB 1 and one on the rear labeled USB 2. They can host removable devices like flash drives

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## Cooling

Each base model is available with front-to-back cooling.

Switch cooling is provided by replaceable fan modules. The available fan module uses airflow from front to back. Two modular power supply slots accommodate AC power supplies. Power supplies have integrated cooling fans that operate independently of the switch fan.

A spare fan module (XN-FAN-005-F) with front-to-back airflow is available for 5720 Series switches.

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## Power Supplies

Two power supply bays accommodate modular AC power supplies. Power supplies have integrated cooling fans that operate independently of the switch fans. Like the fan modules, the power supplies are available in models with front-to-back cooling airflow. For more information about the power supplies used in the 5720 Series switches, see [Power Supplies for Use with Your Switch](#) on page 21.

Power supplies are ordered separately.

---

## Versatile Interface Module Options

The following Versatile Interface Modules (VIM) are available for 5720 Series switches:

- 5720-VIM-2CE versatile interface module that provides two 100-GbE (QSFP28) MACsec capable ports.
- 5720-VIM-6YE versatile interface module that provides six 25-GbE (SFP28) MACsec capable ports.



### Warning

The switch must be powered off before you install any VIM options. The interface module options are not hot swappable.

See [Expansion Modules](#) on page 23 for more information regarding VIM modules.

---

## Stacking

Each switch comes equipped with two stacking ports, also referred to as Universal Ethernet ports. The stacking ports are labeled U1 and U2 and are located on the front of the switch. 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 and optical transceivers. The U1 and U2 ports operate as stacking ports by default. Use the `disable stacking-support` command to set the U1 and U2 ports in Ethernet mode. When used as Ethernet ports,

the U1 and U2 ports can support data rates of 100Gb, 2 x 50Gb (Switch Engine only), 1 x 40Gb, 4 x 25Gb, or 4 x 10Gb using QSFP+ optics.

When running Fabric Engine, the stacking (or Universal Ethernet) ports are reserved for use by advanced features on the switch by default. For more information, see the advanced-feature-bandwidth-reservation Boot Flag documentation in the *Fabric Engine User Guide* for your version of the Fabric Engine operating system.

Stacking cables are ordered separately.

For information about optical modules, see the [Extreme Optics](#) website.

For information about stacking, see [Build Stacks](#) on page 45.

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## Secure Boot

Secure boot establishes a chain-of-trust relationship in the boot process. The chain-of-trust is established by cryptographic checks at each stage of the boot process to validate the integrity and authenticity of the next stage before it can execute. The current implementation validates boot images. It cannot be disabled after it has been programmed on the device. There is no command-line interface or commands to enable or disable secure boot. The status of the boot image verification can be monitored in the operating system.

For more information, see [Secure Boot](#) on page 20.

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## Operating Temperatures

All 5720 switch models support an operating range from 0°C to 50°C. Temperature restrictions apply for some models at high altitudes.

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## Feature Licensing

The 5720 Series switches support Unified Licensing, so that you can use them with multiple operating systems. 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 software.

For Fabric Engine licensing, see the Licensing chapter in the *Fabric Engine User Guide* for your version of the Fabric Engine operating system.

For XIQ licensing, see [ExtremeCloud IQ](#).

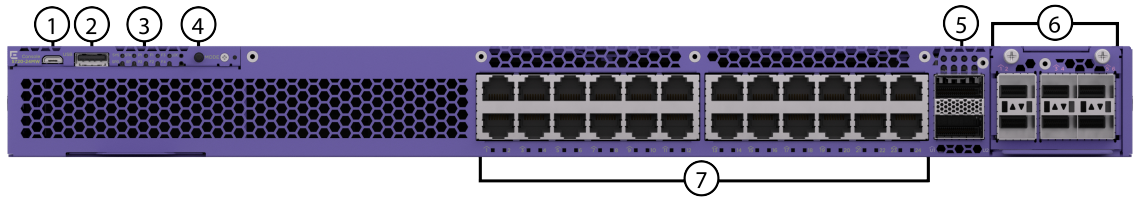
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## 5720-24MW Switch Features

The front panel of the 5720-24MW switch includes:

- 24 x 100M/1/2.5/5Gbase-T 802.3bt PoE (90W) full-duplex MACsec capable ports
- 2 Stacking (Universal Ethernet)/QSFP28 ports (unpopulated)

- 1 USB A port for management or external USB flash
- 1 USB Micro-B console port
- 1 VIM slot (unpopulated)

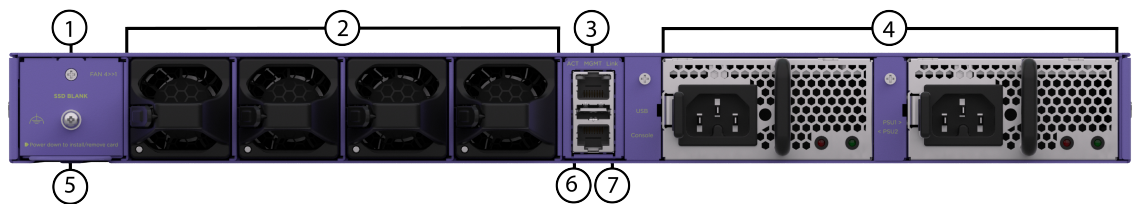


**Figure 1: 5720-24MW Front Panel**

1 = Micro-B USB console port	4 = Mode button	6 = VIM slot
2 = USB A port	5 = Stacking/QSFP28 ports	7 = 1/2.5/5Gbase-T ports
3 = System LEDs		

The rear panel of the switch includes:

- 1 SSD slot (not used)
- Grounding lug
- 4 fan modules
- 1 Serial console port (RJ-45)
- 1 Type-A USB port for management or external USB flash
- 1 10/100/1000BASE-T out-of-band management port
- 2 power supply slots (unpopulated)



**Figure 2: 5720-24MW Rear Panel**

1 = SSD slot	3 = OOB management port	5 = Grounding lug
2 = Fan modules	4 = Power supply slots	6 = Serial console port
7 = USB 2 port		

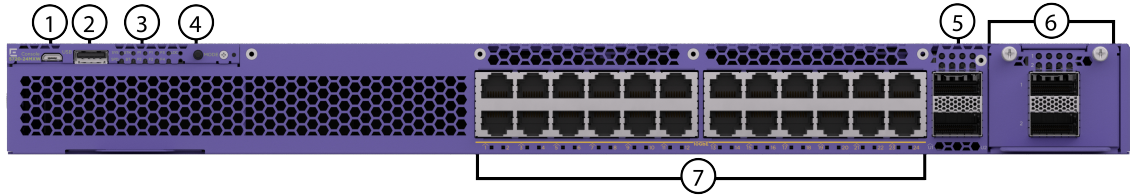
## 5720-24MXW Switch Features

The front panel of the 5720-24MXW switch includes:

- 24 x 100M/1/2.5/5/10Gbase-T 802.3bt (90W) full-duplex MACsec capable ports

<https://bit.ly/3KMYP2s>

- 2 Stacking (Universal Ethernet)/QSFP28 ports (unpopulated)
- 1 USB A port for management or external USB flash
- 1 USB Micro-B console port
- 1 VIM slot (unpopulated)

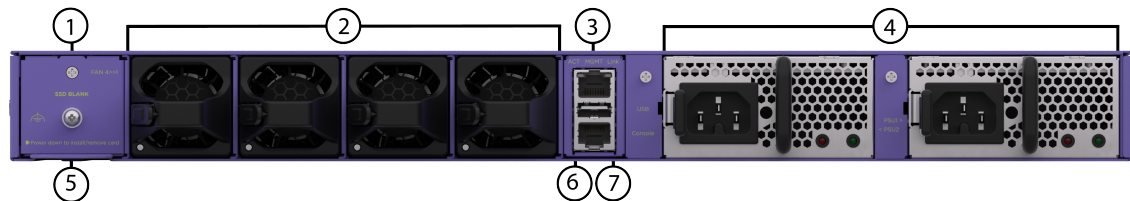


**Figure 3: 5720-24MXW Front Panel**

1 = Micro-B USB console port	4 = Mode button	6 = VIM slot
2 = USB 1 port	5 = Stacking/QSFP28 ports	7 = 1/2.5/10Gbase-T ports
3 = System LEDs		

The rear panel of the switch includes:

- 1 SSD slot (unpopulated)
- Grounding lug
- 4 fan modules
- 1 Serial console port (RJ-45)
- 1 Type-A USB port for management or external USB flash
- 1 10/100/1000BASE-T out-of-band management port
- 2 power supply slots (unpopulated)



**Figure 4: 5720-24MXW Rear Panel**

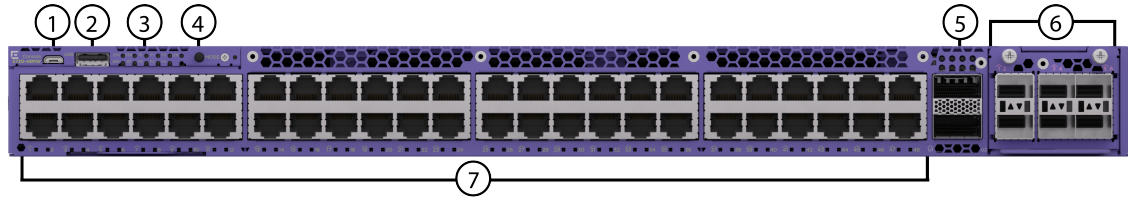
1 = SSD slot	3 = OOB management port	5 = Grounding lug
2 = Fan modules	4 = Power supply slots	6 = Serial console port
7 = USB 2 port		



## 5720-48MW Switch Features

The front panel of the 5720-48MW switch includes:

- 48 x 100M/1/2.5/5Gbase-T 802.3bt PoE (90W) full-duplex MACsec capable ports
- 2 Stacking (Universal Ethernet)/QSFP28 ports (unpopulated)
- 1 USB A port for management or external USB flash
- 1 USB Micro-B console port
- 1 VIM slot (unpopulated)

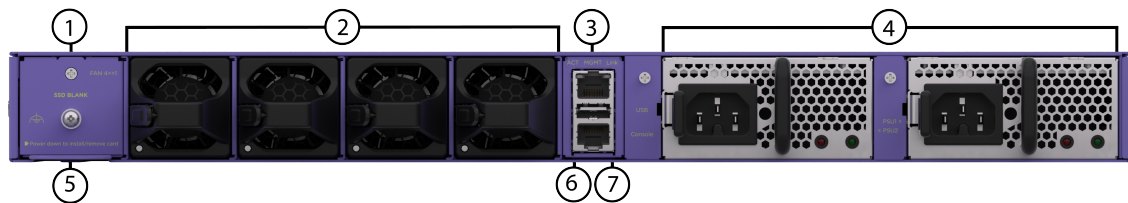


**Figure 5: 5720-48MW Front Panel**

1 = Micro-B USB console port	4 = Mode button	6 = VIM slot
2 = USB A port	5 = Stacking/QSFP28 ports	7 = 1/2.5/5Gbase-T ports
3 = System LEDs		

The rear panel of the switch includes:

- 1 SSD slot (not used)
- Grounding lug
- 4 fan modules
- 1 Serial console port (RJ-45)
- 1 Type-A USB port for management or external USB flash
- 1 10/100/1000BASE-T out-of-band management port
- 2 power supply slots (unpopulated)



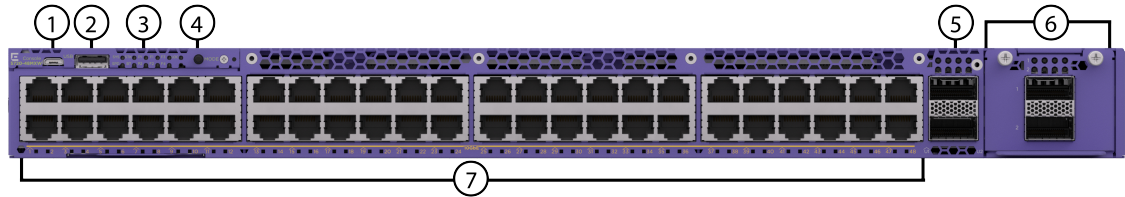
**Figure 6: 5720-48MW Rear Panel**

1 = SSD slot	3 = OOB management port	5 = Grounding lug
2 = Fan modules	4 = Power supply slots	6 = Serial console port
7 = USB 2 port		

## 5720-48MXW Switch Features

The front panel of the 5720-48MXW switch includes:

- 48 x 100M/1/2.5/5/10Gbase-T 802.3bt (90W) full-duplex MACsec capable ports
- 2 Stacking (Universal Ethernet)/QSFP28 ports (unpopulated)
- 1 USB A port for management or external USB flash
- 1 USB Micro-B console port
- 1 VIM slot (unpopulated)

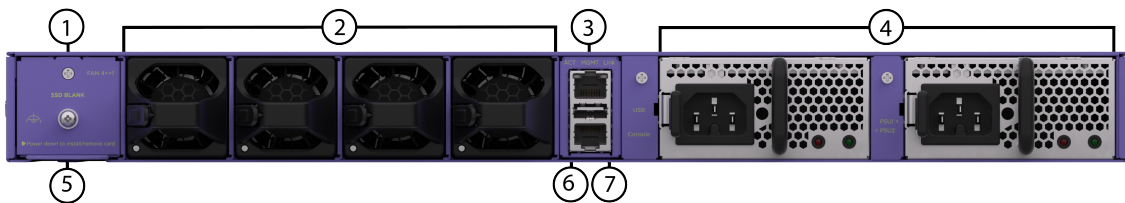


**Figure 7: 5720-48MXW Front Panel**

1 = Micro-B USB console port	4 = Mode button	6 = VIM slot
2 = USB 1 port	5 = Stacking/QSFP28 ports	7 = 1/2.5/10Gbase-T ports
3 = System LEDs		

The rear panel of the switch includes:

- 1 SSD slot (unpopulated)
- Grounding lug
- 4 fan modules
- 1 Serial console port (RJ-45)
- 1 Type-A USB port for management or external USB flash
- 1 10/100/1000BASE-T out-of-band management port
- 2 power supply slots (unpopulated)



**Figure 8: 5720-48MXW Rear Panel**

1 = SSD slot	3 = OOB management port	5 = Grounding lug
2 = Fan modules	4 = Power supply slots	6 = Serial console port
7 = USB 2 port		



# Port Partitioning

On some ExtremeSwitching Universal 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:

**Table 4: QSFP28 Port Partitioning**

Switch model	Port bandwidth	Port partitions
5720 (all models) QSFP28 (U1 and U2 ports)	100 Gb	One U1 or U2 port with one of the following: <ul style="list-style-type: none"> <li>• One 100 Gb port (default)</li> <li>• Two 50 Gb ports (Switch Engine only)</li> <li>• One 40 Gb port</li> <li>• Four 25 Gb ports</li> <li>• Four 10 Gb ports</li> </ul>
5720-VIM-6YE SFP28	25 Gb	The 5720-VIM-6YE has two speed groups, each with three ports that can be partitioned with the following: <ul style="list-style-type: none"> <li>• Three 1 Gb ports</li> <li>• Three 10 Gb ports</li> <li>• Three 25 Gb ports (default)</li> </ul>
5720-VIM-2CE QSFP28	100 Gb	The 5720-VIM-2CE has two ports, each of which can be partitioned with the following: <ul style="list-style-type: none"> <li>• One 100 Gb port (default)</li> <li>• One 40 Gb port</li> <li>• Four 25 Gb ports</li> <li>• Four 10 Gb ports</li> </ul>

For information about configuring partitioned ports, see the [Switch Engine 32.1 Command Reference Guide](#).



## Secure Boot

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The status of the boot image verification can be monitored in the operating system.

### Switch Engine

---

The Trusted Delivery field in the output of the `show switch` and `show system` commands in Switch Engine displays the status of the boot image verification. For example:

```
5520-24X-EXOS.2 # sh switch
SysName:          5520-24X-EXOS
SysLocation:
SysContact:       https://www.extremenetworks.com/support/
System MAC:       00:04:96:F2:F8:00
System Type:      5520-24X-EXOS
SysHealth check:  Enabled (Normal)
Recovery Mode:    All
System Watchdog:  Enabled
Trusted Delivery: Boot Image Verified
Current Time:     Mon Jul 27 19:35:03 2020
Timezone:         [Auto DST Disabled] GMT Offset: 0 minutes, name is UTC.
Boot Time:        Mon Jul 27 19:31:50 2020
```

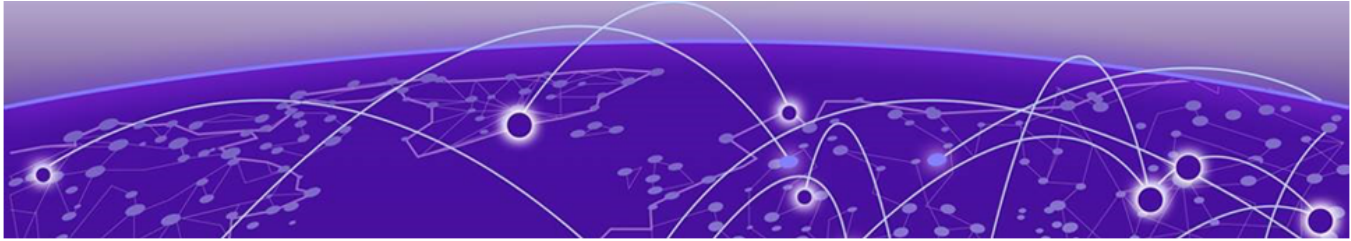
Trusted delivery can only be in one of two states:

- Boot Image Verified
- Boot Image Verification Failed

### Secure Boot Troubleshooting

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When there is a secure boot validation failure, the switch is booted to a recovery stage or halts. Contact GTAC for assistance with recovering the switch.



# Power Supplies for Use with Your Switch

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[715 W AC Power Supplies](#) on page 21

[1100 W AC Power Supplies](#) on page 21

[2000 W AC Power Supply](#) on page 22

Each 5720 Series switch operates with two replaceable internal power supply units that provide all of the power needed for the switch to operate. The power supply units must be a matched pair with the same power rating, such as 750W, for long term use. You can remove one power supply without interrupting the switch's operation. The 5720 Series can support an unmatched pair of power supply units when you are upgrading or downgrading to matched pair with a different power rating.

Power supplies are ordered separately.

## 715 W AC Power Supplies

---

The 715 W AC PSU-FB (model XN-ACPWR-715W-FB with front-to-back ventilation airflow) is compatible with all 5720 Series switch models.

The 715 W AC power supply has a keyed power inlet (C16) that requires a notched (C15) power cord.

The 715 W AC power supply has the status LEDs listed in the following table:

**Table 5: 715 W AC Power Supply LED Status Indications**

IN_OK (Green)	OUT_OK (Green or Red)	Description
Off	Off	No AC input power connection or low AC voltage.
On	Off	AC input good, 54V output disabled.
On	(Red) On	AC input good, output (54V) fault.
On	(Green) On	AC input good.

