Installing and Maintaining the Passport 8000 Series Chassis

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- EMC - Electromagnetic Immunity – CISPR 24
- Electrical Safety – IEC 60950, with CB member national deviations

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This digital apparatus (8000 Series chassis and installed components) does not exceed the Class A limits for radio-noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Règlement sur le brouillage radioélectrique du ministère des Communications

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Warning: 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 appropriate measures.

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명　　　칭 (모 델 명) : Switch (Passport 8600)
인　증　번　호 : E–E011–02–0015 (A)
인증받은자의상호 : Nortel Networks Ltd.
제　　조　　일 : 별도표기
제 조 자(제 조 국) : Nortel Networks Ltd.(미국)

National safety statements of compliance

CE marking statement (Europe only)

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Tel:	52 5 480 2100
Fax:	52 5 480 2199
Input:	(8003 Chassis only)
	100 to 240 VAC, 50 to 60 Hz, 9 A max. per power supply single supply, or + one redundant supply configurations
Input:	(8006 and 8010 Chassis only)
	100 to 240 VAC, 50 to 60 Hz, 12 A max. per power supply –48 to –60 VDC, 29 A max. per power supply single supply, two supplies, or two supplies + one redundant supply configurations

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	Col. San Jose Insurgentes
	Deleg-Benito Juarez
	México D.F. 03900
Tel:	52 5 480 2100
Fax:	52 5 480 2199
Embarcar a:	(8003 Chassis)
	100 to 240 V CA, 50 to 60 Hz, 9 A max. por fuente de poder
	una fuente o una + configuraciones de una fuente redundante
Embarcar a:	(8006 and 8010 Chassis)
	100 to 240 V CA, 50 to 60 Hz, 12 A max. por fuente de poder
	–48 to –60 V CD, 29 A max. por fuente de poder
	una fuente, dos fuentes o dos + configuraciones de una fuente redundante

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Preface

The Nortel Networks* 8000 Series chassis provides the physical framework for the 8000 Series switch modules. When switch modules are installed in the chassis, the resulting network switch provides a range of data speeds and high-performance switching and routing features.

This guide provides instructions on how to install the 8000 Series chassis in an equipment rack and how to install and replace fan trays, power supplies, modules, gigabit interface converters, and media dependent adapters. This guide also describes some of the routine tasks of operating the 8000 Series switch and includes technical specifications for the chassis and modules.

Before you begin

This guide is intended for qualified service personnel who are installing an 8000 Series switch in an 8000 Series chassis for the first time or who need to install or replace any 8000 Series customer-replaceable unit (CRU) in the chassis.

Before installing the 8000 Series chassis, ensure that all network wiring has been installed on the premises using standard cable-system practices.

Text conventions

This guide uses the following text conventions:

bold Courier text	Indicates command names and options and text that you need to enter.
	Example: Use the **dinfo** command.
	Example: Enter **show ip** {**alerts**|**routes**}.
italic text	Indicates new terms, book titles, and variables in command syntax descriptions. Where a variable is two or more words, the words are connected by an underscore.
	Example: If the command syntax is show at *<valid_route>*, *valid_route* is one variable and you substitute one value for it.

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> **Note:** For a list of related publications, see the release notes that accompany your software.

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Chapter 1
Passport 8000 Series Chassis hardware components

Each Passport 8000 series chassis consists of a sheet metal enclosure, a backplane, and a power backplane. The number of bays for power supplies and the number of fan trays depends on the chassis type.

The Passport 8000 series chassis comprise the following chassis types:

- 8010co chassis
- 8010 chassis
- 8006 chassis
- 8003 chassis

This chapter includes the following topics:

8010co chassis

As shown in Figure 1, the 8010co Chassis provides eight slots for installing Passport 8600 interface modules and two slots for installing the 8691SF or 8692SF switch fabric modules. Slots are numbered from left to right. You can install Passport 8600 interface modules in slots 1 through 4 and slots 7 through 10. Slots 5 and 6 are reserved for Passport 8000 Series switch fabric modules. For complete information about Passport 8600 modules and instructions for installing them, see *Installing Passport 8600 Switch Modules.*

The 8010co chassis has three bays for either 8004AC or 8004DC power supplies (refer to *Installing an AC Power Supply in an 8000 Series Switch* or *Installing a DC Power Supply in an 8000 Series Switch*), and two 8010co fan trays for cooling (refer to *Installing a Fan Tray in an 8000 Series Switch*). Figure 1 also shows the location of customer-replaceable components in the 8010co chassis.

Figure 1 8010co Chassis and components
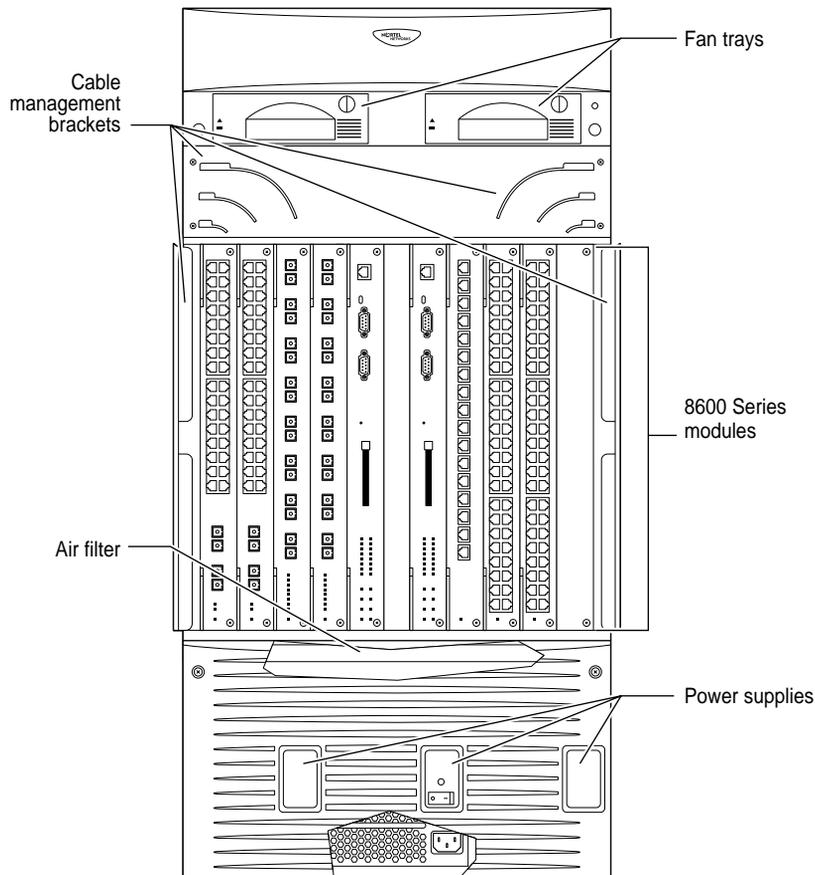
8010 chassis

As shown in Figure 2, the 8010 Chassis provides eight slots for installing interface modules and two slots for installing either Passport 8190SM switch management modules, or Passport 8691SF or 8692SF switch fabric modules. Slots are numbered from the top down. You can install either Passport 8100 or 8600 interface modules in slots 1 through 4 and slots 7 through 10. Slots 5 and 6 are reserved for Passport 8000 Series switch fabric or switch management modules.

In a system with Passport 8100 modules, the interface module installed in slots 1 or 2 serves as a clock source for the entire chassis. Therefore, you must install a 8100 series module in either slot 1 or 2 to avoid traffic loss.

> → **Note:** Passport 8000 Series software Release 3.2 and later does not support configurations of Passport 8100 modules and Passport 8600 modules concurrently within the same chassis.

For complete information about the Passport 8100 modules and instructions for installing them, see *Installing Passport 8100 Switch Modules*. For complete information about Passport 8600 modules and instructions for installing them, see *Installing Passport 8600 Switch Modules.*

The 8010 chassis has three bays for either 8004AC or 8004DC power supplies (refer to *Installing an AC Power Supply in an 8000 Series Switch or Installing a DC Power Supply in an 8000 Series Switch),* and two 8010 fan trays for cooling (refer to *Installing a Fan Tray in an 8000 Series Switch.* Figure 2 also shows the location of customer-replaceable components in the 8010 chassis.

Figure 2   8010 Chassis and components
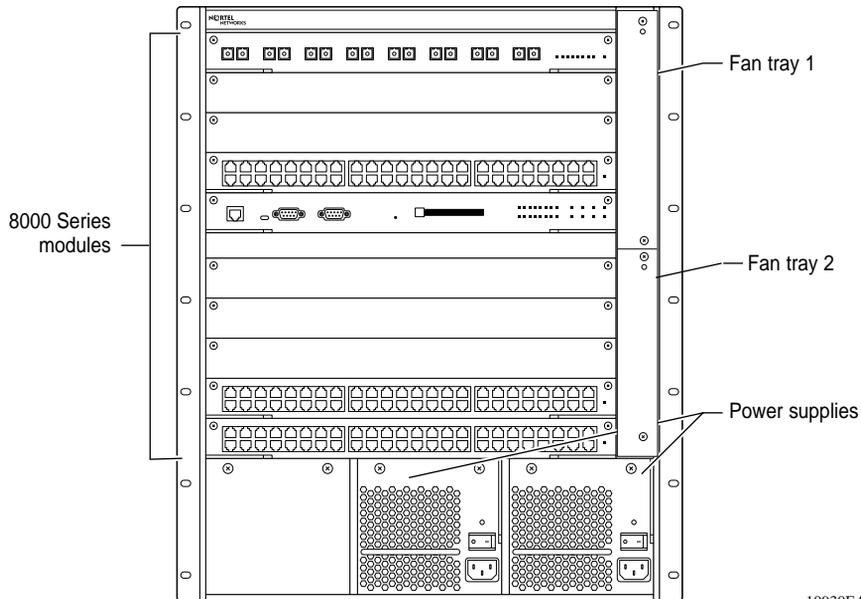
8006 chassis

As shown in Figure 3, the 8006 Chassis provides four slots for installing interface modules and two slots for installing either 8190SM switch management modules or 8691SF or 8692SF switch fabric modules. The top four slots allow you to install either Passport 8100 or 8600 interface modules. Slots 5 and 6 are reserved for Passport 8000 Series switch fabric or switch management modules.

For complete information about Passport 8100 modules and instructions for installing them, see *Installing Passport 8100 Switch Modules.* For complete information about Passport 8600 modules and instructions for installing them, see *Installing Passport 8600 Switch Modules.*

In a system with Passport 8100 modules, the interface module installed in slot 1 or 2 serves as a clock source for the entire chassis. Therefore, you must install a Passport 8100 series module in either slot 1 or 2 to avoid traffic loss.

> → **Note:** Passport 8000 Series software Release 3.2 and later does not support configurations of Passport 8100 modules and Passport 8600 modules concurrently within the same chassis.

The 8006 chassis has three bays for either 8004AC or 8004DC power supplies (refer to *Installing an AC Power Supply in an 8000 Series Switch* or *Installing a DC Power Supply in an 8000 Series Switch*), and a single 8006 fan tray for cooling (refer to *Installing a Fan Tray in an 8000 Series Switch*). Figure 3 also shows the location of customer-replaceable components in the 8006 chassis.

Figure 3   8006 Chassis and components
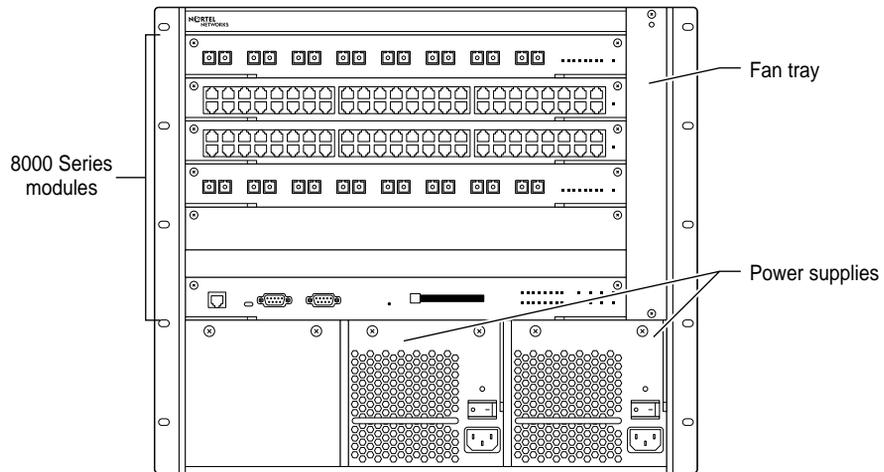
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8003 chassis

The 8003 Chassis provides two slots for installing Passport 8600 interface modules and one slot for installing a 8691SF Switch Fabric Module.

> → **Note:** The 8692SF is not supported in the 8003 chassis with Passport 8600 software Release 3.7.

Slots are numbered from the top down. Slots 1 and 2 allow you to install Passport 8600 interface modules. Slot 3 is reserved for the Passport 8690SF or 8691SF Switch Fabric Module. For complete information about Passport 8600 modules and instructions for installing them, see *Installing Passport 8600 Series Switch Modules*.

The 8003 chassis has two bays for 8003AC power supplies (refer to *Installing an AC Power Supply in an 8000 Series Switch*), and a single 8003 fan tray for cooling (refer to *Installing a Fan Tray in an 8000 Series Switch*). Figure 4 also shows the location of customer-replaceable components in the 8003 chassis.

Figure 4 8003 Chassis and components
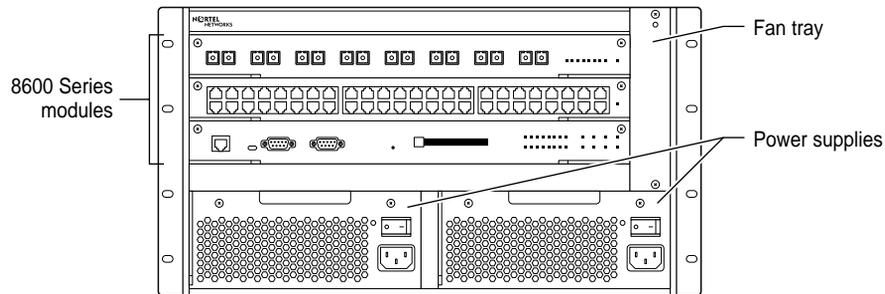
Power supplies

The 8010co, 8010, and 8006 chassis each provide three bays for installing power supplies. The following power supplies are available for these chassis:

- 8004 AC Power Supply
- 8004 DC Power Supply

The 8006 and 8010 chassis provide two bays for installing 8004AC or 8004DC power supplies. Two power supplies constitute a redundant power configuration for all installed module options comprising five or fewer modules. Three power supplies constitute a redundant power configuration for all installed module options comprising six or greater modules.

A minimum of two power supplies is required for the 8010co Chassis. You can also install an additional power supply for redundancy.

> **Note:** The 8004 AC Power Supply is derated from 850 W to 780 W maximum output @ 100 - 109 VAC input. See Appendix A, "Technical specifications for the Passport 8000 Series Chassis," on page 95 for additional power supply technical specifications.

The 8003 chassis provides two bays for installing 8003 AC power supplies. Each power supply provides 500 watts (W) of output power for the switch. Two power supplies constitute a redundant power configuration for all installed module configurations in the chassis.

For complete information about the power supplies and instructions for installing them, see *Installing an AC Power Supply in an 8000 Series Switch* and *Installing a DC Power Supply in an 8000 Series Switch.*

Fan trays

Table 1 lists the number of fan trays for each Passport 8000 Series chassis.

Table 1   Number of fan trays installed each chassis

Chassis	Fan tray
8010co	Two fan trays; each fan tray contains two high-capacity fans
8010	Two fan trays; each fan tray contains eight high-capacity fans
8006	One fan tray containing eight high-capacity fans.
8003	One fan tray containing three high-capacity, fans.

A control/monitor circuit board in the fan tray reports temperature and fan operating status to the network management software. A green LED indicates that the fan is operating correctly. For instructions on installing the fan, see *Installing a Fan Tray in a Passport 8000 Series Switch*.

Chapter 2
Installing the 8010, 8006, and 8003 Chassis

This chapter describes how to install the 8010, 8006, and 8003 Chassis. It includes the following topics:

Preparing to install the 8010, 8006, and 8003 Chassis

Before beginning the installation, verify that:

• Your shipment is complete and undamaged.
• You have the cables, tools, and other equipment that you need.
• Your installation site meets the physical, electrical, and environmental requirements described in "Site requirements" on page 34.

