Part No. 302283-K Rev 00
April 2004

600 Technology Park Drive
Billerica, MA 01821-4130

Installing Hardware Options for the Contivity Secure IP Services Gateway

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Note: 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. If it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to take whatever measures may be necessary to correct the interference at their own expense.

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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

European requirements only

EN 55 022 statement (Class A)

This is to certify that the Nortel Networks Contivity 600, 1700, 1740, 2600, 2700, 4500, 4600, and 5000 are shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55 022 Class A (CISPR 22).

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.

Achtung: Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmaßnahmen verantwortlich ist.

Attention: Ceci est un produit de Classe A. Dans un environnement domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilisateur de prendre les mesures spécifiques appropriées.

EN 55 022 statement (Class B)

This is to certify that the Nortel Networks Contivity 1010/1050/1100 and Contivity 1600 are shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55 022 Class B (CISPR 22).

EC Declaration of Conformity

These products conform to the provisions of the R&TTE Directive 1999/5/EC.

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Canada requirements only

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This digital apparatus (Contivity 600, 1700, 1740, 2600, 2700, 4500, 4600, or 5000) 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 (Classe A)

Cet appareil numérique (Contivity 600, 1700, 1740, 2600, 2700, 4500, 4600, ou 5000) respecte les limites de bruits radioélectriques visant les appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique du ministère des Communications du Canada.

Canadian Department of Communications Radio Interference Regulations (Class B)

This digital apparatus (Contivity 1010/1050/1100 and Contivity 1600) does not exceed the Class B 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 (Classe B)

Cet appareil numérique (Contivity 1010/1050/1100 and Contivity 1600) respecte les limites de bruits radioélectriques visant les appareils numériques de classe B prescrites dans le Règlement sur le brouillage radioélectrique du ministère des Communications du Canada.

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Preface

The Nortel Networks* Contivity* Secure IP Services Gateway product family supports secure, reliable IP VPNs in a single, integrated hardware device. In this guide, all Contivity Secure IP Services Gateway models are referred to generically as *the gateway.* This guide provides instructions on how to install or replace the following field-replaceable units in the Contivity gateway:

- LAN, WAN, and serial interface cards
- Hardware encryption accelerator cards
- Dual inline memory modules (DIMMs)
- Power supplies (Contivity 5000, 4600, and 4500)
- Hard disk drives (Contivity 5000, 4600, and 4500)
- Fan trays (Contivity 5000)

Warning: Some Contivity models must be returned to Nortel Networks Manufacturing via your Customer Service Representative for repair. **Do not attempt to make any changes** to these models; untrained individuals could be harmed, you could invalidate your warranty, or you could possibly cause irreparable damage to the equipment.

Before you begin

This guide is intended for qualified service personnel who need to install or replace a field-replaceable unit (FRU) in the gateway chassis. A qualified service person should have appropriate technical training and experience and be aware of the hazards involved in installing and replacing field replaceable units.

Warning: Improper handling of internal components or assemblies, with the power connected, could cause severe injury.

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 **`show health`** command. Example: Enter **`terminal paging {off | on}`**.
italic text	Indicates new terms and book titles.
`plain Courier text`	Indicates system output, for example, prompts and system messages. Example: `File not found.`
separator (>)	Shows menu paths. Example: Choose Status > Health Check.

Acronyms

This guide uses the following acronyms:

CSU	channel service unit
DIMM	dual inline memory module
DSU	digital service unit
DTE	data terminal equipment
ISDN	Integrated Services Digital Network
LAN	local area network
LED	light emitting diode
PCI	peripheral component interconnect
URL	uniform resource locator
VPN	virtual private network
WAN	wide area network

Related publications

For more information about using the Contivity Secure IP Services Gateway, refer to the following publications:

- *Contivity Secure IP Services Gateway Release Notes*

  Provides the latest information about the software and hardware, including new features, known problems, workarounds, and special considerations.

- Installation guide for your Contivity gateway

  Provides instructions on how to install a new gateway—installing the chassis in an equipment rack, attaching cables, and starting the gateway—as well as technical specifications and initial configuration instructions.

- *Configuring Basic Features for the Contivity Secure IP Services Gateway*

  Introduces the product and provides information about initial setup and configuration.

- *Configuring Authentication and Certificates for the Contivity Secure IP Services Gateway*

  Provides instructions for configuring authentication services and digital certificates.

- *Configuring Firewalls, Filters, NAT, and QoS for the Contivity Secure IP Services Gateway*

  Provides instructions for configuring the Contivity Stateful Firewall, NAT, and Contivity interface and tunnel filters.

- *Configuring Advanced Features for the Contivity Secure IP Services Gateway*

  Provides instructions for configuring the tunneling protocols IPsec, L2TP, PPTP, and L2F, as well as instructions for configuring physical interfaces, PPP, frame relay, PPPoE, and advanced WAN settings.

- *Configuring Routing for the Contivity Secure IP Services Gateway*

  Provides instructions for configuring RIP, OSPF, and VRRP, as well as instructions for configuring ECMP, routing policy services, and client address redistribution (CAR).

- *Managing and Troubleshooting the Contivity Secure IP Services Gateway*

  Provides information about system administrator tasks such as backup and recovery, file management, and upgrading software, and instructions for monitoring gateway status and performance. Also, provides troubleshooting information and interoperability considerations.

- *Reference for the Contivity Secure IP Services Gateway Command Line Interface*

  Provides syntax, descriptions, and examples for the commands that you can use from the command line interface.

You can print selected technical manuals and release notes free, directly from the Internet. Go to the www.nortelnetworks.com/documentation URL. Find the product for which you need documentation. Then locate the specific category and model or version for your hardware or software product. Use Adobe* Acrobat Reader* to open the manuals and release notes, search for the sections you need, and print them on most standard printers. Go to Adobe Systems at the www.adobe.com URL to download a free copy of the Adobe Acrobat Reader.

Note: If you need instructions for an older Contivity model that is not in this guide, go to the Nortel Networks documentation URL. From the Product Family menu, choose “Contivity.” From the list of products, choose the older product, for example, Contivity 2500, then find an older version of this book (for example, part number 302283-F Rev 00).

How to get help

If you purchased a service contract for your Nortel Networks product from a distributor or authorized reseller, contact the technical support staff for that distributor or reseller for assistance.

If you purchased a Nortel Networks service program, contact Nortel Networks Technical Support. To obtain contact information online, go to the www.nortelnetworks.com/cgi-bin/comments/comments.cgi URL, then click on Technical Support.

From the Technical Support page, you can open a Customer Service Request online or find the telephone number for the nearest Technical Solutions Center. If you are not connected to the Internet, you can call 1-800-4NORTEL (1-800-466-7835) to learn the telephone number for the nearest Technical Solutions Center.

An Express Routing Code (ERC) is available for many Nortel Networks products and services. When you use an ERC, your call is routed to a technical support person who specializes in supporting that product or service. To locate an ERC for your product or service, go to the http://www.nortelnetworks.com/help/contact/erc/index.html URL.

Chapter 1
Contivity 600 option installation

This chapter provides instructions on how to install and replace the following field replaceable units (FRUs) in the Contivity 600:

- LAN, WAN, and serial interface cards
- Dual inline memory module (DIMM)

To install any of these components, you must remove the Contivity 600 chassis from its steel enclosure.

This chapter contains the following topics:

Shutting down the system to add or replace hardware

Shut down the Contivity 600 and unplug it to install or replace an option card or to replace the DIMM.

To shut down the Contivity 600:

1. Use the Web GUI or the command line interface to shut down the gateway.
   - Web GUI: Choose Admin > Shutdown. Select the option to power off the gateway after shutdown.
   - Command line interface: Use the **`reload`** command to shut down the system. For example, enter **`reload power-off disable-logins "Upgrade hardware"`** (for the complete syntax of the **`reload`** command, see the *Reference for the Contivity Secure IP Services Gateway Command Line Interface*).
2. Wait for the system to shut down. You may need to wait several minutes.
3. Remove all interface cables from the rear of the chassis.
4. Disconnect the power cord from the power outlet and then disconnect the cord from the Contivity 600.

Danger: Make sure to turn off the Contivity 600 and unplug it before you attempt to remove or install an option card or DIMM.

Opening the Contivity 600

To install an interface card or to replace the DIMM, you must remove the Contivity 600 chassis from its steel enclosure.

To access the chassis:

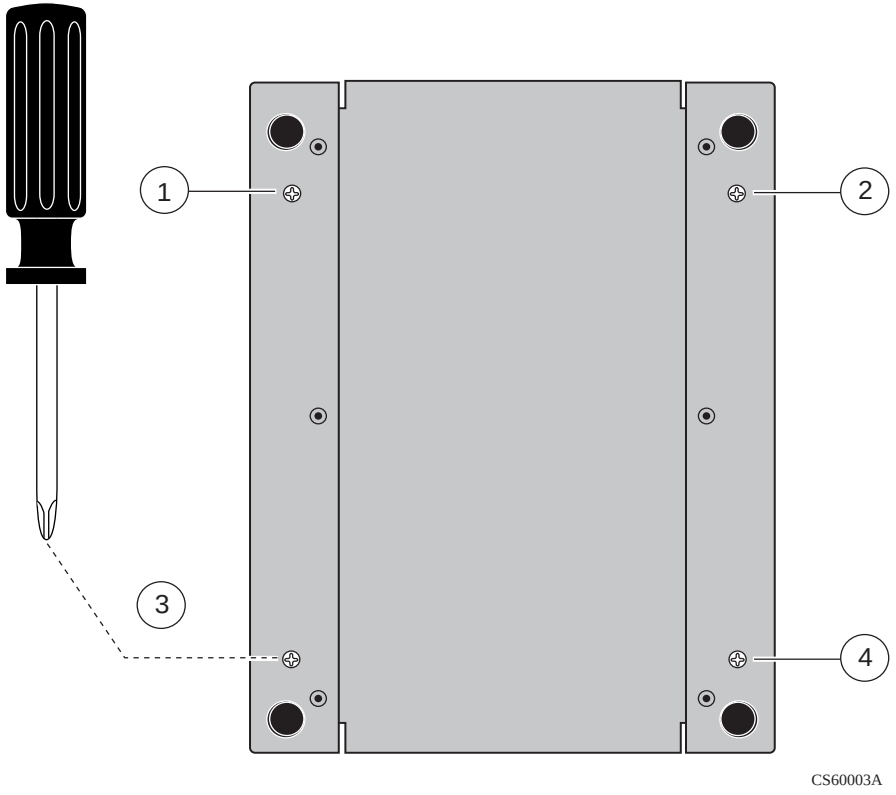
1. Shut down the Contivity 600 and then unplug it as described in "Shutting down the system to add or replace hardware" on page 24.

Danger: Make sure to turn off the Contivity 600 and unplug it before you attempt to remove or install an option card or DIMM.

2 Turn the Contivity 600 over to see the bottom of the gateway.

3 Using a Phillips screwdriver, remove the 4 screws that secure the bottom to the chassis (Figure 1).

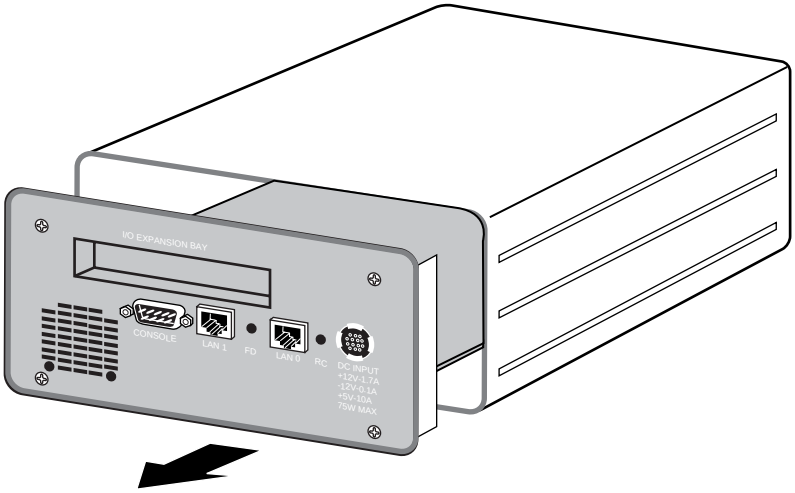
Figure 1 Removing the screws from the bottom of the Contivity 600



4 Grasp the rear of the chassis and firmly pull the chassis toward you to loosen it from the steel enclosure (Figure 2).

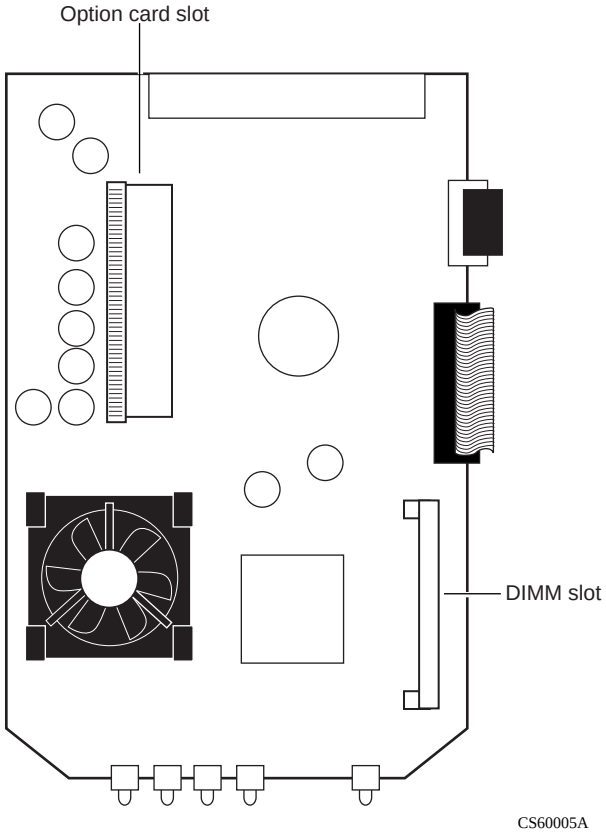
You can gently shake the chassis so that it slips outward and into your hand, or you can pull gently on the I/O expansion bay.

Figure 2 Removing the chassis from the steel enclosure



The system board is now exposed. Figure 3 shows the location of the option card slot and the DIMM slot on the Contivity 600 system board.

Figure 3 Contivity 600 system board



Warning: Beware of danger if the battery is incorrectly replaced. Replace with the *same* or an *equivalent battery* only, as recommended by the manufacturer's instructions.

Danger: In spite of the above warning, which is mandated for regulatory approval, *you should not change the battery.* If you suspect a dead battery, contact Nortel Networks Customer Support.

Installing and replacing an option card

The Contivity 600 has one expansion slot for option cards (see Figure 3 on page 27). This section provides instructions on installing a LAN, WAN, or serial option card in the Contivity 600 or, if necessary, replacing the installed card.

You can install the following option cards in the Contivity 600:

- 10/100 Ethernet* LAN interface card
- ADSL WAN interface card (requires software Version 4.90 or later)
- ISDN BRI S/T or U interface card (requires software Version 4.80 or later)
- T1/E1 CSU/DSU WAN interface card
- Single V.35/X.21 WAN interface card
- V.90 modem interface card (requires software Version 4.80 or later)

To install or replace a LAN, WAN, or serial interface card:

1. Shut down the Contivity 600 using the Web GUI or the command line interface and then unplug it as described in "Shutting down the system to add or replace hardware" on page 24.

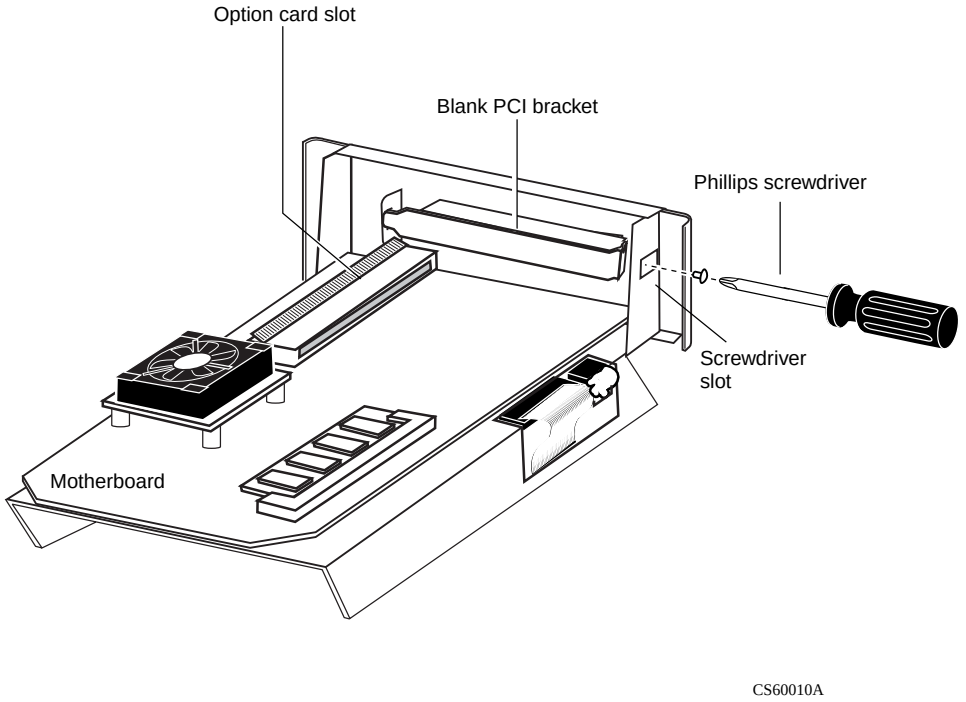
Danger: Turn off the Contivity 600 and unplug it before you attempt to install an option card.

2. Remove the chassis from the steel enclosure (see "Opening the Contivity 600" on page 24).
3. Attach an antistatic wrist strap.

Caution: Electrostatic discharge can damage Contivity 600 components.

4 Remove the blank PCI bracket by inserting a Phillips screwdriver into the slot at the right of the blank PCI bracket and rotating the screw counterclockwise (Figure 4).

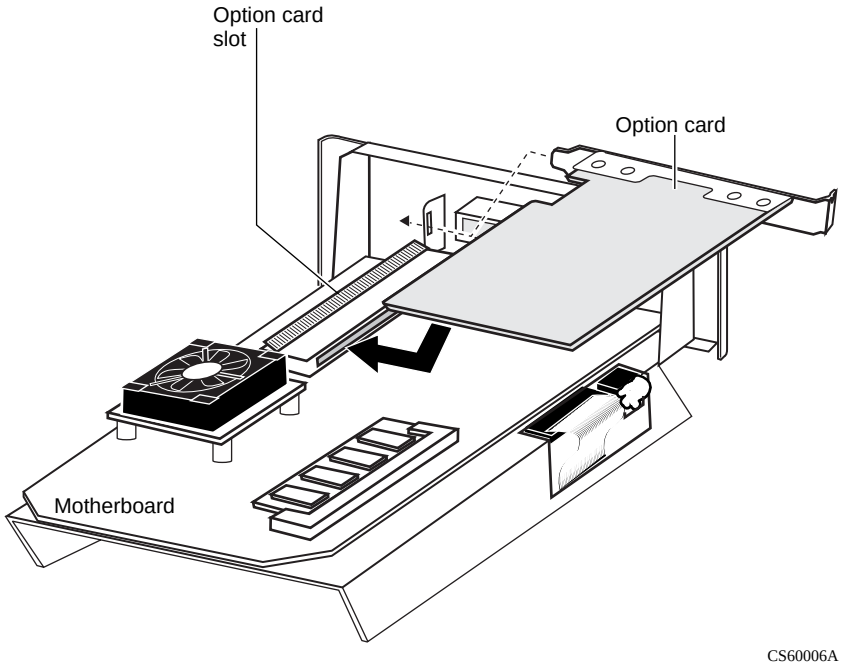
Figure 4 Removing the blank bracket from the option card slot



5 Slide the option card into the option card slot (Figure 5).

Note: Be careful not to bend the copper fingers in the slot.

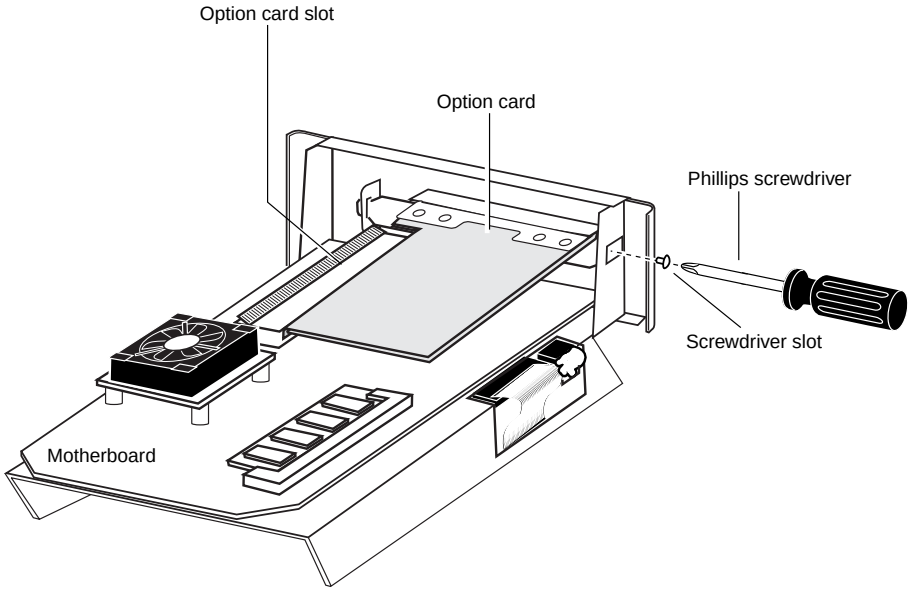
Figure 5 Inserting the option card



Make sure that the option card is seated firmly and evenly in the card slot and that the left tabbed end of the card is seated in its slot. If the card is not seated properly, it will not work.

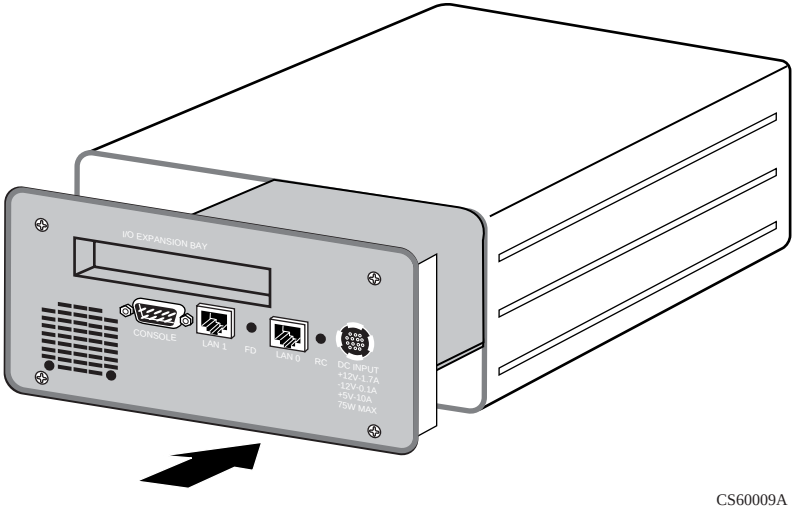
6 Replace the screw at the right end of the PCI bracket (Figure 6).

Figure 6 Securing the option card in the slot



7 Slide the chassis into the steel enclosure (Figure 7).

Figure 7 Replacing the chassis in the steel enclosure



8 Replace the 4 Phillips screws that secure the bottom panel to the chassis (see Figure 1 on page 25).

9 Reconnect the network cables.

10 Reconnect the power cord to restart the Contivity 600.

Replacing a DIMM

The Contivity 600 has one slot for a dual inline memory module (DIMM). If you have a Contivity 600 with a 64 MB DIMM, you can upgrade system memory by replacing the installed DIMM with a 128 MB DIMM.

Note: Newer Contivity 600 gateways ship with 128 MB of memory installed. If you purchased your Contivity 600 after January 2002, your gateway most likely has 128 MB of memory.

To replace the DIMM in the Contivity 600:

1 Shut down the Contivity 600 using the Web GUI or the command line interface and then unplug it as described in "Shutting down the system to add or replace hardware" on page 24.

Danger: Turn off the Contivity 600 and unplug it before you attempt to replace the DIMM.

2 Remove the chassis from the steel enclosure (see "Opening the Contivity 600" on page 24).

3 Attach an antistatic wrist strap.

Caution: Electrostatic discharge can damage Contivity 600 components.

4 Locate the DIMM slot on the system board (see Figure 3 on page 27).

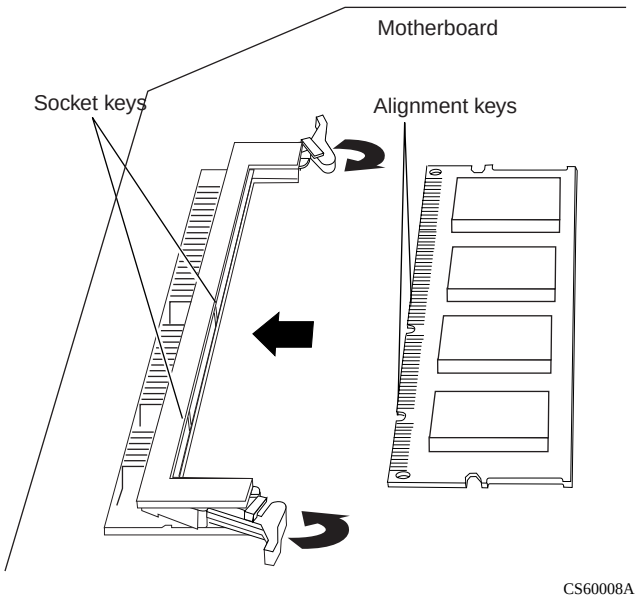
5 Pull the locking levers back to release the DIMM. It will snap up from the circuit board.

6 Pull the DIMM out of the slot.

7 Insert the new DIMM into the slot at a 45 degree angle (Figure 8).

Use the alignment keys on the DIMM to properly position the DIMM in the connector.

Figure 8 Installing a DIMM



8 Gently press down on the DIMM until it is locked into position by the locking levers.

9 Slide the chassis into the steel enclosure (see Figure 7 on page 31).

10 Replace the 4 Phillips screws that secure the bottom panel to the chassis (see Figure 1 on page 25).

11 Reconnect the network cables.

12 Reconnect the power cord to restart the Contivity 600.

Chapter 2
Contivity 1100 option installation

The Contivity 1100 has two expansion slots for option cards. This chapter provides instructions on how to install and replace LAN, WAN, and serial option cards in the Contivity 1100.

Table 1 lists the option cards that you can install in the Contivity 1100.

Table 1 Supported option cards for the Contivity 1100

Option card	Maximum number[1]
10/100 Ethernet LAN interface	2
ADSL WAN interface[2]	2
ISDN BRI S/T or U interface[3]	1
T1/E1 CSU/DSU WAN interface (half-height)	2
T1/E1 CSU/DSU WAN interface (full-height)	1
Single V.35/X.21 WAN interface	1
V.90 modem interface[3]	1

1 When only one card of a type is supported, you must install that card in the larger slot, that is, slot 2.

2 The Contivity 1100 must be running Version 4.90 or later.

3 The Contivity 1100 must be running Version 4.80 or later.

To install a new LAN, WAN, or serial option card:

1. Use the Web GUI or the command line interface to shut down the gateway.
   - Web GUI: Choose Admin > Shutdown. Select the option to power off the gateway after shutdown.
   - Command line interface: Use the **`reload`** command to shut down the system. For example, enter **`reload power-off disable-logins "Upgrade hardware"`** (for the complete syntax of the **`reload`** command, see the *Reference for the Contivity Secure IP Services Gateway Command Line Interface*).
2. Wait for the system to shut down.
3. Turn off the Contivity 1100 power.

