

# BlackDiamond X8 Series Switches Hardware Installation Guide

**Extreme Networks, Inc.**

3585 Monroe Street  
Santa Clara, California 95051  
(888) 257-3000  
(408) 579-2800

<http://www.extremenetworks.com>

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# Preface

This guide provides the instructions and supporting information needed to install the Extreme Networks® BlackDiamond® X8 series switch.

The guide includes information about site preparation and switch functionality.

## 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 *ExtremeXOS Concepts Guide* and the *ExtremeXOS Command Reference Guide* for information about configuring the BlackDiamond X8 series switch.



### NOTE

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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.

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## Conventions

Table 1 and Table 2 list conventions used throughout this guide.

**Table 1: Notice Icons**

Icon	Notice Type	Alerts you to...
	Note	Important features or instructions.
	Caution	Risk of personal injury, system damage, or loss of data.
	Warning	Risk of severe personal injury.

**Table 2: Text Conventions**

Convention	Description
Screen displays	This typeface represents information as it appears on the screen, or command syntax.
Words in <i>italicized</i> type	Italics emphasize a point of information or denote new terms at the place where they are defined in the text. Book titles are printed in italics.

## Related Publications

The documentation set for Extreme Networks ExtremeXOS® switches and routers includes:

- *ExtremeXOS Concepts Guide*
- *ExtremeXOS Command Reference Guide*
- *ExtremeXOS Release Notes*
- *BlackDiamond® 20800 Series Switches Hardware Installation Guide* (legacy product)
- *BlackDiamond 10808 Switch Hardware Installation Guide* (legacy product)
- *BlackDiamond 12800 Series Switches Hardware Installation Guide* (legacy product)
- *BlackDiamond 8800 Series Switches Hardware Installation Guide*
- *BlackDiamond X8 Series Switches Hardware Installation Guide* (this guide)
- *Summit Family Switches Hardware Installation Guide*
- *Extreme Networks E4G Series Routers Hardware Installation Guide*
- *Extreme Networks Pluggable Interface Modules Installation Guide*
- *ExtremeXOS Hardware and Software Compatibility Matrix*

Hardware and software documentation for Extreme Networks products is available from the Extreme Networks website at the following location:

<http://www.extremenetworks.com/go/documentation>

You can download software concepts guides and reference guides, hardware installation guides, and other documents.

Under your product warranty or with a current support contract, you can access software release notes and entitled software from the eSupport web pages at:

<https://esupport.extremenetworks.com/>

For instructions on accessing and downloading software and software release notes, see the *Technical Assistance Center User Guide* at:

<http://www.extremenetworks.com/services/tac-userguide.aspx>



### NOTE

You must have an active support agreement or a product registered to you in order to receive an eSupport login and access to Extreme Networks software release notes.



To request an eSupport user name and password, select the Request Web Login link on the eSupport home page at:

<https://esupport.extremenetworks.com>

You can see complete information about all of our services online at:

<http://www.extremenetworks.com/solutions/service-solutions.aspx>



  
  
PART

# About the BlackDiamond X8 Series Switches



# 1

CHAPTER

## BlackDiamond X8 Series Switches

This chapter includes the following sections:

- [Overview of the BlackDiamond X8 Series Switches on page 13](#)
- [BlackDiamond X8 Chassis on page 14](#)
- [Management Ports on page 16](#)

For information about management modules, fabric modules, and I/O modules for the BlackDiamond X8 series switch, see [Chapter 2](#).

For instructions to install the BlackDiamond X8 chassis, see [Chapter 5](#).

### Overview of the BlackDiamond X8 Series Switches

The BlackDiamond X8 series switches are chassis-based switches designed for virtualized data centers and high-performance compute cluster installations. They provide high-density, line rate 10/40 GbE ports. For more information about configuring a BlackDiamond switch, see the *ExtremeXOS Concepts Guide* and the *ExtremeXOS Command Reference Guide*.

The features of these switches include:

- I/O modules that are hot-swappable and provide 10-Gigabit or 40-Gigabit Ethernet fiber ports using SFP+ or QSFP+ optical modules
- Up to 768 line-rate 10-Gigabit Ethernet ports or 192 line-rate 40-Gigabit Ethernet ports in one chassis
- Redundant management modules that provide the CPU control subsystem
- N+1 redundant switch fabric modules that provide the active switching fabric
- Redundant, load-sharing, hot-swappable power supplies
- Field-replaceable, hot-swappable fan trays
- 20+ Tbps switching capacity
- 1.28 Tbps bandwidth per slot

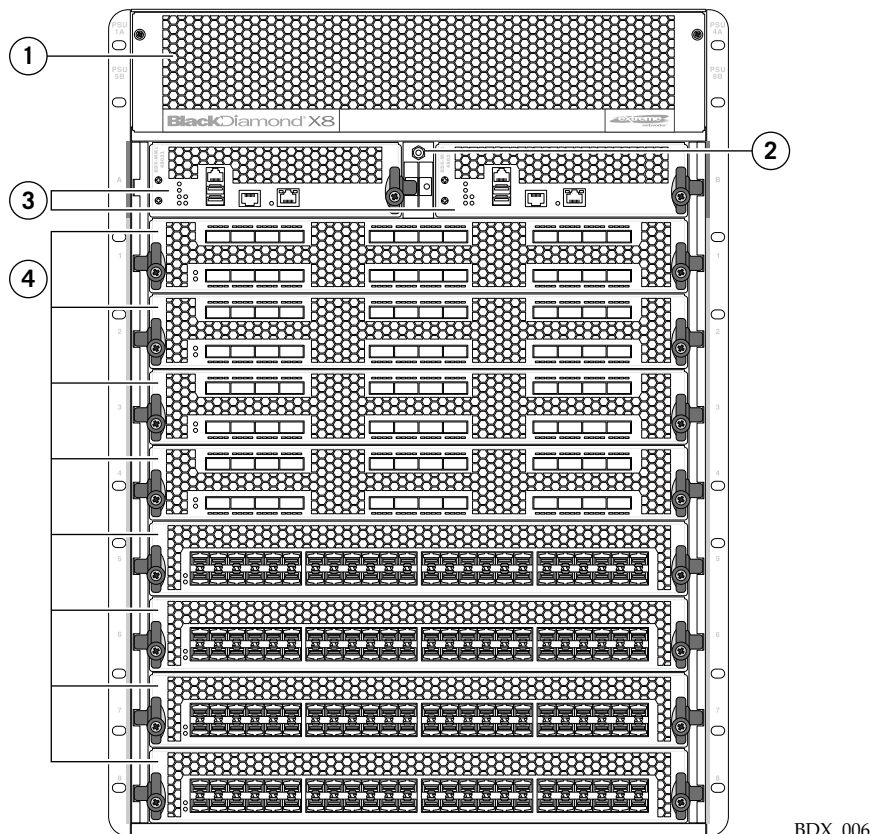
## BlackDiamond X8 Chassis

The BlackDiamond X8 switch chassis (Figure 1) has the following physical features:

- Height of 14.5 RU, allowing three switches to be installed in a 7-foot rack
- Optional mid-mount brackets for flexibility in rack positioning
- Horizontal front slots for I/O modules and management modules
  - Eight full-width slots for IO modules
  - Two half-width slots for management modules (MMs)
- Four vertical slots in the back (behind fan trays) for fabric modules (FMs)
- Eight bays in the front for redundant power supplies; rear-accessible power connections
- Five vertical fan trays at the back
- Two connectors for an ESD-preventive wrist strap
  - On the front panel between the management modules
  - On the back panel at the top right corner

Figure 1 shows a BlackDiamond X8 chassis equipped with management modules and I/O modules.

**Figure 1: Front of the BlackDiamond X8 Chassis**



- 1 = Power supply cover
- 2 = ESD jack
- 3 = Management modules
- 4 = I/O modules

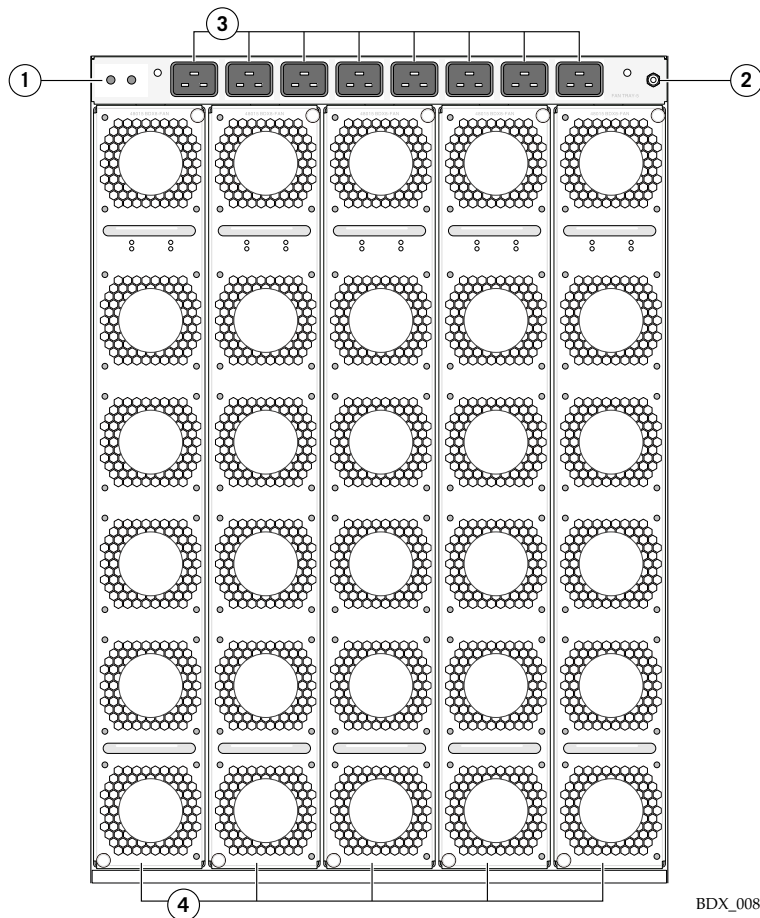
BDX\_006

The front of the chassis provides access to:

- Card cage for the management modules and I/O modules
- Bays for redundant power supplies, with ventilated cover
- Connection point for ESD-preventive strap

Figure 2 shows the back of the BlackDiamond X8 chassis.

**Figure 2: Back of the BlackDiamond X8 Chassis**



BDX\_008

- 1 = Grounding point
- 2 = ESD jack
- 3 = AC power input connectors
- 4 = Fan trays

The back of the BlackDiamond X8 chassis provides access to:

- Eight AC power input connectors
- Five vertical fan trays
- Access to four fabric module slots behind the fan trays
- Connection point for ESD-preventive strap
- Attachment point for optional chassis ground

## Management Ports

Each BlackDiamond management module (MM) has a 10/100/1000BASE-TX Ethernet management port. This port allows you to communicate directly with the central processing unit (CPU) of the switch. You can plug an Ethernet cable directly from your laptop into the management port for direct access into the switch. This access allows you to view and locally manage the switch configurations.

USB ports on the management module allow you to attach a single USB 2.0 flash drive. Only a USB flash drive that is formatted using the file allocation table (FAT) file system is recognized on these ports. Other devices, such as a USB external hard drive, will not be mounted.



# 2

CHAPTER

## BlackDiamond X8 Series Modules and Fans

This chapter includes the following sections:

- [Overview of the BlackDiamond X8 Modules on page 17](#)
- [Management Module on page 18](#)
- [I/O Modules on page 21](#)
- [Fabric Modules on page 25](#)
- [Fan Trays on page 26](#)

### Overview of the BlackDiamond X8 Modules

Modules for the BlackDiamond X8 series switch include management modules, I/O modules, and switch fabric modules.

Each module for the BlackDiamond X8 series switch consists of a printed circuit board mounted on a metal panel. The module carrier also includes ejector/injector levers and captive retaining screws on the module front panel.

[Table 3](#) lists the module types and models available for the BlackDiamond X8 series switch.

**Table 3: Modules for the BlackDiamond X8 Series Switch**

Type	Models
Management module	BDX-MM1
Switch fabric module	BDXA-FM20T BDXA-FM10T
I/O module	BDXA-10G48X BDXA-40G24X BDXA-40G12X

## Management Module

The BlackDiamond X8 series switch has two dedicated management module slots, labeled A and B, for the BDX-MM1 management module. One management module is required for switch operation; however, adding a second management module increases system availability through redundancy. Each management module contains a temperature sensor, nonvolatile random-access memory (NVRAM), and a real-time clock.

The BlackDiamond X8 Management Module has very high speed and scalable control plane support with an Intel i7 dual core CPU which will run at 2 GHz, 1 GB compact flash and 2 GB ECC DDR3 SDRAM.

## Redundant Management Module Activity

The BlackDiamond X8 series switch can operate with a single management module installed or with two management modules installed for redundancy. When you install a second management module, one of the management modules operates as the primary, and the other becomes the secondary or backup. The management modules are solely responsible for upper-layer protocol processing and system management functions and do not carry data plane traffic between I/O slots.

When you save the switch configuration, it is saved to all installed management modules.

Selection of the primary management module occurs automatically. The following examples describe the selection process:

- When a BlackDiamond X8 series switch boots with two management modules installed, the management module in slot A becomes the primary.  
If a switch is operating with one management module and a second management module is added to the switch after it has been powered up, the added management module becomes the secondary. Management modules that operate as secondary, or backup, management modules can be inserted and removed without disrupting network services.
- If you remove the primary management module while the switch is operating, the secondary management module becomes the primary management module.

For example, if you have a BlackDiamond X8 series switch with a primary management module in slot A and a secondary management module in slot B, and you remove the primary management module from slot A, the secondary, or backup, management module in slot B becomes the primary.

## Features of the Management Module

Figure 3 shows the front panel of the BDX-MM1 management module.

Management modules have the following features on the front panel:

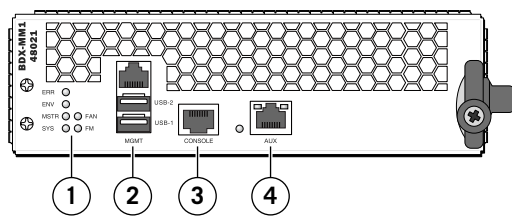
- Management1 port—The 10/100/1000BASE-T Ethernet management port allows you to connect an Ethernet cable directly from your laptop to the management port to view and locally manage the switch configurations. This port can also be used to connect the system to a parallel management network for administration.
- Two USB ports—These ports allow you to attach a single external USB 2.0 flash drive for downloading new software or rescuing an image. Only one of these ports can be used at any one time. Only a USB flash drive that is formatted using the file allocation table (FAT) file system is recognized on this port. Other devices, such as a USB external hard drive, will not be mounted.

- Console port—The RJ-45 serial console port is used to connect a terminal, allowing you to perform local management.
- Auxiliary (AUX) port—For future development

Management modules have the following LEDs (see [Table 4](#)):

- Presence of system errors (ERR)
- System environmental status (ENV)
- Master/backup status of the module (MSTR)
- General system status (SYS)
- General fan status (FAN)
- Fabric module status (FM)

**Figure 3: BDX-MM1 Module**



BDX\_011

- 1 = LEDs
- 2 = Management port and USB ports
- 3 = Console port
- 4 = Auxiliary port with LED

## Management Module LEDs

LEDs on the management module (Table 4) provide status information about operation of the switch and major chassis components.

**Table 4: LEDs on the BDX-MM1 Management Module**

Label/Function	Color/State	Meaning
ERR Error	Amber/steady	A critical software error has been logged since power-up.
	Off	Normal operation is occurring.
ENV Environmental status	Green/steady	The system is operating within the defined operational limits.
	Amber/steady	The system is operating outside the defined operational limits.
MSTR Master/backup status of module	Green/steady	This management module is the master in the system.
	Green/blinking	Power-on self-test (POST) is running.
	Amber/steady	Module is operating as backup (secondary) MM.
	Off	Normal operation for diagnostics.
SYS System status	Green/blinking	The system has booted and is operating normally.
	Amber/blinking	Diagnostic tests are running on the module. The LED resets if the diagnostics are terminated. The LED returns to flashing amber if another diagnostic test is started.
	Amber/steady	Diagnostic failure has occurred.
	Off	The switch is not receiving power.
FAN General fan status	Amber/steady	A fan failure has occurred. Check the Fan LEDs on the fan trays at the rear of the chassis. (See Table 7 on page 26.)
	Off	Fans are operating normally.
FM Fabric module status	Amber/steady	The fabric module is running diagnostics or has a fault condition. Check the FM LEDs on the fan trays at the rear of the chassis. (See Table 6 on page 25.)
	Off	All the fabric modules are operating normally.
Link (on Management port)	Green	Link is up.
	Off	Link is down.
Activity (on Management port)	Amber	Packet activity is occurring.
	Off	No packet activity is occurring.
Auxiliary port (unlabeled)	N/A	For future development

## I/O Modules

The following I/O modules are available for the BlackDiamond X8 switch:

- BDXA-10G48X
- BDXA-40G24X
- BDXA-40G12X

No configuration information is stored on the I/O modules; all configuration information is stored on the management modules.

When a BlackDiamond X8 series switch is powered on, the software generates a default configuration for any slots that contain I/O modules. The default configuration allows the I/O module ports to participate in the VLAN named *default*. The default configuration for the I/O module is not preserved unless you explicitly save the configuration to NVRAM.

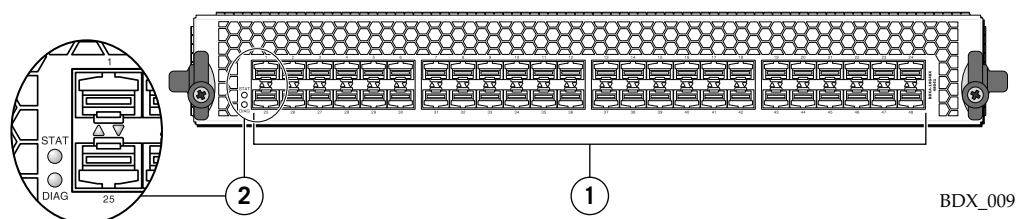
You can configure parameters of an I/O module after it is installed, or preconfigure a slot for a certain type of module and configuration. The preconfigured information is applied to the module after it is inserted. If you preconfigure a slot for a specific module type and then insert a different type of module, the inserted module reverts to its default configuration.

See the *ExtremeXOS Concepts Guide* and the *ExtremeXOS Command Reference Guide* for feature-specific information related to BlackDiamond X8 series modules.

### BlackDiamond BDXA-10G48X I/O Module

The BDXA-10G48X I/O module (Figure 4) has 48 unpopulated SFP+-based 10-gigabit Ethernet ports.

**Figure 4: BDXA-10G48X I/O Module**



- 1 = 10-gigabit Ethernet ports  
2 = LEDs

In the default configuration for the BDXA-10G48X module, all ports:

- Are added to the default VLAN as untagged.
- Inherit the properties of the default VLAN (for example, protocol type and VLAN ID).

The BDXA-10G48X module has the following LEDs:

- Module status (STAT)
- Module diagnostics (DIAG)
- Port status

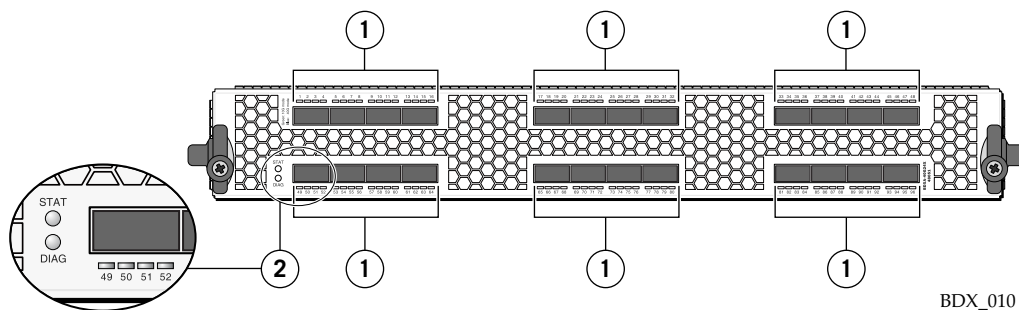
For information about the LEDs and their activity on the BDXA-10G48X modules, see [“I/O Module LEDs” on page 24](#). For information about the SFP+ modules, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

## BlackDiamond BDXA-40G24X I/O Module

The BDXA-40G24X I/O module (Figure 5) has 24 unpopulated QSFP+-based 40-gigabit Ethernet ports. Each installed QSFP+ optical module can operate as a single 40-gigabit port or as four 10-gigabit ports. In 40G port mode, the module provides 24 ports; if all ports are operating in 10G mode, the module provides 96 ports.

When the ports are operating in 40-Gbps mode, the port numbers increment by 4. For example, the first four ports in the top row would be numbered (from left to right) 1, 5, 9, and 13. Other port numbers are displayed in ExtremeXOS as “not available.” When a port is configured to operate in 10-Gbps mode, all four port numbers associated with that physical port are displayed as being available. The default mode for the ports is 40-Gbps operation. To configure a port for 10-Gbps operation, use the `configure ports partition` command.

**Figure 5: BDXA-40G24X I/O Module**



1 = QSFP+ ports  
2 = LEDs

In the default configuration for the BDXA-40G24X module, all ports:

- Are added to the default VLAN as untagged.
- Inherit the properties of the default VLAN (for example, protocol type and VLAN ID).

The BDXA-40G24X module has the following LEDs:

- Module status (STAT)
- Module diagnostics (DIAG)
- Port status

When a port is operating in 40-Gbps mode, the farthest left LED below that port lights blue to indicate the 40-Gbps operation. When a port is operating in 10-Gbps mode, each LED for an active channel from the port lights green.

For information about the LEDs and their activity on the BDXA-40G24X modules, see [“I/O Module LEDs” on page 24](#). For information about the QSFP+ modules, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.



### NOTE

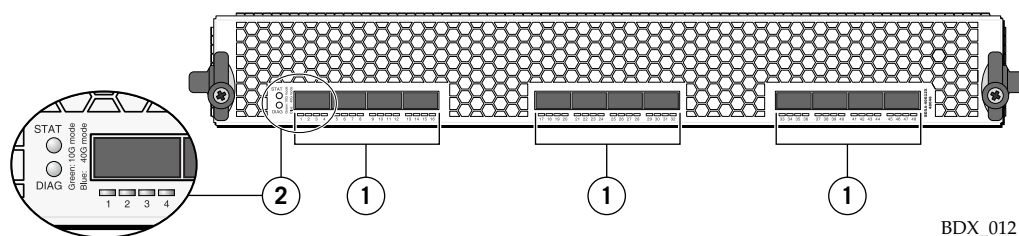
The BDXA-40G24X module requires BDX-FM20T fabric modules in order to function.