The sections that follow provide information to help you prepare for installation.

Shipment contents

Inspect all items for shipping damage. If you detect any damage, do not install the chassis. Call the Nortel Networks Technical Solutions Center in your area (see "How to get help" on page 19.)

In addition to the 8010, 8006 or 8003 Chassis, your shipping container contains several hardware accessories. Verify that the items in the shipping container match those on the shipment packing list.

Use Table 2 as a checklist when verifying the contents of the shipping container.

Table 2 Chassis shipping accessories: 8010, 8006, 8003

Check	Accessory	Use to
	Bracket kit containing • Two rack mounting brackets • Flat head screws	Prepare the chassis for installation in an equipment rack.
	Screw package	Mount the chassis in an equipment rack.
	Side cable management bracket(s) (Two brackets for the 8010 chassis; one bracket each for the 8006 and 8003 chassis)	Manage network interface cables.
	Rubber footpads	Keep the chassis from slipping when mounting it on a flat surface.
	Console cable	Connect an optional management console to the chassis.
	Cable adapter	Connect an optional management console to the DB-9 connector.

Figure 5, Figure 6, and Figure 7 illustrate the items in the chassis shipping container.

Figure 5   Items in the 8010 Chassis shipping container
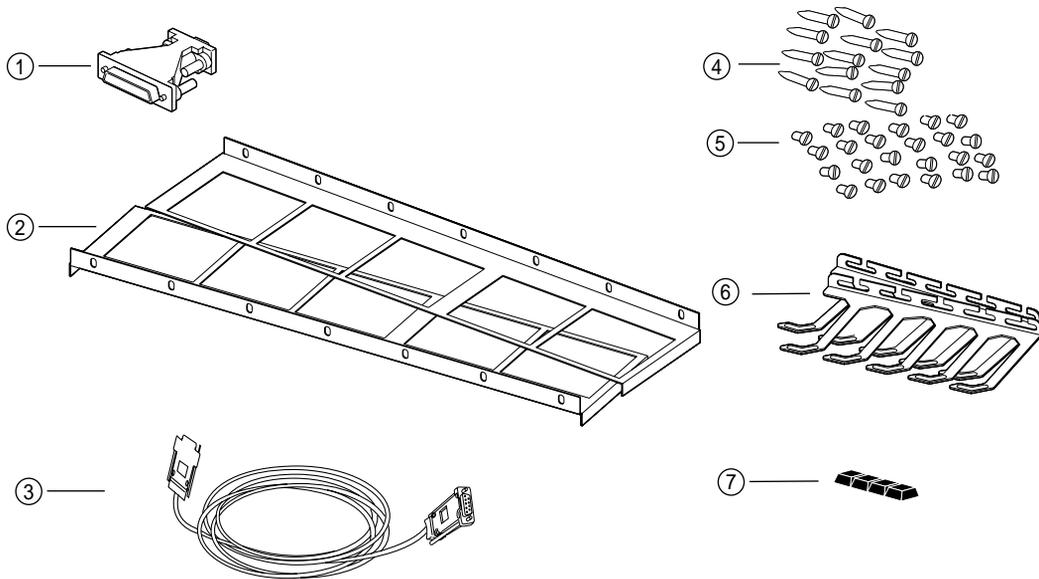
1 = Cable adapter
2 = Rack mounting brackets
3 = Console cable
4 = Screws (x14) for brackets
5 = Screws (x24) for equipment rack
6 = Cable guides
7 = Rubber footpads

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Figure 6 Items in the 8006 Chassis shipping container
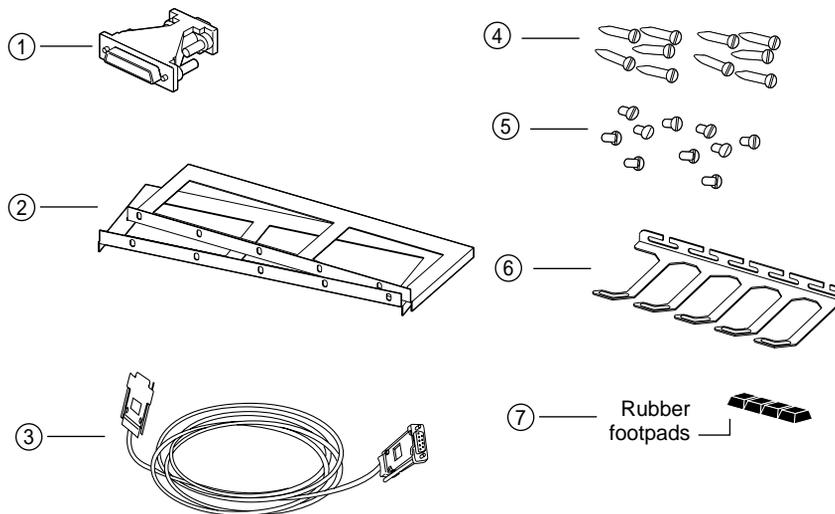
1 = Cable adapter
2 = Rack mounting brackets
3 = Console cable
4 = Screws (x10) for brackets
5 = Screws (x10) for equipment rack
6 = Cable guide
7 = Rubber footpads

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Figure 7   Items in the 8003 Chassis shipping container
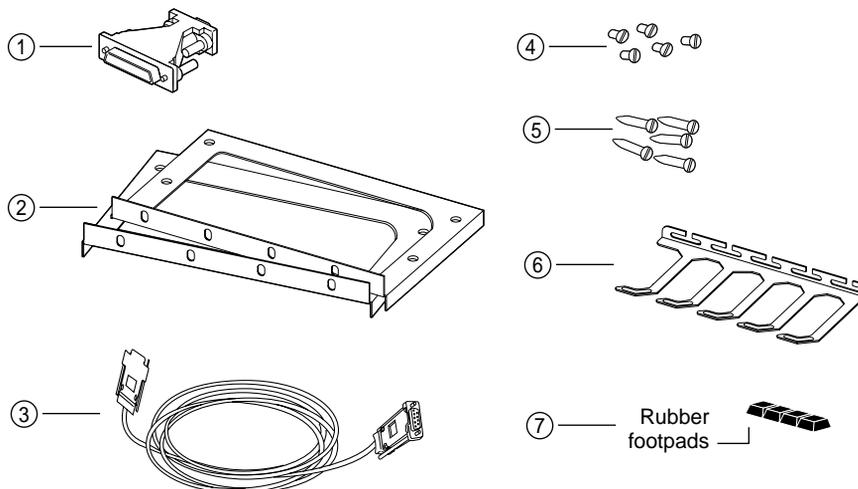
1 = Cable adapter
2 = Rack mounting brackets
3 = Console cable
4 = Screws for brackets
5 = Screws for equipment rack
6 = Cable guide
7 = Rubber footpads

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Supplying equipment

You will need items that are not included in the 8010, 8006, 8003 Chassis accessory package. Before installing the hardware, make sure that you have all the cables, tools, and other equipment that you will need.

Management console

To configure startup options and to monitor the results of startup diagnostics, you can attach an optional PC, laptop, VT-100 console or equivalent, such as a PC terminal emulator. Or, you can attach an AT-compatible modem to allow dial-in access to startup configuration and diagnostics.

Cables

Unless you specifically ordered them, the cables required for your network configuration are not included in the chassis accessory package. If you do not have the proper cables, contact your network administrator.

Hardware for mounting the 8010, 8006, 8003 chassis in an equipment rack

To install the 8010, 8006, or 8003 Chassis in an equipment rack, you need a Phillips screwdriver and an equipment rack that meets the following specifications:

- Heavy-duty steel construction
- Electronic Industries Association (EIA) standard hole-spacing
- Width of 19 in. (48.26 cm) and depth of 24 in. (60.96 cm)

Site requirements

Ensure that the installation site meets the space, electrical, and environmental requirements listed in this section. See Appendix A, "Technical specifications for the Passport 8000 Series Chassis," on page 95 for more information.

Space requirements

The installation site must provide sufficient free space around the chassis to ensure proper ventilation and access for servicing.

Use the following guidelines to plan front and rear access:

- The maintenance aisle in front of the frame requires a clearance of 76.2 cm (30 inches).
- The wiring aisle at the back of the frame requires a clearance of 61 cm (24 inches).

AC input electrical requirements (8010, 8006 and 8003 chassis)

The installation site must meet the following electrical requirements for AC power (Table 3). For additional electrical requirements, see Appendix A, "Technical specifications for the Passport 8000 Series Chassis," on page 95.

Table 3   Wall receptacle requirements for AC power

Country	Receptacle	Voltage
United States and Canada	National Electrical Manufacturers Association (NEMA) 5-15P standard receptacle 10405EA	100-120 V
Any other country	For installation outside of North America, make sure that you have the proper power cord for your country.	100-240 V
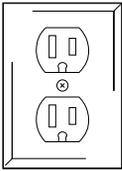
DC input electrical requirements (8010 and 8006 chassis)

The installation site must meet the following electrical requirements for DC power (Table 4). For additional electrical requirements, see Appendix A, "Technical specifications for the Passport 8000 Series Chassis," on page 95.

Table 4   Electrical requirements for the DC model

Nominal Input voltage	Input current	Input power
–48/ –60 VDC	29 -23 A	1308 W

Environmental requirements

The installation site must meet the following environmental requirements (Table 5).

Table 5 Environmental requirements

Altitude	Humidity	Temperature
0-10,000 ft (0-3048 m)	5%-85%, noncondensing	32°F-104°F (0°C-40°C), stable

Installing the chassis

When you are ready to install the chassis, you can do one of the following:

- Position the chassis on a flat, sturdy, horizontal surface.
- Mount the chassis in a standard 19-inch equipment rack.

To make the chassis lighter to install, you can do the following:

- Remove the power supply filler panels (see "Removing and Installing a Power Filler Panel" in *Installing an AC Power Supply in an 8000 Series Switch* or *Installing a DC Power Supply in an 8000 Series Switch*).
- Remove the module filler panels (see "Removing and Installing a Filler Panel" in *Installing Passport 8600 Switch Modules*).
- Remove the fan trays (see *Installing a Fan Tray in an 8000 Series Switch*).

Positioning the 8010, 8006, and 8003 chassis on a flat surface

The Passport 8010 and 8006 chassis can be mounted onto any appropriate flat, level surface that can safely support the weight of the chassis, its components, and its attached cables, as long as there is adequate space around the unit for access to cable connectors (Table 6).

Table 6 Chassis weight including components and cables

Chassis	Weight (chassis, components, cables)
8010	225 lbs 101 kilograms
8006	170 lbs 77 kilograms
8003	110 lbs 49.5 kilograms

To install the switch on a tabletop, shelf, or any other flat surface, follow these steps:

1 Set the switch on the flat surface and check for proper ventilation.

Allow at least 2 inches 5.1 cm) on each side for proper ventilation and 5 inches (12.7 cm) at the front for power cord clearance.

2 Attach rubber feet to each marked location on the bottom of the chassis.

The rubber feet are optional but recommended to keep the unit from slipping.

3 Attach all devices to the ports.

Mounting the 8010, 8006, and 8003 chassis in an equipment rack

To mount the chassis in an equipment rack, you need the following items:

• Standard 19 in. (48.2 cm) equipment rack

> ➡ **Note:** If you are mounting the chassis in a 23-inch equipment rack, refer to the rack manufacturer's 19-inch-to-23-inch rack adapter installation instructions.

• 10 screws and washers (extra screws are shipped with the 8010 Chassis)
• Phillips screwdriver

Table 7 list the maximum number of chassis installed in a 7-foot rack.

Table 7 Maximum number of chassis in 7-foot rack

Chassis	Maximum number of chassis installed in 7-foot rack
8010	3
8006	5
8003	7

To install the chassis in a 19-inch equipment rack:

1 Hold each rack-mounting bracket against one side of the chassis. Make sure that the attachment holes in the bracket match the holes in the chassis (Figure 8, Figure 9, and Figure 10).

> ➡ **Note:** Each bracket fits only one side of the chassis. The brackets are labeled R (right) and L (left). If the mounting holes do not line up between a bracket and the chassis, try that bracket on the other side of the chassis.

Figure 8 Positioning the rack-mounting brackets: 8010 Chassis
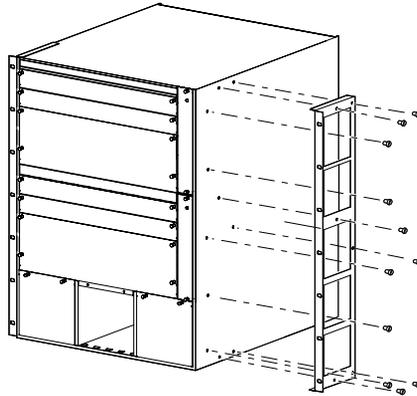
Figure 9 Positioning the rack-mounting brackets: 8006 Chassis

11151FA
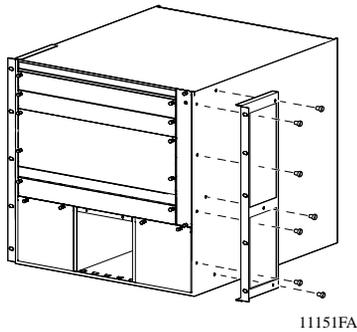
Figure 10 Positioning the rack-mounting brackets: 8003 Chassis

10236FA
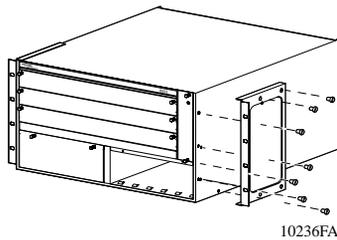
2 Insert and tighten the supplied flat-head screws to fasten each bracket to the chassis (Figure 11, Figure 12, and Figure 13).

Figure 11 Attaching the rack-mounting brackets to the chassis: 8010 Chassis
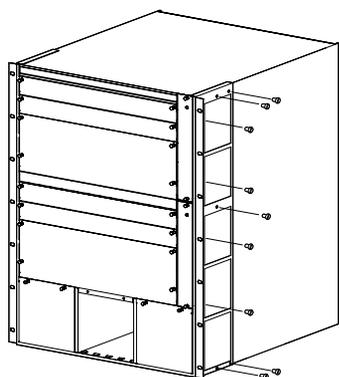
9104FA

Figure 12 Attaching the rack-mounting brackets to the chassis: 8006 Chassis
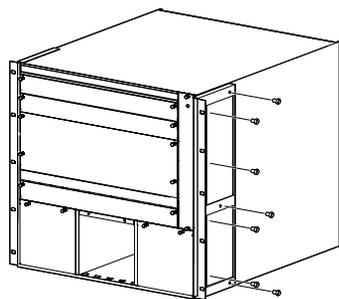
9418FA

Figure 13 Attaching the rack-mounting brackets to the chassis: 8003
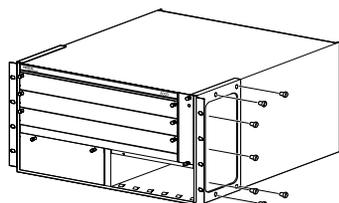
10237FA

3 Measure the appropriate number of rack units of free vertical space inside the rack and mark the spot (Table 8).

Table 8 Number of rack units to allocate for chassis

Chassis	Rack units	Inches
8010	13.2	23.10
8006	9.7	16.9
8003	6	10.5

4 Holding the chassis in position, align the flanged end of each mounting rail with two holes on each side of the vertical rack support.

It is easiest to complete this step with two people. Make sure that the hole pairs on either side of the vertical support match horizontally (Figure 14, Figure 15, and Figure 16).