   The power switch and power outlet are located on the rear of the Contivity 1100.
4. Disconnect the power cord from the power outlet and then disconnect the cord from the Contivity 1100.

Danger: Make sure to turn off the Contivity 1100 and unplug it before you attempt to remove or install an option card.

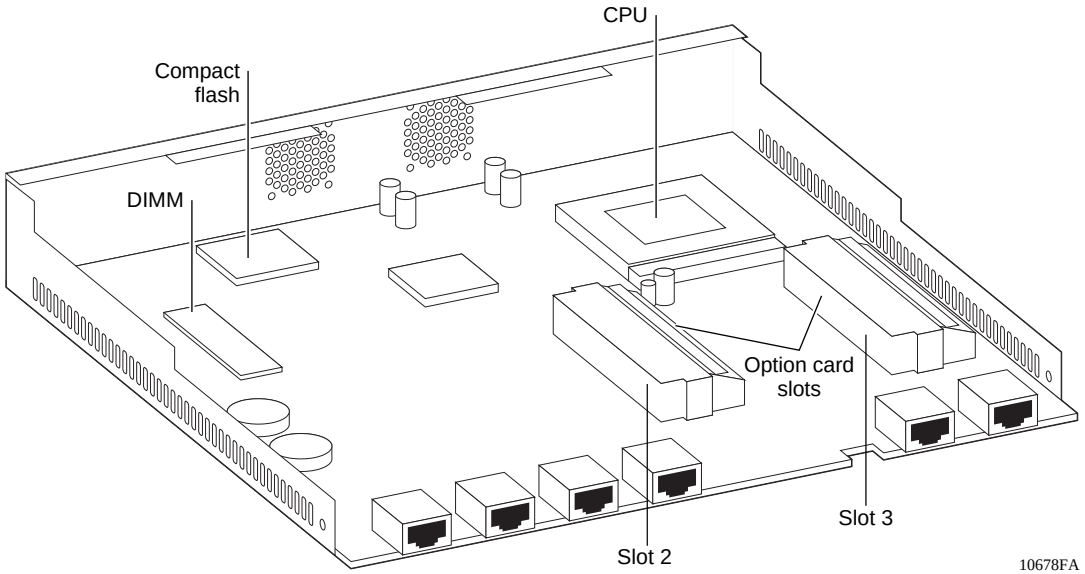
5. Remove the cables attached to the ports of the Contivity 1100.
6. If there are option cards currently installed, unscrew the 2 screws on each bracket.

Caution: Unscrew the option card brackets before you remove the cover from the Contivity 1100 or you will damage the option cards.

7. Remove the 4 screws located on the sides of the Contivity 1100.
8. Slide the chassis cover away from the base.

   The Contivity 1100 system board is now exposed. Figure 9 shows the location of the option card slots on the system board.
9. Locate the slot where you plan to install the new or replacement option card (see Table 1 on page 35).

Figure 9 Contivity 1100 system board



Warning: Beware of danger if the battery is incorrectly replaced. Replace with the *same* or an *equivalent battery* only, as recommended by the manufacturer's instructions.

Danger: In spite of the previous warning, which is mandated for regulatory approval, *you should not change the battery.* If you suspect a dead battery, contact Nortel Networks Customer Support.

10 Attach an antistatic wrist strap (not included with the Contivity 1100 shipment).

Caution: Electrostatic discharge can damage Contivity 1100 components.

11 Remove the blank card bracket (or the option card that you are replacing) from the slot.

Caution: If you need to remove an ADSL option card from slot 3 (see Figure 9 on page 37), lift the free end of the card so that the card is at a slight angle, then carefully pull it up and out of the slot so that the card clears the connector of the adjacent slot 2. If you damage components on the underside of the ADSL interface card, the card will not work.

12 Install the new option card.

Caution: To prevent stress damage to components on the underside of the ADSL option card when you install that card in slot 3 (see Figure 9 on page 37), hold the card at a slight angle and insert it into the connector so that the card clears the connector of the adjacent slot 2. If you damage components on the underside of the ADSL interface card, the card will not work.

Make sure to press the card all the way into the PCI connector on the motherboard.

13 Carefully slide the chassis cover onto the base and secure it with the 4 screws.

14 Attach the bracket of the new option card to the front panel with 2 screws.

15 Connect the cables to the system ports and to the option card ports.

16 Plug the power cord into the AC power outlet.

17 Plug the external power supply into the port labeled “DC Input” on the back of the Contivity 1100.

18 Press the power switch to the “on” position and wait for the gateway to boot.

Chapter 3
Contivity 1700 and 1600 option installation

This chapter provides instructions on how to install and replace the following field replaceable units (FRUs) in the Contivity 1700 and the Contivity 1600:

- LAN, WAN, and serial interface cards
- Hardware encryption accelerator card (Contivity 1700 only)
- Dual inline memory modules (DIMMs)

This chapter contains the following topics:

Note: The Contivity 1700 and the Contivity 1600 look very similar. The differences in these gateways are small enough so that a figure of one gateway—for example, the Contivity 1700—can represent the Contivity 1600 for the purposes of this chapter.

Shutting down the system to add or replace hardware

To install or replace an option card or a DIMM, you must first shut down the Contivity 1700 or Contivity 1600 and unplug it.

Caution: Shut down the gateway as described in this section before you attempt to add or replace an option card or DIMM.

To shut down the Contivity 1600 or 1700:

1. Use the Web GUI or the command line interface to shut down the gateway.
   - Web GUI: Choose Admin > Shutdown. Select the option to power off the gateway after shutdown.
   - Command line interface: Use the **`reload`** command to shut down the system. For example, enter **`reload power-off disable-logins "Upgrade hardware"`**

     For the complete syntax of the **`reload`** command, see the *Reference for the Contivity Secure IP Services Gateway Command Line Interface*.
2. Wait for the system to shut down.
3. Disconnect the power cord from the power outlet and then disconnect the cord from the Contivity 1700 or 1600.

   The power receptacle is located on the rear of the gateway.

Danger: Make sure to turn off the gateway and unplug the power cord before you attempt to remove or install an option card or DIMM.

Removing the front bezel and top cover

To install option cards or DIMMs, you must remove the front bezel and the top cover from the gateway.

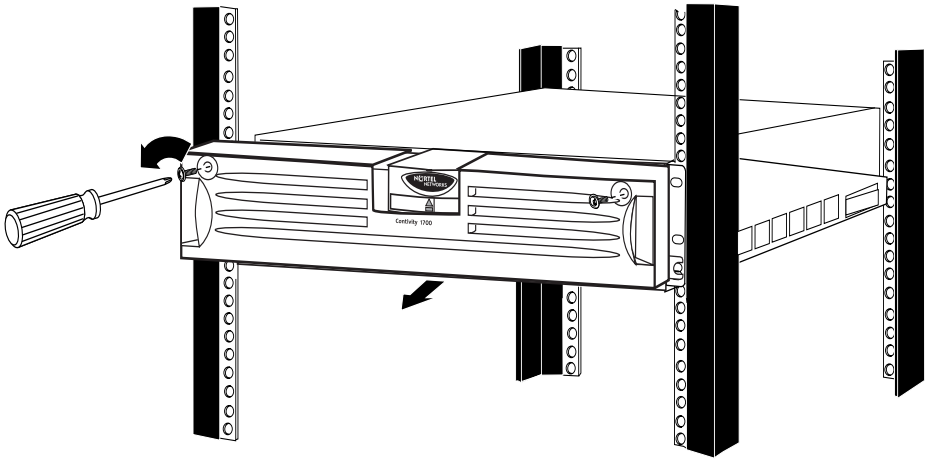
To remove the front bezel:

1. Shut down the Contivity 1600 or 1700 using the Web GUI or the command line interface and then unplug it as described in "Shutting down the system to add or replace hardware" on page 40.

Danger: Make sure to turn off the gateway and unplug it before you attempt to install an option card or DIMM.

2. Using a Phillips screwdriver, turn each of the 2 screws on the front bezel a quarter turn counterclockwise (Figure 10).

Figure 10 Removing the front bezel



CS160014A

3. Grip the two handles and firmly pull the bezel toward you to unsnap it from the chassis.

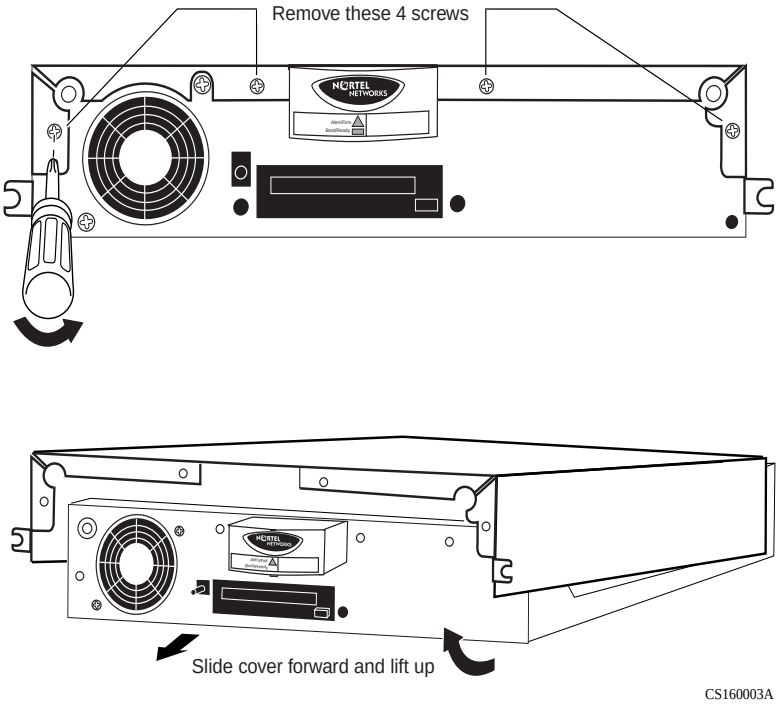
Caution: Do not use the piece with the Nortel Networks logo and the LEDs as a handle.

The first few times that you remove the front bezel, it may be somewhat difficult to remove because the ball studs and socket clips are new.

To remove the top cover:

1. If the gateway is installed in an equipment rack, remove it from the rack.
   a. At the front of the chassis, remove the 2 panhead screws that secure the bottom of the chassis to the equipment rack.
   b. Remove the Contivity 1600 or 1700 from the rack-mount shelf and set it on a sturdy surface.
2. Using a Phillips screwdriver, remove the 4 screws that secure the cover to the chassis (Figure 11).

Figure 11 Removing the top cover

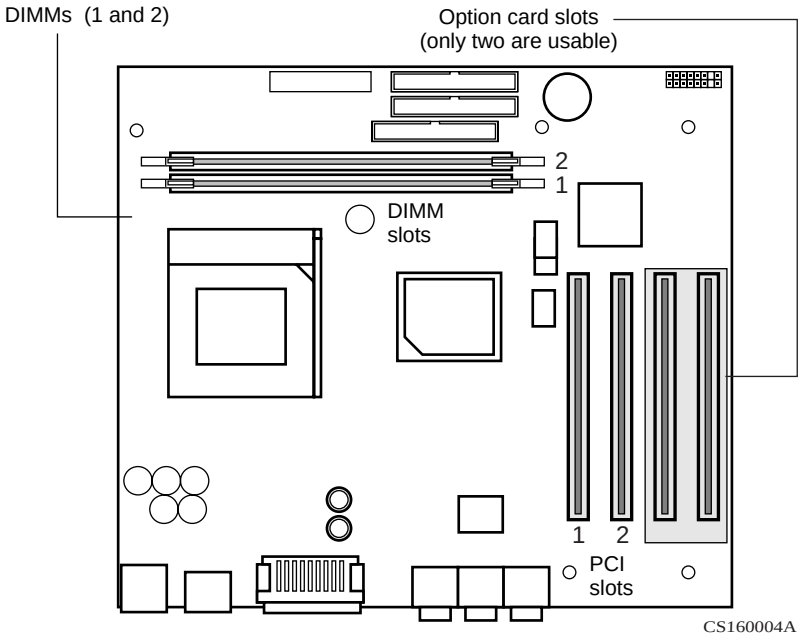


3. Slide the top cover forward approximately 1/4 inch.

4 Lift the lid 2 or 3 inches and pull it off the chassis.

The system board is now exposed. Figure 12 shows the location of the option card slots and the DIMMs on the system board. (Figure 12 shows the Contivity 1700, but the Contivity 1600 is very similar.)

Figure 12 Location of option card slots and DIMMs on the system board



Warning: Beware of danger if battery is incorrectly replaced. Replace with the *same* or an *equivalent battery* only, as recommended by the manufacturer's instructions.

Danger: In spite of the above warning, which is mandated for regulatory approval, *you should not change the battery.* If you suspect a dead battery, contact Nortel Networks Customer Support.

Attaching the antistatic wrist strap

Nortel Networks ships the Contivity 1700 with an antistatic wrist strap. The antistatic wrist strap directs the discharge of static electricity from your body to the chassis of the gateway to avoid damage to sensitive electronic components.

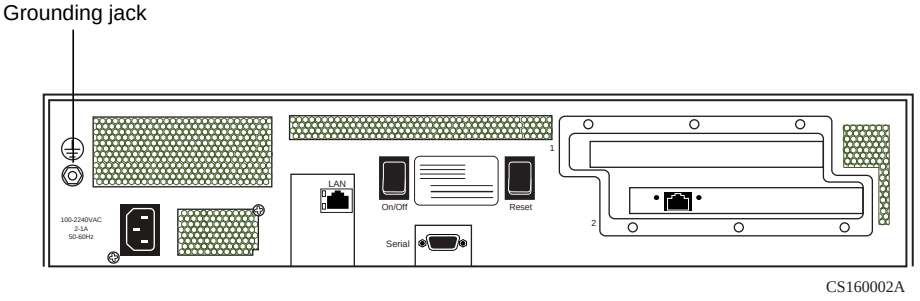
You must wear an antistatic wrist strap on your arm whenever you remove, install, or handle option cards and DIMMs.

Caution: Electrostatic discharge can damage hardware. Follow the procedure in this section to protect your equipment from damage.

To attach the antistatic wrist strap:

1. Locate the antistatic wrist strap and verify that the cable is attached to the wrist strap.
2. Place the strap around your wrist and adjust it to ensure that the metal buckle inside the strap touches your skin.
3. Insert the banana plug into the grounding jack at the rear of the chassis (Figure 13).

Figure 13 Location of the grounding jack for the antistatic wrist strap



Installing and replacing option cards

The Contivity 1700 and the Contivity 1600 have two slots for option cards (see Figure 12 on page 43). This section provides instructions on adding new option cards to the gateway or, if necessary, replacing an existing card. Table 2 lists the option cards that you can install in the Contivity 1700.

Table 2 Supported option cards for the Contivity 1700

Option card	Maximum number	Restrictions
Hardware Accelerator	1	The CSA card is not supported.
10/100 Ethernet LAN interface	2	
ADSL WAN interface[1]	2	
ISDN BRI S/T or U interface[2]	2	
T1/E1 CSU/DSU WAN interface	2	
Quad T1/E1 CSU/DSU WAN interface[1]	1	
V.90 modem interface[2]	2	
Single V.35/X.21 WAN interface	2	
Dual V.35 WAN interface[3]	1	Install in slot 1 only.
HSSI WAN interface[4]	1	Install in slot 1 only.

1 The Contivity 1700 must be running Version 4.90 or later.

2 The Contivity 1700 must be running Version 4.80 or later.

3 This option card is no longer available for purchase.

4 The gateway must be running Version 4.76 or later, or the hardware revision must be at least 03.

Table 3 lists the option cards that you can install in the Contivity 1600.

Table 3 Supported option cards for the Contivity 1600

Option card	Maximum number	Restrictions
10/100 Ethernet LAN interface	2	
T1/E1 CSU/DSU WAN interface	2	
Single V.35/X.21 WAN interface	2	
Dual V.35 WAN interface[1]	1	Install in slot 1 only.

1 This option card is no longer available for purchase.

To install or replace an interface card or a hardware encryption accelerator card:

1. Shut down the Contivity 1600 or 1700 using the Web GUI or the command line interface and then unplug it as described in “Shutting down the system to add or replace hardware” on page 40.

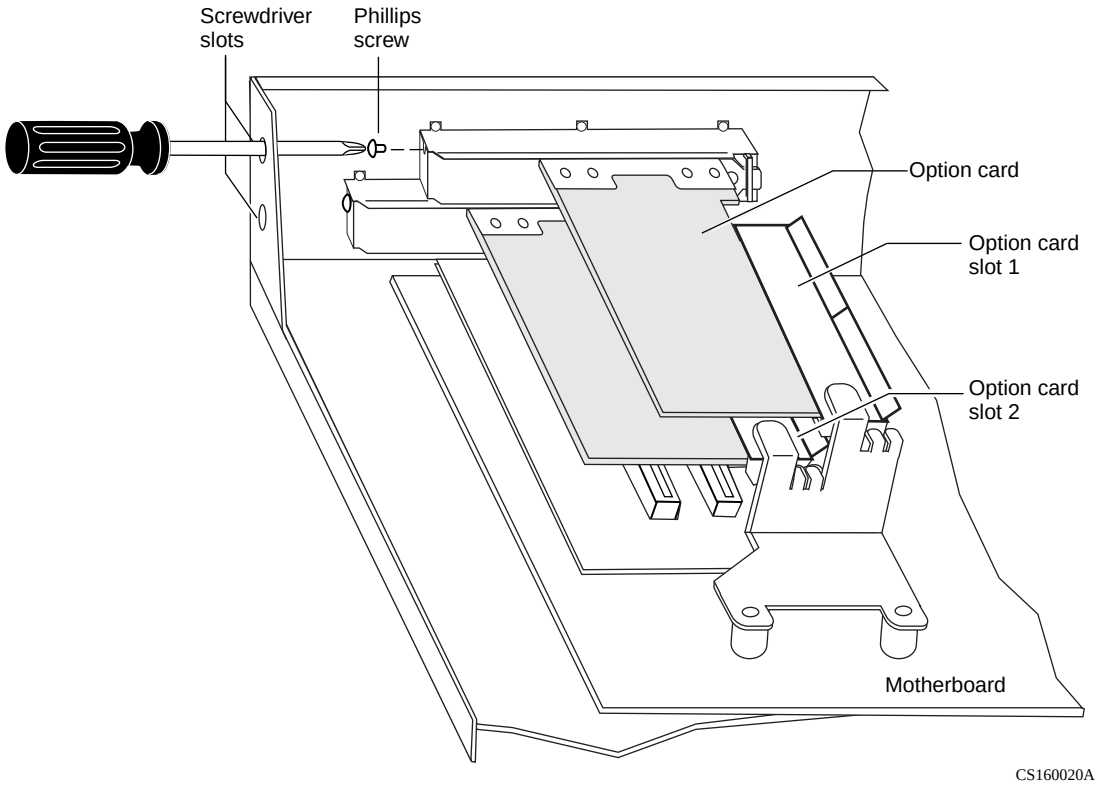
Danger: Turn off the gateway and unplug it before you attempt to install an option card.

2. Remove the front bezel from the chassis, then remove the chassis from the equipment rack (see “Removing the front bezel and top cover” on page 41).
3. Remove the top cover from the chassis (see “Removing the front bezel and top cover” on page 41).
4. Attach the antistatic wrist strap that was shipped with the gateway (see “Attaching the antistatic wrist strap” on page 44).
5. Locate the slot where you plan to install the new or replacement option card.

Note: If no option cards are installed in the Contivity 1700 or 1600, install the new card in the lower slot.

6. Remove the filler panel screw and pull out the filler panel (or the option card that you are replacing) from the slot (Figure 14).

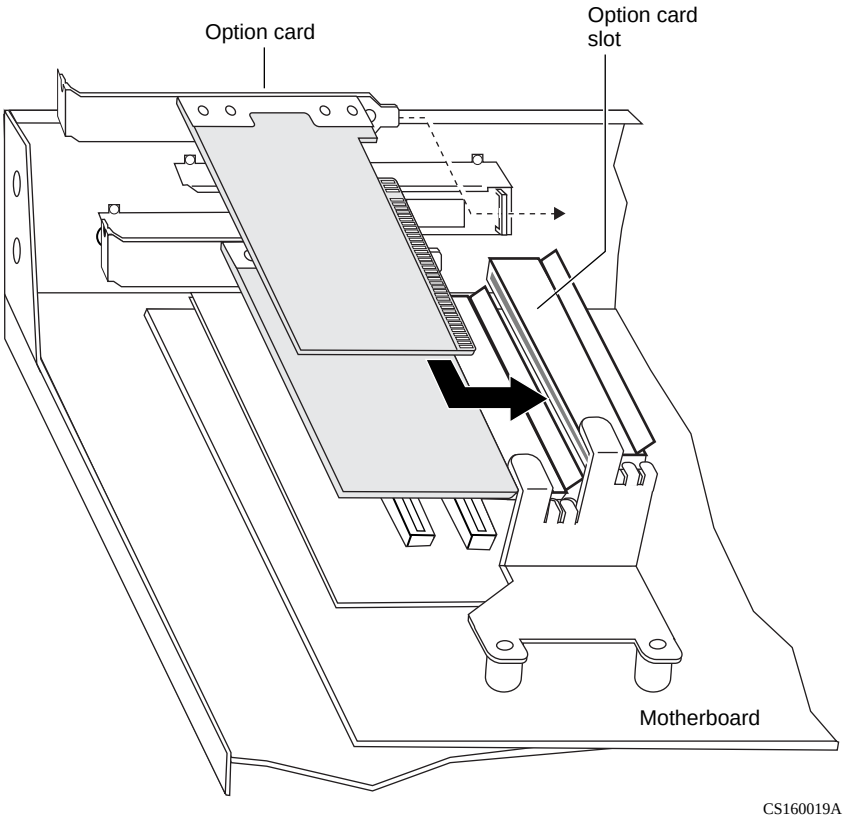
Figure 14 Removing an option card or a filler panel



7 Slide the option card into the intended slot (Figure 15).

Make sure that the card is seated firmly in the slot. If the card is not seated properly, it will not work.

Figure 15 Installing an option card



8 Replace the screw that secures the card to the slot (see Figure 14 on page 47).

9 Replace the top cover on the chassis (see Figure 11 on page 42).

a Hold the cover at an angle and slide it onto the chassis.

b Using a screwdriver, insert and tighten the 4 screws that secure the cover to the chassis.

10 If the gateway is installed in an equipment rack, mount it in the rack.

a Set the Contivity 1700 or 1600 on the rack-mount shelf in the rack.

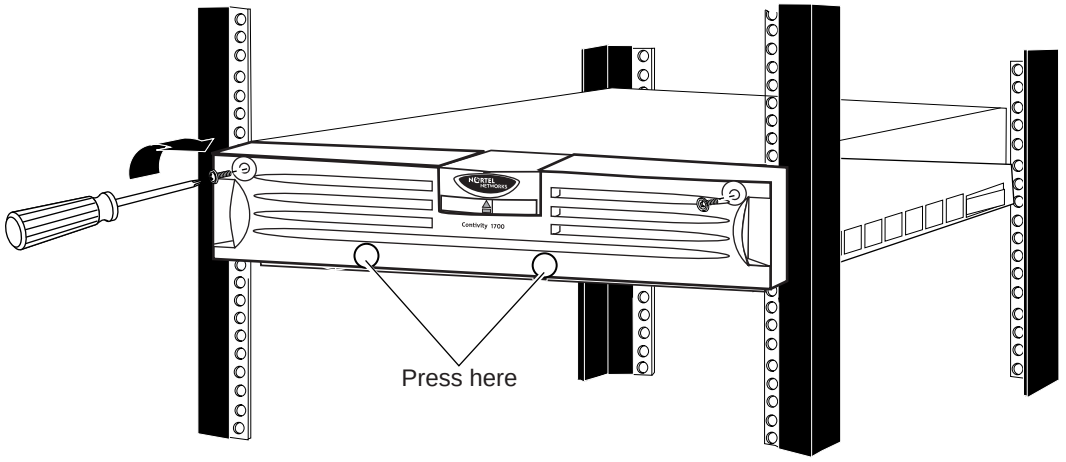
b Insert one of the panhead screws through the bottom hole on each side of the shelf into the hole in the rack and tighten the screws.

11 Replace the front bezel (Figure 16).

a Hold the bezel by its two handles and push it onto the chassis.

b Using a screwdriver, tighten the 2 screws to secure the bezel to the chassis.

Figure 16 Replacing the front bezel



Installing and replacing DIMMs

The Contivity 1700 and 1600 have two slots for dual inline memory modules (DIMMs) (see Figure 12 on page 43). Unless you ordered additional memory, the gateway is shipped with one 128 MB DIMM installed. You can upgrade memory in the gateway by installing a second 128 MB DIMM.

This section provides instructions on adding a second DIMM to the gateway or, if necessary, replacing an existing DIMM.

Caution: Make sure to install the same type of DIMM that is already installed in your gateway. For example, do not install a 256 MB DIMM in the Contivity 1700 or 1600.

To install or replace a DIMM:

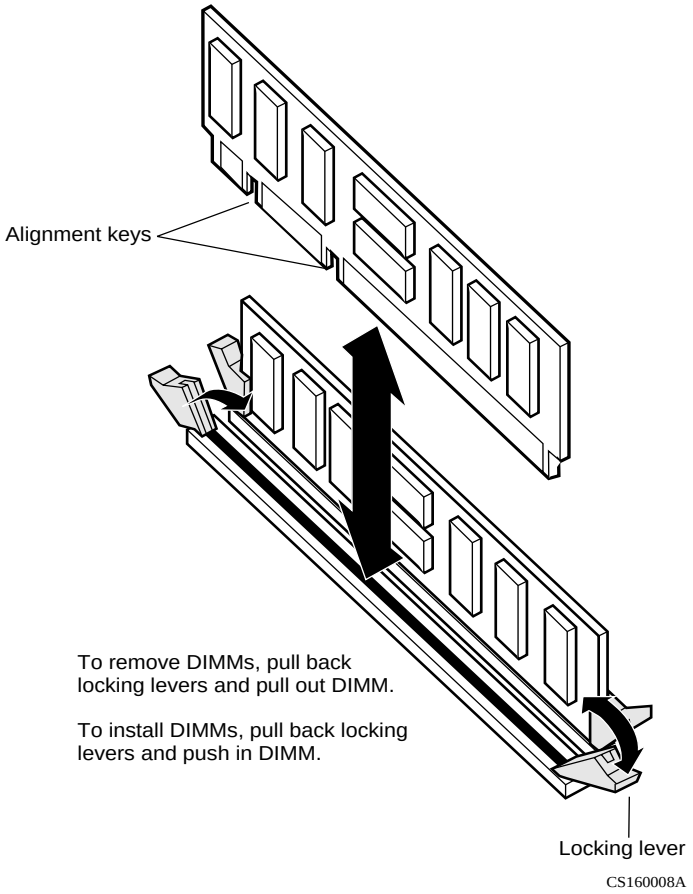
1. Shut down the Contivity 1700 or 1600 using the Web GUI or the command line interface and then unplug it as described in "Shutting down the system to add or replace hardware" on page 40.