## 1100 W AC Power Supplies

---

The 1100 W AC PSU-FB (model XN-ACPWR-1100W-FB with front-to-back ventilation airflow) is compatible with all 5720 Series switch models.

The 1100 W AC power supply has a keyed power inlet (C16) that requires a notched (C15) power cord.

The 1100 W AC power supply has the status LEDs listed in the following table:

**Table 6: 1100 W AC Power Supply LED Status Indications**

IN_OK (Green)	OUT_OK (Green or Red)	Description
Off	Off	No AC input power connection or low AC voltage.
On	Off	AC input good, 54V output disabled.
On	(Red) On	AC input good, output (54V) fault.
On	(Green) On	AC input good.

## 2000 W AC Power Supply

The 2000 W AC PSU-FB (model XN-ACPWR-2000W-FB with front-to-back ventilation airflow) is compatible with all 5720 Series switch models.



**Note**

In order to obtain 2000W output from this power supply, the PSU must be connected to a 200-240VAC source.

The ExtremeSwitching 2000 W AC power supply has a keyed power inlet (C16) that requires a notched (C15) power cord.

The ExtremeSwitching 2000 W AC power supply has the status LEDs listed in the following table:

**Table 7: ExtremeSwitching 2000 W AC Power Supply LED Status Indications**

IN_OK (Green)	OUT_OK (Green or Red)	Description
Off	Off	No AC input power connection or low AC voltage.
On	Off	AC input good, 54V output disabled.
On	(Red) On	AC input good, output (54V) fault.
On	(Green) On	AC input good.



# Expansion Modules

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[Versatile Interface Modules](#) on page 23

[Solid-State Drives](#) on page 26

[LRM/MACsec Adapter](#) on page 27

Several different hardware accessories are available for expanding the capabilities of your Extreme Networks switch. Collectively, they are referred to as *expansion modules*.

- You can install a versatile interface module (VIM) in a dedicated slot in the front panel of the ExtremeSwitching 5720 Series switch to provide 25/100G dedicated high speed ports.
- You can install a Solid-state Drive (SSD) to provide modular storage support.
- You can install LRM/MACsec Adapters that increase flexibility by supporting 10Gb Long Reach Multimode (LRM) connections. The adapter plugs into SFP+ ports that do not support LRM, effectively turning them into LRM-capable ports.

## Versatile Interface Modules

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The front panel of every 5720 Series switch provides one slot to install the following:

- 5720-VIM-2CE versatile interface module that provides two 100GbE QSFP28 MACsec capable ports. 10/25/40Gb data rates supported through port partitioning.
- 5720-VIM-6YE versatile interface module that provides six 1/10/25GbE SFP28 MACsec capable ports.

The 5720-VIM-2CE ports are 1-2 on the 5720-VIM-2CE faceplate.

The 5720-VIM-6YE ports are 1-6 on the 5720-VIM-6YE faceplate.

In Fabric Engine, the 5720-VIM slot number is 2.

5720-VIMs are ordered separately. Each VIM label can be found on the bottom side of the device, as seen in the following figure:



**Figure 9: 5720-VIM Label**

**Table 8: 5720-VIM Matrix**

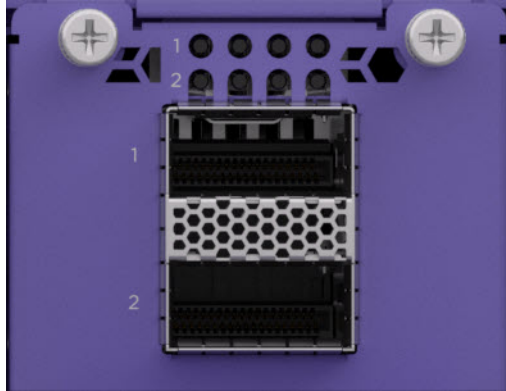
	5720-VIM-2CE	5720-VIM-6YE
Usable ports	2	6
Operational speeds	10/25/40/100Gbps	1/10/25Gbps
PHY present	Yes	Yes
1000BASE-T & 10GBASE-T	10GBASE-T only	Both
Mixed speeds	10/25/40Gbps	1/10/25Gbps
1G Auto-negotiation	Not supported	Not supported
10G Auto-negotiation	Not supported	Not supported
25G Auto-negotiation		
FEC	Supported CL74/CL91	Supported CL74/CL91
MACsec	128/256bit	128/256bit

## 5720-VIM-2CE Versatile Interface Module

The 5720-VIM-2CE versatile interface module provides two 100GbE QSFP28, MACsec capable ports. Data rates of 10/25/40Gb are supported through port partitioning.

For information about the supported optical modules, refer to the most recent version of the [Extreme Optics](#) website.





**Figure 10: 5720-VIM-2CE Versatile Interface Module**

**Table 9: Port Numbers for Ports on the 5720-VIM-2CE Module**

Switch Engine			Fabric Engine
24MW and 24 MXW models	1x100G (default) or 1x40G	27, 28	VIM slot number = 2 Interface names = 2/1-2/2
	4x10G or 4x25G	27:1, 27:2, 27:3, 27:4; 28:1, 28:2, 28:3, 28:4	
48MW and 48 MXW models	1x100G (default) or 1x40G	51, 52	
	4x10G or 4x25G	51:1, 51:2, 51:3, 51:4; 52:1, 52:2, 52:3, 52:4	

## 5720-VIM-6YE Versatile Interface Module

The 5720-VIM-6YE versatile interface module provides six 10/25GbE SFP28, MACsec capable ports. The six ports are divided into two groups which must be configured at the same speed. Ports 1, 2, and 3 are the first group and must be configured together at the same speed, such as 10 GbE. Ports 4, 5, and 6 are the second and must be configured together at the same speed, such as 25 GbE. Or Group 1 can be configured at 25 GbE and Group 2 can be configured at 10 GbE. See [Figure 11](#) for reference.

For information about the supported optical modules, refer to the most recent version of the [Extreme Optics](#) website.



**Figure 11: 5720-VIM-6YE Versatile Interface Module**

**Table 10: Port Numbers for Ports on the 5720-VIM-6YE Module**

Switch Engine		Fabric Engine (all models)
24MW and 24MXW models	27, 28, 29, 30, 31, 32	VIM slot number=2
48MW and 48MXW models	51, 52, 53, 54, 55, 56	Interface names=2/1-2/6

An LRM/MACsec adapter can be used with the 5720-VIM-6YE versatile interface module, but is only used for its LRM capability. MACsec is supported natively on the ports the LRM/MACsec adapter is connected to on the versatile interface module. The following table details the maximum number of LRM/MACsec adapters you can use. The maximum number varies according to:

- Whether you are running in LRM mode only, or in LRM plus MACsec mode.
- Whether you are using an auxiliary power (USB) cable to draw additional power beyond what is provided by the host switch.

Switch Model	Mode: LRM only		Mode: LRM and MACsec	
	Two ports no aux. power	Two ports 0.5A aux. power	Two ports aux. power <sup>1</sup>	One port one bypass aux. power <sup>1</sup>
5720-VIM-6YE	2	3	N/A	N/A

<sup>1</sup> With 1W optics modules (SR, LR, LRM, 10 km bidirectional, AOC, DAC, and most 1 Gb optics), use 0.5A auxiliary power sources.

## Solid-State Drives

Solid-state drives (SSD) provide modular storage support. 5720-24MXW and 5720-48MXW models accommodate one SSD module using a reserved slot on the rear of the switch, which is supported on Fabric Engine 8.7 or later and Switch Engine 32.3 or later.

The following SSD module is available for 5720 Series switches:

**Table 11: Available SSD Module**

SSD Module	Description	Compatible Switch Models
XN-SSD-002-120	Modular 120GB SSD	5720-24MXW and 5720-48MXW



**Note**

An SSD module is not supported on 5720-24MW and 5720-48MW models.

## LRM/MACsec Adapter

Deploy the LRM/MACsec Adapter by connecting both ports – using a dedicated SFP cable called the *host cable* – to SFP or SFP+ ports on a switch that does not natively support LRM and MACsec connections. The switch is referred to as the *host switch*.



**Caution**

Connect the adapter to the host switch using only the host cable that is provided for this purpose. The use of other cables can damage the equipment.

The LRM/MACsec Adapter can be physically mounted on a standard equipment rack. You can also purchase a bracket that attaches to the rack and holds up to five adapters together.

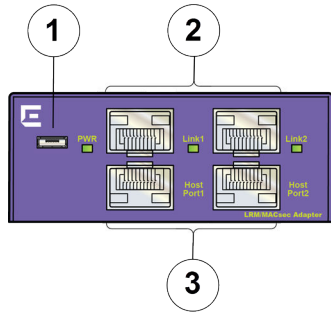
The LRM/MACsec Adapter receives power through its connection to the host switch's SFP port. Auxiliary power is supplied through a USB (micro-B) cable that connects the adapter to a power source that is capable of providing at least 0.5A of current. The auxiliary power cable is required for MACsec connections. It is optional for LRM-only connections.

To use the LRM/MACsec Adapter, you must have at least Switch Engine version 32.3 or Fabric Engine 8.9 installed on the host switch to which the adapter is attached.



**Note**

LRM/MACsec Adapter initialization may take extended time - about 40-85 seconds per adapter plus 15-35 seconds per transceiver, depending on the platform type used with the adapter.



**Figure 12: LRM/MACsec Adapter: Front Panel**

1 = Auxiliary power connector	3 = SFP+ ports (connect to the host switch)
2 = SFP+ ports (connect to the network)	

## Maximum Capacity for Using the LRM/MACsec Adapter

The following table details the maximum number of LRM/MACsec Adapters you can use. The maximum number varies according to:

- Whether you are running in LRM mode only, or in LRM plus MACsec mode.
- Whether you are using an auxiliary power (USB) cable to draw additional power beyond what is provided by the host switch.



### Note

- The LRM/MACsec Adapter is used only for its LRM capability. MACsec is supported natively on the ports that the LRM/MACsec adapter is connected to. MACsec is not supported on the stacking ports.
- The figures listed assume that, in every case, both adapter ports are connected to the host switch. The adapter will not operate properly if only one port is connected to the host switch.
- Corresponding 5720-VIM-6YE port groups need to be configured to 3x10G partitions to support an LRM/MACsec adapter and 10G-LRM optics.

**Table 12: Maximum Number of LRM/MACsec Adapters, by Switch Model and Connection Type**

Switch Model	Mode: LRM Only		Mode: LRM and MACsec	
	Two ports no aux. power	Two ports 0.5A aux. power	Two ports aux. power <sup>1</sup>	One port One bypass aux. power <sup>1</sup>
5720-VIM-6YE	2	3	N/A	N/A

<sup>1</sup>With 1W optics modules (SR, LR, LRM, 10 km bidirectional, AOC, DAC, and most 1 Gb optics), use 0.5A auxiliary power sources.

### Temperature Limitations

In most circumstances, the LRM/MACsec Adapter can operate at temperatures up to 45°C (113°F). However, the maximum operating temperature is 40°C (104°F) when the adapter is used with any of the following optical transceivers:

- 10Gb ER SMF (part no. 10309)
- 10Gb ZR SMF (part no. 10310)
- 10Gb Tunable DWDM ZR (part no. 10325)
- 1000BASE-BX-U bidirectional SFP 120 km (part no. MGBIC-BX120-U)
- 1000BASE-BX-D bidirectional SFP 120 km (part no. MGBIC-BX120-D)

You can find a complete listing of cables and optical transceivers that are compatible with the LRM/MACsec Adapter in the [Extreme Hardware/Software Compatibility and Recommendation Matrices](#).

### LRM/MACsec Adapter LEDs

The LEDs on the front panel of the LRM/MACsec Adapter have the following meanings:

**Table 13: LRM/MACsec Adapter LEDs**

LED	Meaning
PWR	Green: Normal operation. The adapter is receiving power, either from the host switch or through the USB connector. Amber: The adapter is receiving insufficient power. Off: The adapter is not receiving power.
Link1	Steady green: The Link1 connection – from the host switch, through the adapter, to the network – is ready. Blinking green: Link1 is active. Off: Link1 is not ready.
Link2	Steady green: The Link2 connection – from the host switch, through the adapter, to the network – is ready. Blinking green: Link2 is active. Off: Link2 is not ready.



# Site Preparation

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- [Plan Your Site](#) on page 30
- [Operating Environment Requirements](#) on page 31
- [Rack Specifications and Recommendations](#) on page 34
- [Evaluate and Meet Cable Requirements](#) on page 36
- [Meet Power Requirements](#) on page 42
- [Follow Applicable Industry Standards](#) on page 44

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 "Technical Specifications."

## Plan Your Site

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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."

## Operating Environment Requirements

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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](http://www.iccsafe.org)

The organizations listed in [Table 14](#) are authorities on electrical codes.

**Table 14: Authorities on Electrical Codes**

Organization	Address	Web Site URL
National Electrical Code (NEC) Classification (USA only) 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 1 Batterymarch Park Quincy, MA 02169 USA	<a href="http://www.nfpa.org/">www.nfpa.org/</a>
Underwriters' Laboratory (UL) 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 333 Pfingsten Road Northbrook, IL 60062 USA	<a href="http://www.ul.com">www.ul.com</a>
National Electrical Manufacturing Association (NEMA) (USA only) Organization of electrical product manufacturers. Members develop consensus standards for cables, wiring, and electrical components.	NEMA 1300 N. 17th Street Rosslyn, VA 22209 USA	<a href="http://www.nema.org">www.nema.org</a>
Electronic Components Industry Association (ECIA) Trade association that develops technical standards, disseminates marketing data, and maintains contact with government agencies in matters relating to the electronics industry.	ECIA 111 Alderman Drive Suite 400 Alpharetta, GA 30005 USA	<a href="http://www.ecianow.org">www.ecianow.org</a>
Federal Communications Commission (FCC) (USA only) Commission that regulates all interstate and foreign electrical communication systems that originate in the United States according to the Communications Act of 1934. The FCC regulates all U.S. telephone and cable systems.	FCC 445 12th Street S.W. Washington, DC 20554 USA	<a href="http://www.fcc.gov">www.fcc.gov</a>

## 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 34 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  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ) and  $70^{\circ}\text{C}$  ( $158^{\circ}\text{F}$ ).

[Table 15](#) 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 15: Thermal Shutdown and Restart Behavior**

Switch Model(s)	Behavior
All models	<p>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.</p> <p>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.</p>

## 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**

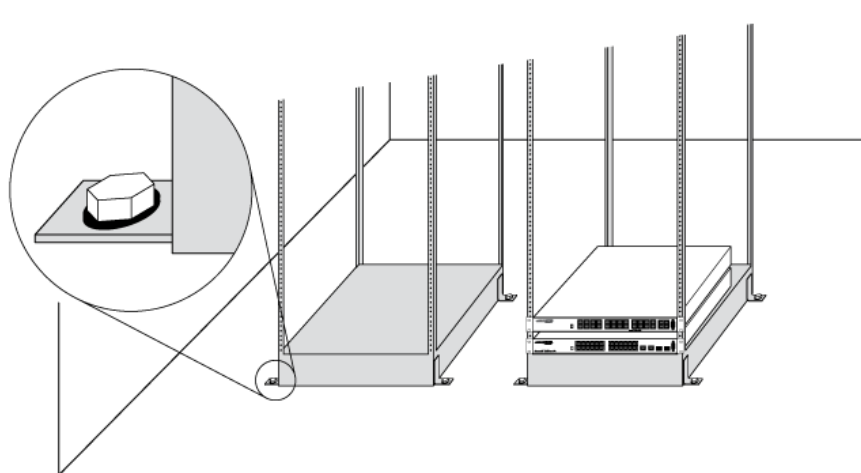
Extreme Networks switches do not have a switch for turning power to the unit on and off. For systems using an AC power supply, power to the switch is disconnected by removing the wall plug from the electrical outlet.

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 13: 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](http://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.

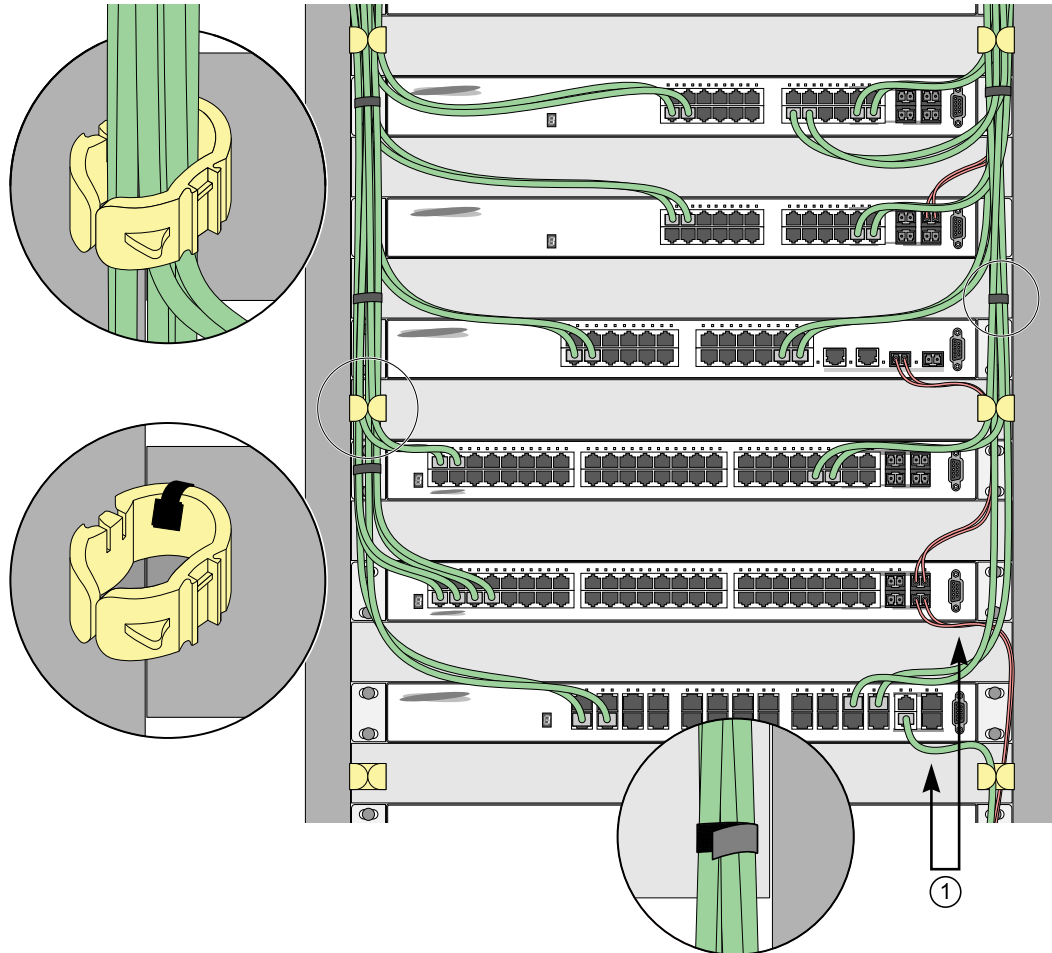
- Examine cable for cuts, bends, and nicks.
- Support cable using a cable manager that is mounted above connectors to avoid unnecessary weight on the cable bundles.
- Use cable managers to route cable bundles to the left and right of the network equipment to maximize accessibility to the connectors.
- Provide enough slack, approximately 5 to 7.5 cm (2 to 3 in), to provide proper strain relief as shown in [Figure 14](#) on page 38.
- 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 14: 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.