## BlackDiamond BDXA-40G12X I/O Module

The BDXA-40G12X I/O module (Figure 6) has 12 unpopulated QSFP+-based 40-gigabit Ethernet ports. Each installed QSFP+ optical module can operate as a single 40-gigabit port or as four 10-gigabit ports. In 40G port mode, the module provides 12 ports; if all ports are operating in 10G mode, the module provides 48 ports.

When the ports are operating in 40-Gbps mode, the port numbers increment by 4. For example, the first four ports would be numbered (from left to right) 1, 5, 9, and 13. Other port numbers are displayed in ExtremeXOS as “not available.” When a port is configured to operate in 10-Gbps mode, all four port numbers associated with that physical port are displayed as being available. The default mode for the ports is 40-Gbps operation. To configure a port for 10-Gbps operation, use the `configure ports partition` command.

**Figure 6: BDXA-40G12X I/O Module**



1 = QSFP+ ports  
2 = LEDs

In the default configuration for the BDXA-40G12X module, all ports:

- Are added to the default VLAN as untagged.
- Inherit the properties of the default VLAN (for example, protocol type and VLAN ID).

The BDXA-40G12X module has the following LEDs:

- Module status (STAT)
- Module diagnostics (DIAG)
- Port status

When a port is operating in 40-Gbps mode, the farthest left LED below that port lights blue to indicate the 40-Gbps operation. When a port is operating in 10-Gbps mode, each LED for an active channel from the port lights green.

For information about the LEDs and their activity on the BDXA-40G12X modules, see [“I/O Module LEDs” on page 24](#). For information about the QSFP+ modules, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

## I/O Module LEDs

LEDs on the front panel of the BlackDiamond X8 series I/O modules (Table 5) provide information about the operating status of the module and ports.

**Table 5: LEDs on the BlackDiamond X8 Series I/O Modules**

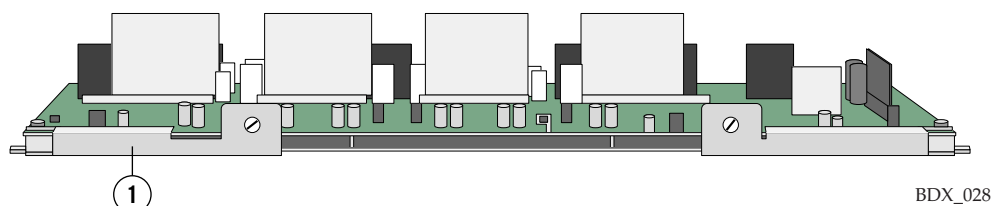
Type	Label/Function	Color/State	Meaning
Module	STAT Module status	Green/blinking	Normal operation.
		Amber/blinking	Configuration error, code version error, diagnostic failure, or other severe module error.
		Off	The module is not receiving power.
	DIAG Module diagnostics	Amber/blinking	Diagnostic tests are in progress.
		Amber/steady	A diagnostic failure has occurred.
		Off	Normal operation.
Port	Port status	Green/steady	Link is up.
		Green/blinking	Port is disabled.
		Amber blinking	Packet activity on port.
		Off	Link is down.



## Fabric Modules

Up to four fabric modules (Figure 7) can be installed in each BlackDiamond X8 chassis to provide the active switching fabric for the switch. The switch fabric supports N+1 redundancy. Three fabric modules are required to provide full switch fabric capacity. The fourth module provides excess capacity but is not required to maintain full line rate on the front-panel ports. Fabric modules are installed in dedicated slots at the back of the chassis, behind the fan trays.

**Figure 7: Fabric Module**



1 = Inserter/extractor lever

Two types of fabric modules are available for the BlackDiamond X8 switch:

- BDXA-FM10T module
- BDXA-FM20T module

BDXA-FM10T fabric modules provide a total switch fabric capacity of 10 Terabits per second, and BDXA-FM20T fabric modules provide 20 Terabits per second.

A switch fabric composed of BDXA-FM10T modules will provide full line rate for the BDXA-10G48X and BDXA-40G12X I/O modules. For the BDXA-40G24X I/O module, a BDXA-FM20T switch fabric is required for full line rate on all ports. The BDXA-40G24X I/O module will not operate with a switch fabric composed of BDXA-FM10T modules.

All the fabric modules in a BlackDiamond X8 switch must be the same type; you cannot combine BDXA-FM10T modules and BDXA-FM20T modules.

Status LEDs for each fabric module are on the fan tray that is in front of that fabric module. The status LEDs for the fabric module are labeled Diag and Stat.

Table 6 describes the meanings of the fabric module LEDs.

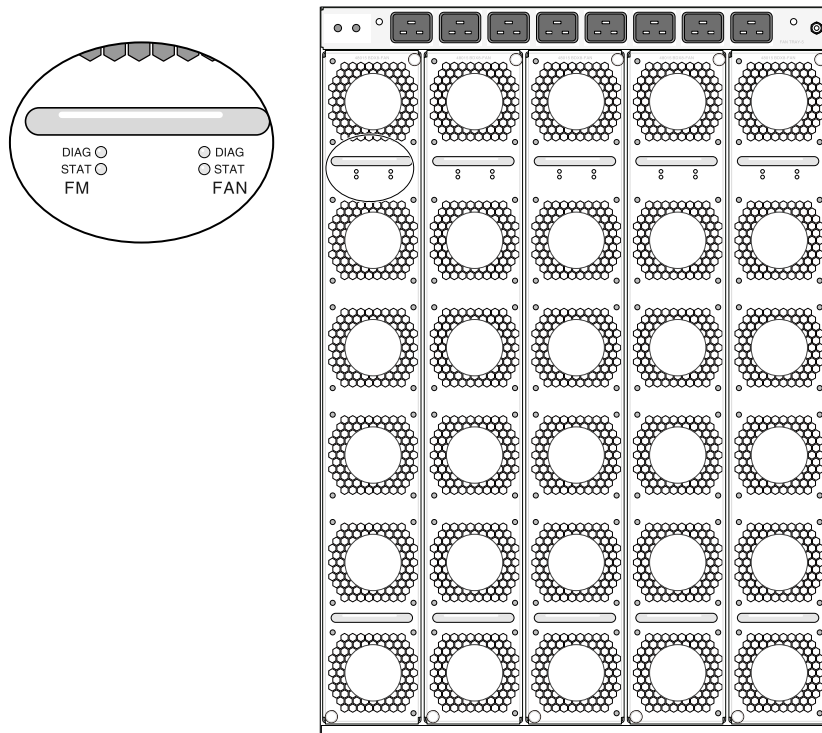
**Table 6: LEDs for the BlackDiamond X8 Series Fabric Modules**

Label/Function	Color/State	Meaning
DIAG Module diagnostics	Amber/blinking	Diagnostic tests are in progress.
	Amber/steady	A diagnostic failure has occurred.
	Off	Normal operation
STAT Module status	Green/blinking	Normal operation
	Amber/blinking	Configuration error, code version error, or other severe module error.
	Amber/steady	The module is present but not receiving power.
	Off	The module is not present.

## Fan Trays

At the back of the BlackDiamond X8 chassis are five vertical fan trays, each holding six fans (Figure 8). Fan trays are hot-swappable. Two pairs of LEDs on each fan tray indicate operating status for the fabric module installed behind that fan tray (Table 6 on page 25) and for the fan tray (Table 7). Only the first four fan trays are associated with fabric modules.

**Figure 8: Fan Trays in the BlackDiamond X8 Chassis**



BDX\_029

**Table 7: LEDs for the Fan Trays**

Label/Function	Color/State	Meaning
Stat	Green	Fans are operating normally.
	Amber/blinking	One or more fans are not operating properly.
	Off	No power.
Diag	Amber/steady	Controller is not functioning properly.
	Amber/blinking	Firmware upgrade is in progress.
	Off	Normal operation.

# 3

CHAPTER

## Power Supplies for the BlackDiamond X8 Switch

This chapter includes the following sections:

- [Overview of the BlackDiamond X8 Series Power Supplies on page 27](#)
- [AC Power Supply on page 28](#)



### **WARNING!**

---

Field operators must 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.

---

## Overview of the BlackDiamond X8 Series Power Supplies

The BlackDiamond X8 series switch is powered by AC power supplies that are installed at the top front of the chassis. The power supply bay in the BlackDiamond X8 switch can accommodate up to eight AC power supplies.

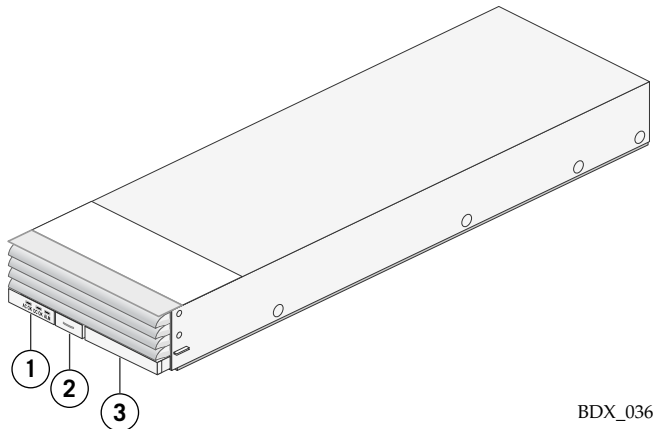
The BlackDiamond X8 AC power supplies can operate from 110 V AC or 220 V AC and automatically adjust to the supply voltage. With 220 V AC input, the BlackDiamond X8 AC power supplies can operate in an N+N or N+1 configuration.

Power supplies in the BlackDiamond X8 switch are fully fault tolerant and load-sharing in an N+1 configuration. After the system is properly configured, if one power supply fails, the others provide sufficient power to operate a fully loaded switch.

## AC Power Supply

The AC power supply for the BlackDiamond X8 switch ([Figure 9](#)) delivers 2500 W when operated from 185 to 264 V AC, or 1250 W when operated from 90 to 140 V AC.

**Figure 9: BlackDiamond X8 AC Power supply**



BDX\_036

- 1 = LEDs
- 2 = Release button
- 3 = Inserter/extractor lever

Each AC PSU contains two cooling fans at the front of the unit. Airflow is from front to back.

For information about installing the BlackDiamond X8 AC PSU, see [“Installing Power Supplies” on page 54](#).

## LEDs

The BlackDiamond X8 AC power supply has status LEDs on the front panel. [Table 8](#) describes the meanings of the LEDs.

**Table 8: LEDs on the BlackDiamond X8 AC Power Supply**

Power Supply Condition	LED Type and Color		
	AC OK Green	DC OK Green	ALM Red
No AC input power to any power supply. (Receiving standby output from backplane)	Off	Off	Off
AC input power is present. 48 V output is disabled. Standby output is ON.	On	Off	Off
AC input is present; DC outputs are good.	On	On	Off
AC input is good; output (48 V) has a fault.	On	Off	On
Output is good, but a warning alarm has been detected (for example, Undervoltage).	On	On	On

## Fuse

The BlackDiamond X8 AC power supply does not contain a field-operator-replaceable fuse.



---

**WARNING!**

Field operators must not attempt to configure or replace fuses in Extreme Networks AC power supplies. In the event of failure, immediately return the defective Extreme Networks AC power supply for a complete replacement.

---

## Power Supply Cords

An AC power cord is not included with the BlackDiamond X8 AC power supply. You can purchase AC power cords for use in the US and Canada from Extreme Networks or from your local supplier. An AC power cord for use with the BlackDiamond X8 AC power supply must meet the requirements listed in [“Power Cord Requirements” on page 113](#).



# 2

PART

## Hardware Installation





# 4

CHAPTER

## Site Preparation

This chapter includes the following sections:

- [Planning Your Site on page 33](#)
- [Meeting Site Requirements on page 34](#)
- [Evaluating and Meeting Cable Requirements on page 40](#)
- [Meeting Power Requirements on page 44](#)
- [Applicable Industry Standards on page 46](#)

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. This chapter assumes a working knowledge of local area network (LAN) operations, familiarity with communications protocols that are used on interconnected LANs, and familiarity with basic installation procedures for networking equipment.



### NOTE

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Before installing or removing any components of the system, or before carrying out any maintenance procedures, read the safety information in [Appendix A](#) of this guide.

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## Planning Your Site

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 site planning process has three major parts:

- 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

- 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.

- Meeting power requirements

To run your equipment safely, you must meet the specific power requirements for each power supply unit installed in the system. For power supply specifications, see [“Power Supplies for BlackDiamond X8 Switches”](#) on page 113.

## Meeting Site Requirements

This section describes requirements to consider when preparing your installation site, including:

- [Operating Environment Requirements](#)
- [Rack Specifications and Recommendations](#)

## 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 LAN, it is important that you develop a thorough understanding of the regulations that pertain to your location and industry.

### 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. The following sections are provided as a resource to obtain additional information.

Information about major building codes is located at the following websites:

- International Code Council (ICC); 5203 Leesburg Pike; Falls Church, Virginia 22041 USA.  
<http://www.iccsafe.org>  
<http://www.sbcci.org>

The organizations listed in [Table 9](#) are authorities on electrical codes.

**Table 9: Authorities on Electrical Codes**

<b>Organization</b>	<b>Address</b>	<b>Web Site URL</b>
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, Massachusetts 02169 USA	<a href="http://www.nfpa.org">http://www.nfpa.org</a>
Underwriters' Laboratory (UL) (USA only) 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, Illinois 60062-2096 USA	<a href="http://www.ul.com">http://www.ul.com</a>
National Electrical Manufacturing Association (NEMA) (USA only) Organization of electrical product manufacturers. Members develop consensus standards for cables, wiring, and electrical components.	NEMA 1300 N. 17th Street Rosslyn, Virginia 22209 USA	<a href="http://www.nema.org">http://www.nema.org</a>
Electronics Industries Alliance (EIA) Trade association that develops technical standards, disseminates marketing data, and maintains contact with government agencies in matters relating to the electronics industry.	EIA 2500 Wilson Boulevard Arlington, Virginia 22201 USA	<a href="http://www.eia.org">http://www.eia.org</a>
Federal Communications Commission (FCC) (USA only) Commission that regulates all interstate and foreign electrical communication systems that originate in the United States according to the Communications Act of 1934. The FCC regulates all U.S. telephone and cable systems.	FCC 445 12th Street S.W. Washington, D.C. 20554 USA	<a href="http://www.fcc.gov">http://www.fcc.gov</a>

## Wiring Closet Considerations

Be aware of the following recommendations for your wiring closet:

- Be sure that your system is easily accessible for installation and service. See [“Rack Specifications and Recommendations” on page 37](#) for 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 distribution 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

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Extreme Networks recommends that you consult an electrical contractor for commercial building and wiring specifications.

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## 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. Too much humidity can cause a fire. Too little humidity can produce electrical shock and fire.

Follow these general thermal recommendations for your wiring closet:

- Be sure that the ventilation in the wiring closet is adequate to maintain a temperature below 104° F (40° C).
- 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 an ambient operating temperature of 32° to 104° F (0° to 40° C).
- Maintain a storage temperature of -40° to 158° F (-40° to 70° C).



### NOTE

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As with all electrical equipment, Extreme Networks product lifetimes degrade with increased temperature. If possible, temperatures should be kept at approximately 78° F (25° C) or lower.

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## Humidity

To maximize equipment life, keep operating humidity between 50% and 70% relative humidity (non-condensing) during typical operation. The equipment can operate between 10% and 95% relative humidity (non-condensing) for short intervals.

## Chassis Airflow Requirements

To ensure proper airflow through a BlackDiamond switch, refer to the following recommendations when you install the switch:

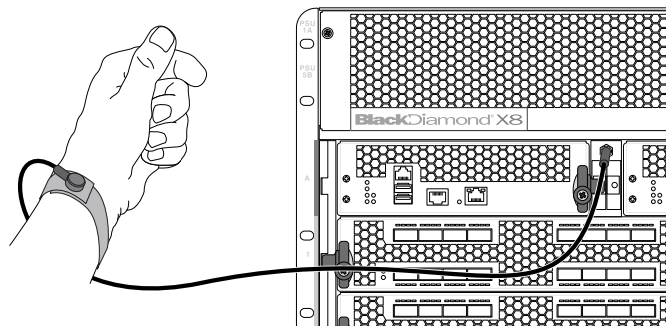
- For proper airflow, BlackDiamond X8 series switches require a minimum of 24 inches (61 cm) between any cabinet wall or other obstruction and the front and back of the chassis.
- Air temperature measured approximately 1 inch (2.5 cm) from the front of I/O slot 1 should be less than 104 °F (40 °C).

## Electrostatic Discharge

Your system must be protected from static electricity or electrostatic discharge (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 and the ESD-preventive wrist strap that is provided with your equipment. All switches have ESD-preventive wrist strap connectors and are shipped with an ESD-preventive wrist strap as shown in [Figure 10](#).

**Figure 10: Using an ESD-preventive Wrist Strap**



BDX\_043

## 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 1260 pounds (572 kilograms).

## Protective Grounding for the Rack

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

All Extreme Networks switches are designed with mounting brackets that provide solid metal-to-metal connection to the rack. If you do not use equipment racks, you can attach wiring terminals directly to the mounting brackets for appropriate grounding. Extreme Networks switches have grounding terminals that are mounted on the back of the chassis.

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.
- Use the appropriate chassis grounding wire for your system; the correct size depends on the available input current to the power supply.
  - For AC systems using a 20A breaker per PSU (SSI AC), the chassis ground can be as small as 14 AWG. The power cable ground should be the same size as the primary.
  - For DC systems using a 15A breaker per PSU, the chassis ground can be as small as 14 AWG. The power cable ground should be the same size as the primary.
  - For DC systems using a 40A breaker per PSU (SSI DC), the chassis ground can be as small as 10 AWG. The power cable ground should be the same size as the primary.



### NOTE

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For complete details on power supplies and power supply cords, refer to [Chapter 3, “Power Supplies for the BlackDiamond X8 Switch”](#) and to [“Selecting Power Supply Cords” on page 99](#). Drill and tap wire terminals to equipment racks.

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- 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 insure good grounding between the chassis, rack, and earth ground.



### NOTE

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Because building codes vary worldwide, Extreme Networks strongly recommends that you consult an electrical contractor to ensure proper equipment grounding for your specific installation.

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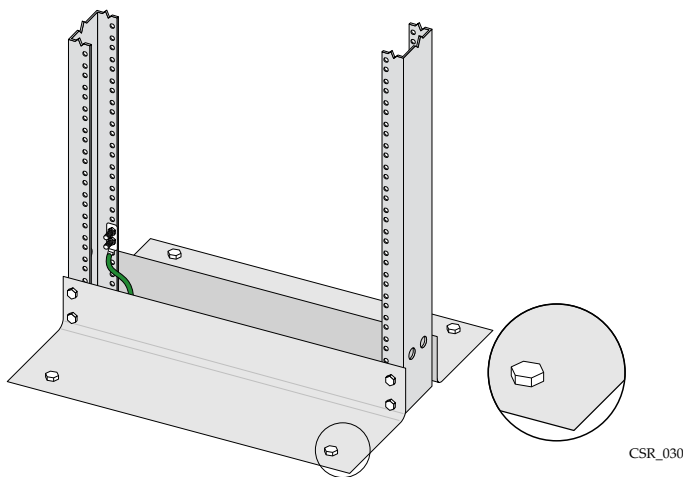
## Space Requirements for the Rack

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 24 inches (61 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.

## Securing the Rack

The rack should be attached to the wiring closet floor with 3/8-inch (9.5 mm) lag screws or equivalent hardware. The floor under the rack should be level within 3/16-inch (5 mm). Use a floor-leveling cement compound if necessary or bolt the racks to the floor as shown in [Figure 11](#).

**Figure 11: Properly Secured Rack**



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

## Evaluating and Meeting Cable Requirements

This section describes requirements for the cable you should use when installing your network equipment. It includes:

- [Cabling Standards](#)
- [Cable Labeling and Record Keeping](#)
- [Cable Distances](#)
- [Installing Cable](#)
- [Radio Frequency Interference](#)

### Cabling Standards

Extreme Networks recommends using the Building Industry Consulting Service International (BICSI) Registered Communications Distribution Designer (RCDD), which is globally recognized as a standard in site planning and cabling. For information, go to:

<http://www.bicsi.org>

### Cable Labeling and Record Keeping

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

Consider the following recommendations when setting up a cable labeling system suitable for your installation:

- Identify cables by securely attaching a label 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 distribution 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 distribution rack. Include the following cable drop information:
  - Cable source
  - Cable destination
  - Jumper location



## Cable Distances

This section provides information to help you select the cables to be used with the BlackDiamond X8 series switch. [Table 10](#) shows cable media types and maximum distances that support reliable transmission in accordance with international standards, except where noted. [Table 11](#) lists the Extreme Networks direct-attach cables.

**Table 10: Media Types and Maximum Distances**

Standard	Media Type	Mhz•Km Rating	Maximum Distance
1000BASE-SX (850 nm optical window)	50/125 µm multimode fiber	400	500 meters
	50/125 µm multimode fiber	500	550 meters
	62.5/125 µm multimode fiber	160	220 meters
	62.5/125 µm multimode fiber	200	275 meters
1000BASE-LX (1300 nm optical window)	50/125 µm multimode fiber	400	550 meters
	50/125 µm multimode fiber	500	550 meters
	62.5/125 µm multimode fiber	500	550 meters
	10/125 µm single-mode fiber	–	5,000 meters
	10/125 µm single-mode fiber <sup>a</sup>	–	10,000 meters
1000BASE-ZX (1550 nm optical window)	10/125 µm single-mode fiber	–	80 km
100BASE-LX100 (1550 nm optical window)	10/125 µm single-mode fiber	–	100 km
1000BASE-BX10 (1490 nm optical window) (1310 nm optical window)	10/125 µm single-mode fiber	–	10 km
1000BASE-LX70 (1550 nm optical window)	10/125 µm single-mode fiber	–	70,000 meters
10GBASE-SR SFP+ (850 nm optical window)	62.5 µm multimode fiber	160	26 m
	62.5 µm multimode fiber (OM1)	200	33 m
	50 µm multimode fiber	400	66 m
	50 µm multimode fiber (OM2)	500	82 m
	50 µm multimode fiber (OM3)	2000	300 m
10GBASE-LR SFP+ (1310 nm optical window)	10/125 µm single-mode fiber	–	10 km
10GBASE-ER SFP+ (1550 nm optical window)	10/125 µm single-mode fiber	–	40 km
40GBASE-SR4 QSFP+ (850 nm optical window)	50 µm multimode fiber (OM3)	–	100 meters
	50 µm multimode fiber (OM4)		150 meters

a. 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 11: Extreme Networks Direct-Attach Cables**

Cable Type	Model Number	Length
SFP+ passive copper cable	10304	1 meter
	10305	3 meters
	10306	5 meters
	10307	10 meters
QSFP+ passive copper cable	10311	0.5 meter
	10312	1 meter
	10313	3 meters
QSFP+ active optical cable	10315	10 meters
	10316	20 meters
	10318	100 meters
QSFP+ to-SFP+ fan-out passive copper cable	10321	3 meters
	10322	5 meters

## Installing Cable

Consider the following recommendations when you connect cable to your network equipment:

- Examine cable for cuts, bends, and nicks.
- To avoid unnecessary weight on the cable bundles, support cable using cable management hardware.
- Use cable management hardware to route cable bundles to the left and right of the network equipment to maximize accessibility to the connectors.
- Provide enough slack, approximately 2 to 3 inches (5.08 to 7.62 cm), to provide proper strain relief.
- Bundle cable using velcro straps to avoid injuring cables.
- If you build your own cable, be sure that cable is properly crimped.
- When installing a patch panel using twisted pair wiring, untwist no more than 1 inch (2.54 cm) of the cable to avoid radio frequency (RF) interference.
- Discharge the RJ-45 Ethernet cable before plugging it into a port on the switch.
- 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.