Danger: Turn off the gateway and unplug it before you attempt to install a DIMM.

2. Remove the front bezel from the chassis, then remove the chassis from the equipment rack (see "Removing the front bezel and top cover" on page 41).
3. Remove the top cover from the chassis (see "Removing the front bezel and top cover" on page 41).
4. Attach the antistatic wrist strap that was shipped with the Contivity 1700 (see "Attaching the antistatic wrist strap" on page 44).
5. If you are replacing a DIMM, remove the installed DIMM as follows:
   a. Press down the locking lever on either side of the DIMM (Figure 17).
   b. Pull the DIMM up to remove it from the slot.
6. Press down the locking lever on either side of the slot where you plan to install the DIMM (Figure 17).
7. Place the new or replacement DIMM in the slot (Figure 17).

   Use the alignment keys to properly position the DIMM in the slot.
8. Press the DIMM firmly into the socket.
9. Pull up the locking lever on either side of the DIMM to snap it into position.

Figure 17 Installing and removing a DIMM in a Contivity 1700 or 1600



10 Replace the top cover on the chassis (see Figure 11 on page 42).

a Hold the cover at an angle and slide it onto the chassis.

b Using a screwdriver, insert and tighten the 4 screws to secure the cover to the chassis.

11 If the gateway is installed in an equipment rack, mount it in the rack.

a Set the Contivity 1700 or 1600 on the rack-mount shelf in the rack.

b Insert one of the panhead screws through the bottom hole on each side of the shelf into the hole in the rack and tighten the screws.

12 Replace the front bezel (see Figure 16 on page 49).

a Hold the bezel by its two handles and push it onto the chassis.

b Using the screwdriver, tighten the 2 screws to secure the bezel to the chassis.

Chapter 4
Contivity 1740 option installation

This chapter provides instructions on how to install and replace the following field replaceable units (FRUs) in the Contivity 1740:

- LAN, WAN, and serial interface cards
- Hardware encryption accelerator card
- Dual inline memory modules (DIMMs)

This chapter contains the following topics:

Shutting down the system to add or replace hardware

To install or replace an option card or a DIMM, you must first shut down the Contivity 1740 and unplug it.

Caution: Shut down the Contivity 1740 as described in this section before you attempt to add or replace an option card or DIMM.

To shut down the Contivity 1740:

1. Use the Web GUI or the command line interface to shut down the gateway.
   - Web GUI: Choose Admin > Shutdown. Select the option to power off the gateway after shutdown.
   - Command line interface: Use the **`reload`** command to shut down the system. For example, enter **`reload power-off disable-logins "Upgrade hardware"`**

     For the complete syntax of the **`reload`** command, see the *Reference for the Contivity Secure IP Services Gateway Command Line Interface*.
2. Wait for the system to shut down.
3. Disconnect the power cord from the power outlet and then disconnect the cord from the Contivity 1740.

   The power receptacle is located on the rear of the Contivity 1740.

Danger: Make sure to turn off the Contivity 1740 and unplug the power cord before you attempt to remove or install an option card or DIMM.

Removing the front bezel and top cover

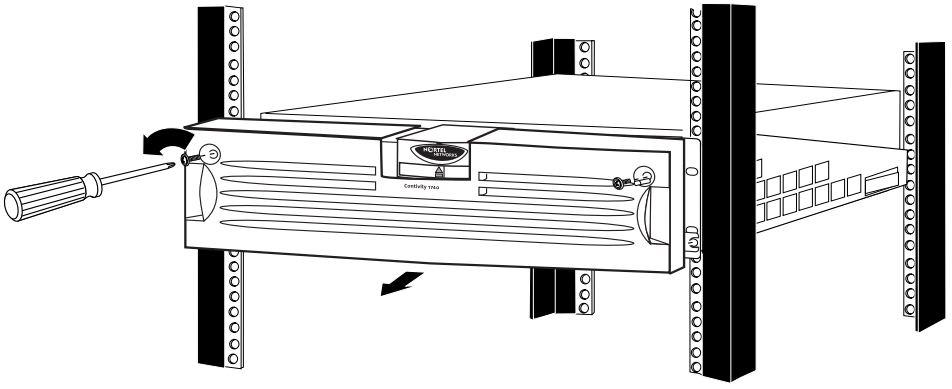
To install option cards or DIMMs, you must remove the front bezel and the top cover from the gateway. To remove the front bezel:

1 Shut down the Contivity 1740 using the Web GUI or the command line interface and then unplug it as described in "Shutting down the system to add or replace hardware" on page 54.

Danger: Make sure to turn off the Contivity 1740 and unplug it before you attempt to install an option card or DIMM.

2 Using a Phillips screwdriver, turn each of the 2 screws on the front bezel a quarter turn counterclockwise (Figure 18).

Figure 18 Removing the front bezel



3 Grip the two handles and firmly pull the bezel toward you to unsnap it from the chassis.

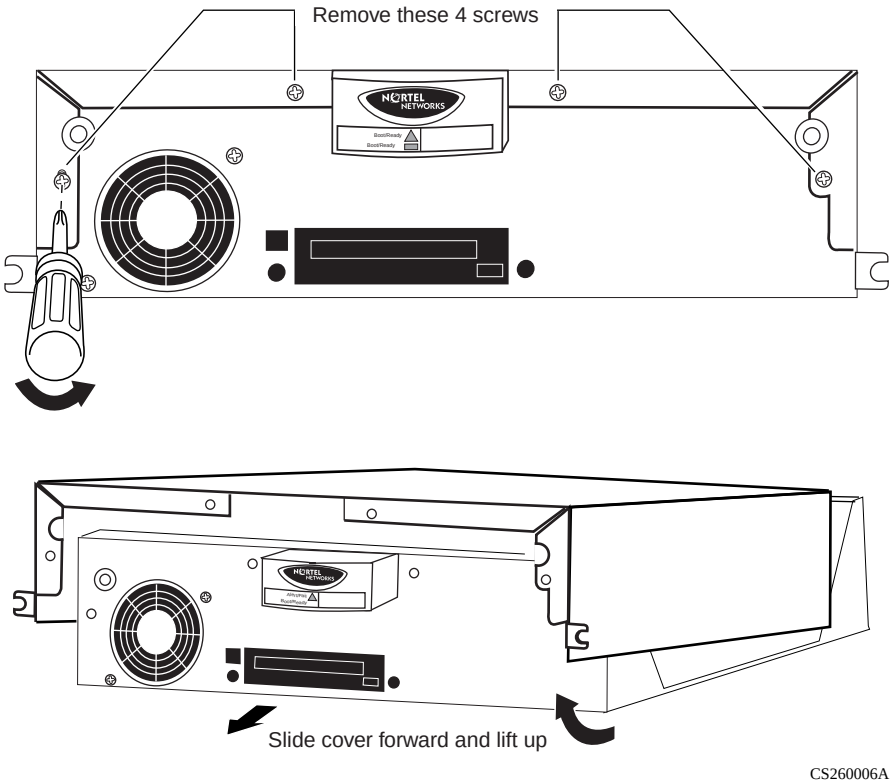
Caution: Do not use the piece with the Nortel Networks logo and the LEDs as a handle.

The first few times that you remove the front bezel, it may be somewhat difficult to remove because the ball studs and socket clips are new.

To remove the top cover:

1. If the Contivity 1740 is installed in an equipment rack, remove it from the rack.
   a. At the front of the chassis, remove the 2 panhead screws that secure the bottom of the chassis to the equipment rack.
   b. Remove the Contivity 1740 from the rack-mount shelf and set it on a sturdy surface.
2. Using a Phillips screwdriver, remove the 4 screws that secure the cover to the chassis (Figure 19).

Figure 19 Removing the top cover

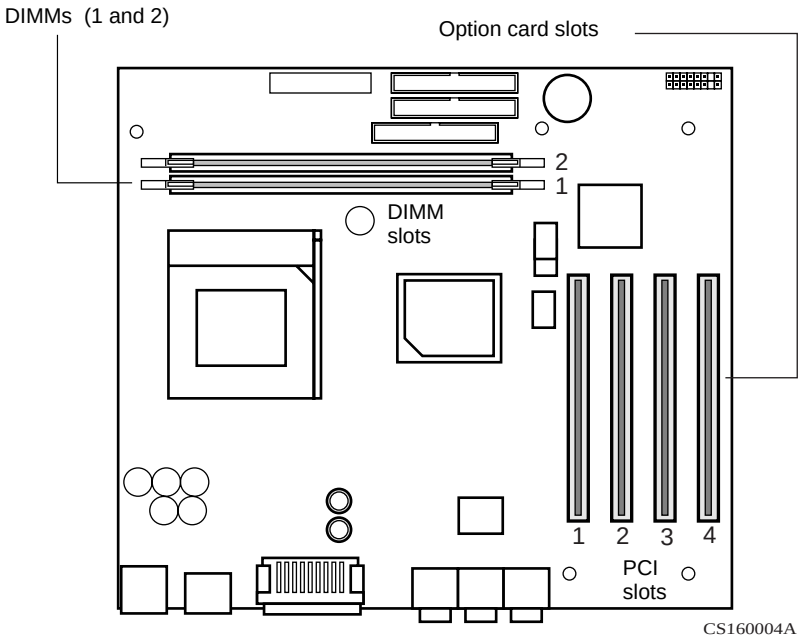


3. Slide the top cover forward approximately 1/4 inch.

4 Lift the lid 2 or 3 inches and pull it off the chassis.

The Contivity 1740 system board is now exposed. Figure 20 shows the location of the option card and DIMM slots on the system board.

Figure 20 Location of option card and DIMM slots on the system board



Warning: Beware of danger if battery is incorrectly replaced. Replace with the *same* or an *equivalent battery* only, as recommended by the manufacturer's instructions.

Danger: In spite of the above warning, which is mandated for regulatory approval, *you should not change the battery.* If you suspect a dead battery, contact Nortel Networks Customer Support.

Attaching the antistatic wrist strap

Nortel Networks ships the Contivity 1740 with an antistatic wrist strap. The antistatic wrist strap directs the discharge of static electricity from your body to the chassis of the gateway to avoid damage to sensitive electronic components.

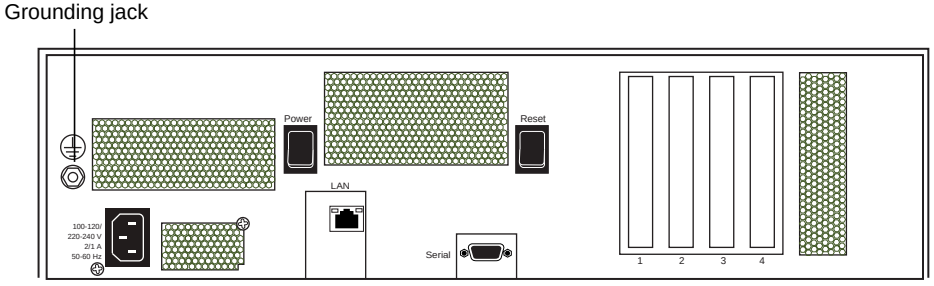
You must wear an antistatic wrist strap on your arm whenever you remove, install, or handle option cards and DIMMs.

Caution: Electrostatic discharge can damage hardware. Follow the procedure in this section to protect your equipment from damage.

To attach the antistatic wrist strap:

1. Locate the antistatic wrist strap and verify that the cable is attached to the wrist strap.
2. Place the strap around your wrist and adjust it to ensure that the metal buckle inside the strap touches your skin.
3. Insert the banana plug into the grounding jack at the rear of the chassis (Figure 21).

Figure 21 Location of the grounding jack for the antistatic wrist strap



Installing and replacing option cards

The Contivity 1740 has four slots for option cards (see Figure 20 on page 57). This section provides instructions on adding new option cards to the Contivity 1740 or, if necessary, replacing an existing card.

Table 4 lists the option cards that you can install in the Contivity 1740.

Table 4 Supported option cards for the Contivity 1740

Option card	Maximum number	Restrictions
Contivity Security Accelerator (CSA)[1]	1	Install one CSA or one Hardware Accelerator card. Do not install either card in slot 4.
Hardware Accelerator	1	
10/100 Ethernet interface	4	
1000BASE-T interface (copper)[1]	2	Install two 1000BASE-T cards, two 1000BASE-SX cards, or one card of each type.
1000BASE-SX interface (fiber)[1]	2	
ADSL WAN interface[1]	4	
ISDN BRI S/T or U interface[2]	4	
T1/E1 CSU/DSU WAN interface	4	
Quad T1/E1 CSU/DSU WAN interface[1]	3	
V.90 modem interface[2]	4	
Single V.35/X.21 WAN interface	4	
Dual V.35 WAN interface[3]	4	
HSSI WAN interface	2	Do not install in slot 4. Install in slot 1 or slot 3 if possible.

1 The Contivity 1740 must be running Version 4.90 or later.

2 The Contivity 1740 must be running Version 4.80 or later.

3 This option card is no longer available for purchase.

To install or replace an interface card or a hardware encryption accelerator card:

1. Shut down the Contivity 1740 using the Web GUI or the command line interface and then unplug it as described in "Shutting down the system to add or replace hardware" on page 54.

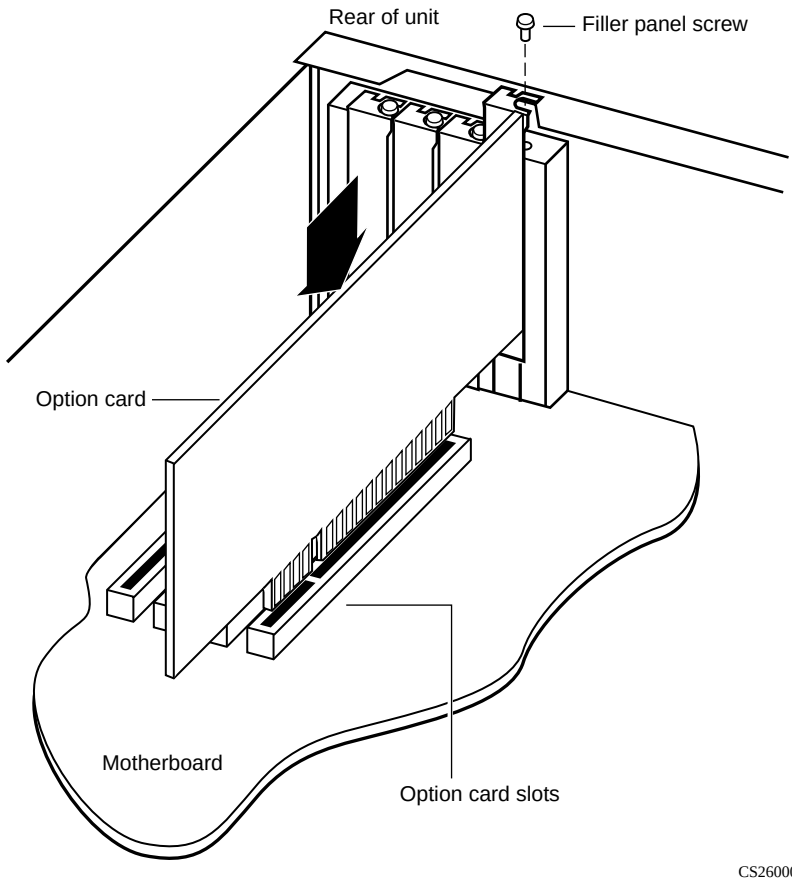
Danger: Turn off the Contivity 1740 and unplug it before you attempt to install an option card.

2. Remove the front bezel from the chassis, then remove the chassis from the equipment rack (see "Removing the front bezel and top cover" on page 55).
3. Remove the top cover from the chassis (see "Removing the front bezel and top cover" on page 55).
4. Attach the antistatic wrist strap that was shipped with the Contivity 1740 (see "Attaching the antistatic wrist strap" on page 58).
5. Locate the slot where you plan to install the new or replacement option card.

Note: Do not try to install an HSSI WAN interface card or a hardware accelerator card in slot 4.

6. Remove the filler panel screw and pull out the filler panel (or the option card that you are replacing) from the slot (Figure 22).

Figure 22 Installing and removing an option card



7 Lower the new option card into the slot and gently press the connector into the slot.

Make sure that the card is seated firmly in the slot. If the card is not seated properly, it will not work.

8 Replace the screw that secures the card to the slot (Figure 22).

9 Replace the top cover on the chassis (see Figure 19 on page 56).

a Hold the cover at an angle and slide it onto the chassis.

b Using a screwdriver, insert and tighten the 4 screws that secure the cover to the chassis.

10 If the Contivity 1740 is installed in an equipment rack, mount it in the rack.

a Set the Contivity 1740 on the rack-mount shelf in the rack.

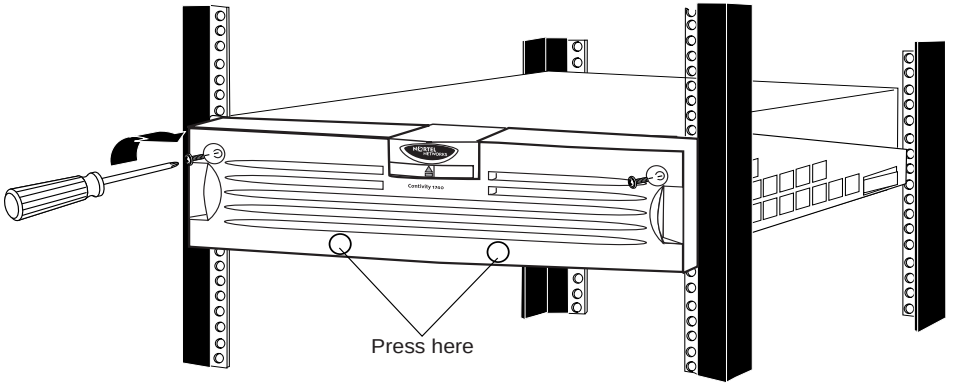
b Insert one of the panhead screws through the bottom hole on each side of the shelf into the hole in the rack and tighten the screws.

11 Replace the front bezel (Figure 23).

a Hold the bezel by its two handles and push it onto the chassis.

b Using a screwdriver, tighten the 2 screws to secure the bezel to the chassis.

Figure 23 Replacing the front bezel



Installing and replacing DIMMs

The Contivity 1740 has two slots for dual inline memory modules (DIMMs) (see Figure 20 on page 57). Unless you ordered additional memory, the Contivity 1740 is shipped with one 128 MB DIMM installed. You can upgrade memory in the gateway by installing a second 128 MB DIMM.

This section provides instructions on adding a second DIMM to the Contivity 1740 or, if necessary, replacing an existing DIMM.

Caution: Make sure to install the same type of DIMM that is already installed in your gateway. For example, do not install a 256 MB DIMM in the Contivity 1740.

To install or replace a DIMM:

1. Shut down the Contivity 1740 using the Web GUI or the command line interface and then unplug it as described in "Shutting down the system to add or replace hardware" on page 54.

Danger: Turn off the Contivity 1740 and unplug it before you attempt to install a DIMM.

2. Remove the front bezel from the chassis, then remove the chassis from the equipment rack (see "Removing the front bezel and top cover" on page 55).
3. Remove the top cover from the chassis (see "Removing the front bezel and top cover" on page 55).
4. Attach the antistatic wrist strap that was shipped with the Contivity 1740 (see "Attaching the antistatic wrist strap" on page 58).

Caution: Electrostatic discharge can damage Contivity 1740 components.

5 If you are replacing a DIMM, remove the installed DIMM as follows:

   a Press down the locking lever on either side of the DIMM (Figure 24).

   b Pull the DIMM up to remove it from the slot.

6 Press down the locking lever on either side of the slot where you plan to install the new DIMM (Figure 24).

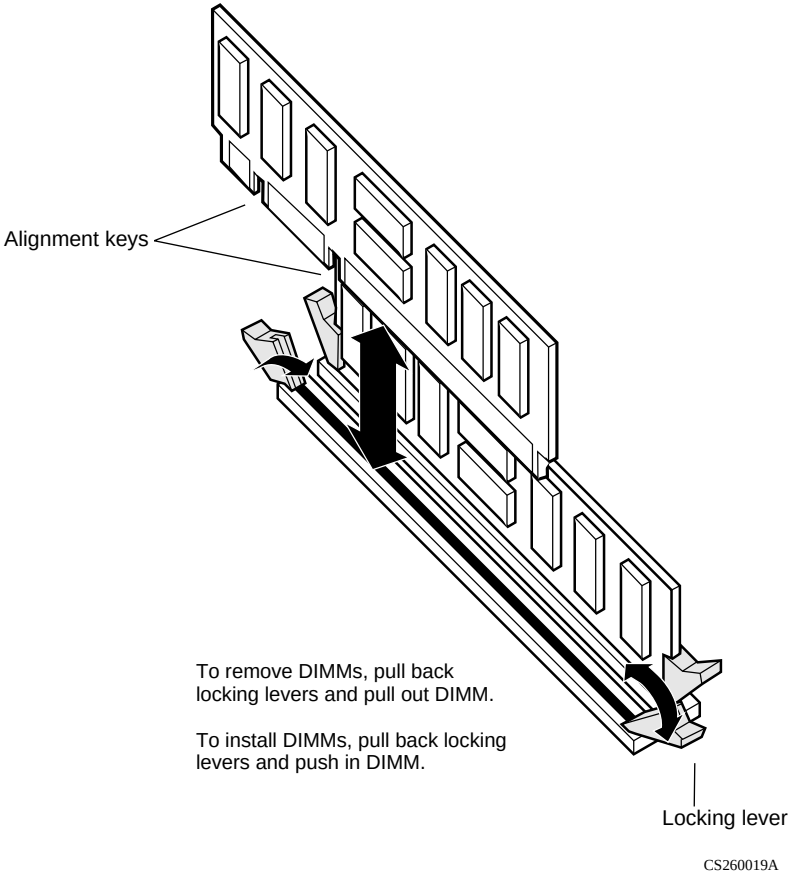
7 Place the new or replacement DIMM in the slot (Figure 24).

   Use the alignment keys to properly position the DIMM in the slot.

8 Press the DIMM firmly into the socket.

9 Pull up the locking lever on either side of the DIMM to snap it into position.

Figure 24 Installing and removing a DIMM



10 Replace the top cover on the chassis (see Figure 19 on page 56).

a Hold the cover at an angle and slide it onto the chassis.

b Using a screwdriver, insert and tighten the 4 screws to secure the cover to the chassis.

11 If the Contivity 1740 is installed in an equipment rack, mount it in the rack.

a Set the Contivity 1740 on the rack-mount shelf in the rack.

b Insert one of the panhead screws through the bottom hole on each side of the shelf into the hole in the rack and tighten the screws.

12 Replace the front bezel (see Figure 23 on page 62).

a Hold the bezel by its two handles and push it onto the chassis.

b Using the screwdriver, tighten the 2 screws to secure the bezel to the chassis.

Chapter 5
Contivity 2700 and 2600 option installation

This chapter provides instructions on how to install and replace the following field replaceable units (FRUs) in the Contivity 2700 and the Contivity 2600:

- LAN, WAN, and serial interface cards
- Hardware encryption accelerator cards
- Dual inline memory modules (DIMMs)

This chapter contains the following topics:

Note: The Contivity 2700 and the Contivity 2600 look very similar. The differences in these gateways are small enough so that a figure of one gateway—for example, the Contivity 2700—can represent the Contivity 2600 for the purposes of this chapter.

Shutting down the system to add or replace hardware

To install or replace an option card or a DIMM, you must first shut down the Contivity 2700 or 2600 and unplug it.

Caution: Shut down the gateway as described in this section before you attempt to add or replace an option card or DIMM.

To shut down the Contivity 2600 or 2700:

1. Use the Web GUI or the command line interface to shut down the gateway.
   - Web GUI: Choose Admin > Shutdown. Select the option to power off the gateway after shutdown.
   - Command line interface: Use the **`reload`** command to shut down the system. For example, enter **`reload power-off disable-logins "Upgrade hardware"`**

     For the complete syntax of the **`reload`** command, see the *Reference for the Contivity Secure IP Services Gateway Command Line Interface*.
2. Wait for the system to shut down.
3. Disconnect the power cord from the power outlet and then disconnect the cord from the gateway.

   The power receptacle is located on the rear of the Contivity 2700 and 2600.

Danger: Make sure to turn off the gateway and unplug the power cord before you attempt to remove or install an option card or DIMM.

Removing the front bezel and top cover

To install option cards or DIMMs, you must remove the front bezel and the top cover from the gateway.

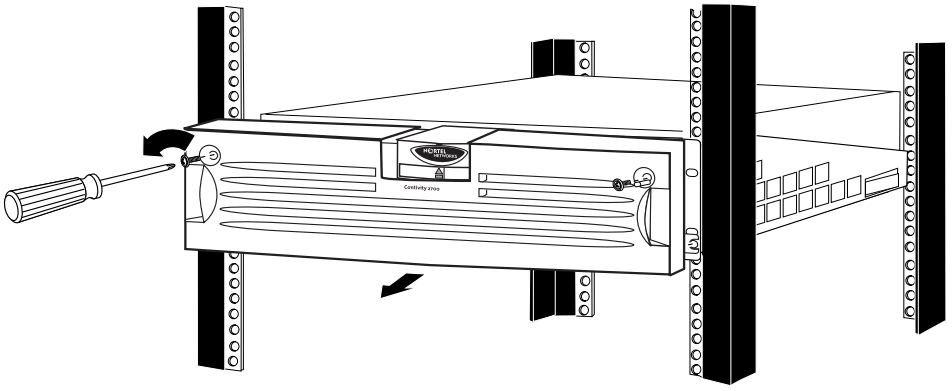
To remove the front bezel:

1 Shut down the Contivity 2700 or 2600 using the Web GUI or the command line interface and then unplug it as described in "Shutting down the system to add or replace hardware" on page 68.

Danger: Make sure to turn off the gateway and unplug it before you attempt to install an option card or DIMM.

2 Using a Phillips screwdriver, turn each of the 2 screws on the front bezel a quarter turn counterclockwise (Figure 25).

Figure 25 Removing the front bezel



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3 Grip the two handles and firmly pull the bezel toward you to unsnap it from the chassis.