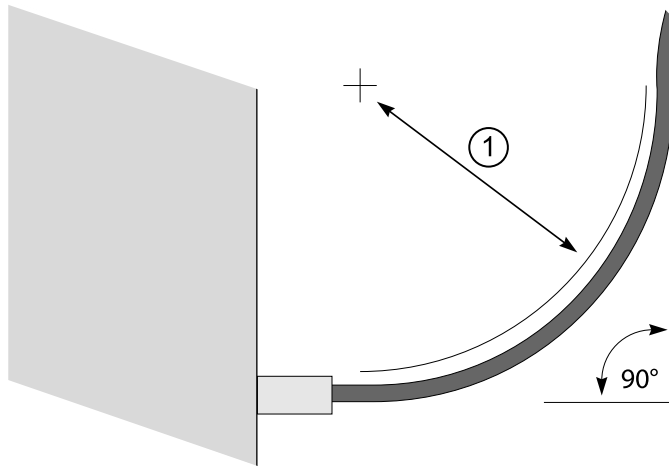
Every cable has a minimum bend radius, and fibers will be damaged if the cables are bent too sharply. It is also important not to stretch the cable during installation. Ensure

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 15](#).



**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 15: Bend Radius for Fiber Optic Cable**

1 = Minimum 5 cm (2 in) radius in 90° bend

*Cable Distances and Types*

[Table 16](#) shows one example of cable media types and maximum distances that support reliable transmission in accordance with international standards (except where noted). 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.

**Table 16: Cable Distances and Types**

Standard	Media Type	MHz·km Rating	Maximum Distance (Meters)
1000BASE-SX (850nm optical window)	50/125 μm multimode fiber	400	500
	50/125 μm multimode fiber	500	550
	62.5/125 μm multimode fiber	160	220
	62.5/125 μm multimode fiber	200	275

**Table 16: Cable Distances and Types (continued)**

Standard	Media Type	MHz·km Rating	Maximum Distance (Meters)
1000BASE-LX (1300nm optical window)	50/125 µm multimode fiber	400	550
	50/125 µm multimode fiber	500	550
	62.5/125 µm multimode fiber	500	550
	10/125 µm single-mode fiber	–	5,000
	10/125 µm single-mode fiber <sup>1</sup>	–	10,000
1000BASE-ZX (1550nm optical window)	10/125 µm single-mode fiber	–	80,000
100BASE-LX100 (1550nm optical window)	10/125 µm single-mode fiber	–	100,000
1000BASE-BX10 (1490nm optical window) (1310nm optical window)	10/125 µm single-mode fiber	–	10,000
1000BASE-LX70 (1550nm optical window)	10/125 µm single-mode fiber	–	70,000
10/100/1000BASE-T SFP	(1 Gbps link) Category 5 and higher UTP cable	–	100
	(100 Mbps link) Category 5 and higher UTP cable	–	150
	(10 Mbps link) Category 5 and higher UTP cable	–	250
10GBASE-T SFP+	(10 Gb links) Category 6A and higher UTP cable	–	30
10GBASE-SR SFP+ (850nm optical window)	62.5 µm multimode fiber	160	26
	62.5 µm multimode fiber (OM1)	200	33
	50 µm multimode fiber	400	66
	50 µm multimode fiber (OM2)	500	82
	50 µm multimode fiber (OM3)	2000	300
10GBASE-LR SFP+ (1310nm optical window)	10/125 µm single-mode fiber	–	10,000
10GBASE-ER SFP+ (1550nm optical window)	10/125 µm single-mode fiber	–	40,000

<sup>1</sup> Proprietary to Extreme Networks. Connections between two Extreme Networks 1000BASE-LX interfaces that use 10/125 µm single-mode fiber can use a maximum distance of 10,000 meters.



**Table 16: Cable Distances and Types (continued)**

Standard	Media Type	MHz·km Rating	Maximum Distance (Meters)
1000BASE-T	Category 5 and higher UTP cable	–	100
100BASE-TX	Category 5 and higher UTP cable	–	100
10BASE-T	Category 3 and higher UTP cable	–	100

Refer to the [Extreme Optics](#) website for details about direct-attach cables that are supported by this equipment.

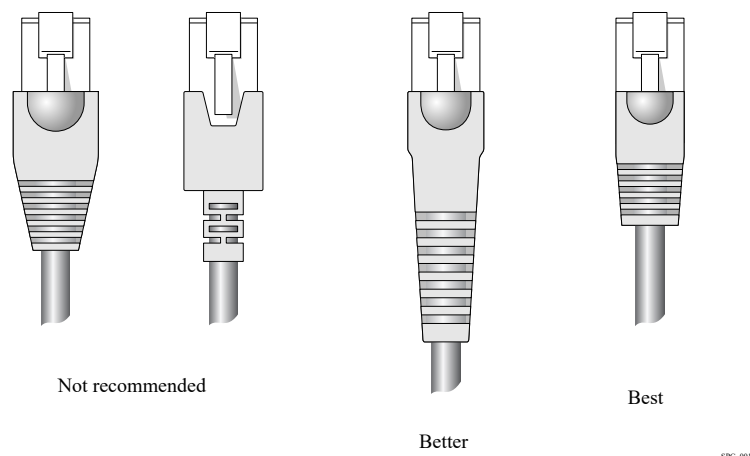
### Use RJ45 Connector Jackets

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 16 shows examples of recommended and non-recommended connector jacket types.



**Figure 16: 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.

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## 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."

## Power Cord Requirements

Most ExtremeSwitching switches do not ship with power cords. Visit [www.extremenetworks.com/product/powercords/](http://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 44.)



#### 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):

$VA = \text{Volts} \times \text{Amperes}$

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

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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: [www.ansi.org](http://www.ansi.org) or [www.tiaonline.org](http://www.tiaonline.org).



# Build Stacks

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[Introduction to Stacking](#) on page 45

[Plan to Create Your Stack](#) on page 55

[Set up the Physical Stack](#) on page 59

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 32.1 User Guide](#) for information about configuring a stack, maintaining the stack configuration, and troubleshooting.

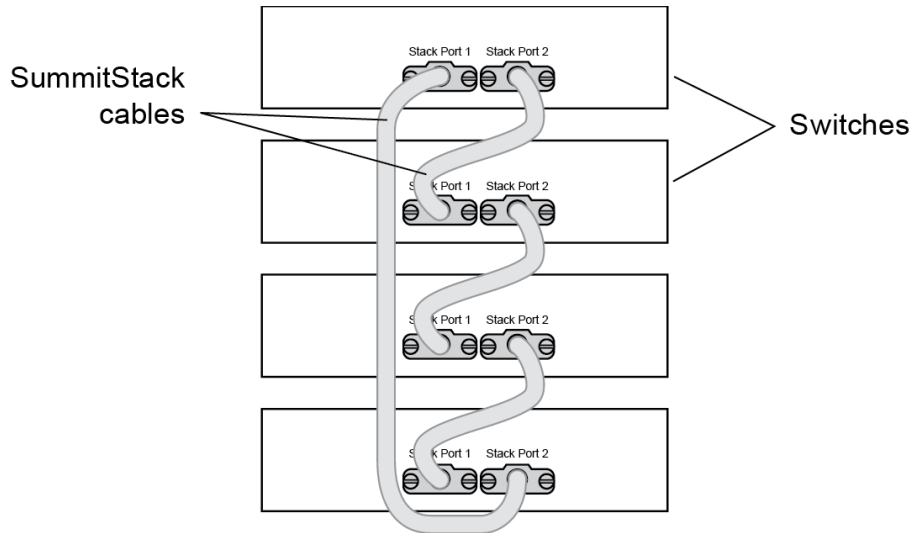
## Introduction to Stacking

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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 17](#) 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 17: Switches Connected to Form a Stack**

Using the SummitStack feature—part of the Switch Engine Edge 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 57 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 10-Gbps 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.



### Note

5720 Series switches do not support alternate stacking. Only native stacking is supported on 5720 Series switches.

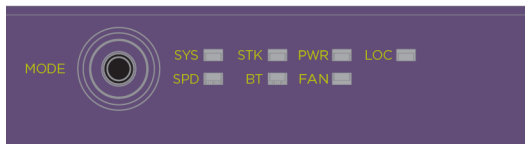
When planning and building your stack, be sure to follow port compatibility and cabling recommendations as described in this chapter.

### 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 59 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 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 18: Mode Button with SRK 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.

When assigning the primary and backup roles in mixed stacks, consider the feature scalability and the speed of each switch model. The easy setup configuration process selects primary and backup switches based on capability and speed. The following list

shows the capabilities based on the ability to cross stack with other switch families. The most capable switches are shown at the top of each list:

1. ExtremeSwitching 5720
2. ExtremeSwitching 5520

For example, in a stack that combines 5720 series switches with 5520 series switches, a 5720 series switch might provide more memory and more features than the 5520 series switches in the stack. Consider these differences when selecting a primary node, selecting a backup node, and configuring failover operation.

**Important**

The 5720 series switches can be stacked with themselves using Native V400 stacking (SummitStack-V400) or with the 5520 series switches using Native V200 stacking (SummitStack-V200). Assign the primary and backup roles to switches from the same series. For example, if the primary node is a 5720 series switch, the backup node must also be a 5720 series switch. The 5520 series switches must only be used as standby nodes when they are in a mixed stack with 5720 Series switches. Similarly, if the primary node is an 5520 series switch, the backup node must also be an 5520 series switch.

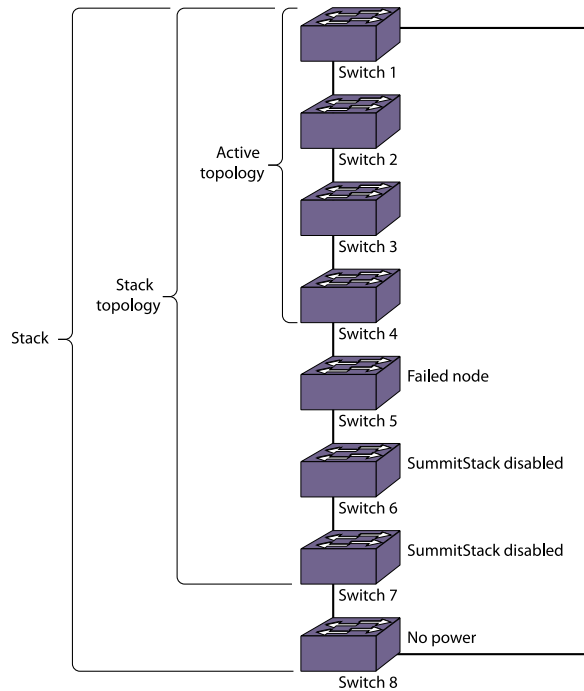
When easy setup compares two switches that have the same capability, the lower slot number takes precedence.

Follow the same ranking hierarchy when you plan the physical placement of the switches in the stack.

## SummitStack Topologies

[Figure 19](#) presents a graphical representation of a stack and some of the terms that describe stack conditions.





**Figure 19: 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.

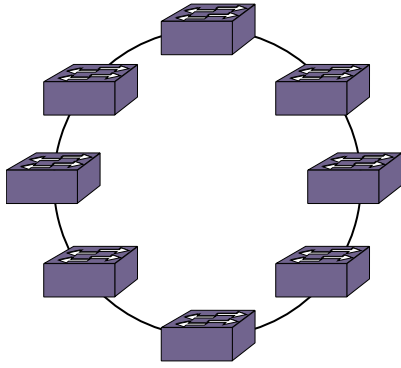
Switch 5 in the example has failed, stacking is disabled on Switches 6 and 7, and Switch 8 has no power. As a result, the active topology includes Switches 1 through 4 only.

For more information about SummitStack terminology, see [SummitStack Terms](#) on page 51.

#### *Ring Topology: Recommended for Stacking*

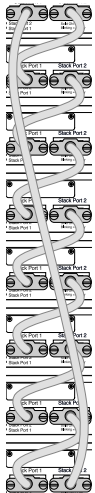
SummitStack nodes should be connected to each other in a ring topology. In a ring topology, one link is used to connect to a node and the other link is used to connect to another node. The result forms a physical ring connection. This topology is highly recommended for normal operation.

[Figure 20](#) represents a maximal ring topology of eight active nodes.



**Figure 20: Graphical Representation of a Ring Topology**

Figure 21 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 21: 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 22](#), 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 22: 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 32.1 User Guide](#).

## SummitStack Terms

[Table 17](#) describes the terms used for the SummitStack feature. These terms are listed in the recommended reading sequence.

**Table 17: 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.

**Table 17: List of Stacking Terms (continued)**

Term	Description
Alternate stacking	A stacking configuration in which stack members are connected using 10-Gbps 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 <i>stackable switch</i> .
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 <code>show stacking</code> 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.
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 <code>show slot {slot} {detail}   detail</code> 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.

**Table 17: List of Stacking Terms (continued)**

Term	Description
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 node – 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	<p>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).</p> <p>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.</p>
Backup node	<p>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.</p> <p>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.</p>
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. When a node operates in a standby role, most databases are not synchronized – except those few that directly relate to hardware programming.
Acquired node	<p>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.</p> <p>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.</p>
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.

**Table 17: List of Stacking Terms (continued)**

Term	Description
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 <code>show slot {slot} {detail}   detail</code> 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 <code>show switch {detail}</code> command on the primary node.
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 <code>show stacking</code> 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. The choice to run Easy Setup is offered when you run the <code>enable stacking {node-address node-address}</code> command and the essential stacking parameters are unconfigured or inconsistent. It can also be invoked directly by running the <code>configure stacking easy-setup</code> command.

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## Plan to Create Your Stack

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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 `enable stacking-support` command.  
You must enable stacking-support individually for every switch in the stack that does not have stacking support enabled by default.
- To disable stacking support, configure the switch data ports to use the Ethernet protocol instead of the stacking protocol.  
Use the `disable stacking-support` command.

### 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. Stacking cables are available in lengths ranging from 0.3 meters to 100 meters.
- 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 49). Include only the nodes that you expect to be active in the stack.

Follow the recommendations in [Recommendations for Configuring Stacks](#) on page 56 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 59.

## 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 [Switch Engine 32.1 Feature License Requirements](#).) 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 32.1 User Guide](#) 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 32.1 User Guide](#).
- 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 55 for physically situating your equipment.

## Combine Switches from Different Series

5720 Series switches can be stacked with themselves using Native V400 stacking (SummitStack-V400) and qualified QSFP28 passive direct attach cables in the QSFP28 ports. 5720 Series switches can also be stacked with 5520 Series switches using Native V200 stacking (SummitStack-V200). When creating a mixed stack of 5720 Series and 5520 Series switches, the Primary and Backup nodes must be 5720 Series switches and they must be configured for Native V200 stacking.

## 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 100 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. In this example, stacking ports are represented by U1 and U2 on the right side.



**Figure 23: 5720 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 don't 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.
  - For any switch in the stack, select the U1 and U2 symbols to choose stacking methods – for example, SummitStack-V and SummitStack-V400.
  - 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 18: 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 "Installing Your Switch"), 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 59.
2. Connect the switches to your management network.
  - See [Connect Your Stack to the Management Network](#) on page 62.

After setting up and connecting the switches, perform software configuration for the stack. See "Configuring a New Stack" in the [Switch Engine 32.1 User Guide](#).

### 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*

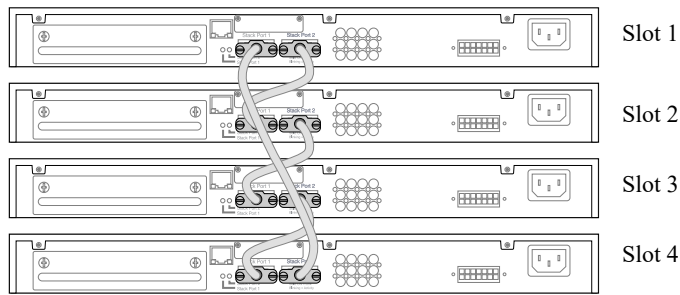
The examples in the following sections show various physical stacking arrangements: all switches in a single rack, switches in two adjacent racks, and switches at the tops of several racks in a row.

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



**Figure 24: SummitStack Cable Connections Using Four Switches with Integrated SummitStack Ports**

Table 19 lists the recommended order for connecting the stacking ports in this example.

**Table 19: 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 25 shows cable connections for an 8-node stack using SummitStack 40G cables to connect switches with integrated SummitStack ports.



**Figure 25: SummitStack Cable Connections Using Eight Switches with Integrated SummitStack Ports**

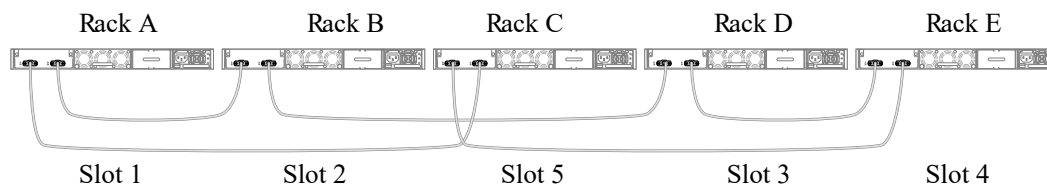
Table 20 lists the recommended order for connecting the stacking ports in this example.

**Table 20: 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 26 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 26: Top-of-Rack Stack Installation**

Table 21 lists the recommended order for connecting the stacking ports in this example.

**Table 21: 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 the Ethernet management 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 59, 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 the version of Switch Engine you are using, for instructions to perform the software configuration for your stack.



# Install Your Switch

---

- [Safety Considerations for Installation](#) on page 64
- [What You Will Need for the Installation](#) on page 64
- [Attach the Switch to a Rack or Cabinet](#) on page 65
- [Install Optional Components](#) on page 73
- [Install Internal AC Power Supplies](#) on page 74
- [Connect Network Interface Cables](#) on page 74
- [Turn on the Switch](#) on page 75

Before you attempt to install or remove an Extreme Networks switch, read the precautions in [Safety Considerations for Installation](#) on page 64.

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

A four-post rack-mounting kit is provided with the switch. A two-post kit can be ordered separately.