### CAUTION

Unshielded twisted pair (UTP) cable can build up ESD 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 RJ-45 connector into a LAN Static Discharge device or use an equivalent method.

## Fiber Optic Cable

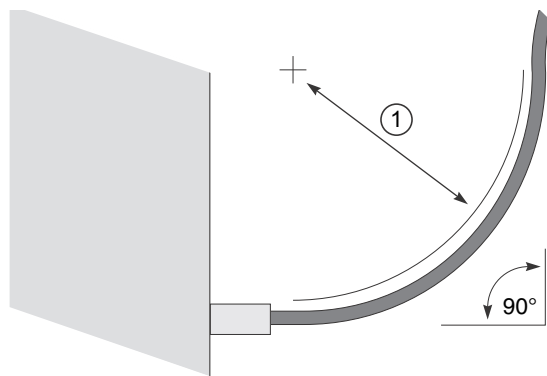
Fiber optic cable must be handled carefully during installation. Every cable has a minimum bend radius, for example, and fibers will be damaged if the cables are bent too sharply. It is also important not to stretch the cable during installation. Extreme Networks recommends that the bend radius for fiber optic cable equal 2 inches (5.08 cm) minimum for each 90 degree turn as shown in [Figure 12](#).



### 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 12: Bend Radius for Fiber Optic Cable**



SPG\_002

1 = Minimum 2-inch (5.08 cm) radius in 90° bend

## Radio Frequency Interference

If you use UTP cabling in an installation, take precautions to avoid 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 an amateur 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 (STP).

## Meeting Power Requirements

This section describes power requirements, including:

- [Power Supply Requirements](#)
- [AC Power Cord Requirements](#)
- [Uninterruptible Power Supply Requirements](#)

### Power Supply Requirements

Follow these recommendations when you plan power supply connections for your Extreme Networks 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 different, independent power sources.

If a power source fails, it will affect only the 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, Extreme Networks recommends that you plug your system into a surge suppressor.

For power specifications of the BlackDiamond power supplies, see [“Power Supplies for BlackDiamond X8 Switches”](#) on page 113.



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#### **WARNING!**

The chassis does not have a switch for turning power to the unit on and off. For systems using an AC power supply, power to the chassis is disconnected by removing the wall plug from the electrical outlet. For systems using a DC SSI power supply, power to the chassis can be turned off by lifting the handle on the power supply or by de-energizing the circuit that feeds the power supply, which is usually accomplished by turning off a circuit breaker.

---

## AC Power Cord Requirements

AC power input cords are not provided with BlackDiamond power supplies. To purchase a power cord for your product and for your specific country, contact your local Extreme Networks Channel Account Manager or Sales Manager, or purchase a cord from your local supplier.

Make sure that the power cord you use is certified for the country of end use and suitable for the device. Check your local electrical codes and regulatory agencies for power cable requirements.

The power cord must meet the requirements listed in [“Selecting Power Supply Cords”](#) on page 99.



### NOTE

When using multiple power supplies, make sure that each AC power supply attaches to an independent power source.

## Uninterruptible Power Supply Requirements

An uninterruptible power supply (UPS) 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 some time after a blackout has occurred.

In addition, some UPS 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.

## Selecting 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 your installation will allow?



### NOTE

Extreme Networks recommends that you use a UPS that provides online protection.

## Calculating Volt-Amperage Requirements

To determine the minimum volt-amperage requirements for your UPS:

- 1 Locate the voltage and amperage requirements for each piece of equipment. These numbers are usually located on a sticker on the back or bottom of your equipment.
- 2 Multiply the numbers together to get Volt-Amps (VA):

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

- 3 Add together the VA from all the pieces of equipment to find the total VA requirement.

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

## UPS Transition Time

Transition time is the time that is necessary for the UPS to transfer from utility power to full-load battery power. For Extreme Networks products, a transition time of less than 20 milliseconds is required for optimum performance.

## Applicable Industry Standards

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

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

You can access these standards at:

<http://www.ansi.org>

or

<http://www.tiaonline.org>

# 5

CHAPTER

## Installing a BlackDiamond X8 Series Chassis

This chapter provides instructions for installing the BlackDiamond X8 chassis in an equipment rack. The BlackDiamond X8 chassis is designed to fit into a standard 19-inch equipment rack. Optional mid-mount brackets allow you to install the chassis in a mid-mount position.

This chapter includes the following sections:

- [Unpacking the Chassis on page 47](#)
- [Pre-Installation Requirements on page 50](#)
- [Rack-Mounting the Chassis on page 51](#)
- [Grounding the Chassis on page 54](#)
- [Installing Power Supplies on page 54](#)
- [Connecting Power on page 58](#)

### Unpacking the Chassis



#### CAUTION

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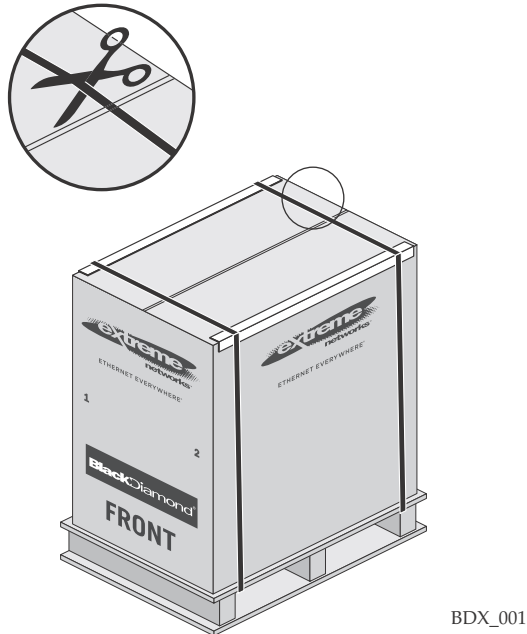
An unpopulated BlackDiamond X8 chassis weighs approximately 152 pounds (69 kg) as shipped. Lifting the BlackDiamond X8 chassis safely requires a minimum of two people or appropriate lifting equipment.

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Refer to the illustrations printed on the BlackDiamond X8 shipping container and unpack the chassis and accessories as follows:

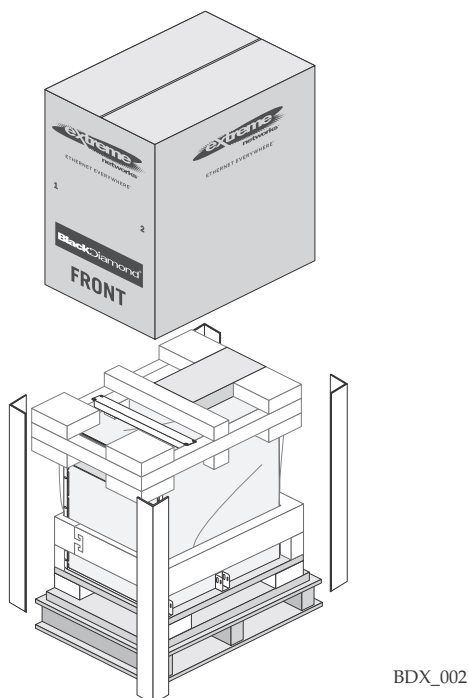
- 1 Cut the straps around the box (Figure 13).

**Figure 13: Unstrapping the Box**



- 2 Slide the box up and off the chassis and interior packing foam (Figure 14). Remove the inside corner braces.

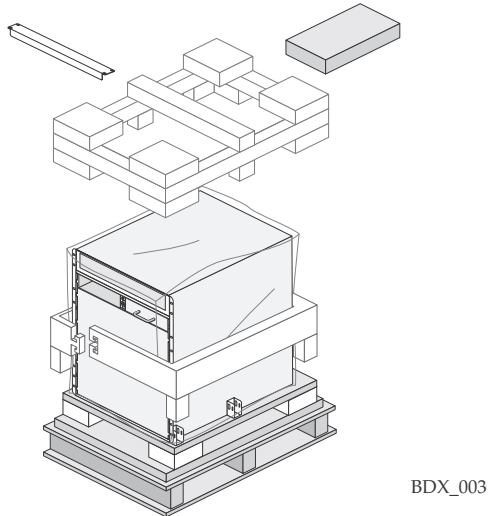
**Figure 14: Removing the Box**





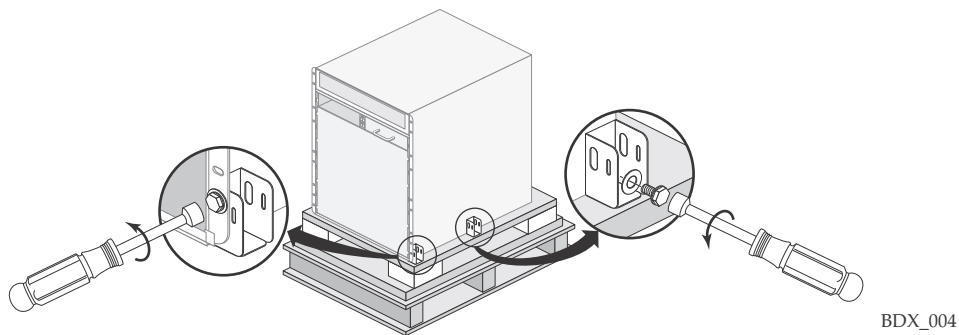
- 3 Remove the support brackets and boxed accessories and set them aside until you need them (Figure 15).
- 4 Lift off the upper packing foam. Pull apart the keyed corner of the lower packing foam and remove the lower packing foam from around the chassis (Figure 15).

**Figure 15: Removing the Accessories and Foam**



- 5 On each side, remove the restraining bolts from the shipping brackets at the front and middle of the chassis (Figure 16).

**Figure 16: Unbolting the Chassis**



- 6 Open the accessory box and locate the four lifting handles.



- Screwdriver appropriate for the selected rack mounting screws
- Chassis grounding materials as listed [on page 54](#).

Before you install the chassis, verify that none of the modules or power supplies have been pre-installed. Because of the weight of the BlackDiamond X8 chassis, it should be empty when you install it.

## Rack-Mounting the Chassis



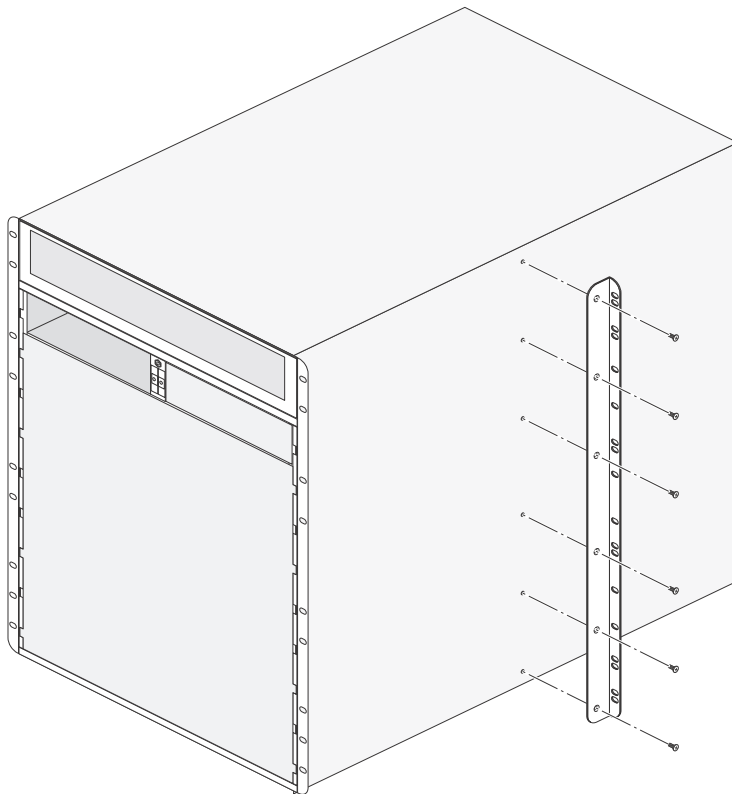
### NOTE

The chassis provides three possible locations on each side for the mid-mount brackets, labeled A, B, and C. When you attach the brackets, make sure you use the same position on each side.

To install the chassis in a rack:

- 1 Attach mid-mount brackets to the sides of the chassis.
  - a On each side of the chassis, align a mid-mount brackets with its mounting holes on the chassis sheet metal.
  - b Using a #2 Phillips screwdriver, insert and tighten the mounting screws to secure the bracket to the chassis ([Figure 18](#)).

**Figure 18: Attaching Mid-mount Brackets**

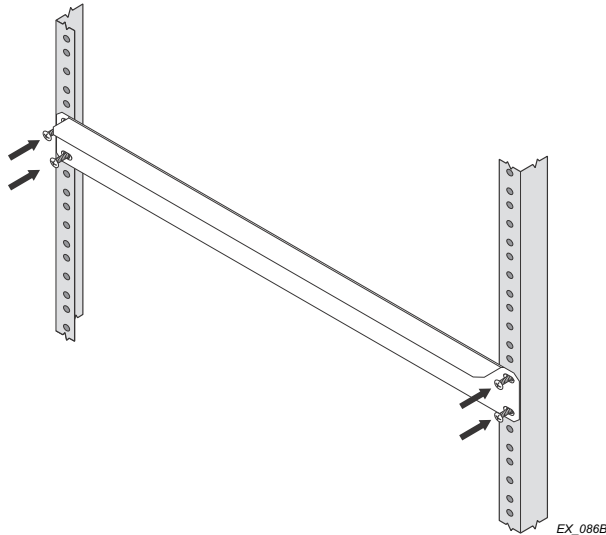


BDX\_013

- 2 Identify the rack location where the chassis will be installed.
- 3 Using four rack mounting screws, attach the support bracket to the equipment rack immediately below the intended chassis location (Figure 19). (Screws are not provided.)

To provide wider support for the chassis as you install it, you can attach the second support bracket on the other side of the rack post.

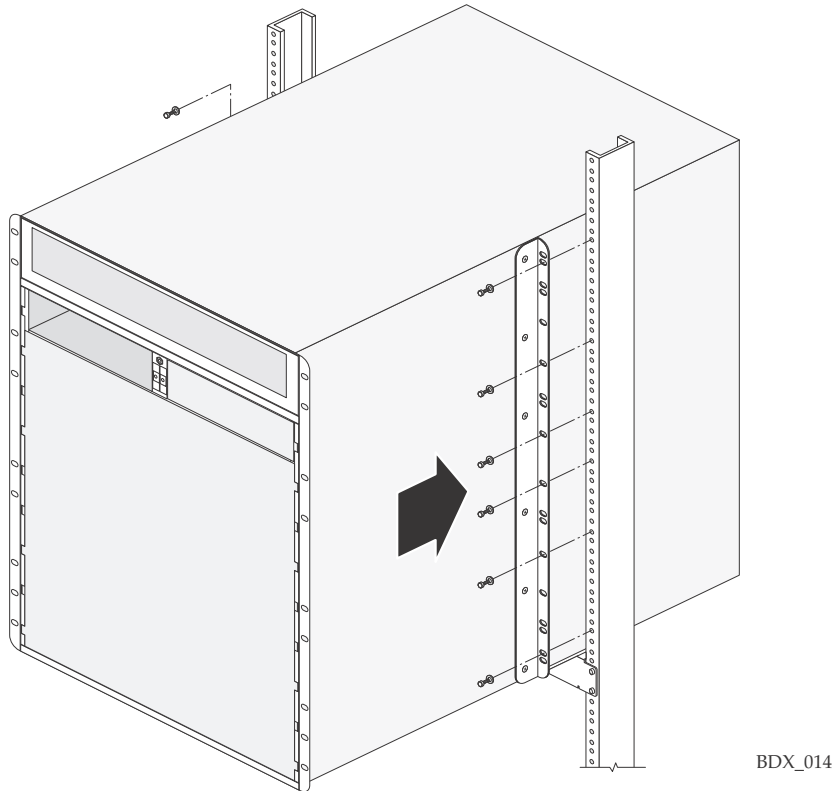
**Figure 19: Attaching the Support Bracket**



- 4 If necessary, attach the lifting handles to each side of the chassis.
- 5 From the front of the rack, lift the back of the empty BlackDiamond X8 chassis onto the support bracket.
- 6 Slowly guide the chassis into the equipment rack until the mounting brackets are flush against the rack uprights.

- 7 Secure the chassis to the equipment rack using six rack mounting screws. (Screws are not provided.) Be sure that the screws are secure. Refer to [Figure 20](#) for the screw locations.

**Figure 20: Securing the Chassis to the Rack**



After the chassis is secured to the equipment rack, ground the chassis as described in the next section.

## Grounding the Chassis

Although grounding the BlackDiamond X8 series chassis is optional, it is recommended to do so. The rear panel of the chassis provides a grounding pad with threaded holes for attaching a ground cable.

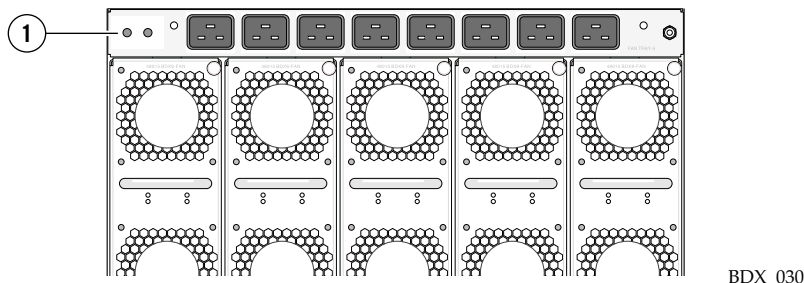
You must provide the following materials to ground the chassis:

- Two 10-24 screws
- One copper, standard barrel 2-hole compression grounding lug with 0.63-inch hole spacing, type LDC, equivalent to Panduit part number LCD4-14A-L or Thomas & Betts part number: LCN4-14
- # 14 AWG stranded copper wire

To ground the chassis:

- 1 Identify the grounding pad on the back of the chassis ([Figure 21](#)).

**Figure 21: Grounding Pad on the Chassis**



1 = Grounding pad

- 2 Strip 0.5 inch (1.2 cm) of insulation from the stranded copper wire cable.
- 3 Insert the stripped wire into the cable lug.
- 4 Crimp the lug securely onto the cable.
- 5 Insert the screws through the lug and into the grounding pad on the back of the chassis.
- 6 Connect the other end of the wire to a known reliable earth ground point at your site.

After the chassis is grounded, install two or more power supplies as described in the next section.

## Installing Power Supplies

You need the following tools and equipment to install an AC power supply in the BlackDiamond X8 chassis:

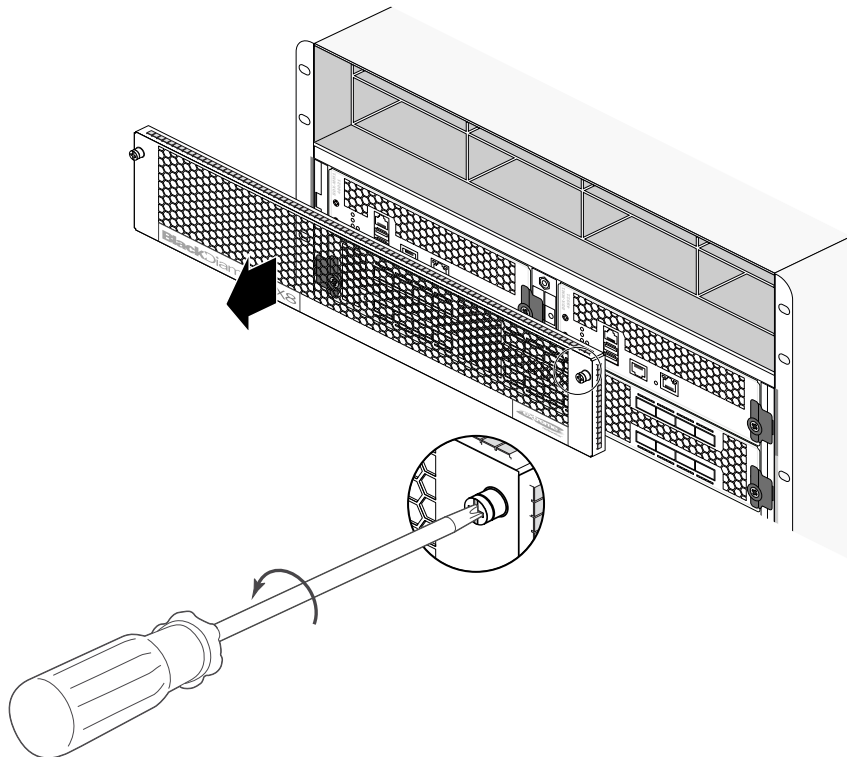
- # 2 Phillips screwdriver
- AC power cord rated for 100-120/200-240 V AC

An AC power cord is not included with the BlackDiamond X8 chassis. You must obtain a power supply cord that meets the requirements listed under [“Selecting Power Supply Cords”](#) on page 99.

To install a power supply:

- 1 Remove the power supply ventilation cover as follows:
  - a Loosen the retaining screws at the top corners of the cover panel.
  - b Pull outward on the retaining screws to tilt the cover panel away from the front of the chassis.
  - c Lift the cover panel away from the chassis.

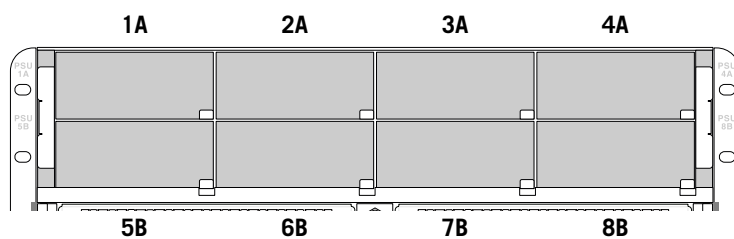
**Figure 22: Removing the Power Supply Ventilation Cover**



BDX\_017

- 2 Identify the power supply bay where you will install the power supply. Power supply bays are numbered from 1A to 8B (Figure 23). To establish an N+N redundant power configuration, install power supplies in both the upper and lower rows.