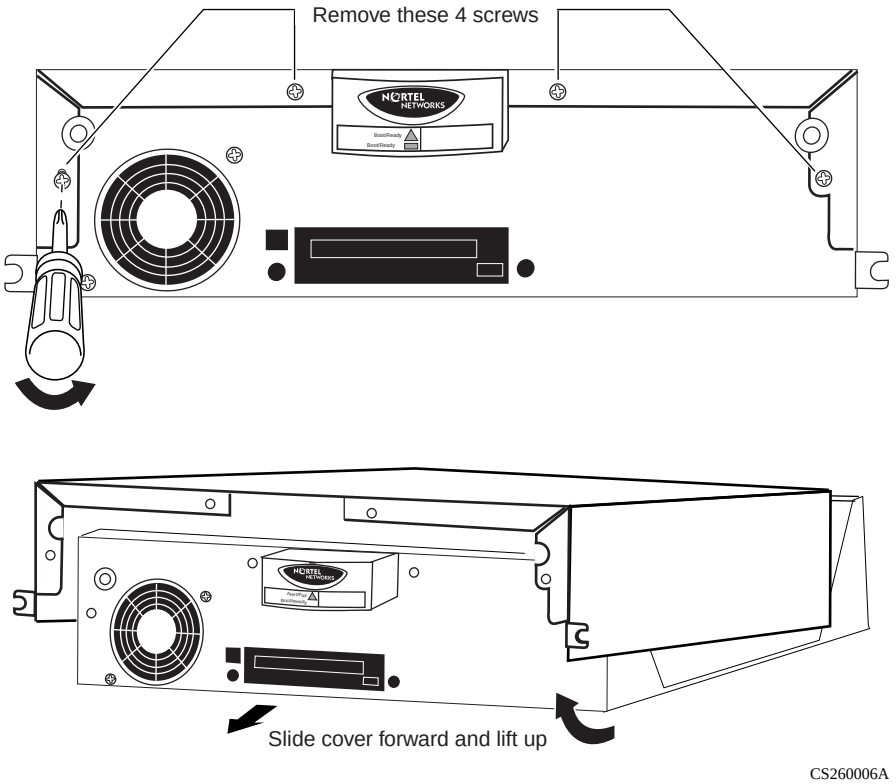
Caution: Do not use the piece with the Nortel Networks logo and the LEDs as a handle.

The first few times that you remove the front bezel, it may be somewhat difficult to remove because the ball studs and socket clips are new.

To remove the top cover:

1. If the gateway is installed in an equipment rack, remove it from the rack.
   a. At the front of the chassis, remove the 2 panhead screws that secure the bottom of the chassis to the equipment rack.
   b. Remove the Contivity 2700 or 2600 from the rack-mount shelf and set it on a sturdy surface.
2. Using a Phillips screwdriver, remove the 4 screws that secure the cover to the chassis (Figure 26).

Figure 26 Removing the top cover

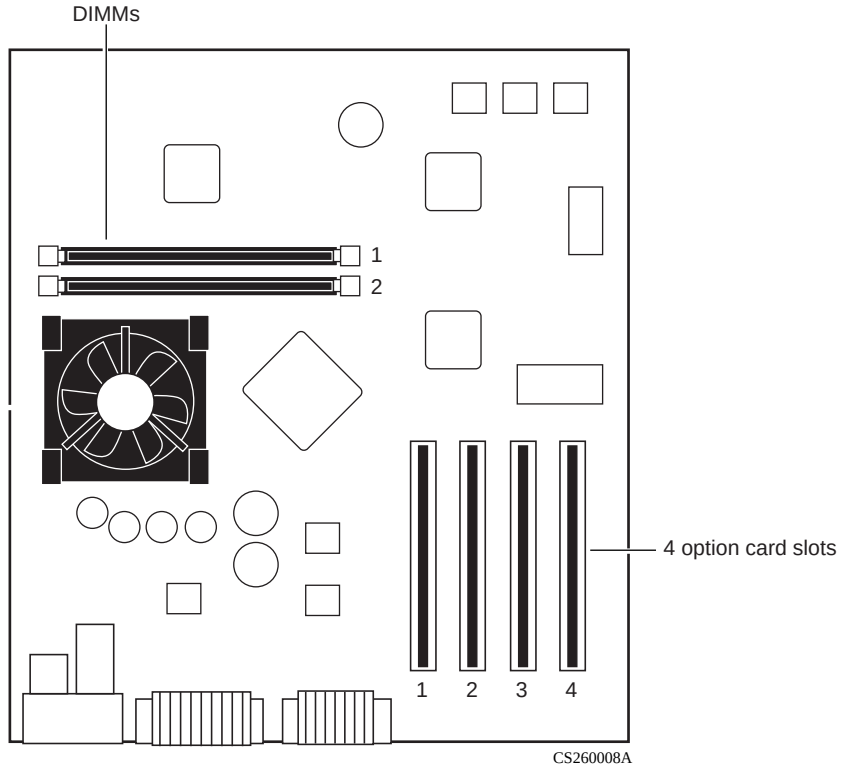


3. Slide the top cover forward approximately 1/4 inch.

4 Lift the lid 2 or 3 inches and pull it off the chassis.

The system board is now exposed. Figure 27 shows the location of the option card slots and the DIMMs on the system board. (Figure 27 shows the Contivity 2600, but the Contivity 2700 is very similar.)

Figure 27 Location of option card slots and DIMMs on the system board



Warning: Beware of danger if battery is incorrectly replaced. Replace with the *same* or an *equivalent battery* only, as recommended by the manufacturer's instructions.

Danger: In spite of the above warning, which is mandated for regulatory approval, *you should not change the battery.* If you suspect a dead battery, contact Nortel Networks Customer Support.

Attaching the antistatic wrist strap

Nortel Networks ships the Contivity 2700 and 2600 with an antistatic wrist strap. The antistatic wrist strap directs the discharge of static electricity from your body to the chassis of the gateway to avoid damage to sensitive electronic components.

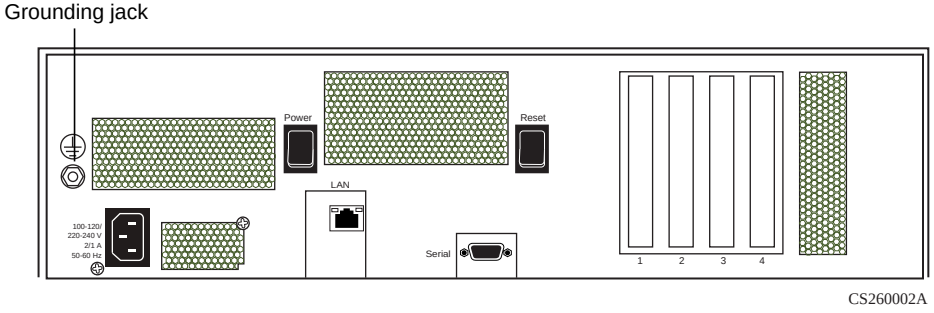
You must wear an antistatic wrist strap on your arm whenever you remove, install, or handle option cards and DIMMs.

Caution: Electrostatic discharge can damage hardware. Follow the procedure in this section to protect your equipment from damage.

To attach the antistatic wrist strap:

1. Locate the antistatic wrist strap and verify that the cable is attached to the wrist strap.
2. Place the strap around your wrist and adjust it to ensure that the metal buckle inside the strap touches your skin.
3. Insert the banana plug into the grounding jack at the rear of the chassis (Figure 28).

Figure 28 Location of the grounding jack for the antistatic wrist strap



Installing and replacing option cards

The Contivity 2700 and 2600 have four slots for option cards (see Figure 27 on page 71). This section provides instructions on adding new option cards to the gateway or, if necessary, replacing an existing card.

Table 5 lists the option cards that you can install in the Contivity 2700.

Table 5 Supported option cards for the Contivity 2700

Option card	Maximum number	Restrictions
Contivity Security Accelerator (CSA)[1]	2	Install two cards of either type, or one card of each type. Do not install either card in slot 4.
Hardware Accelerator	2[2]	
10/100 Ethernet interface	4	
1000BASE-T interface (copper)[1]	2	Install two 1000BASE-T cards, two 1000BASE-SX cards, or one card of each type.
1000BASE-SX interface (fiber)[1]	2	
ADSL WAN interface[1]	4	
ISDN BRI S/T or U interface[3]	4	
T1/E1 CSU/DSU WAN interface	4	
Quad T1/E1 CSU/DSU WAN interface[1]	3	
V.90 modem interface[3]	4	
Single V.35/X.21 WAN interface	4	
Dual V.35 WAN interface[4]	4	
HSSI WAN interface	2	Do not install in slot 4 (preferred slots are slots 1 and 3).

1 The Contivity 2700 must be running Version 4.90 or later.

2 To support two Hardware Accelerator cards, the gateway must be running Version 4.76 or later.

3 The Contivity 2700 must be running Version 4.80 or later.

4 This option card is no longer available for purchase.

Table 6 lists the option cards that you can install in the Contivity 2600.

Table 6 Supported option cards for the Contivity 2600

Option card	Maximum number	Restrictions
Hardware Accelerator	1	The CSA card is not supported.
10/100 Ethernet interface	4	
1000BASE-T interface (copper)[1]	2	Install two 1000BASE-T cards, two 1000BASE-SX cards, or one card of each type.
1000BASE-SX interface (fiber)[1]	2	
T1/E1 CSU/DSU WAN interface	4	
Quad T1/E1 CSU/DSU WAN interface[1]	3	
Single V.35/X.21 WAN interface	4	
Dual V.35 WAN interface[2]	4	
HSSI WAN interface	2	

1 The Contivity 2600 must be running Version 4.90 or later.

2 This option card is no longer available for purchase.

To install or replace an interface card or a hardware encryption accelerator card:

1. Shut down the Contivity 2700 or 2600 using the Web GUI or the command line interface and then unplug it as described in "Shutting down the system to add or replace hardware" on page 68.

Danger: Turn off the gateway and unplug it before you attempt to install an option card.

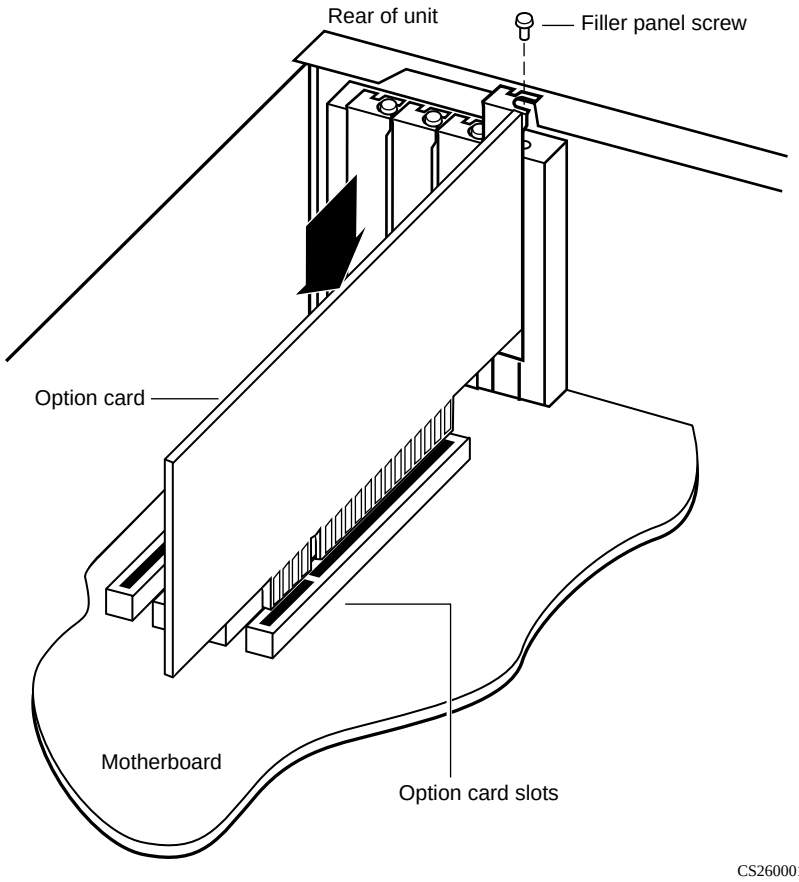
2. Remove the front bezel from the chassis, then remove the chassis from the equipment rack (see "Removing the front bezel and top cover" on page 69).
3. Remove the top cover from the chassis (see "Removing the front bezel and top cover" on page 69).
4. Attach the antistatic wrist strap that was shipped with the gateway (see "Attaching the antistatic wrist strap" on page 72).

5 Locate the slot where you plan to install the new or replacement option card.

Caution: Do not try to install an HSSI WAN interface card or a hardware encryption accelerator card in slot 4 of the Contivity 2700.

6 Remove the filler panel screw and pull out the filler panel (or the option card that you are replacing) from the slot (Figure 29).

Figure 29 Installing and removing an option card



7 Lower the new option card into the slot and gently press the connector into the slot.

Make sure that the card is seated firmly in the slot. If the card is not seated properly, it will not work.

8 Replace the screw that secures the card to the slot (Figure 29).

9 Replace the top cover on the chassis (see Figure 26 on page 70).

a Hold the cover at an angle and slide it onto the chassis.

b Using a screwdriver, insert and tighten the 4 screws that secure the cover to the chassis.

10 If the gateway is installed in an equipment rack, mount it in the rack.

a Set the Contivity 2700 or 2600 on the rack-mount shelf in the rack.

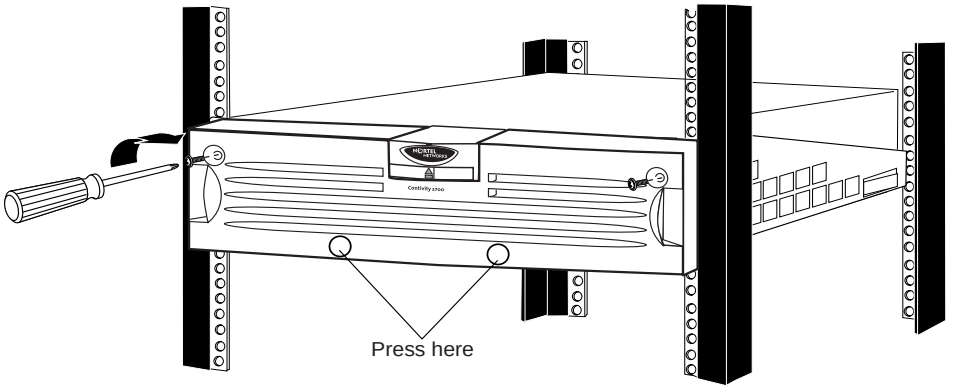
b Insert one of the panhead screws through the bottom hole on each side of the shelf into the hole in the rack and tighten the screws.

11 Replace the front bezel (Figure 30).

a Hold the bezel by its two handles and push it onto the chassis.

b Using a screwdriver, tighten the 2 screws to secure the bezel to the chassis.

Figure 30 Replacing the front bezel



Installing and replacing DIMMs

The Contivity 2700 and 2600 have two slots for dual inline memory modules (DIMMs) (see Figure 27 on page 71). Unless you ordered additional memory, the gateway is shipped with one DIMM installed. You can upgrade memory in the gateway by installing a second DIMM.

Table 7 lists the base memory and the maximum memory for the Contivity 2700 and the Contivity 2600.

Table 7 Base and maximum memory for the Contivity 2600 and 2700

Contivity model	Base memory (one installed DIMM)	Maximum memory (two installed DIMMs)
2600	128 MB	256 MB
2700	256 MB	512 MB

This section provides instructions on adding a second DIMM to the gateway or, if necessary, replacing an existing DIMM.

Caution: Make sure to install the same type of DIMM that is already installed in your gateway. For example, to upgrade memory in a Contivity 2600, which is shipped with one 128 MB DIMM, install a second 128 MB DIMM, not a 256 MB DIMM.

To install or replace a DIMM:

1. Shut down the Contivity 2600 or 2700 using the Web GUI or the command line interface and then unplug it as described in “Shutting down the system to add or replace hardware” on page 68.

Danger: Turn off the gateway and unplug it before you attempt to install a DIMM.

2. Remove the front bezel from the chassis, then remove the chassis from the equipment rack (see “Removing the front bezel and top cover” on page 69).

3 Remove the top cover from the chassis (see "Removing the front bezel and top cover" on page 69).

4 Attach the antistatic wrist strap that was shipped with the Contivity 2700 or 2600 (see "Attaching the antistatic wrist strap" on page 72).

Caution: Electrostatic discharge can damage gateway components.

5 If you are replacing a DIMM, remove the installed DIMM as follows:

   a Press down the locking lever on either side of the DIMM (Figure 31).

   b Pull the DIMM up to remove it from the slot.

6 Press down the locking lever on either side of the slot where you plan to install the DIMM (Figure 31).

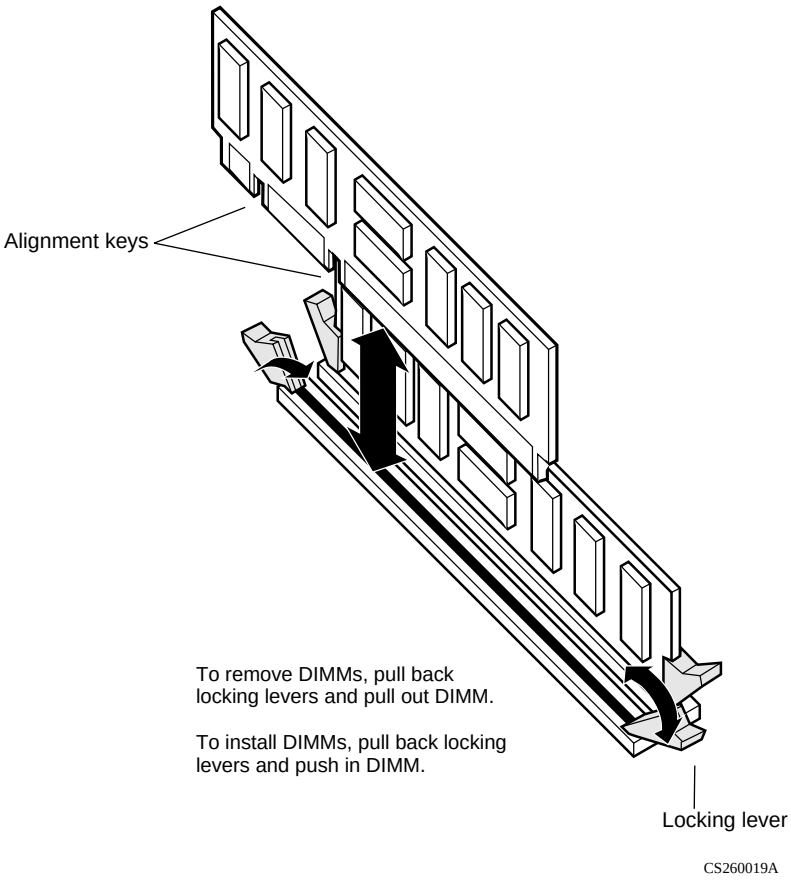
7 Place the new or replacement DIMM in the slot (Figure 31).

   Use the alignment keys to properly position the DIMM in the slot.

8 Press the DIMM firmly into the socket.

9 Pull up the locking lever on either side of the DIMM to snap it into position.

Figure 31 Installing and removing a DIMM



10 Replace the top cover on the chassis (see Figure 26 on page 70).

a Hold the cover at an angle and slide it onto the chassis.

b Using a screwdriver, insert and tighten the 4 screws to secure the cover to the chassis.

11 If the gateway is installed in an equipment rack, mount it in the rack.

a Set the Contivity 2700 or 2600 on the rack-mount shelf in the rack.

b Insert one of the panhead screws through the bottom hole on each side of the shelf into the hole in the rack and tighten the screws.

12 Replace the front bezel (see Figure 30 on page 76).

a Hold the bezel by its two handles and push it onto the chassis.

b Using the screwdriver, tighten the 2 screws to secure the bezel to the chassis.

Chapter 6
Contivity 4500 option installation

This section describes how to install or replace hardware components for the Contivity 4500.

Warning: Wear an antistatic band when handling electronic components for the Contivity 4500 to avoid damaging them.

Danger: Make sure to turn off the Contivity 4500 and unplug it before you attempt to install option cards or system memory.

Opening the Contivity 4500

To replace power supplies and hard disk drives, or to access the diskette drive for system recovery operations, you must remove the front bezel from the Contivity 4500. To install LAN or WAN cards, or to install additional memory, you must remove the front bezel and the top cover from the Contivity 4500.

Note: Removing the front bezel on the Contivity 4500 activates the chassis intrusion alarm only if the gateway is turned on. The intrusion alarm is reported to the system log file.

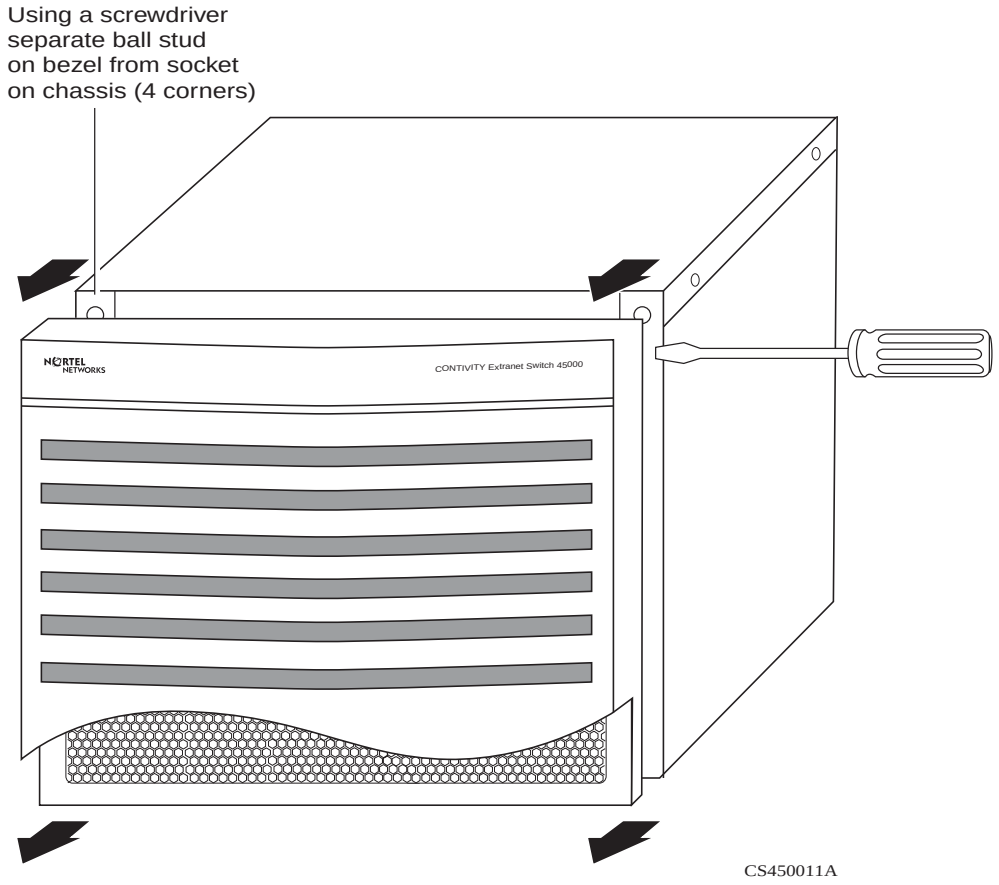
The first few times that you remove the front bezel it will be somewhat difficult to remove. This is because the ball stud and sockets are new. After a few times, removal is easier.

To remove the front bezel:

1. Insert a flat-head screwdriver into the slots on the lower left and right sides of the chassis, and pry the bezel forward.
2. Slide your fingers between the front bezel and the gateway.
3. Pull the bezel forward firmly, separating the ball studs on the bezel from the sockets on the chassis.

   Figure 32 shows you how to remove the front bezel from the gateway. You do not need to turn off the gateway to remove the front bezel.

Figure 32 Removing the Contivity 4500 front bezel

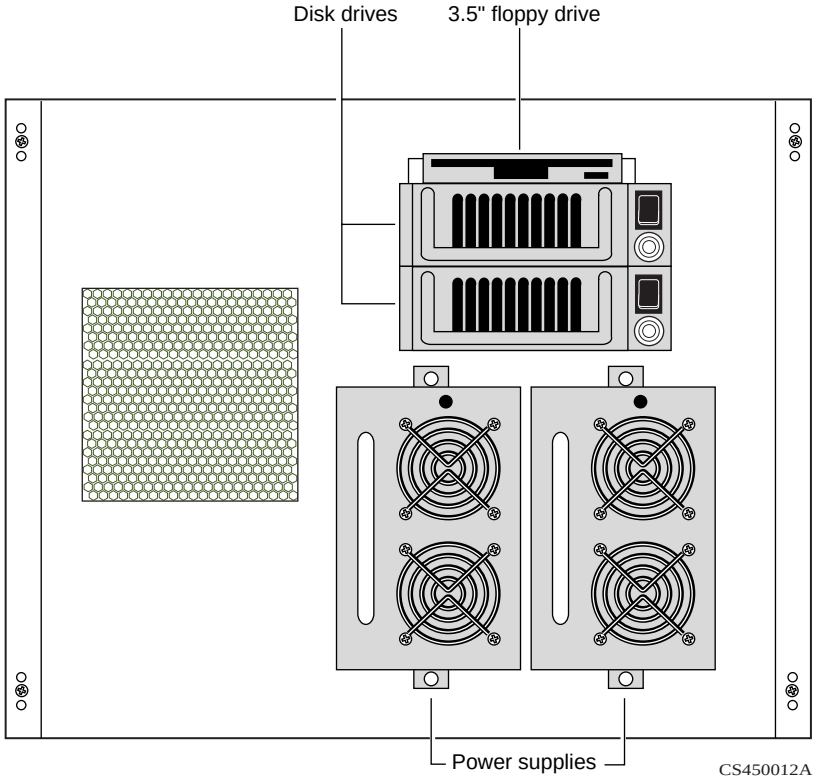


Remove the Contivity 4500 front bezel to:

- Replace a power supply.
- Replace a hard disk drive.
- Insert the recovery diskette.

Figure 33 shows the Contivity 4500 front components.

Figure 33 Contivity 4500 front components



Contivity 4500 system board layout

This section shows the Contivity 4500 system board.

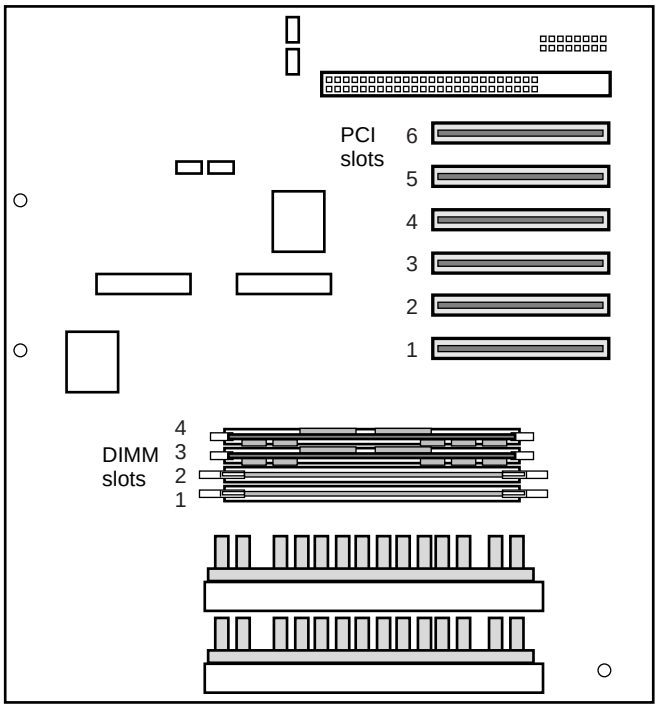
Warning: Only Nortel Networks trained service personnel should change existing hardware configurations. *Improper handling of internal components or assemblies, with the power connected, could cause severe injury.*

Note: Wear an antistatic wrist strap when handling electronic components for the Contivity 4500 to avoid damaging them.

Danger: Turn off the Contivity 4500 and unplug both power cords before you attempt to install option cards or system memory.

Figure 34 shows the Contivity 4500 system board, in particular the DIMMs and option card slots.

Figure 34 Sample Contivity 4500 system board



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Installing and replacing option cards

The Contivity 4500 has six slots for option cards (see Figure 34 on page 85). This section provides instructions on adding new option cards to the gateway or, if necessary, replacing an existing card. The following procedure is for Nortel Networks trained service personnel only.