The installation process includes the following tasks:

1. Prepare to install the switch.  
See [What You Will Need for the Installation](#) on page 64.
2. Install the switch in the rack.  
See [Attach the Switch to a Rack or Cabinet](#) on page 65.
3. Install optional components: optical transceivers and cables.  
See the instructions in [Install Optional Components](#) on page 73.
4. If your switch does not come with an installed internal power supply, install one or two power supplies.  
See [Install Internal AC Power Supplies](#) on page 74.
5. Power up the switch.  
See [Turn on the Switch](#) on page 75.
6. Connect network interface cables.  
See [Connect Network Interface Cables](#) on page 74.
7. Perform initial network connection and configuration.  
See [Activate and Verify the Switch](#) on page 76.

## 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 DC power cables. Disconnect the ground wire **after** you disconnect all DC 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.



### Note

See [Safety and Regulatory Information](#) on page 111 for additional safety information and additional information regarding regulatory compliance certifications.

## What You Will Need for the Installation

---

Ensure that you have followed the guidance in [Site Preparation](#) on page 30, 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.

You need the following additional tools and equipment. These are not provided with your switch:

- Screwdriver for securing the rack mounting screws.
- #2 Phillips magnetic screwdriver to attach bracket screws that are provided with the switch.
- ESD-preventive wrist strap for installing optional ports at the back of the switch.



---

## Attach the Switch to a Rack or Cabinet

---

The 5720 Series switch can be attached to a standard 19-inch equipment rack, in either of the following ways:

- Four-post rack, using the mounting kit provided.
- Two-post rack, using mounting brackets (not provided) to attach the front or the middle of the switch to the posts.

To attach a switch to a two-post rack, a four-post rack or a cabinet, follow these steps.

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

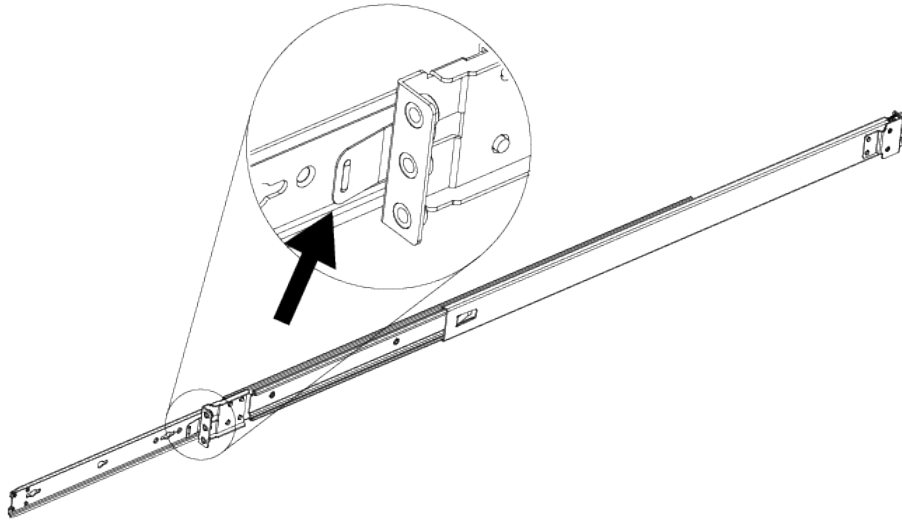
### Four-Post Rack Mount

A four-post rack-mounting kit is included in the box with your switch. The kit contains an instruction sheet, along with the following components:

- Two mounting brackets, known as *inner member* in the instruction sheet. These pieces attach directly to both sides of the switch housing.
- Two slider assemblies, one for each side of the switch. Each slider assembly consists of an outer piece that is secured to the rack and a sliding rail to which you will attach the corresponding mounting bracket. These pieces are known on the instruction sheet as the *outer member* and *intermediate member*.
- Mounting ears - Black rack ears with a thumb screw in the middle (2 count)
- Black mounting ear screws (6 count)

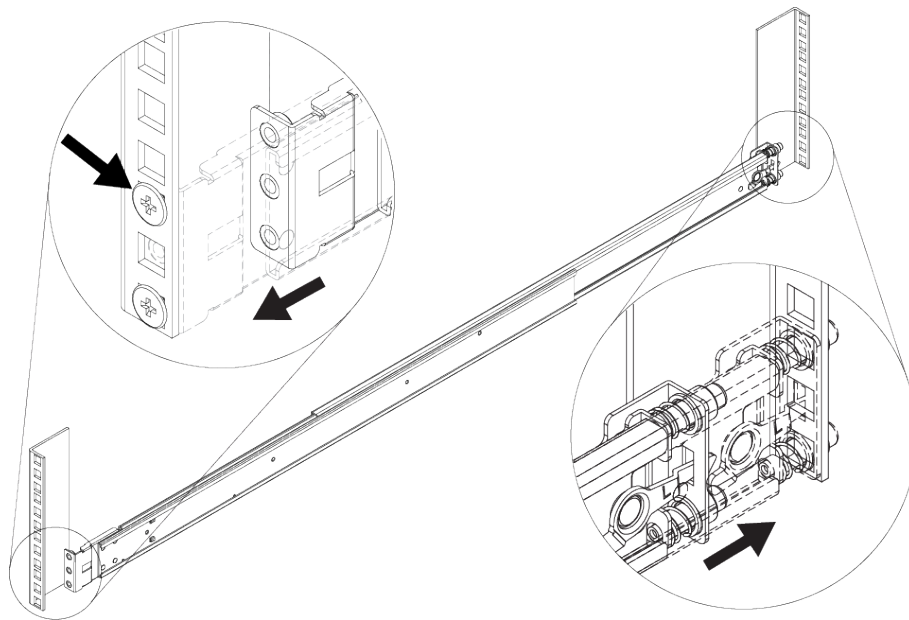
To attach your switch to a four-post rack, follow these steps:

1. Separate the inner sliding rails from the outer rails by extending the rails and pulling the disconnect latch. Note which direction the sliding rails slide from the outer rails for correct installation.



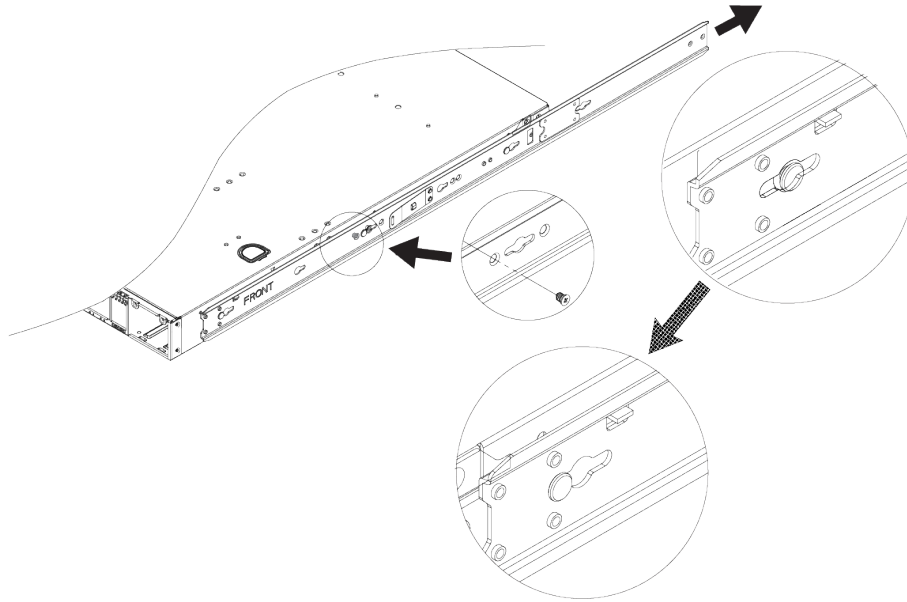
**Figure 27: Separating the Inner Sliding Rails by Pulling the Disconnect Latch**

2. Attach the outer rail (bracket) to the rack, securing it with the M5 screws.



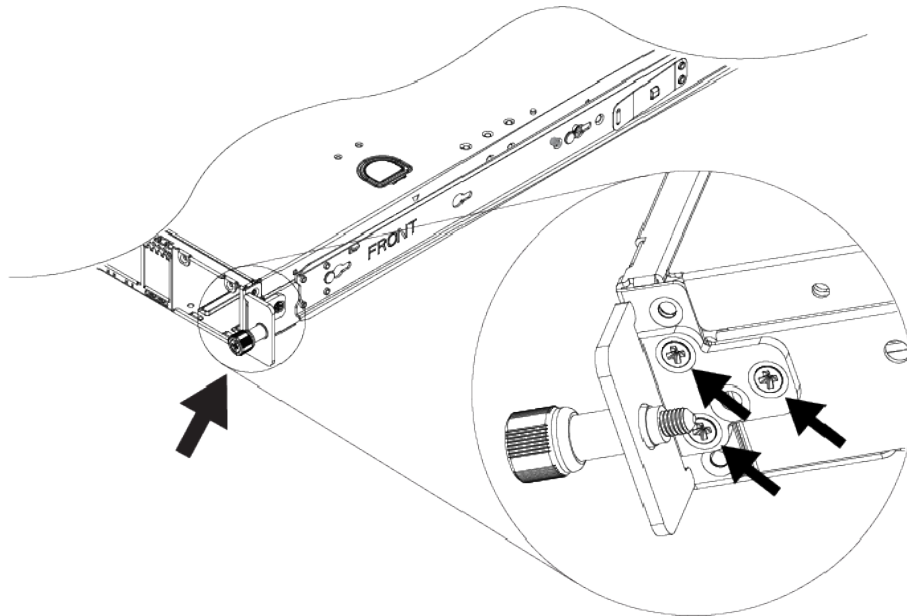
**Figure 28: Attaching the Outer Rail to the Rack**

3. Attach the inner rail to a side of the switch using the M4 screws.
  - If you are using the 1U long rack ears (already attached to the inner rail): Ensure that the rack ear is flush with the either the front or the rear panel of the unit and continue to step 4 on page 68.

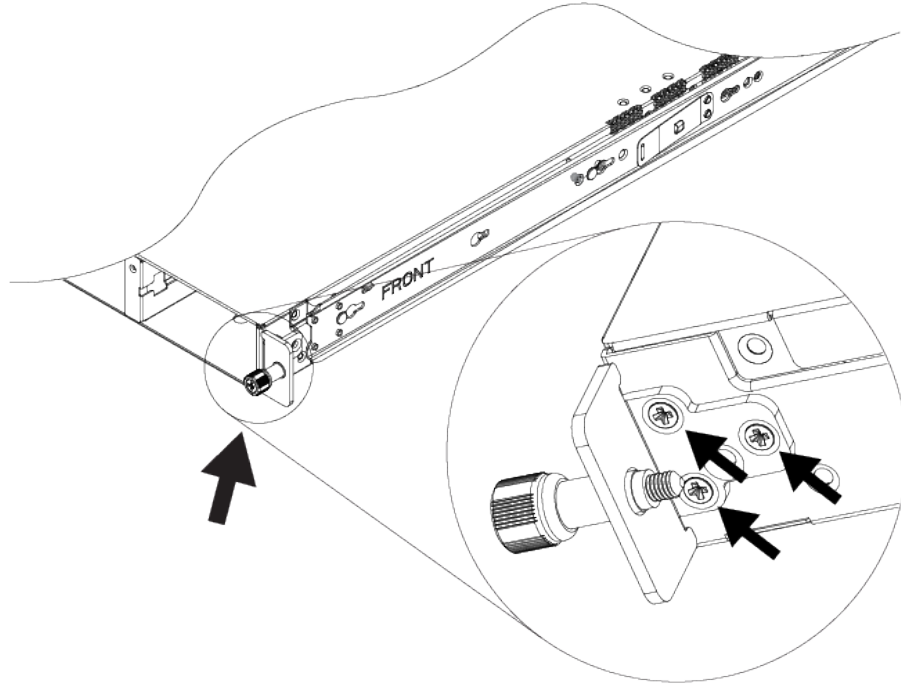


**Figure 29: Front Installation: Attaching the Inner Rail**

- If using the 1U or 2U short rack ears, attach one to the side of the unit using the #6-32 screws, so that the rack ear is flush with either the front or the rear panel of the unit.

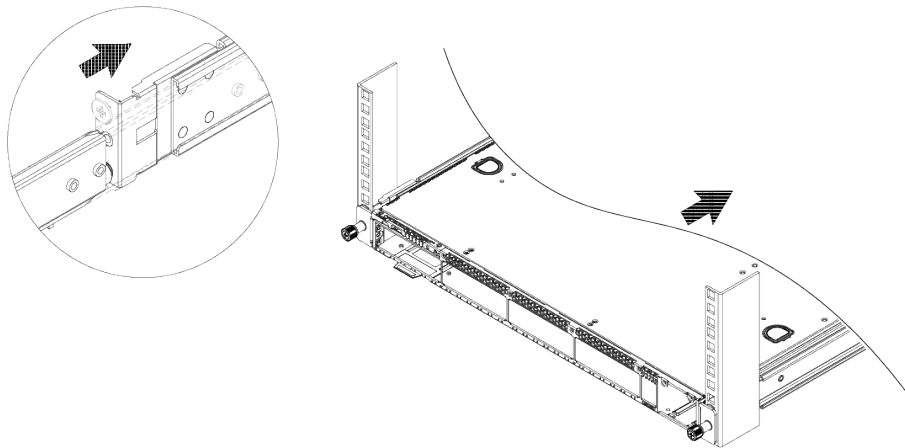


**Figure 30: Front Installation: Attaching a Rack Ear**



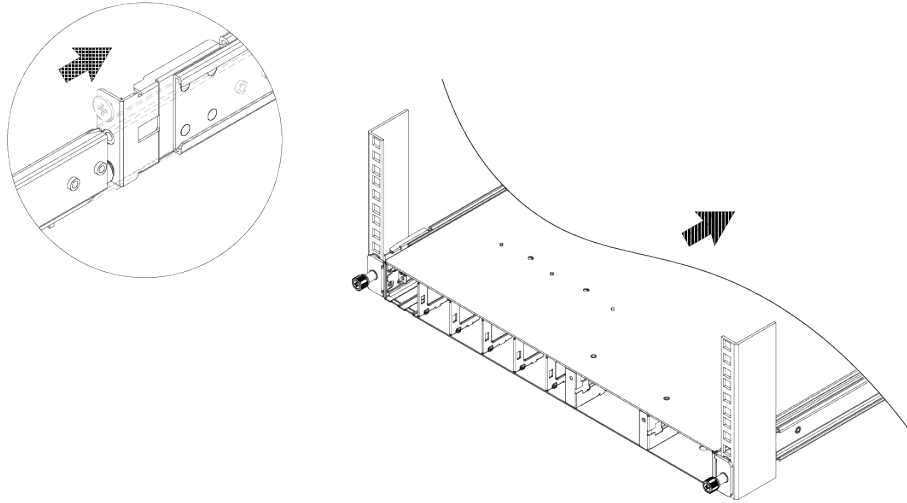
**Figure 31: Rear Installation: Attaching a Rack Ear**

4. Repeat steps 2 on page 66 and 3 for the other side of the device.
5. Insert the switch into the rail kit. To install the switch in the front of the rack, slide the switch into the outer rails in the front of the rack.



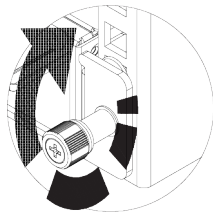
**Figure 32: Inserting the Switch into the Front of the Rack**

To install the switch in the rear of the rack, slide the switch into the outer rails in the rear of the rack.



**Figure 33: Inserting the Switch into the Rear of the Rack**

Secure the switch to the rack using the thumb screws on the mounting ears.



**Figure 34: Secure the Switch with Thumb Screws**

## Two-Post Rack Mount

You can attach your switch to a two-post rack in either of two configurations:

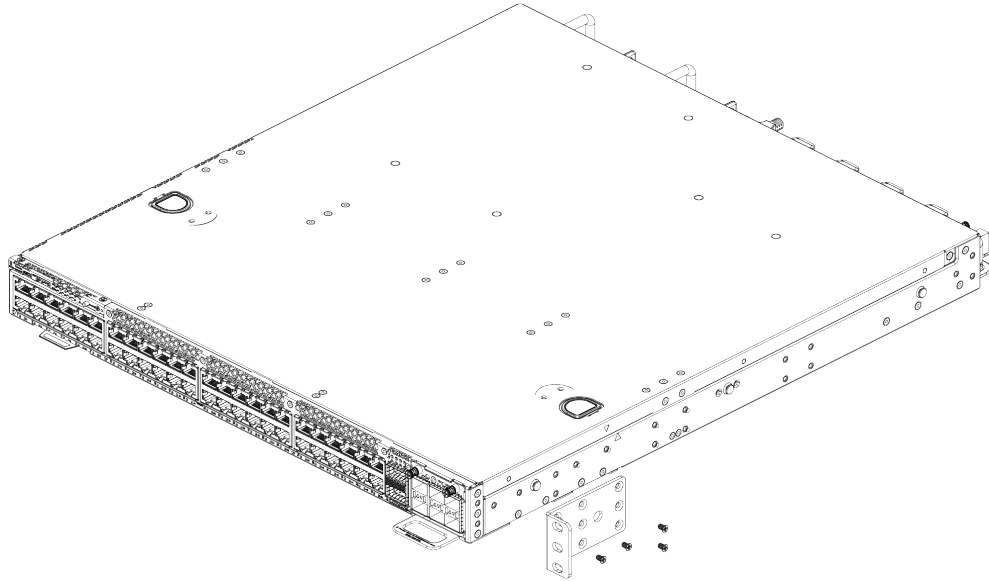
- Front mount
- Mid-mount

The side of the switch has different sets of holes for attaching mounting brackets in either configuration.

Brackets for a two-post mount are not included in the box with your switch. However, they can be ordered separately using part number XN-2P-RKMT299.

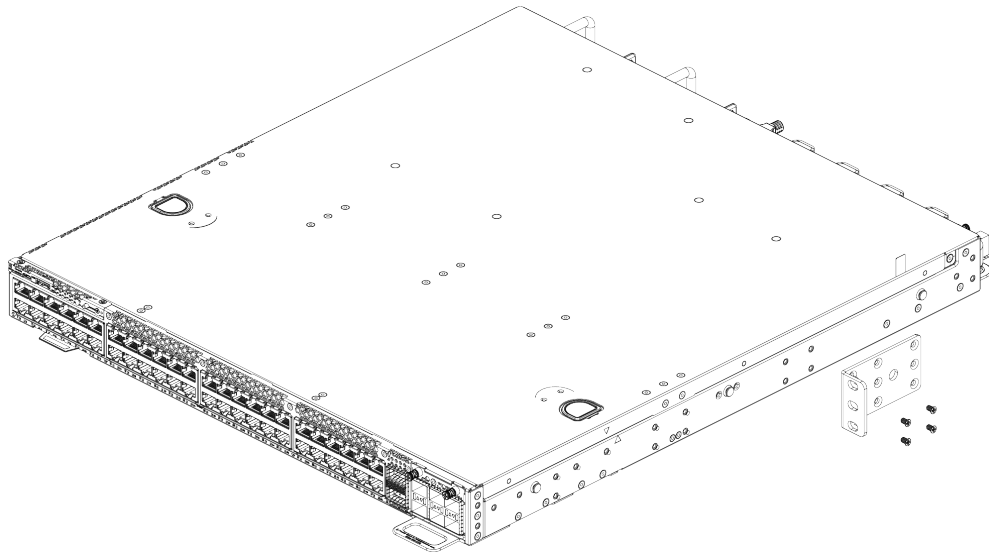
To attach your switch to a two-post rack, follow these steps:

1. On one side of the switch, attach one of the short mounting brackets to the switch housing.
  - a. For a front mount, position the bracket over the holes so that the flange (ear) is even with the front of the switch, as shown in the figure below: [Figure 35](#).