**Figure 23: Power Supply Bay Numbering on the Chassis**

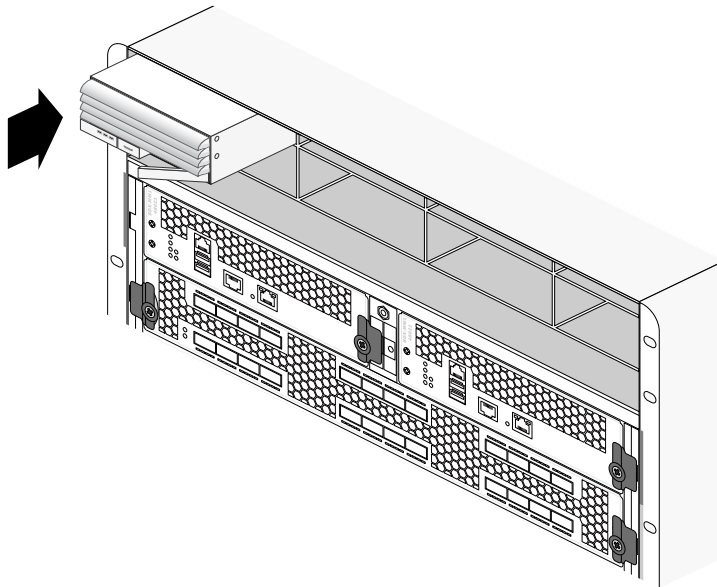


BDX\_031

- 3 On the front of the power supply, push the release button to unlatch the insertion/ejector lever.

- Slide the power supply into the chassis until the lever starts to engage (Figure 4).

**Figure 24: Installing a Power Supply**



BDX\_018

- Rotate the lever toward the front of the power supply to fully seat the power supply in the chassis.
- Repeat steps 3 through 5 to install other power supplies as required by your system configuration.
- Replace the power supply ventilation cover as follows:
  - Set the lower edge of the cover in place so that the tabs on the edge fit into the matching slots in the chassis frame (Figure 25).
  - Rotate the top of the cover into place against the front of the chassis frame.
  - Align and tighten the retaining screws.



**CAUTION**

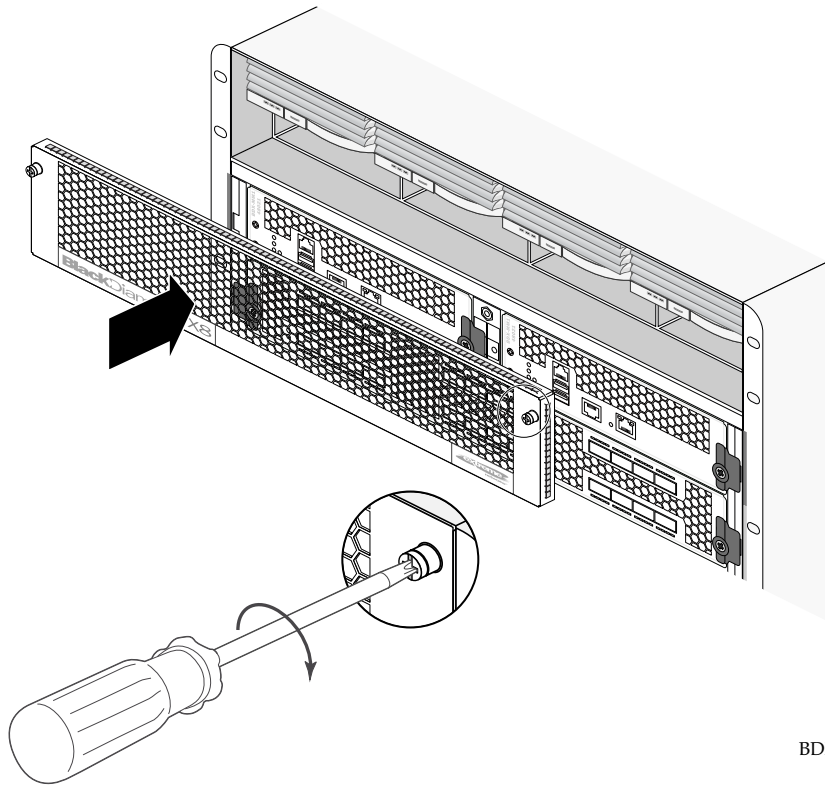
---

Do not operate the BlackDiamond X8 switch without the power supply cover in place. This cover is required to maintain proper EMI levels for the switch.

---



**Figure 25: Installing the Power Supply Ventilation Cover**



BDX\_019

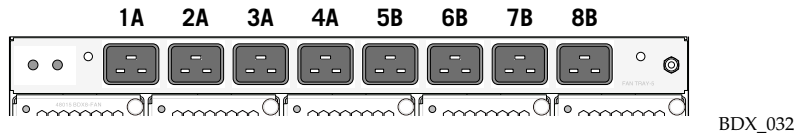
## Connecting Power

To connect power to the BlackDiamond X8 chassis:

- 1 At the back of the chassis, connect an AC power cord to the power input socket that corresponds to each installed power supply.

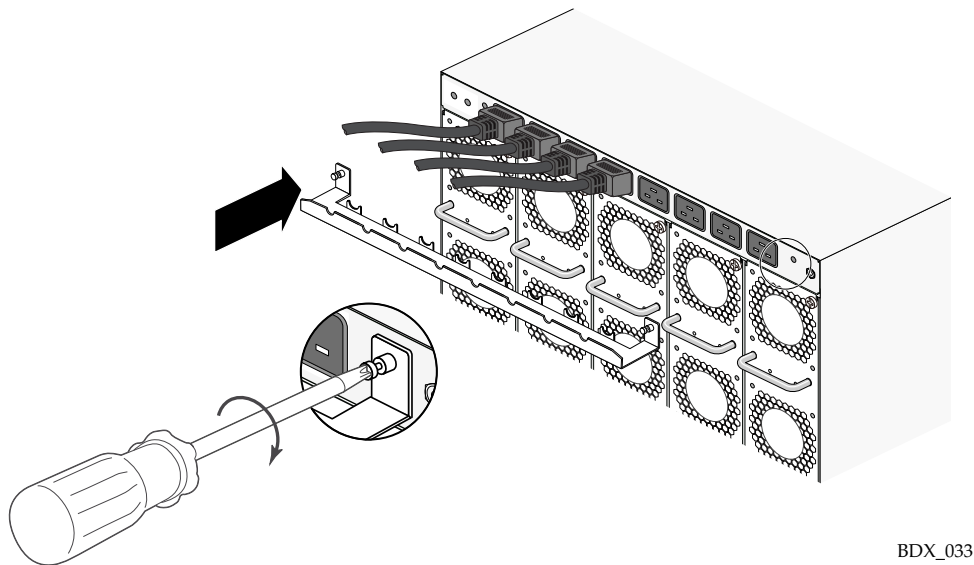
Power input sockets are numbered from 1A to 8B from left to right, as you face the chassis back (Figure 26).

**Figure 26: Numbers for Power Connectors**



- 2 After all the power cords have been connected, set the power cord retainer over the power cord connectors and against the back of the chassis (Figure 27).
- 3 Align and tighten the captive retaining screws on the power cord retainer.

**Figure 27: Installing the AC Power Cord Retainer**



# 6

CHAPTER

## Installing BlackDiamond X8 Series Modules

This chapter provides instructions to install system modules in the BlackDiamond X8 switch and includes the following sections:

- [Installation Order on page 59](#)
- [Installing Fabric Modules on page 60](#)
- [Installing Management Modules on page 64](#)
- [Installing I/O Modules on page 65](#)
- [I/O Module Blanks on page 67](#)
- [Initial Management Access on page 69](#)

### Installation Order

For an initial system installation, the recommended order for populating the chassis is:

- 1 Install all fabric modules (FMs).
- 2 Install all management modules (MMs).
- 3 Install I/O modules.

### Required Tools

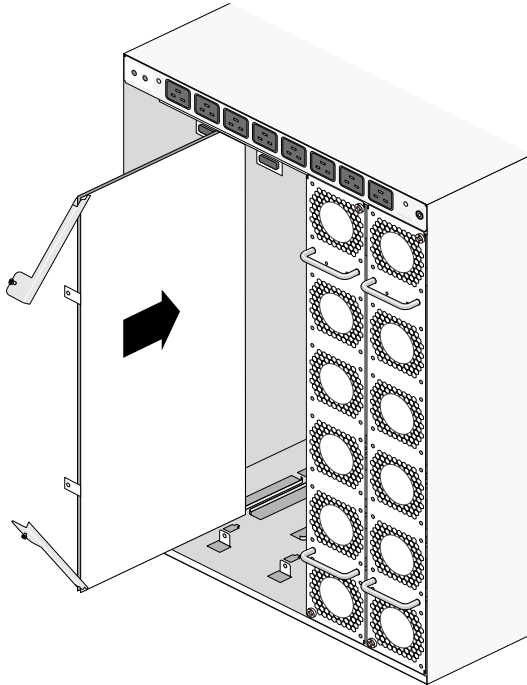
You need the following tools and equipment to install modules in a BlackDiamond X8 chassis:

- ESD-preventive wrist strap
- #2 Phillips screwdriver for the retaining screws on the fan tray and locking screws on management and I/O modules
- 5/16-inch flat-tip screwdriver for the retaining screws on the fabric module



- 3 Install each fabric module:
  - a Loosen the screws on the insertion/extraction levers and open the levers (Figure 29).

**Figure 29: Installing a Fabric Module**

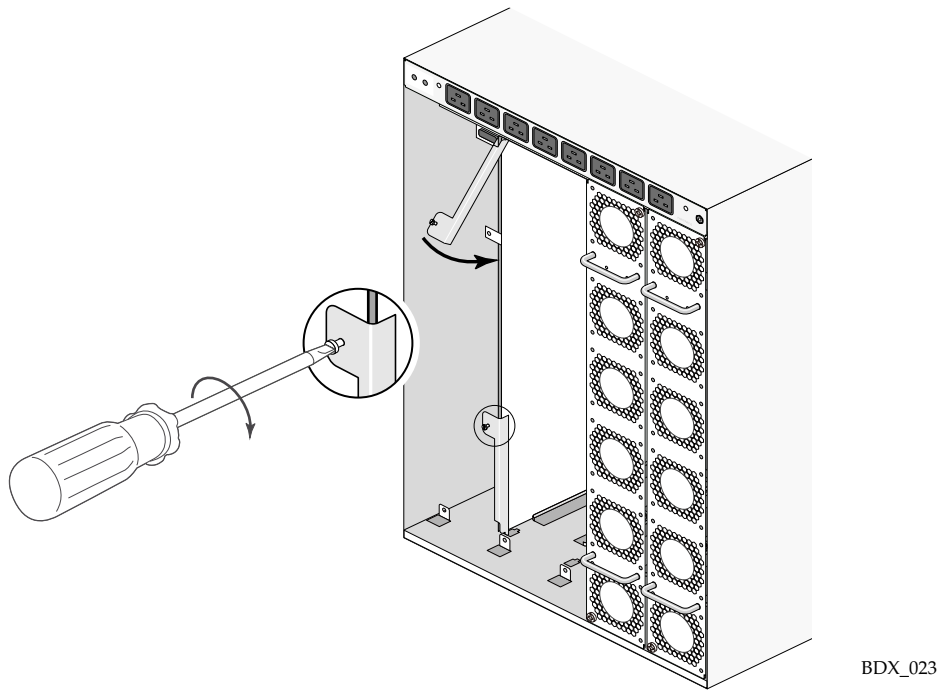


BDX\_021

- b Align the circuit board with the guides at the top and bottom of the chassis and slide the module into the chassis.
    - c When the levers start to engage, push them toward the module to seat the module in the chassis.

- d Align and tighten the retaining screws to fasten the module in place (Figure 30).

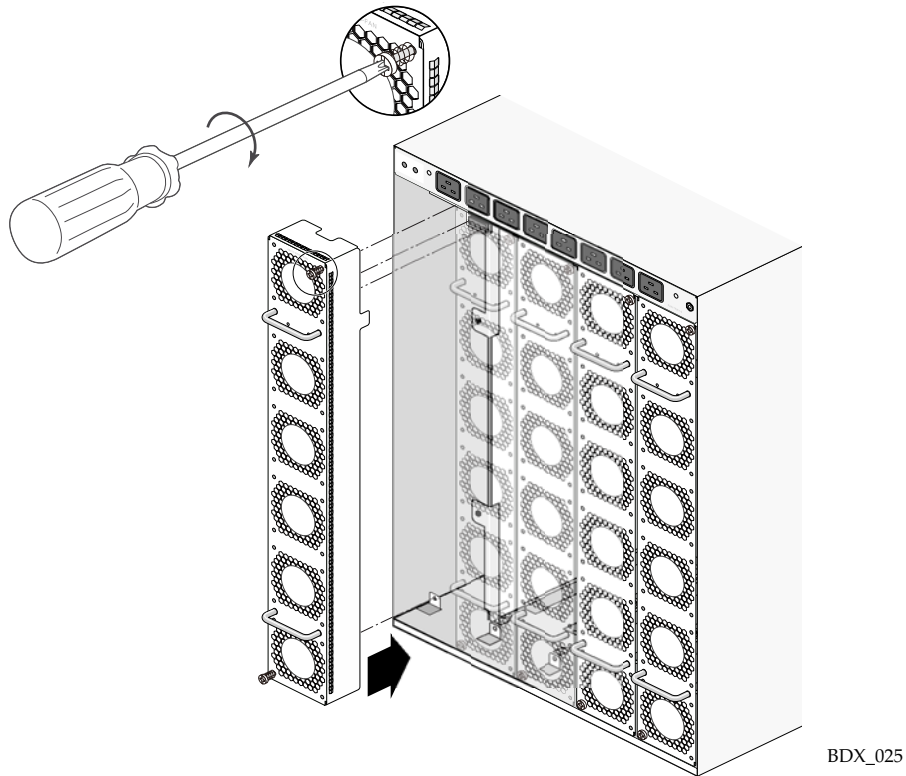
**Figure 30: Securing a Fabric Module**



- 4 Repeat these steps to install additional fabric modules.

- 5 Re-install the removed fan trays:
  - a Set each fan tray into the chassis and push it firmly into place (Figure 31).
  - b Align and tighten the retaining screws.

**Figure 31: Installing a Fan Tray**



## Installing Management Modules

Slots for management modules are labeled A and B. Install the first management module in slot A.

To install a management module:

- 1 Attach the ESD-preventive wrist strap to your bare wrist. If it is not already connected, connect the metal end to the receptacle between the management module slots.
- 2 If necessary, remove the cover from the unoccupied slot.
- 3 Remove the module from the antistatic packaging.

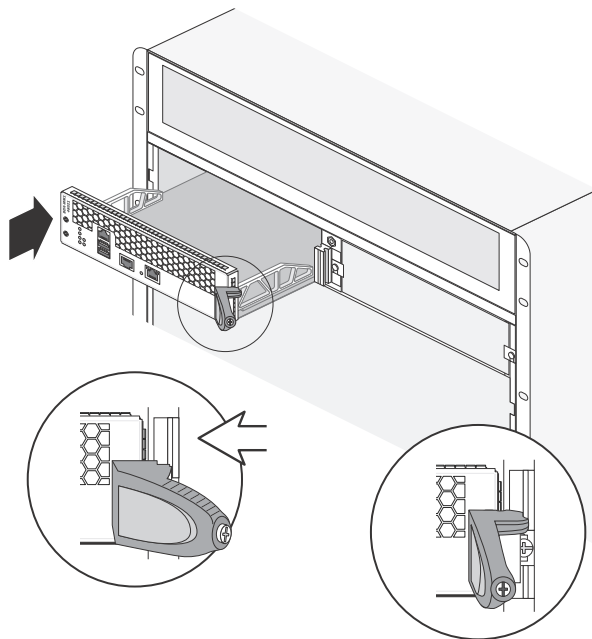


### CAUTION

To prevent ESD damage, hold the module by the metal rail and front panel only. Never touch the components on the PCB or the pins on any of the connectors.

- 4 Verify that the injector/ejector handle is in the open position (Figure 32).  
Keep the injector/ejector handle in the open position as you slide the module into the chassis slot.
- 5 Carefully slide the module into the slot until the injector/ejector handle engages the edge of the chassis and begins to rotate toward the module.
- 6 Use the lever to fully seat the module internal connectors.

**Figure 32: Seating the Management Module**



BDX\_015



- 7 Use a #2 Phillips screwdriver to lock the handle into place (Figure 33).

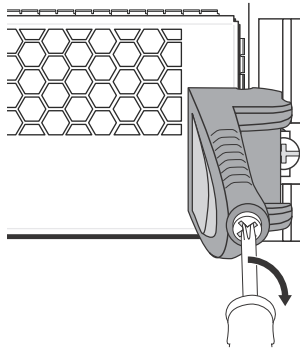
When the locking screw is fully tightened, the yellow band around the screw head is completely hidden.



### CAUTION

Be careful to avoid over-torquing and stripping the screw head.

**Figure 33: Locking the Module into Place**



BDX\_016

## Installing I/O Modules

Slots for I/O modules are numbered 1 through 8, starting at the top.



### NOTE

All unoccupied I/O module slots must be covered by I/O module blanks to ensure proper system ventilation and EMI compliance. Individual I/O module blanks are purchased separately from the chassis.

To install I/O modules:

- 1 Remove the shipping cover from the I/O module slots.

The shipping cover maintains the mechanical stability of the chassis during shipping. Keep the shipping cover and store it with the other chassis shipping materials, in case you need to move the chassis or return it to Extreme Networks.

- 2 Attach the ESD-preventive wrist strap to your bare wrist. If it is not already connected, connect the metal end to the receptacle between the management module slots.
- 3 Remove the module from the antistatic packaging.



### CAUTION

To prevent ESD damage, hold the module by the metal rail and front panel only. Never touch the components on the PCB or the pins on any of the connectors.

- 4 Verify that the module injector/ejector handles are open ([Figure 34](#)).

Keep the injector/ejector handles in the open position as you slide the module into the chassis slot.

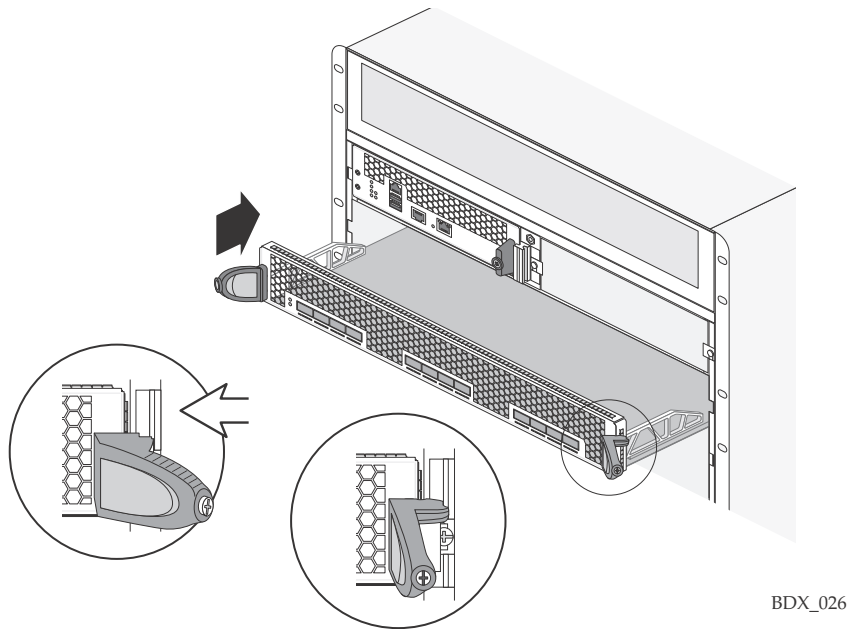


**NOTE**

If the injector/ejector handles are in the latched position, they prevent the module from sliding all the way into the slot.

---

**Figure 34: Installing an I/O Module**



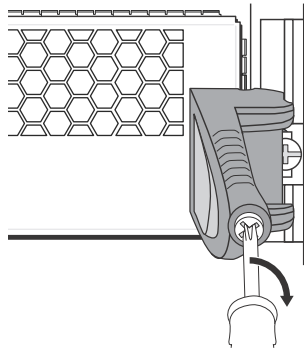
- 5 Carefully slide the module into the slot until the injector/ejector handles engage the edges of the chassis and begin to rotate toward the center of the module.
- 6 Push the handles toward each other to seat the module internal connectors ([Figure 34](#)).

- 7 Use a #2 Phillips screwdriver to lock each handle into place (Figure 35).  
When a locking screw is fully tightened, the yellow band around the screw head is completely hidden.

**CAUTION**

Be careful to avoid over-torquing and stripping the screw heads.

**Figure 35: Locking the Module into Place**



BDX\_016

## I/O Module Blanks

BlackDiamond X8 switches are shipped with a reinforcement shipping cover installed over all the I/O module slots. After you have installed all the I/O modules for your system configuration, you must install module blanks in all remaining unoccupied slots.

**CAUTION**

All unoccupied slots in a BlackDiamond X8 series switch must have module blanks correctly installed to ensure conformance to FCC requirements as well as to maintain adequate airflow through the switch.

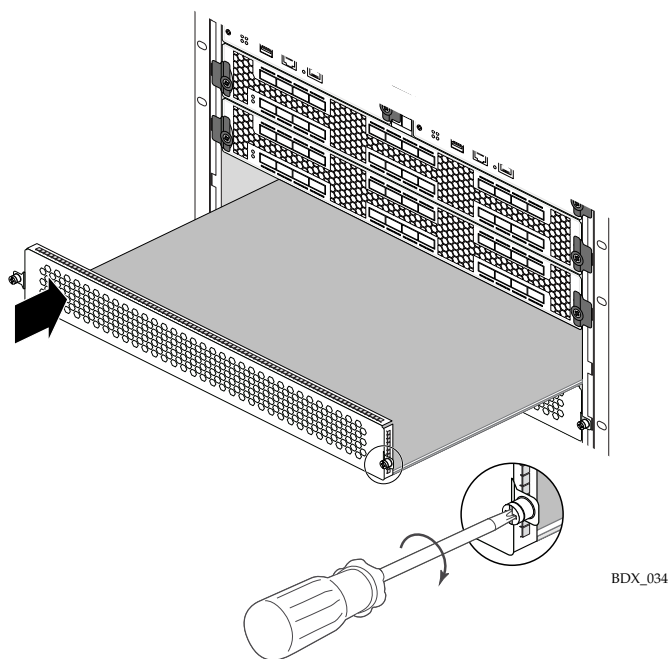
You need a #2 Phillips screwdriver to install a module blank.