Figure 14 Aligning the rack-mounting brackets with the equipment rack: 8010 Chassis

9074FA
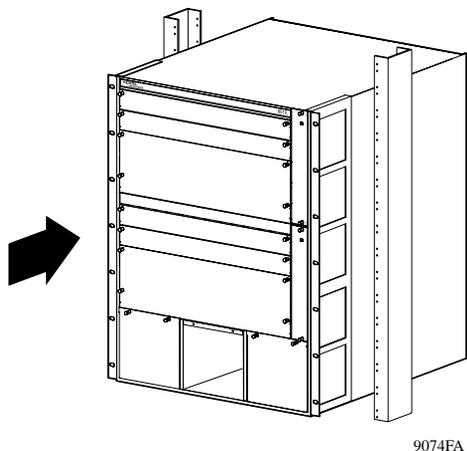
Figure 15 Aligning the rack-mounting brackets with the equipment rack: 8006 Chassis

9419FA
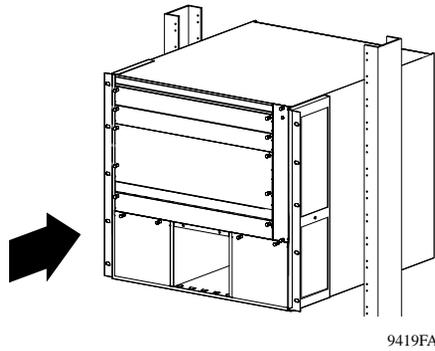
Figure 16 Aligning the rack-mounting brackets with the equipment rack: 8003 Chassis

10238FA
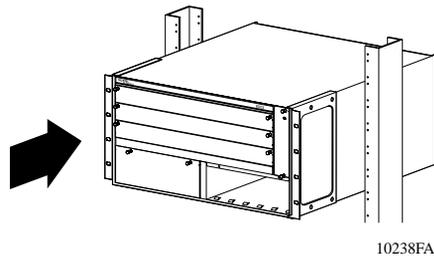
5 Insert and tighten the rack-mounting screws with a Phillips screwdriver (Figure 17, Figure 18, and Figure 19).

Figure 17   Installing the 8010 Chassis in an equipment rack

9075FA
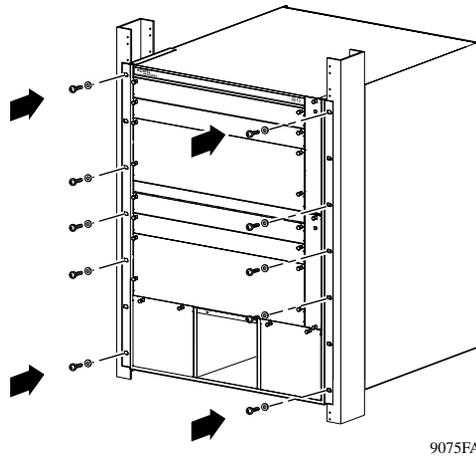
Figure 18   Installing the 8006 Chassis in an equipment rack

9420FA
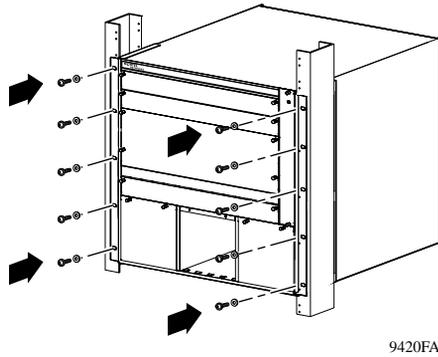
Figure 19   Installing the 8003 Chassis in an equipment rack

10239FA
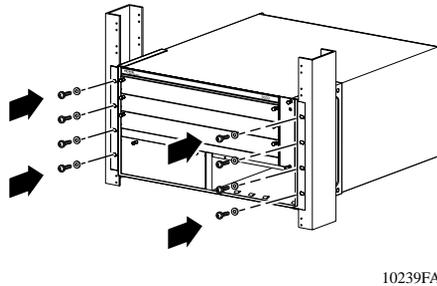
Installing the cable guides

The cable guides keep cable clusters fastened and out of the way, but still accessible for maintenance.

To install the cable guides:

1 Loosen, but do not remove, the rack-mounting screws needed to install one cable guide (Figure 20, Figure 21 and Figure 22).

Figure 20   Loosening the rack-mounting screws: 8010 Chassis

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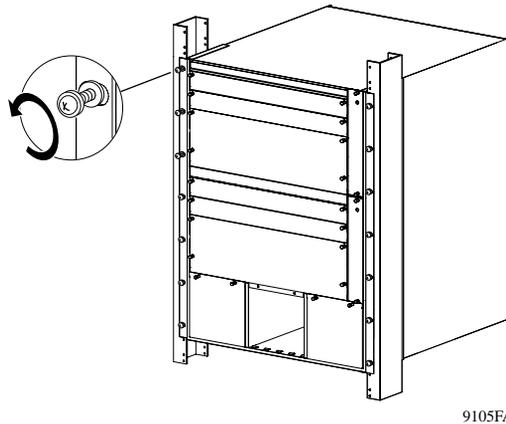
Figure 21   Loosening the rack-mounting screws: 8006 Chassis

9421FA
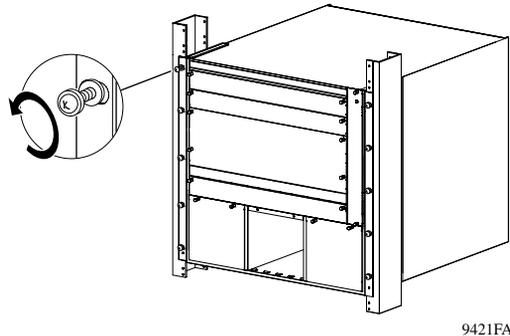
Figure 22   Loosening the rack-mounting screws: 8003 Chassis

10245FA
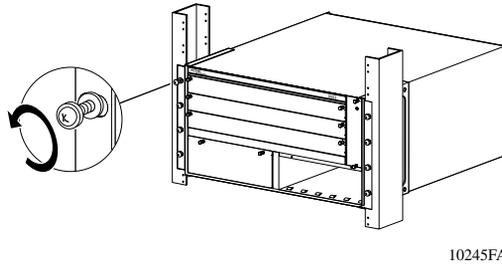
2   Slide the guide onto the loosened screws (Figure 23, Figure 24).

Figure 23   Sliding the cable guide onto the screws

9106FA
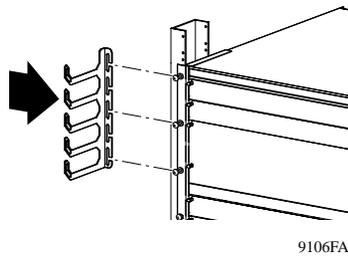
Figure 24   Sliding the cable guide onto the screws: 8003 Chassis

10246FA
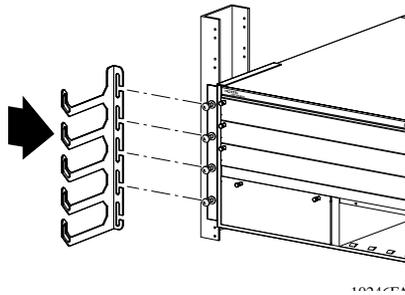
3 Tighten the screws to secure the guide to the chassis (Figure 25, Figure 26, and Figure 27).

Figure 25 Securing the cable guide to the chassis: 8010 Chassis

9107FA
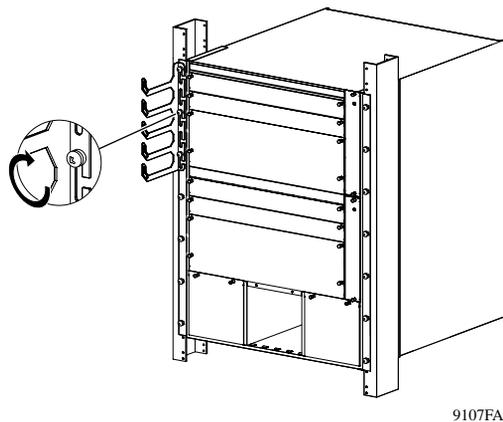
Figure 26 Securing the cable guide to the chassis: 8006 Chassis

9422FA
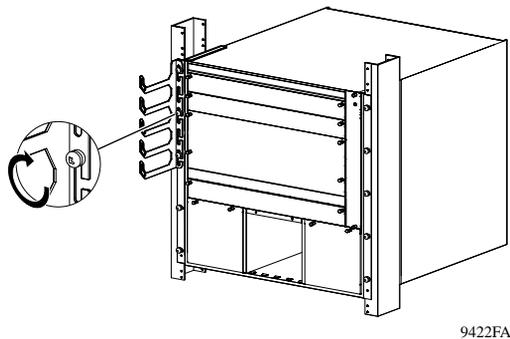
Figure 27   Securing the cable guide to the chassis: 8003 Chassis
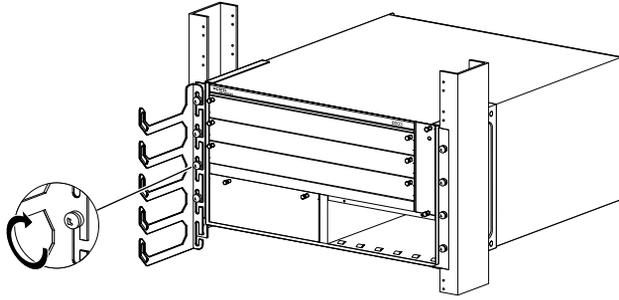
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Chapter 3
Installing the 8010co Chassis

This chapter describes how to install the 8010co Chassis. It includes the following topics:

Topic	Page

➡️ **Note:** If you plan to install DC power supplies and the optional breaker interface panel (BIP), first install the 8010co Chassis as described in this chapter, then install the DC power supplies as described in *Installing a DC Power Supply in an 8000 Series Switch*. Install the BIP as described in *Installing the Breaker Interface Panel for the 8010co Chassis*.

Preparing to install the 8010co Chassis

Before beginning the installation, verify that:

- Your shipment is complete and undamaged.
- You have the cables, tools, and other equipment that you need.
- Your installation site meets the physical, electrical, and environmental requirements.

The sections that follow provide information to help you prepare for installation.

Shipment contents

Inspect all items for shipping damage. If you detect any damage, do not install the 8010co Chassis. Call the Nortel Networks Technical Solutions Center in your area (see "How to get help" on page 19).

In addition to the 8010co Chassis, your shipping container contains several hardware accessories. Verify that the items in the shipping container match those on the shipment packing list.

Use Table 9 as a checklist when verifying the contents of the shipping container.

Table 9 8010co Chassis shipping accessories

Check	Accessory	Use to
	Antistatic wrist strap	Direct the discharge of static electricity from your body to the chassis, thereby avoiding discharge to, and possible damage of, sensitive electronic components.
	• One cable adapter • One 10-foot console serial cable	Connect an optional management console.
	Screws and hardware:	NOTE: The hardware required for mounting the chassis in a rack depends on your rack type.
	• 12 Phillips head screws • 12 self tapping hex head screws • 12 clipnuts	Mount the chassis to a rack rail. Mount the chassis to a Hendry rack. Use the clipnuts if necessary. NOTE: The hardware required for mounting the installation shelf in a rack depends on your rack type.
	• 4 Phillips head screws • 4 hex nuts • 4 self tapping hex head screws	Mount the installation shelf to a rack rail. Mount the installation shelf to a rack rail. Mount the installation shelf to a Hendry rack.
	• 4 pan head screws	Installing the cable management bracket.
	Installation shelf	Eases mounting the 8010co Chassis in an equipment rack.
	1 upper cable management bracket	Manage network interface cables.
	2 side cable management brackets	Manage network interface cables.
	Bottom bezel	Cover the power supplies and separate the chassis air intake from the power supply air intake.

Figure 28 illustrates the accessories in the 8010co Chassis shipping container.

Figure 28 Accessories in the 8010co Chassis shipping container
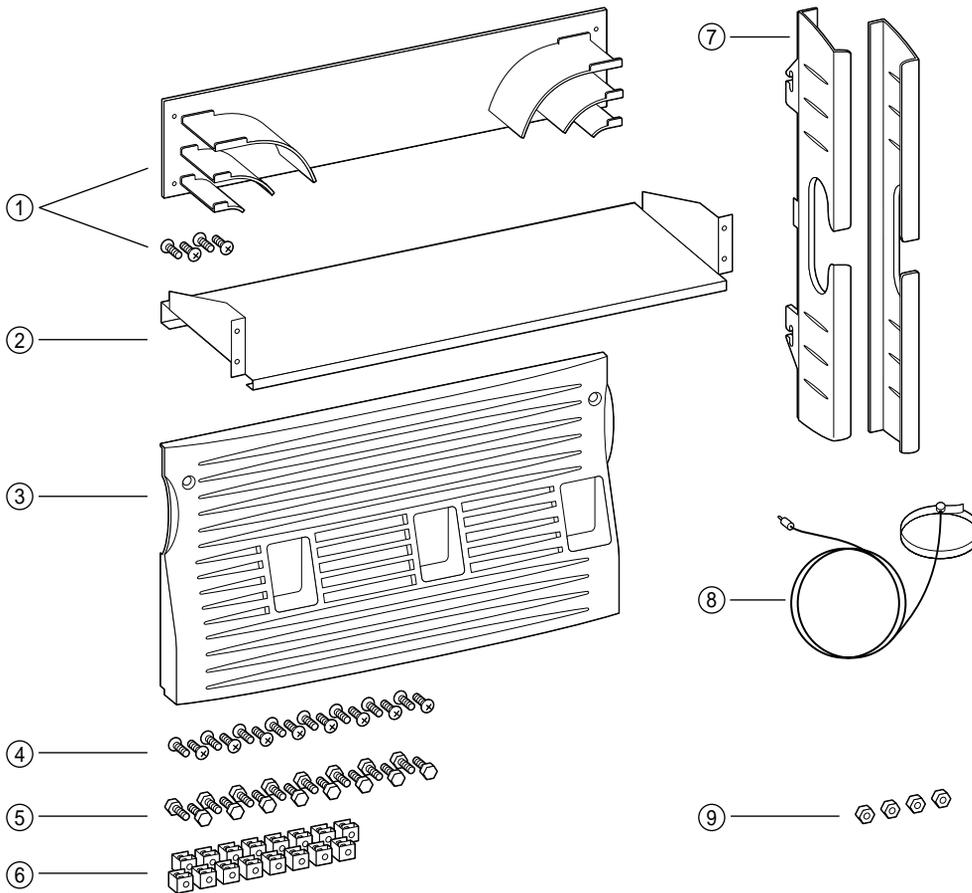
1 = Upper cable management bracket and screws (x 4)
2 = Installation shelf
3 = Bottom bezel
4 = Phillips head screws for mounting
    chassis and installation shelf in a
    standard 19-inch rack (x 16)

5 = Hex head screws for mounting
    chassis and installation shelf in a
    Hendry rack (x 16)
6 = Clipnuts, use as required for rack type (x 16)
7 = Side cable management brackets (x 2)
8 = Antistatic wrist strap
9 = Hex nuts for mounting installation shelf in a
    standard 19-inch rack (x4)

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Supplying equipment

You might need items that are not included in the 8010co Chassis accessory package. Before installing the 8010co hardware, ensure that you have all the cables, tools, and other equipment that you need.

Cables

Unless you specifically ordered them, the cables required for your network configuration are not included in the 8010co Chassis accessory package. If you do not have the proper cables, contact your network administrator.

Hardware for mounting the chassis in an equipment rack

The hardware required for mounting the 8010co Chassis in an equipment rack depends on your equipment rack type.

You will need a Phillips screwdriver to install the 8010co Chassis in a standard rail-type equipment rack. You will need a nutdriver to install the 8010co Chassis in a Hendry rack.

The racks must meet the following specifications:

- Heavy-duty steel construction
- Electronic Industries Association (EIA) standard hole-spacing
- Two-post rack with width of 19 in. (48.26 cm) and depth of 24 in. (60.96 cm)
- Two-post rack with width of 23 in. (58.42 cm) and depth of 24 in. (60.96 cm) (Requires an EIA 19-to-23-inch adapter. Contact your rack manufacturer to order this adapter).

If the rack does not have threaded rail holes, you must use the supplied clipnuts with the clipnut screws (see Figure 32).

Management console

To configure startup options and to monitor the results of startup diagnostics, you can attach a PC, laptop, VT-100 console or equivalent, such as a PC terminal emulator. Or, you can attach an AT-compatible modem to allow dial-in access to startup configuration and diagnostics.

Site requirements

Ensure that the installation site meets the space, electrical, and environmental requirements listed in this section. See Appendix A, "Technical specifications for the Passport 8000 Series Chassis," on page 95 for more information.

Space requirements

The installation site must provide sufficient free space around the 8010co Chassis to ensure proper ventilation and access for servicing.

Use the following guidelines to plan front and rear access:

• The maintenance aisle in front of the frame requires a clearance of 76.2 cm (30 inches).

• The wiring aisle at the back of the frame requires a clearance of 61 cm (24 inches).

AC input electrical requirements

If you purchased the AC power supplies, the installation site must meet the following electrical requirements for AC power (Table 10).

