9920 Network Packet Broker Hardware Installation Guide

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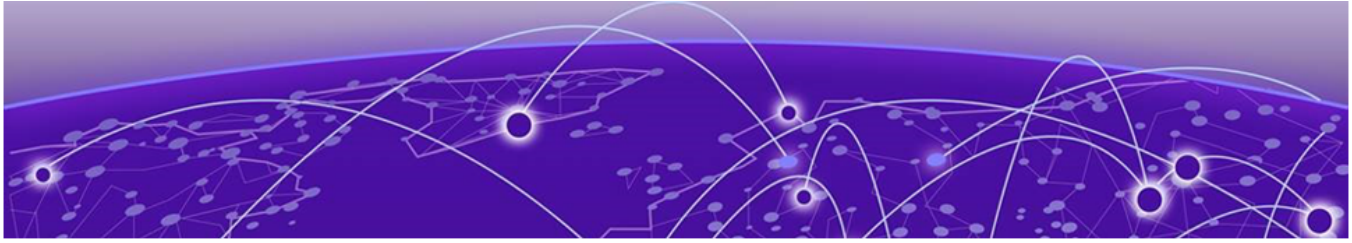

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Preface

This guide provides the instructions and supporting information needed to install the Extreme Networks® Extreme 9920.

The guide includes information about site preparation, device functionality, and device operation.

Audience

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 and the 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.

Conventions

This section discusses the conventions used in this guide.

Text Conventions

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

When a feature, function, or operation pertains to a specific hardware product, the product name is used. When features, functions, and operations are the same across an entire product family, such as 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 *enter* and *type*	When you see the word *enter* in this guide, you must type something, and then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says *type*.
Key names	Key names are written in boldface, for example **Ctrl** or **Esc**. If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press **Ctrl**+**Alt**+**Del**
Words in italicized type	Italics emphasize a point or denote new terms at the place where they are defined in the text. Italics are also used when referring to publication titles.
NEW!	New information. In a PDF, this is searchable text.

Table 3: Command syntax

Convention	Description
bold text	Bold text indicates command names, keywords, and command options.
italic text	Italic text indicates variable content.
`[ ]`	Syntax components displayed within square brackets are optional. Default responses to system prompts are enclosed in square brackets.
`{ x | y | z }`	A choice of required parameters is enclosed in curly brackets separated by vertical bars. You must select one of the options.

Table 3: Command syntax (continued)

Convention	Description
x | **y**	A vertical bar separates mutually exclusive elements.
< >	Nonprinting characters, such as passwords, are enclosed in angle brackets.
...	Repeat the previous element, for example, *member*[*member*...].
\	In command examples, the backslash indicates a "soft" line break. When a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash.

Terminology

When features, functionality, or operation is specific to a device family, such as ExtremeSwitching, the family name is used. Explanations about features and operations that are the same across all product families simply refer to the product as the *device*.

Providing Feedback

The Information Development team at Extreme Networks has made every effort to ensure the accuracy and completeness of this document. We are always striving to improve our documentation and help you work better, 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 in the document.
- Broken links or usability issues.

If you would like to provide feedback, you can do so in three ways:

- In a web browser, select the feedback icon and complete the online feedback form.
- Access the feedback form at https://www.extremenetworks.com/documentation-feedback/.
- Email us at 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.

Getting Help

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

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.

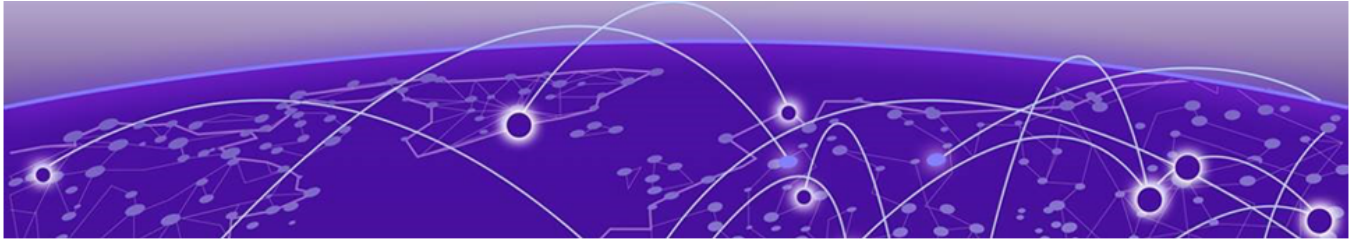
You can modify your product selections or unsubscribe at any time.

Documentation and Training

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/.



Extreme 9920 Overview

The Extreme 9920 is a next-generation network packet broker solution for pervasive monitoring of large, fixed service provider networks (SPs) and for both physical and virtual 5G mobile networks operators (VMNOs). The Extreme 9920 delivers uncompromising insights into the traffic traveling across large service provider networks, assists in understanding user behavior, and helps businesses protect themselves by centralizing and improving network efficiency and ROI across many network devices.

The Extreme 9920:

- Provides highly scalable network visibility for high-capacity network monitoring.
- Enables wire-speed traffic aggregation, regeneration, optimization, and load balancing to deliver maximum tool productivity.
- Provides selective or full data traffic aggregation and regeneration as well as load balancing.
- Facilitates high availability (HA) and business continuity.
- Provides hierarchical scale out architecture to better align function and robustness for the largest data center and service provider environments.
- Enables intelligent filtering, packet slicing, and decapsulation.
- Works in tandem with Extreme Visibility Manager.

The Extreme 9920 is a high density chassis in a 4U vertically oriented configuration. The Extreme 9920 supports up to 256 multispeed ports ranging from 10 Gb to 100 Gb, and aggregates and monitors up to 12.8 Tbps of total traffic. The chassis supports four power supplies and five fan modules, each with 2x80 mm fans. Five fan modules are required. For more information, see Technical Specifications on page 57.

Figure 1: 9920 Network Packet Broker

Management

A Type A USB console port on the front panel of the Extreme 9920 connects the chassis to a laptop or PC for local management functions. A Mini-B USB console serial port on the front panel can also be used for management functions. If the USB Type A host port is connected, it is selected over the Mini-USB port, and system does not accept any input from the Mini-USB port. A DB9 adapter is required to convert from serial to DB9. There is also an additional adapter that can be used with the cable to convert to RJ-45.

An Ethernet management port can also connect the system to an out of band management network for administration. Alternatively, an Ethernet cable can connect this port directly to a laptop to view and locally manage the chassis configuration. The Ethernet management port supports 10/100/1000 Mbps speeds.

There is also a Type A USB 2.0 port that can host removable devices like flash drives.

Power Supplies for Use with the Extreme 9920

Four power supply slots support the installation of up to four 1,600 watt power supplies. The Extreme 9920 accommodates AC power supplies, DC power supplies, or a mixture of both. Each power supply is self enclosed with an integrated cooling fan that vents directly to the rear of the Extreme 9920, to provide front-to-back cooling airflow.

The following figure shows the rear of the chassis with four power supply modules. The power supply slots are situated in the four contiguous slots starting from the left-hand side to the bottom and the rear of the chassis. They are numbered PSU 1 through PSU 4. Power supplies are hot swappable as long as there are enough power supplies remaining to provide the necessary amount of power. Power needs vary depending on the number of installed interface modules.

Note

Do not remove the cover from the fifth, or last, power supply slot on the far right to the bottom and the rear of the chassis. The slot has no function and system airflow is disrupted if the cover is removed, which affects the cooling of the internal components.