## Installing a Module Blank

To install a module blank:

- 1 Check the condition of the EMI gaskets along the front panel edges of the blank, and confirm that the gaskets are not damaged.
- 2 Align the module blank with the card guides for the open slot on the chassis (see [Figure 36](#)).

**Figure 36: Installing a Module Blank**



- 3 Use a #2 Phillips screwdriver to tighten the captive screws at each end of the module blank.



### NOTE

Tighten the screws of each installed module blank before inserting additional modules or blanks. Otherwise, you might unseat modules or blank front panels that you have not secured.

---

## Initial Management Access

After your switch has completed all power on self-tests, it is operational. You can log in and configure an IP address for the default VLAN (named *default*).



### NOTE

In BlackDiamond switches, the management port on the MM is part of the management VLAN by default. Refer to [“Management Ports” on page 16](#) for further details.

## Connecting Equipment to the Console Port

Connection to the console port is used for direct local management. The console port settings are:

- Baud rate—9600
- Data bits—8
- Stop bit—1
- Parity—None
- Flow control—XON/XOFF

The terminal or PC with terminal-emulation software that you connect to an Extreme Networks switch must be configured with these settings. This procedure is described in the documentation supplied with the terminal.

Appropriate cables are available from your local supplier, or you can make your own. To ensure the electromagnetic compatibility of the unit, use only shielded serial cables. For information about the DB-9 console plug connector, see [“Connector Pinouts” on page 114](#).

## Logging In for the First Time

To log in and manually configure the IP settings:

- 1 Connect a terminal or PC with terminal-emulation software to the management module in the BlackDiamond switch.
- 2 At your terminal, press [Return] one or more times until you see the login prompt.
- 3 At the login prompt, enter the default user name *admin* to log on with administrator privileges. For example:

```
login: admin
```

Administrator capabilities allow you to access all switch functions.

- 4 The system will ask a series of questions about the default management settings, which allow all forms of management access for convenience in setting the initial configuration. Answer each question based on the level of security needed for the particular management access type.



### NOTE

For more information about logging in to the switch and configuring switch management access, see the *ExtremeXOS Concepts Guide*.

- 5 At the password prompt, press [Return].

The default user name *admin* has no password assigned to it. When you have successfully logged on to the system, the command line prompt displays the system name (for example, *BlackDiamondX8>*) in its prompt.



**NOTE**

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For more information about how to assign a specific system name, see the *ExtremeXOS Concepts Guide*.

---

- 6 Assign an IP address and subnetwork mask for VLAN *default* by typing:

```
configure vlan default ipaddress 123.45.67.8 255.255.255.0
```

Your changes take effect immediately.

- 7 Save your configuration changes so that they will be in effect after the next system reboot by typing:

```
save
```

The configuration is saved to the configuration database of the management modules in the switch.



**NOTE**

---

For more information about saving configuration changes, see the *ExtremeXOS Concepts Guide*.

---

- 8 When you are finished with these tasks, log out of the switch by typing:

```
logout
```

# 3

PART

## **Maintenance Procedures**





# 7

CHAPTER

## BlackDiamond X8 Maintenance Procedures

This chapter provides instructions for maintenance procedures for the BlackDiamond X8 switch and includes the following sections:

- [Replacing a Power Supply on page 74](#)
- [Replacing a Fan Tray on page 76](#)
- [Replacing a Fabric Module on page 78](#)
- [Replacing a Management Module on page 82](#)
- [Replacing an I/O Module on page 86](#)
- [Packing the Chassis for Shipping on page 89](#)

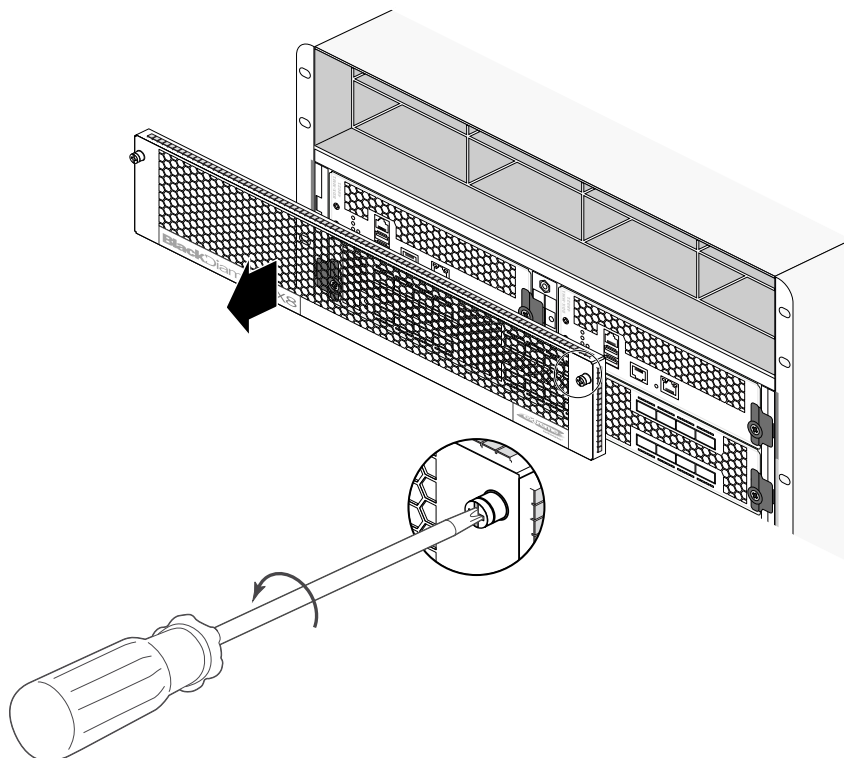
## Replacing a Power Supply

You need a #2 Phillips screwdriver to remove the power supply ventilation cover.

To replace a power supply:

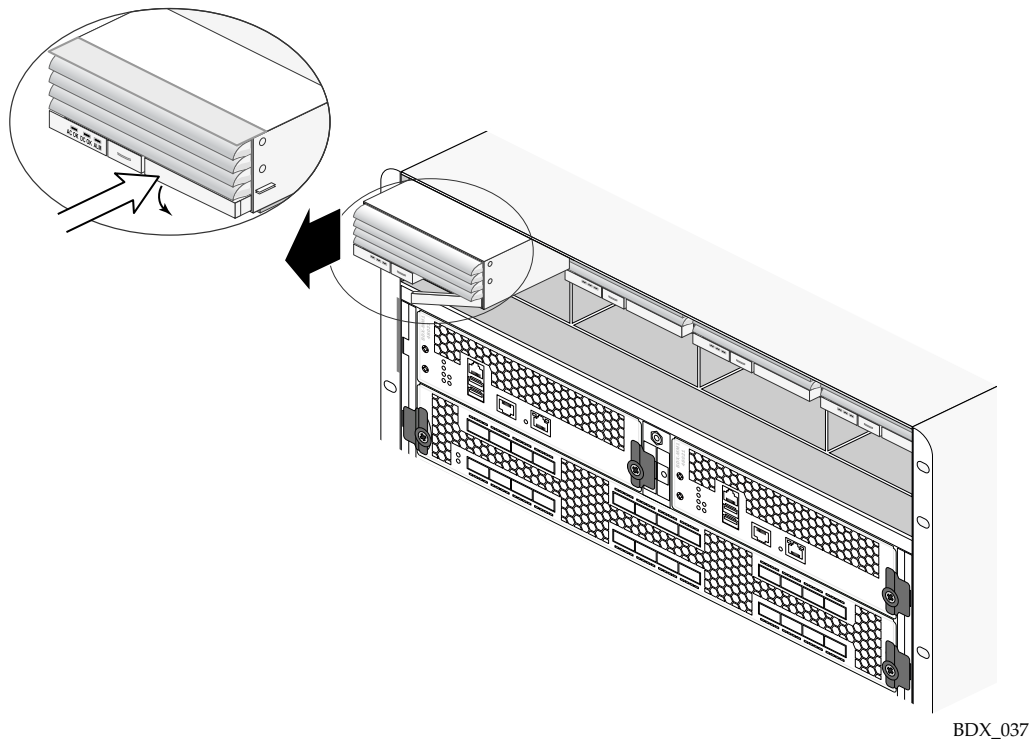
- 1 Remove the power supply ventilation cover ([Figure 37](#)).
  - a Loosen the retaining screws at the top corners of the cover panel.
  - b Pull outward on the retaining screws to tilt the cover panel away from the front of the chassis.
  - c Lift the cover panel away from the chassis.

**Figure 37: Removing the Power Supply Ventilation Cover**

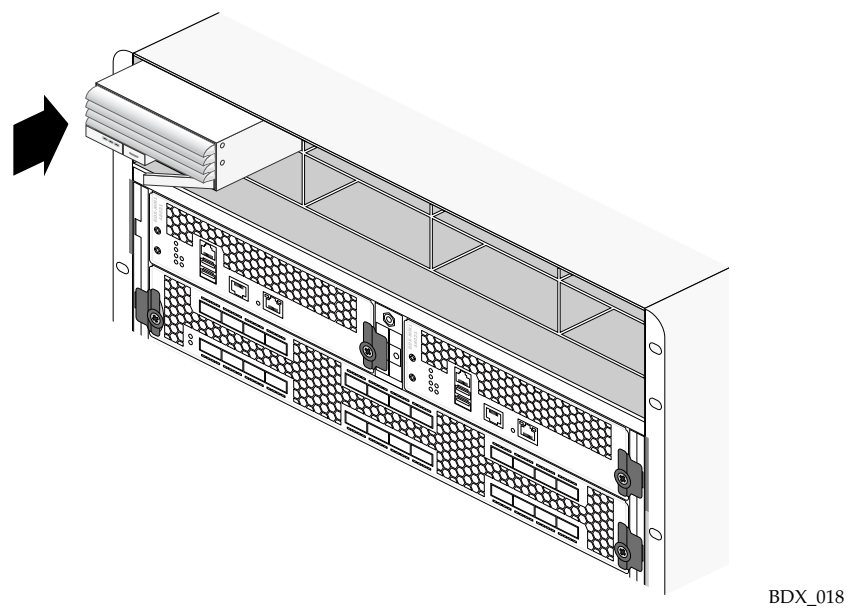


BDX\_017

- 2 Push the release button for the inserter/extractor lever on the front of the power supply.
- 3 Rotate the inserter/extractor lever to the right to unseat the power supply from the internal connectors.
- 4 Carefully slide the power supply out of the chassis and set it aside ([Figure 38](#)).

**Figure 38: Removing a Power Supply**

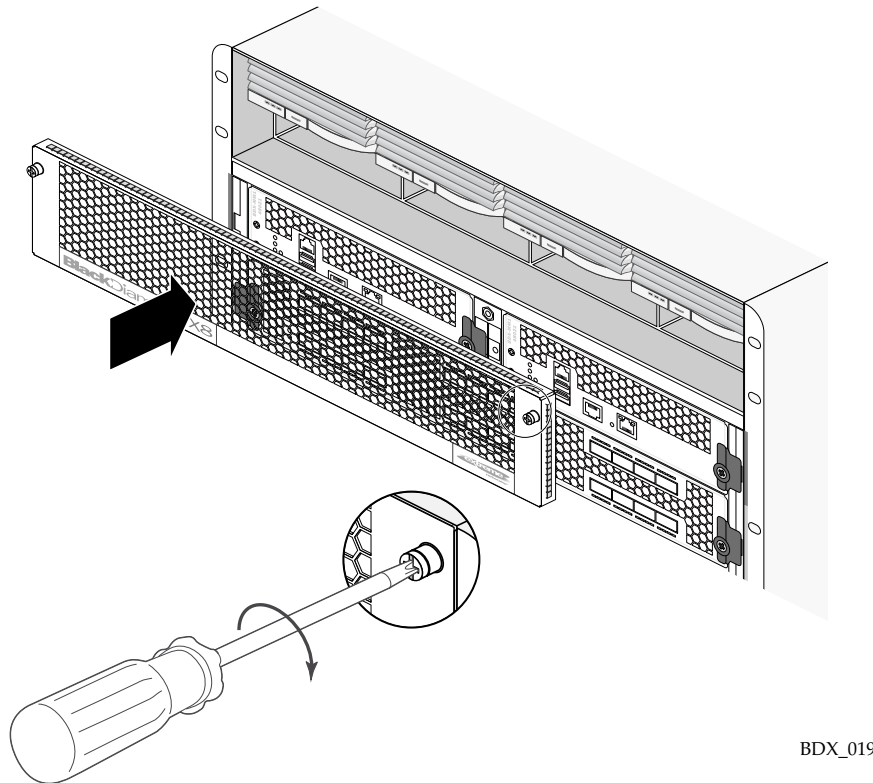
- 5 On the front of the replacement power supply, push the release button for the insertion/ejector lever.
- 6 Slide the power supply into the chassis until the lever starts to engage ([Figure 39](#)).

**Figure 39: Installing a Power Supply**

- 7 Rotate the lever toward the front of the power supply to fully seat the power supply in the chassis.

- 8 Replace the power supply ventilation cover as follows:
  - a Set the lower edge of the cover in place so that the tabs on the edge fit into the matching slots in the chassis frame (Figure 40).
  - b Rotate the top of the cover into place against the front of the chassis frame.
  - c Align and tighten the retaining screws.

**Figure 40: Installing the Power Supply Ventilation Cover**



BDX\_019



**CAUTION**

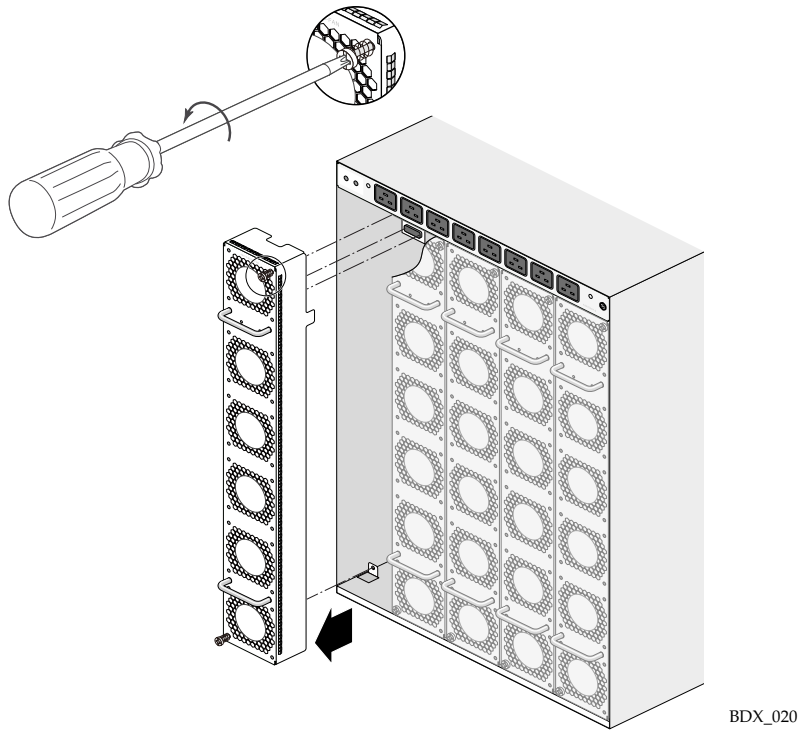
Do not operate the BlackDiamond X8 switch without the power supply ventilation cover in place. This cover is required to maintain proper EMI levels for the switch.

## Replacing a Fan Tray

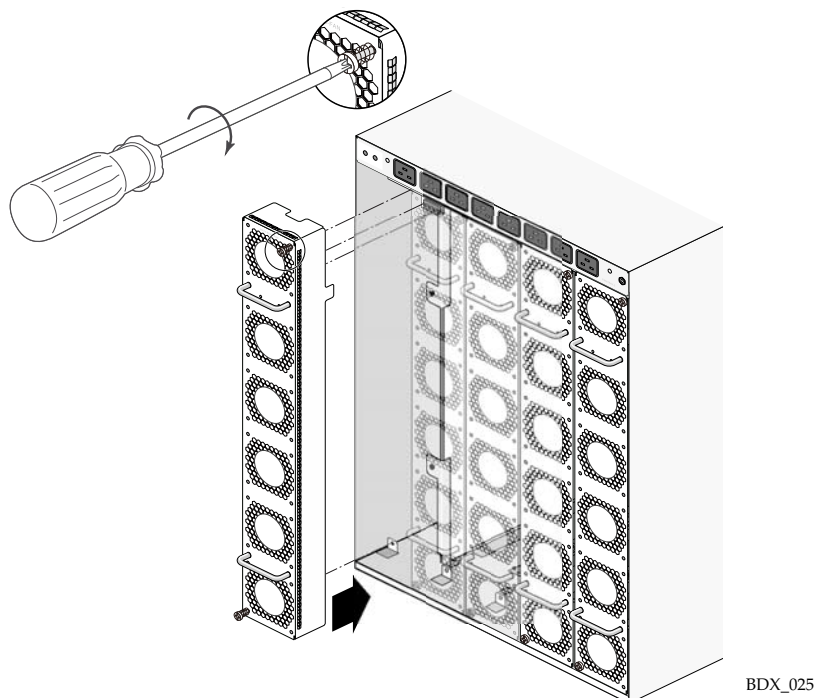
You need a #2 Phillips screwdriver to replace a fan tray. You can replace a fan tray without powering down the switch.

To replace a fan tray:

- 1 Completely loosen the retaining screws at the top and bottom of the fan tray (Figure 41)
- 2 Holding both handles, pull straight outward on the fan tray to disconnect the internal connector.  
Set the fan tray aside in a safe place.

**Figure 41: Removing a Fan Tray**

- 3 Holding the replacement fan tray with both handles, align it with the opening and slide it straight into the chassis (Figure 42).
- 4 Align and tighten the retaining screws.

**Figure 42: Installing a Fan Tray**

## Replacing a Fabric Module

You need the following tools to replace a fabric module:

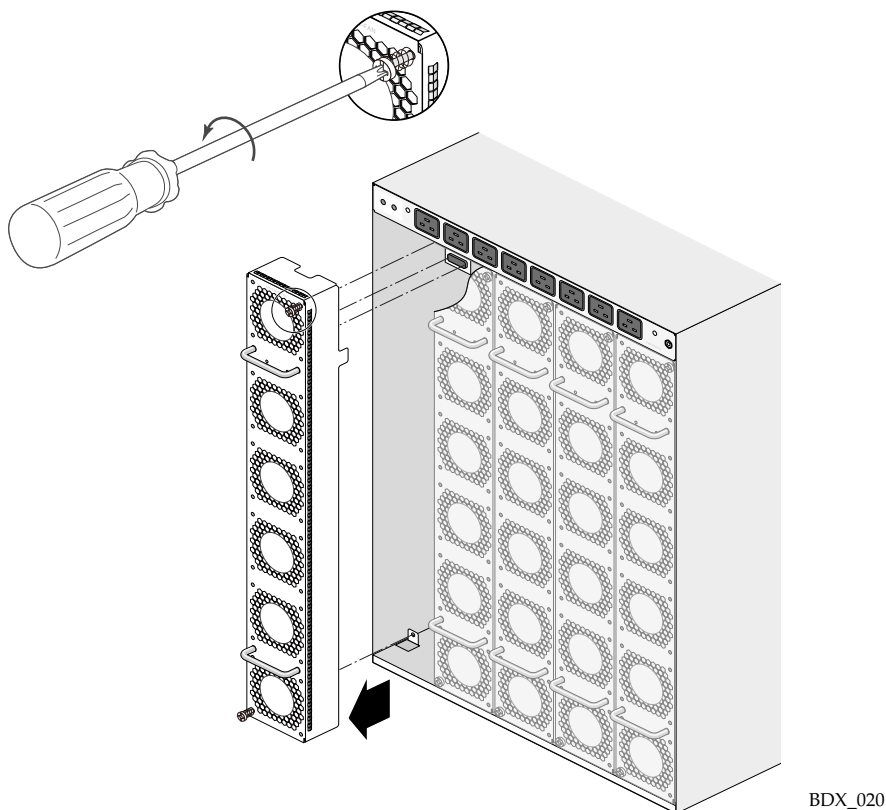
- ESD-preventive wrist strap
- #2 Phillips screwdriver for the retaining screws on the fan tray
- 5/16-inch flat-tip screwdriver for the retaining screws on the fabric module

You can replace a fabric module without powering down the switch.

To replace a fabric module:

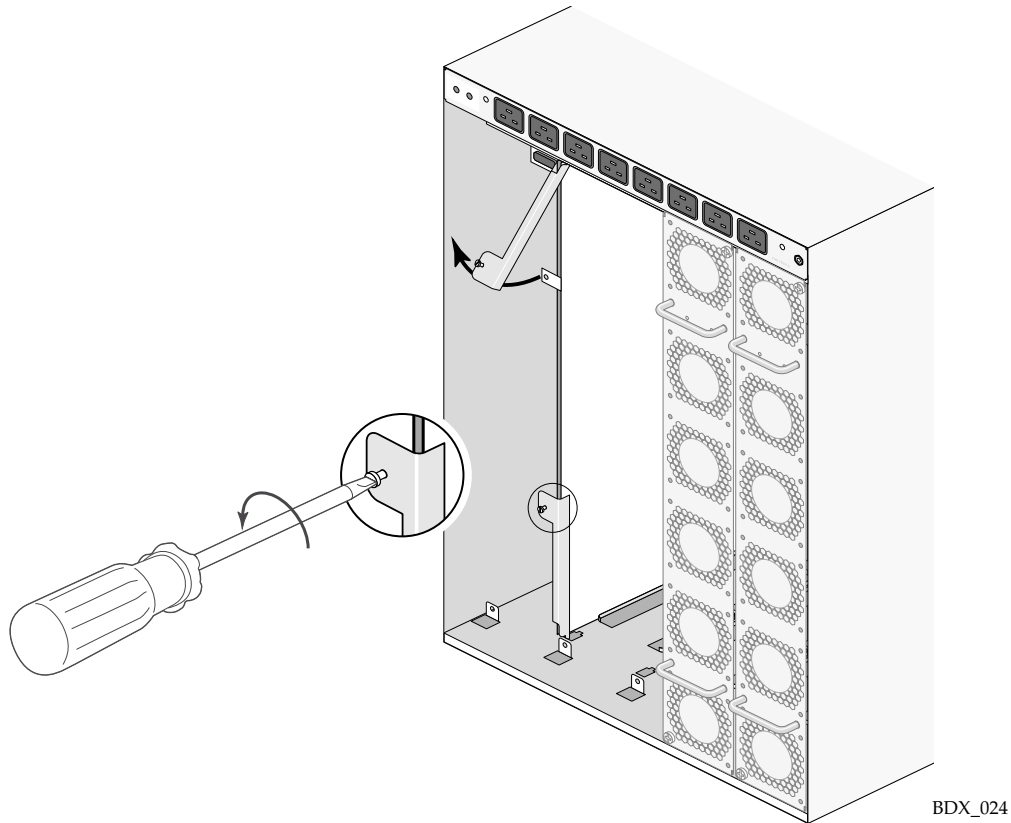
- 1 Attach the ESD-preventive wrist strap to your bare wrist. If it is not already connected, connect the metal end to the receptacle at the right of the power input connectors.
- 2 Remove the fan tray in front of the faulty fabric module.
  - a Loosen the captive retaining screws at the top and bottom of the fan tray.
  - b Holding both handles, pull the fan tray straight out of the chassis.
  - c Set the fan tray aside in a safe place.