Table 10 Wall receptacle requirements for AC power

Country	Receptacle	Voltage
United States and Canada	National Electrical Manufacturers Association (NEMA) 5-15P 10405EA	100-120 V
Any other country	For installation outside of North America, make sure that you have the proper power cord for your country.	100-240 V
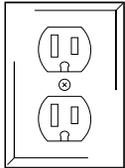
DC input electrical requirements

If you are installing a BIP, the installation site must meet the following electrical requirements for DC power (Table 11).

Table 11 DC power requirement for BIP

Nominal input voltage	Maximum input current	Physical
–48 /–60 VDC	60 A	Reinforced insulation from the main DC power

If you are not installing a BIP, refer to the system power specifications for the 8004DC power supply in Appendix A, "Technical specifications for the Passport 8000 Series Chassis," on page 95.

Environmental requirements

The installation site must meet the following environmental requirements (Table 12).

Table 12 Environmental requirements

Environmental specifications	
Operating temperature:	-5° to 55° C (23° to 131° F)
Storage temperature:	-40° to 70° C (-40° to 158° F)
Operating humidity:	90%
Storage humidity:	92.5%
Operating altitude:	13,123 ft. at 35°C and 45°C
	6,000 ft.at 55°C
	-200 ft. at 55°C
Storage altitude:	40,000 ft

Installing the chassis

To install the 8010co Chassis, you can mount the 8010co Chassis in a standard two-post equipment rack.

> **Note:** To make the chassis lighter to install, you should do the following:
> - Remove the power supply filler panels (see "Removing and Installing a Power Filler Panel" in *Installing an AC Power Supply in an 8000 Series Switch* or *Installing a DC Power Supply in an 8000 Series Switch*).
> - Remove the module filler panels (see "Removing and Installing a Filler Panel" in *Installing Passport 8100 Switch Modules* or *Installing Passport 8600 Switch Modules*).
> - Remove the fan trays (see *Installing a Fan Tray in an 8000 Series Switch*).

Mounting the 8010co Chassis in a two-post rack

To mount the 8010co Chassis in a two-post rack, you need the following equipment:

- Installation shelf (shipped with the 8010co Chassis)
- A standard 19-inch or 23-inch equipment rack

  Attach the clipnuts shipped with the 8010co Chassis if necessary.

> **Note:** To install the 8010co Chassis in a 23-inch equipment rack refer to the rack manufacturer's 19-to-23-inch adapter installation instructions.

The hardware required for mounting the chassis in a rack depends on your rack type. Use the 12 Phillips screws and a Phillips screwdriver to intall the chassis in a standard rack. Use the 12 hex head screws and a nutdriver to install the chassis in a Hendry rack.

In a 7-foot two-post rack, you can install two 8010co Chassis platforms and a BIP.

Figure 29 shows two 8010co Chassis with a BIP installed in a two-post rack.

Figure 29   Two 8010co Chassis with BIP in a two-post rack
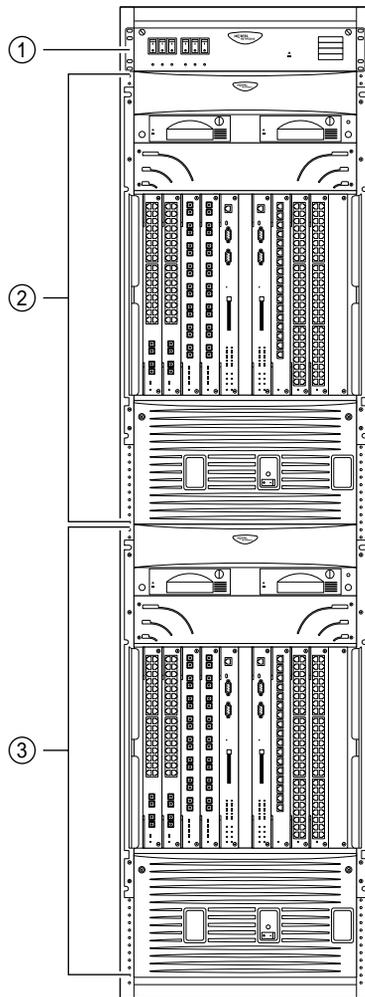
1 = Breaker interface panel
2 = 8010co Chassis (upper shelf position)
3 = 8010co Chassis (lower shelf position)

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Mounting the 8010co Chassis in a 19-inch rack

To install the 8010co Chassis in a 19-inch two-post rack:

1 Place the installation shelf at the bottom of the rack inside the rails.

2 Holding the installation shelf in position, align the shelf's mounting rail with two holes on each side of the vertical rack support.

3 Insert a Phillips screw through each installation shelf mounting hole and into the corresponding hole in the rack (Figure 31).

4 Add a hex nut to each screw and tighten using a hex wrench.

5 Tighten each screw with a Phillips screwdriver.

6 If the holes in the rack's vertical supports requires clipnuts, insert a clipnut in 12 locations.

7 Using the chassis handles shown in Figure 30, lift the 8010co Chassis onto the installation shelf.

> ⚠ **Warning:** It requires three people to lift the 8010co Chassis. You must remove the I/O modules and power supplies before lifting.

Figure 30 Location of handles on the 8010co chassis
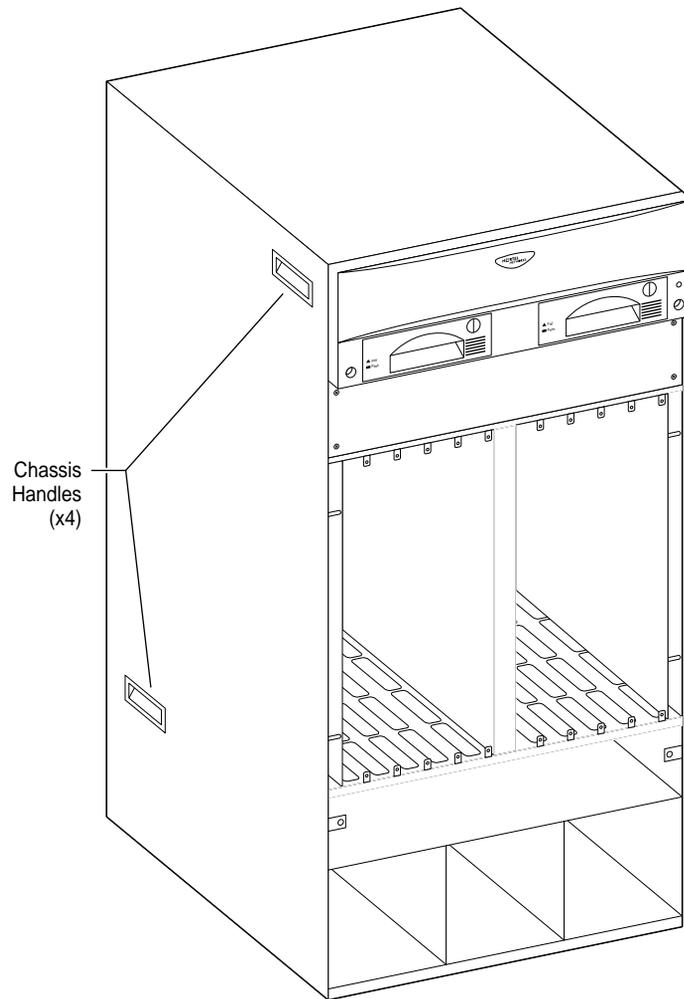
Chassis
Handles
(x4)

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8. Holding the 8010co Chassis in position, align the flanged end of the chassis mounting rail with six holes on each side of the vertical rack support (Figure 32).

9. Make sure that the hole pairs on either side of the vertical support match horizontally.

10. Tighten each screw with a Phillips screwdriver.

Figure 31   Installing the installation shelf in a 19-inch equipment rack

1 = Phillips head screws (x4)
2 = Standard 19-inch equipment rack
3 = Nuts (x4)
4 = Installation shelf

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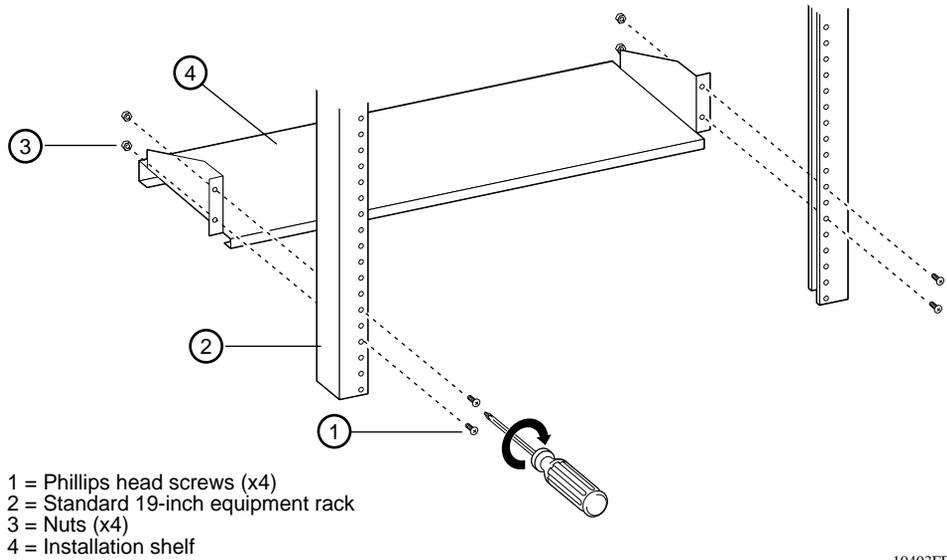
Figure 32   Installing the 8010co Chassis in a 19-inch two-post rack
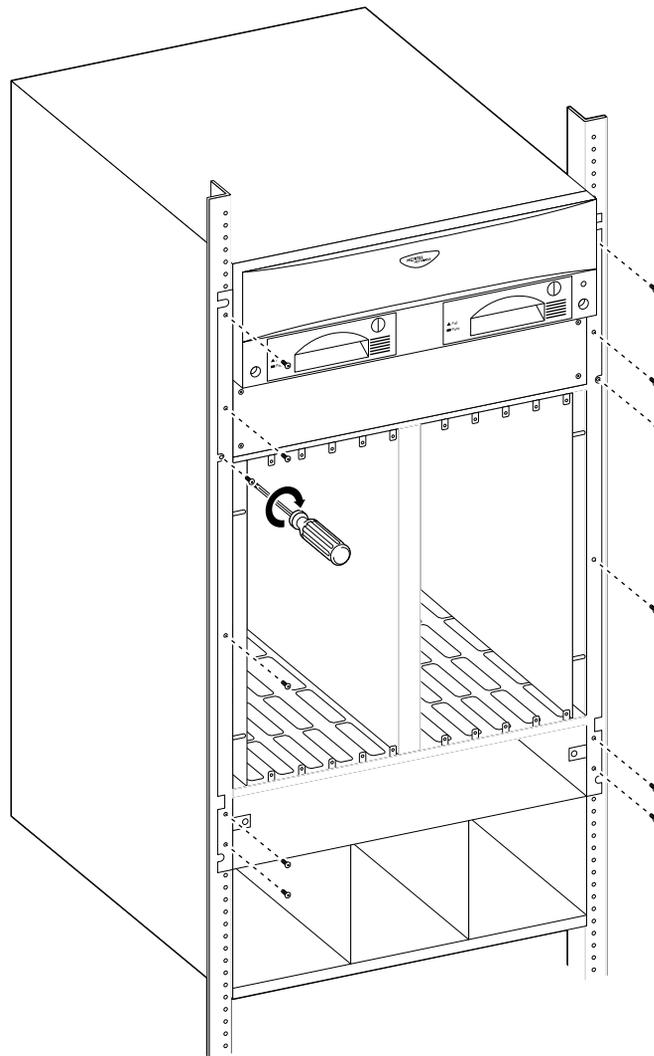
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Mounting the 8010co Chassis in a Hendry rack

To install the 8010co Chassis in a Hendry rack:

1 Place the installation shelf at the bottom of the rack.

2 Holding the installation shelf in position, align the shelf's mounting rail with two holes on each side of the vertical rack support.

3 Insert a hex head screw through each installation shelf mounting hole and into the corresponding hole in the rack (Figure 33).

Figure 33   Installing the installation shelf in a Hendry rack

1 = Hex head screws (x4)
2 = Installation shelf
3 = Hendry equipment rack
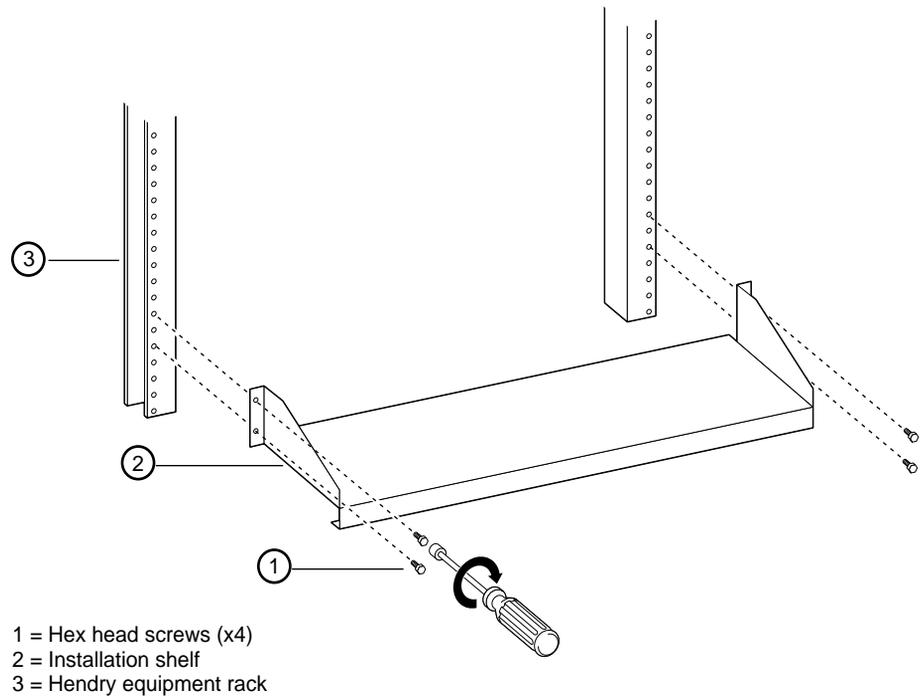
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4 Tighten each screw with a nutdriver.

5 Using a Phillips screwdriver, remove the 5 screws securing each of the two mounting rails to the 8010co Chassis (Figure 34).

Figure 34   Removing the mounting rails from the 8010co Chassis
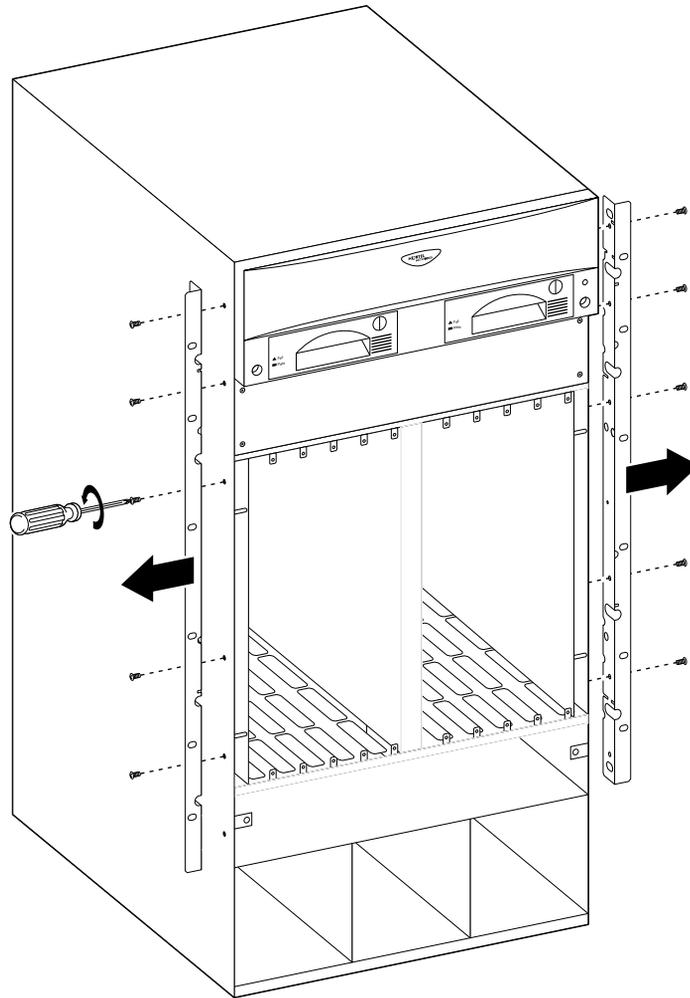
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6 Using the 10 screws that you removed from the two mounting rails, reinstall the mounting rails as shown in Figure 35.