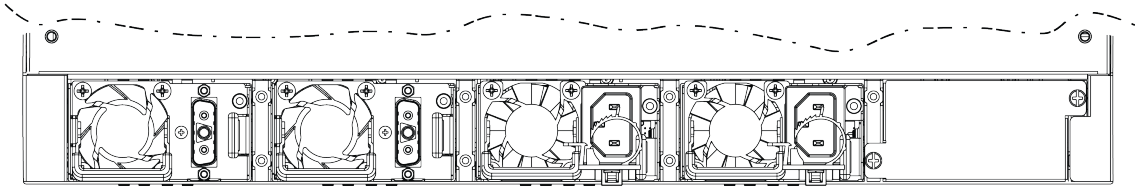


Figure 2: View of the power supply units in the rear of the 9920

AC power supply

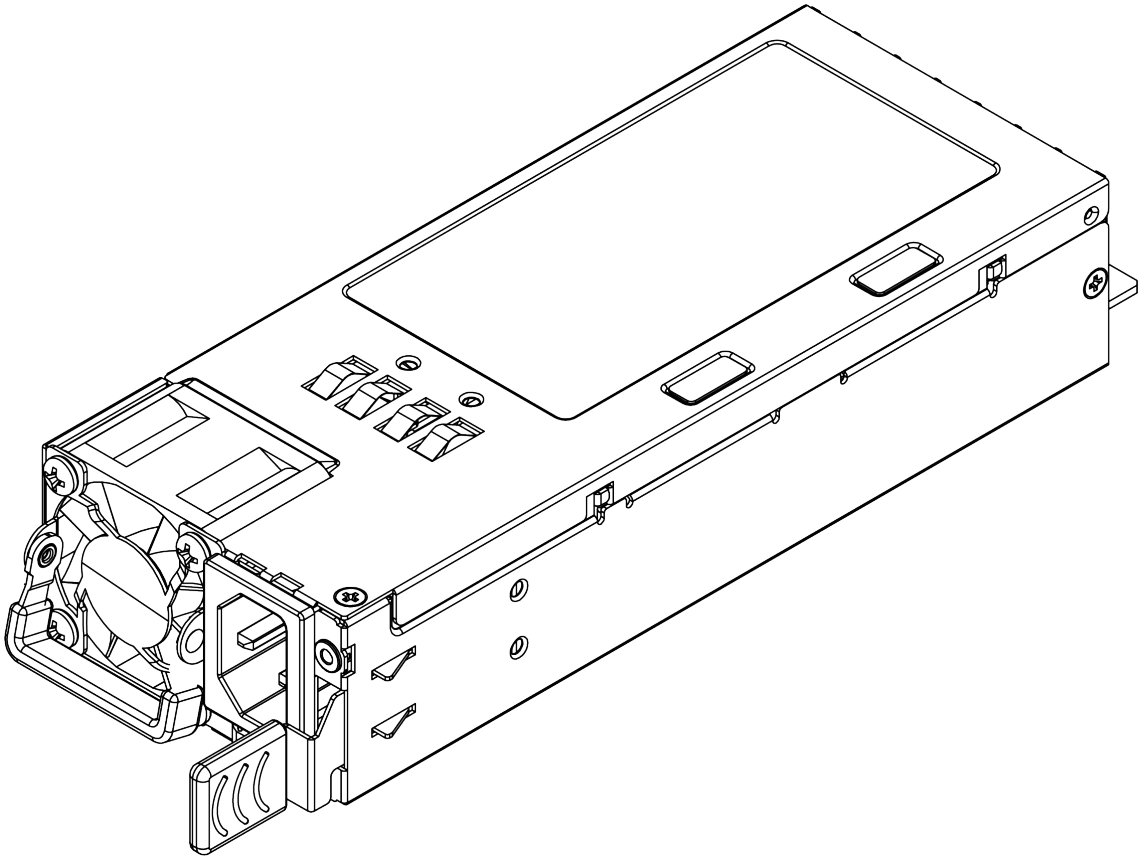


Figure 3: Front view of a 1600W AC power supply

DC power supply

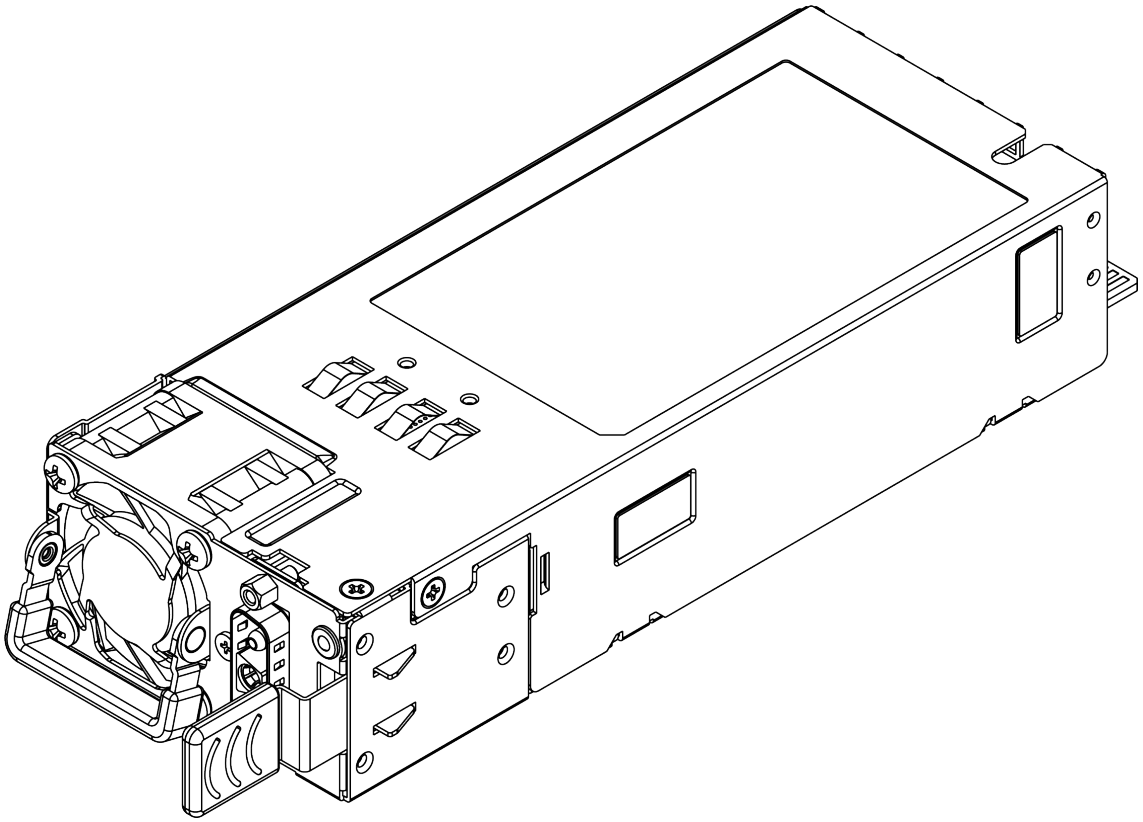


Figure 4: Front view of a 1600W DC power supply

DC power cable

A DC power cord is provided with the DC power supply.

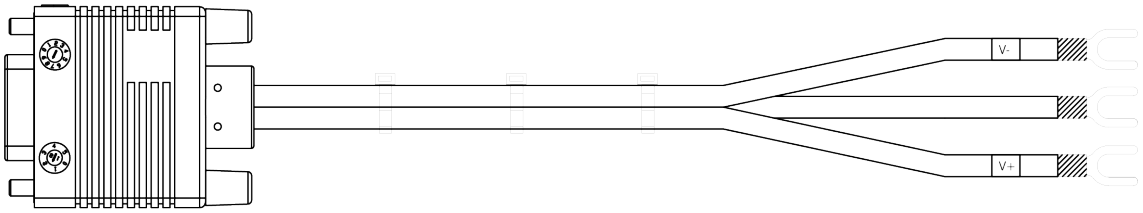


Figure 5: DC power cord provided with the DC power supply

Fan Modules for Use with the Extreme 9920

Five fan module slots accommodate five fan modules. Each fan module contains 2x80 mm fans that provide front-to-back airflow to cool the chassis. All five fan modules must be installed for proper cooling. The fans in each module create a negative pressure that is evenly distributed across the interface modules. If a fan module fails, do not remove it until a replacement is available. When a fan module is removed, the empty slot diminishes air flow in the places where it is needed, which can cause interface modules to overheat and shutdown. The system can operate with an inoperable, but present, fan module indefinitely, but it can only operate for a short period of time with one module removed.

The following figure shows the rear of the chassis with all five fan modules. Facing the rear, the fan modules are numbered Fan 1 through Fan 5 from left-to-right. Fan modules are hot-swappable.

Warning

Risk of personal injury

When you remove a fan module, wait for the fans to spin down before you fully withdraw the fan module. Be careful to keep your fingers out of the fan blades.

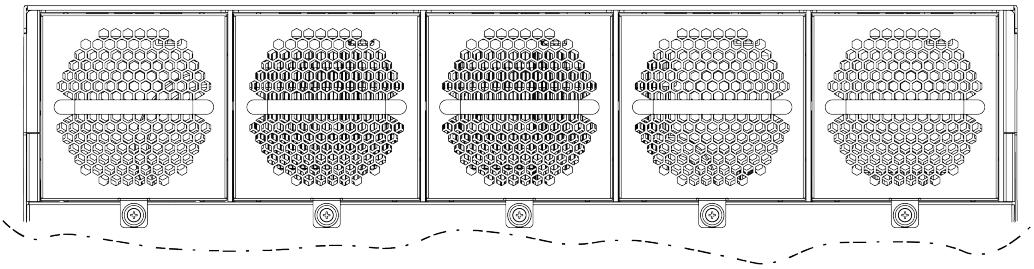


Figure 6: View of the fans in the rear of the 9920

Fan speed

There are thermal sensors inside the chassis that monitor the temperature inside the chassis. The sensors send information regarding temperature readings to the central controller, which automatically adjusts the fan module fan speed to maintain the proper temperature. For example, when the central controller determines that the temperature readings of the sensors is decreasing, the fan module fan speed also decreases. However, if one of the fan modules fails or is temporarily removed, the central controller increases the speed of the other fan modules to provide maximum cooling to the chassis. The chassis can operate with a single fan module failure and still maintain uniform airflow across all module slots. When all fan modules are operational, the central controller, using internal temperature sensors, determines the speed of the fans.

Warning

Do not operate the chassis for more than a few minutes with a missing fan module. To ensure internal chassis air pressure is maintained and to avoid interface modules overheating and shutting down, leave a failed fan module installed until a replacement is available.

Alarms are triggered when the temperature exceeds the following alarm thresholds—Warning, Critical, and Shutdown.

Note

%d represents a number for either a sensor, slot, or temperature.

The following list shows the log messages for the three threshold types:

- Warning—Temperature Sensor *%d* is (*%d* C) has exceeded the alarm threshold temperature (*%d* C).
- Critical—Sensor %d slot %d temperature (%d C) exceeded the critical alarm threshold (%d C). Module will be shut down at (%d C).
- Shutdown—Sensor %d in slot %d temperature (%d C) exceeded the shutdown threshold temperature (%d C). Module has been powered down.

Alarms are cleared when the temperature decreases 2° below the threshold temperature. The following list shows the log messages when an alarm is cleared:

- Critical threshold—Sensor %d in slot %d overheat critical alarm cleared
- Warning threshold—Temperature Sensor %d overheat temperature alarm cleared

You can use the following command to monitor the current temperature, and view the threshold values for Warning, Critical, and Shutdown.

```
show sys-info temperature
```

The following table provides a description of the various threshold limits:

Table 4: Alarm thresholds

Value	Description
Sensor Index	Specifies sensor IDs from 1 to 5. There are five sensors on each module.
Current temperature	Specifies the current temperature sensor reading.
Warning threshold	Specifies the temperature at which an alarm is raised.
Critical threshold	Specifies the point at which a log message is generated. Action must be taken at this point otherwise the module is at risk of reaching the shutdown threshold.
Shutdown threshold	Specifies the critical maximum value when the module shuts down. Note: A module must be powered on again when it returns to normal state after entering a shutdown state. Normal state is when the temperature is below the Warning threshold value, and there is no alarm on the system.

The following table shows an example of the threshold values for each temperature sensor in degrees Celsius (° C):

```
NPB# show sysinfo sensor all

Sensor Information
Id        Name               Current(˚C)   Warning(˚C)   Critical(˚C)  Shutdown(˚C)
-------------------------------------------------------------------------------------
1         CPU Core                 35            85            90
100
2         TF2 MAC                  41            75            80
95
3         TF2 Serdes1              49            80            85
95
4         TF2 Serdes2              46            80            85
95
5         TF2 Serdes3              48            80            85
95
6         TF2 Serdes4              47            80            85
95
7         LC1 PHY MAX              65            115           120
125
8         LC1 QSFP MAX             38            63            68
73
9         LC2 PHY MAX              60            115           120
```

```
125
10        LC2 QSFP MAX            25            63            68
73
11        LC3 PHY MAX             65            115           120
125
12        LC3 QSFP MAX            31            63            68
73
13        LC4 PHY MAX             64            115           120
125
14        LC4 QSFP MAX            30            63            68
73
15        LC5 PHY MAX             66            115           120
125
16        LC5 QSFP MAX            33            63            68
73
17        LC6 PHY MAX             57            115           120
125
18        LC6 QSFP MAX            0             63            68
73
19        LC7 PHY MAX             53            115           120
125
20        LC7 QSFP MAX            0             63            68
73
21        LC8 PHY MAX             52            115           120
125
22        LC8 QSFP MAX            0             63            68
73
23        DIMM1                   39            80            85
0
24        DIMM2                   35            80            85
0
25        DIMM3                   36            80            85
0
26        DIMM4                   34            80            85
0
27        SSD                     40            80            85            0
```

Each fan module contains two fans. Use the following command to monitor the status of each fan in all five cooling modules:

`show sys-info fan`

```
NPB# show sysinfo fan

Fan Information
Id     Status      RPM     Percentage SpeedLevel     Direction
-------------------------------------------------------------------------------
1      Up          5800    33         LOW            FAN_DIR_F2B
2      Up          5800    33         LOW            FAN_DIR_F2B
3      Up          5900    33         LOW            FAN_DIR_F2B
4      Up          5800    33         LOW            FAN_DIR_F2B
5      Up          5900    33         LOW            FAN_DIR_F2B

FAN_DIR_F2B - Fan Airflow Direction is FrontToBack

FanSpeedLevel - <40%[LOW],40-70%[MEDIUM],>70%[HIGH]
```

Interface Module for Use with the Extreme 9920

Eight vertically oriented interface module slots support the installation of up to eight 9920-16C interface modules. Each interface module supports up to sixteen 100 Gb ports, for a total of 128 100Gb ports.

There is also one feature slot that is reserved for future use. The 9920-16C interface module is hot-swappable.

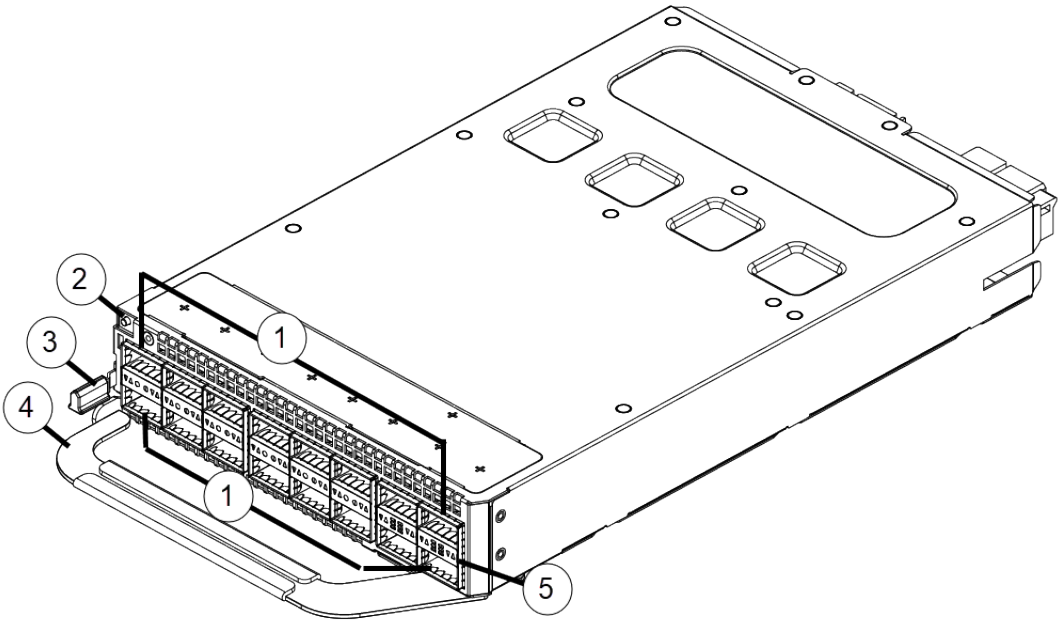
The front panel of the 9920-16C modules contains four LEDs located between the upper and lower ports. The two LEDs on the left are both green and indicate the channel within the port, which is indicated by the remaining two LEDs. The font panel also contains a Channel Selector button, which cycles through the four selectable channels.

esd

Electrostatic discharge (ESD) can damage electronic circuits. Do not touch electronic hardware unless you wear a grounding wrist strap or other static-dissipating device.

warning

Keep the metal cover plate in place over empty module slots. An empty module slot allows air into the chassis, which reduces the negative pressure in the chassis. This reduces airflow to the installed modules.