**Figure 43: Removing a Fan Tray**



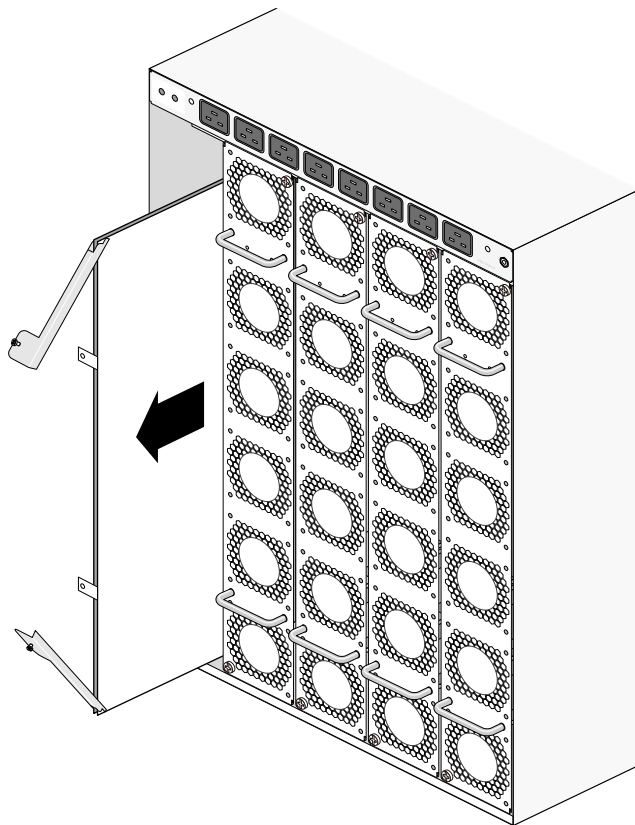
- 3 Remove the fabric module:
  - a Loosen the retaining screw on each inserter/extractor lever on the fabric module (Figure 44).
  - b Simultaneously rotate both levers toward the ends of the module to unseat the internal connectors (Figure 44).

**Figure 44: Unseating a Fabric Module**



- c Carefully slide the module out of the switch chassis (Figure 45) and set it aside on an anti-static surface.

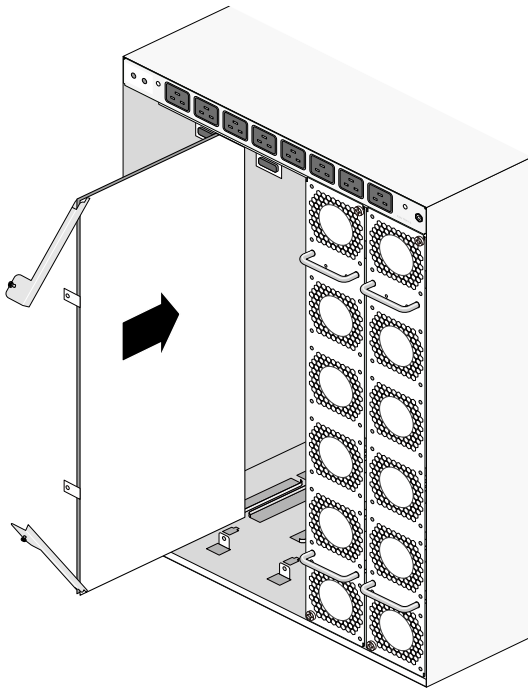
**Figure 45: Removing a Fabric Module**



BDX\_022

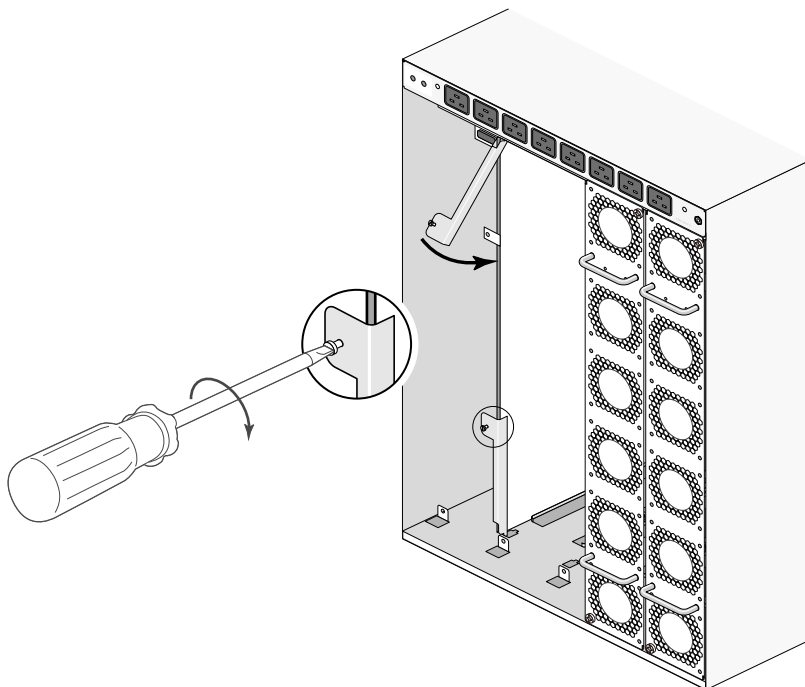
- 4 Install the replacement fabric module:
  - a Remove the module from the antistatic packaging.
  - a Loosen the screws on the insertion/extraction levers and open the levers.
  - b Align the circuit board with the guides at the top and bottom of the chassis and slide the module into the chassis (Figure 46).



**Figure 46: Installing a Fabric Module**

BDX\_021

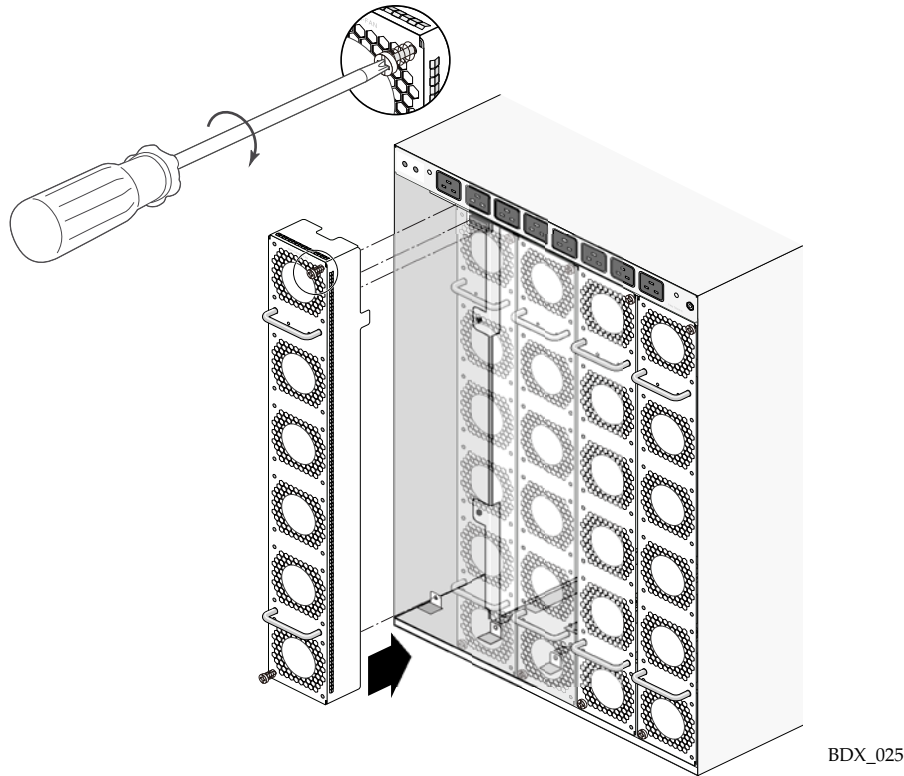
- c When the levers start to engage, push them toward the module to seat the module in the chassis.
- d Align and tighten the retaining screws to fasten the module in place.

**Figure 47: Securing a Fabric Module**

BDX\_023

- 5 Re-install the removed fan tray:
  - a Set the fan tray into the chassis and push it firmly into place.
  - b Align and tighten the retaining screws.

**Figure 48: Installing a Fan Tray**



## Replacing a Management Module

You need the following tools and equipment to replace a BlackDiamond X8 series management module:

- ESD-preventive wrist strap
- #2 Phillips screwdriver
- Module blank panel if you are not replacing the module

You can replace a management module without powering down the switch.

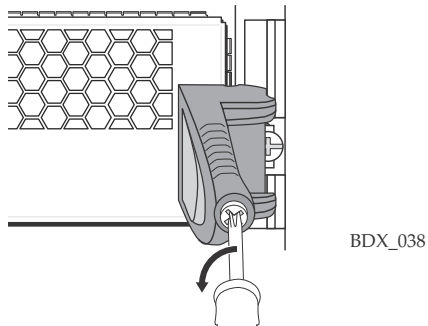
## Removing a Management Module

To remove a management module:

- 1 Attach the ESD-preventive wrist strap to your bare wrist. If it is not already connected, connect the metal end to the receptacle between the management module slots.
- 2 Disconnect network cables from the front of the module.

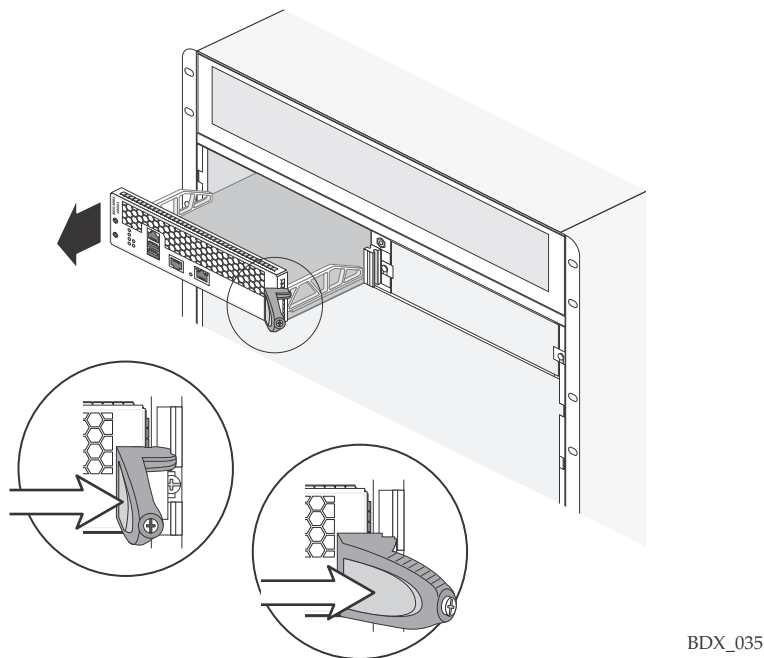
- 3 On the injector/ejector lever, turn the captive screw counter-clockwise until the yellow band around the screw head of is completely visible (Figure 49).

**Figure 49: Unlocking a Module**



- 4 Squeeze the release latch on the injector/ejector handle and rotate the handle to the right (away from the module) to unseat the module from the internal connectors (Figure 50).

**Figure 50: Removing a Management Module**



- 5 Slide the module out of the chassis slot.  
Immediately place the module into an anti-static bag to protect it from potential ESD damage. The bag will also prevent dust from collecting on the module connectors.
- 6 If you are not going to install a replacement module, install a blank front panel as described in [“Installing a Management Module Blank”](#) on page 85.

## Installing a Management Module

To install the replacement management module:

- 1 Remove the module from the antistatic packaging.

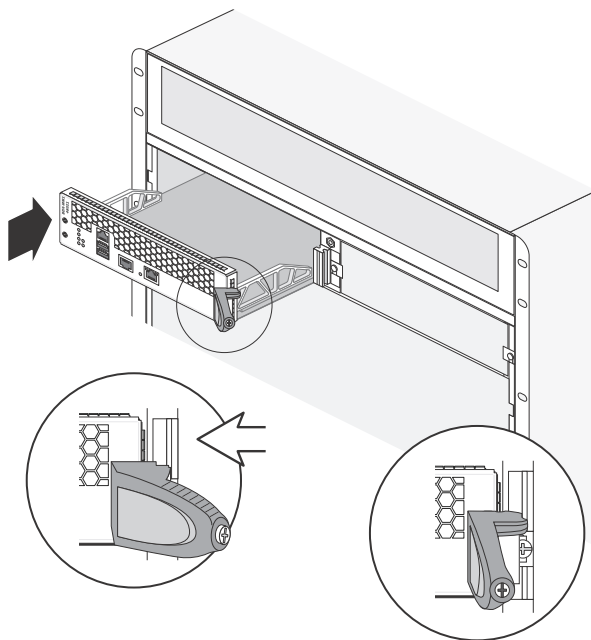


### CAUTION

To prevent ESD damage, hold the module by the metal rail and front panel only. Never touch the components on the PCB or the pins on any of the connectors.

- 2 Verify that the injector/ejector handle is in the open position (Figure 51).  
Keep the injector/ejector handle in the open position as you slide the module into the chassis slot.
- 3 Carefully slide the module into the slot until the injector/ejector handle engages the edge of the chassis and begins to rotate toward the module.
- 4 Use the lever to fully seat the internal module connectors.

**Figure 51: Installing a Management Module**

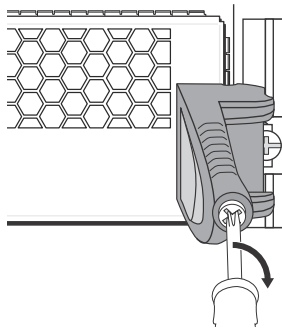


- 5 Use a #2 Phillips screwdriver to lock the handle into place (Figure 52).  
When the locking screw is fully tightened, the yellow band around the screw head is completely hidden.



### CAUTION

Be careful to avoid over-torquing and stripping the screw head.

**Figure 52: Locking the Module into Place**

BDX\_016

## Installing a Management Module Blank

If a management module is not installed in a slot, you must install a blank cover over the slot to maintain proper EMI levels and ventilation to ensure conformance to FCC requirements as well as to maintain adequate airflow through the switch.

To install a management module blank:

- 1 Set the blank in place over the open slot.
- 2 Align and tighten the captive retaining screws.

## Replacing an I/O Module

You need the following tools and equipment to replace a BlackDiamond X8 series module:

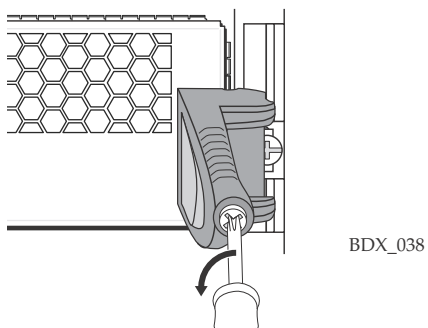
- ESD-preventive wrist strap
- #2 Phillips screwdriver
- Module blank panel if you are not replacing the module

## Removing an I/O Module

To remove an I/O module;

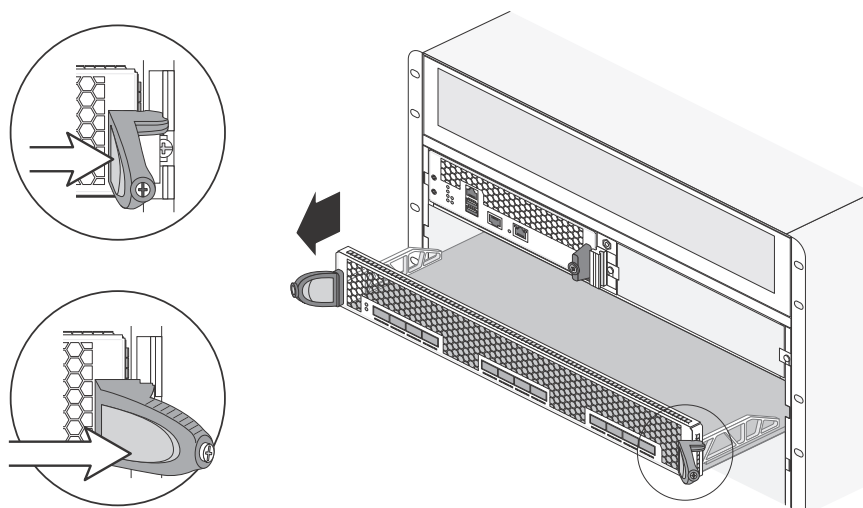
- 1 Attach the ESD-preventive wrist strap to your bare wrist. If it is not already connected, connect the metal end to the receptacle between the management module slots.
- 2 Disconnect network cables from the front of the module.
- 3 On each injector/ejector lever, turn the captive screw counter-clockwise until the yellow band around the screw head of is completely visible (Figure 53).

**Figure 53: Unlocking a Module**



- 4 Squeeze the release latch on each injector/ejector handle and rotate both handles outward to disconnect the internal module connectors (Figure 54).

**Figure 54: Removing an I/O Module**



- 5 Slide the module out of the chassis slot.
- 6 Immediately place the module into an anti-static bag to protect it from potential ESD damage. The bag will also prevent dust from collecting on the module connectors.
- 7 If you are not going to install a replacement module, install a blank front panel as described in [“Installing I/O Module Blanks” on page 88](#).  
To install a replacement module, follow the installation procedure in the next section.

## Installing an I/O Module

To install an I/O module:

- 1 Remove the replacement module from the antistatic packaging.



### CAUTION

To prevent ESD damage, hold the module by the metal rail and front panel only. Never touch the components on the circuit board or the pins on any of the connectors.

- 2 Verify that the module injector/ejector handles are open.  
Keep the injector/ejector handles in the open position as you slide the module into the chassis slot.

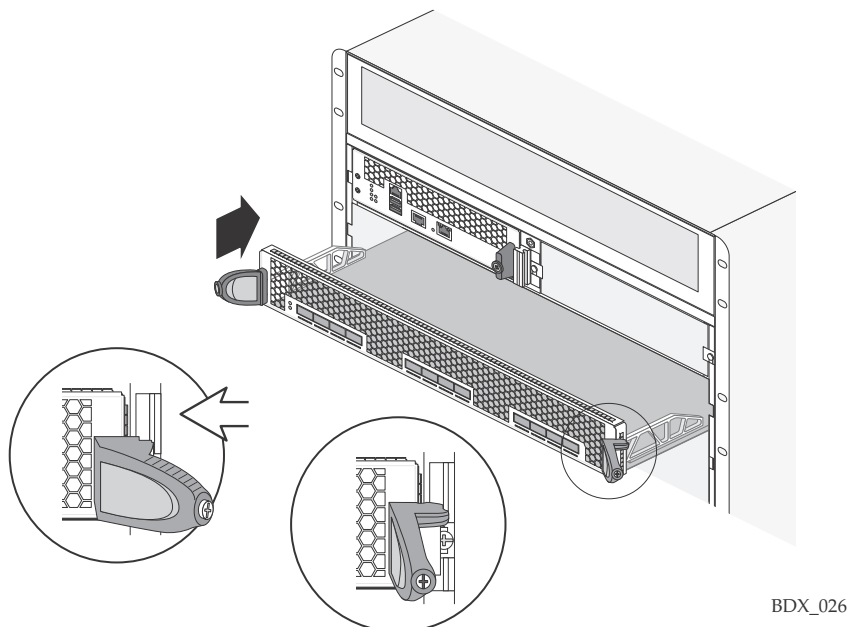


### NOTE

If the injector/ejector handles are in the latched position, they prevent the module from sliding all the way into the slot.

- 3 Carefully slide the module into the slot until the injector/ejector handles engage the edges of the chassis and begin to rotate toward the center of the module ([Figure 55](#)).

**Figure 55: Installing an I/O Module**



- 4 Push the handles toward each other to seat the internal module connectors.
- 5 Use a #2 Phillips screwdriver to lock each handle into place (Figure 56).  
When a locking screw is fully tightened, the yellow band around the screw head is completely hidden.



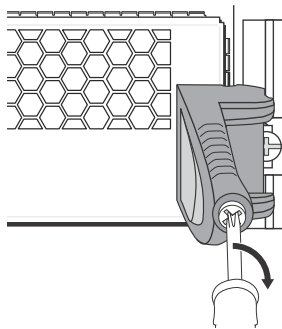
**CAUTION**

---

Be careful to avoid over-torquing and stripping the screw heads.

---

**Figure 56: Locking the Module into Place**



BDX\_016

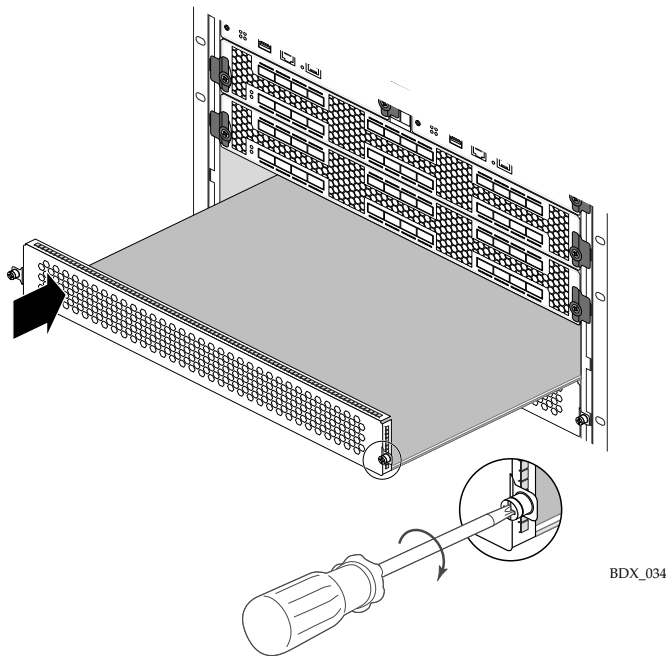
## Installing I/O Module Blanks

All unoccupied slots in a BlackDiamond X8 series switch must have blank front panels correctly installed to ensure conformance to FCC requirements as well as to maintain adequate airflow through the switch.