Figure 35 Installing the mounting rails for a Hendry rack
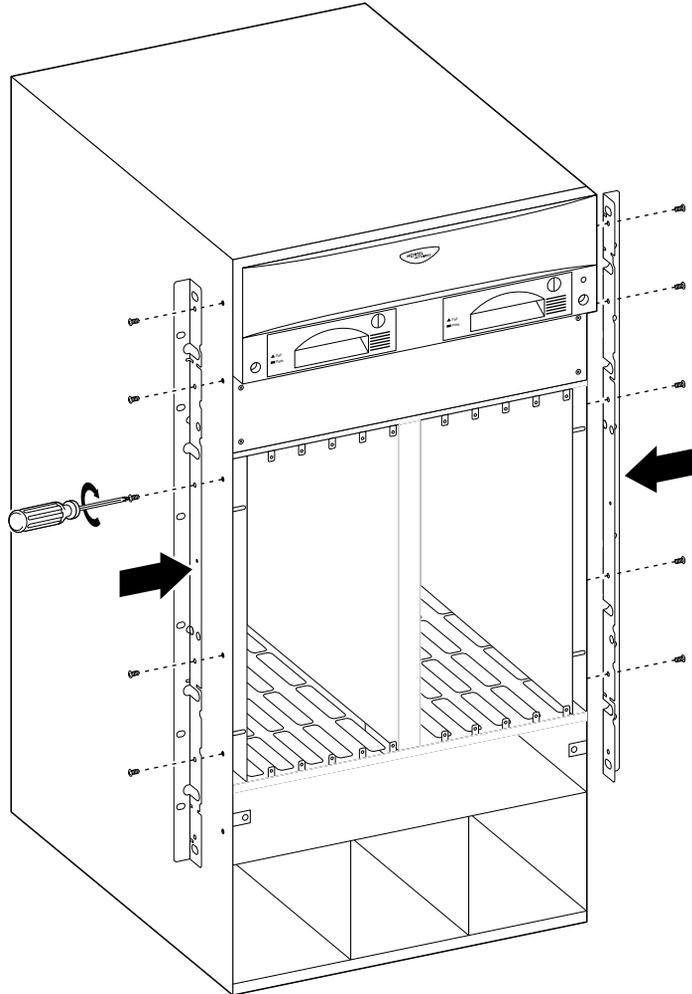
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7 If the holes in the rack's vertical supports require clipnuts, insert a clipnut in 12 locations.

8 Using the chassis handles shown in Figure 36, lift the 8010co Chassis onto the installation shelf.

⚠ **Warning:** It requires three people to lift the 8010co Chassis. You must remove the interface modules and power supplies before lifting

Figure 36   Location of handles on 8010co chassis

Chassis Handles (x4)
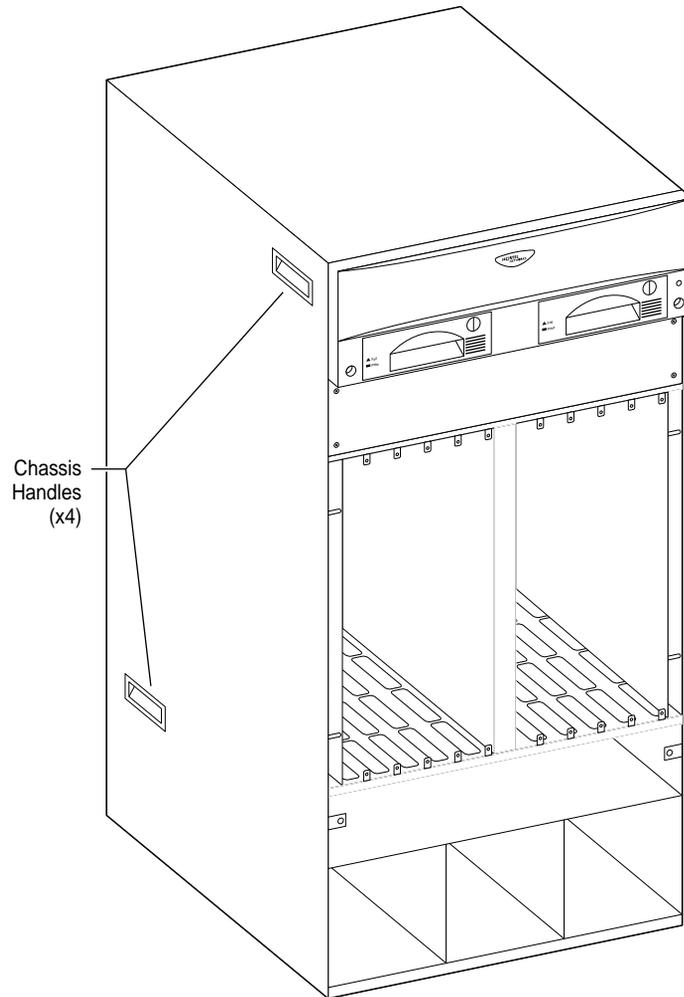
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9 Holding the 8010co Chassis in position, align the flanged end of the chassis mounting rail with six holes on each side of the vertical rack support.

10 Make sure that the hole pairs on either side of the vertical support match horizontally.

11 Tighten each clipnut screw with a Phillips screwdriver.

> → **Note:** After the 8010co Chassis is secured in the rack, you can remove the installation shelf.

Installing the cable management brackets

The cable management brackets keep groups of cables fastened and out of the way, but accessible for maintenance.

To install the top cable management bracket:

1 Align the mounting retainers on the inside of the top cable management bracket with the holes on the front of the chassis (Figure 37).

2 Push the sides of the top cable management bracket in place.

3 Insert and tighten the 8 screws using a Phillips screwdriver to secure the top cable management bracket to the chassis (Figure 37).

To install the two side cable management brackets:

1 Align the slots on the side bracket with the rods in the chassis (Figure 37).

2 Push the bracket into place.

Figure 37 Installing cable management brackets
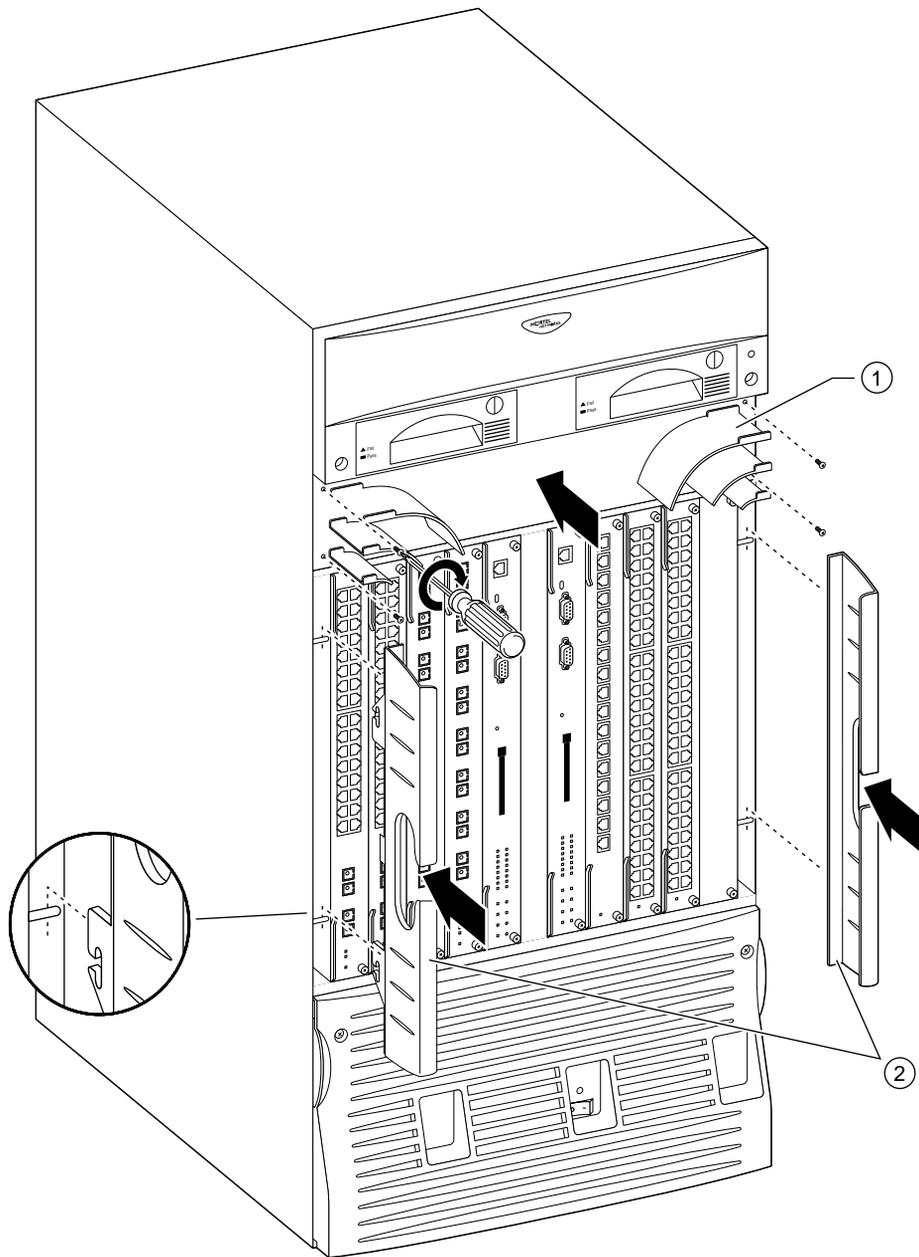
1 = Top cable management bracket
2 = Side cable management brackets (x2)

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Grounding the 8010co chassis

Before you connect power cables or network cables to your switch, Nortel
Networks recommends that you ground the 8010co chassis. Figure 38 shows the
location of the ground studs on the 8010co chassis rear panel.

Figure 38   Location of 8010co chassis ground studs

1 = Grounding studs

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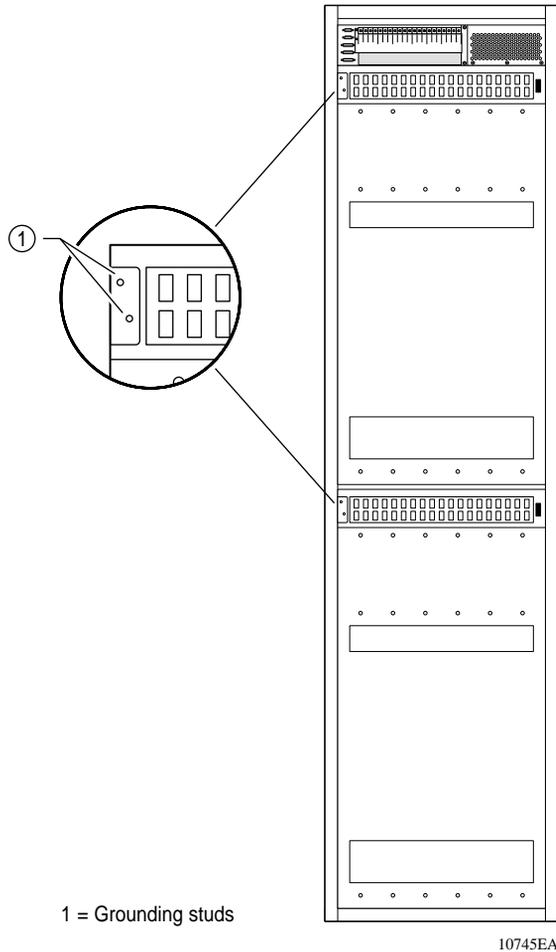
To attach a ground to one of the chassis grounding studs, you need the following:

- One single-hole cable lug that fits over one of the grounding studs
- Nut and a locking washer for the grounding stud.
- 6-AWG grounding wire that is long enough to connect to the ground point.
- 7/16-inch hex wrench to fasten the hardware in the correct order.

Figure 39 shows an example of how to ground two 8010co chassis and a BIP. For this example, each chassis is configured with three DC power supplies.

> **Note:** Your rack-grounding strip may look different or may be in a different location than the one shown in the following example.

Table 13 describes the reference items shown in Figure 39.

Figure 39   Chassis and DC power supply grounding example

Legend:

⊕	= Chassis ground
⏚	= Earth ground
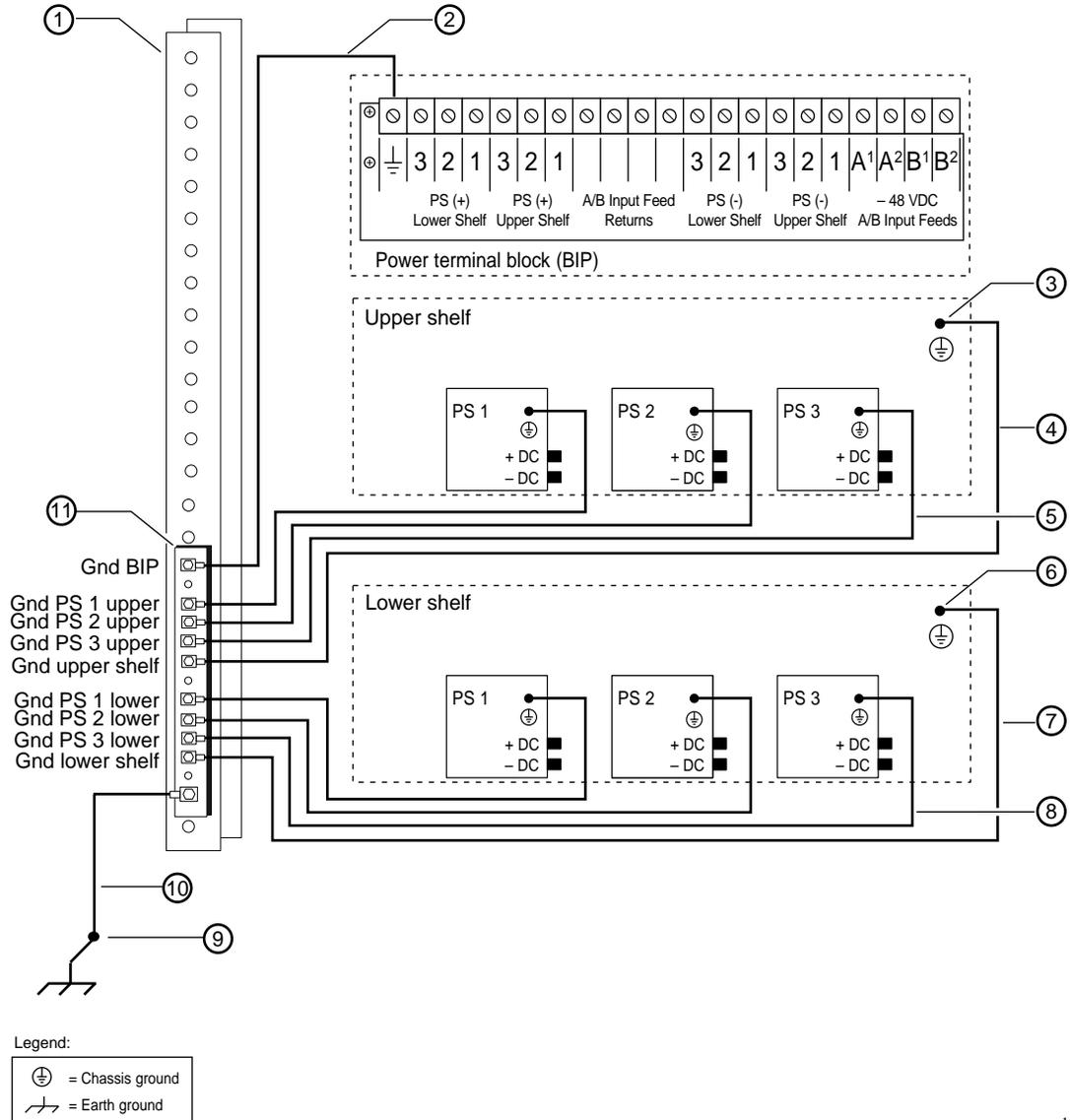
10761EA

Table 13   Item description for chassis and DC power supply grounding

Item	Description
1	Cabinet frame or equipment rack
2	AWG#6 ground lead (provided with BIP)
3	Upper shelf chassis ground stud.
4	Upper shelf ground lead (not provided).
5	Upper shelf power supply ground leads x 3. (Provided with BIP option)
6	Lower shelf chassis ground stud
7	Lower shelf ground lead (not provided)
8	Lower shelf power supply ground leads x 3. (Provided with BIP option)
9	Single point ground system
10	Awg #6 ground lead (not provided). Customer provides lead to ground cabinet frame or equipment rack.
11	Rack ground strip (example only). Design and location of this item determined by customer

Figure 40 shows an example of how to ground two 8010co chassis. For this example, each chassis is configured with three AC power supplies. Table 14 describes the reference items shown in Figure 40.