The following table provides a description of the ports and LED indicators for all IOC models, as shown in the preceding figure:

1 = 16 port 40Gb/100 Gbps QSFP ports, even ports (2, 4, 6, 8, 10, 12, and 14) can be patitioned to 4 x 25Gbps or 4 x 10Gbps	4 = Interface module ejector lever
2 = Channel select button	5 = LED status indicators: Left two LEDs indicate channel. Right two LEDs indicate port speed and link status. LEDs are for every port pair.
3 = Interface module handle release	

Port Partioning

With port partitioning (or channelization), you can configure a single port to operate as four individual ports. Port partitioning is supported for the following port speeds:

40 Gbps (QSFP+)

When partitioned, the port operates as four seperate 10 Gbps ports while using QSFP+ cables.

100 Gbps (QSFP28)

When partitioned, the port operates as four seperate 25 Gbps ports while using QSFP28 cables.

When partitioning either 40 Gbps QSFP+ ports or 100 Gbps QSFP28 ports, only the eight even numbered ports can be partioned. The lower odd numbered port interface is blocked when the higher even numbered port interface is partioned. You can use 40GBASE-CR4 (copper) or 40GBASE-SR4 (fiber) or 100GBASE-CR4 (copper) or 100GBASE-SR4 (fiber) breakout cables to connect the 40/100 Gigabit Ethernet ports to other servers, storage devices, and switches. For breakout cable details, see *Extreme Networks Pluggable Transceivers Installation Guide*.

Ports are not partitioned by default. If partitioning is not enabled, the ports display the existing port format as “slot/port”. When partitioning is enabled, ports display the format as “slot/port/sub-port” in the input/output.

FEC Configuration Support

Configure Forward Error Correction (FEC) on a port to obtain error control in data transmission over an unreliable or noisy channel. You can configure FEC on 100 Gbps ports or on channelized 100 Gbps ports operating at 25 Gbps speed.

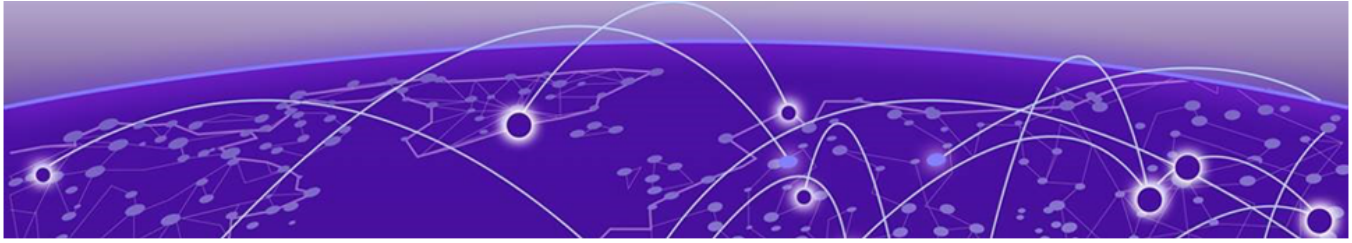
The following FEC options are supported:

- Disabled
- RS-FEC
- FC-FEC

FEC is not supported on a 100 Gbps port operating at 40 Gbps speed or on a management port.

Important

On ports that support FEC configuration, ensure that you configure the same option at both end points. Otherwise, the link does not come up.



Site Preparation

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

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

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

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

Plan Your Site

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

1. Meeting site requirements.

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

   - Building and electrical code requirements
   - Environmental, safety, and thermal requirements for the equipment you plan to install
   - Equipment rack requirements
2. Evaluating and meeting cable requirements.

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

3. Meeting power requirements.

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

   For power specifications of the switches, see the specific switch listings in "Technical Specifications."

Operating Environment Requirements

Verify that your site meets all environmental and safety requirements.

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

Meet Building and Electrical Codes

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

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

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

The organizations listed in Table 5 are authorities on electrical codes.

Table 5: 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	www.nfpa.org/
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	www.ul.com

Table 5: Authorities on Electrical Codes (continued)

Organization	Address	Web Site URL
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	www.nema.org
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	www.ecianow.org
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 of1934. The FCC regulates all U.S. telephone and cable systems.	FCC 445 12th Street S.W. Washington, DC 20554 USA	www.fcc.gov

Set Up the Wiring Closet

Be aware of the following recommendations for your wiring closet:

- Make sure that your system is easily accessible for installation and service. See Rack Specifications and Recommendations on page 23 for more information.
- Use appropriate AC or DC power, power distribution, and grounding for your specific installation.
- Use a vinyl floor covering in your wiring closet. (Concrete floors accumulate dust, and carpets can cause static electricity.)
- Prevent unauthorized access to wiring closets by providing door locks. Install the equipment in a secured, enclosed, and restricted access location, ensuring that only qualified service personnel have access to the equipment.
- Provide adequate overhead lighting for easy maintenance.
- Be sure that each wiring closet has a suitable ground. All equipment racks and equipment installed in the closet should be grounded.
- Be sure that all system environmental requirements are met, such as ambient temperature and humidity.

Note

Consult an electrical contractor for commercial building and wiring specifications.

Control the Temperature

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

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

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

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

Table 6 summarizes the behavior of ExtremeSwitching 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 6: Thermal Shutdown and Restart Behavior

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

Control the Humidity Level

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

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

Protect Your System from ESD (Electrostatic Discharge)

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

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

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

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

Rack Specifications and Recommendations

Racks should conform to conventional standards.

In the United States, use EIA Standard RS-310C: Racks, Panels, and Associated Equipment. In countries other than the United States, use IEC Standard 297. In addition, verify that your rack meets the basic mechanical, space, and earthquake requirements that are described in this section.

Mechanical Recommendations for the Rack

Use equipment racks that meet the following mechanical recommendations:

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

Ground the Rack

The rack must be properly grounded.

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

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

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

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

Note

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

Provide Adequate Space for the Rack

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

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

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

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

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

Secure the Rack

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

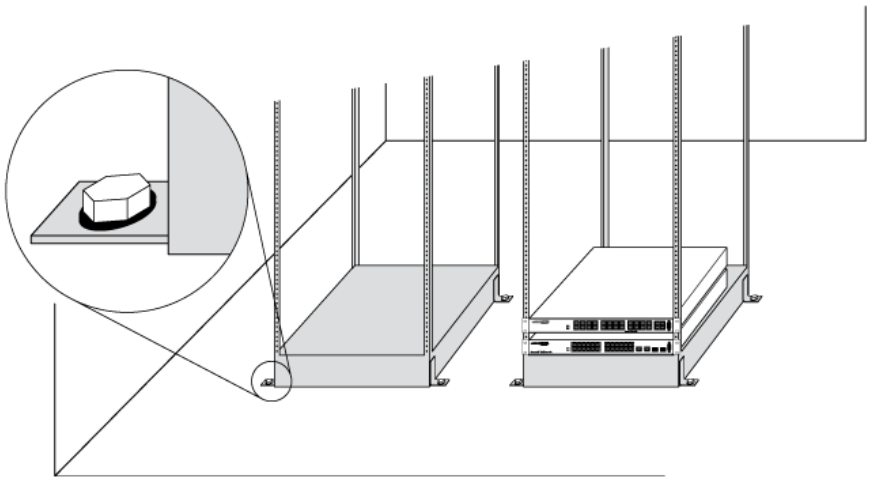


Figure 7: Properly Secured Rack

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

Evaluate and Meet Cable Requirements

Use professional consultants for site planning and cabling.

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

For information, visit www.bicsi.org.

Label Cables and Keep Accurate Records

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

Keeping accurate records helps you to:

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

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

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

Install Cable

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

- Examine cable for cuts, bends, and nicks.
- Support cable using a cable manager that is mounted above connectors to avoid unnecessary weight on the cable bundles.
- Use cable managers to route cable bundles to the left and right of the network equipment to maximize accessibility to the connectors.
- Provide enough slack, approximately 5 to 7.5 cm (2 to 3 in), to provide proper strain relief as shown in Figure 8 on page 26.
- 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.

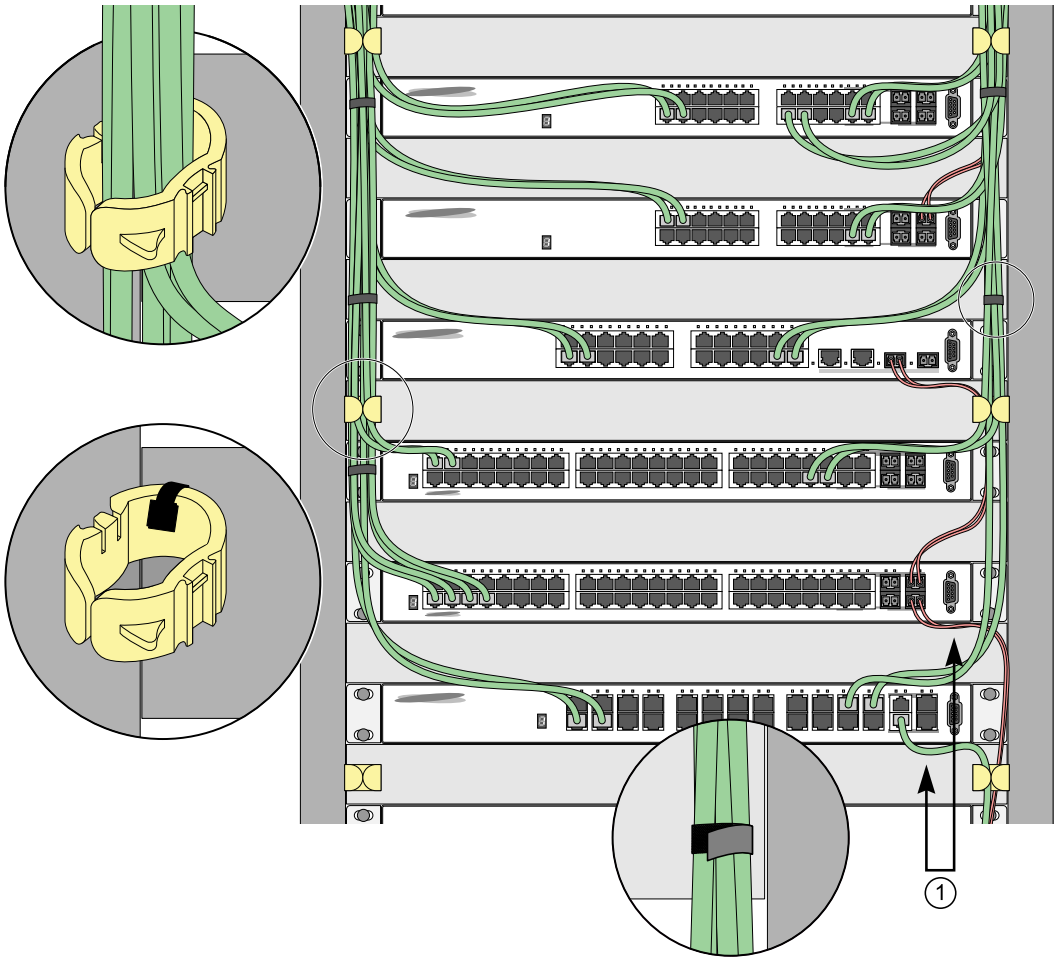


Figure 8: Properly Installed and Bundled Cable

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, example, 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 9.

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.