To install an I/O module blank:

- 1 Check the condition of the EMI gaskets along the front panel edges of the blank, and confirm that the gaskets are not damaged.
- 2 Align the module blank with the card guides for the open slot on the chassis (see Figure 57).



**Figure 57: Installing a Module Blank**

- 3 Use a #2 Phillips screwdriver to tighten the captive screws at each end of the module blank.

**NOTE**

Tighten the screws of each installed module blank before inserting additional modules or blanks. Otherwise, you might unseat modules or blank front panels that you have not secured.

## Packing the Chassis for Shipping

This section describes how to pack the BlackDiamond X8 chassis for shipment back to Extreme Networks.

You need the following tools and materials to pack a BlackDiamond X8 series chassis:

- Original shipping cover for the front module slots
- Lifting handles that were shipped with the chassis
- Original shipping box and packing materials
- Screwdriver for ground lug screws
- Four rack-mounting screws for attaching the support brackets to the rack (if they have been removed)
- #2 Phillips screwdriver for removing the chassis from the rack
- Nylon package strapping material and a crimping tool

Before you begin, set the pallet in a convenient, stable location near the equipment rack.

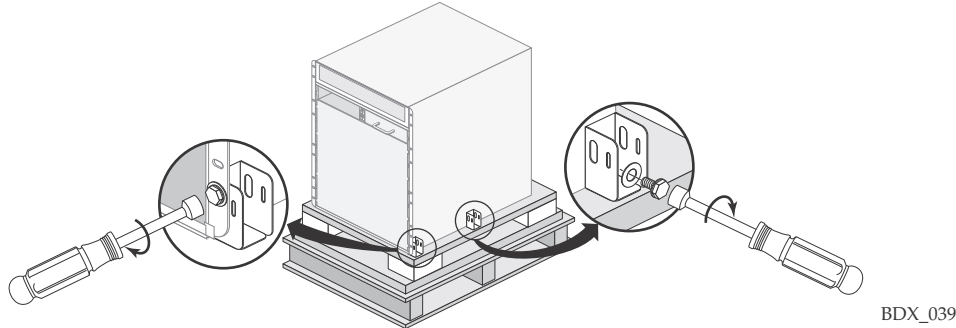


## Assembling the Shipping Container

To assemble the shipping container for the BlackDiamond X8 chassis:

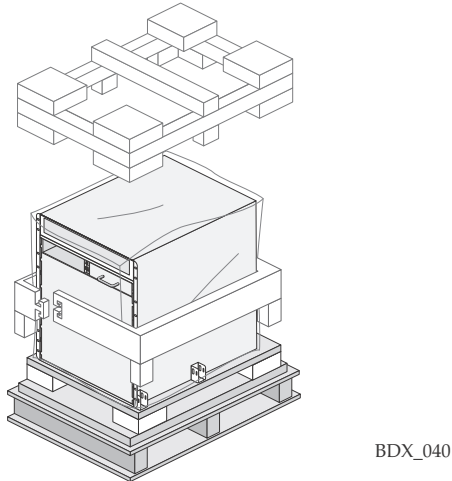
- 1 At each corner, attach a restraining bolt to the shipping bracket, securing the BlackDiamond X8 chassis to the shipping pallet (see [Figure 59](#)).

**Figure 59: Reocrating the BlackDiamond X8 Chassis**



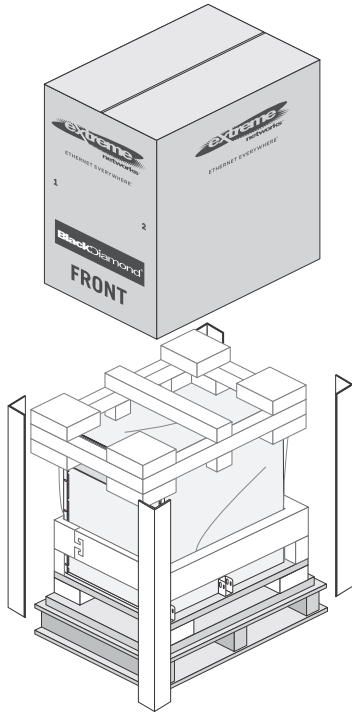
- 2 Put the lower foam cushion around the base of the chassis and set the upper foam cap on top of the chassis ([Figure 60](#)).

**Figure 60: Placing the Foam Cushioning Around the Chassis**



- 3 Set a corner brace at each corner of the chassis, and slide the shipping carton down over the chassis (Figure 61).

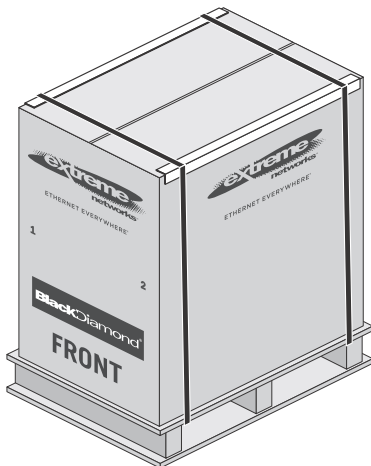
**Figure 61: Placing the Shipping Carton over the Chassis**



BDX\_041

- 4 Secure the carton to the pallet using nylon strapping (Figure 62).

**Figure 62: Shipping Carton with Nylon Straps**



BDX\_042

# 4

PART

## Appendices



# A

APPENDIX

## Safety Information



### **WARNING!**

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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) 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 in the USA, install the system in accordance with the U.S. National Electrical Code (NEC).

This appendix includes the following sections:

- [Considerations Before Installing on page 96](#)
- [Maintenance Safety on page 96](#)
- [General Safety Precautions on page 97](#)
- [Cable Routing for LAN Systems on page 97](#)
- [Installing Power Supply Units and Connecting Power on page 98](#)
- [Selecting Power Supply Cords on page 99](#)
- [Battery Replacement and Disposal on page 99](#)
- [Fiber Optic Ports and Optical Safety on page 99](#)
- [Sicherheitshinweise on page 101 \(Safety information in German\)](#)

## Considerations Before Installing

Consider the following items before installing equipment.

- The system is designed to operate in a typical Telco environment that is environmentally controlled. Choose a site that has the following characteristics:
  - Temperature- and humidity-controlled, such that the maximum ambient room temperature shall not exceed 40°C (104°F)
  - Clean and free from airborne materials that can conduct electricity.
  - Well ventilated and away from sources of heat including direct sunlight.
  - Away from sources of vibration or physical shock.
  - Isolated from strong electromagnetic fields produced by electrical devices.
  - Secured, enclosed, and restricted-access, ensuring that only trained and qualified service personnel have access to the equipment.
- 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 network equipment.
- Do not place a monitor or other objects on top of the equipment. The chassis cover is not designed to support weight.

## Maintenance Safety

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

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



## General Safety Precautions

Follow these guidelines:

- Do not attempt 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.
- Only use 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.

## 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.

## Installing Power Supply Units and Connecting Power

For the ratings and power requirements of each power supply unit, see [Appendix B](#) of this guide or the data sheet for the power supply at <http://www.extremenetworks.com>.



### **WARNING!**

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

---

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.

When you install AC power supplies:

- For switches with field-replaceable power supplies, do not connect the power supply to an electrical source when the power supply is not installed in the switch; doing so would expose a hazardous energy and poses a potential shock and fire hazard.
- Plug power supplies only into properly grounded electrical outlets to help prevent electrical shock and to comply with international safety standards.
- Use only power cords that are certified for use within the country of use. Do not attempt to modify AC power cords.
- Make sure that the voltage and frequency of your power outlet match the system electrical ratings for the equipment. The building and/or power source must provide overload protection.
- Use a surge suppressor, line conditioner, or uninterruptible power supply to protect the system from momentary increases or decreases in electrical power.
- When multiple power supplies are used with a system, connect each power supply to a different, independent over-current protection device, such as a circuit breaker. If a single power source fails, it will affect only that power supply to which it is connected.
- Extreme Networks AC power supplies do not have switches for turning the unit on and off. Remove all wall plugs from the electrical outlet to disconnect the power. Make sure that these connections are easily accessible.

When you install DC power supplies or connect DC power:

- Making the connection to your facility DC source voltage must be performed by a qualified, licensed electrician.
- 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 power socket on the Extreme Networks equipment.
- Do not connect a DC power supply to the DC source power when the power supply is not installed in the chassis; doing so would expose a hazardous energy and poses a potential shock and fire hazard.

**NOTE**

Because building codes vary worldwide, Extreme Networks strongly recommends that you consult an electrical contractor to ensure proper equipment grounding and power distribution for your specific installation and country.

## Selecting Power Supply Cords

Extreme Networks does not provide power input cords in the product box. To purchase a power cord for your product and for your specific country, contact your local Extreme Networks Channel Account Manager or Sales Manager, or purchase a cord from your local supplier. Requirements for the power cord are listed in [Appendix B](#) of this guide.

To locate a Sales Manager or Partner in your region visit:

<http://www.extremenetworks.com/how-to-buy/how-to-buy.aspx>

**NOTE**

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

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

## Battery Replacement and Disposal

Batteries included with Extreme products are encapsulated and must be replaced only by qualified Extreme Service personnel. Contact your Extreme Networks Service personnel for product replacement. Do not attempt to replace the battery. If these instructions are disregarded and replacement of these batteries is attempted, the following guidelines must be followed to avoid danger of explosion:

- Replace with the same or equivalent battery type as recommended by the battery manufacturer.
- Dispose of the battery in accordance with the battery manufacturer's recommendation.

## 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.

---



**WARNING!**

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

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- 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.



**NOTE**

Extreme Networks optical modules are tested to work in all supported Extreme Networks switches. We recommend that all customers use Extreme Networks optical modules in their Extreme Networks switches. Extreme Networks assumes no liability for third-party optical modules. Although Extreme Networks does not block third-party optical modules, we cannot ensure that all third-party optical modules operate properly in all Extreme Networks switches. The customer assumes all risks associated with using third-party optical modules in Extreme Networks switches.

---

## 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 2004/108/EEC EMC Directive, the 2006/95/EC Low Voltage Directives
- UL and/or CSA registered component for North America
- 47 CFR Part 15, Class A when installed into Extreme products

## Sicherheitshinweise



### WARNUNG!

Lesen Sie die folgenden Sicherheitshinweise aufmerksam durch, ehe Sie Extreme Networks-Produkte installieren. Eine Missachtung dieser Sicherheitshinweise kann zu Verletzungen oder zu einer Beschädigung des/r Geräte/s führen.

Extreme Networks-Geräte und deren Komponenten dürfen nur durch geschulte und qualifizierte Wartungstechniker (wie in IEC 60950-1 und AS/NZS 3260 definiert) installiert, ausgetauscht oder gewartet werden. Dieses qualifizierte Personal muss den Inhalt aller zugehörigen Installationsanleitungen kennen sowie über die technische Ausbildung und Erfahrung verfügen, um die Gefahren, die mit der Ausführung einer Aufgabe assoziiert sind, zu kennen und zu wissen, wie sie diese Gefahren für sich selbst und Dritte minimieren können.

In den USA muss das System gemäß dem US National Electrical Code (NEC) installiert werden.

## Überlegungen vor der Installation

Berücksichtigen Sie vor der Installation der Geräte folgende Punkte.

- Wählen Sie für Geräte, die in einer typischen Telekommunikationsumgebung mit kontrollierten Umweltbedingungen eingesetzt werden, einen Ort mit folgenden Merkmalen:
  - Temperatur und Feuchtigkeit werden kontrolliert, und die maximale Raumtemperatur liegt nicht über 40 °C.
  - Sauber und frei von in der Luft enthaltenen Stoffen, die Elektrizität übertragen können.
  - Gut belüftet und fern von Wärmequellen inklusive direkter Sonneneinstrahlung.
  - Fern von Quellen für Erschütterungen oder mechanische Einwirkungen.
  - Getrennt von starken elektromagnetischen Feldern, die von elektrischen Geräten erzeugt werden.
- Bei Geräten, die nicht für eine Installation in Umgebungen mit kontrollierten Umweltbedingungen vorgesehen sind, wie z. B. Gehäuse im Freien, beachten Sie bitte das Produktdatenblatt oder Anhang B dieser Anleitung mit den Spezifikationen für Umgebungsbedingungen, Temperatur und Feuchtigkeit.
- Lassen Sie auf allen Seiten mindestens 3 Zoll Platz, um eine ausreichende Luftzirkulation zu gewährleisten. Die Lüftungsschlitze an der Vorder- oder Rückseite und an den Seiten dürfen nicht blockiert werden. Stellen Sie das System nicht in der Nähe von Wärmequellen auf.
- Versichern Sie sich, dass Ihre Geräte in einem Bereich aufgestellt werden, der für den Stromverbrauch und die damit verbundene Wärmestrahlung der Komponenten geeignet ist.
- Versichern Sie sich, dass Ihre Netzteile den Gleichstrom- bzw. Wechselstrombedarf aller Netzwerkgeräte decken können.
- Racks für Extreme Networks-Geräte müssen fest am Boden verankert werden. Bei nicht vorschriftsmäßiger Fixierung des Racks besteht die Gefahr, dass das Rack bei Wartungsarbeiten umkippt.

- Voraussetzung für den Betrieb des Systems ist die vollständige Anbringung aller Module, Blenden, Frontabdeckungen und rückseitigen Abdeckungen. Blenden und Abdeckplatten erfüllen folgende Funktionen:
  - Schutz vor gefährlich hohen Spannungen und Strömen im Inneren des Gerätes
  - Eindämmung von elektromagnetischen Interferenzen (EMI), die andere Geräte stören könnten
  - Vorgabe der Luftströmungsrichtung durch das Gerät
- Bei der Entsorgung des Gerätes sind alle nationalen Gesetze und Vorschriften zu beachten.

## Allgemeine Sicherheitshinweise

Befolgen Sie die Richtlinien:

- Heben Sie keine Gegenstände, die zu schwer für Sie sind.
- Bei der Installation von Geräten in einem Rack platzieren Sie die schwereren Geräte in der unteren Hälfte, damit das Rack nicht kopflastig wird.
- Verwenden Sie nur Werkzeuge und Geräte, die sich in einem einwandfreien Zustand befinden. Werkzeuge, die sichtbar beschädigt sind, dürfen nicht benutzt werden.
- Achten Sie bei der Verlegung von Kabeln darauf, mögliche Beschädigungen der Kabel zu vermeiden und Risiken, z. B. Stolpergefahren, auszuschalten.
- Stellen Sie keinen Bildschirm oder anderen Gegenstände auf die Geräte. Die Chassisabdeckung ist keine Abstellfläche.
- Zum Schutz vor Selbstentzündung verwenden Sie nur Datenübertragungskabel der Größe 26 AWG oder größer. Verwenden Sie nur Kupferleiter.
- Arbeiten Sie während eines Gewitters nicht an dem System und stecken Sie keine Kabel an oder ab.
- Das Gerät muss geerdet werden. Der Schutzleiter darf nicht manipuliert oder umgangen werden und das Gerät darf auf keinen Fall ohne einen entsprechend installierten Schutzleiter betrieben werden.

## Sicherheit bei Wartungsarbeiten

Befolgen Sie bei allen Wartungsarbeiten an Extreme Networks-Geräten folgende Empfehlungen:

- Verwenden Sie nur zugelassene Zubehörteile oder Komponenten, die für den Einsatz mit diesem System genehmigt sind. Eine Missachtung dieser Hinweise kann zu einer Beschädigung des/r Geräte/s führen und die einschlägigen Sicherheits- und EMV-Vorschriften verletzen.
- Das System enthält keinerlei Teile, die vom Benutzer zu warten sind. Versuchen Sie nicht, Chassis, Netzteil, Modul oder andere Komponenten eigenmächtig zu reparieren. Senden Sie im Falle einer Störung das defekte Teil zur Reparatur oder zum Austausch an Extreme Networks ein, sofern ein Extreme Networks-Vertreter nicht etwas anderes angibt.
- Um das System spannungslos zu machen, müssen Sie alle Netzkabel aus den Netzsteckdosen ziehen. Das Netzkabel ist der "Trennschalter" für die Netzspannungsquelle.
- Trennen Sie vor allen Arbeiten in der unmittelbaren Nähe von Netzteilen alle Netzkabel von der Spannungsquelle, sofern die produktspezifische Wartungsanleitung nicht etwas anderes angibt.
- Legen Sie für alle Arbeiten an optischen Geräten, Netzteilen oder sonstigen modularen Zubehörteilen ein geerdetes Massearmband an, um das Risiko einer Beschädigung des Gerätes durch elektrostatische Aufladung zu reduzieren. Schließen Sie das eine Ende des Armbands an einem

geeigneten Erdungspunkt am Rack oder an einer ESD-Buchse am Chassis (sofern vorhanden) an. Lassen Sie das geerdete Massearmband am Rack oder am Chassis angeschlossen, damit Sie es jederzeit parat haben, wenn Sie mit Komponenten umgehen, die empfindlich gegenüber elektrostatischer Aufladung sind.

- Die Kabel sind spannungsfrei zu installieren. Verwenden Sie Kabelbinder oder sonstige Zugentlastungsvorrichtungen.

## Kabelverlegung für LAN-Systeme

Extreme Networks-Geräte erfüllen die Anforderungen für Geräte für LAN-Systeme. LAN-Systeme sind für gebäudeinterne Installationen konzipiert, das heißt, die Kabel zwischen den einzelnen Einheiten müssen im gleichen Gebäude verlaufen, in dem auch die Geräte untergebracht. Hiervon ausgenommen sind nur die unten aufgeführten Bedingungen.

Laut dem US-amerikanischen National Electrical Code (NEC) darf diese Ausrüstung zwischen Gebäuden verbunden werden, sofern eine der folgenden Bedingungen erfüllt ist:

- Die Länge der zwischen Gebäuden verlegten Kabel beträgt höchstens 140 Fuß.
- Die Kabel sind zwischen den Gebäuden direkt erdverlegt.
- Die Kabel zwischen den Gebäuden sind in einem unterirdischen Kanal verlegt, wobei ein durchgehender metallischer Kabelschirm oder eine durchgehende Metallleitung, die das Kabel umschließt, an den Erdungselektrodensystemen der einzelnen Gebäude angeschlossen ist.



### ACHTUNG

Eine Missachtung dieser Bedingungen für die Kabelverlegung kann Nutzer der Gefahr eines elektrischen Stromschlages aussetzen und das Gerät so beschädigen, dass es nicht mehr einwandfrei arbeitet.



### WARNUNG!

Die Ethernet-Anschlüsse des Gerätes und der zugehörigen Baugruppen sind nur für gebäudeinterne (innerhalb ein und desselben Gebäudes) Verbindungen oder für Anschlüsse an nicht exponierte Verdrahtungen oder Verkabelungen geeignet (siehe die oben aufgeführten Bedingungen). Die Ethernet-Anschlüsse des Gerätes und der zugehörigen Baugruppen dürfen nicht mit Metallkontakt an Schnittstellen angeschlossen werden, die mit einer externen Anlage (Outside Plant, OSP) oder deren Verdrahtung verbunden sind. Ethernet-Schnittstellen sind nur für eine Verwendung als gebäudeinterne Schnittstellen konzipiert (sog. Ports vom Typ 2 oder Typ 4 gemäß GR-1089-CORE, Ausgabe 6) und müssen durch Isolierung von exponierter OSP-Verdrahtung getrennt werden. Primäre Protektoren sind kein ausreichender Schutz für den Anschluss dieser Schnittstellen über einen Metallkontakt mit OSP-Verdrahtung.

Diese Warnung gilt nicht für Ports vom Typ T1/E1, weil diese Ports über eine integrierte Isolierung und einen Schutz vor Spannungsspitzen verfügen, der den Anschluss an OSP-Verdrahtung gestattet.



## Installation der Netzteile und Netzanschluss

Die Leistungsdaten und die Anforderung der einzelnen Netzteile an den Leistungseingang entnehmen Sie bitte Anhang B dieser Anleitung oder dem Datenblatt für die Netzversorgung unter <http://www.extremenetworks.com>.



### **WARNUNG!**

---

Die in diesem Abschnitt aufgeführten Anforderungen müssen bei der Installation von Extreme Networks-Netzteilen und beim Netzanschluss unbedingt erfüllt werden.

---

Bei Installation eines Netzteils:

- Schieben Sie das Netzteil nicht mit Gewalt in den Einschub.
- Versuchen Sie nicht, das Gehäuse des Netzteils zu öffnen; das Netzteil enthält keinerlei Teile, die vom Nutzer zu warten sind. Senden Sie im Falle einer Störung das defekte Netzteil zur Reparatur oder zum Austausch an Extreme Networks ein.
- Fassen Sie nicht mit der Hand in einen offenen Netzteileinschub, wenn das Netzteil entfernt wurde.
- Legen Sie vor allen Arbeiten an einem an Leistungskabeln angeschlossenen Gerät sämtlichen Schmuck sowie Ihre Armbanduhr ab. Im Falle eines Kurzschlusses (Kontakt mit Leistung und Erde) erwärmen sich Metallgegenstände, was zu ernsthaften Verbrennungen führen oder den Metallgegenstand mit den Anschlüssen verschweißen kann.
- Legen Sie vor allen Arbeiten an einem an Leistungskabeln angeschlossenen Gerät sämtlichen Schmuck sowie Ihre Armbanduhr ab. Metallgegenstände erwärmen sich, wenn sie an Leistung und an Erde angeschlossen werden, was zu ernsthaften Verbrennungen führen oder den Metallgegenstand mit den Anschlüssen verschweißen kann.
- Wenn das Netz bei angeschlossener Netzversorgung angeschlossen oder getrennt wird, kann ein elektrischer Lichtbogen entstehen. Dies kann bei Installationen in Gefahrenbereichen zu einer Explosion führen. Achten Sie unbedingt darauf, dass das Gerät nicht mit der Netzversorgung verbunden ist.
- Achten Sie bei der Installation oder beim Austausch von Geräten darauf, dass Sie zuerst den Erdungsanschluss herstellen bzw. den Erdungsanschluss zuletzt trennen.