Table 8 lists the option cards that you can install in the Contivity 4500.

Table 8 Supported option cards for the Contivity 4500

Option card	Maximum number	Restrictions
Hardware Accelerator	1	
10/100 Ethernet LAN interface	6	
ISDN BRI S/T or U interface[1]	5	
V.90 modem interface[1]	5	
T1/E1 CSU/DSU WAN interface	5	
Single V.35/X.21 WAN interface	5	
Dual V.35 WAN interface[2]	5	
HSSI WAN interface	2	

1 The Contivity 4500 must be running Version 4.80 or later.

2 This option card is no longer available for purchase.

To install or replace an interface card or a hardware encryption accelerator card:

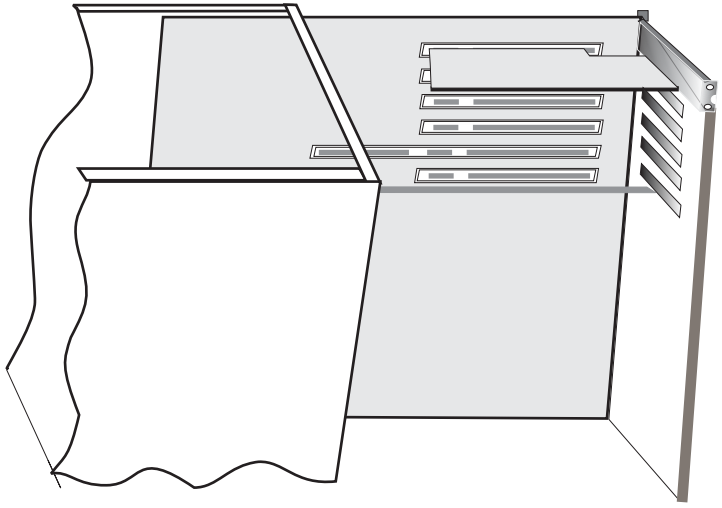
1. Turn off the gateway and unplug both power cords from the power source.
2. Unscrew the four slotted thumb screws securing the slide-out tray. Pull out the tray by gripping it with the screws. It will only pull out half way.
3. Remove the filler panel screw and pull out the slot filler panel.
4. Slide the option card into the intended slot. Make sure the card seats firmly and evenly into the card slot. If the card is not seated properly, it will not work. Populate the slots from Slot 1 to Slot 6, in that order.
5. Secure the option card in the tray with the slot filler panel screw.
6. Push in the tray by gripping it with the screws. Tighten the four slotted thumb screws securing the slide-out tray.

7 Plug in both power cords to the power source and turn on the gateway.

Caution: Be careful when inserting option cards into the Contivity 4500, because the slide-out tray is not fully supported once pulled out. You should support the back of the tray with your hand while inserting an option card.

Figure 35 shows you how to install LAN, WAN, or hardware accelerator option cards into the Contivity 4500. You can use the 6 slots for any mix of LAN and WAN or hardware accelerator cards; however, **you must populate the slots from bottom to top, in that order.**

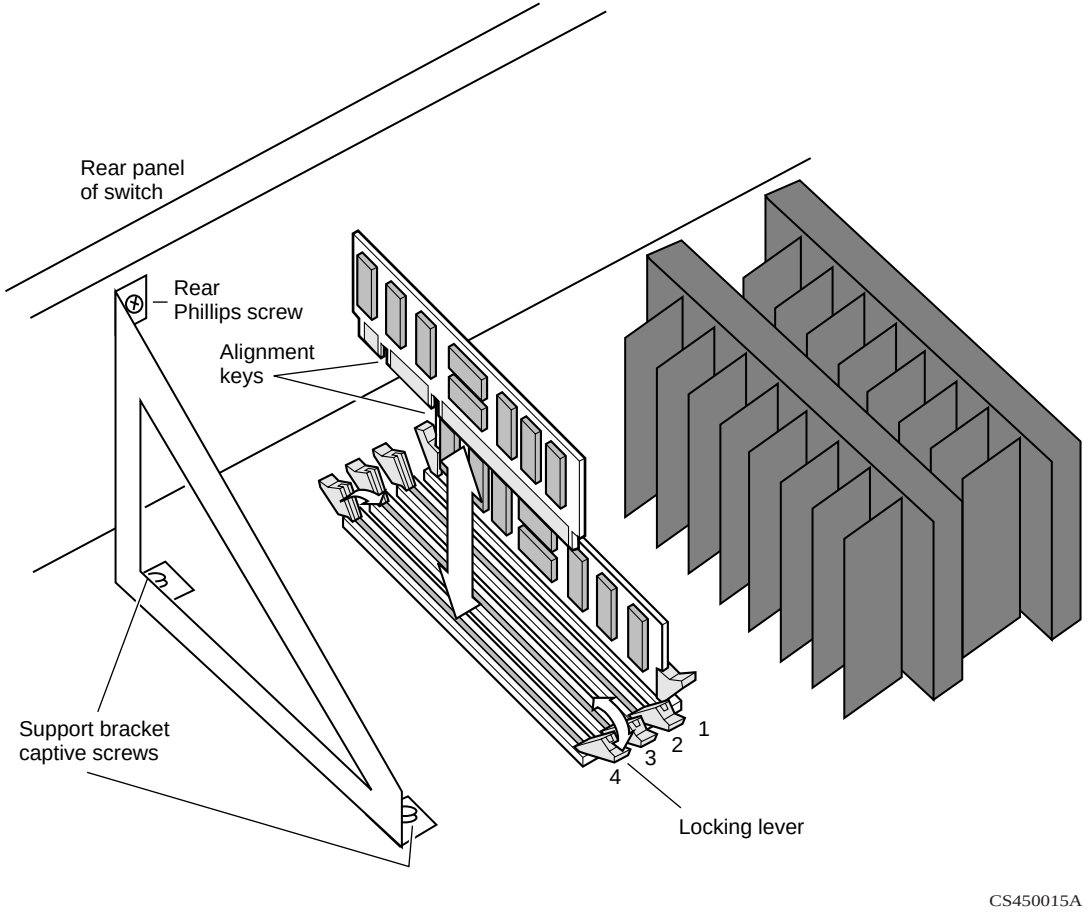
Figure 35 Installing Contivity 4500 option cards



Installing and replacing DIMMs

Figure 36 shows you how to unlock a dual inline memory module (DIMM) in the Contivity 4500, and remove or install a DIMM. Install a DIMM in the next available slot (for example, if the DIMM #1 slot is populated, then add the next DIMM to the DIMM #2 slot).

Figure 36 Installing Contivity 4500 DIMMs



To install a DIMM in the Contivity 4500:

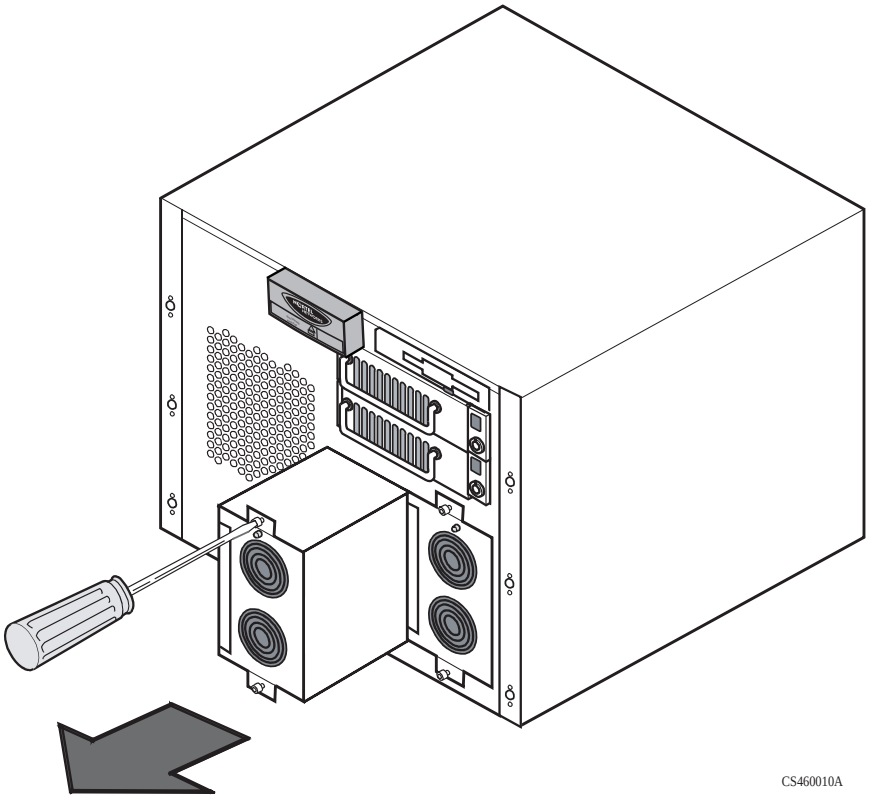
1. Turn off the gateway.
2. Remove the power cords.
3. Unscrew the slide-out tray at the back of the unit and pull it out using the thumb screws.
4. Remove the support bracket by loosening the two secured captive screws and the rear Phillips screw.
5. Press down the locking levers on both sides of the next available DIMM slot to allow the new DIMM to be inserted.
6. Place the new DIMM in the slot, making sure to properly position the DIMM's alignment keys. Make sure the DIMM is pressed firmly into the socket.
7. Pull up the locking levers on both sides of the DIMM, and snap the DIMM into the socket.
8. Replace the support bracket by tightening the two secured captive screws and the rear Phillips screw.
9. Push in the slide-out tray and tighten the thumb screws.

Caution: Be careful when inserting option cards into the Contivity 4500, because the slide-out tray is not fully supported once pulled out. You should support the back of the tray with your hand while inserting an option card.

Replacing a power supply

Figure 37 shows you how to replace a hot-swappable power supply for the Contivity 4500.

Figure 37 Removing a Contivity 4500 power supply



To remove the power supply:

1. Remove the front bezel as shown in Figure 32.
2. Use a flat-head screwdriver to unscrew the top and bottom power supply screws.
3. Grab the handle and pull the power supply firmly, until the device disengages. Avoid the sharp sheet-metal edges.

4 Insert the new power supply. Make sure the power supply seats firmly in its socket and is locked in. Be sure the green power LED on the front of the power supply is on.

5 Secure the power supply screws tightly with a screwdriver.

6 Replace the front bezel.

Replacing a hard disk drive

Warning: Contivity 4500 hard disks are not hot-swappable.

When swapping a disk drive, you must first perform the steps listed below to ready the Contivity 4500 for the swap. This process is referred to as "warm-swapping" a disk drive.

Software

First save any data that has not yet been saved to the hard disk from the disk cache:

1 Connect to the gateway using a Web browser and go to the Admin > File System screen.

2 Click the button "Prepare selected device for removal."

Hardware

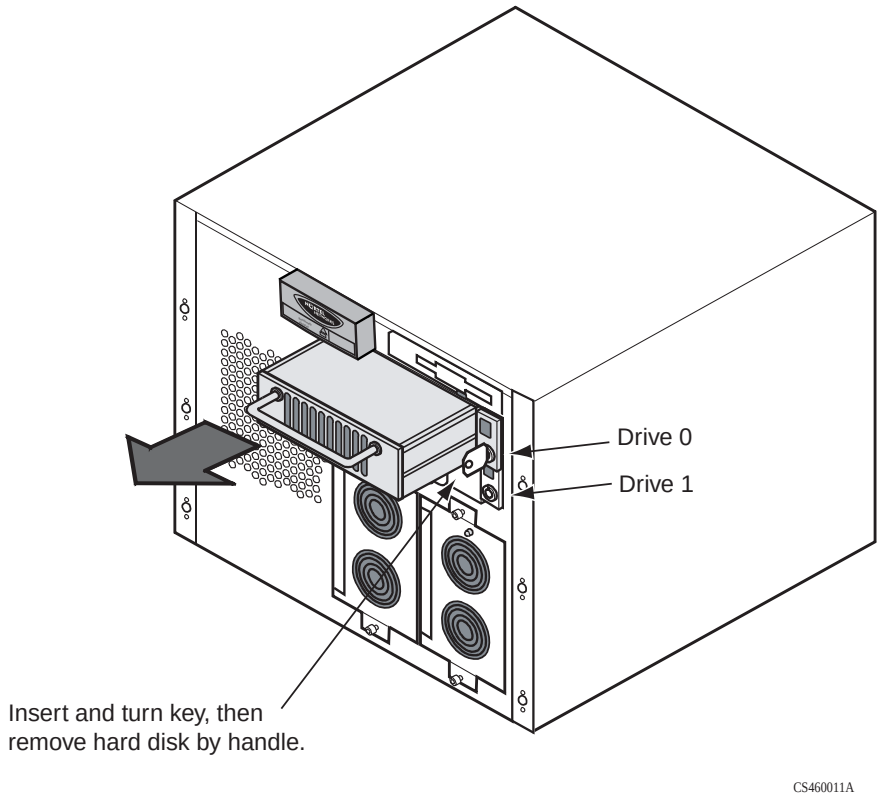
Remove the front bezel from the Contivity 4500 as shown in Figure 32, and then follow these steps:

1 Insert and turn the hard disk drive key to the right. The LED becomes a "U" for unlocked.

Note: Turning the key shuts off the power to the hard disk drive.

2 Pull the handle to remove the hard disk drive as shown in Figure 38.

Figure 38 Removing a Contivity 4500 hard disk drive



3 Insert the replacement hard drive fully, and lock it by turning the key clockwise. Make sure the hard disk drive LED shows the proper drive number.

4 Replace the front bezel.

5 Reload the software on the disk. Refer to “Using the Recovery Diskette” in *Installing the Contivity 4600* for more information on using the recovery diskette.

Software

Enable the gateway by following these steps:

1 Connect to the gateway using a Web browser and go to the Admin > File System screen.

2 Click on the drive and click the Enable button.

Chapter 7
Contivity 4600 option installation

This section describes how to install or replace hardware components for the Contivity 4600.

Caution: Wear an antistatic wrist strap when handling electronic components for the gateway to avoid damaging them.

Danger: Turn off the Contivity 4600 and unplug both power cords before you attempt to install option cards or system memory.

Opening the Contivity 4600

To replace power supplies and hard disk drives, or to access the diskette drive for system recovery operations, you must remove the front bezel from the Contivity 4600.

Note: Removing the front bezel on the Contivity 4600 activates the chassis intrusion alarm on power only. This intrusion is reported to the system log file.

The first few times you remove the front bezel it might seem to resist removal. This is simply because the ball stud and sockets are new. After a few times, removal is easier. Remove the Contivity 4600 front bezel as follows:

1. Insert a flat-head screwdriver into the slots on the lower left and right sides of the chassis, and pry the bezel forward.
2. Slide your fingers between the front bezel and the gateway.

3 Pull the bezel forward firmly, separating the ball studs on the bezel from the sockets on the chassis.

Figure 39 shows how to remove the front bezel from the Contivity 4600. You do not need to turn off the gateway to remove the front bezel when installing a power supply or hard disk drive.

Figure 39 Removing the Contivity 4600 front bezel

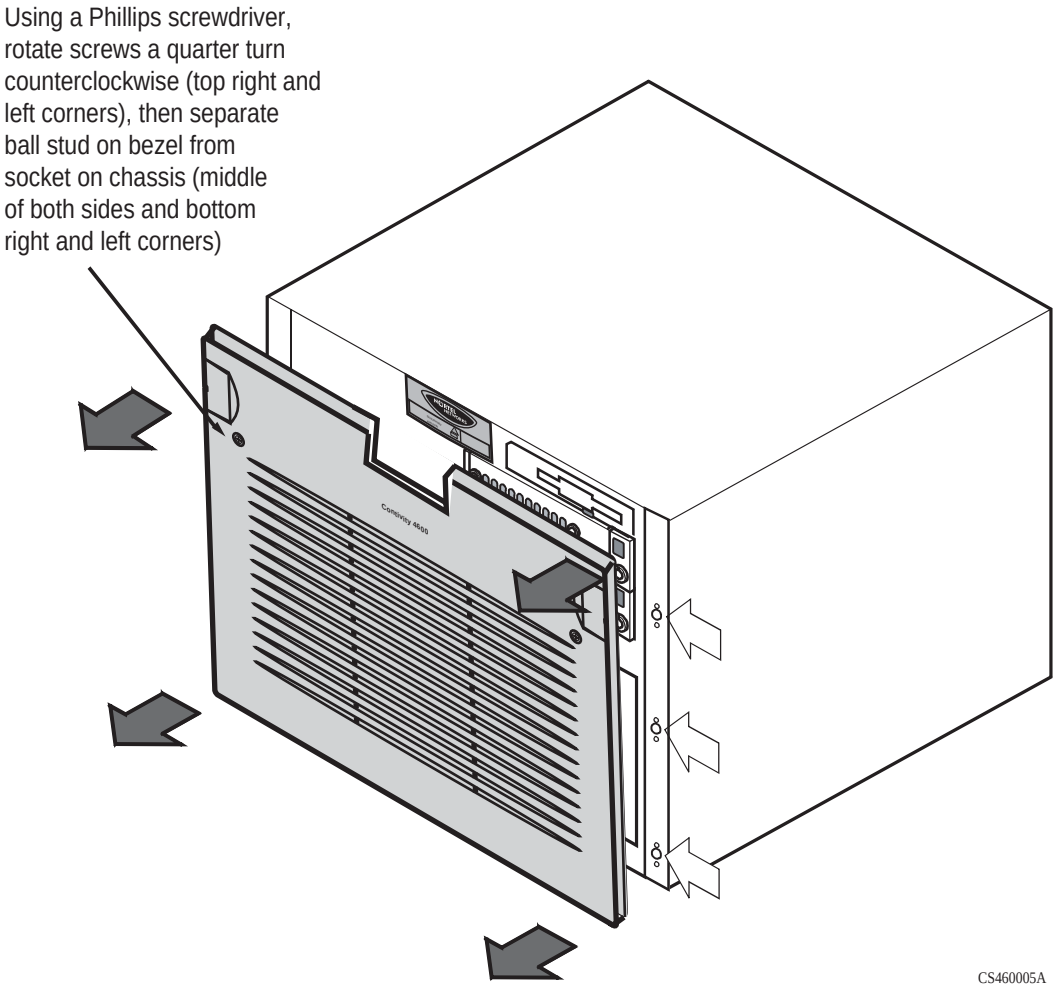
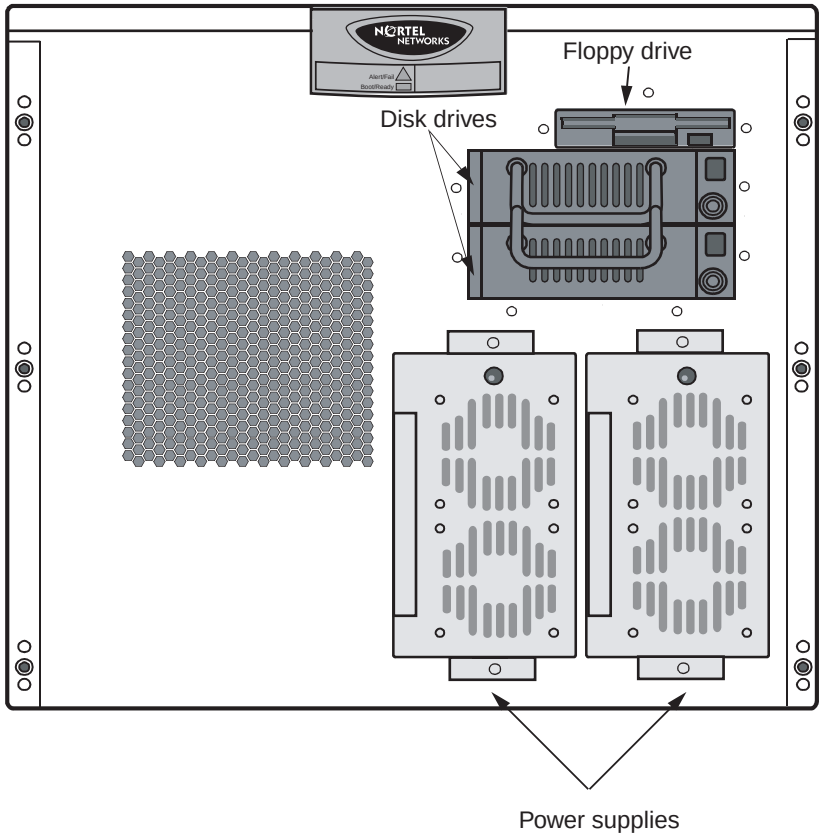


Figure 40 shows the Contivity 4600 front components.

Figure 40 Contivity 4600 front components



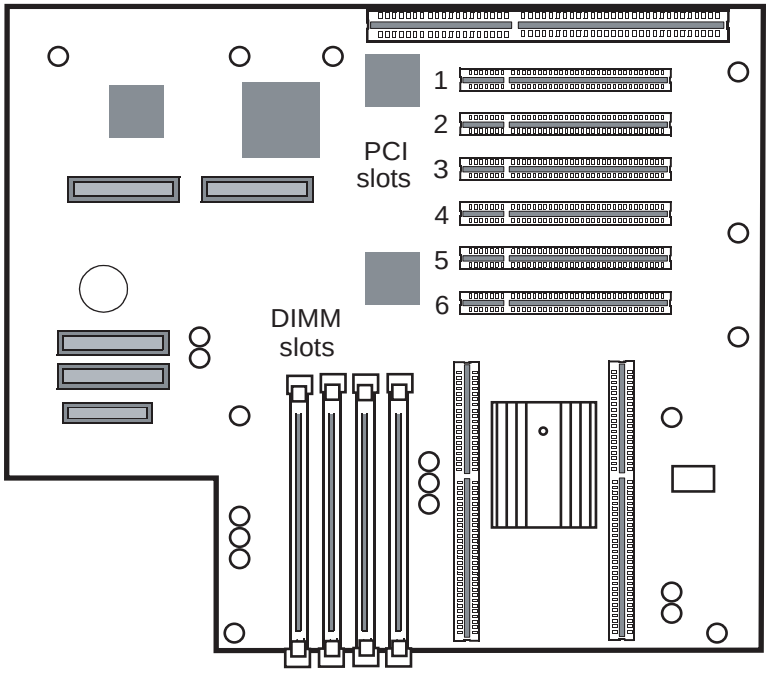
Contivity 4600 system board layout

This section shows the Contivity 4600 system board.

Warning: Only Nortel Networks trained service personnel should change existing hardware configurations. *Improper handling of internal components or assemblies, with the power connected, could cause severe injury.*

Figure 41 shows a sample Contivity 4600 system board, including the dual inline memory modules (DIMMs) and peripheral component interconnect (PCI) slots.

Figure 41 Sample Contivity 4600 system board



Installing and replacing option cards

The Contivity 4600 has six slots for option cards (see Figure 41 on page 96). This section provides instructions on adding new option cards to the gateway or, if necessary, replacing an existing card. The following procedure is for Nortel Networks trained service personnel only.

Table 9 lists the option cards that you can install in the Contivity 4600.

Table 9 Supported option cards for the Contivity 4600

Option card	Maximum number	Restrictions
Contivity Security Accelerator (CSA)[1]	2	Install two cards of either type, or one card of each type. Do not install the CSA card in slot 4.
Hardware Accelerator	2[2]	
10/100 Ethernet LAN interface	6	
1000BASE-T interface (copper)[1]	2	Install two 1000BASE-T cards, two 1000BASE-SX cards, or one card of each type. Do not install either card in slot 4.
1000BASE-SX interface (fiber)[1]	2	
ISDN BRI S/T or U interface[3]	5	
T1/E1 CSU/DSU WAN interface	5	
Quad T1/E1 CSU/DSU WAN interface[1]	3	
V.90 modem interface[3]	5	
Single V.35/X.21 WAN interface	5	
Dual V.35 WAN interface[4]	5	
HSSI WAN interface	2	

1 The Contivity 4600 must be running Version 4.90 or later.

2 To support two Hardware Accelerator cards, the gateway must be running Version 4.76 or later.

3 The Contivity 4600 must be running Version 4.80 or later.

4 This option card is no longer available for purchase.

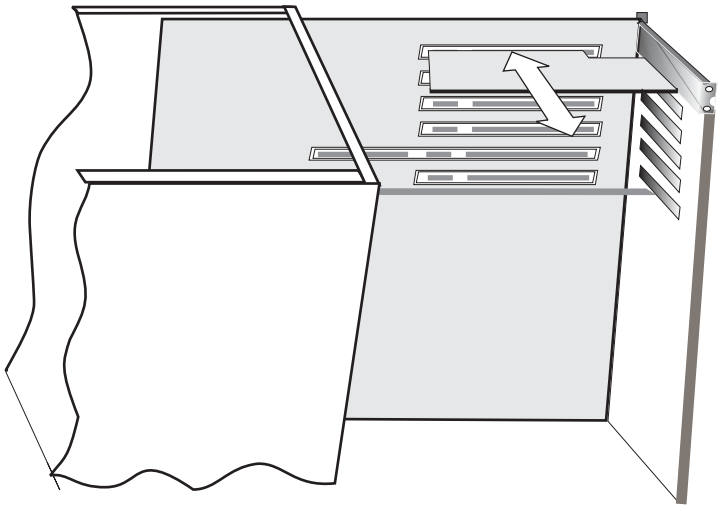
The Contivity 4600 supports a maximum of 16 I/O ports. This number includes the built-in LAN port on the gateway. When you provision a Contivity 4600 with I/O cards, do not exceed the 16-port maximum. For example, the following configuration results in 17 I/O ports:

- Built-in LAN port and installed 10/100 Ethernet LAN interface card (2 ports)
- Three quad T1/E1 CSU/DSU WAN interface cards (12 ports)
- One dual V.35 WAN interface card (2 ports)
- One ISDN BRI S/T interface card (1 port)

To install or replace an interface card or a hardware encryption accelerator card:

1. Turn off the gateway and unplug both power cords from the power source.
2. Unscrew the four slotted thumb-screws securing the slide-out tray. Pull out the tray by gripping it with the screws. It will only pull out halfway.
3. Remove the filler panel screw and pull out the slot filler panel.
4. Slide the option card into the intended slot. Make sure the card seats firmly and evenly in the card slot. If the card is not seated properly, it will not work. Populate the slots from slot 1 to slot 6 (top to bottom), in that order, as shown in Figure 42.

Figure 42 Installing Contivity 4600 option cards



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5. Secure the option card in the tray with the slot filler panel screw.
6. Push in the tray by gripping it with the screws. Tighten the four slotted thumb-screws securing the slide-out tray.
7. Plug in both power cords to the power source and turn on the Contivity 4600.

Caution: Be careful when inserting option cards into the Contivity 4600, because the slide-out tray is not fully supported once pulled out. You should support the back of the tray with your hand while inserting an option card.