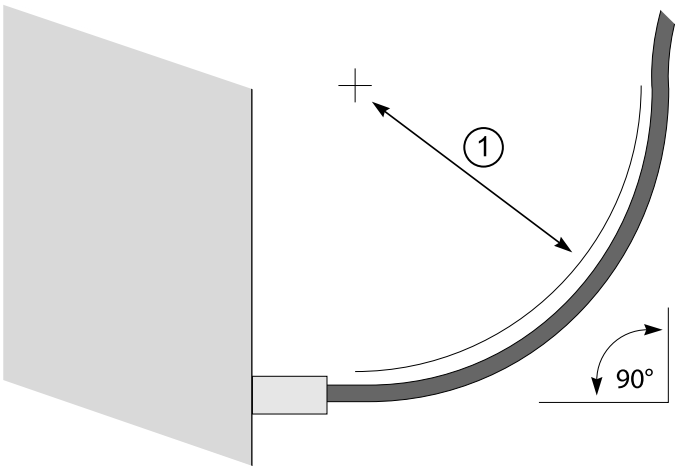


Figure 9: Bend Radius for Fiber Optic Cable

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

Cable Distances and Types

Table 7 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 7: 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
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	–	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

[1] 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 7: Cable Distances and Types (continued)

Standard	Media Type	MHz•km Rating	Maximum Distance (Meters)
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-LRM SFP+ (1310nm optical window)	62.5/125 µm multimode fiber	–	220
10GBASE-ER SFP+ (1550nm optical window)	10/125 µm single-mode fiber	–	40,000
40GBASE-SR4 QSFP+ (850nm optical window)	50 µm multimode fiber (OM3)	–	100
	50 µm multimode fiber (OM4)		150
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 10 shows examples of recommended and non-recommended connector jacket types.

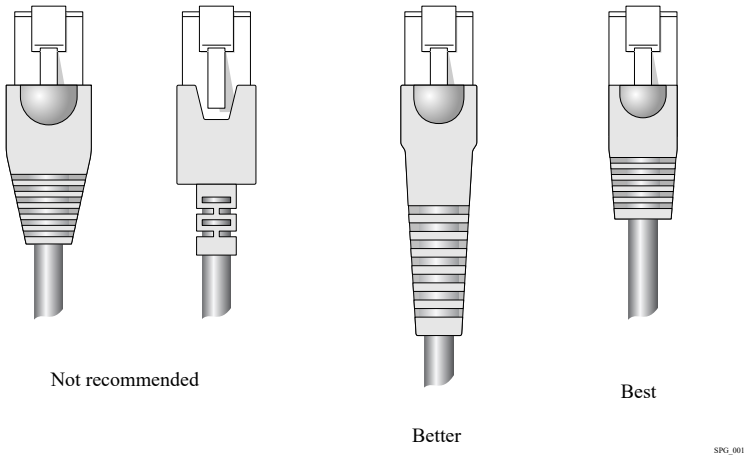


Figure 10: RJ45 Connector Jacket Types

Prevent Radio Frequency Interference (RFI)

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

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

To prevent RF interference, avoid the following situations:

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

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

Meet Power Requirements

Observe the following requirements and precautions for powering your hardware.

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/ 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 31.)

Note
Use a UPS that provides online protection.

Calculate Volt-Amperage Requirements

To determine the size of UPS that you need:

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

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

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

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

Provide a Suitable UPS Transition Time

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

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

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

DC Power Requirements

This system should be installed in a DC-I battery return configuration.

In a DC-I configuration, the battery return conductor should be connected directly to the central office power return bus, and not to the equipment frame or the grounding means of the equipment.

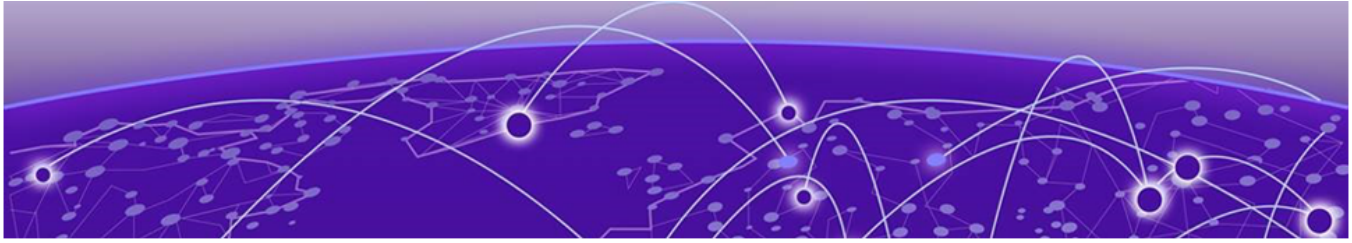
Follow Applicable Industry Standards

Always follow applicable industry standards.

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

- ANSI/TIA/EIA-568-A—the six subsystems of a structured cabling system
- ANSI/TIA/EIA-569-A—design considerations
- ANSI/TIA/EIA-606—cabling system administration
- ANSI/TIA/EIA-607—commercial building grounding and bonding requirements

You can access these standards at: www.ansi.org or www.tiaonline.org.



Install the Device and the Components

The following topics describe the various installation tasks. For more information about each component, see the following:

- 9920-16C module: Interface Module for Use with the Extreme 9920 on page 16
- Fan modules: Fan Modules for Use with the Extreme 9920 on page 13.
- AC and DC power supplies: Power Supplies for Use with the Extreme 9920 on page 11

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 65 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 19, 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. MicoVSP switches do not come with rack-mounting brackets or screws.

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.

Install the Extreme 9920 in an Equipment Rack

The Extreme 9920 can be installed in any standard 19–inch (48 cm) deep four-post equipment rack in a flush-mount configuration. Take care to load the rack so that it is not top-heavy. Start installing equipment at the bottom and work up

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

- Slider assemblies, one for each side of the device. Each slider assembly consists of an outer rail, which is secured to the rack, and a sliding rail, which is secured to a side of the device and has a mounting bracket attached to it (2 count).
- Mounting brackets that contain a thumbscrew in the lower position (2 count).
- #6-32 mounting bracket and rail slide screws (20 count).
- M4 screws for securing the sliding rail in place (8 count).
- Screw hole rack to square hole rail adaptors (4 count).
- M5 screws and washers, for the rack rail adaptors (16 count).

To attach the Extreme 9920 to a four-post rack or a cabinet, follow these steps.

1. Locate 4U of rack space to use to install the Exteme 9920.

2. Separate the inner sliding rails from the outer rails.

   Note which direction the sliding rails slide from the outer rails for correct installation. Figure 11 illustrates how to separate the sliding rails from the outer rails.

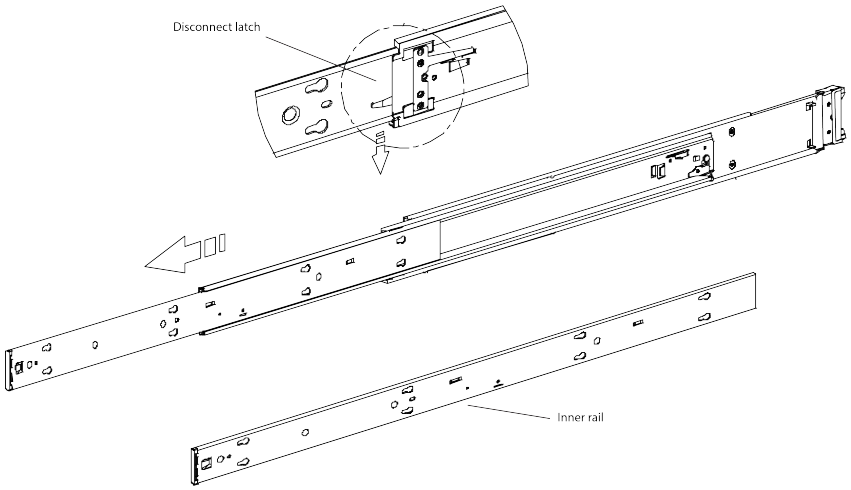


Figure 11: Separating the sliding rails from the outer rails

3. Attach the sliding rails and mounting brackets.

   Figure 12 illustrates how to attach the sliding rails and mounting brackets.

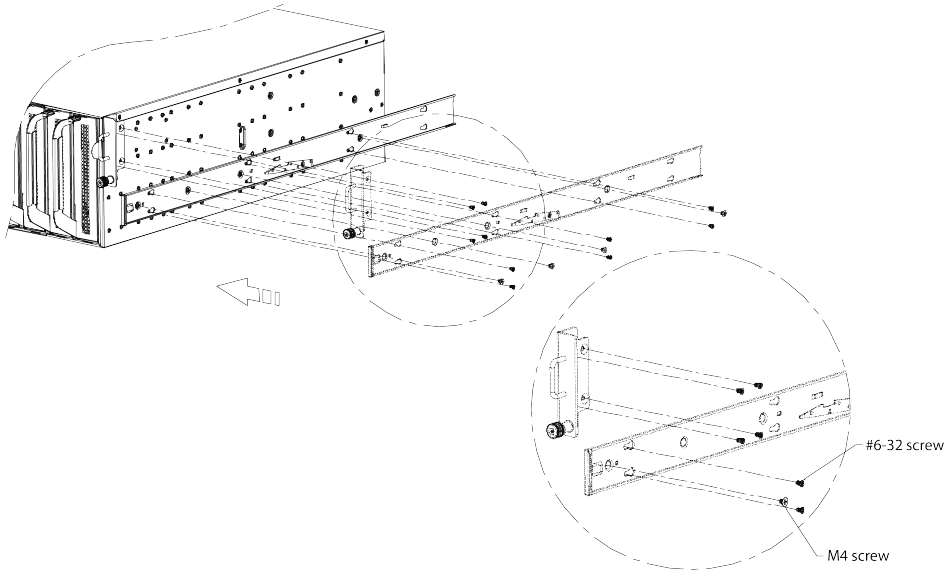


Figure 12: Attaching the sliding rails and mounting brackets

   a. Fasten six #6-32 guide screws on one side and at the bottom of the device, as shown in Figure 12.

      Tighten each screw to 3.5 in-lb (0.4 N m) so that the sliding rail can fit onto them. These screws support the sliding rail when it is mounted in the rack.

   b. Position the sliding rails onto the guide screws.

c. Fasten the M4 screws in the 4 available holes of a sliding rail while the rail is in position, as shown in Figure 12 on page 35.

   Tighten the guide screws.

d. Attach a mounting bracket using the provided #6-32 screws, as shown in Figure 12 on page 35.

   The holes to attach the mounting bracket are near the top and the front of the device. The mounting bracket is flush with the faceplate of the device, and the thumbscrew is in the lower position when the mounting bracket is attached correctly.

4. Repeat step 3 for the other side of the device.
5. Attach the outer rails to the rack or cabinet.

   Figure 13 illustrates how to attach the outer rails to the rack.

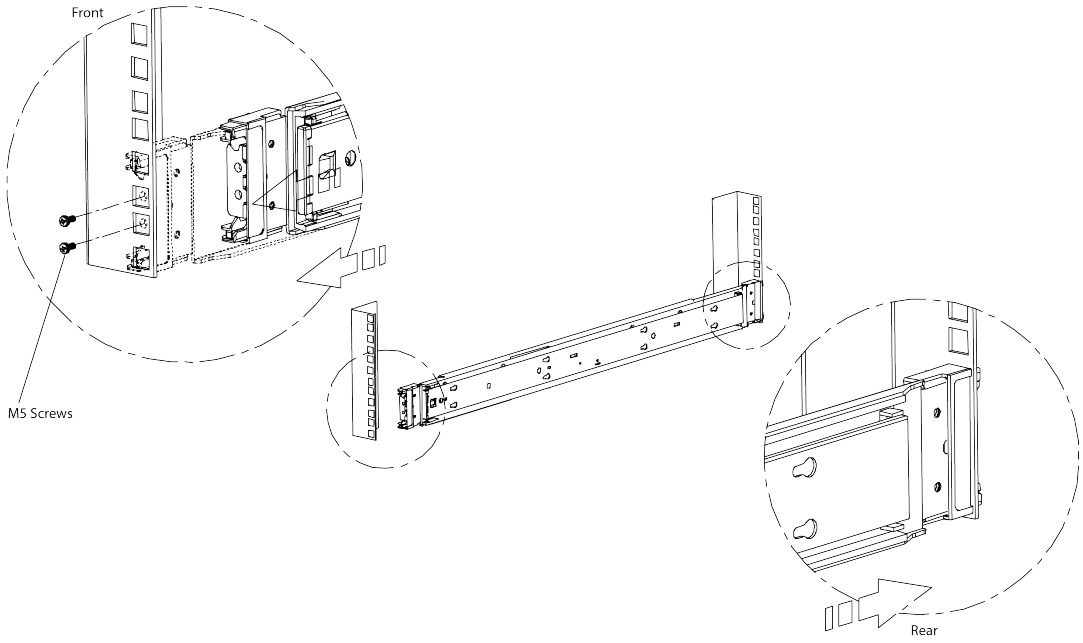


Figure 13: Attaching the outer rails to the rack

a. Prepare the rack by inserting the M5 cage nuts.