Bei Installation von AC-Netzteilen:

- Schließen Sie bei Switches mit einem vor Ort austauschbaren Netzteil die Spannungsversorgung nicht an einer elektrischen Spannungsquelle an, wenn das Netzteil nicht im Switch eingebaut ist; andernfalls kann gefährliche Energie freigesetzt werden und es besteht potenzielle Stromschlag- und Brandgefahr.
- Stecken Sie Netzteile nur an vorschriftsmäßig geerdete Netzsteckdosen an, um die Gefahr eines elektrischen Stromschlages zu vermeiden und internationale Sicherheitsstandards zu erfüllen.
- Verwenden Sie nur Netzkabel, die in dem jeweiligen Einsatzland zugelassen sind. Versuchen Sie nicht, modifizierte AC-Netzkabel zu verwenden
- Versichern Sie sich, dass Spannung und Frequenz Ihrer Steckdose mit den elektrischen Daten Ihres Gerätes übereinstimmen. Das Gebäude und/oder die Spannungsquelle muss gegen Überlast geschützt sein.
- Verwenden Sie einen Überspannungsschutz, einen Netzfilter oder eine unterbrechungsfreie Spannungsversorgung, um das System plötzlichen Spannungsschwankungen zu schützen.
- Bei Systemen mit mehreren Netzteilen schließen Sie jedes Netzteil an einer anderen, unabhängigen Überstromschutzvorrichtung an, z. B. an einem Schütz. Bei Ausfall einer Spannungsquelle ist nur



das daran angeschlossene Netzteil betroffen. Für die korrekte Auslegung des Schützes siehe das Datenblatt des Netzteils.

- AC-Netzteile von Extreme Networks haben keinen Ein-/Ausschalter. Trennen Sie alle Netzstecker von den elektrischen Steckdosen, um die Spannungsversorgung zu unterbrechen. Achten Sie auf gute Zugänglichkeit der Steckdosen.

Installation von DC-Netzteilen und Anschluss von Gleichspannung:

- Der Anschluss an die Gleichspannungsquelle Ihrer Einrichtung muss von einem qualifizierten, geprüften Elektriker vorgenommen werden.
- DC-Netzteile von Extreme Networks haben keinen Ein-/Ausschalter. Versichern Sie sich, dass der DC-Kreis spannungslos ist, ehe Sie das Gleichstromkabel an einer Gleichstromeingangsbuchse an- oder abstecken.
- Schließen Sie eine Gleichstromversorgung nicht an die DC-Quelle an, wenn das Netzteil nicht im Chassis eingebaut ist; andernfalls kann gefährliche Energie freigesetzt werden und es besteht potenzielle Stromschlag- und Brandgefahr.
- Schließen Sie das System oder das Netzteil nur an eine DC-Spannungsquelle an, die die Bestimmungen für Sicherheitskleinspannung (SELV) in den IEC 60950-basierten Sicherheitsstandards erfüllt.
- DC-Geräte müssen in einem zugangsbeschränkten Bereich installiert werden, damit gewährleistet ist, dass nur geschultes und qualifiziertes Wartungspersonal Zugang zu den Geräten hat. Ein zugangsbeschränkter Bereich kann beispielsweise nur mithilfe eines Spezialwerkzeugs, Schloss und Schlüssel oder einer anderen Sicherheitsvorrichtung geöffnet werden.



#### HINWEIS

Da die Gebäudevorschriften in aller Welt unterschiedlich sind, empfiehlt Extreme Networks dringend, sich bezüglich der korrekten Erdung und Spannungsverteilung für Ihre Installation in Ihrem Land an einen Elektrofachbetrieb zu wenden.

## Auswahl der Netzkabel

Im Lieferumfang von Extreme Networks-Produkten sind keine Netzkabel enthalten. Ein für Ihr Produkt und Land passendes Netzkabel erhalten Sie entweder von Ihrem zuständigen Extreme Networks Channel Account Manager oder Sales Manager oder im örtlichen Fachhandel. Die Anforderungen an das Netzkabel entnehmen Sie Anhang B zu dieser Anleitung.

Hier finden Sie Ihren zuständigen Sales Manager oder Fachhändler:

<http://www.extremenetworks.com/how-to-buy/how-to-buy.aspx>



#### HINWEIS

Dieses Gerät ist nicht für eine direkte Versorgung von einem Spannungsverteilungssystem vorgesehen, wo die Leiter-Leiter-Spannung den Wert von 240 V AC (2 Phasen+Schutzerde), wie zum Beispiel in Norwegen, Frankreich und anderen Ländern. Für derartige Anwendungen wird ein Transformator empfohlen, um die Spannung auf einen Wert unter < 240 V AC (Leiter-Leiter) herunterzutransformieren oder ein Anschluss an eine (P+N+Schutzerde) Spannungsverteilung, wo die Spannung 240 V AC nicht überschreitet.

Alle Installationen müssen eine zuverlässige Erdung gemäß den nationalen Elektrovorschriften vorsehen.

## Wechseln und Entsorgen der Batterie

Die Batterien in Extreme Produkten sind gekapselt und dürfen nur durch qualifiziertes Extreme-Wartungspersonal ausgetauscht werden. Wenden Sie sich für den Austausch eines Produktes an das Wartungspersonal von Extreme Networks. Versuchen Sie nicht, die Batterie selbst auszuwechseln. Bei einer Missachtung dieser Anweisungen und dem Versuch, die Batterien eigenmächtig zu wechseln, müssen folgende Richtlinien eingehalten werden, um eine mögliche Explosion zu vermeiden:

- Tauschen Sie die Batterie nur gegen eine Batterie des gleichen Typs (wie vom Hersteller empfohlen) aus.
- Entsorgen Sie die Batterie gemäß den Empfehlungen des Batterieherstellers.

## LWL-Ports und optische Sicherheit

Folgende Sicherheitswarnung gilt für alle optischen Geräte, die in Extreme Networks-Geräten eingesetzt werden und entweder herausnehmbar sind oder direkt in einem E/A-Modul oder im Chassissystem eingebaut sind. Solche Geräte sind nicht nur Gigabit-Interface-Konverter (GBICs), steckbare Kleinformatmodule (SFP) (oder Mini-GBICs), QSFP+ Module, XENPAK Sendeempfänger und laseroptische XFP-Module.



### **WARNUNG!**

Laseroptische Module können bei längerem Gebrauch sehr heiß werden. Seien Sie beim Ausbau eines laseroptischen Moduls aus dem Modul oder der Optionskarte äußerst vorsichtig. Wenn das laseroptische Modul zum Anfassen zu heiß ist, trennen Sie das laseroptische Modul und lassen Sie es abkühlen, ehe Sie es komplett ausbauen.

---



### **WARNUNG!**

Ergreifen Sie beim Arbeiten mit laseroptischen Modulen die nachfolgenden Vorsichtsmaßnahmen, um eine Aussetzung gegenüber gefährlicher Strahlung zu vermeiden.

---

- Blicken Sie auf keinen Fall durch ein Vergrößerungsglas in die Sendediode/den Laser, solange die Sendediode aktiv ist.
- Blicken Sie auf keinen Fall in den LWL-Port am Switch oder auf die Stirnflächen eines aktiven LWL-Kabels.
- Bei offenen Anschlüssen kann unsichtbare Laserstrahlung abgegeben werden. Vermeiden Sie eine direkte Aussetzung der Augen gegenüber dem Strahl, wenn die optischen Anschlüsse offen (ohne Stecker) sind.
- Optische Geräte dürfen auf keine andere Weise als in diesem Dokument empfohlen verändert, modifiziert oder umgebaut werden.

## Konformität von GBIC, SFP (Mini-GBIC), QSFP+, XENPAK und XFP

Steckbare optische Module von Extreme Networks und direkt angeschlossene Kabel erfüllen folgende gesetzliche Vorschriften:

- Laserprodukt der Klasse 1 oder Klasse 1M
- EN60825-1:2007 2. Ausgabe oder später, Europäische Norm
- FCC 21 CFR Kapitel 1, Paragraph J in Übereinstimmung mit FDA- und CDRH-Bestimmungen
- Anwendung des CE-Zeichens gemäß der EMV-Richtlinie 2004/108/EEC und der Niederspannungsrichtlinie 2006/95/EC
- UL und/oder CSA-geprüfte Komponente für Nordamerika
- 47 CFR Teil 15, Klasse A bei Einbau in Extreme-Produkte



# B

APPENDIX

## Technical Specifications

This appendix contains the following specifications:

- [BlackDiamond X8 Switch on page 109](#)
- [Modules for BlackDiamond X8 Switches on page 112](#)
- [Power Supplies for BlackDiamond X8 Switches on page 113](#)
- [Connector Pinouts on page 114](#)
- [Conformity Statements for EMC Class A on page 115](#)

### BlackDiamond X8 Switch

**Table 12: BlackDiamond X8 Switch Technical Specifications**

#### Physical Characteristics

BlackDiamond X8 chassis	Height: 25 inches (63.5 cm) Width: 18 inches (45.7 cm) Depth: 30 inches (76.2 cm)  Note: Handles on the fan trays add 1.25 inches (3.2 cm) to the depth of the chassis.  Weight (empty): 187.4 lb (85 kg) Weight (with 5 fan trays): 218.4 lb (99.1 kg) Weight (fully loaded): 420.6 lb (190.6 kg)
BlackDiamond X8 fan tray	Height: 24 inches (60.9 cm) Width: 4 inches (10.1 cm) Depth: 3 inches (7.6 cm)  Note: Handles add 1.25 inches (3.2 cm) to the depth of the fan tray.  Weight: 6.2 lb (2.8 kg)  Fan speed: 12,000 RPM $\pm$ 10%
Power input socket	IEC 320 C14
Power supply cord selection	Refer to <a href="#">“Selecting Power Supply Cords” on page 99</a> .

**Table 12: BlackDiamond X8 Switch Technical Specifications (Continued)****Safety Standards**

North American	UL 60950-1:2007 2nd Ed. or UL 60950-1 1st Ed.:2007 as applicable (US) cULus listed to CSA 22.2 No. 60950-1-07 (Canada) FCC 21 CFR 1040.10 (US Laser Safety) CDRH Letter of Approval (US FDA Approval)
European/International	CB Scheme, IEC 60950-1:2005, 2nd Ed. with national differences GS Mark, EN 60950-1:2006+A11 EN 60825-1:2007 (EU Laser Safety) 2006/95/EC Low Voltage Directive AS/NZS 60950-1 (Australia/New Zealand) Mexico, NOM-19 (NRTL) Russia (GOST-R)

**EMI/EMC Standards**

North American	FCC CFR 47 part 15:2009 Class A (US) ICES-003 Issue 4:2004 Class A (Canada)
European	EN 55022:2006+A1:2007 Class A EN 55024:1998+A1:2001+A2:2003 EN50121-4:2006 EN/IEC 61000-3-2:2006+A2:2009 (Harmonics) EN/IEC 61000-3-3:2009 (Flicker) EN/IEC 61000-4-2 Ed 2.0:2008 Electrostatic Discharge, 8kV Contact, 15kV Air, Criteria A IEC/EN 61000-4-3 Ed 3.2:2010 Radiated Immunity, 80–1GHz 20V/m, 1000–2100 10V/m, 2100–2700 5V/m, Criteria A IEC/EN 61000-4-4 Ed 2.0:2010 Transient Burst, 2kV, Criteria A IEC/EN 61000-4-5 Ed 2.0:2010 Surge, 1/2kV, Criteria A IEC/EN 61000-4-6 Ed 3.0:2008 Conducted Immunity, 0.15-80MHz, 10V/rms, unmod., Criteria A IEC/EN 61000-4-11 Ed 2.0:2004 Power Dips & Interruptions, >30%, 25 periods, Criteria C 2004/108/EC EMC Directive
International	CISPR 22:2005+A1:2005 Class A (International Emissions) CISPR 24:1997_A1:2001+A2:2002 (International Immunity) VCCI, 2010-04, Class A (Japan) ACMA, AS/NZS CISPR22:2009 (Australia) KCC Mark, KN22, KN24 (Korea) BSMI, CNS 13438:1997 Class A (Taiwan) BSMI, CNS 14336-1:2010 Safety (Taiwan)

**Telecommunications**

EN/ETSI 300 386 v1.4.1:2008-04 (Emissions & Immunity)  
EN/ETSI 300 019-2-1 v2.1.2 - Class 1.2 Storage  
EN/ETSI 300 019-2-2 v2.1.2 - Class 2.3 Transportation  
EN/ETSI 300 019-2-3 v2.1.2 - Class 3.1e Operational  
EN/ETSI 300 753 (1997 - 10) - Acoustic Noise

**IEEE 802.3 Media Access Standards**

IEEE 802.3 10BASE-T (management port only)  
IEEE 802.3u 100BASE-TX, 100BASE-FX (management port only)  
IEEE 802.3z 1000BASE-X  
IEEE 802.3ab 1000BASE-T  
IEEE 802.3ac VLAN Tag  
IEEE 802.3ad Link Aggregation  
IEEE 802.3ae 10GBASE-X

Note: These standards are module-specific and may not apply to every module in the series.

**Table 12: BlackDiamond X8 Switch Technical Specifications (Continued)****Environmental Data**

Operating conditions	<p>Operating temperature range: 0° C to 40° C (32° F to 104° F)  Operating humidity: 10% to 93% relative humidity, non-condensing  Operational shock: 30 m/s<sup>2</sup> (3 g), 11 ms, 60 shocks  Operational sine vibration: 5 to 100 to 5 Hz @ 0.2 g, 0 to peak, 0.1 oct./min.  Operational random vibration: 3 to 500 Hz @ 1.5g rms  ASTM D3580 random vibration unpackaged 1.5g</p> <p>NOTE: Operating temperature refers to the input air temperature in the environment and applies to all switch components. The <code>show temperature</code> CLI command displays the internal temperature of individual hardware components, as well as the allowable internal temperature range for each component.</p>
Storage & transportation conditions (packaged)	<p>Transportation temperature: -40° C to 70° C (-40° F to 158° F)  Storage and transportation humidity: 10% to 93% relative humidity, non-condensing</p> <p>Packaged shock (half sine):  &lt;50 kg 180 m/s<sup>2</sup> (10 g), 6 ms, 600 shocks, modules  &gt;50 kg 100 m/s<sup>2</sup> (6 g), 11 ms, 600 shocks, chassis</p> <p>Packaged random vibration:  5 to 20 Hz @ 1.0 ASD w/-3 dB/oct. from 20 to 200 Hz  14 drops minimum on sides &amp; corners  @ 39.5" &lt;22 lb (10 kg) modules  @ 11.8" &lt;110 lb (50 kg) chassis</p>
<b>Acoustic Sound</b>	
Sound pressure for comparison to legacy standards	<p>Low Speed: 60.3 dB(A) per ISO 7779:2010  Medium Speed: 66.0 dB(A) per ISO 7779:2010  High Speed: 82.3 dB(A) per ISO 7779:2010</p>
Sound power in accordance with EN 300 753 v1.3.1 (2011-11)	<p>Low Speed: 72.0 dB(A) per ISO 3744:1994  Medium Speed: 78.0 dB(A) per ISO 3744:1994  High Speed: 94.4 dB(A) per ISO 3744:2010</p>
Declared sound power in accordance with EN 300 753 v1.3.1 (2011-11)	<p>Low Speed: 7.5 B(A) in accordance with ISO 9296:1998  Medium Speed: 8.1 B(A) in accordance with ISO 9296:1998  High Speed: 9.7 B(A) in accordance with ISO 9296:1998</p>

## Modules for BlackDiamond X8 Switches

**Table 13: Specifications for BlackDiamond X8 Series Modules**

### I/O Modules

Dimensions (all models)	3 inches high by 17 inches wide by 18 inches deep (7.6 cm x 43.1 cm x 45.7 cm)
	Note: Inserter/extractor levers add 2.25 inches (5.7 cm) to the depth measurement.
BDXA-10G48X	Weight: 10.9 lb (4.9 kg) Packaged weight: 15.60 lb (7.08 kg) Power: 290 W (Heat Dissipation 990 BTU)
BDXA-40G24X	Weight: 14.0 lb (6.3 kg) Packaged weight: 18.85 lb (8.57 kg) Power: 510 W (Heat Dissipation 1740 BTU)
BDXA-40G12X	Weight: 11.0 lb (5.0 kg) Packaged weight: 14 lb (6.3 kg) Power: 265 W (Heat Dissipation 904 BTU)
Module blank	Weight: 4.85 lb (2.20 kg)

### Management Module

Dimensions	3 inches high by 8 inches wide by 18 inches deep (7.6 cm x 20.3 cm x 45.7 cm)
BDXA-MM1	Weight: 5.5 lb (2.5 kg) Packaged weight: 7.90 lb (3.59 kg) Power: 150 W (Heat Dissipation: 512 BTU)

### Fabric Modules

Dimensions	20 inches high by 3 inches wide by 10 inches deep (50.8 cm by 7.6 cm by 25.4 cm)
BDXA-FM10T	Weight: 9.2 lb (4.1 kg) Packaged weight: 14.40 lb (6.55 kg) Power: 270 W (Heat Dissipation: 921 BTU)
BDXA-FM20T	Weight: 9.2 lb (4.1 kg) Packaged weight: 14.40 lb (6.55 kg) Power: 330 W (Heat Dissipation: 1126 BTU)



## Power Supplies for BlackDiamond X8 Switches

**Table 14: Specifications for the BlackDiamond X8 AC Power Supply (Model # 48011)**

Typical configuration	3 power supplies
Full configuration	8 power supplies
Physical characteristics	Height: 1.5 inches (3.8 cm) Width: 4.2 inches (10.6 cm) Depth: 14.5 inches (36.8 cm)  Weight: 5.3 lb (2.4 kg) Packaged weight: 6.15 lb (2.80 kg)
Input	Rated inputs: Low range: 100 to 120 V $\sim$ , 60/50 Hz, 13 A maximum each power supply High range: 200 to 240 V $\sim$ , 60/50 Hz, 13 A maximum each power supply Input ranges: Low range: 90 to 132 V $\sim$ , 47 to 63 Hz, 15.4 A High range: 185 to 264 V $\sim$ , 47 to 63 Hz, 14.6 A Power supply input socket: IEC 320 C20 Minimum wire size: 16 AWG (1.0 mm <sup>2</sup> ) copper stranded
Output	DC voltage output range: 47.5 to 48.5 V $\equiv$ Nominal DC output: Low range: 48 V $\equiv$ , 50 A maximum each power supply High range: 48 V $\equiv$ , 25 A maximum each power supply DC output power: 2500 W @ high range for one power supply 1250 W @ high range for one power supply
Efficiency	90 % typical at full load
Operating conditions	Operating temperature: $-10^{\circ}$ C to $50^{\circ}$ C Storage temperature: $-40^{\circ}$ C to $85^{\circ}$ C Operating humidity: 10% to 95% relative humidity, non-condensing Operational shock: 30 m/s <sup>2</sup> (3 g)

## Power Cord Requirements

Power cords for use on BlackDiamond X8 AC power supplies have the following requirements

- The power supply cord must be agency-certified for country of use, and rated at 13 A by in-country regulatory authority.
- The power supply cord must have an IEC 320 C19, straight plug to connect to the IEC320 C20 connector on the 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 16 AWG (1.0 mm<sup>2</sup>).

## Connector Pinouts

Table 15 shows the pinouts for the RJ-45 console port on the BlackDiamond X8 switch.

**Table 15: RJ-45 Console Port on BlackDiamond X8 Switch**

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

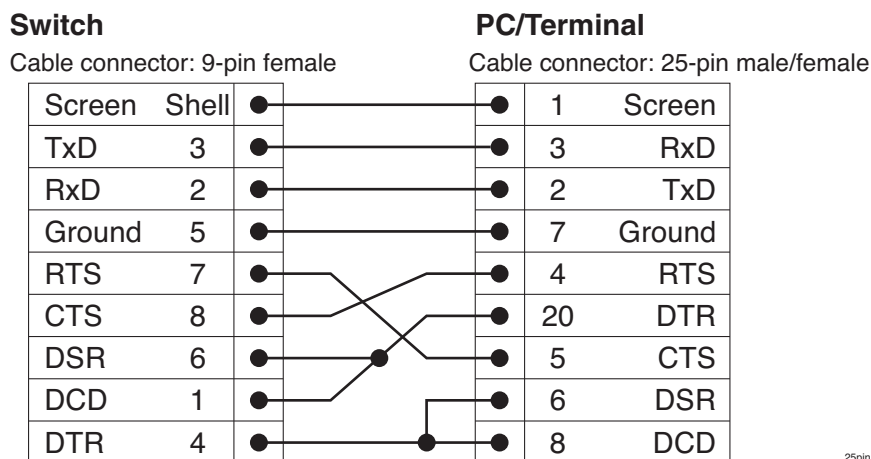
Table 16 shows the pinouts for an RJ-45-to-DB-9 adapter.

**Table 16: Pinouts for an RJ-45 to DB-9 Adapter**

Signal	RJ-45 Pin	DB-9 Pin
CTS (clear to send)	1	8
DTR (data carrier detect)	2	6
TXD (transmit data)	3	2
GND (ground)	4	5
GND (ground)	5	5
RXD (receive data)	6	3
DSR (data set ready)	7	4
RTS (request to send)	8	7

Figure 63 shows the pinouts for a 9-pin to 25-pin (RS-232) null-modem cable.

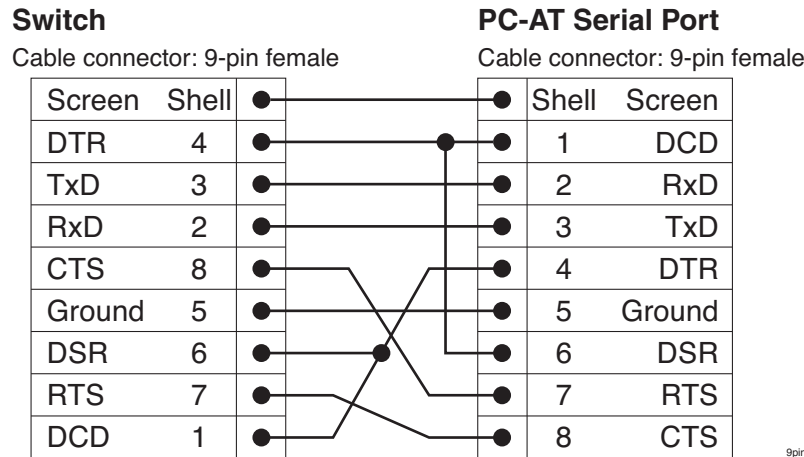
**Figure 63: Null-modem Cable Pinouts**



25pin

Figure 64 shows the pinouts for a 9-pin to 9-pin (PC-AT) null-modem serial cable.

**Figure 64: PC-AT Serial Null-modem Cable Pinouts**



## Conformity Statements for EMC Class A

### International—CISPR 22 Class A

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate remedial measures.

### FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you are required to correct the interference at your own expense.

### Canada Class A

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

## Class A Notice for Taiwan



**WARNING!**

This is a Class A product. In a residential environment this product may cause radio interference, in which case the user may be required to take appropriate measures.

---



**WARNING!**

警告使用者：這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

---



**WARNING!**

警告:此为A级产品，在生活环境中，该产品可能造成线电干扰。在这种情下，可能需要用户对干扰采取切实可行的措施。

---

## Japan (VCCI Class A)

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

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