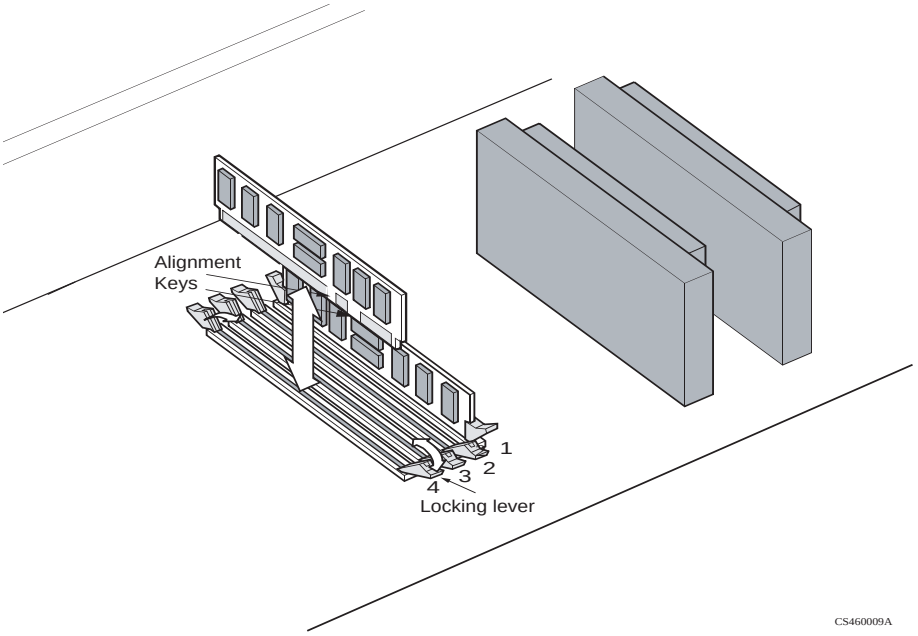
Installing and replacing DIMMs

Figure 43 shows you how to unlock a DIMM in the Contivity 4600, and remove or install a DIMM. Install a DIMM in the next available slot (for example, if the DIMM #1 slot is populated, then add the next DIMM to the DIMM #2 slot).

To install a DIMM in the Contivity 4600:

1. Turn off the gateway and unplug both power cords from the power source.
2. Unscrew the four slotted thumb-screws securing the slide-out tray. Pull out the tray by gripping it with the screws. It will only pull out halfway.
3. Unscrew the slide-out tray at the back of the unit and pull it out using the thumb screws.
4. Remove the support bracket by loosening the two secured captive screws and the rear Phillips screw.
5. Press down the locking levers on both sides of the next available DIMM slot.
6. Place a new DIMM in the slot, making sure to properly position the DIMM alignment keys, as shown in Figure 43.

Figure 43 Installing Contivity 4600 DIMMs



7 Pull up the locking levers on both sides of the next available DIMM, and snap the DIMM into its socket.

8 Replace the support bracket by tightening the two secured captive screws and the rear Phillips screw.

9 Push in the slide-out tray and tighten the thumb-screws.

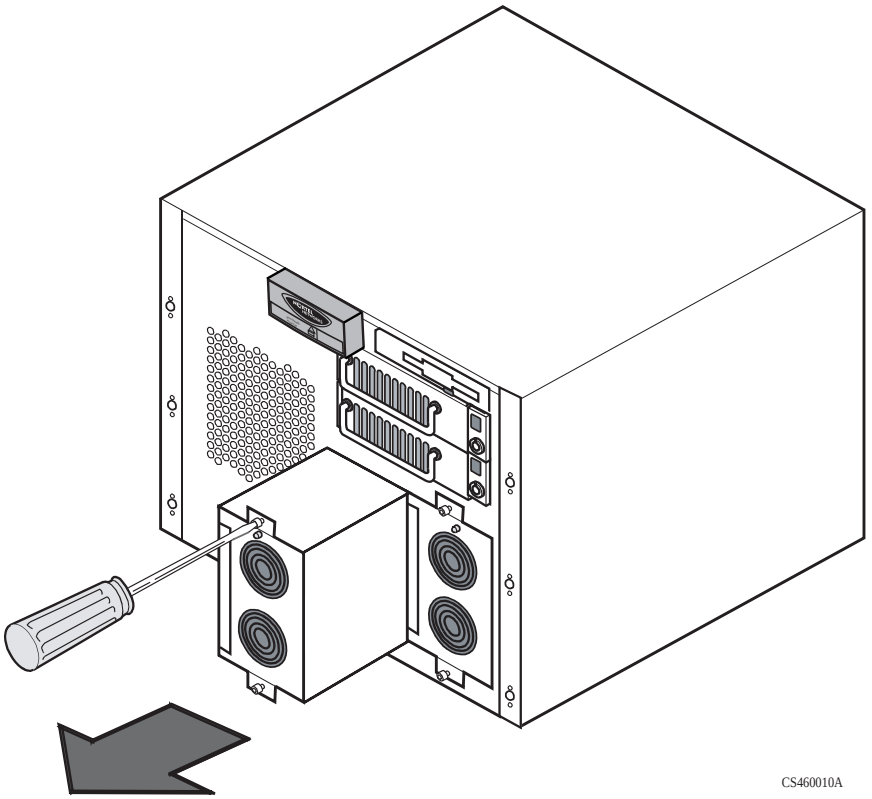
Replacing a power supply

To remove the power supply:

1 Remove the front bezel as shown in Figure 39.

2 Use a flat-head screwdriver to unscrew the top and bottom power supply screws, as shown in Figure 44.

Figure 44 Removing a Contivity 4600 power supply



3 Grab the handle and pull the power supply firmly, until the device disengages. Be careful of the sharp sheet-metal edges.

4 Insert the new power supply. Make sure it seats firmly in its socket and is locked in. Be sure the green power LED on the front of the power supply is on.

5 Secure the power supply screws tightly with a screwdriver.

6 Replace the front bezel.

Replacing a hard disk drive

Figure 45 shows you how to replace Contivity 4600 hard disk drives.

Caution: Hard disks are not hot-swappable.

To replace a hard disk drive, you must do the following:

Software

First save any data that has not yet been saved to the hard disk from the disk cache:

1. Use your Web browser to navigate to the gateway, and go to the Admin > File System display.
2. Click the button “Prepare selected device for removal.”

Hardware

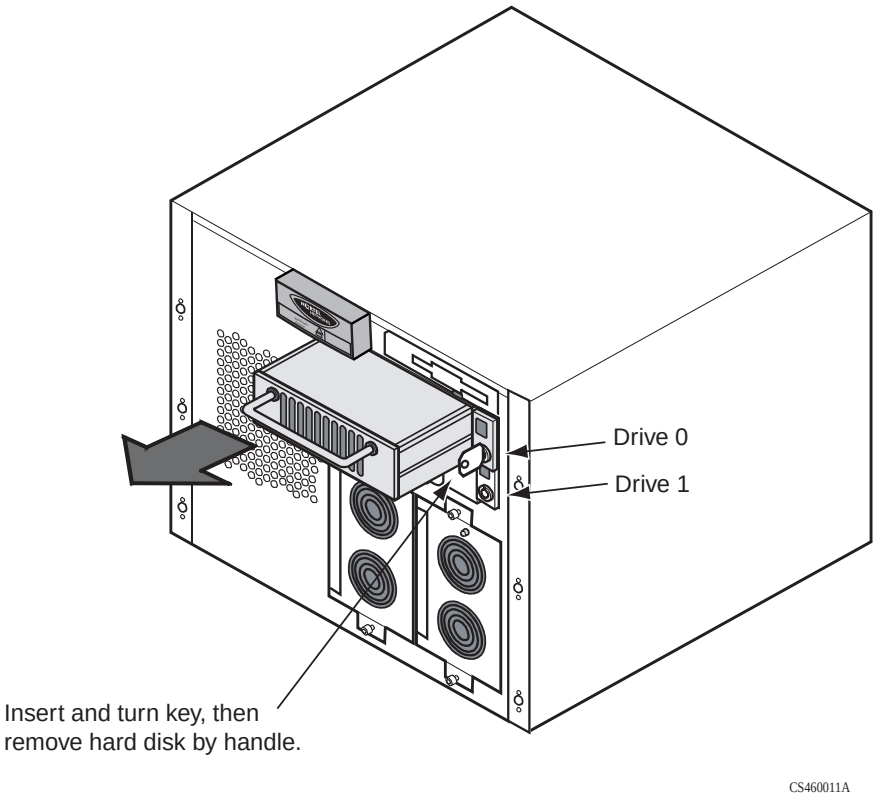
Next, remove the Contivity 4600 front bezel as shown in Figure 39, and then follow these steps:

1. Insert and turn the hard disk drive key to the right. The LED becomes a “U” for unlocked.

Note: Turning the key shuts off the power to the hard disk drive.

2. Pull the handle to remove the hard disk drive, as shown in Figure 45.

Figure 45 Removing a Contivity 4600 hard disk drive



3 Insert the replacement hard drive fully, and lock it by turning the key clockwise. Make sure the hard disk drive LED shows the proper drive number.

4 Replace the front bezel.

If you need to reload the software on the disk, see the information on using the recovery diskette in the book *Installing the Contivity 4600*.

Software

Enable the Contivity 4600 by following these steps:

1 Use your Web browser to navigate to the gateway, and go to the Admin > File System display.

2 Click on the drive and click the Enable button.

Chapter 8
Contivity 5000 option installation

This chapter provides instructions on how to install and replace the following field replaceable units (FRUs) in the Contivity 5000:

- LAN, WAN, and serial interface cards
- Hardware encryption accelerator cards
- Dual inline memory modules (DIMMs)
- Power supplies
- Hard disk drives
- Fan trays

This chapter contains the following topics:

Preparing to install hardware options

This section describes preliminary steps for installing and replacing field replaceable units in the Contivity 5000.

Option cards, DIMMs, and fan trays

To install an option card, pair of DIMMs, or fan tray, you must first follow these steps:

1. Shut down the Contivity 5000 and unplug it.
2. Remove the front bezel from the chassis.
3. Remove the chassis from the equipment rack.
4. Remove the top cover from the chassis.

If you need to add or replace an option card, pair of DIMMs, or fan tray, see "Shutting down the system to add or replace hardware" on page 107.

Power supplies

The Contivity 5000 power supplies are hot-swappable. You do not need to shut down the system to replace a power supply. For instructions, see "Replacing a power supply" on page 119.

Hard disk drives

The backup hard disk drive is hot-swappable, but the primary disk drive is not.

- To replace either hard disk drive, you must remove the front bezel.
- To replace the primary hard disk drive, you must first shut down the gateway.

For complete information about replacing a hard disk drive, see "Replacing a hard disk drive" on page 122.

Shutting down the system to add or replace hardware

Shut down the Contivity 5000 and unplug it to install or replace any of these field replaceable units:

- Option card
- Pair of DIMMs
- Fan tray

To replace the primary hard disk drive, shut down the system as described in this section. However, you do not need to unplug the chassis to replace a hard drive.

Caution: Shut down the Contivity 5000 as described in this section before you attempt to add or replace option cards, DIMMs, fan trays, or hard disk drives.

To shut down the Contivity 5000:

1. Use the Web GUI or the command line interface to shut down the gateway.
   - Web GUI: Choose Admin > Shutdown. Select the option to power off the gateway after shutdown.
   - Command line interface: Use the **`reload`** command to shut down the system. For example, enter **`reload power-off disable-logins "Upgrade hardware"`**

     For the complete syntax of the **`reload`** command, see the *Reference for the Contivity Secure IP Services Gateway Command Line Interface*.
2. Wait for the system to shut down. You may need to wait several minutes.
3. Disconnect the two power cords from the power outlets and then disconnect the cords from the Contivity 5000.

   The power receptacles are located on the rear of the Contivity 5000.

Danger: Make sure to turn off the Contivity 5000 and unplug *both* power cords before you attempt to remove or install an option card, DIMM, or fan tray.

Removing the front bezel and top cover

To replace a hard disk drive, you must remove the front bezel from the Contivity 5000. To install option cards or DIMMs, or to replace a fan tray, you must remove the front bezel and the top cover from the Contivity 5000.

To remove the front bezel:

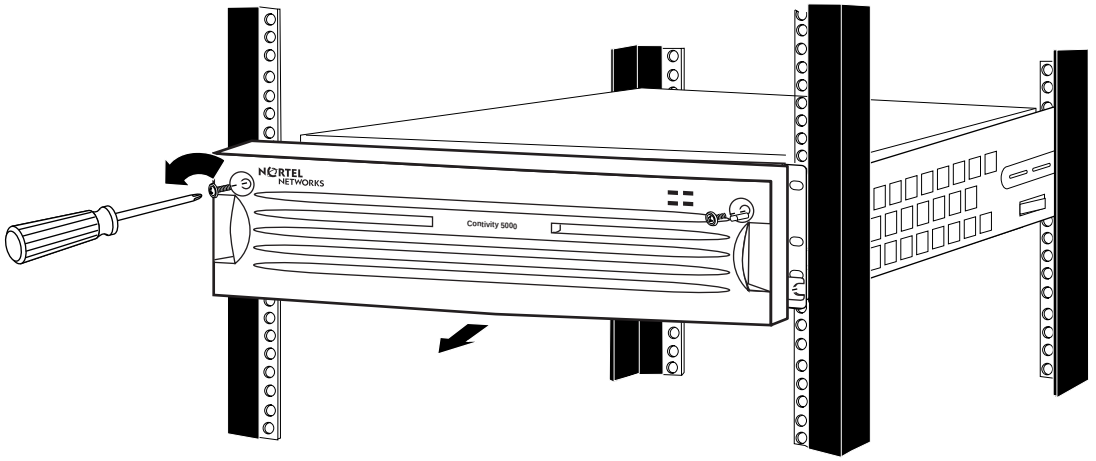
1. Shut down the Contivity 5000 using the Web GUI or the command line interface and then unplug it as described in "Shutting down the system to add or replace hardware" on page 107.

   You do not need to unplug the gateway to replace a hard disk drive.

Danger: Make sure to turn off the Contivity 5000 and unplug it before you attempt to install an option card, DIMM, or fan tray.

2. Using a Phillips screwdriver, turn each of the 2 screws on the front bezel a quarter turn counterclockwise (Figure 46).

Figure 46 Removing the front bezel



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3 Grip the two handles and firmly pull the bezel toward you to unsnap it from the chassis.

The first few times that you remove the front bezel, it may be somewhat difficult to remove because the ball studs and socket clips are new.

Note: If you are replacing a hard disk drive, you do not need to remove the chassis from the equipment rack; go to "Replacing a hard disk drive" on page 122.

If the Contivity 5000 is installed in an equipment rack, you must remove it from the rack to add or replace DIMMs, option cards, or fan trays.

To remove the chassis from the rack:

1 At the front of the chassis, remove the two 1/2-in. truss screws that secure the bottom of the chassis to the equipment rack.

Warning: The Contivity 5000 weighs approximately 50 pounds (23 kg). This weight is not evenly distributed; the right side of the gateway weighs more than the left. For this reason, two people should remove the system from the equipment rack.

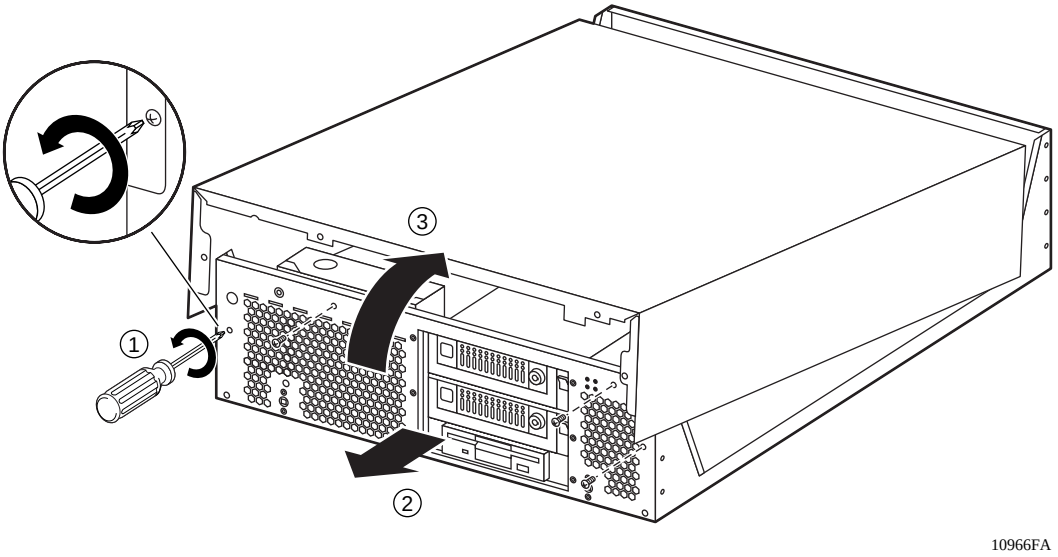
2 With two people facing the front of the equipment rack, remove the Contivity 5000 from the rack-mount shelf and set it on a sturdy surface.

To remove the top cover:

1 Using a Phillips screwdriver, remove the 4 screws that secure the cover to the chassis (Figure 47).

2 Slide the top cover forward approximately 1/4 inch.

Figure 47 Removing the top cover



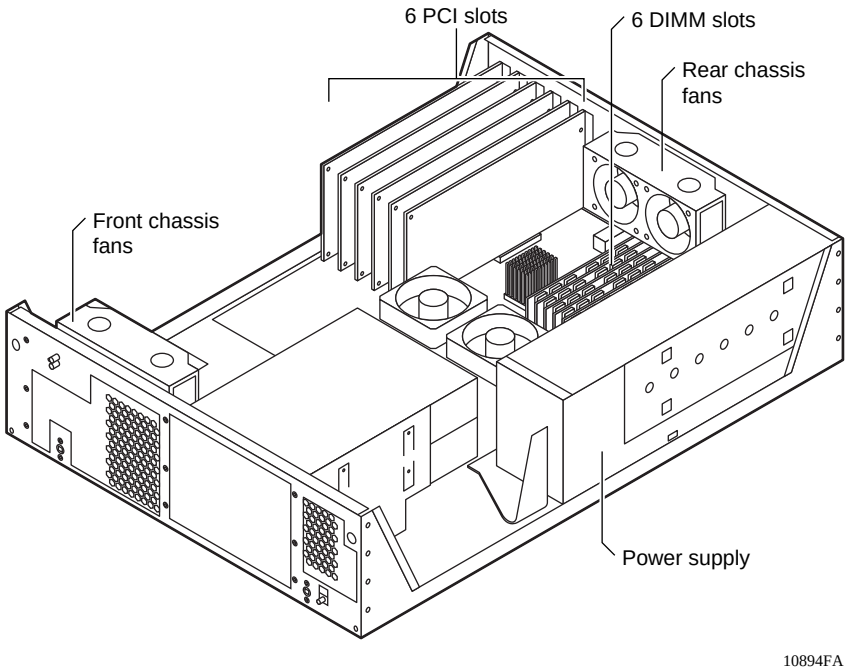
3 Lift the lid 2 or 3 inches and pull it toward you to remove it from the chassis.

The Contivity 5000 system board is now exposed. Figure 48 shows the location of the option card slots, the DIMM slots, and the fan trays on the system board.

Go to the appropriate section in this chapter.

- “Installing and replacing option cards” on page 113
- “Installing and replacing DIMMs” on page 117
- “Replacing a fan tray” on page 126

Figure 48 Location of option cards, DIMMs, and fan trays on the system board



Warning: Beware of danger if battery is incorrectly replaced. Replace with the *same* or an *equivalent battery* only, as recommended by the manufacturer's instructions.

Danger: In spite of the above warning, which is mandated for regulatory approval, *you should not change the battery.* If you suspect a dead battery, contact Nortel Networks Customer Support.

Attaching the antistatic wrist strap

Nortel Networks ships the Contivity 5000 with an antistatic wrist strap. The antistatic wrist strap directs the discharge of static electricity from your body to the chassis of the gateway to avoid damage to sensitive electronic components.

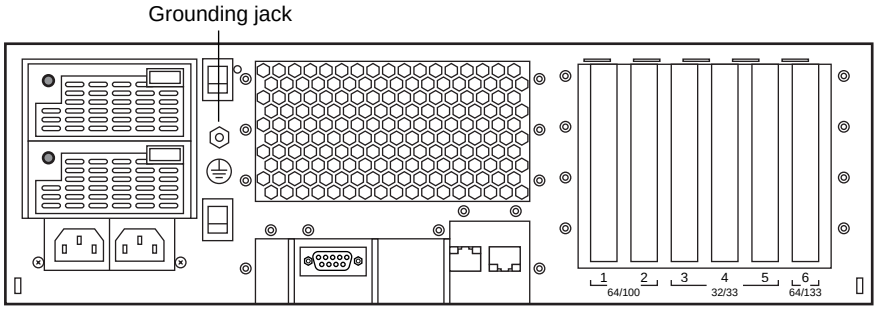
You must wear an antistatic wrist strap on your arm whenever you remove, install, or handle option cards, DIMMs, power supplies, hard disk drives, and fan trays.

Caution: Electrostatic discharge can damage hardware. Follow the procedure in this section to protect your equipment from damage.

To attach the antistatic wrist strap:

1. Locate the antistatic wrist strap and verify that the cable is attached to the wrist strap.
2. Place the strap around your wrist and adjust it to ensure that the metal buckle inside the strap touches your skin.
3. Insert the banana plug into the grounding jack at the rear of the chassis (Figure 49).

Figure 49 Location of the grounding jack for the antistatic wrist strap



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Installing and replacing option cards

The Contivity 5000 has six slots for option cards (see Figure 48 on page 111). These slots are connected to three separate buses:

- Slots 1 and 2 are connected to the 64-bit/100-MHz bus.
- Slots 3, 4, and 5 are connected to the 32-bit/33-MHz bus.
- Slot 6 is connected to the 64-bit/133-MHz bus.

If you install a slower (32-bit/33-MHz) card such as the 10/100 Ethernet LAN in a slot attached to a faster bus, the speed of the whole bus is reduced to the speed of the slower card. For example, if you install a 10/100 Ethernet LAN card in slot 1, any card installed in slot 2 runs at 32/33, not the bus speed of 64/100.

Note: The HSSI WAN interface and the dual V.35 WAN card are supported in slots 3, 4, and 5 only (that is, the slots connected to the 32-bit/33-MHz bus).

Table 10 lists the option cards that you can install in the Contivity 5000.

Table 10 Supported option cards for the Contivity 5000

Option card	Maximum number	Restrictions
Contivity Security Accelerator (CSA)[1]	2	Install two cards of either type or one card of each type. If possible, install the second card in slot 2.
Hardware Accelerator	2	
10/100 Ethernet interface	5	If possible, install in slots 3, 4, and 5.
1000BASE-T interface (copper)[1]	2	Install two 1000BASE-T cards, two 1000BASE-SX cards, or one card of each type.
1000BASE-SX interface (fiber)[1]	2	
ADSL WAN interface[1]	5	
ISDN BRI S/T or U interface[2]	5	If possible, install in slots 3, 4, and 5.
T1/E1 CSU/DSU WAN interface	5	If possible, install in slots 3, 4, and 5.
Quad T1/E1 CSU/DSU WAN interface[1]	3	
V.90 modem interface[2]	5	If possible, install in slots 3, 4, and 5.
Single V.35/X.21 WAN interface	5	If possible, install in slots 3, 4, and 5.

Table 10 Supported option cards for the Contivity 5000 (continued)

Option card	Maximum number	Restrictions
Dual V.35 WAN interface[3]	3	Install in slots 3, 4, and 5 only.
HSSI WAN interface	2	Install in slots 3, 4, and 5 only.

1 The Contivity 5000 must be running Version 4.90 or later.

2 The Contivity 5000 must be running Version 4.80 or later.

3 This option card is no longer available for purchase.

The Contivity 5000 supports a maximum of 16 I/O ports. This number includes the two built-in LAN ports on the gateway. When you provision a Contivity 5000 with I/O cards, do not exceed the 16-port maximum. For example, the following configuration results in 17 I/O ports:

- Two built-in LAN ports (2 ports)
- Three quad T1/E1 CSU/DSU WAN interface cards (12 ports)
- One 1000BASE-SX Ethernet interface card (1 port)
- One (legacy) dual V.35 WAN interface card (2 ports)

To install or replace an interface card or a hardware encryption accelerator card:

1 Shut down the Contivity 5000 using the Web GUI or the command line interface and then unplug it as described in “Shutting down the system to add or replace hardware” on page 107.

Danger: Turn off the Contivity 5000 and unplug it before you attempt to install an option card.

2 Remove the front bezel from the chassis, then remove the chassis from the equipment rack (see “Removing the front bezel and top cover” on page 108).

3 Remove the top cover from the chassis (see “Removing the front bezel and top cover” on page 108).

4 Attach the antistatic wrist strap that was shipped with the Contivity 5000 (see “Attaching the antistatic wrist strap” on page 112).

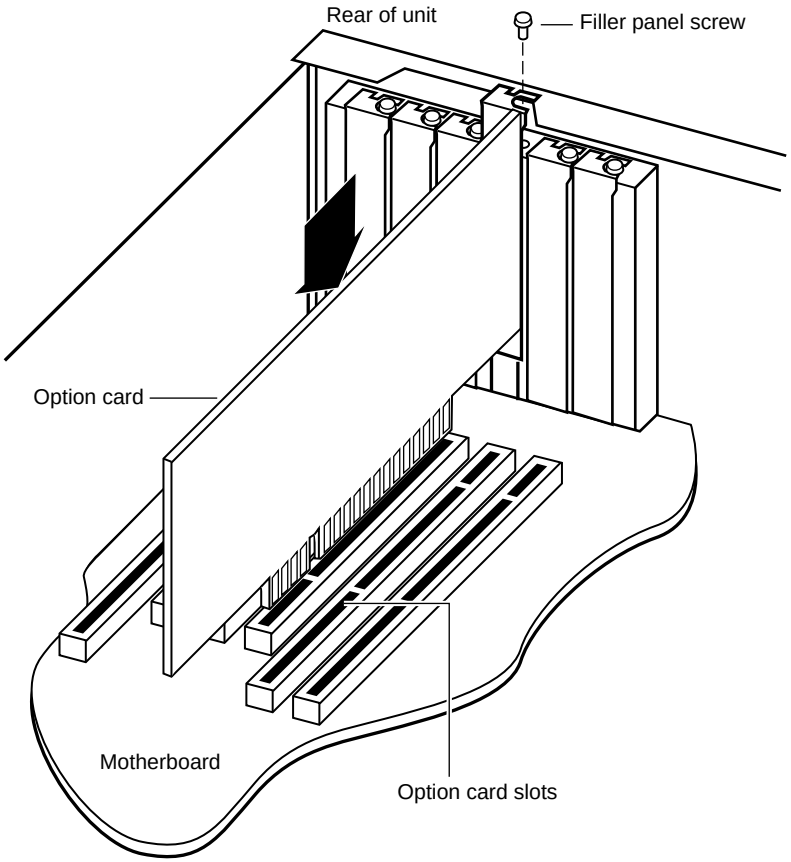
5 Locate the slot where you plan to install the new or replacement option card (see Table 10 on page 113 for guidelines).

6 Remove the filler panel screw and pull out the filler panel (or the option card that you are replacing) from the slot (Figure 50).

7 Lower the new option card into the slot connector and gently press the option card into the connector.

Make sure that the card is seated firmly in the slot. If the card is not seated properly, it will not work.

Figure 50 Installing and removing an option card



8 Replace the screw that secures the card to the slot (Figure 50).

9 Replace the top cover on the chassis (see Figure 47 on page 110).

a Hold the cover at an angle and slide it onto the chassis.

b Using a screwdriver, insert and tighten the 4 screws that secure the cover to the chassis.