   The M5 cage nuts should be inserted into the bottom hole of the second rack unit from the top of the chosen location. For exmple, if the rack location for the device rack is units 27 through 30, the M5 cage nuts are inserted in the bottom hole of rack unit 29. No cage nuts are inserted in the bottom two rack units of the chosen location (rack unit 28 in the example).

b. Slide the yellow locking sliders to the middle of each rail so that the retention hooks latch into the rack.
c. Insert the rail so that the retention hooks latched in the middle hole of the two bottom most rack units for the device are spaced correctly.

   The holes are the middle holes on rack unit 27 and rack unit 28 from the previous example.

d. Slide the yellow locking sliders outward from the middle of the rail, so that the small yellow fingers prevent the latches from being undone.
e. Use four M5 screws and washers on the positions with threads to secure the sliding rails in place.

   This is the top hole on rack unit 27 and the bottom hole on rack unit 28 from the previous example.

6. Insert the Extreme 9920 into the rack or cabinet.

   Figure 14 illustrates how to insert the Exteme 9920 into the rack.

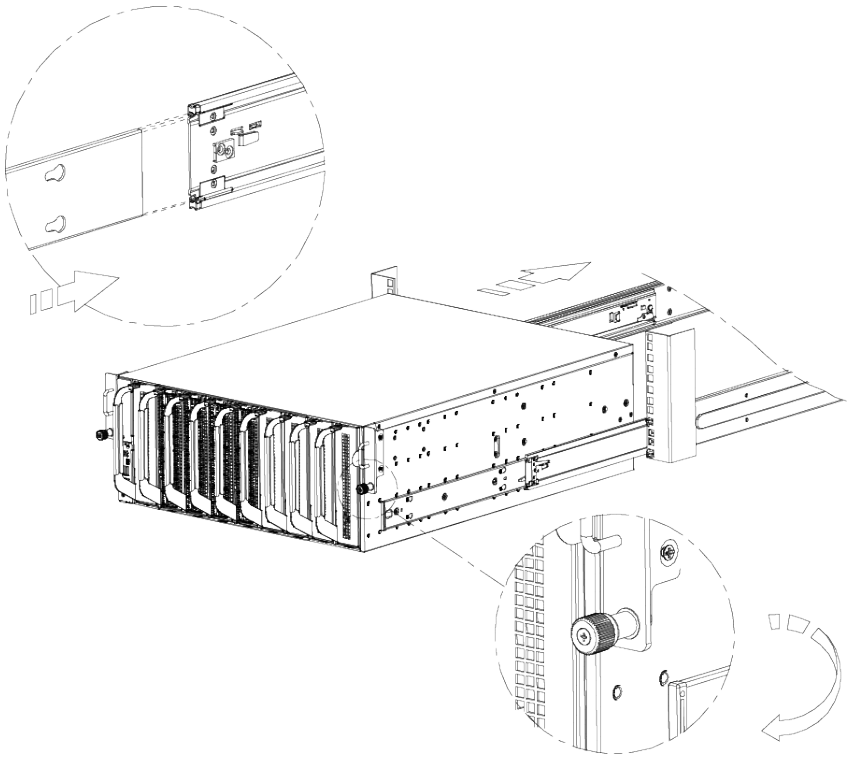


Figure 14: Inserting the Extreme 9920 into the rack

   a. Pull the middle rails, and the raceways inside them, to full extension from the rack so that they lock into place.
   b. Align the sliding rails that are attached to the Extreme 9920 with the middle rails on the rack and slide the device along the rails until it reaches the extension latch.
   c. Toggle the extension latch on the inner rails and finish sliding the device into the rack.
   d. Secure the mounting brackets to the rack by screwing the thumbscrews on the mounting brackets into the installed M5 cage nuts.

Ground the Chassis

Ground the chassis before you install power supplies or connect power and network cables to the system.

1. Locate the grounding point at the rear of the chassis, which is marked by the international symbol for earth ground.

2. Insert a retaining screw into the grounding point, but do not tighten the reataining screw completely.
3. Strip the insulation to expose 1/2 inch (12 mm) of bare wire at one end of the grounding wire.
4. Use a straight-tip torque screwdriver to tighten the retaining screw to 20 in-lb (2.25 N m).
5. Connect the other end of the grounding wire to a known reliable earth ground point at your site.

Install an Interface Module

Up to eight interface modules can be installed in the Extreme 9920 chassis. An interface module is hot-swappable.

- The following items are needed:
  - Phillips #2 screwdriver
  - Antistatic wrist strap
- Visually inspect the connectors for damage before you insert the module.

Important

If you insert a module with damaged connectors you will damage the switch.

To prevent damage, use the following best practices when installing or handling modules:

- Keep the modules on antistatic material when not in the chassis.
- Avoid touching the components or connector pins.
- Do not stack modules on top of each other outside of the chassis.
- Always keep a module or a filler panel installed to maintain safety compliance, proper cooling, and EMI containment.
- Do not overtighten screws or use a power tool to tighten screws.

Note

Electrostatic discharge (ESD) can damage electronic circuits. Do not touch electronic hardware unless you wear a grounding wrist strap or other static-dissipating device.

1. Open the package and verify the package contents.

   The package contains one interface module and this document.
2. Remove the interface module from the box and then remove it from the anti-static bag.

   Handle the interface module by the edges and avoid touching the components or connector pins.
3. Identify the I/O slot in the chassis to install the 9920-16C interface module and remove the filler panel.
   a. Slide the red handle release of the I/O slot to the right, as you are facing the chassis, to unlock the slot handle.
   b. Pull the slot ejector lever slightly down to fully unlock the filler panel and remove it from the I/O slot in the chassis.

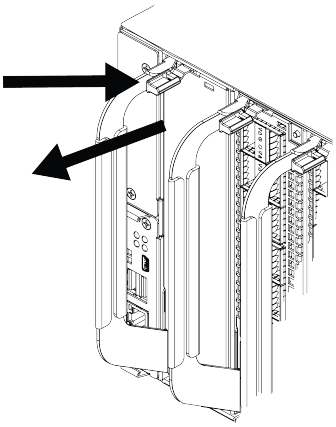


Figure 15: Removing a blank interface module panel

4. Unlock the handle by sliding the red handle release away from the handle of the interface module that you are inserting.
5. Insert the 9920-16C interface module into the slot with the handle facing towards you and to the left side of the slot.

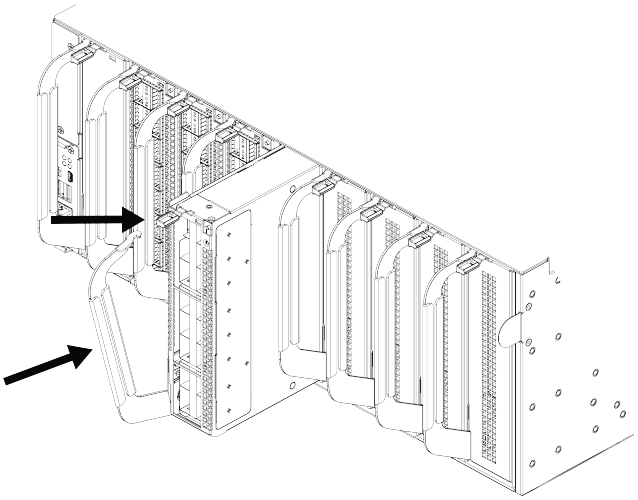


Figure 16: Inserting an interface module into the chassis

6. Continue to apply light pressure on the 9920-16C interface module until the it connects with the backplane and is fully seated.
7. Press the red-tabbed handle gently up and forward until it is locked in place by the handle release.

Install an AC Power Supply

Up to four 1,600 watt power supply modules can be installed in the Extreme 9920 chassis. Each power supply is self enclosed and vents directly to the rear of the chassis. If the chassis has more than two power supplies installed, power supplies are hot-swappable. The power supply slots are situated in the

four contiguous slots starting from the left-hand side to the bottom and the rear of the chassis. They are numbered PSU 1 through PSU 4.

Note

Do not remove the cover from the fifth, or last, power supply slot on the far right to the bottom and the rear of the chassis.

The AC power supply does not ship installed and must be ordered separately.

Note

Electrostatic discharge (ESD) can damage electronic circuits. Do not touch electronic hardware unless you wear a grounding wrist strap or other static-dissipating device.

1. Identify the power supply slot in the chassis to install the power supply module, and remove the filler panel, if necessary.
2. Verify that the power supply is right side up by orienting the power supply so that the green tabbed release lever is on the right-hand side.
3. Slide the power supply into the power supply slot, until the release lever locks the power supply in place and the power supply is properly seated.

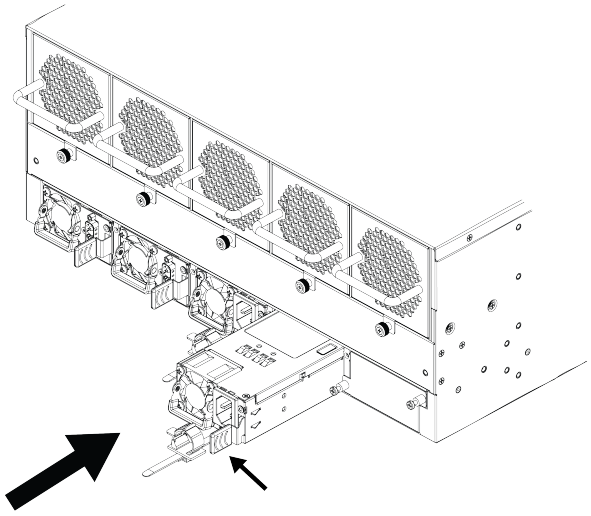


Figure 17: Inserting an AC power supply into the Extreme 9920

4. Connect the AC power cord and secure it using the retention clip as the provided cable management.
5. Repeat these steps for each power supply.

Connect an AC Power Supply

After you have installed the AC power supply into the chassis, use the following procedure to attach the retention clip and connect the AC power cord to an AC power source.

- Obtain AC power cords to match the power service conventions for your country (one for each power supply).
- Locate the retention clip (supplied) for use with straight-ended power cords.

Warning

Use AC power cords that have a ground wire (if applicable). If you use power cords without a ground wire, ensure the switch is properly grounded before powering on the unit. Without a proper ground, you are in danger of receiving an electrical shock. Lack of a grounding path to the switch can result in excessive emissions.

1. Extend the retention strap to its full length by pressint the tab (A) on the underside of the cable clamp, and pull the retention strap until the cable clamp reaches the end of the retention strap, as shown in Figure 18.

Tip

Power cable plugs vary in size so when you extend the retention strap to its full length, you can accommodate most plug sizes.

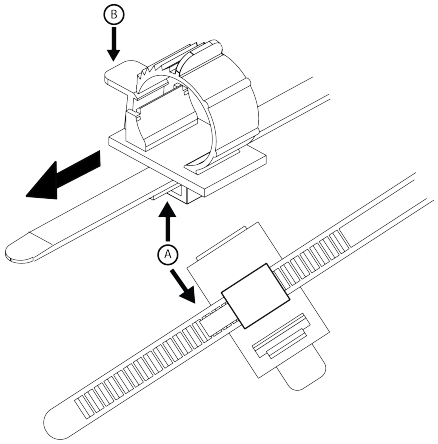


Figure 18: Connecting an AC power supply

2. Connect the AC power cord to the power supply.

3. Place the cable clamp around the power cord, and squeeze the ring until the cable is snug in the clamp, as shown in Figure 19.

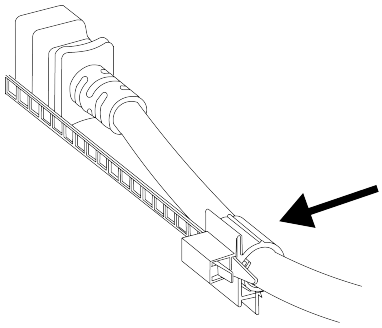


Figure 19: Placing the cable clamp around the power cord

4. Slide the clamp until it is snug against the power cord plug, as shown in Figure 20.

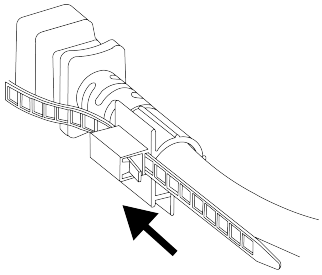


Figure 20: Sliding the clamp until it is snug against the power cord plug

5. Connect the other end of the cord to an AC power source.

Important

The chassis does not have an AC power switch. After you connect the power cord to an AC power outlet, the switch powers up immediately.