**Figure 35: Attaching a Short Mounting Bracket (Ear): Front of Switch**

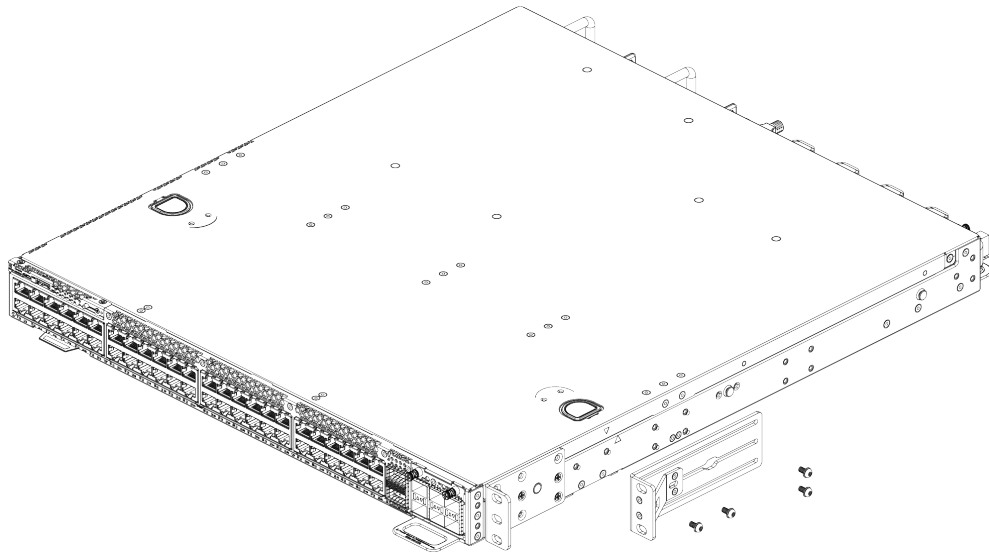
- b. For a mid-mount, position the bracket so that the flange (ear) is positioned slightly more than halfway between the front and back of the switch, as shown in figure below: [Figure 36](#).



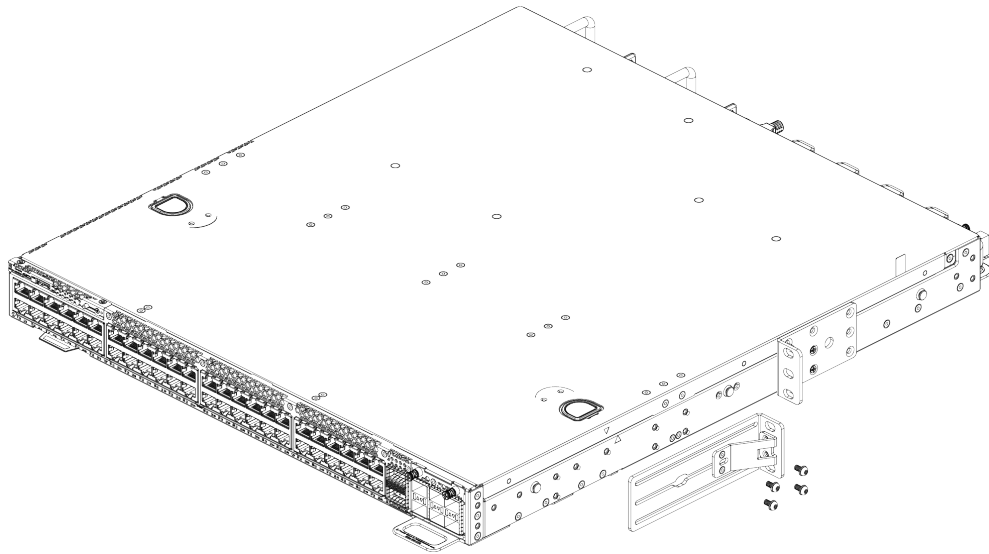
**Figure 36: Attaching a Short Mounting Bracket (Ear): Middle of Switch**

- c. Use four small mounting screws (provided) to attach the bracket to the switch.
2. Attach the other short mounting bracket to the other side of the switch housing, as you did in step 1.
3. Attach a long mounting bracket to one side of the switch housing and to the rack post.
  - a. Position the long bracket over the holes between the front and the middle of the switch. Orient it so that its flange (ear) rests against the rack post.

See [Figure 37](#) and [Figure 38](#).



**Figure 37: Attaching a Long Mounting Bracket: Front of Switch**



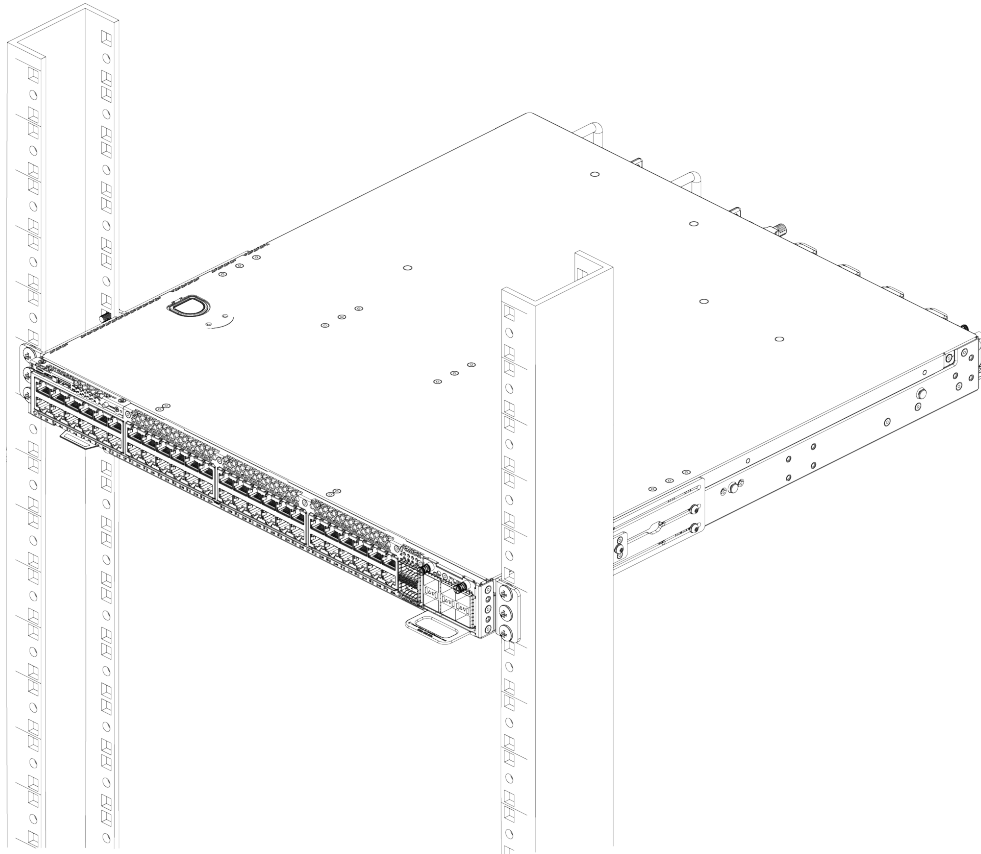
**Figure 38: Attaching a Long Mounting Bracket: Middle of Switch**

- b. Use four small mounting screws (provided) to attach the bracket to the switch.
- c. Secure the long bracket to the rack post. (Rack-mounting screws are not provided.)
4. Repeat step 3 to attach the other long bracket on the other side of the switch.
5. Tilting the switch slightly, lift it into the rack so that the mounting brackets align with the rack posts.

If the switch cannot be tilted (because other equipment is mounted directly above and below), remove one or both short mounting brackets from the switch. Lift the switch into position, secure the flanges (ears) on the long brackets to the rack posts, and then reattach the short brackets.

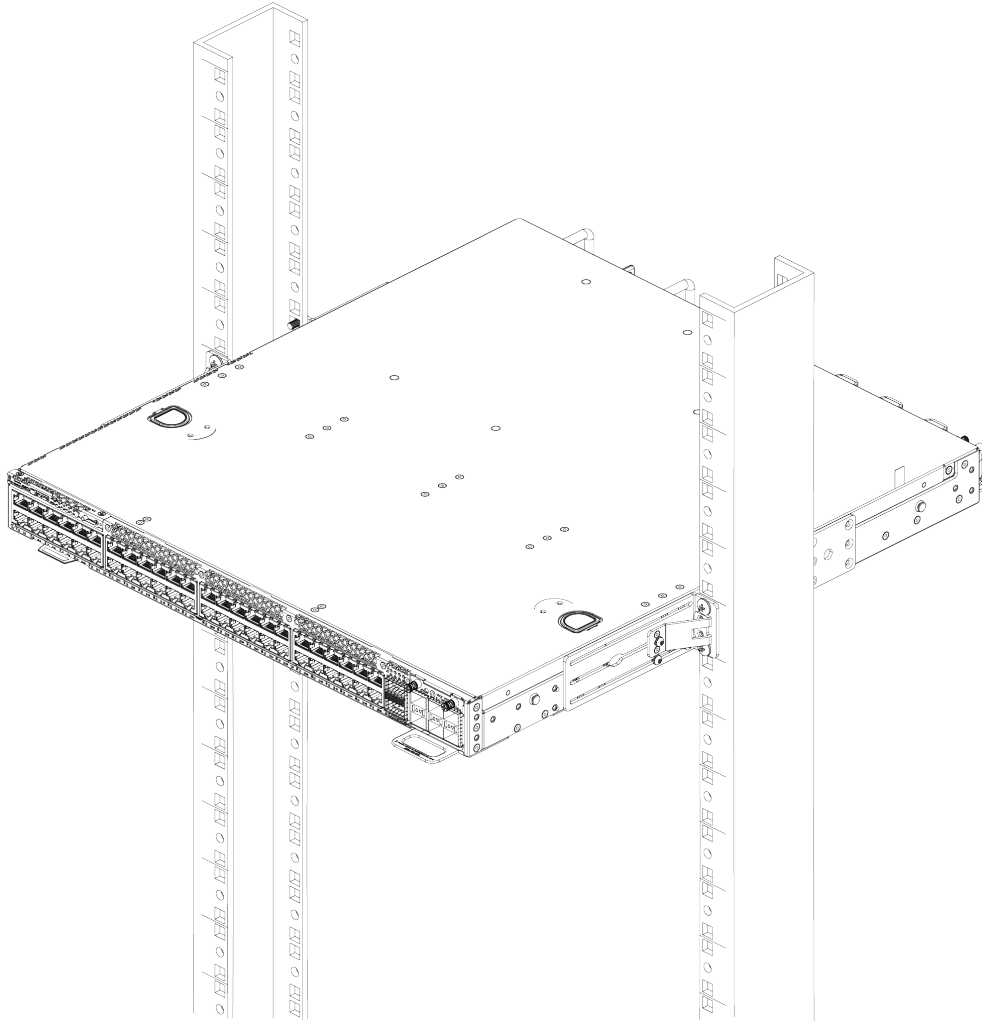
- Secure the flanges (ears) on both sides of the switch to the rack posts, using screws that are appropriate for the rack. (Rack-mounting screws are not provided.)

See [Figure 39](#) and [Figure 40](#) for the completed installations.



**Figure 39: Two-Post Front Mount: Complete**





**Figure 40: Two-Post Mid-Mount: Complete**

7. Verify that the switch is level and is firmly attached to the rack.

If your switch comes with installed AC power supplies, skip to the topic [Turn on the Switch](#) on page 75.

If your switch does not have an installed power supply, install one or two power supplies using the instructions in [Replace Internal AC Power Supplies](#) on page 84.

## Install Optional Components

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

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

For a list of the optical components supported with ExtremeSwitching 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.



### Note

A small flat-blade screwdriver can be used to free an obstructed bale clasp on an optical module.

## Optical Cables

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

## Install Internal AC Power Supplies

The following AC internal power supplies (PSUs) are available for 5720 Series switches:

### 715 W AC PSU-FB

Part number XN-ACPWR-715W-FB is compatible with all 5720 Series switch models.

### 1100 W AC PSU-FB

Part number XN-ACPWR-1100W-FB is compatible with all 5720 Series switch models.

### 2000 W AC PSU-FB

Part number XN-ACPWR-2000W-FB is compatible with all 5720 Series switch models.

For installation instructions, see [Replace Internal AC Power Supplies](#) on page 84.

## Connect Network Interface Cables

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

Cable Type	Maximum Distance
CAT5E	55 meters
CAT6	55 meters
CAT6A	100 meters

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

---

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 108.

Use the following instructions to turn on the device.

1. For devices that are connected to AC power, connect the power cord to the AC power input socket on the device (or power supply) and to an AC power outlet.
2. When power is connected, verify that the PSU LED is green.

If the PSU LEDs do not turn green, refer to the [Monitor the Device](#) on page 96 topic for your device for troubleshooting information.



# Activate and Verify the Switch

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[Connect to a Management Console](#) on page 76

[Log in for the First Time on Switch Engine](#) on page 76

[Configure the Switch's IP Address for the Management VLAN](#) on page 78

[Change the Switch OS via the Bootloader Menu](#) on page 78

[Change the Switch OS via the Startup Menu](#) on page 79

[Log In for the First Time on Fabric Engine](#) on page 79

Operating system selection and activation can be done via the following:

1. XIQ - automatically by pre-selecting the preferred switch OS
2. Bootloader menu - option to change the switch OS on initial activation only
3. Startup menu in Switch Engine CLI - post-Bootloader menu prompt

Refer to *Read Me First - Switch OS Selection for Universal Hardware* shipped with your switch, or visit <https://www.extremenetworks.com/support/switch-os-selection/> for information on changing your switch OS after initial activation.

Otherwise, use the instructions in the following topics.

## 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 for the 5720 Series. If you want to run Fabric Engine, see [Change the Switch OS via the Bootloader Menu](#) on page 78 or [Change the Switch OS via the Startup Menu](#) on page 79.

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 76.

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

1. Use a terminal emulator such as PuTTY or TeraTerm to connect to the switch through 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, `5720-24MW-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 32.1 User Guide](#).

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.

```
5720-48MW-SwitchEngine.1 # show ver
Switch : 801131-00-01 AR032207Q-40019 Rev 01 BootROM: N/A IMG: 32.1.0.359
```

**Note**

Software upgrade is required.

Configure the switch's IP address for the management virtual LAN (VLAN) by following the steps in [Configure the Switch's IP Address for the Management VLAN](#) on page 78.

## 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 32.1 User Guide](#).

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

## Change the Switch OS via the Bootloader Menu

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 for the 5720 Series. You can change the switch OS from the Bootloader menu on initial activation only by completing the following steps:

1. Use a terminal emulator such as PuTTY or TeraTerm to connect to the switch through 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. When the switch is powered on, after seeing the "5720 Boot Menu" screen, press the **[spacebar]** key within 30 seconds.
3. Use the **down-arrow** key to select Change the switch OS to Fabric Engine, then select **Enter**.

The switch will install Fabric Engine, then reset. Once the NOS is selected, the "5720 Boot Menu" will only wait for 3 seconds before continuing.

To change the switch OS if you take no action during the initial boot, see [Change the Switch OS via the Startup Menu](#) on page 79.

## Change the Switch OS via the Startup Menu

---

Onboard your switch with Switch Engine™. 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 for the 5720 Series. If you take no action during the initial bootup, you can change the switch OS from the Startup menu on initial activation only by completing the following steps:

1. Connect to the switch via telnet, SSH, or console with a baud rate of 115200.
2. At the login prompt, log in using the default user name `admin`.

For example:

```
login: admin
```



### Note

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

3. The switch prompts you to choose which switch personality you want to use:

```
This switch can alternatively run the Fabric Engine Network Operating System.
If you answer yes, all data including configurations, logs and debugs will be
cleared, except for the license activation status,
Fabric Engine will be installed, and Switch Engine will be removed.
Would you like to change the switch OS to Fabric Engine? [y/N/q]:
```

The switch will install Fabric Engine, then reset.

After resetting, your switch will boot with Fabric Engine. See [Log In for the First Time on Fabric Engine](#) on page 79 for more information.

## Log In for the First Time on Fabric 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>.

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

1. Use a terminal emulator such as PuTTY or TeraTerm to connect to the switch through 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: 115200
- Data bits: 8
- Stop bit: 1

2. Press **[Enter]** one or more times until you see the login prompt.

3. At the login prompt, log in using the default user name `rwa`.

For example:

```
login: rwa
```

When prompted for the password, enter `rwa`.

When you are logged in with the role-based authentication level of `rwa`, you can configure the login and password values for the other role-based authentication levels.





# Install Expansion Modules

---

[Install a Versatile Interface Module in a 5720 Series Switch](#) on page 81

[Install an SSD Module](#) on page 82

This topic describes how to install expansion modules:

- Versatile interface modules (5720-VIMs)
- Solid-State Drive Module (SSD)



## Note

Read the information in this topic thoroughly before trying install or remove an expansion module.

## Install a Versatile Interface Module in a 5720 Series Switch

---

This topic describes how to install a versatile interface module (VIM) in the front slot of a 5720 Series switch.

You need the following tools and materials to install a VIM:

- ESD-preventive wrist strap
- Flat head screwdriver

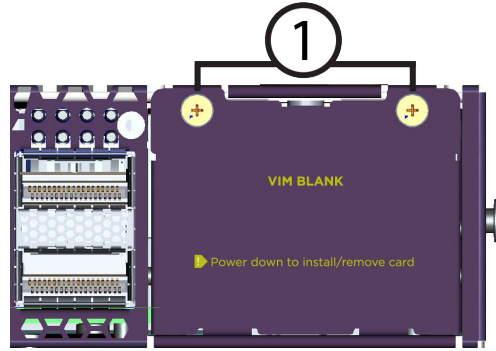


## Caution

Extreme Networks VIMs are not hot-swappable. Disconnect power to the switch before removing an installed VIM or installing a new VIM.