Warning: The Contivity 5000 weighs approximately 50 pounds (23 kg). Two people are needed to install the gateway in the equipment rack.

10 With two people facing the front of the equipment rack, set the Contivity 5000 on the rack-mount shelf.

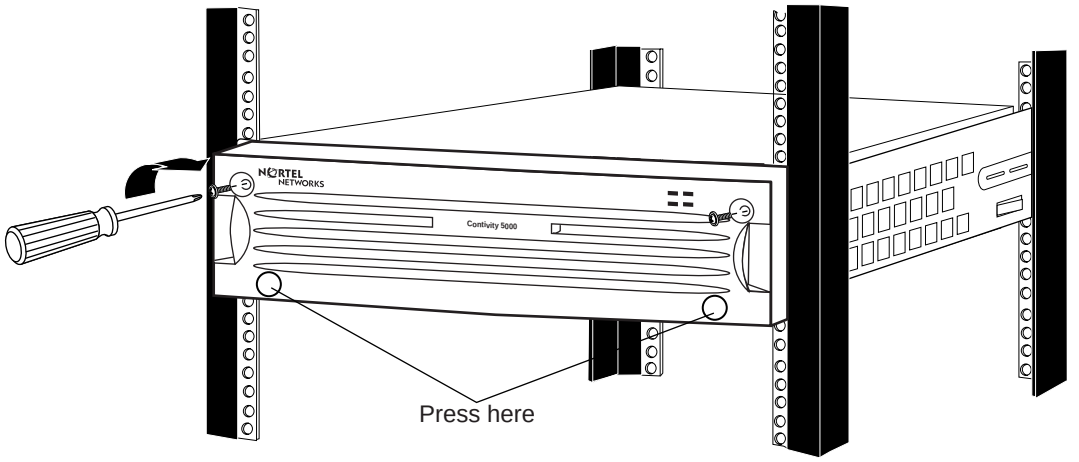
11 Insert one of the 1/2-in. truss screws through the bottom hole on each side of the shelf into the hole in the rack and tighten the screws.

12 Replace the front bezel (Figure 51).

a Hold the bezel by its two handles and push it onto the chassis.

b Using a screwdriver, tighten the 2 screws to secure the bezel to the chassis.

Figure 51 Replacing the front bezel



Installing and replacing DIMMs

The Contivity 5000 has six slots for dual inline memory modules (DIMMs) (see Figure 48 on page 111). Unless you ordered additional memory, the Contivity 5000 is shipped with two 256 MB DIMMs installed. You can upgrade memory by installing one or two additional *pairs* of DIMMs (additional DIMMs must be installed two at a time).

Caution: Make sure to install the same type of DIMM that is already installed in your gateway. For example, do not install a 128 MB DIMM in the Contivity 5000.

To install or replace a DIMM:

1. Shut down the Contivity 5000 using the Web GUI or the command line interface and then unplug it as described in "Shutting down the system to add or replace hardware" on page 107.

Danger: Turn off the Contivity 5000 and unplug it before you attempt to install DIMMs.

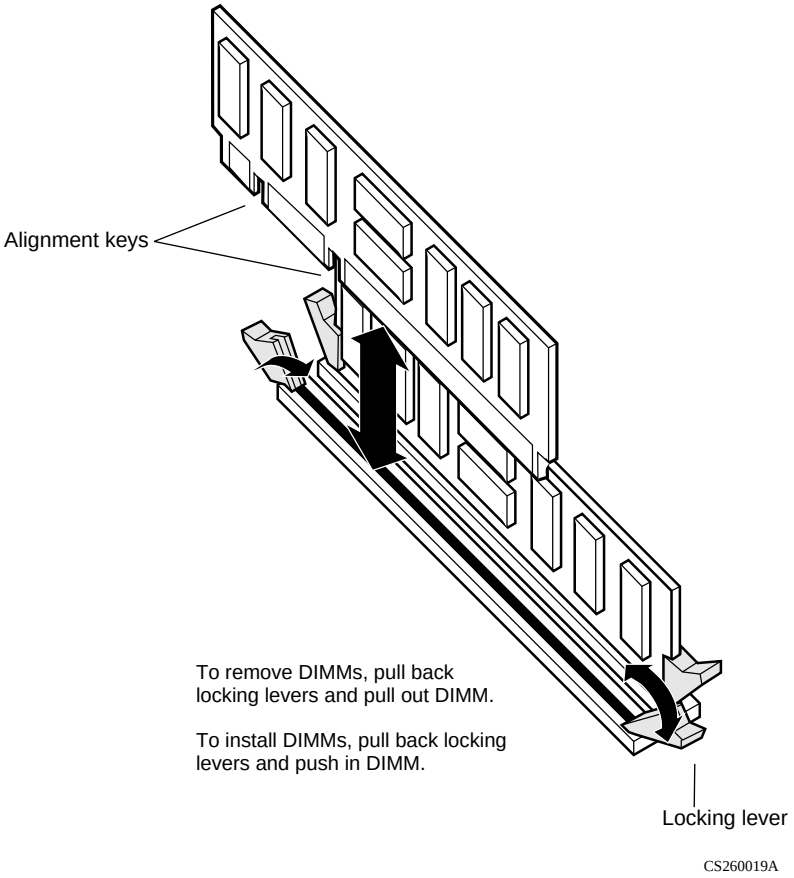
2. Remove the front bezel from the chassis, then remove the chassis from the equipment rack (see "Removing the front bezel and top cover" on page 108).
3. Remove the top cover from the chassis (see "Removing the front bezel and top cover" on page 108).
4. Attach the antistatic wrist strap that was shipped with the Contivity 5000 (see "Attaching the antistatic wrist strap" on page 112).
5. If you are replacing a DIMM, remove the installed DIMM as follows:
   a. Press down the locking lever on either side of the DIMM (Figure 52).
   b. Pull the DIMM up to remove it from the slot.
6. Install the new DIMM by pressing down the locking lever on either side of the empty DIMM slot (Figure 52).
7. Place the new or replacement DIMM in the slot (Figure 52).

   Use the alignment keys to properly position the DIMM in the slot. The alignment keys enforce the proper installation of the DIMM.

8 Press the DIMM firmly into the socket.

9 Pull up the locking lever on either side of the DIMM to snap it into position.

Figure 52 Installing and removing a DIMM



10 Replace the top cover on the chassis (see Figure 47 on page 110).

a Hold the cover at an angle and slide it onto the chassis.

b Using a screwdriver, insert and tighten the 4 screws to secure the cover to the chassis.

Warning: The Contivity 5000 weighs approximately 50 pounds (23 kg). Two people are needed to install the gateway in the equipment rack.

11 With two people facing the front of the equipment rack, set the Contivity 5000 on the rack-mount shelf.

12 Insert one of the 1/2-in. truss screws through the bottom hole on each side of the shelf into the hole in the rack and tighten the screws.

13 Replace the front bezel (see Figure 51 on page 116).

a Hold the bezel by its two handles and push it onto the chassis.

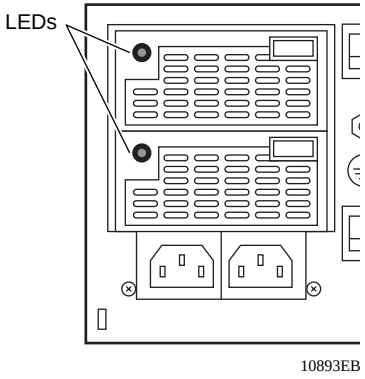
b Using the screwdriver, tighten the 2 screws to secure the bezel to the chassis.

Replacing a power supply

The Contivity 5000 ships with dual hot-swappable 350 W power supplies installed in the chassis. The power supplies share the load of providing power to the Contivity 5000. If one power supply fails, the second one provides all the power required by the gateway.

The power supplies are accessible from the rear of the chassis (Figure 53).

Figure 53 Location of the Contivity 5000 power supplies



If a power supply fails, the following indicators report the failure:

- LED on the power supply lights yellow.
- Front-panel Fail LED lights red.
- Audible alarm beeps.
- Event and system logs report the failure.

Replace a failed power supply as soon as possible.

Caution: Two power supplies must be installed to ensure proper airflow. If a power supply fails and you do not have a replacement power supply, leave the failed power supply installed until a replacement is available.

You can replace a power supply with the system power on or off. (To turn off the system, see "Shutting down the system to add or replace hardware" on page 107.)

To replace a power supply:

1. Attach the antistatic wrist strap that was shipped with the Contivity 5000 (see "Attaching the antistatic wrist strap" on page 112).
2. Remove the failed power supply from the chassis.
   a. Squeeze up on the metal portion of the power supply handle that is on the underside of the handle (Figure 54).
   b. Pull on the handle to remove the power supply from the chassis.

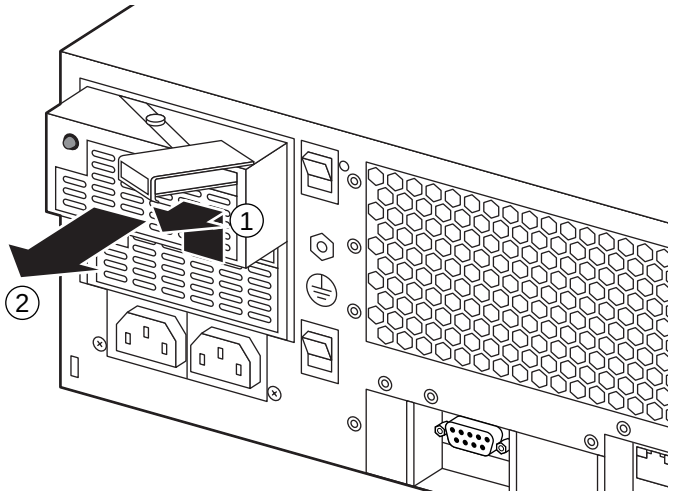
      As you pull on the handle, the handle rotates to the left.

Caution: The power supply will feel hot to the touch, even if the Contivity 5000 has been turned off. The power supply is operating as designed.

   c. Support the bottom of the power supply as you pull it free of the chassis.

   When you remove a power supply, the Contivity 5000 automatically redistributes the power load to the remaining power supply.

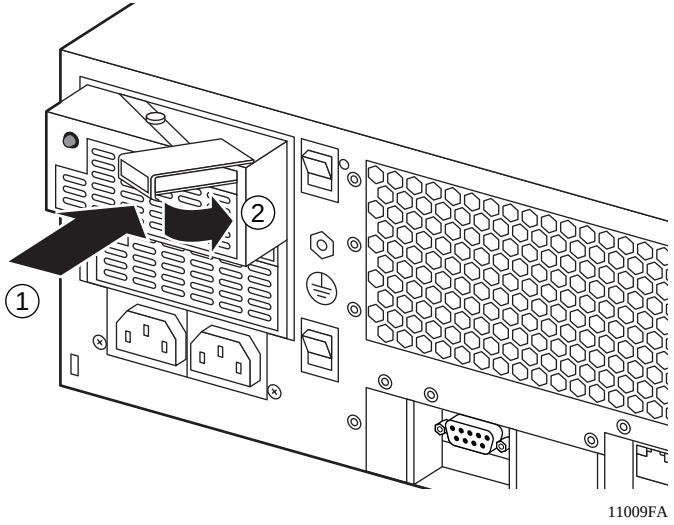
Figure 54 Removing a power supply



3 Insert the replacement power supply into the chassis.

a Guide the power supply into the slot (Figure 55).

Figure 55 Inserting a power supply



b Push the power supply all the way into the slot.

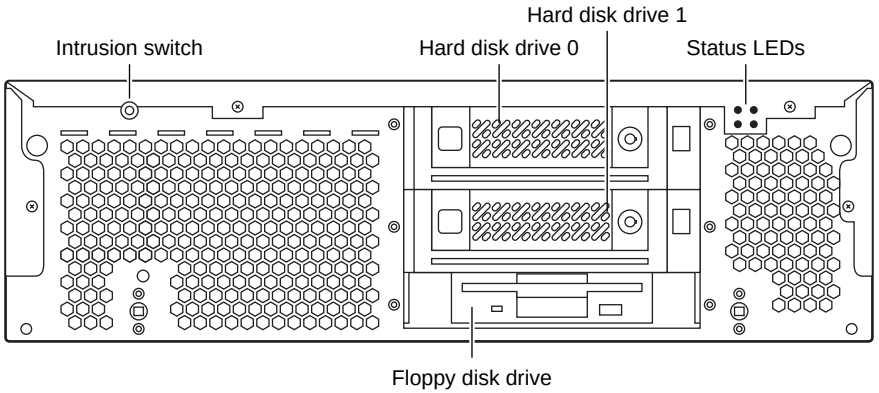
When you push the power supply in, the handle rotates to the right.

When the replacement power supply is correctly inserted into the slot, its LED should light green and the front-panel Fail LED should turn off. The Contivity 5000 automatically redistributes the power load between the two power supplies.

Replacing a hard disk drive

The Contivity 5000 ships with dual hard disk drives installed in the chassis. The hard disk drives are accessible from the front of the chassis (Figure 56). Remove the front bezel to access the hard disk drives.

Figure 56 Location of the Contivity 5000 hard disk drives



The top disk drive slot is slot 0; the bottom disk drive slot is slot 1. The hard disk drive in slot 0 is referred to as “hard drive 0”; the hard disk drive in slot 1 is referred to as “hard drive 1.”

One hard disk drive is the primary drive, that is, the active system disk. The other hard disk drive is the backup drive. By default, the disk drive installed in slot 0 is the primary disk, but you can select either disk drive as the primary on the Admin > Shutdown screen.

The backup disk drive is redundant and is used only to store a copy of the primary disk in case the primary disk fails. You configure the frequency of the backup operation to the redundant drive on the Admin > Auto Backup screen.

Note: For instructions on configuring automatic backups and designating the primary disk drive, see *Managing and Troubleshooting the Contivity Secure IP Services Gateway.*

You can hot-swap the backup disk drive only. To replace the primary disk drive, you must first shut down the system.

Note: If you do not want to shut down the Contivity 5000 to replace the primary disk drive, you can reboot the system from the backup disk. For example, if disk 0 is the primary disk, reboot the gateway from disk 1. After the reboot, disk 1 is the primary disk and you can hot-swap disk 0.

To replace a hard disk drive:

1 If you are replacing the primary disk drive, shut down the Contivity 5000. (If you are replacing the backup disk drive, go to step 2.)

Caution: To avoid damage to the hard disk drive, you must shut down the Contivity 5000 before you replace the primary disk drive.

a Use the Web GUI or the command line interface to shut down the gateway.

— Web GUI: Choose Admin > Shutdown. Select the option to power off the gateway after shutdown.

— Command line interface: Use the **`reload`** command to shut down the system. For example, enter **`reload power-off disable-logins "Upgrade hardware"`**

For the complete syntax of the **`reload`** command, see the *Reference for the Contivity Secure IP Services Gateway Command Line Interface*.

b Wait for the system to shut down. You may need to wait several minutes.

c Go to step 3.

2. If you are replacing the secondary disk drive, save any data that has not yet been saved to the hard disk from the disk cache.

   a. Using the Web GUI, go to the Admin > File System screen and select the backup disk drive from the Devices list.

   b. Click on the Prepare button to prepare the hard drive for removal.

3. Remove the front bezel from the chassis (see "Removing the front bezel and top cover" on page 108).

4. Attach the antistatic wrist strap that was shipped with the Contivity 5000 (see "Attaching the antistatic wrist strap" on page 112).

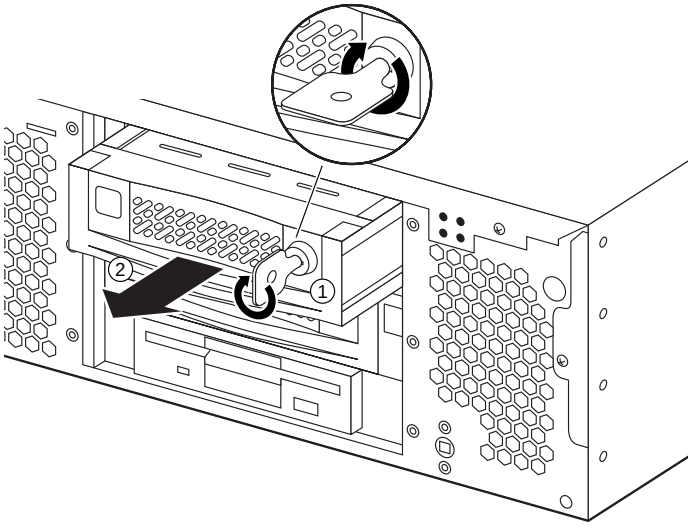
5. Insert the hard disk drive key into the lock and turn it to the right (Figure 57). The LED displays the letter "U" (for "unlocked").

   You may need to push the key in before you can turn it. The key should now be straight up and down.

Note: Turning the key shuts off the power to the hard disk drive.

6. Grasp the handle on the hard disk drive and pull the drive out of the chassis (Figure 57).

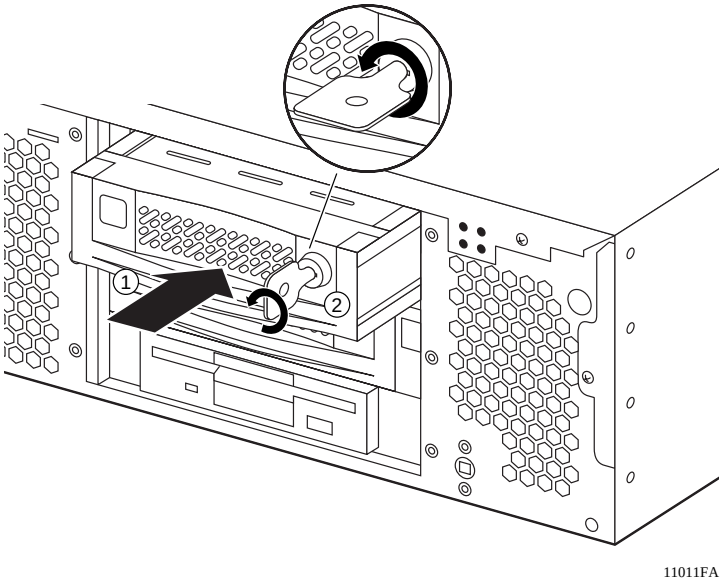
Figure 57 Removing a hard disk drive



7 Insert the replacement hard drive into the chassis and push it all the way into the chassis.

8 Insert the hard disk drive key into the lock and turn the key left (Figure 58). Make sure that the hard disk drive LED displays the drive number.

Figure 58 Inserting a hard disk drive



9 Replace the front bezel (see Figure 51 on page 116).

a Hold the bezel by its two handles and push it onto the chassis.

b Using the screwdriver, tighten the 2 screws to secure the bezel to the chassis.

10 If you shut down the gateway before you replaced the hard disk drive, press and release the power switch on the rear of the Contivity 5000 and wait for the gateway to boot.

11 Use your Web browser to navigate to the Contivity 5000.

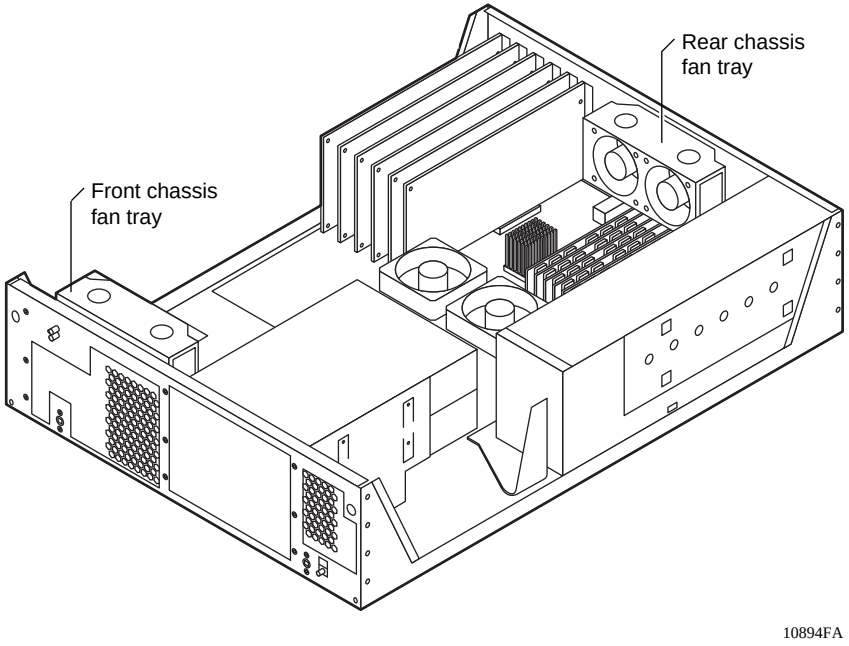
12 Go to the Admin > File System screen and select the new disk drive from the Devices list.

13 Click on the Enable button.

Replacing a fan tray

The Contivity 5000 ships with two fan trays installed in the chassis: one tray in the front of the chassis and the other in the rear of the chassis (Figure 59).

Figure 59 Location of the Contivity 5000 fan trays



If a fan fails, the following indicators report the failure:

- Front-panel Fail LED lights red.
- Audible alarm beeps.
- Event and system logs report the failure.

Caution: Replace a failed fan tray as soon as possible. Overheating can damage Contivity 5000 components.

To replace a fan tray:

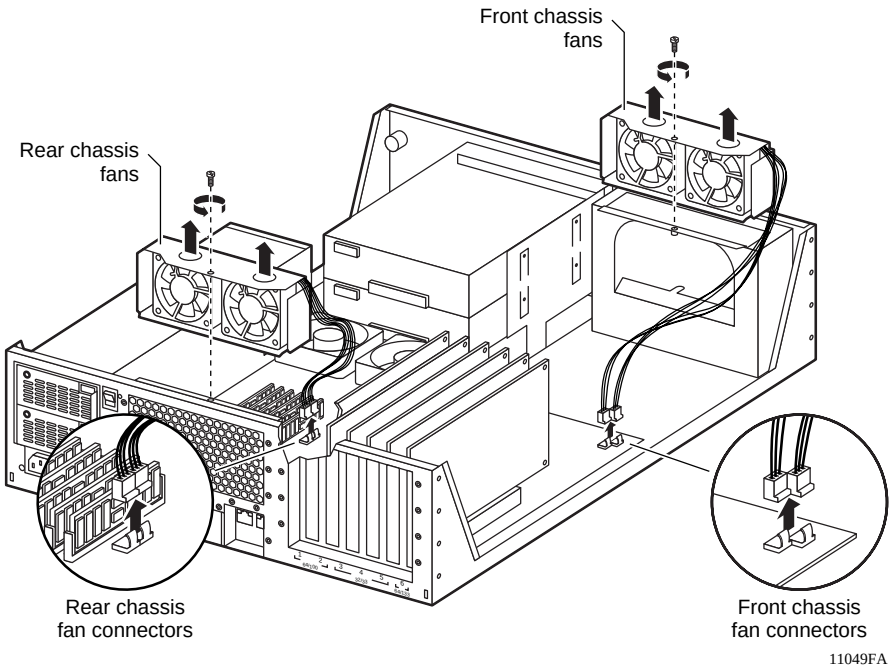
1. Shut down the Contivity 5000 using the Web GUI or the command line interface and then unplug it as described in "Shutting down the system to add or replace hardware" on page 107.

Danger: Turn off the Contivity 5000 and unplug it before you attempt to replace a fan tray.

---

2. Remove the front bezel from the chassis, then remove the chassis from the equipment rack (see "Removing the front bezel and top cover" on page 108).
3. Remove the top cover from the chassis (see "Removing the front bezel and top cover" on page 108).
4. Attach the antistatic wrist strap that was shipped with the Contivity 5000 (see "Attaching the antistatic wrist strap" on page 112).
5. Locate the connectors on the system board where the two fan plugs for the fan tray are attached (Figure 60).

Figure 60 Removing a fan tray



Each fan tray has a bundle of cables attached to it. The cables are terminated by two 3-hole plugs. When you replace a fan tray, you must attach the fan plugs to the correct connectors on the system board. (However, either plug can go onto either of the connectors.)

Caution: Do not remove the fan tray cables from the system board until you are certain that you know where to attach them again when you replace the fan tray (see Figure 60 on page 127).

6 After you note the location of the fan plugs, disconnect the plugs for the fan tray that you are replacing from the system board.

7 Remove the cables from the plastic hooks that secure them to the chassis base and to the fan tray itself.

8 Using a flat-tip screwdriver, unscrew the single captive screw in the center of the fan tray (see Figure 60 on page 127).

9 Insert two fingers into the holes on top of the fan tray and pull it straight up, out of its enclosure.

The front fan tray is contained in a bay; the rear fan tray rests on a metal support.

10 Insert two fingers into the holes in the replacement fan tray and lower it straight down to install it (Figure 61).

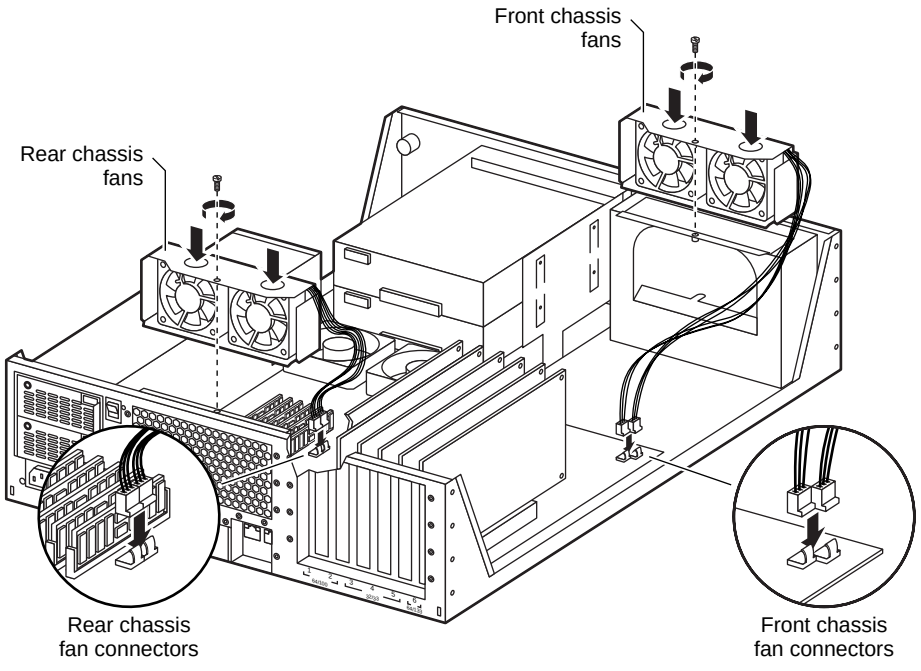
If you are replacing the front fan tray, the fans face the outside of the chassis; for the rear fan tray, the fans face the inside of the chassis.

Note: There is only one type of fan tray for the Contivity 5000. You install the same fan tray in the front or the rear of the chassis.

11 Insert the single captive screw into the hole in the bay (front fan tray) or the support (rear fan tray) and use the flat-tip screwdriver to secure the screw (Figure 61).

12 Secure the cables to the side of the fan tray and to the chassis base by inserting the cable bundles into the small plastic hooks.

Figure 61 Installing a fan tray



13 Attach the two fan plugs to the correct 3-pin connectors on the system board (Figure 61). Either plug can go onto either connector.

When you replace the rear fan tray, make sure that the excess cable length is neatly folded below the top of the fan tray.