Both LED lights for the AC power supply units show steady green when connected and operating normally.

Install a DC Power Supply

Up to four 1,600 watt power supply modules can be installed in the Extreme 9920 chassis. Each power supply is self enclosed and vents directly to the rear of the chassis. If the chassis has more than two power supplies installed, power supplies are hot-swappable. The power supply slots are situated in the four contiguous slots starting from the left-hand side to the bottom and the rear of the chassis. They are numbered PSU 1 through PSU 4.

Note

Do not remove the cover from the fifth, or last, power supply slot on the far right to the bottom and the rear of the chassis.

The DC power supply does not ship installed and must be ordered separately. A DC power cord is provided with the DC power supply.

Caution
Make sure that the DC power supply circuit is not overloaded. Use proper overcurrent protection, such as a circuit breaker, to prevent overcurrent conditions. You can use up to a 36-Amp or greater breaker.

Use the following tasks to install a DC power supply in a switch:

1. Make sure you have the tools and materials you need. See Required Tools and Materials for Installing a DC Power Supply.
2. Insert the power supply into the switch. See Install the DC Power Supply on page 43.
3. Connect the power supply to the DC source voltage. See Connect a DC Power Supply to the Source Voltage on page 44.

Required Tools and Materials for Installing a DC Power Supply

You need the following tools and materials to install or remove a DC power supply.

- Connection hardware appropriate to the installation site:
  - Hardware for connecting the power wires to the DC source.
  - Hardware for connecting the ground wire to the site grounding point.
- ESD-preventive wrist strap.
- Thermal protective gloves (for removal of a warm power supply).

Install the DC Power Supply

Note
Before installing a DC power supply, verify that the airflow direction for the power supply is the same as the airflow direction of the installed fan modules in the switch.

To install the power supply, follow these steps:

Caution
The handle on the power supply is not designed to be used to lift or carry the power supply or the switch to which it is attached.

1. Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to an appropriate ground point on the rack.
2. Identify the power supply slot in the chassis to install the power supply module, and remove the filler panel, if necessary.
3. Verify that the power supply is right side up by orienting the power supply so that the green tabbed release lever is on the right-hand side.
4. Slide the power supply into the power supply slot, until the release lever locks the power supply in place and the power supply is properly seated, as shown in Figure 21.

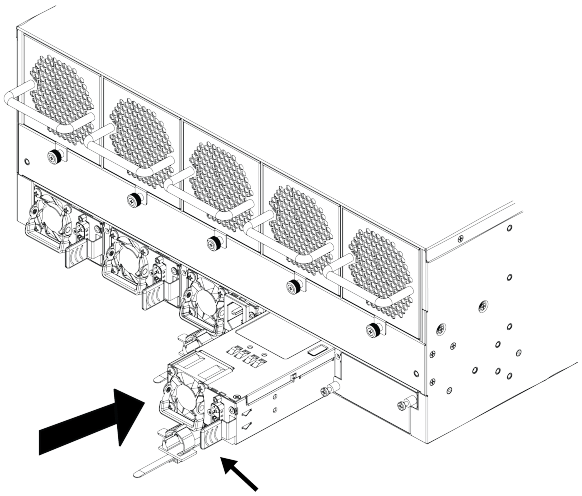


Figure 21: Inserting a DC power supply into the chassis

Caution
Do not slam the power supply into the switch.

5. To install additional power supplies, repeat the procedure.

When you are finished, use the DC power input cable that is provided with the DC power supply to ground the power supply and connect the power supply to the power source. Follow the instructions in Connect a DC Power Supply to the Source Voltage.

Connect a DC Power Supply to the Source Voltage

The DC power connection at your facility must be made by a qualified electrician, following these instructions.

Warning
Always make sure that the DC circuit is de-energized before connecting or disconnecting the DC power cables on the DC power supply.

Caution
Provide proper connection and strain relief on the DC power cables in accordance with all local and national electrical codes.

1. Verify that the DC circuit is de-energized.
2. Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to an appropriate ground point on the rack.
3. Position the DC power cable connector so that the wide, flat side is closest to the fan, as shown in Figure 22. The DC power cable connector can only connect to the power supply one way.

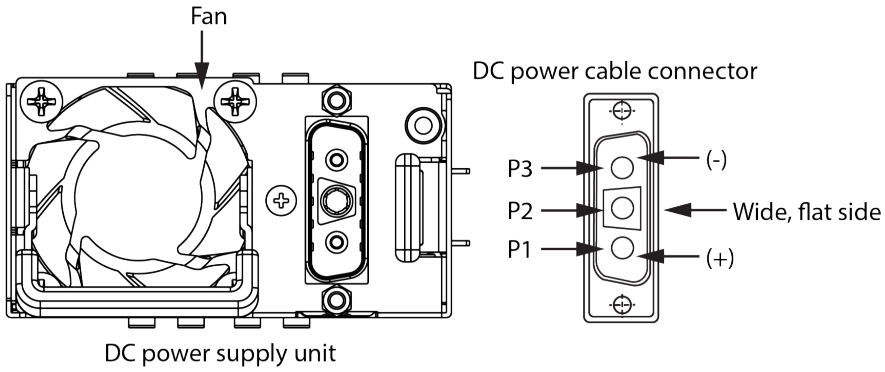


Figure 22: Connecting the DC power cord

4. Tighten the two thumb screws to secure the DC power connector in place.
5. The installation electrician connects the other end of the power cord to the building power system.

Warning
Before installing, be sure to connect the chassis ground wire before you connect any power cables.

Warning
Before removing, be sure to disconnect the ground wire after you disconnect all power cables.

Use the following for the building wire harness:

Pin 3	Red	-DC
Pin 2	Yellow	FGRND
Pin 1	Black	+DC

a. Connect the fork terminal of the yellow ground wire to a known reliable earth ground point at your site.

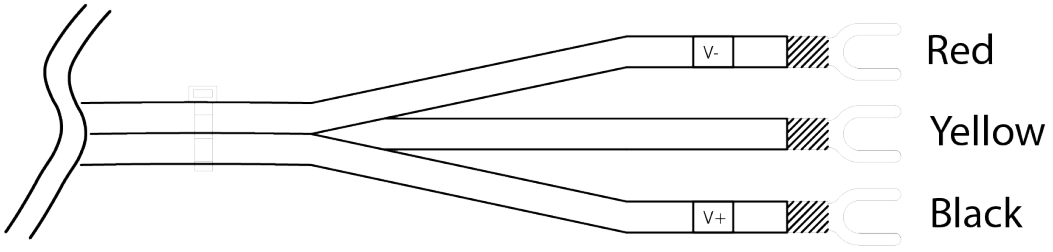


Figure 23: DC power cable terminals

b. Connect the fork terminal of the positive power cable to the positive terminal of the DC power source, and connect the fork terminal of the negative power cable to the negative terminal of the DC power source.
6. Repeat these steps for each power supply.

Leave the ESD strap permanently connected to the rack, so that the strap is always available when you need to handle ESD-sensitive components.

After connecting the DC power supply to the power source, the DC circuit can be energized. Follow the instructions in the topic Turn on the Extreme 9920 on page 46 to energize the DC circuit. The LED light for the DC power supply unit is solid green when connected and operating normally.

Turn on the Extreme 9920

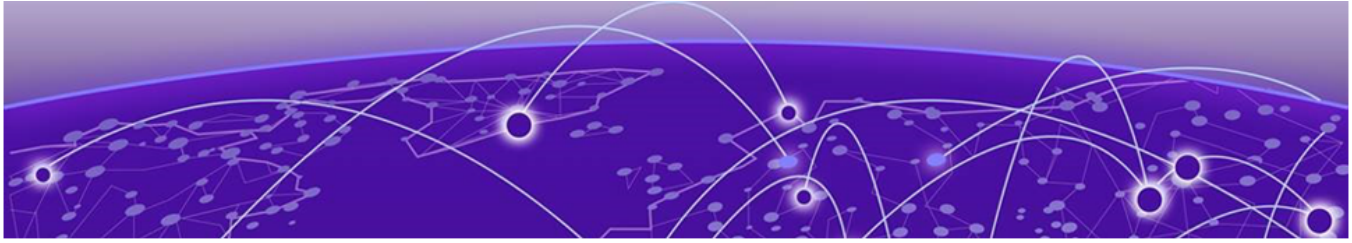
An AC power cord is not included with the AC power supply. You can purchase AC power cords for use in the US and Canada from Extreme Networks or from your local supplier. The cord must meet the requirements listed in Power Cord Requirements for AC-Powered Switches and AC Power Supplies on page 64.

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. For devices that are connected to DC power, do the following:
   a. Verify that the DC circuit is de-energized.
   b. Verify that the ground wire is connected to the grounding lug on the rear of the device.

      The grounding lug is identified by the international symbol for earth ground: 
   c. Verify that the DC power input cables are properly connected to the DC power supplies at the rear of the device.
   d. Energize the circuit.
3. When power is connected, verify that the PSU LED is green.

If the PSU LEDs do not turn green, refer to the 9920 LEDs on page 54 topic for your device for troubleshooting information.



Activate and Verify the Extreme 9920

After the Extreme 9920 is installed and powered on, use the instructions in the following topics to activate and verify the device:

- Connect to a Management Console on page 47
- Configure the IP Address for the Management VLAN on page 47

Connect to a Management Console

Use a USB Type A cable to connect the USB console port to a laptop or PC to configure and monitor the device. A Mini-B USB console serial port on the front panel can also be used for management functions. The laptop or PC serves as the *management console*.

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

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

A login prompt displays when the connection is initiated. Use the following default credentials to login:

username: `admin`
password: `rocks`

Note
There might be a delay of up to five minutes before the device is ready for login after powering on or rebooting.

Configure the IP Address for the Management VLAN

You can configure the device'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 device, 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.

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

Replace Components

This following topics provide information about replacing components in the Extreme 9920.

Replace a Power Supply

Use the following procedure when you need to remove or replace an AC power supply module, part number 9920-ACPWR-1600W-F, or a DC power supply module, part number 9920-DCPWR-1600W-F, from the appliance.

Tip
You can hot swap power supplies while the appliance is operational.

Note
Electrostatic discharge (ESD) can damage electronic circuits. Do not touch electronic hardware unless you wear a grounding wrist strap or other static-dissipating device.

Caution
To turn off power to this device, you must disconnect the power cord. After the device has powered down, allow at least 30 seconds before you restore power. Otherwise, this device might produce a core file during the reset that can result in an extra delay during the boot process.

1. For an AC power supply:

Note
If your AC power cord is secured with a retention clip, continue to Step a; otherwise go to Step c.

a. Press the tab (A) on the underside of the cable clamp and slide the cable clamp away from the power cord plug until the cable clamp reaches the end of the retention strap, as shown in Figure 24.

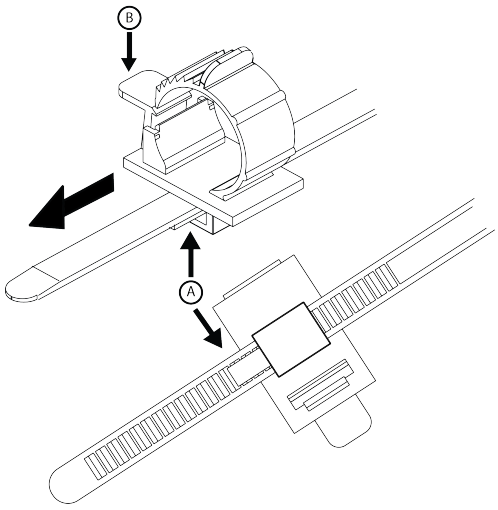


Figure 24: Removing the AC power cord

b. To release the clamp around the power cord, press the tab (B) down and remove the retention clip from the power cord.
c. Remove the AC power cord from the AC power supply.
d. Disconnect the other end of the power cord at the power source.
e. Continue to Step 3 on page 50.