Figure 40   Chassis and AC power supply grounding example
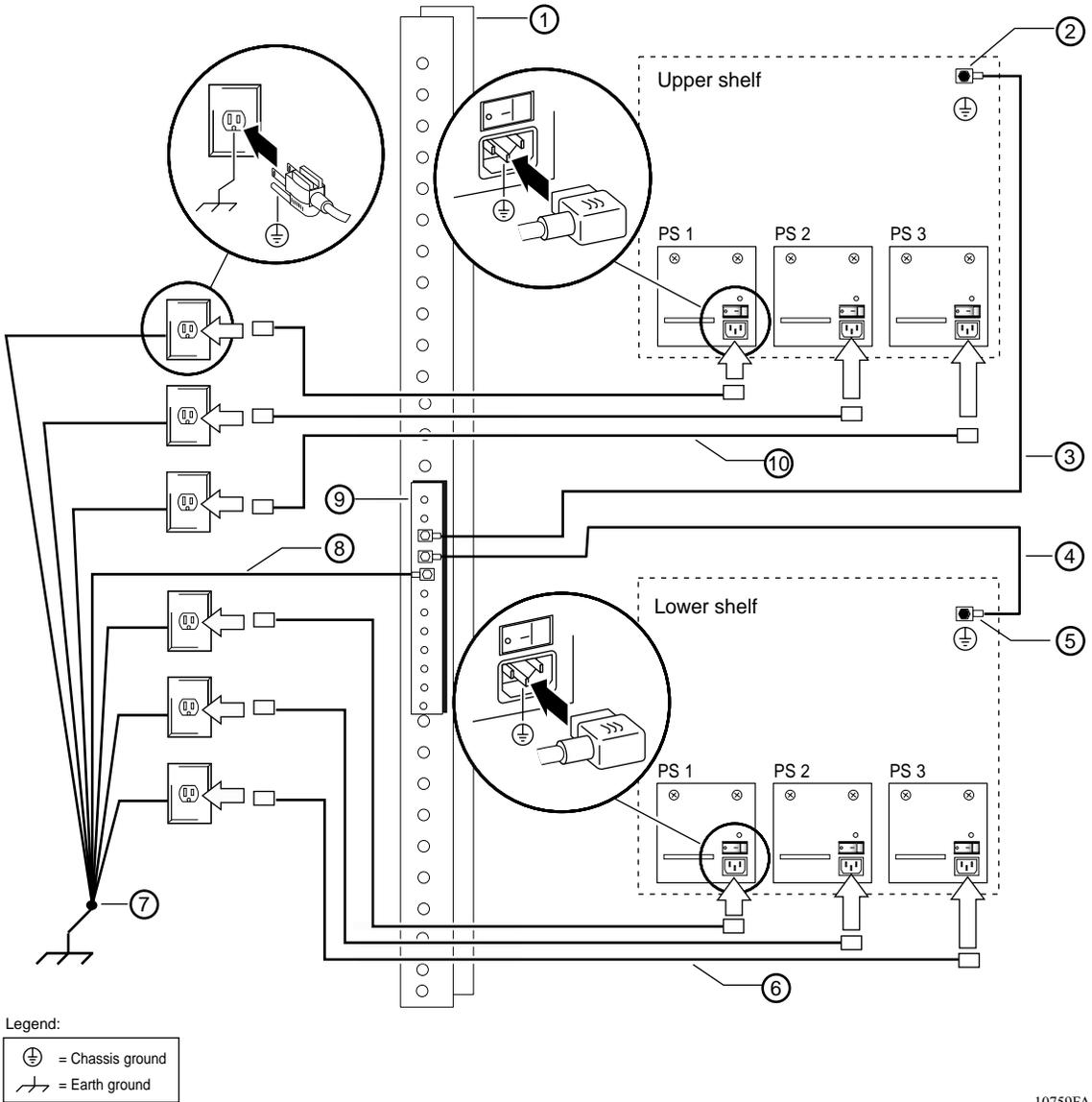
Table 14 Item description for chassis and AC power supply grounding

Item	Description
1	Cabinet frame or equipment rack
2	Upper shelf chassis ground stud
3	Upper shelf ground leads (not provided)
4	Lower shelf chassis ground stud
5	Upper shelf ground leads (not provided)
6	AC equipment ground (ACEG) leads within individual lower shelf cords (x 3)
7	Single-point ground system
8	Awg #6 ground lead (not provided). Customer provides lead to ground cabinet frame or equipment rack
9	Rack ground strip (example only). Design and location of this item determined by customer
10	AC equipment ground (ACEG) leads within individual upper shelf cords (x 3)

Connecting the ground cables to the rack grounding strip

To connect the chassis ground cables to the rack grounding strip:

1 Locate the shelf grounding point on the rack. This grounding point could be a grounding strip at the back base, top, or side of the rack.

> → **Note:** Figure 41 shows an example of a rack grounding strip. Your rack grounding strip may look different than the one shown in this example.

2 Attach the lug ends of the chassis ground cables to the rack grounding strip (Figure 41).

Use a 7/16-inch hex wrench to fasten the hardware in the correct order.

Figure 41   Rack grounding strip example

1 = Hex head bolt   3 = Ground crimp lug
2 = Lock washer   4 = Rack grounding strip
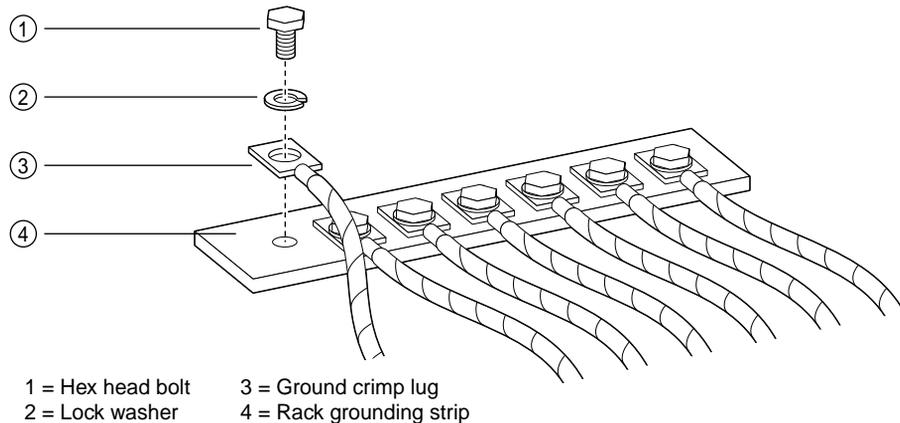
10433FA

Chapter 4
Operating the Passport 8000 Series switch

This chapter describes some of the routine tasks of operating the Passport 8000 Series switch and provides troubleshooting information. It includes the following topics:

Turning the Passport 8000 Series switch on and off

If the Passport 8000 Series Chassis has one or more DC power supplies, go to the next section, "Turning DC power supplies on and off." If the Passport 8000 Series Chassis has one or more AC power supplies, go to "Turning AC power supplies on and off" on page 78.

Turning DC power supplies on and off

To turn on a Passport 8000 Series switch with a DC power source:

1 If you are turning on a 8010co chassis with a DC power source and the chassis is connected to the optional breaker interface panel, make sure that the circuit breakers on the BIP are in the on position.

2 Turn the power switch on each DC power supply to the on position (Figure 42). Do not remove the bezel to turn the switch on. You can access the switch with the bezel on. Do not operate the 8010co Chassis with only one power supply.

> → **Note:** When you first install a chassis that contains two or three power supplies, you must turn on two of the power supply units simultaneously. If you wait longer to turn on the second power supply, one of the power supplies could shut down. To correct this condition, turn off both power supplies, wait at least 30 seconds, and then turn on both power supplies again simultaneously.

Figure 42 DC power supply power switch
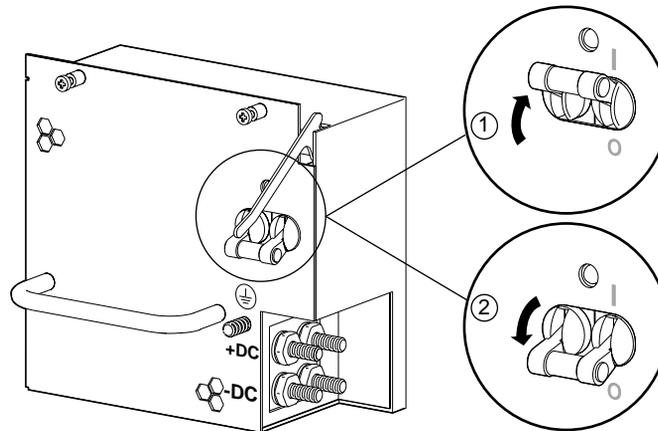
1 = On
2 = Off

10298FA

3 Verify that the power output LED for each power supply lights green.

4 Verify that the power supply status LEDs and the fan LED on the 8691SF or 8692SF switch fabric modules light green.

5 Verify that air is flowing from the cooling fans out through the back of the 8010co Chassis.

> **Note:** The fan tray red fail LED may light briefly while the fans are powering to operational speed.

After you turn on the Passport 8000 Series switch, each module automatically initiates a diagnostic test to verify proper module function (see "Verifying a successful installation" on page 79).

If the power supply LED remains off, or if you cannot feel air flow from the 8010co Chassis vents, do the following:

1 Turn the power switch on each power supply to the off position.

2 If the installed chassis is the 8010co Chassis and it is connected to the optional breaker interface panel, make sure that the circuit breakers on the BIP are in the off position.

3 Wait 1 minute.

4 If the installed chassis is the 8010co Chassis and it is connected to the optional breaker interface panel, turn the circuit breakers on the BIP to the on position.

5 Turn the power switch on each power supply to the on position.

If the problem persists, contact the Nortel Networks Technical Solutions Center.

To turn off an 8000 Series switch with a DC power source:

1 Turn the power switch on each power supply to the off position (see Figure 42 on page 77).

2 If the installed chassis is the 8010co Chassis and it is connected to the optional breaker interface panel, make sure that the circuit breakers on the BIP are in the off position.

Turning AC power supplies on and off

To turn on a Passport 8000 Series switch with an AC power supply:

1 Verify that the AC power cords are connected to AC power outlets.

2 Turn the power switch on each AC power supply to the on position. Do not operate the 8010co Chassis with only one power supply.

> → **Note:** When you first install a chassis that contains two or three power supplies, you must turn on two of the power supply units simultaneously. If you wait longer to turn on the second power supply, one of the power supplies could shut down. To correct this condition, turn off both power supplies, wait at least 30 seconds, and then turn on both power supplies again simultaneously.

3 Verify that the power LED on each power supply lights green.

4 Verify that the power supply status LEDs and the fan LED on the 8691SF or 8692SF switch fabric modules light green.

5   Verify that air is flowing from the cooling fans out through the vents of the chassis.

→   **Note:** The fan tray red fail LED may light briefly while the fans are powering to operational speed.

After you turn on the Passport 8000 Series switch, each module automatically initiates a diagnostic test to verify proper module function (see "Verifying a successful installation" on page 79).

If the power supply LED remains off, or if you cannot feel air flow from the chassis vents, turn the AC power supplies off, wait 1 minute, and then turn them on again. If the problem persists, contact the Nortel Networks Technical Solutions Center.

Verifying a successful installation

In a normal power-up sequence, the LEDs light as follows:

1   When power is applied to the Passport 8000 Series switch, the green LED on each power supply and fan tray turns on, and the Online LED for each module lights amber.

2   Each module initiates a self-test, during which the port and module LEDs display various patterns to indicate the progress of the self-test.

3   Upon successful completion of the self-test (within 2 or 3 minutes after power is applied for a fully loaded chassis), the module Online LED transitions from amber to green.

4   After one minute of operation, the fan tray Pass LED lights steady green.

If the LEDs on the modules light in this sequence, your installation is successful. Contact your network administrator to verify that the Passport 8000 Series switch is now connected to the network.

If the LEDs do not light in this sequence, contact your local Nortel Networks Technical Solutions Center.

Configuring the chassis to operate in E mode or M mode

The Passport 8600 system has two modes of operation: E mode and M mode. E mode is the default mode and supports up to 32,000 table entries in the system M mode supports up to 128,000 table entries in the system. For full support of M mode (128,000 table entries) the following configuration conditions are required:

- The chassis must include at least one 8691SF CPU module. If the chassis includes a 8690SF module, the mode defaults to E mode.
- All modules installed in the chassis must support 128,000 table entries (these are referred to as M modules and include the 8632TXM, 8648TXM, 8608GBM, 8608GTM, 8683POSM, 8672ATMM, 8672ATMM, 8681XLR and 8681XLW).
- M modules require 8000 Series Release 3.3 or later.
- M mode must be enabled. For instructions on enabling M mode, see *Managing Platform Operations*.

> → **Note:** If M mode is enabled and one or more modules installed in the chassis is an E module (32,000 table entries), the E modules will be disabled. This protects the system forwarding tables from lost entries. For instructions on enabling or disabling M mode, refer to *Managing Platform Operations*.

When you configure a chassis you need to ensure that a system having both M mode and E mode modules will reboot in the desired mode. The boot mode is determined by the type of modules installed in the chassis and whether 128K mode is enabled (Table 15).

Table 15 Boot mode at startup

if configuration is:	And M mode status at startup is:	Then:
All M modules	Enabled	System starts in M mode
Mixed modules	Enabled	System starts in M mode. Non-M modules are disabled.
All non-M modules	Enabled	Non-M modules are disabled.
All M modules	Disabled	System starts in E mode

Table 15 Boot mode at startup

if configuration is:	And M mode status at startup is:	Then:
Mixed modules	Disabled	System starts in E mode
All non-M modules	Disabled	System starts in E mode

For information on using Device Manager or the CLI to configure M mode, see *Managing Platform Operations*.

Resetting the Passport 8000 Series switch

You can use the Reset button on the following modules to reboot the Passport 8000 Series switch hardware without cycling power:

- 8190SM
- 8691SF
- 8692SF

To *warm-start* the Passport 8000 Series switch (no diagnostic tests are run), press the Reset button for less than 5 seconds.

Figure 43 shows the location of the Reset button.

Figure 43 Reset button

Reset button
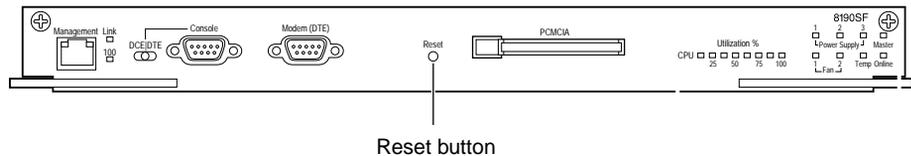
OPT0010A

Installing removable flash memory cards

To install a removable flash memory card in a 8190SM Module, 8691SF Module, or 8692SF Module:

1 Position the card with the label facing to the left and the insert arrow pointing toward the card receptacle (Figure 44 and Figure 45).

Figure 44 Inserting a removable flash memory card: 8010co Chassis

BAC0030A
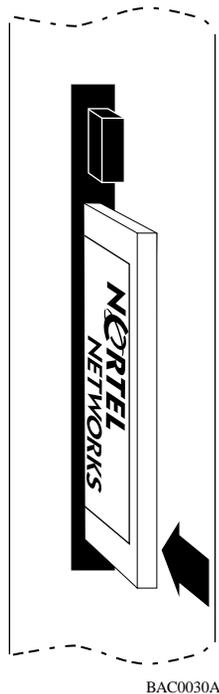
Figure 45 Inserting a removable flash memory card: 8010, 8006, and 8003 Chassis

PPOC0021A
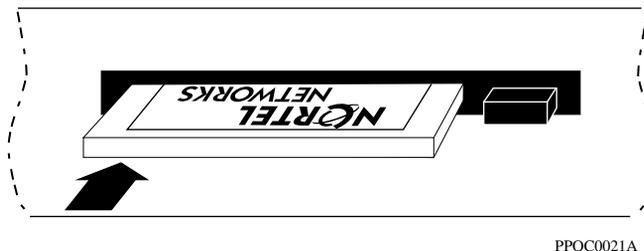
2 Insert the card into the card receptacle.