To install a versatile interface module, follow these steps:

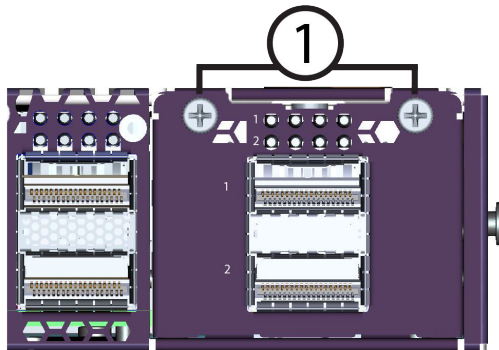
1. Attach the ESD wrist strap to your wrist and connect the metal end to an appropriate ground point on the rack.
2. Ensure that the switch is completely powered down.
  - a. Use the screwdriver to loosen and remove the two retaining screws on the cover plate.



**Figure 41: Removing a slot Cover Plate (VIM slot cover shown)**

1 = VIM module retaining screw locations

- b. Remove the cover plate from the VIM slot.
3. Remove the new VIM from its anti-static packaging.
4. Install the VIM in the switch:
  - a. Carefully slide the VIM module into the switch.
  - b. Insert and tighten the retaining screws you previously removed, using the screws provided.



**Figure 42: VIM Module Inserted in Slot**

1 = VIM module retaining screw locations

## Install an SSD Module

This topic describes how to install a Solid-State Drive (SSD) module in the rear slot of the 24MXW and 48MXW switch models.

You need the following tools and materials to install an SSD module:

- ESD-preventive wrist strap

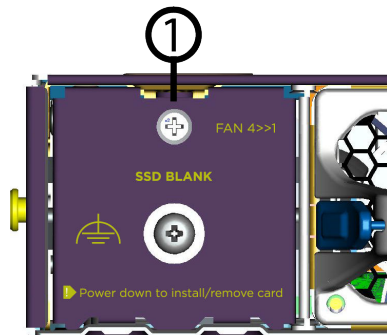
- #2 Phillips screwdriver



### Warning

To prevent damage to the switch or SSD module, the switch must be powered OFF when removing or installing SSD modules. SSD modules are not hot-swappable.

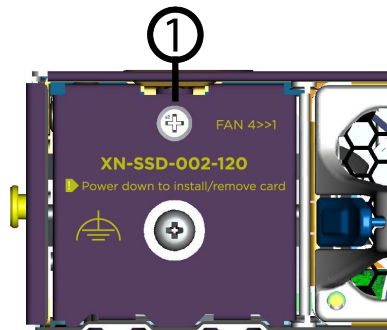
1. Attach the ESD wrist strap to your wrist and connect the metal end to an appropriate ground point on the rack.
2. Ensure that the switch is completely powered down.
3. Remove the rear panel blank from the SSD slot (#2 Phillips screwdriver required) in the rear of the switch.



**Figure 43: SSD Rear Panel Blank**

1 = SSD blank retaining screw location

4. Remove the SSD module from its packaging.
5. Carefully slide the SSD module into the slot on the rear panel until it is firmly in place.
6. Secure the SSD module using the screw provided.



**Figure 44: SSD Module Inserted in Slot**

1 = SSD module retaining screw location



# Replace Internal AC Power Supplies

---

[Replace a 715 W AC Power Supply](#) on page 84

[Replace an 1100 W AC Power Supply](#) on page 86

[Replace a 2000 W AC Power Supply](#) on page 88

This topic describes how to replace internal AC power supplies in a switch.



## Caution

Power supplies that support PoE cannot be installed in switches that do not support PoE. The switch operating system prevents PoE power contribution from a power supply that is not listed for use with that particular switch model.

## Replace a 715 W AC Power Supply

---

The 715 W AC power supply with part number XN-ACPWR-715W-FB is compatible with all 5720 Series models.

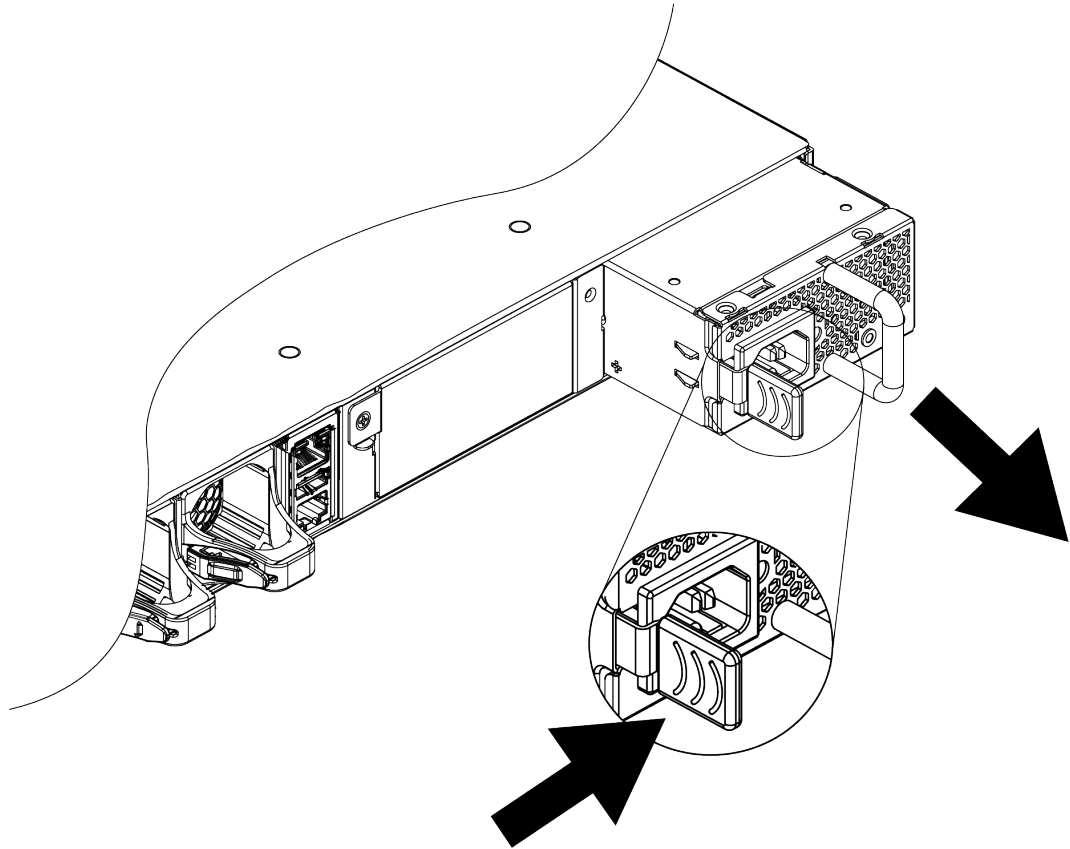
These switches have two bays for hot-swappable power supplies. In a switch with a redundant power configuration, you can replace one AC power supply without powering down the switch.

You need the following tools and materials to replace a 715 W AC power supply:

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

To replace a 715 W AC power supply, follow these steps:

1. Disconnect the AC power cord from the wall outlet and from the power supply.
2. Note the orientation of the installed power supply, and the location of the latching tab at the left of the unit.
3. Push the latching tab toward the power supply handle and pull outward on the handle to disengage the power supply internal connectors. See [Figure 45](#).



**Figure 45: Removing a 715 W AC Power Supply**

4. Carefully slide the power supply the rest of the way out of the switch.



**Caution**

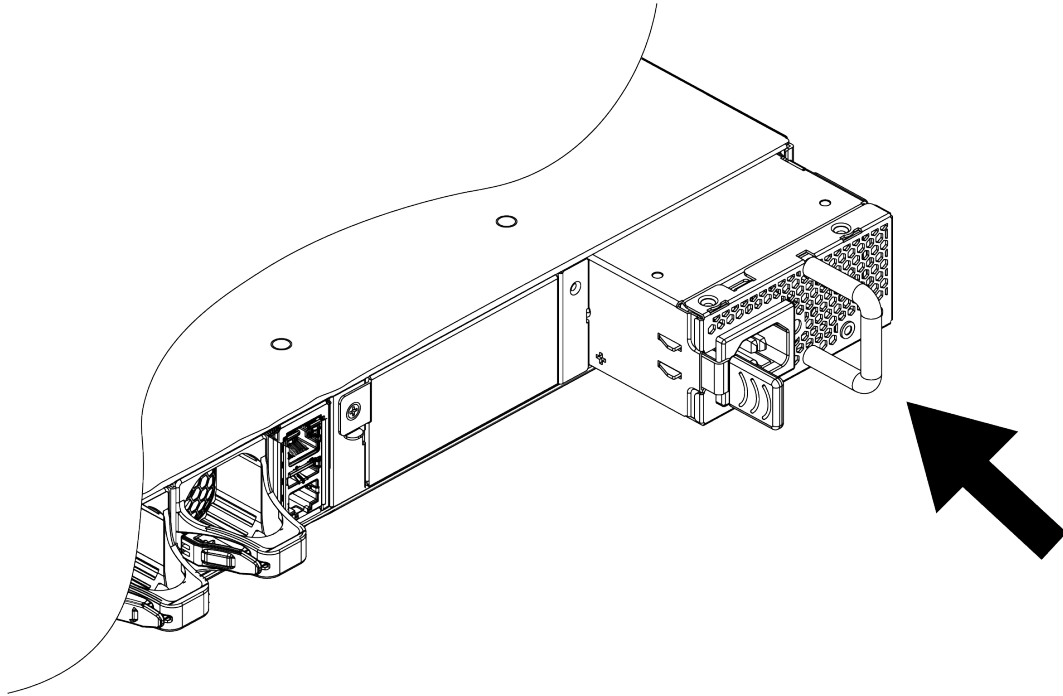
Power supplies can become very hot during operation. Wear thermal protective gloves when you remove a power supply from an operating switch.



**Note**

If you are not installing a replacement power supply, install a cover over the unoccupied power supply bay. Unoccupied bays must always be covered to maintain proper system ventilation and EMI levels.

5. Verify that the replacement power supply is oriented the same way as the unit you removed, and has the same airflow direction.
6. Carefully slide the power supply all the way into the power supply bay, as shown in [Figure 46](#).



**Figure 46: Installing a 715 W AC Power Supply**

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



**Caution**

Do not slam the power supply into the switch.

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



**Warning**

Always be 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 an 1100 W AC Power Supply

The 1100 W AC power supply with part number XN-ACPWR-1100W-FB is compatible with all 5720 Series models.

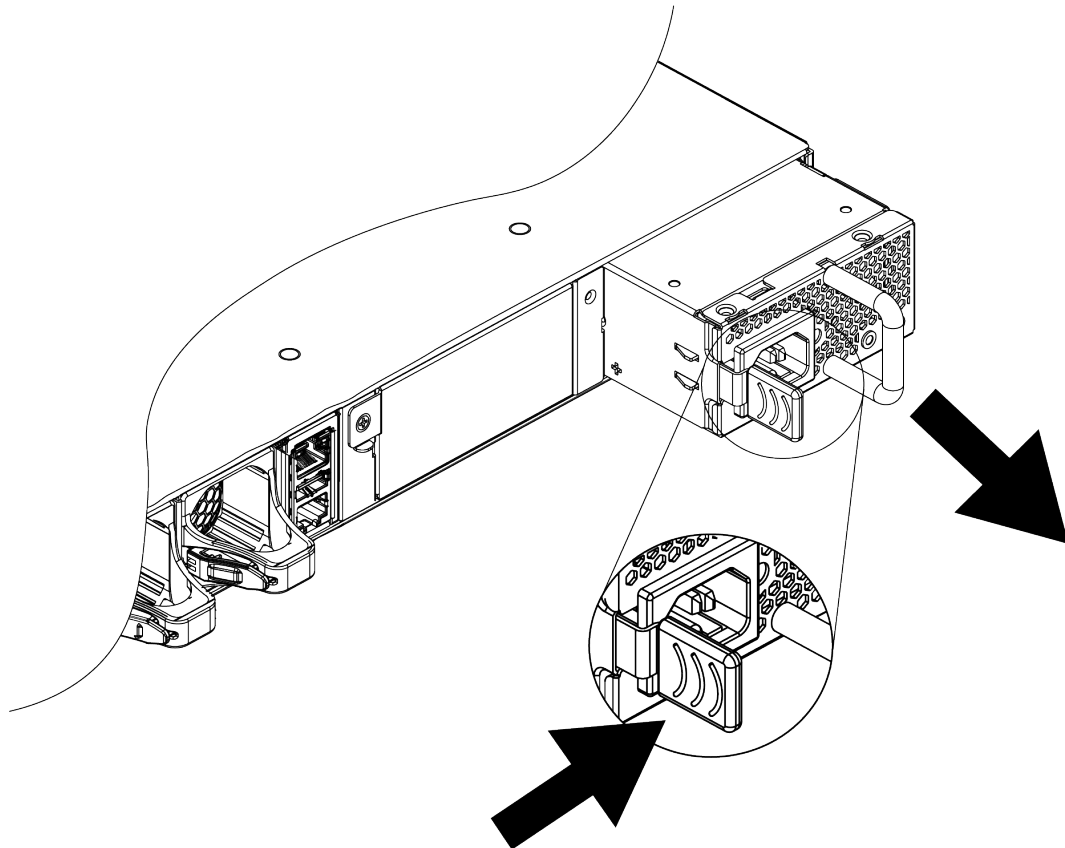
These switches have two bays for hot-swappable power supplies. In a switch with a redundant power configuration, you can replace one AC power supply without powering down the switch.

You need the following tools and materials to replace an 1100 W AC power supply:

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

To replace an 1100 W AC power supply, follow these steps:

1. Disconnect the AC power cord from the wall outlet and from the power supply.
2. Note the orientation of the installed power supply, and the location of the latching tab at the left of the unit.
3. Push the latching tab toward the power supply handle and pull outward on the handle to disengage the power supply internal connectors. See [Figure 47](#).



**Figure 47: Removing an 1100 W AC Power Supply**

4. Carefully slide the power supply the rest of the way out of the switch.



**Caution**

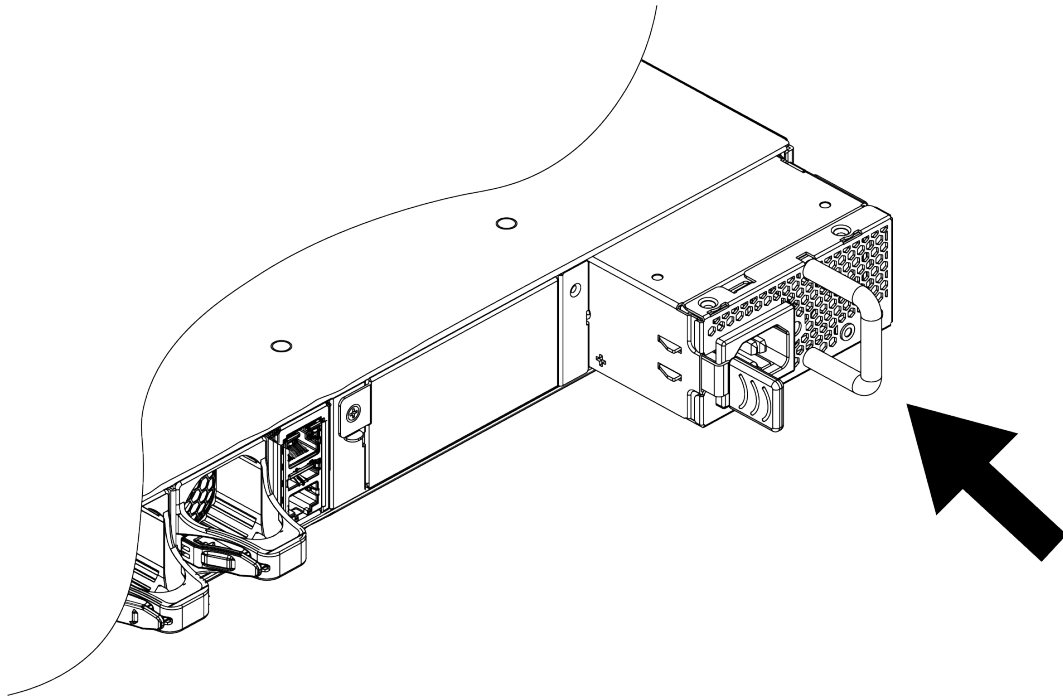
Power supplies can become very hot during operation. Wear thermal protective gloves when you remove a power supply from an operating switch.



**Note**

If you are not installing a replacement power supply, install a cover over the unoccupied power supply bay. Unoccupied bays must always be covered to maintain proper system ventilation and EMI levels.

5. Verify that the replacement power supply is oriented the same way as the unit you removed, and has the same airflow direction.
6. Carefully slide the power supply all the way into the power supply bay, as shown in [Figure 48](#).



**Figure 48: Installing an 1100 W AC Power Supply**

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



**Caution**

Do not slam the power supply into the switch.

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



**Warning**

Always be 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 a 2000 W AC Power Supply

The ExtremeSwitching 2000 W AC power supply with part number XN-ACPWR-2000W-FB is compatible with all 5720 Series models.

These switches have two bays for hot-swappable power supplies. In a switch with a redundant power configuration, you can replace one AC power supply without powering down the switch.

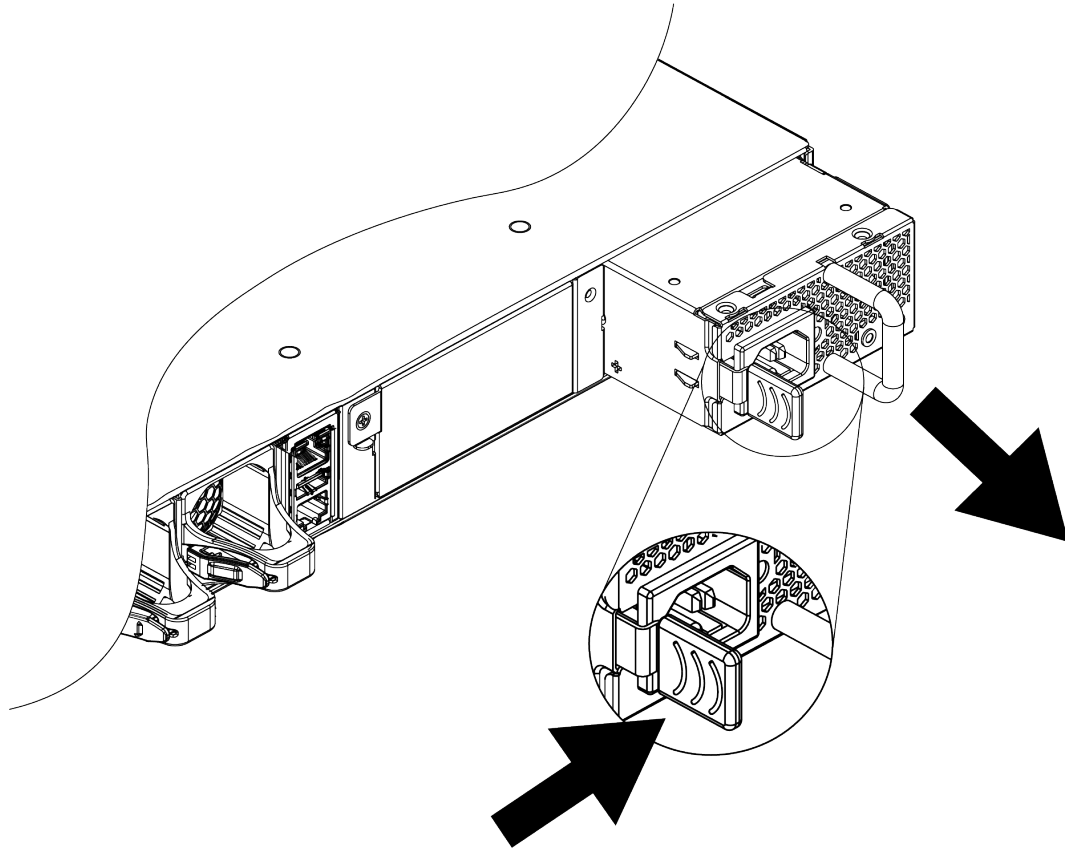
You need the following tools and materials to replace a 2000 W AC power supply:

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



To replace a 2000 W AC power supply, follow these steps:

1. Disconnect the AC power cord from the wall outlet and from the power supply.
2. Note the orientation of the installed power supply, and the location of the latching tab at the left of the unit.
3. Push the latching tab toward the power supply handle and pull outward on the handle to disengage the power supply internal connectors. See [Figure 49](#).