2. For a DC power supply:
   a. Disconnect both ends of the power cord.
   b. Remove the grounding cable.
3. Pull up on the lever bar until it reaches straight out, and forms a 90° angle with the front of the power supply.

4. Press the release lever to the left and remove the power supply using the handle.

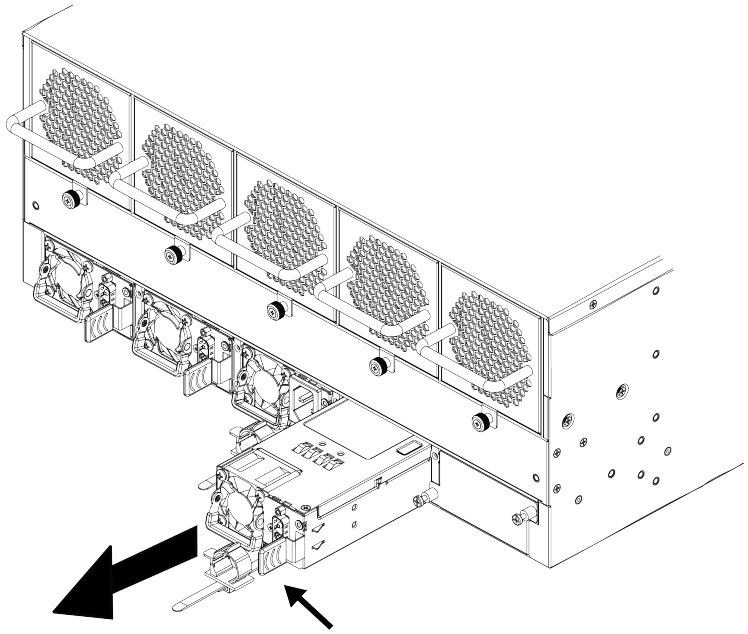


Figure 25: Removing the power supply from the chassis

5. If you are replacing the power supply, see the procedure for Installing an AC power supply or Installing a DC power supply.

Note

A filler panel is required if you are not replacing the power supply.

Replace a Fan Module

Use the following procedure when you need to replace a fan module, part number 9920-FAN-F.

Tip

You can hot swap the fan modules.

The following items are needed:

- Antistatic wrist strap

Warning

Risk of personal injury

When you remove a cooling module, allow time for the fans to spin down before you fully withdraw the cooling module. Be careful to keep your fingers out of the fan blades.

warning

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

1. Locate the slot that contains the fan module to remove.
2. Loosen the thumb screw until it is no longer attached to the chassis.

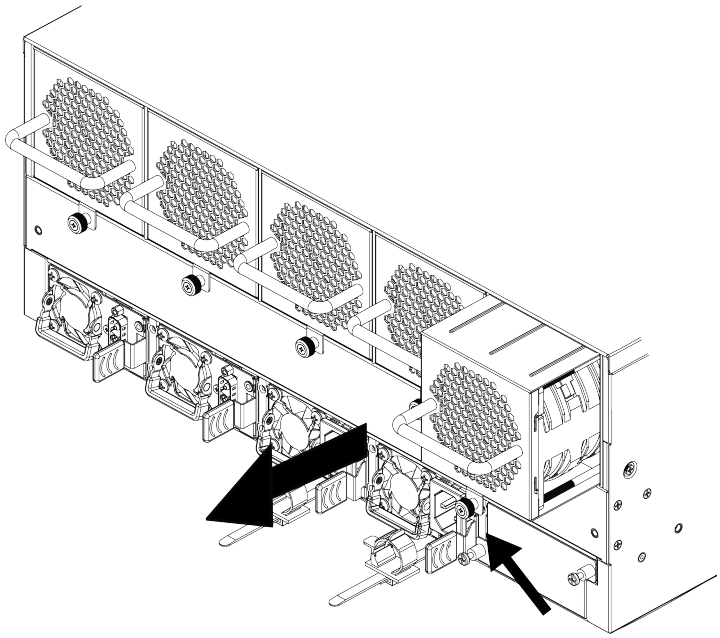


Figure 26: Removing a fan module

3. Use the handle to slide the fan module out of the chassis.
4. Replace with the fan with a spare fan module.

Replace an Interface Module

The interface module is hot-swappable.

- The following items are needed:
  - Antistatic wrist strap
- Remove all cables and optics from the network interface ports.

To prevent damage, use the following best practices when installing or handling 9920-16C modules:

- Keep the modules on antistatic material when not in the chassis.
- Avoid touching the components or connector pins.

- Do not stack modules on top of each other outside of the chassis.
- Always keep a module or a filler panel installed to maintain safety compliance, proper cooling, and EMI containment.

Warning

Risk of eye injury by laser

Fiber optic equipment can emit laser or infrared light that can injure your eyes. Never look into an optical fiber or connector port. Always assume that fiber optic cables are connected to a light source.

Note

Electrostatic discharge (ESD) can damage electronic circuits. Do not touch electronic hardware unless you wear a grounding wrist strap or other static-dissipating device.

1. Slide the red handle release of the I/O slot to the right, as you are facing the chassis, to unlock the handle for the slot.
2. Pull the handle slightly down to fully unlock the 9920-16C module and slide it out of the slot in the chassis.

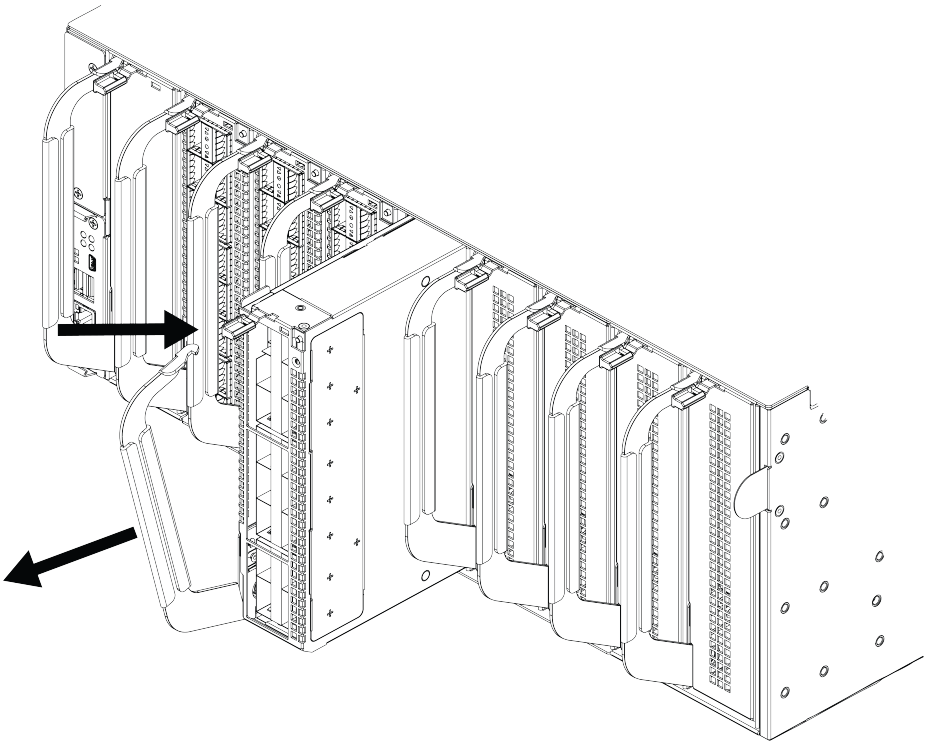


Figure 27: Removing an interface module from the chassis

3. Replace the 9920-16C interface modoule with a spare 9920-16C interface module or filler panel.

Monitor the Device

The following topics help you monitor the status of the Extreme 9920 while it is operating.

9920 LEDs

ExtremeSwitching 9920 Front Panel LEDs, as described in the following table:

LED	State	Description
Power (PWR)	Off	No Power. Some power rails are dropping below specification.
	Green (steady)	Valid power. All monitored voltages are nominal.
Status	Off	No power and not operational.
	Green (steady)	The chassis is in normal operational mode.
	Amber (steady)	An error has occurred and the diagnostic software is running.
	Amber - Green (blinking)	Attention.
PSU	Off	No power.
	Green (steady)	Power is on. Main and standby power output is enabled and no PSU warning or fault is detected.
	Green (blinking)	Stand-by. Standby power output is enabled and no power supply warning or fault is detected.
	Amber (steady)	Fault. A power supply fault is detected.
	Amber (blinking)	Warning. A power supply warning is detected.
Fan	Off	No power.
	Green (steady)	All fans are operating normally.
	Amber (steady)	A fan has failed.

Management Port LEDs

The Management port uses two bicolored (amber and green) LEDs to indicate the activity and speed of the link.

- The left bicolored LED (Link/Act) indicates the state of the link and whether it is active.
- The right bicolored LED (Speed) indicates the current speed of the port.

Port label	Color and state	Description
Link/Activity	Off	Not applicable.
	Green (steady)	Link established. The port link is established but there is no data activity.
	Green (blinking)	Link activity. The port link is established and there is data activity. The port is operating at 1 Gbps.
	Green (slow blinking)	Disabled. The port is disabled by the admin.
	Amber (steady)	Fault. A fault condition is detected.
Speed	Off	The port is operating at 10 Mbps.
	Green (steady)	The port is operating at 1 Gbps.
	Amber (steady)	The port is operating at 100 Mbps.

9920-16C Module LEDs

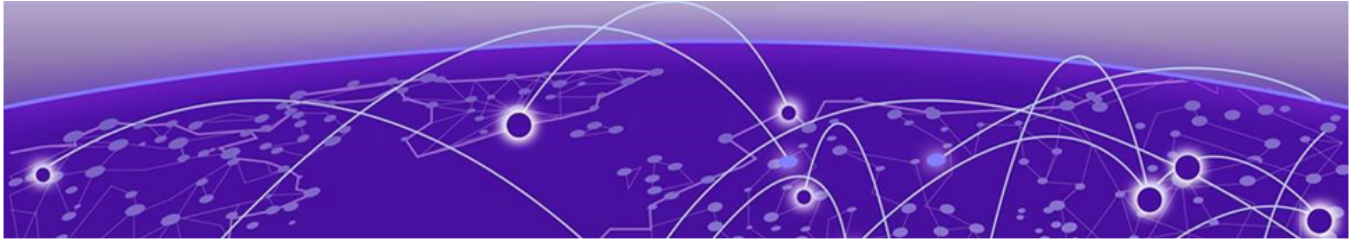
The front panel of the 9920-16C modules contains four LEDs located between the upper and lower ports. The two LEDs on the left are both green and indicate the channel within the port, which is indicated by the remaining two LEDs. The font panel also contains a Channel Selector button, which cycles through the four selectable channels. The selected channel applies to all ports on the card.

Channel indicators		
LED 0	LED 1	Port number
0	0	1
0	1	2
1	0	3
1	1	4

The rate indication determines if a port is channelized. The link status for the entire port is indicated regardless of the channel selected when the port is not channelized.

The rate/link/activity LEDs use the colors red, green, and blue and indicate the configured port rate, port linkage, and port traffic activity. The LEDs also indicate fault conditions.

LED	Color and state	Description	Red	Green	Blue
Link/Activity	Off	No link or fault. The port is either administratively disabled, or is enabled but no transceiver is installed.			
	White (steady)	Link in 100 Gbps mode.	1	1	1
	White (fast blinking)	Activity in 100 Gbps mode.	1	1	1
	Yellow (solid)	Link in 50 Gbps mode.	1	1	0
	Yellow (fast blinking)	Activity in 50 Gbps mode.	1	1	0
	Blue (steady)	Link in 40 Gbps mode.	0	0	1
	Blue (fast blinking)	Activity in 40 Gbps mode.	0	0	1
	Purple (steady)	Link in 25 Gbps mode.	1	0	1
	Purple (fast blinking)	Activity in 25 Gbps mode.	1	0	1
	Green (steady)	Link in 10 Gbps mode.	0	1	0
	Green (fast blinking)	Activity in 10 Gbps mode.	0	1	0
	Red (steady)	Fault detected.	1	0	0



Technical Specifications

The following topics list technical specifications for the hardware products described in this document.