3 Gently push the card in until it fits snugly in place.

Removing removable flash memory cards

To remove removable flash memory cards from the 8190SM Module, the 8691SF Module, or the 8692SF Module:

1 Press the eject button above the memory card receptacle on the 8190SM Module, the 8691SF Module, or the 8692SF Module (Figure 46).

The card pops out slightly.

Figure 46 Removing a removable flash memory card: 8010co Chassis

Eject button
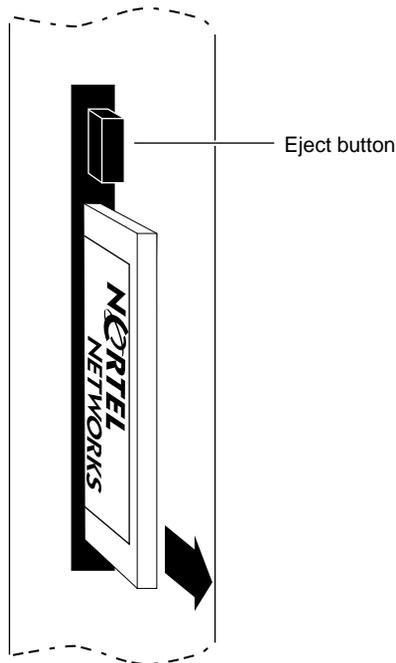
NORTEL NETWORKS

BAC0031A

Figure 47   Removing a removable flash memory card: 8010, 8006, 8003 Chassis

Eject button

PPOC0022A
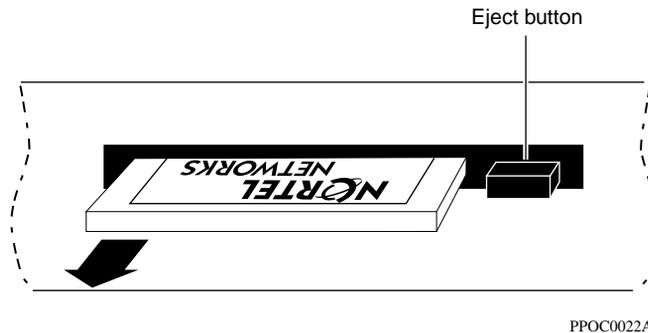
2   Pull the flash memory card out of the card receptacle.

Protecting memory card files

Nortel Networks ships each memory card with its read-write protect switch in the unprotected position. After you successfully load the configuration file and save your configuration, you may want to write-protect the memory card for backup purposes.

> **Note:** You typically do not operate a Passport 8000 Series switch with a write-protected memory card. You should make a copy of your configuration on another memory card, write-protect that card, and store it in a safe place. If you do not have a second memory card you can copy your configuration to a TFTP or FTP server.

To change memory card protection:

1   Remove the memory card from the 8000 Series chassis.

   a   Press the eject button above the memory card receptacle (see Figure 46 on page 83).

> **b** Pull the card out of the card receptacle.

> ⬤ **Caution:** You must remove the card from the Passport 8000 Series chassis before changing the read-write protection. Failure to remove the card may result in improper write protection.

---

2 Locate the read-write protect switch on the edge opposite the arrow on the memory card (Figure 48).

Figure 48 Memory card read-write protect switch
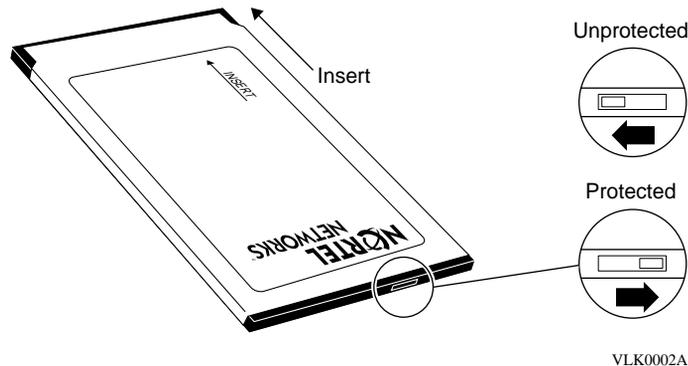
3 Adjust the read-write protect switch.

4 Reinsert the memory card into the card receptacle (see Figure 44 on page 82).

   a Position the card with the label facing to the left and the insert arrow pointing toward the card receptacle.

   b Insert the card into the card receptacle.

   c Gently push the card in until it fits snugly in place.

Replacing an air filter (8010co chassis only)

To maintain proper operation of the 8010co Chassis, you must periodically replace the air filter in the chassis. How often you need to replace the air filter depends on the conditions of cleanliness at the installation site. Replacement air filters (part number 312194-A) are available from Nortel Networks. To order, contact the Nortel Networks Technical Solutions Center.

The air filter complies with the following standards:

* Telcordia (formerly Bellcore)
* GR-63-CORE
* GR-78-CORE
* UL 94 HF-1 flame safety

Table 16 lists the air filter physical specifications.

Table 16   8010co air filter physical specifications

Parameter	Specifications
Part number	312194-A
Height	1.09 cm (0.43 in.)
Width	43.68 cm (17.20 in.)
Depth	46.27 cm (18.22 in.)

Nortel Networks recommends that you replace the air filter every three months. After you install the first 8010co Chassis at your site, inspect the air filter monthly until you can establish an average period of replacement.

If you install a second 8010co Chassis in the same equipment rack, the effect of the total airflow on the filters changes. Inspect the air filters frequently: the average period of replacement for the lower air filter can differ from that of the upper air filter because of its proximity to the floor. You may want to replace both filters according to the shortest average.

Removing and inserting an air filter (8010co chassis only)

Replace an air filter in the 8010co Chassis while the switch continues to operate. To minimize the amount of time that the switch operates without an air filter, have the replacement filter ready to install before you remove the old one.

1 Open the container of the new air filter.

2 Remove the bottom front bezel of the 8010co Chassis. For instructions, see the instructions for removing the bottom front bezel of the 8010co chassis in your power supply document.

3 Remove the installed air filter from its housing and set it aside.

   If dust is visible on it, move it to another area to prevent dust re-contamination.

4 Hold the new filter by its short sides with the airflow indicator pointing up and align it with the filter housing (Figure 49).

5 Slide the new filter gently into the housing.

6 Reinstall the bottom front bezel.

Figure 49   Inserting an air filter into the 8010co Chassis
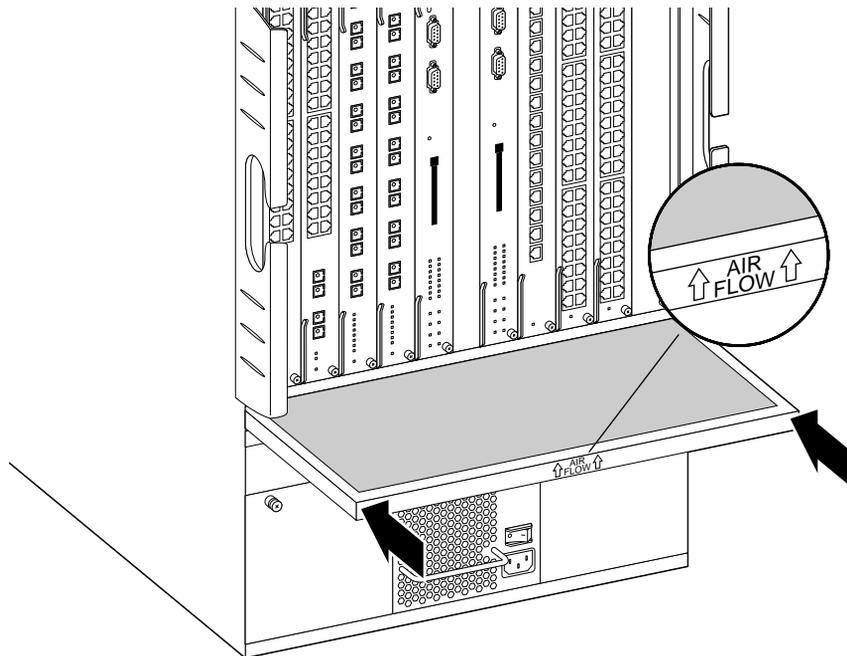
10282FB

Troubleshooting

The following sections provide troubleshooting information for some of the more common problems that you may encounter with the Passport 8000 Series switch.

LED indications of problems

Table 17 lists possible problems indicated by the LEDs on the switch modules and suggests corrective action.

Table 17 LED problem indicators

Symptom	Probable cause	Corrective action
Green AC power supply LEDs are off.	The switch is not receiving AC power or the power supply has failed.	Verify that each AC power cord is fastened securely at both ends and that power is available at each AC power outlet. Plug in a device such as a lamp to ensure that the power outlet is operational. Verify that each power supply is turned on.
The Link/Activity LED for a connected port is off or does not blink (and you believe that traffic is present).	The switch is experiencing a port connection problem, or the switch's link partner is not autonegotiating properly.	Verify that the cable connections to the link partner are correct. Verify port configuration parameters for both ends of the connection. Move the cable to another port to see whether the problem occurs on the new port.
The Link/Activity LED blinks continuously.	There may be a high traffic load or possible packet broadcast storm.	Verify port configuration parameters for both ends of the connection.
The Online LED is steady amber for longer than 3 minutes.	Software incompatibility exists, or the module cannot communicate with the master module over the backplane.	Use the show log command to check the system log for indications of communication problems. Use the boot command to download a new software image.

Table 17 LED problem indicators (continued)

Symptom	Probable cause	Corrective action
The Master LED on a module in slot 1 or slot 2 is amber.	The module has detected a system clock generation failure on its own circuitry.	Replace the module; make sure that it is in the correct slot. **Note:** This LED has significance only for the module in slot 1 or slot 2 that provides the clock function for the switch.
The Fault LED is blinking amber.	A chassis failure has been detected.	From the console management station, use the show log command to check the system log for information about hardware failures. Check the fan tray in the 8000 Series chassis to make sure both fans are running. Check the switch power supplies; one may have stopped functioning. The module may have failed to read the MAC address from the chassis backplane. If this is the case, arrange to replace the chassis.
The Fault LED is steady amber.	The module failed its power-on self-test. A diagnostic or hardware failure has been detected.	Replace the module.
No LEDs are lit.	A hardware failure has been detected.	Turn the switch power off and then turn it on again.

Apparent module failure

If a module failure occurs, check for possible backplane connection problems. Make sure that the module is correctly seated in the backplane connector and that the retaining screws are securely tightened.

If a module fails during module initialization and the replacement module is the same module type, in rare cases the new module may not initialize.

To workaround this issue, follow the steps in either workaround 1 or 2.

Module failure workaround 1

1 Remove the faulty module.

2 Insert a module type that is different from the module type removed in Step 1and wait for this replacement module to initialize.

3 Remove the module inserted in Step 2.

4 Insert a new module model in the same slot as the faulty module resided. This new module model must be identical to the module model removed in Step 1.

Module failure workaround 2

1 Remove the faulty module.

2 Insert a new module.

3 Reboot the chassis.

If the module still fails to operate, contact the Nortel Networks Technical Solutions Center for assistance.

Failure to get a login prompt from the Console port

If you connect a terminal to the Console port of the 8190SM Module, 8691SF Module, or 8692SF Module and you fail to get a login prompt, the port may have an incorrect DCE/DTE setting. Try moving the DCE/DTE switch from its current setting to the other position (Figure 50).

Figure 50 DCE/DTE switch
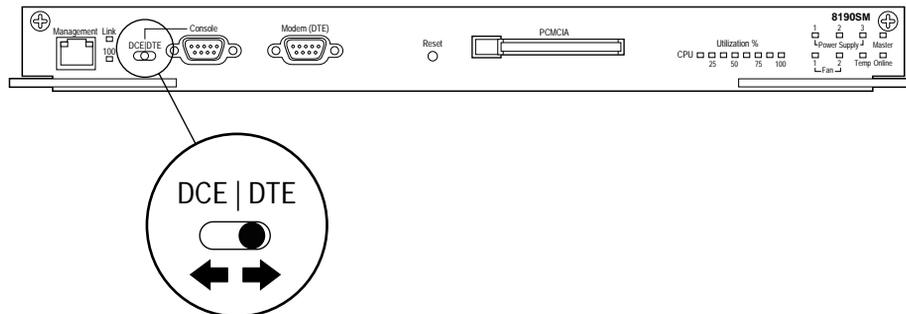
10456EA

Cable connection problems

Port connection problems can usually be traced to a poor cable connection or to an improper connection of the port cables at either end of the link. To remedy such problems, make sure that the cable connections are secure and that the cables are connected to the correct ports at both ends of the link.

> → **Note:** Port connection problems can also be traced to the autonegotiation mode (see "Autonegotiation mode problems for Passport 8100 modules" on page 92).

10BASE-T cables

Cabling for 10BASE-T networks can consist of two-pair Category 3, 4, or 5 unshielded twisted pair (UTP) wiring. However, to prepare for future upgrades to Fast Ethernet, Nortel Networks strongly recommends that you use all Category 5 cable in your network.

Ethernet 10BASE-T network installations use cables consisting of two pairs of twisted pair wires—one pair to send data and one to receive data. These wires must connect to another 10BASE-T station that has the sending pair attached to its receiving pair and vice versa. If the two nodes are wired alike, they both attempt to send data out on the same RJ-45 pins. In such a case, a straight-through cable would not work. However, a crossover cable would operate normally.

The 8100 modules are designed to have Ethernet network interface cards (NICs) connect directly to their RJ-45 ports using straight-through cables. NIC's port types are MDI. However, if a 8100 module must connect to a hub or another switch that follows usual conventions, a crossover cable is required because the port types are MDI-X. You only need crossover cables when connecting cables to devices that have the same port type.

100BASE-T and 1000BASE-T cables

The 100 Mb/s ports and 1 Gb/s ports are designed to operate using Category 5 UTP cabling only. Category 5 UTP cable is a two-pair cable certified to handle up to 100 Mb/s bandwidth. To minimize crosstalk noise, maintain the twist ratio of the cable up to the point of termination; untwist at any termination should not exceed 0.5 in.
(1.27 cm).

8100 Series fiber MDA cables

The 8100 Series fiber MDAs use only multimode 62.5/125 μm fiber cable. The Nortel Networks 100BASE-FX MDA is not supported on single-mode fiber. SC connectors are used on 2-port 100BASE-FX MDAs, and MT-RJ connectors are used on 4-port 100BASE-FX MDAs.

GBIC cables

Cables for the GBICs vary depending on the specific GBIC type. For information about the cable requirements for GBICs, see *Installing GBIC and Gigabit SFP Transceivers*.

Autonegotiation mode problems for Passport 8100 modules

Port connection problems can occur when a port (or station) is connected to another port (or station) that is not operating in a compatible mode (for example, connecting a full-duplex port on one station to a half-duplex port on another station).

The 8100 modules negotiate port speeds according to the IEEE 802.3 Clause 1998 autonegotiating standard. The switch adjusts (autonegotiates) its port speed and duplex mode to match the best service provided by the connected station, up to 100 Mb/s in full-duplex mode.

The following autonegotiation problems can occur:

- If the connected station uses a form of autonegotiation that is not compatible with the IEEE 802.3 Clause 1998 autonegotiating standard, the 8100 module cannot negotiate a compatible mode for correct operation.

- If the autonegotiation feature is not present or is not enabled at the connected station, the Passport 8100 module may not be able to determine the correct duplex mode.

In both situations, the Passport 8100 module autosenses the speed of the connected station and, by default, reverts to half-duplex mode. If the connected station is operating in full-duplex mode, it cannot communicate with the switch.

To correct this mode mismatch problem:

1 Use the CLI to disable autonegotiation for the suspect port.

   See *Configuring Network Management* for the appropriate CLI commands.

2 Use the CLI to set the speed and duplex mode of the port to match the speed and duplex mode of the connected station.

   You may need to try several settings before you find the correct speed/duplex mode for the connected station.

