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Installing the Contivity 600

NORTEL NETWORKS™

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Contents

Figures

Tables

Preface

The Contivity* 600 is part of the Nortel Networks* Contivity Secure IP Services Gateway product family. Contivity Secure IP Services Gateways support secure, reliable IP VPNs in a single, integrated hardware device. Throughout this guide, the Contivity 600 is also referred to as *the gateway.*

This guide provides instructions on how to install and start the Contivity 600 and how to install and replace option cards and the dual inline memory module (DIMM). This guide also provides some initial configuration information and includes technical specifications for the gateway.

For complete information about configuring and monitoring the Contivity 600, see the documentation on the software CD. (For information about Contivity documentation, see "Related publications" on page 15.)

Before you begin

This guide is intended for qualified service personnel who are installing the Contivity 600 for the first time or who need to install or replace the following field replaceable units (FRUs):

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

Before you install the Contivity 600, make sure that all network wiring has been installed on the premises using standard cable system practices.

Text conventions

This guide uses the following text conventions:

`bold Courier text`	Indicates command names and options and text that you need to enter. Example: Use the **`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:

ADSL	asymmetric digital subscriber line
AIS	alarm indication signal
BRI	Basic Rate Interface
CSU	channel service unit
DIMM	dual inline memory module
DSU	digital service unit
DTE	data terminal equipment
IP	Internet Protocol
IPsec	IP Security
ISDN	Integrated Services Digital Network
LAN	local area network
LED	light emitting diode

LOS	loss of signal
OOF	out of frame
PCI	peripheral component interconnect
URL	uniform resource locator
VPN	virtual private network
WAN	wide area network

Related publications

For complete information about configuring, monitoring, and managing the Contivity 600, refer to the following publications (included on the software CD):

- Release notes provide the latest information, including brief descriptions of the new features, problems fixed in this release, and known problems and workarounds.
- *Configuring Basic Features for the Contivity Secure IP Services Gateway* introduces the product and provides information about initial setup and configuration.
- *Configuring Servers, Authentication, and Certificates for the Contivity Secure IP Services Gateway* provides instructions for configuring authentication servers and services, as well as 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 Tunneling Protocols for the Contivity Secure IP Services Gateway* provides instructions for configuring the tunneling protocols IPsec, L2TP, PPTP, and L2F.
- *Configuring Advanced Features for the Contivity Secure IP Services Gateway* provides instructions for configuring 802.1Q VLANs, circuitless IP, advanced WAN settings, PPP, PPPoE, frame relay, ADSL and ATM, T1/E1 CSU/DSU interfaces, dial services and BIS, DLSw, IPX, and hardware accelerator cards.
- *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.

- *Reference for the Contivity Secure IP Services Gateway Command Line Interface* provides syntax, descriptions, and examples for the commands that you can use to configure, manage, and monitor the gateway.
- *Managing and Troubleshooting the Contivity Secure IP Services Gateway* provides information about backup and recovery, file management, upgrading software, and troubleshooting. This guide also provides instructions for monitoring gateway status and performance.

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.

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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
Introducing the Contivity 600

This chapter describes the Contivity 600 and how to install it.

Note: Before you install the chassis, make sure that all network wiring has been installed on the premises using standard cable system practices.

This chapter contains the following topics:

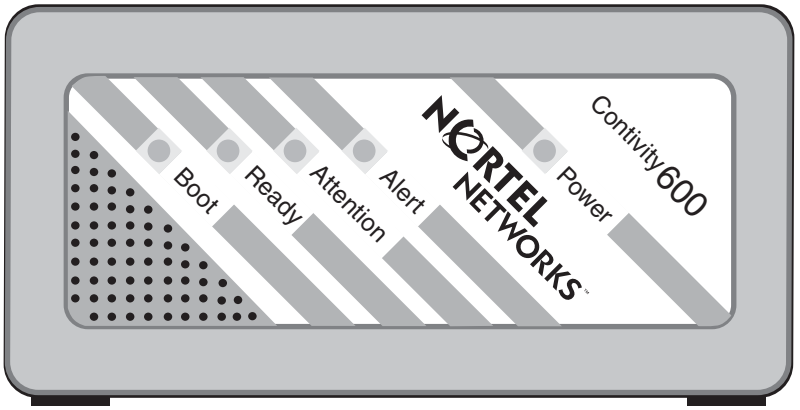
Description of the Contivity 600

The Contivity 600 enables scalable, secure, and robust IP virtual private networks (VPNs) for up to 50 simultaneous users across the public data network. The Contivity 600 is for branch offices and small businesses that need to be interconnected via managed IP VPNs.