9920 Technical Specifications

Table 8: 9920 Unpackaged Dimensions

- Height: 6.93 inches (17.6 cm) – 4U
- Width: 17.24 inches (43.8 cm)
- Depth: 22.05 inches (56 cm)

Table 9: 9920 Unpackaged Dimensions (with fan modules and PSU)

- Height: 6.93 inches (17.6 cm) – 4U
- Width: 17.24 inches (43.8 cm)
- Depth: 23.39 inches (59.4 cm)

Table 10: 9920 Unpackaged Weight (no fan modules; no PSU; no interface modules)

72.75 pounds (33 kg), 4 empty power supply slots, no power supply filler panels, 8 empty interface module slots, no interface module filler panels, 5 empty fan slots,

Table 11: 9920 Unpackaged Weight (with fan modules and interface modules)

95.9 pounds (43.5 kg), 5 fans and 8 interface modules

Table 12: 9920 Packaged Dimensions (with fan modules; no PSU)

- Height: 13.46 inches (34.2 cm) – 4U
- Width: 32.28 inches (82.0 cm)
- Depth: 40.16 inches (102.0 cm)

Table 13: 9920 Packaged Weight (without fan modules; no PSU)

104.7 pounds (47.5 kg)

Fan and Accoustic Noise

Refer to the *9920 Data Sheet* for up-to-date information.

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.

Table 14: 9920 Fan Speed and Power Consumption

Fan Speed	Fan Module RPM (typical)		Power
	Inlet Fan	Outlet Fan	Typical
Full (100%)	17000 (typ)	14500 (typ)	12V*5.0A = 60.0W per module
Low (50%)	8500 (typ)	7250 (typ)	16.6W (per module)

Power Options

Refer to the *9920 Data Sheet* for up-to-date information.

Table 15: 9920 Power Supply Options

Power Supply	Input Rating
1600 W AC Power Supply: Part no. 9920-ACPWR-1600W-F 1600 W AC Power Supply (front-to-back airflow)	100-120/200-240Vac, 50/60 Hz, 10A/8A max for each PSU
1600 W DC Power Supply: Part no. 9920-DCPWR-1600W-F 1600 W DC Power Supply (front-to-back airflow)	-48 to -60Vdc, 36A Max. for each PSU

CPU and Memory

Table 16: CPU, Memory

CPU/Memory
12-core, x86 Skylake-D-2163
4 x 32GB DDR4 ECC memory
32 GB SLC NAND Flash Memory
32MB packet buffer per chip

Standards and Environmental Data

Table 17: Safety Standards

North American Safety of ITE	UL 60950-1 UL 62368-1 CAN/CSA No. 22.2 62368-1-14 CAN/CSA 22.2 No. 60950-1-07 Complies with FCC 21CFR 1040.10 (US Laser Safety) CDRH Letter of Approval (US FDA Approval)
European Safety of ITE	EN 60825-1 Class 1 (Lasers Safety) EN 62368-1 2014/35/EU Low Voltage Directive
International Safety of ITE	IEC 62368-1 IEC 60950-1 GB 4943.1 CNS 14336-1 AS/NZS 60950-1 (Australia /New Zealand)
Country-specific	BSMI (Taiwan Safety) NRCS LOA (South Africa) CCC (China Safety)

Table 18: EMI/EMC Standards

North America 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 55035 EN 61000-3-2:2014 (Harmonics) EN 61000-3-3:2013 (Flicker) ETSI EN 300 386 (EMC Telecommunications) 2014/30/EU EMC Directive EN 55011 Class A
International EMC certifications	CISPR 32: 2015, Class A (International Emissions) IEC 61000-4-2:2008 Electrostatic Discharge, 8kV Contact, 15 kV Air, Criteria A IEC 61000-4-3-4-3:2010 Radiated Immunity 10V/m, Criteria IEC 61000-4-4-4-4:2012 Transient Burst, 1 kV, Criteria A IEC 61000-4-5-4-5:2014 Surge, 2 kV L-L, 2 kV L-G, Level 3, Criteria A IEC 61000-4-6-4-6:2013 Conducted Immunity, 0.15-80 MHz, 10V/m unmod. RMS, Criteria A IEC 61000-4-11:2004 Power Dips & Interruptions, >30%, 25 periods, Criteria C
Country-specific	VCCI Class A (Japan Emissions)

Table 19: Telecom Standards

	EN/ETSI 300 386 EN 300 386 V2.1.1 (2016-07) (EMC Telecommunications) EN/ETSI 300 019 (Environmental for Telecommunications)

Table 19: Telecom Standards (continued)

	MEF9 and MEF14 certified for EPL, EVPL, and ELAN

Table 20: IEEE 802.3 Media Access Standards

	IEEE 802.3ab 1000BASE-T IEEE 802.3z 1000BASE-X IEEE 802.3ae 10GBASE-X IEEE 802.3ba 40GBASE-X IEEE 802.3bz 2.5GBASE-T and 5GBASE-T (for X460-G2-16mp-32p-10GE4) IEEE 802.3at PoE Plus IEEE 802.3az (EEE)

Table 21: Environmental Data

Environmental standards	EN/ETSI 300 019-2-1 v2.1.2 (2000 - 2009) - Class 1.2 Storage EN/ETSI 300 019-2-2 v2.1.2 (1999 - 09) - Class 2.3 Transportation EN/ETSI 300 019-2-3 v2.1.2 (2003 - 04) - Class 3.1e Operational EN/ETSI 300 753 (1997-10) - Acoustic Noise ASTM D3580 Random Vibration Unpackaged 1.5G
Operating conditions	Temperature range: 0°C to 50°C (32°F to 122°F) Humidity: 5% to 95% relative humidity, non-condensing Altitude: 0 to 1,800 meters (5,905 feet) Operational shock (half sine): 30 m/s^2 (3 G), 11 ms, 60 shocks Operational random vibration: 3 to 500 Hz at 1.5 G rms
Storage & transportation conditions (packaged)	Transportation temperature: -40°C to 70°C (-40°F to 158°F) Storage and transportation humidity: 5% to 95% relative humidity, non-condensing 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 13 drops minimum on sides and corners at 18 inches (<50 kg box)

AC and DC Power Supply Specifications

There are four power supply units. Both AC and DC power supplies have 12 V output and load sharing. Power supplies vent to the rear of the chassis.

A minimum of one installed power supply is required.

Note

Power supplies do not ship installed.

The following table provides the AC power supply specifications for the 9920:

Table 22: AC power supply

Dimensions:	Height	1.57 in. (4 cm)
	Width	2.89 in. (7.35 cm)
	Depth	7.28 in. (18.5 cm)
	Weight	2.2 lb (1 kg)
Input voltage range		100 -127 VAC/200 -240 VAC
Input turn on (maximum)		89 VAC
Input frequency		47 to 63 Hz
Input current 240 VAC (typical)		8.5 Ampere (A)
Inrush transient (maximum)		30 A
Efficiency (typical)		92% for loads greater than 20% of full load 91% for loads 75% to 100% of full load
Thermal rating		539.93 BTU/hour
MTBF rating		250,000 hours
Power generated (maximum)		1,600 watts
Power dissipated (maximum)		158 watts

The following table provides the DC power supply specifications for the 9920:

Table 23: DC power supply

Dimensions:	Height	1.57 in. (4 cm)
	Width	2.89 in. (7.35 cm)
	Depth	7.28 in. (18.5 cm)
	Weight	2.2 lb (1 kg)
Input voltage range		–48 VDC minimum to –60 VDC maximum
Input current		75 A with input voltage great than 40 VDC
Cold start Inrush current (maximum)		35 A
Turn on delay (typical)		5 secs
Efficiency		88% for loads greater than 25% of full load 91% for loads 75% to 100% of full load
Thermal rating		539.93 BTU/hour
MTBF rating		200,000 hours

Table 23: DC power supply (continued)

Power generated (maximum)	1,600 watts
Power dissipated (maximum)	461 watts

Table 24: Environmental Specifications

Operating temperature	0°C to 50°C (normal operation)
Storage temperature	-40°C to 70°C
Operating humidity	85% relative humidity, non-condensing at 30C
Operational shock	30 m/s2 (3 G)

Fan Module Specifications

Five fan modules can be installed at the rear of the chassis and all five are mandatory. Each fan module contains two 80 mm fans. The chassis is designed for front-to-back airflow.

Fan module technical specifications:

Physical specifications	
Height:	3.23 in. (8.2 cm)
Width:	3.23 in. (8.2 cm)
Depth:	3.62 in. (9.2 cm)
Weight:	0.6kg (1.3 lbs)

Electrical specifications		
Thermal rating:		204.72 BTU/hour
MTBF rating:		329,447 hours @ 30°C
Power dissipated	Maximum	60 watts
	Typical	16.66 watts

9920-16C Module Specifications

Eight 9920-16C interface modules can be installed in the chassis.

9920-16C interface module specifications:

Physical specifications	
Height:	1.58 inches (4.0 cm)
Width:	6.7 inches (17.0 cm)

Physical specifications	
Depth:	10.98 inches (27.9 cm)
Weight:	4.4 pounds (2.0 kg)

Electrical specifications		
Thermal rating:		443.56 BTU/hour
MTBF rating:		370,228 hours @ 25°C
Connector type:		SFP+
Power dissipated	Maximum	130 watts
	Typical	70 watts

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^2) minimum; over 6 feet, the minimum wire size is 16 AWG (1.0 mm^2).

  The power cords for switches that use either the 1100 W or 715 W power supplies are keyed with a “notch” to ensure the proper orientation when plugged in. These cords are of 3x14 AWG.

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

Safety and Regulatory Information

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).

Considerations Before Installing

Consider the following items before you install equipment.

- For equipment designed to operate in a typical Telco environment that is environmentally controlled, choose a site that has the following characteristics:
  - Temperature-controlled and humidity-controlled, such that the maximum ambient room temperature shall not exceed 40°C (104ºF).
  - Clean and free from airborne materials that can conduct electricity.

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

General Safety Precautions

Follow these guidelines:

- Do not try to lift objects that you think are too heavy for you.
- When you install equipment in a rack, load heavier devices in the lower half of the rack first to avoid making the rack top-heavy.
- Use only tools and equipment that are in perfect condition. Do not use equipment with visible damage.
- Route cables in a manner that prevents possible damage to the cables and avoids causing accidents, such as tripping.
- Do not place a monitor or other objects on top of the equipment. The chassis cover is not designed to support weight.
- To reduce the risk of fire, use only #26 AWG or larger telecommunications line cord. Use only copper conductors.
- Do not work on the system or connect or disconnect cables during periods of lightning activity.
- This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor.

Maintenance Safety

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

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

Fiber Optic Ports and Optical Safety

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

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

Warning

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

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

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

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

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

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

Cable Routing for LAN Systems

Extreme Networks equipment meets the requirements for LAN system equipment.

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

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

- Cable runs between buildings are less than 140 feet long.
- Cable runs between buildings are directly buried.
- Cable runs between buildings are in an underground conduit, where a continuous metallic cable shield or a continuous metallic conduit containing the cable is bonded to each building grounding electrode system.

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

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

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.

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

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.

Note

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

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

Battery Notice

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

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

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

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

Battery Warning - Taiwan

警告

如果更換不正確之電池型式會有爆炸的風險,

請依製造商說明書處理用過之電池。

EMC Warnings

Taiwan BSMI Warning

警告使用者:

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 CCC 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

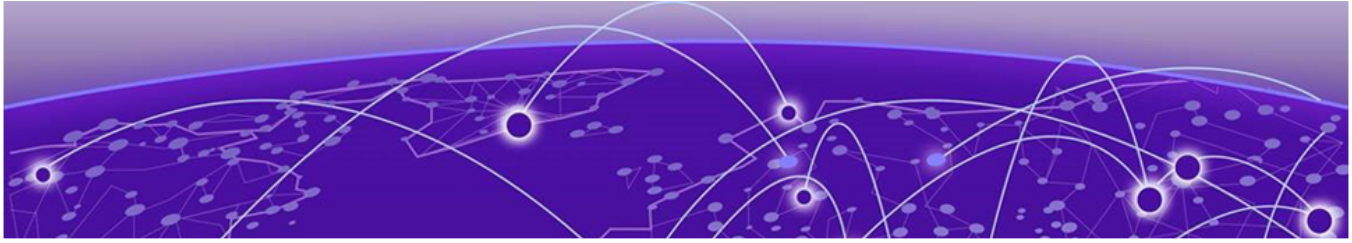
This is a Class A product based on the standard of the VCCI Council. If this equipment is used in a domestic environment, radio interference may occur, in which case the user may be required to take corrective actions.

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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