**Figure 49: Removing an ExtremeSwitching 2000 W AC Power Supply**

4. Carefully slide the power supply the rest of the way out of the switch.



**Caution**

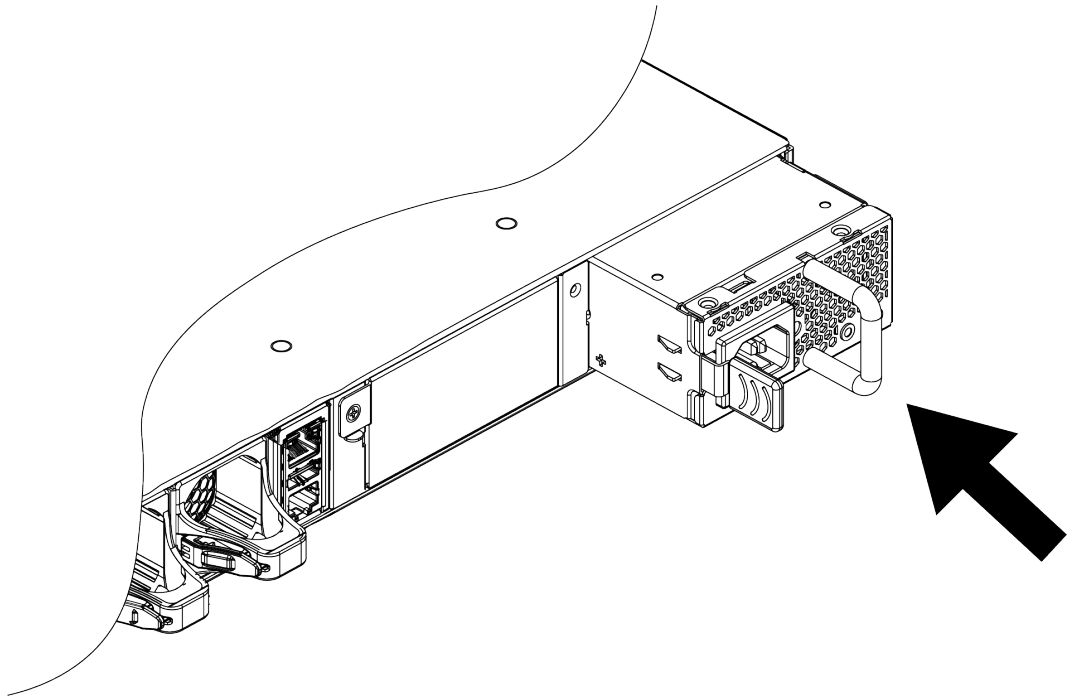
Power supplies can become very hot during operation. Wear thermal protective gloves when you remove a power supply from an operating switch.



**Note**

If you are not installing a replacement power supply, install a cover over the unoccupied power supply bay. Unoccupied bays must always be covered to maintain proper system ventilation and EMI levels.

5. Verify that the replacement power supply is oriented the same way as the unit you removed, and has the same airflow direction.
6. Carefully slide the power supply all the way into the power supply bay, as shown in [Figure 50](#).



**Figure 50: Installing an ExtremeSwitching 2000 W AC Power Supply**

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



**Caution**

Do not slam the power supply into the switch.

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



**Warning**

Always be 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

---

[Pre-Installation Requirements](#) on page 91

[Airflow Direction Requirements](#) on page 91

[Replace a Fan Module](#) on page 92

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



## Note

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

## Pre-Installation Requirements

---

You need a 1/4-inch flat-blade screwdriver to replace a fan module.



## Caution

Be sure to finish the replacement procedure promptly. The switch could overheat if left without cooling for an extended period.

## Airflow Direction Requirements

---

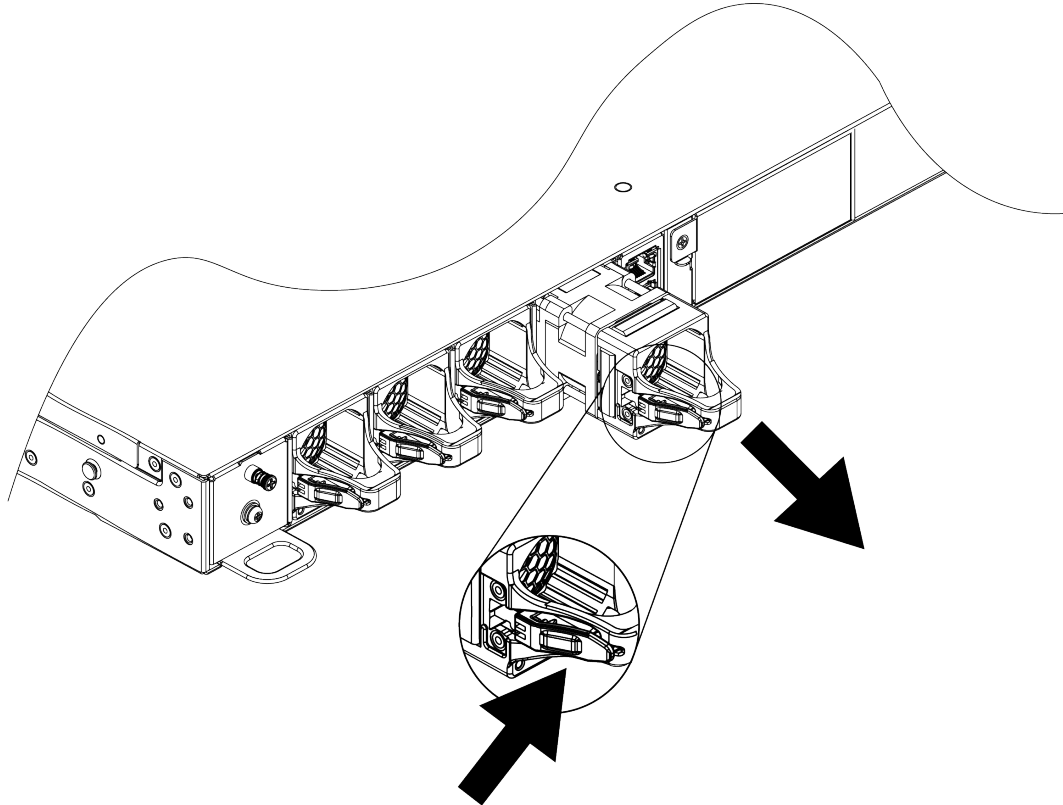
5720 Series switches are available with front-to-back airflow. In this switch, the fan modules are labeled **Air Out**.

All installed fan modules must blow air in the same direction and must match the airflow direction of the installed power supplies.

## Replace a Fan Module

To replace the fan module in a switch, do the following:

1. Push the latching tab toward the fan module handle and pull outward on the handle to disengage the fan module internal connectors. See [Figure 51](#).



**Figure 51: Removing a Fan Module**

2. Carefully slide the fan module the rest of the way out of the switch.



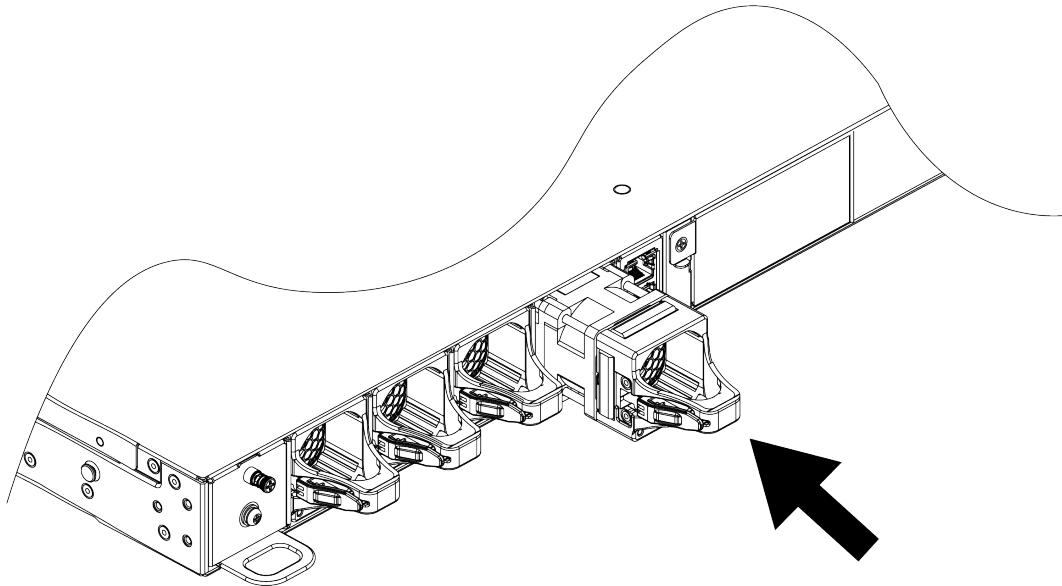
**Note**

If you are not installing a replacement fan module, install a cover over the unoccupied fan module slot. Unoccupied slots must always be covered to maintain proper system ventilation.

3. Verify that the airflow direction on the replacement fan module matches that of the installed fan modules.

Fans with front-to-back airflow are labeled **Air Out**.

- Carefully slide the replacement fan module all the way into the fan module slot, as shown in [Figure 52](#).



**Figure 52: Installing a Fan Module**

- Push the fan module in until the latch snaps into place.



**Caution**

Do not slam the fan module into the switch.



# Replace a Versatile Interface Module or Solid-State Drive

This section describes how to replace versatile interface modules (VIMs) or an SSD in the rear slot of an 5720 Series switch.

You need the following tools and materials to install a VIM:

- ESD-preventive wrist strap
- #2 Phillips screwdriver

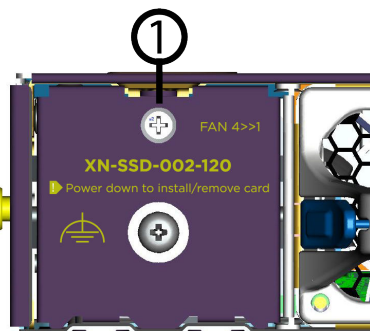


### Caution

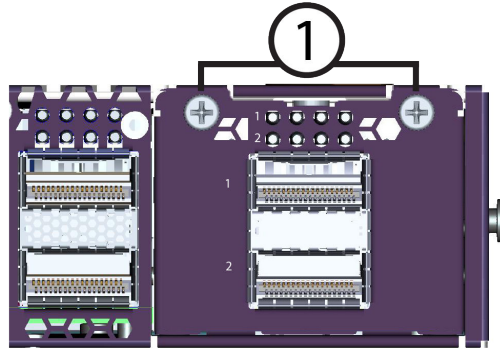
VIMs and SSDs are not hot-swappable. Disconnect power to the switch before removing an installed a VIM or SSD, or installing a new one.

To replace a VIM or SSD:

1. Attach an ESD-preventive wrist strap to your wrist and connect the metal end to an appropriate ground point on the rack.
2. Disconnect the switch power.
3. Remove the existing VIM or SSD:
  - a. Remove the retaining screws holding the existing module in place.

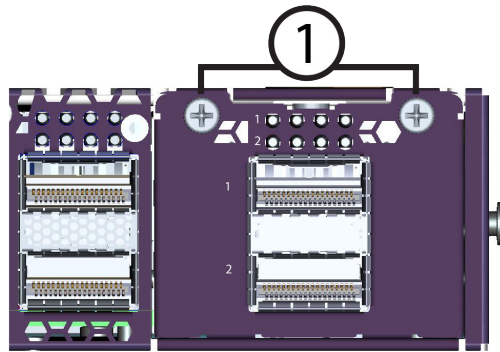


**Figure 53: SSD Module Inserted in Slot**

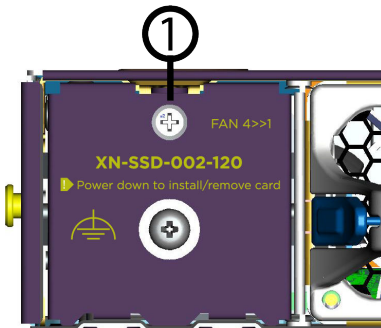


**Figure 54: VIM Module Inserted in Slot**

- b. Save the retaining screws to secure the new module in the switch.
- c. Pull the old module out of the module slot.
4. Remove the new VIM or SSD module from its anti-static packaging.
5. Install the VIM or SSD in the switch:
  - a. Carefully slide the module into the switch.
  - b. Insert and tighten the retaining screws you removed in step 3.a.



**Figure 55: Tighten Screws to Secure the VIM Module**



**Figure 56: Tighten Screw to Secure the SSD Module**



# Monitor the Device

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[5720 Series LEDs](#) on page 96

The following topics help you monitor the status of the 5720 Series while it is operating.

## 5720 Series LEDs

---

ExtremeSwitching 5720 Series Front Panel LEDs, as described in the following table:

**Table 22: 5720 Series Port LEDs**

LED	Color/State	Port State
SYStem status LED (Legacy MGMT function)	Green Flash slowly	POST Passed, normal operation, blinks on standalone switch, stack primary, and backup nodes in a stack; off for standby nodes in a stack
	Green Blinking	POST in progress
	Amber Blinking	POST failed or overheat
PSU status LEDs (P1/P2)	Green	Power On
	Off	Power off and no power attached
	Amber Blinking	Power supply failures
Fan status LEDs (F1/F2/F3/F4)	Green	Normal operation
	Amber Blinking	Fan failure
Bluetooth Status LED (BT)	Green Blinking	Bluetooth pairing in progress
	Green	Bluetooth connected
Locator LED (LOC)	Blue Blinking	Locator function

The following figure shows the LEDs for 5720 Series switches, including the two alternate mode LEDs: SPD and STK. You can use the Mode button to cycle through the three display modes for the port LEDs. In the default mode, SPD and STK are off. SPD and STK display modes expire after 30 seconds, at which time the port LEDs revert to the default SYS mode.





**Figure 57: 5720 Series Mode and System Status LEDs**



**Note**

Front-panel PoE ports use Amber to indicate PoE states.

## Port LEDs in Default (SYS) Mode

In the default SYS mode, SPD is OFF, and the port status displays behavior for link, traffic, and PoE as described in the following table:

**Table 23: Port LEDs in SYS Mode (default)**

Color/State	Meaning
Steady green	Link is OK; port is not PoE powered
Steady amber	Link is OK; port is PoE powered; no traffic
Blinking green	Link is OK and transmitting packets; port is not PoE powered
Blinking amber	Link is OK and transmitting packets; port is PoE powered
Slow blinking amber	No link, or disabled port; port is PoE powered
Alternating amber and green	Port has a power fault
Off	Port is not PoE powered, has no link, or is disabled

## Port LEDs in SPD Mode

After one press of the Mode button, the port LEDs enter the SPD Display Mode, indicated by the SPD LED. SPD mode is used to help determine the operational speed of a port.

RJ45 and SFP ports have a single LED per port. QSFP ports have four LEDs because QSFP ports can be divided into four different channels, each of which can indicate link and activity independent of the other channels. When a QSFP port is divided, each LED indicates the rate of an individual channel. When a QSFP port is used as single port, all of the channel LEDs indicate the rate of the single port. Color and blink pattern indicate speeds, as referenced by the following table:

**Table 24: Port LEDs in SPD Mode**

Color/State	Speed
Fast blinking green	100Mbps
Steady green	1Gbps

**Table 24: Port LEDs in SPD Mode (continued)**

Color/State	Speed
Slow blinking amber	2.5Gbps
Fast blinking amber	5Gbps
Slow blinking green	10Gbps
Fast blinking green	25Gbps
Fast blinking green	40Gbps
Fast blinking green	50Gbps
Fast blinking green	100Gbps

## Port LEDs in STK Mode

After two presses of the Mode button, the port LEDs 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, as referenced by the following table:

**Table 25: Port LEDs in STK Mode**

Port 1-8 Color/State	Speed
Steady green	Slot corresponding to the port number of the LED is present
Blinking green	Slot number corresponding to the port number of the blinking LED

## Management Port LEDs

The management port uses two LEDs to indicate port activity and link status, as referenced by the following table:

**Table 26: Management Port LEDs**

Right side LED		State
Link	Solid Green	Link up
	Off	No link up or port disabled
Left side LED		State
Act	Blinking Green	Packet transmitting or receiving
	Off	No packet transmitting or receiving

## Locator LED

The blue LED labelled LOC on the front panel is the locator LED, which is controlled by using the CLI.



# Extreme 5720 Series Technical Specifications

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[5720 Series Technical Specifications](#) on page 100

[Acoustic Noise and Fan Speed](#) on page 101

[CPU and Memory](#) on page 102

[Mean Time Between Failures](#) on page 102

[Power Specifications](#) on page 103

[LRM/MACsec Adapter Technical Specifications](#) on page 104

[Environmental](#) on page 106

[Standards](#) on page 106

[Power Cord Requirements for AC-Powered Switches and AC Power Supplies](#) on page 108

[Console Connector Pinouts](#) on page 108

This section lists technical specifications for the hardware products described in this document.