If the problem persists, follow these additional steps:

1 Using the CLI, disable the autonegotiation feature at the connected station.

2 Manually set the speed/duplex mode of the connected station to the same speed/duplex mode that you manually set for the Passport 8100 module port.

> → **Note:** Nortel Networks recommends that you manually set the Passport 8100 module port to the desired speed/duplex mode when connecting to any of the following Nortel Networks products:
>
> - Nortel Networks 28000 product family
> - Nortel Networks 58000 product family
> - BayStack* 302T switch (100 Mb/s port)

Appendix A
Technical specifications for the Passport 8000 Series Chassis

This appendix lists the specifications for the Passport 8000 Series Chassis and includes the following topics:

This appendix includes the following topics:

8010co Chassis

This section provides physical, environmental, and electrical specifications for the 8010co Chassis and includes the following topics:

Physical specifications

The following physical specifications apply to the 8010co chassis:

Parameter	Specification
Height:	35 in. (88.9 cm)
Rack units (RUs)	20
Width:	19 in (48.26 cm)
Depth:	23.7 in. (60.19 cm)
Weight:	
Empty:	127 lbs (57.6kg)
Including the following components: cable management brackets, power supply filler panels, power supply bezel, fan trays, module filler panels.	191 lbs (86.63kg)
Fully loaded:	315 lbs (142.88 kg)

Network Equipment Building Standard

The 8010co chassis complies with Network Equipment Building Standard (NEBS) Level 3 as specified in SR3580

Environmental specifications

The following environmental specifications apply to the 8010co chassis:

Parameter	Specification
Operating temperature:	-5° to 55° C (23° to 131° F)
Storage temperature:	-40° to 70° C (-40° to 158° F)
Operating humidity:	90%
Storage humidity:	92.5%
Operating altitude:	13,123 ft. at 35°C and 45°C 6,000 ft.at 55°C -200 ft. at 55°C
Storage altitude:	40,000 ft

Maximum airflow

The maximum airflow specification for the 8010co chassis is 330 linear ft/min.

8004AC power supply specifications

The specifications for the 8004AC power supply are as follows:

Parameter	Specification
Nominal input voltage:	100 - 240 VAC
Input frequency:	47 - 63 Hz
Input current:	12 - 6 A
Input power:	1308 W
Input volt amperes:	1.3 kilovolt amperes (kVA)
Output power:	850 W maximum (110 - 240 VAC)
	Derated 780 W maximum (100 - 109 VAC)
Thermal output	4464 Btu/hr maximum

8004DC power supply specifications

The specifications for the 8004DC power supply are as follows:

Parameter	Specification
Nominal input voltage:	-48 / -60 VDC
Input current:	29 - 23 A
Input power:	1308 W
Input volt amperes:	1.3 kVA
Output power:	850 W
Thermal output:	4464 Btu/hr maximum
Crimp lugs:	
Two-hole lug terminal:	Panduit LCD6-14A-L or equivalent
One-hole terminal:	Panduit LCA6-14H-L or equivalent

System power specifications

The following system power specifications apply to the 8010co chassis:

Parameter	With: 8004AC-DC power	With: 8004DC-DC power
Input voltage:	100-240 VAC	-48/-60 VDC
Input current:	3 x 12 - 6 A	3 x 29 -23 A
Output power	1700 W maximum	1700 W maximum
	Derated 1560 W maximum @ < 110 VAC	
Thermal output	8928 Btu/hr maximum	8928 Btu/hr maximum

International regulatory requirements

The 8010co chassis conforms to the following international regulatory requirements:

- "Electromagnetic emissions," next
- "Electromagnetic immunity" on page 99
- "Safety agency certification" on page 99

Electromagnetic emissions

The 8010co chassis conforms to the following electromagnetic emissions standards:

Parameter	Specification
Global basis for certification:	CISPR 22-1997 Class A
US:	FCC CFR47 Part 15, Subpart B, Class A
Canada:	ICES-003, Issue-2, Class A
Europe:	EN 55022-1998 Class A; EN 61000-3-2/A14, EN 61000-3-3 (CE Marking)
Australia/New Zealand:	AS/NZS 3548:1995, Class A
Japan:	VCCI-V3/97.04, Class A

Electromagnetic immunity

The 8010co chassis conforms to the following electromagnetic immunity standards:

Parameter	Specification
Global basis for certification:	CISPR 24:1997
Europe:	EN 55024:1998

Safety agency certification

The 8010co chassis conforms to the following safety agency standards:

Parameter	Specification
Global basis for certification:	IEC 60950 current edition with all CB member deviations
US:	UL60950
Canada:	CSA 22.2 No. 60950
Europe:	EN60950 (CE Marking)
Australia/New Zealand:	AS/NZS 3260

8010 Chassis

This section provides physical, environmental, and electrical specifications for the 8010 Chassis and includes the following topics:

- "Physical specifications," next
- "Environmental specifications" on page 100
- "8004AC-DC power supply specifications" on page 101
- "8004DC-DC power supply specifications" on page 101
- "System power specifications" on page 102
- "International regulatory requirements" on page 102

Physical specifications

The following physical specifications apply to the 8010 chassis:

Parameter	Specification
Height:	22.9 in. (58.2 cm)
Width:	17.5 in. (44.5 cm)
Depth:	19.9 in. (50.5 cm)
Weight (empty):	85 lb (39 kg)
Weight (fully loaded):	225 lb (102 kg)
Cooling system:	
Fan trays:	2 per chassis
Fans:	8 per fan tray
Thermal sensors:	1 per fan tray

Environmental specifications

The following environmental specifications apply to the 8010 chassis:

Parameter	Specification
Operating temperature:	0°C to 40°C (32°F to 104°F)
Storage temperature:	–25°C to 70°C (–13°F to 158°F)
Operating humidity:	85% maximum relative humidity, noncondensing
Storage humidity:	95% maximum relative humidity, noncondensing
Operating altitude:	3048 m (10,000 ft) maximum
Storage altitude:	3048 m (10,000 ft) maximum
Free fall/drop:	ISO 4180-s, NSTA 1A
Vibration:	IEC 68-2-6/34
Shock/bump:	IEC 68-2-27-29

8004AC-DC power supply specifications

The specifications for the 8004AC-DC power supply are as follows:

Parameter	Specification
Input voltage:	100 to 240 VAC
Input frequency:	47 to 63 Hz
Input current:	12 - 6 A
Input power:	1308 W
Input volt amperes:	1.3 kilovolt amperes (kVA)
Output power:	850 W maximum (110 - 240 VAC) derated to 780 W maximum (100 - 109 VAC)
Thermal output:	4464 Btu/hr maximum

8004DC-DC power supply specifications

The specifications for the 8004DC-DC power supply are as follows:

Parameter	Specification
Nominal Input voltage:	-48/ -60 VDC
Input current:	29 - 23 A
Input power:	1308 W
Input volt amperes:	1.3 kVA
Output power:	850 W
Thermal output:	4464 Btu/hr maximum
Crimp lugs:	
Two-hole lug terminal:	Panduit LCD6-14A-L or equivalent
One-hole terminal:	Panduit LCA6-14H-L or equivalent

System power specifications

The following system power specifications apply to the 8010 chassis:

Parameter	With: 8004AC-DC power	With: 8004DC-DC power
Input voltage:	100-240 VAC	-48/-60 VDC
Input current:	3 x 12 - 6 A	3 x 29 -23 A
Output power	1700 W maximum	1700 W maximum
	Derated 1560 W maximum @ < 110 VAC	
Thermal output	8928 Btu/hr maximum	8928 Btu/hr maximum

International regulatory requirements

The 8010 chassis conforms to the following international regulatory requirements:

- "Electromagnetic emissions," next
- "Electromagnetic immunity" on page 103
- "Safety agency certification" on page 103

Electromagnetic emissions

The 8010 chassis conforms to the following electromagnetic emissions standards:

Parameter	Specification
Global basis for certification:	CISPR 22-1997 Class A
US:	FCC CFR47 Part 15, Subpart B, Class A
Canada:	ICES-003, Issue-2, Class A
Europe:	EN 55022-1998 Class A; EN 61000-3-2/A14, EN 61000-3-3 (CE Marking)
Australia/New Zealand:	AS/NZS 3548:1995, Class A
Japan:	VCCI-V3/97.04, Class A
Taiwan:	CNS 13438, Class A

Electromagnetic immunity

The 8010 chassis conforms to the following electromagnetic immunity standards:

Parameter	Specification
Global basis for certification:	CISPR 24:1997
Europe:	EN 55024:1998

Safety agency certification

The 8010 chassis conforms to the following safety agency standards:

Parameter	Specification
Global basis for certification:	IEC 60950 current edition with all CB member deviations
US:	UL60950
Canada:	CSA 22.2 No. 60950
Europe:	EN60950 (CE Marking)
Australia/New Zealand:	AS/NZS 3260
Mexico:	NOM-019-SCFI-1998

8006 Chassis

This section provides physical, environmental, and electrical specifications for the 8006 Chassis and includes the following topics:

Physical specifications

The following physical specifications apply to the 8006 chassis:

Parameter	Specification
Height:	15.8 in. (40.1 cm)
Width:	17.5 in. (44.5 cm)
Depth:	19.9 in. (50.5 cm)
Weight (empty):	49 lb (22 kg)
Weight (fully loaded):	140 lb (63 kg)
Cooling system:	
Fan tray:	1 per chassis
Fans:	8 per fan tray
Thermal sensors:	1 per fan tray

Environmental specifications

The following environmental specifications apply to the 8006 chassis:

Parameter	Specification
Operating temperature:	0°C to 40°C (32°F to 104°F)
Storage temperature:	−25°C to 70°C (−13°F to 158°F)
Operating humidity:	85% maximum relative humidity, noncondensing
Storage humidity:	95% maximum relative humidity, noncondensing
Operating altitude:	3048 m (10,000 ft) maximum
Storage altitude:	3048 m (10,000 ft) maximum
Free fall/drop:	ISO 4180-s, NSTA 1A
Vibration:	IEC 68-2-6/34
Shock/bump:	IEC 68-2-27-29

8004AC power supply specifications

The specifications for the 8004AC power supply are as follows:

Parameter	Specification
Input voltage:	100 to 240 VAC
Input frequency:	47 to 63 Hz
Input current:	12 - 6 A
Input power:	1308 W
Input volt amperes:	1.3 kilovolt amperes (kVA)
Output power:	850 W maximum (110 - 240 VAC) derated to 780 W maximum (100 - 109 VAC)
Thermal output:	4464 Btu/hr maximum
Input voltage:	100 to 240 VAC

8004DC power supply specifications

The specifications for the 8004DC power supply are as follows:

Parameter	Specification
Nominal input voltage:	-48 / -60 VDC
Input current:	29 - 23 A
Input power:	1308 W
Input volt amperes:	1.3 kVA
Output power:	850 W
Thermal output:	4464 Btu/hr maximum
Crimp lugs:	
Two-hole lug terminal:	Panduit LCD6-14A-L or equivalent
One-hole terminal:	Panduit LCA6-14H-L or equivalent

System power specifications

The following system power specifications apply to the 8006 chassis:

Parameter	With: 8004AC power	With: 8004DC power
Input voltage:	100-240 VAC	-48/-60 VDC
Input current:	3 x 12 - 6 A	3 x 29 -23 A
Output power	1700 W maximum	1700 W maximum
	Derated 1560 W maximum @ < 110 VAC	
Thermal output	8928 Btu/hr maximum	8928 Btu/hr maximum

International regulatory requirements

The 8006 chassis conforms to the following international regulatory requirements:

- "Electromagnetic emissions," next
- "Electromagnetic immunity" on page 107
- "Safety agency certification" on page 107

Electromagnetic emissions

The 8006 chassis conforms to the following electromagnetic emissions standards:

Parameter	Specification
Global basis for certification:	CISPR 22-1997 Class A
US:	FCC CFR47 Part 15, Subpart B, Class A
Canada:	ICES-003, Issue-2, Class A
Europe:	EN 55022-1998 Class A; EN 61000-3-2/A14, EN 61000-3-3 (CE Marking)
Australia/New Zealand:	AS/NZS 3548:1995, Class A
Japan:	VCCI-V3/97.04, Class A
Taiwan:	CNS 13438, Class A

Electromagnetic immunity

The 8006 chassis conforms to the following electromagnetic immunity standards:

Parameter	Specification
Global basis for certification:	CISPR 24:1997
Europe:	EN 55024:1998

Safety agency certification

The 8006 chassis conforms to the following safety agency standards:

Parameter	Specification
Global basis for certification:	IEC 60950 current edition with all CB member deviations
US:	UL60950
Canada:	CSA 22.2 No. 60950
Europe:	EN60950 (CE Marking)
Australia/New Zealand:	AS/NZS 3260
Mexico:	NOM-019-SCFI-1998

8003 Chassis

This section provides physical, environmental, and electrical specifications for the 8003 Chassis and includes the following topics:

- "Physical specifications," next
- "Environmental specifications" on page 108
- "8003ACPS power supply specifications" on page 109
- "System power specifications" on page 109
- "International regulatory requirements" on page 109

Physical specifications

The following physical specifications apply to the 8003 chassis:

Parameter	Specification
Height:	10.5 in. (26.7 cm)
Width:	18.5 in. (47.0 cm)
Depth:	19.9 in. (50.5 cm)
Weight (empty):	40 lb (18 kg)
Weight (fully loaded):	110 lb (50 kg)
Cooling system:	
Fan tray:	1 per chassis
Fans:	3 per fan tray
Thermal sensors:	1 per fan tray
Noise:	61 dBa maximum

Environmental specifications

The following environmental specifications apply to the 8003 chassis:

Parameter	Specification
Operating temperature:	0°C to 40°C (32°F to 104°F)
Storage temperature:	−25°C to 70°C (−13°F to 158°F)
Operating humidity:	85% maximum relative humidity, noncondensing
Storage humidity:	95% maximum relative humidity, noncondensing
Operating altitude:	3024 m (10,000 ft) maximum
Storage altitude:	3024 m (10,000 ft) maximum
Free fall/drop:	ISO 4180-s, NSTA 1A
Vibration:	IEC 68-2-6/34
Shock/bump:	IEC 68-2-27-29

8003ACPS power supply specifications

The specifications for the 8003ACPS power supply are as follows:

Parameter	Specification
Input voltage:	100 to 240 VAC
Input frequency:	50 to 60 Hz
Maximum input current:	7.8 A per power supply
Input power:	770 W maximum
Input volt amperes rating:	765 VA maximum
Thermal rating:	2625 Btu/hr maximum
Output power	500 W

System power specifications

The following system power specifications apply to the 8006 chassis:

Parameter	With: 8004AC power	With: 8004DC power
Input voltage:	100-240 VAC	-48/-60 VDC
Input current:	3 x 12 - 6 A	3 x 29 -23 A
Output power	1700 W maximum	1700 W maximum
	Derated 1560 W maximum @ < 110 VAC	
Thermal output	8928 Btu/hr maximum	8928 Btu/hr maximum

International regulatory requirements

The 8006 chassis conforms to the following international regulatory requirements:

- "Electromagnetic emissions," next
- "Electromagnetic immunity" on page 110
- "Safety agency certification" on page 110

Electromagnetic emissions

The 8006 chassis conforms to the following electromagnetic emissions standards:

Parameter	Specification
Global basis for certification:	CISPR 22-1997 Class A
US:	FCC CFR47 Part 15, Subpart B, Class A
Canada:	ICES-003, Issue-2, Class A
Europe:	EN 55022-1998 Class A; EN 61000-3-2/A14, EN 61000-3-3 (CE Marking)
Australia/New Zealand:	AS/NZS 3548:1995, Class A
Japan:	VCCI-V3/97.04, Class A
Taiwan:	CNS 13438, Class A

Electromagnetic immunity

The 8006 chassis conforms to the following electromagnetic immunity standards:

Parameter	Specification
Global basis for certification:	CISPR 24:1997
Europe:	EN 55024:1998

Safety agency certification

The 8006 chassis conforms to the following safety agency standards:

Parameter	Specification
Global basis for certification:	IEC 60950 current edition with all CB member deviations
US:	UL60950
Canada:	CSA 22.2 No. 60950
Europe:	EN60950 (CE Marking)
Australia/New Zealand:	AS/NZS 3260
Mexico:	NOM-019-SCFI-1998

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