The Contivity 600 provides routing, firewall, bandwidth management, encryption, authentication, and data integrity services to ensure secure tunneling across IP networks and the Internet. An individual user or group of users can be associated with a set of attributes that provide custom access to an extranet.

Figure 1 shows the front view of the Contivity 600.

Figure 1 Front view of the Contivity 600



The Contivity 600 chassis provides the following:

- Two 10/100 Ethernet* LAN ports on the base system
- One serial port for out-of-band management of the Contivity 600
- One expansion PCI slot that can contain an optional interface card
- One 128 MB dual inline memory module (DIMM)

Preparing to install the Contivity 600

Before you install the Contivity 600, verify that:

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

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

Shipment contents

In addition to the gateway and this guide, the shipping container for the Contivity 600 contains a number of hardware accessories and other items.

Note: Unless you specifically ordered a power cable, no power cable is shipped with the Contivity 600.

Table 1 lists the hardware accessories and other items shipped with the gateway.

Table 1 Items shipped with the Contivity 600

Quantity	Item	Description
1	Molded serial cable DB9/DB25-to-DB9/DB25	Used to connect the Contivity 600 to a PC or to a local terminal
1	AC-to-DC external power supply pack	Provides power to the Contivity 600
1	*Important Notice for the Contivity 600*	Provides shorter instructions for installing the chassis
1	Contivity software kit	Contains Contivity Secure IP Services software and documentation (including this book) on CD
1	Contivity client kit	Contains Contivity VPN Client software and documentation on CD

Inspect all items for shipping damage. If you detect any damage, do not install the Contivity 600. Call the Nortel Networks Technical Solutions Center in your area (see "How to get help" on page 16).

Cables

You will need cables that are not included in the Contivity 600 shipping container. For information about which cables are shipped and which ones you can order, see "Connecting communications cables" on page 22. If you do not have the proper cables, contact your network administrator.

Site requirements

The installation site must provide sufficient free space around the Contivity 600 to ensure proper ventilation and access for servicing. For information about the physical, electrical, and environmental requirements for the Contivity 600, see "Chassis specifications" on page 61.

Installing the chassis

To install the Contivity 600, position the chassis on a flat, sturdy, horizontal surface. Make sure that the surface is large enough for the gateway and sturdy enough to support the combined weight of the Contivity 600 and the cables that you attach to it.

Chapter 2
Cabling the gateway and turning the power on

This chapter provides information about how to connect communications cables and the power cord to the Contivity 600.

Caution: Connect the cables to the built-in Ethernet ports and to the interfaces on the optional interface card installed in the Contivity 600 before you plug the power cord into the outlet.

This chapter contains the following topics:

Caution: Cabling for all WAN, LAN, and serial connections is not to be routed outside the building environment.

Connecting communications cables

Gather the cables that you will attach to the Contivity 600.

Table 2 lists the system ports and the ports provided on the optional interface cards that you can install in the Contivity 600. The table also indicates whether you can obtain cables for the ports from Nortel Networks.