## 5720 Series Technical Specifications

### External Interfaces

Switch Model	Interfaces
5720-24MW	<ul style="list-style-type: none"> <li>• 24 x 100M/1/2.5/5GBASE-T 802.3bt (90W) ports               <ul style="list-style-type: none"> <li>◦ Full-Duplex</li> <li>◦ MACsec-capable</li> </ul> </li> <li>• 2 x Stacking/QSFP28 ports (unpopulated)</li> <li>• 1 x Serial console port (RJ-45)</li> <li>• 1 x 10/100/1000BASE-T out-of-band management port</li> <li>• 2 x USB A ports for management or external USB flash</li> <li>• 1 x USB Micro-B console port</li> <li>• 1 x VIM slot</li> </ul>
5720-48MW	<ul style="list-style-type: none"> <li>• 48 x 100M/1/2.5/5GBASE-T 802.3bt (90W) ports               <ul style="list-style-type: none"> <li>◦ Full-Duplex</li> <li>◦ MACsec-capable</li> </ul> </li> <li>• 2x Stacking/QSFP28 ports (unpopulated)</li> <li>• 1x Serial console port (RJ-45)</li> <li>• 1x 10/100/1000BASE-T out-of-band management port</li> <li>• 2x USB A ports for management or external USB flash</li> <li>• 1x USB Micro-B console port</li> <li>• 1 x VIM slot</li> </ul>
5720-24MXW	<ul style="list-style-type: none"> <li>• 24 x 100M/1/2.5/5/10GBASE-T 802.3bt (90W) ports               <ul style="list-style-type: none"> <li>◦ Full-Duplex</li> <li>◦ MACsec-capable</li> </ul> </li> <li>• 2x Stacking/QSFP28 ports (unpopulated)</li> <li>• 1x Serial console port (RJ-45)</li> <li>• 1x 10/100/1000BASE-T out-of-band management port</li> <li>• 2x USB A ports for management or external USB flash</li> <li>• 1x USB Micro-B console port</li> <li>• 1 x VIM slot</li> <li>• 1 x SSD slot</li> </ul>
5720-48MXW	<ul style="list-style-type: none"> <li>• 48 x 100M/1/2.5/5/10GBASE-T 802.3bt (90W) ports               <ul style="list-style-type: none"> <li>◦ Full-Duplex</li> <li>◦ MACsec-capable</li> </ul> </li> <li>• 2x Stacking/QSFP28 ports (unpopulated)</li> <li>• 1x Serial console port (RJ-45)</li> <li>• 1x 10/100/1000BASE-T out-of-band management port</li> <li>• 2x USB A ports for management or external USB flash</li> <li>• 1x USB Micro-B console port</li> <li>• 1 x VIM slot</li> <li>• 1 x SSD slot</li> </ul>

Switch Model	Interfaces
5720-VIM-6YE	<ul style="list-style-type: none"> <li>6 x 1/10/25G SFP28 ports               <ul style="list-style-type: none"> <li>MACsec-capable</li> </ul> </li> </ul>
5720-VIM-2CE	<ul style="list-style-type: none"> <li>2 x 100Gb QSFP28 ports               <ul style="list-style-type: none"> <li>MACsec-capable</li> <li>10/25/40Gb data rates supported via channelization</li> </ul> </li> </ul>

## Weights and Dimensions

Part Number	Weight	Physical Dimensions
5720-24MW	8.05 kg (17.75 lb.)	Height: 43.2 mm (1.7 in.) Width: 444.5 mm (17.5 in.) Depth: 525.8 mm (20.7 in.)
5720-48MW	8.55 kg (18.85 lb.)	
5720-24MXW	8.05 kg (17.75 lb.)	
5720-48MXW	8.55 kg (18.85 lb.)	
5720-VIM-6YE	0.24 kg (0.53 lb.)	Height: 40.6 mm (1.6 in.) Width: 50.8 mm (2.0 in.) Depth: 175.3 mm (6.9 in.)
5720-VIM-2CE	0.22 kg (0.49 lb.)	

Part Number	Weight	Physical Dimensions
XN-ACPWR-715W-FB (715 W AC Power Supply)	2.55 lb (1.12 kg)	Height: 1.57 inches (4.0 cm) Width: 3.25 inches (8.3 cm) Length: 10.22 inches (26.0 cm)
XN-ACPWR-1100W-FB (1100 W AC Power Supply)		
XN-ACPWR-2000W-FB (2000 W AC Power Supply)	2.95 lb (1.34 kg)	<b>With handle:</b> Height: 1.57 inches (4 cm) Width: 3.25 inches (8.25 cm) Length: 11.51 inches (29.25 cm) <b>Without handle:</b> Height: 1.57 inches (4 cm) Width: 3.25 inches (8.25 cm) Length: 10.25 inches (26.05 cm)

## Acoustic Noise and Fan Speed

Switch Model	Bystander Sound Pressure (dB)	Weighted Sound Power level (B)
5720-24MW	48.8	6.3
5720-48MW	55.1	6.7
5720-24MXW	48.5	6.3
5720-48MXW	54.7	6.7

Note: All ports link up with full traffic, 50% PoE Budget Load, Dual 2000W PSU, 25°C

**Table 27: 5720 Fan Speed and Power Consumption**

Fan Speed	Fan Module RPM (typical)		Power
	Inlet Fan	Outlet Fan	Typical
Full (100%)	22500 (typ)	19500 (typ)	12V*2.3A=27.6W
Low (30%)	7000 (typ)	6100 (typ)	12V*0.2A=2.4W per module

\* Some units are equipped with (3) fan modules, while others are equipped with 4. Total fan power is equal to the number of installed fan modules multiplied by the fan power for each module.

## Fan Speed and Temperature Variation

The speed of the fan increases only when the temperature of the device increases. Fan speed is not dependent on any fan failures.

## CPU and Memory

Model	CPU	DRAM	SSD	eMMC and BIOS Flash
5720-24MW 5720-48MW	2-core, 2.2 GHz x86 Denverton CPU	2 GB DDR4 ECC memory	none	8 GB eMMC Flash Memory 16 MB BIOS flash
5720-24MXW 5720-48MXW	4-core, 2.1 GHz x86 Denverton CPU	8 GB DDR4 ECC memory	1 x 120 GB	

## Mean Time Between Failures

Ambient Temp = 25°C	5720-24MW	5720-24MXW	5720-48MW	5720-48MXW
System base	460,603	351,532	417,583	325,908

## Power Specifications

### Power Supply Specifications

	715W AC PSU	1100W AC PSU	2000W AC PSU*
Voltage Input Range (Nominal)	100-127/200-240 VAC	100-127/200-240 VAC	100-127/200-240 VAC
Line Frequency Range	50Hz to 60Hz	50Hz to 60Hz	50Hz to 60Hz
Power Supply Input Socket	IEC/EN60320 C16	IEC/EN60320 C16	IEC/EN60320 C16
Power Cord Input Plug	IEC/EN60320 C15	IEC/EN60320 C15	IEC/EN60320 C15
Operating Temperature	0°C to 55°C (32°F to 131°F) Normal Operation	0°C to 50°C (32°F to 122°F) Normal Operation	0°C to 50°C (32°F to 122°F)

\* 200-240 VAC is required to achieve full 2000W output. If run at 100-120VAC, output is limited to 1100W.



#### Note

- The ambient temperature of the operating environment must not exceed 45°C at sea level when using the 1100W or 2000W power supplies.
- The ambient temperature of the operating environment must not exceed 40°C at 1,500 meters.
- The ambient temperature of the operating environment must not exceed 35°C at 3,000 meters.
- The ambient temperature of the operating environment can be in the range of 0°C to 50°C at sea level to 3,000 meters when using 5720 models with the 715W power supply.

### 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)**
5720-24M W	86	293	2549	389
5720-24MX W	105	359	2576	416
5720-48M W	103	354	4078	543
5720-48MX W	105	359	4096	561

\* Includes maximum PoE load (W) through the switch

\*\* Does not include PoE load heat dissipated through external electronic load

## PoE Power Budget

Switch Model	1 x 715W	2 x 715W	1 x 1100W	2 x 1100W	1 x 2000W @ 110-132V AC	2 x 2000W @ 110-132V AC	1 x 2000W @ 220-264V AC	2 x 2000W @ 220-264V AC
5720-24M W	450W	1093 W	835W	1825W	835W	1825W	1735W	2160W
5720-24M XW	450W	1093 W	835W	1825W	835W	1825W	1735W	2160W
5720-48M W	450W	1093 W	835W	1825W	835W	1825W	1735W	3535W
5720-48M XW	450W	1093 W	835W	1825W	835W	1825W	1735W	3535W

## LRM/MACsec Adapter Technical Specifications

The LRM/MACsec Adapter (part no. 10965) can be attached to switch ports that are not LRM or MACsec capable, using a cable that is specifically designed for this purpose.

**Table 28: LRM/MACsec Adapter Packaged Dimensions**

Height	3.00 cm (1.18 in)
Width	7.60 cm (2.99 in)
Length	12.35 cm (4.86 in)
Weight	300 g (0.66 lb)

**Table 29: LRM/MACsec Adapter Power Specifications**

--	--



## LRM/MACsec Adapter Environmental Data and Standards

**Table 30: Environmental Data**

Operating temperature	0°C to 40°C (32°F to 104°F) when used with the following optics modules: <ul style="list-style-type: none"> <li>• Tunable DWDM SFP+ (part no. 10325)</li> <li>• ER SFP+ (part no. 10309)</li> <li>• ZR SFP+ (part no. 10310)</li> <li>• Bidirectional 120 km SFP (part nos. MGBIC-BX120-U and MGBIC-BX120-D)</li> </ul> 0°C to 45°C (32°F to 113°F) when used with all other supported optics modules
Storage and transportation temperature	-40°C to 70°C (-40°F to 158°F)
Humidity	10% to 95% relative humidity, non-condensing
Altitude	0 to 3,000 meters (9,850 feet)

**Table 31: Safety Standards**

North American Safety of ITE	UL 62368-1:2014, Listed Device (US) UL 60950-1 2nd Ed., A2:2014, Listed Device (US) CAN/CSA 22.2 #62368-1-14:2014 Canada)
European Safety of ITE	EN 62368-1:2014 EN 60950-1:2006+A11+A1+A12+A2 IEC 62368-1:2014 IEC 60950-1:2005 2nd+A1:2009+A2:2013 2014/35/EU Low Voltage Directive

## Five-Slot Bracket

**Table 32: Five-Slot Bracket for LRM/MACsec Adapter: Specifications**

Part no.	10966
Height	4.32 cm (1.70 in)
Width	48.26 cm (19.00 in)
Length	5.00 cm (1.97 in)
Weight	487 g (1.07 lb)

## Environmental

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### Environmental Specifications

EN/ETSI 300 019-2-1 v2.1.2 - Class 1.2 Storage  
EN/ETSI 300 019-2-2 v2.1.2 - 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) 30m/s<sup>2</sup> (3G), 11ms, 60 shocks  
Random vibration: 3 to 500 Hz at 1.5 G rms

### 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/s<sup>2</sup> (18 G), 6 ms, 600 shocks  
Packaged Vibration: 5 to 62 Hz at velocity 5 mm/s, 62 to 500 Hz at 0.2 G  
Packaged Random Vibration: 5 to 20 Hz at 1.0 ASD w/-3 dB/oct. from 20 to 200 Hz  
Packaged Drop Height: 14 drops minimum on sides and corners at 42 inches (<15 kg box)

## Standards

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### North American ITE

UL 60950-1  
UL/CuL 62368-1 Listed  
CSA 22.2 No. 60950-1 2nd edition 2014 (Canada)  
Complies with FCC 21CFR 1040.10 (U.S. Laser Safety)  
CDRH Letter of Approval (US FDA Approval)

## European ITE

EN 60950-1 2nd Edition  
EN 62368-1  
EN 60825-1 Class 1 (Lasers Safety)  
2014/35/EU Low Voltage Directive

## International ITE

CB Report & Certificate per IEC 60950-1  
CB Report & Certificate IEC 62368-1  
AS/NZS 60950-1 (Australia/New Zealand)

## EMI/EMC Standards

### North American EMC for ITE

FCC CFR 47 Part 15 Class A (USA)  
ICES-003 Class A (Canada)

### European EMC Standards

EN 55032 Class A  
EN 55024  
EN 61000-3-2, 2014 (Harmonics)  
EN 61000-3-3 2013 (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, 2 kV, Criteria B  
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, 0.15-80 MHz, 10V/rms, 80%AM (1kHz), 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)  
CCC Mark (China)  
KCC Mark, EMC Approval (Korea)  
BSMI (Taiwan)  
Anatel (Brazil)

NoM (Mexico)  
 EAC (Russia, Belarus, Kazakhstan)  
 NRCS (South Africa)

## IEEE 802.3 Media Access Standards

IEEE 802.3ab 1000BASE-T  
 IEEE 802.3bz 2.5G/5G/10GBASE-T  
 IEEE 802.3bt Type 4 PoE  
 IEEE 802.3ae 10GBASE-X  
 IEEE 802.3by 25GBASE-X  
 IEEE 802.3ba/802.3bm 40GBASE-X and 100GBASE-X  
 IEEE 802.3az Energy Efficient Ethernet

## 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 IEC320-C13 connector for connection to the switch or power supply.
- The power cord must have an appropriately rated and approved wall plug applicable to the country of installation.
- For cords up to 6 feet (2 m) long, the wire size must be 18 AWG (.75 mm<sup>2</sup>) minimum; over 6 feet, the minimum wire size is 16 AWG (1.0 mm<sup>2</sup>).

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

## Console Connector Pinouts

Table 33 describes the pinouts for a DB-9 console plug connector.

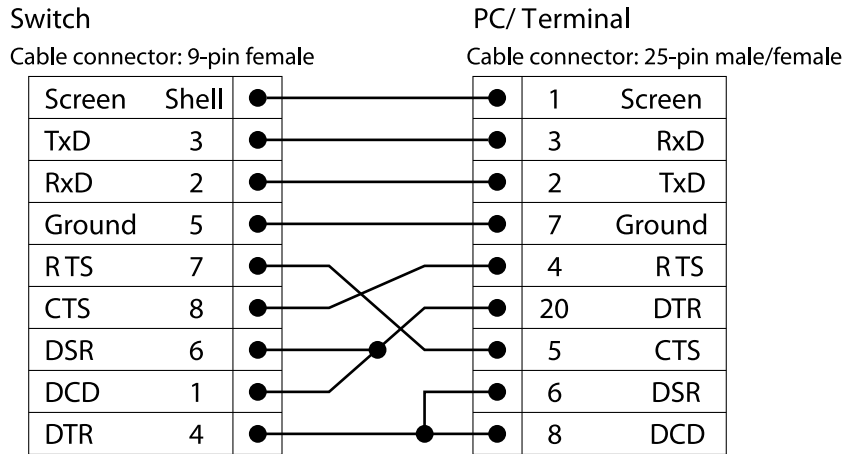
**Table 33: Pinouts for the DB-9 Console Connector**

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

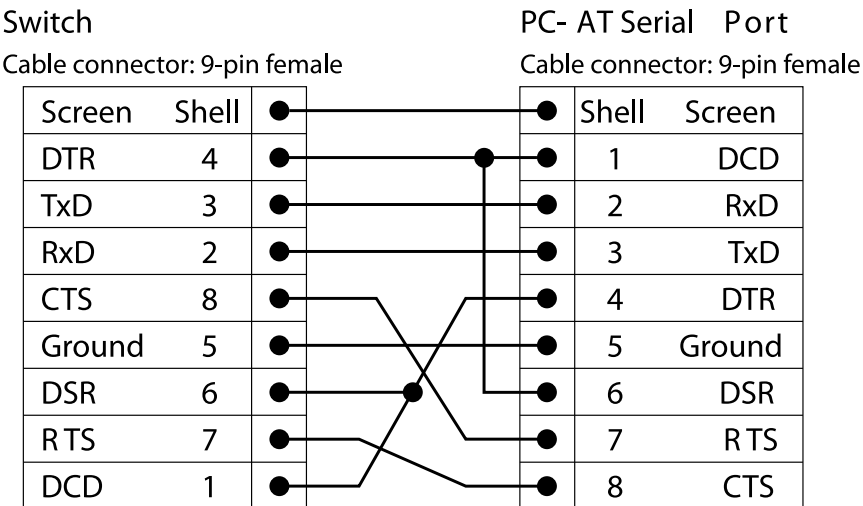
Function	Pin Number	Direction
RTS (request to send)	7	Out
CTS (clear to send)	8	In

Figure 58 shows the pinouts for a 9-pin to 25-pin (RS-232) null-modem cable.



**Figure 58: Null-Modem Cable Pinouts**

Figure 59 shows the pinouts for a 9-pin to 9-pin (PC-AT) null-modem serial cable.



**Figure 59: PC-AT Serial Null-modem Cable Pinouts**

Table 34 shows the pinouts for the RJ45 console port on the ExtremeSwitching switches.

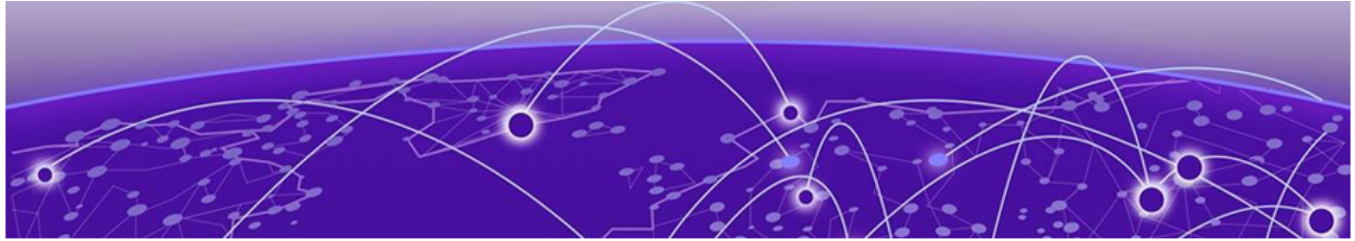
**Table 34: RJ45 Console Port on Switch**

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

**Table 35: 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

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[Considerations Before Installing](#) on page 112

[General Safety Precautions](#) on page 112

[Maintenance Safety](#) on page 113

[Fiber Optic Ports and Optical Safety](#) on page 113

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[Japan \(VCCI Class A\)](#) on page 118

[Korea EMC Statement](#) on page 118



## **Warning**

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).

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## Considerations Before Installing

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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.

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## General Safety Precautions

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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

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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

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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 metalically 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 metalically to OSP wiring. This warning does not apply to T1/E1 ports because T1/E1 ports have built-in isolation and surge protection that allows them to be connected 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](http://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

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A power cord is not included in the product box.

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](http://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

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**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

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### 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

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### Taiwan BSMI Warning

#### 警告使用者:

此為甲類資訊技術設備，於居住環境中使用時，可能會造成射頻擾動，在此種情況下，使用者會被要求採取某些適當的對策。

## China CQC Warning

### 警告使用者:

此为A级产品，在生活环境中，该产品可能会造成无线电干扰。

在这种情况下，可能需要用户对干扰采取切实可行的措施。

## 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情報技術装置です。この装置を家庭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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