14 Replace the top cover on the chassis (see Figure 47 on page 110).

a Hold the cover at an angle and slide it onto the chassis.

b Using a screwdriver, insert and tighten the 4 screws to secure the cover to the chassis.

Warning: The Contivity 5000 weighs approximately 50 pounds (23 kg). Two people are needed to install the gateway in the equipment rack.

15 With two people facing the front of the equipment rack, set the Contivity 5000 on the rack-mount shelf.

16 Insert one of the 1/2-in. truss screws through the bottom hole on each side of the shelf into the hole in the rack and tighten the screws.

17 Replace the front bezel (see Figure 51 on page 116).

a Hold the bezel by its two handles and push it onto the chassis.

b Using the screwdriver, tighten the 2 screws to secure the bezel to the chassis.

Appendix A
Technical specifications

The Contivity Secure IP Services Gateway provides PCI slots that support interface cards and one or two hardware encryption accelerator cards, depending on the Contivity model.

Note: To find out which option cards are supported in your Contivity gateway, see the price list or the appropriate chapter in this guide.

This appendix provides information about the option cards, including the connector and the cable pinouts for each supported network interface card.

Contivity Security Accelerator (CSA) and Hardware Accelerator cards

Nortel Networks supports two option cards that perform bulk encryption and compression algorithms for IPsec tunnel traffic:

- Contivity Security Accelerator (CSA) card

  The CSA card uses a single Hifn* 7854 chip for encryption and compression and has 64 MB of onboard RAM. It supports AES-128 cryptography with SHA-1 authentication and triple DES cryptography with either MD5 or SHA-1 authentication.

- Hardware Accelerator card

  The Hardware Accelerator card uses a single Hifn 7811 chip for encryption and compression. It performs triple DES and DES cryptography, LZS* compression, and MD5 or SHA-1 authentication.

The CSA card is the successor to the Hardware Accelerator card. Along with providing support for AES, the CSA card provides increased encryption throughput and improved compression performance.

Note: The CSA card has one green LED; the Hardware Accelerator card has no LEDs.

At startup, whenever an accelerator card is manually enabled, or whenever the accelerator recovers from a failure, the power-on self-test (POST) verifies the integrity of the hardware. This test includes validation of the accelerator's encryption, MAC, and compression algorithms against their software counterparts. In the event POST fails, the accelerator is set offline.

For more information about the Contivity Security Accelerator card and the Hardware Accelerator card and instructions for configuring these cards, see the guide *Configuring Advanced Features for the Contivity Secure IP Services Gateway.*

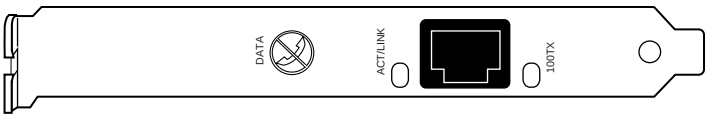
10/100BASE Ethernet interface card

The 10/100BASE Ethernet interface card has a single RJ-45 connector that provides the signals needed to interface to 10BASE-T and 100BASE-TX Ethernet equipment.

Figure 62 shows the 10/100BASE Ethernet interface card.

Note: The 10/100BASE Ethernet interface card for the Contivity 1100 looks very similar to Figure 62. However, the cable pinouts are different (see Table 12 on page 134).

Figure 62 10/100BASE Ethernet interface card



Depending on whether you will use the interface for 10BASE-T or 100BASE-TX operation, select cables for the interface as follows:

- 100BASE-TX connections require Category 5 twisted-pair wire. The 100BASE-TX specification supports 100 Mb/s transmission over two pairs of Category 5 twisted-pair Ethernet wiring: one pair each for transmit and receive operations.

  The maximum recommended cable segment length is 100 meters between a 100BASE-TX repeater and a workstation (due to signal timing requirements). This wiring scheme complies with the EIA 568 wiring standard.

- 10BASE-T connections can use Category 3, 4, or 5 twisted-pair wiring.

Table 11 provides the port pinouts for the 10/100BASE Ethernet interface card installed in all Contivity gateways other than the Contivity 1100.

Table 11 10/100BASE Ethernet port pinouts (all models except Contivity 1100)

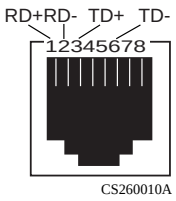
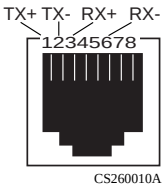
	Pin	Description
	1	RD +
	2	RD -
	3	TD +
	6	TD -

Table 12 provides the port pinouts for the 10/100BASE Ethernet interface card installed in the Contivity 1100.

Table 12 10/100BASE Ethernet port pinouts (Contivity 1100 only)

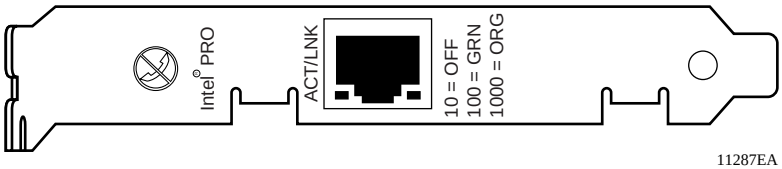
	Pin	Description
	1	TX +
	2	TX -
	3	RX +
	6	RX -

1000BASE-T Ethernet interface card

The 1000BASE-T Ethernet interface card is generally used to connect to Gigabit Ethernet interfaces on other devices in your network, as well as to provide increased throughput. This interface card has a single RJ-45 connector.

Figure 63 shows the 1000BASE-T Ethernet interface card.

Figure 63 1000BASE-T Ethernet interface card

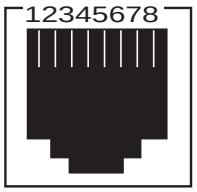


The port on the 1000BASE-T Ethernet interface card accommodates an RJ-45 straight-through cable. Select cables for this port as follows:

- For 1000BASE-T operation, use Category 5 four-pair Ethernet wiring. The cable must comply with the TIA 568 wiring specification. The maximum recommended cable segment length is 100 meters.
- For 100BASE-TX operation, use Category 5 twisted-pair wiring: one pair each for transmit and receive operations. The cable must comply with the EIA 568 wiring specification. The maximum recommended cable segment length is 100 meters.
- For 10BASE-T operation, use Category 3, 4, or 5 twisted-pair wiring.

Table 13 provides the 1000BASE-T Ethernet port pinouts.

Table 13 1000BASE-T Ethernet port pinouts



CS260010A

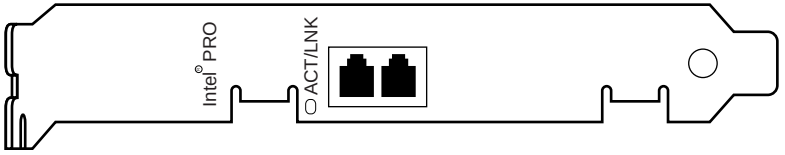
Pin	Description
1	TP0+
2	TP0-
3	TP1+
4	TP2+
5	TP2-
6	TP1-
7	TP3+
8	TP3-

1000BASE-SX Ethernet interface card

The 1000BASE-SX Ethernet interface card implements short-wavelength (850 nm) laser transmissions. This interface card is generally used to connect to fiber Gigabit Ethernet interfaces on other devices in your network, as well as to provide increased throughput. The 1000BASE-SX Ethernet interface card has a single type LC fiber connector.

Figure 64 shows the 1000BASE-SX Ethernet interface card.

Figure 64 1000BASE-SX Ethernet interface card



11288EA

The port on the 1000BASE-SX Ethernet interface card accommodates a multimode fiber (MMF) cable that meets MMF standards. Select fiber cable for this interface as follows:

- 50-micron MMF cable: provides a distance range of 500—550 meters (m)
- 62.5-micron MMF cable: provides a distance range of 220—275 m

You can order a 10-foot MMF cable from Nortel Networks:

- Order no. DM0011117 provides an LC-to-LC connector
- Order no. DM0011118 provides an LC-to-SC connector

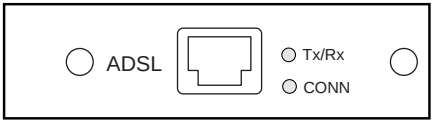
ADSL WAN interface card

The ADSL Annex A and Annex B WAN interface cards have a single RJ-11 connector that provides the signals needed to interface to the digital subscriber line access multiplexer (DSLAM) and to telephone equipment.

Figure 65 shows the ADSL WAN interface card.

Note: The ADSL Annex A and ADSL Annex B cards look identical.

Figure 65 ADSL WAN interface card



10972EA

Included in the accessory box is a 7-foot RJ-11 cable to attach to the DSLAM.

Table 14 provides the ADSL port pinouts.

Table 14 ADSL cable pinouts

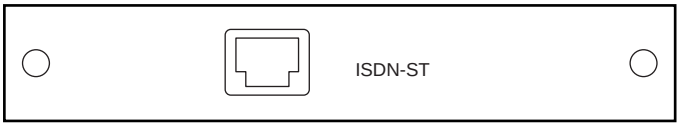
Pin	Function
1	N/C
2	Tip
3	Ring
4	N/C

ISDN BRI interface card

The ISDN BRI S/T and ISDN BRI U interface cards have a single RJ-45 connector that provides the signals needed to interface to ISDN equipment. (To connect the ISDN BRI S/T interface to the ISDN network, you must attach an external NT-1 device to the RJ-45 connector.)

Figure 66 shows the ISDN BRI S/T interface card.

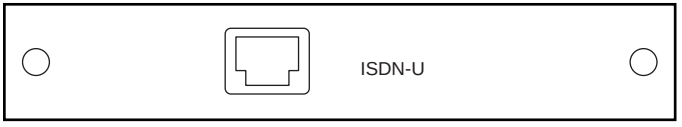
Figure 66 ISDN BRI S/T interface card



10972EA

Figure 67 shows the ISDN BRI U interface card.

Figure 67 ISDN BRI U interface card



10972EB

The connector on the ISDN BRI S/T and ISDN BRI U interface cards accommodates an 8-pin RJ-45 modular patch cord. These cables are commonly sold as Category 5, or Ethernet, cables.

Note: Nortel Networks does not supply a cable with the ISDN BRI interface cards.

Table 15 provides the ISDN BRI S/T cable pinouts.

Table 15 ISDN BRI S/T cable pinouts

Pin	Function
1	N/C
2	N/C
3	Receive +
4	Transmit +
5	Transmit -
6	Receive -
7	N/C
8	N/C

Table 16 provides the ISDN BRI U cable pinouts.

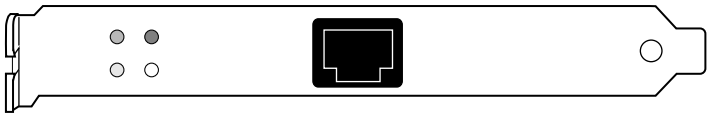
Table 16 ISDN BRI U cable pinouts

Pin	Function
1	N/C
2	N/C
3	N/C
4	U interface network connection (tip)
5	U interface network connection (ring)
6	N/C
7	N/C
8	N/C

T1/E1 CSU/DSU WAN interface card

The T1/E1 CSU/DSU WAN interface card has a single connector that provides the signals needed to interface to T1 or E1 equipment. Figure 68 shows the T1/E1 CSU/DSU WAN interface card.

Figure 68 T1/E1 CSU/DSU WAN interface card



Note: The Contivity 1100 also supports a half-height version of this card that works the same way as the full-height card shown in Figure 68.

The connector on the T1/E1 CSU/DSU WAN interface card accommodates an 8-pin RJ-48 modular patch cord. These cables are commonly sold as Category 5, or Ethernet, cables.

Note: Nortel Networks does not supply an interface cable with the T1/E1 CSU/DSU WAN interface card.

The cable you use should be wired in accordance with EIA-568-A wiring style. This wiring style ensures that the transmit signal (pins 4 and 5) and the receive signal (pins 1 and 2) are carried on a twisted pair inside the patch cord. The use of factory-made patch cords is strongly recommended.

You connect the T1/E1 CSU/DSU WAN interface card to the service provider network using a straight-through cable or a crossover cable, depending on how the service provider wired its jack.

- For a straight-through connection, you can use a standard Category 5 (Ethernet) straight-through cable.
- For a crossover connection, you cannot use a standard Category 5 crossover cable. The T1/E1 CSU/DSU crossover cable and the Ethernet crossover cable are not interchangeable.

Table 17 provides the T1/E1 CSU/DSU cable pinouts for a crossover connection.

Table 17 T1/E1 CSU/DSU cable pinouts for crossover connection

Standard-wired end 8-pin male	Signal name	Pair number and conductor	Special-wired end 8-pin male
1	RXDA<-TXDA	wht/org pair 2A	5
2	RXDB<-TXDB	orange pair 2B	4
3	not used	wht/grn pair 3A	3
4	TXDB->RXDB	blue pair 1B	2
5	TXDA->RXDA	wht/blu pair 1A	1
6	not used	green pair 3B	6
7	not used	wht/brn pair 4A	7
8	not used	brown pair 4B	8

The cable will operate properly if pins 3, 6, 7, and 8 are not connected.

Caution: For crossover connections, do not use Ethernet cable. The T1/E1 CSU/DSU will not work to specifications. Data may be corrupted.

Table 18 provides the T1/E1 CSU/DSU cable pinouts for a straight-through connection.

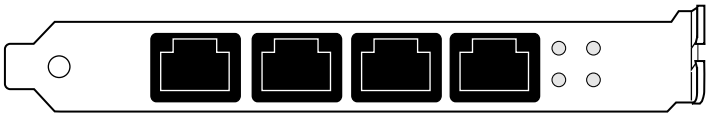
Table 18 T1/E1 CSU/DSU cable pinouts for straight-through connection

Nortel Networks termination		Remote termination	
Signal	**Pin # to Pin #**		**Signal**
Receive A (RXDA)	1	1	Receive A (RXDA)
Receive B (RXDB)	2	2	Receive B (RXDB)
not used	3	3	not used
Transmit B (TXDB)	4	4	Transmit B (TXDB)
Transmit A (TXDA)	5	5	Transmit A (TXDA)
not used	6	6	not used
not used	7	7	not used
not used	8	8	not used

Quad T1/E1 CSU/DSU WAN interface card

The quad T1/E1 CSU/DSU WAN interface card has four connectors that provide the signals needed to interface to T1 or E1 equipment. Figure 69 shows the quad T1/E1 CSU/DSU WAN interface card.

Figure 69 Quad T1/E1 CSU/DSU WAN interface card



CS160012A

Each connector on the quad T1/E1 CSU/DSU WAN interface card accommodates an 8-pin RJ-48 modular patch cord. These cables are commonly sold as Category 5, or Ethernet, cables.

Note: Nortel Networks does not supply cables with the quad T1/E1 CSU/DSU interface card.

The cables you use should be wired in accordance with EIA-568-A wiring style. This wiring style ensures that the transmit signal (pins 4 and 5) and the receive signal (pins 1 and 2) are carried on a twisted pair inside the patch cord. The use of factory-made patch cords is strongly recommended.

You connect the quad T1/E1 CSU/DSU WAN interface card to the service provider network using a straight-through cable or a crossover cable, depending on how the service provider wired its jack.

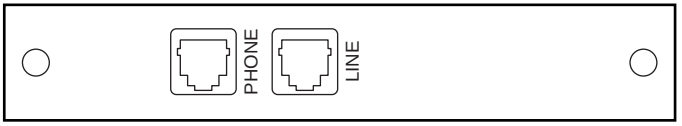
- For a straight-through connection, you can use a standard Category 5 (Ethernet) straight-through cable.
- For a crossover connection, you cannot use a standard Category 5 crossover cable. The T1/E1 CSU/DSU crossover cable and the Ethernet crossover cable are not interchangeable.

For information about the cable pinouts for a crossover connection, see Table 17 on page 141. For information about the cable pinouts for a straight-through connection, see Table 18 on page 141.

V.90 modem interface card

The V.90 modem interface card has two RJ-11 connectors that provide the signals needed to interface to an incoming telephone line and to telephone equipment. Figure 70 shows the V.90 modem interface card.

Figure 70 V.90 modem interface card



Included in the accessory box is a 7-foot RJ-11 cable to attach to a telephone jack.

Table 19 provides the V.90 modem port cable pinouts.

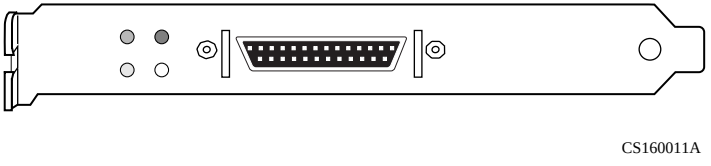
Table 19 V.90 modem cable pinouts

Pin	Function
1	N/C
2	Tip
3	Ring
4	N/C

Single V.35/X.21 WAN interface card

The single V.35/X.21 WAN interface card has a single DB28S connector that provides the signals needed to interface to V.35 and X.21 equipment. Figure 71 shows the single V.35/X.21 WAN interface card.

Figure 71 Single V.35/X.21 WAN interface card



You need a DSU/CSU (digital service unit/channel service unit) between the WAN connection and the gateway. You can order a V.35 or X.21 cable to attach to the connector. This cable enables the WAN adapter to function as DTE (data terminal equipment).

Table 20 provides the V.35 cable pinouts. Table 21 on page 145 provides the X.21 cable pinouts. (The pair suffix A or B refers to an individual wire within a twisted pair.)

Table 20 V.35 cable pinouts

Standard-wired end 28-pin male	Signal name	Pair number and conductor	Special-wired end 34-pin male	Notes
2	TXDA	pair 1A	P	
14	TXDB	pair 1B	S	
3	RXDA	pair 2A	R	
16	RXDB	pair 2B	T	
15	TXCA	pair 3A	Y	
12	TXCB	pair 3B	AA	
17	RXCA	pair 4A	V	
9	RXCB	pair 4B	X	
24	SCTEA	pair 5A	U	
11	SCTEB	pair 5B	W	
4	RTSA	pair 6A	C	
19	RTSB	pair 6B	no conn	Note 1
5	CTSA	pair 7A	D	
13	CTSB	pair 7B	no conn	Note 1
6	DSRA	pair 8A	E	
22	DSRB	pair 8B	J	
20	DTRA	pair 9A	H	
23	DTRB	pair 9B	no conn	Note 1
8	DCDA	pair 10A	F	
10	DCDB	pair 10B	no conn	Note 1
18	LL	pair 11A	L	
21	RL	pair 11B	N	

Table 20 V.35 cable pinouts (continued)

Standard-wired end 28-pin male	Signal name	Pair number and conductor	Special-wired end 34-pin male	Notes
25	TM	pair 12A	NN	
26	M0<-SIGNAL GROUND	pair 12B	B	Note 2
27	M1<-SIGNAL GROUND	pair 13A	B	Note 2
28	M2	pair 13B	no conn	Note 1
1	SHIELD	pair 14A	A	Notes 3,4
7	SIGNAL GROUND	pair 14B	B	Notes 2,4

The following notes apply to the single V.35 DTE cable:

1. The term “no conn” means the wire is not connected to a pin in the 34-pin connector.
2. Wires 12B, 13A, and 14B connect to pin B in the 34-pin connector.
3. At each end, the cable shield and connector shell must connect respectively to pin A of the 34-pin connector and pin 1 of the standard 28-pin connector.
4. Do not connect Shield to Signal Ground because these are separate signals.

Table 21 provides the X.21 cable pinouts. (The pair suffix A or B refers to an individual wire within a twisted pair.)

Table 21 X.21 cable pinouts

Standard-wired end 28-pin male	Signal name	Pair number and conductor	Standard-wired end 15-pin male	Notes
2	TXDA	pair 1A	2	
14	TXDB	pair 1B	9	
3	RXDA	pair 2A	4	
16	RXDB	pair 2B	11	
15	TXCA	pair 3A	6	
12	TXCB	pair 3B	13	
17	RXCA	pair 4A	pair 5A	Note 1
9	RXCB	pair 4B	pair 5B	Note 1
24	SCTEA	pair 5A	pair 4A	Note 1
11	SCTEB	pair 5B	pair 4B	Note 1
4	RTSA	pair 6A	3	
19	RTSB	pair 6B	10	

Table 21 X.21 cable pinouts (continued)

Standard-wired end 28-pin male	Signal name	Pair number and conductor	Standard-wired end 15-pin male	Notes
5	CTSA	pair 7A	5	
13	CTSB	pair 7B	12	
6	DSRA	pair 8A	no conn	Note 2
22	DSRB	pair 8B	no conn	Note 2
20	DTRA	pair 9A	no conn	Note 2
23	DTRB	pair 9B	no conn	Note 2
8	DCDA	pair 10A	no conn	Note 2
10	DCDB	pair 10B	no conn	Note 2
18	LL	pair 11A	no conn	Note 2
21	RL	pair 11B	no conn	Note 2
25	TM	pair 12A	no conn	Note 2
26	M0	pair 12B	no conn	Note 2
27	M1	pair 13A	no conn	Note 2
28	M2<-SIGNAL GROUND	pair 13B	8	Note 3
1	SHIELD	pair 14A	1	Note 4,5
7	SIGNAL GROUND	pair 14B	8	Note 3,5

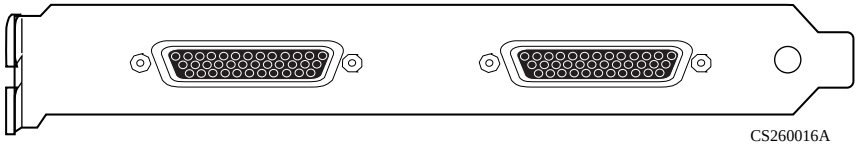
The following notes apply to the single X.21 cable:

1. Wires of pair 4 connect to wires of pair 5, but not to any pins in the DA-15.
2. The term “no conn” means the wire is not connected to a pin in the 15-pin connector.
3. Wires 13B and 14B connect to pin 8 in the 15-pin connector.
4. At each end, the cable shield and connector shell must connect to pin 1 of the connector.
5. Do not interconnect Shield to Signal Ground because these are separate signals.

Dual V.35 WAN interface card

The dual V.35 WAN interface card has two DB26 connectors that provide the signals needed to interface to V.35 equipment. Figure 72 shows the dual V.35 interface card.

Figure 72 Dual V.35 WAN interface card



You need a DSU/CSU (digital service unit/channel service unit) between the WAN connection and the gateway. This section documents the connector and cables used with V.35 WAN synchronous adapters.

If you build your own V.35 DTE cables, observe the following guidelines:

- All connector hoods must be metal.
- Braid must enter and make contact inside the metal connector hood.
- V.35 conn strain relief must be conductive.

Included in the accessory box are two cables to attach to the V.35 connectors. These cables enable the WAN adapter to function as DTE (data terminal equipment).

Table 22 provides the DB26-to-V.35 cable pinouts.

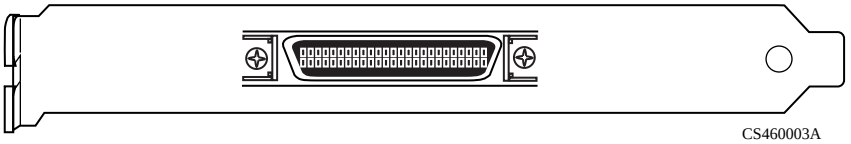
Table 22 DB26-to-V.35 cable pinouts

Standard-wired end 26-pin male	Signal name	Pair number and conductor	Special-wired end 34-pin male
2	TDA	pair 1A	P
14	TDB	pair 1B	S
3	RDA	pair 2A	R
16	RDB	pair 2B	T
24	ETA	pair 3A	U
11	ETB	pair 3B	W
17	RCA	pair 4A	V
9	RCB	pair 4B	X
15	TCA	pair 5A	Y
12	TCB	pair 5B	AA
4	RTS	pair 6A	C
		pair 6B	no conn
5	CTS	pair 7A	D
		pair 7B	no conn
6	DSR	pair 8A	E
		pair 8B	no conn
8	DCD	pair 9A	F
		pair 9B	no conn
20	DTR	pair 10A	H
		pair 10B	no conn
7	SGND	pair 11A	B
		pair 11B	no conn
1	CGND	pair 12A	A
		pair 12B	no conn

HSSI WAN interface card

The HSSI WAN interface card has a 50-pin SCSI II female connector that provides the signals needed to interface to a T3 modem or modem eliminator. Figure 73 shows the HSSI WAN interface card.

Figure 73 HSSI WAN interface card



Included in the accessory box is a cable that maps the T3 signals out to a 50-pin SCSI II male connector.

Table 23 provides the T3 cable pinouts.

Table 23 T3 cable pinouts

50-pin SCSI male	Signal name	50-pin SCSI male
1	GND	1
2	RCB	2
3	CAB	3
4	RDB	4
5	LCB	5
6	STB	6
7	GND	7
8	TAB	8
9	TTB	9
10	LAB	10
11	TDB	11
12	LBB	12
13	GND	13
19	GND	19
24	TESTB	24
25	GND	25

Table 23 T3 cable pinouts (continued)

50-pin SCSI male	Signal name	50-pin SCSI male
26	GND	26
27	RCA	27
28	CAA	28
29	RDA	29
30	LCA	30
31	STA	31
32	GND	32
33	TAA	33
34	TTA	34
35	LAA	35
36	TDA	36
37	LBA	37
38	GND	38
44	GND	44
49	TESTA	49
50	GND	50

External modem adapter for the Contivity 1010/1050/1100

If you need to connect a Contivity 1010, 1050, or 1100 to a modem, you can order a null modem adapter from Nortel Networks. This adapter allows you to connect the Contivity 1010/1050/1100 console cable to an RS-232-C modem port.

Caution: Use only the serial cable shipped with the Contivity 1010, 1050, or 1100 and this modem adapter to connect a modem to the Contivity 1010, 1050, or 1100. Other cables and adapters may not provide adequate shielding for EMI regulatory compliance.

To ensure correct dial-in and dial-out operation, configure the modem with the settings “verbal result codes” and “display result codes.” For more information, see the modem documentation.

The cable adapter has a DB9 connector that connects to the serial cable and a DB-25 connector that connects to the modem (Figure 74).

Figure 74 Serial cable adapter for connection to modem (DB9-to-DB25)

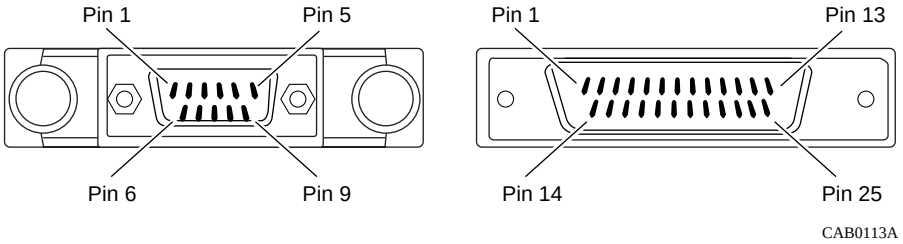


Table 24 provides the null modem adapter cable pinouts.

Table 24 Null modem adapter cable pinouts

DB9 termination		DB25 termination	
Signal	**Pin # to Pin #**		**Signal**
Receive Data	2	2	Send Data
Send Data	3	3	Receive Data
Data Terminal Ready	4	6	Data Set Ready
Signal Ground	5	7	Signal Ground
Data Set Ready	6	20	Data Terminal Ready
Request to Send	7	5	Clear to Send
Clear to Send	8	4	Request to Send

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