Table 2 Interfaces and cables for the Contivity 600

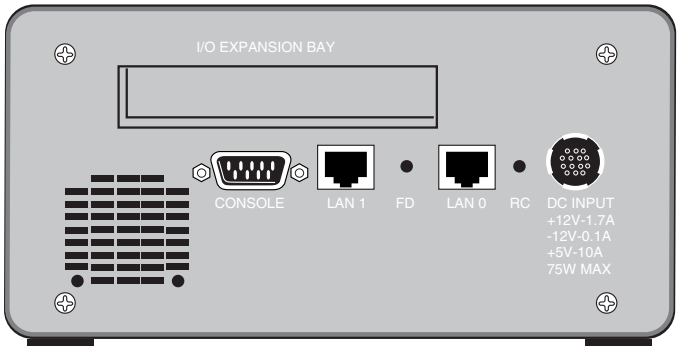
	Cable available from Nortel Networks		
Interface	**Included**	**Ordered separately**	**Contact supplier**
10/100 Ethernet system port			X
Serial port	X		
10/100BASE Ethernet			X
56/64K CSU/DSU WAN			X
ADSL WAN	X		
ISDN BRI			X
V.90 modem	X		
T1/E1 CSU/DSU WAN			X
Single V.35/X.21 WAN		X[1]	

1 Order either the V.35 cable or the X.21 cable.

For information about the connectors and cable pinouts, see Appendix A, “Technical specifications,” on page 61.

Figure 2 shows the back of the Contivity 600. All interface cables and the power cord attach to the rear of the gateway.

Figure 2 Rear view of the Contivity 600



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Connect the interface cables to the Contivity 600 in this order:

1. Connect the 10/100BASE RJ-45 cables to the built-in 10/100BASE Ethernet LAN ports on the gateway (see Figure 2).
2. If you plan to connect a terminal or PC to the gateway, connect the serial cable shipped with the Contivity 600 to the serial port (see Figure 2).
3. Connect the appropriate cables to the ports on the installed interface card.

   If you ordered optional interface cards, connect the cables for these interfaces to the ports.

Connecting the power cord

You must order the power cord for the Contivity 600 separately.

Warning: Do not modify or use the AC power cord if it is not the exact type that is required for your power outlet.

The power cord must meet the requirements described in Table 3.

Table 3 Power cord requirements

Requirement	Description
Current rating	The power cord must be rated for the available AC voltage and must have a current rating that is at least 125 percent of the gateway's current rating (100—240 VAC).
Certification	The power cord must have certification marks from an acceptable regional agency.
Cord length and flexibility	The power cord must be less than 4.5 meters (14.7 feet) long. It must be a flexible HAR (harmonized) cord or VDE-certified cordage to comply with the gateway's safety certifications.
Power supply connector	The connector that you plug into the AC receptacle on the Contivity 600 power supply must be an IEC 320, Sheet C13 female.
Wall outlet connector	The power cord must terminate in a male plug with appropriate grounding.

To connect the power cord and turn on the system power:

Caution: Before you connect the power supply to the gateway, connect the cables to the Ethernet and serial ports and to the ports on the installed option card.

1 Plug the cable attached to the external power pack into the receptacle labeled "DC Input" on the rear of the Contivity 600 (see Figure 2 on page 23).

   Locate the word "top" on the plug end of the cable and align that part of the cable with the arrow printed above the DC input port.

2 Plug the female end of the power cord into the external power supply pack.

3 Plug the other end of the power cord into a surge protector.

Caution: You should protect the Contivity 600 by plugging it into a surge suppressor.

4 Plug the surge protector (or the power cord) into the power outlet.

The Contivity 600 should begin to boot.

Note: The Contivity 600 has no power switch. Connecting the Contivity 600 to a power supply turns the gateway on.

5 Verify a successful installation by checking the LEDs on the front panel (see "Front panel LEDs" on page 26).

If the Ready LED does not turn green (to indicate that the gateway has booted successfully), check that the power cord is properly attached to the power supply pack and to the power outlet.

If the Contivity 600 still does not boot, contact your local Nortel Networks Technical Solutions Center (see "How to get help" on page 16).

Understanding the LEDs

This section describes the LEDs on the front panel of the Contivity 600 and on the interface cards that have LEDs. You can confirm that the LAN and WAN interfaces are cabled properly by examining the LEDs.

Front panel LEDs

The front panel of the Contivity 600 has five LEDs (Figure 3). These LEDs indicate the status of the Contivity 600.

Figure 3 Front panel LEDs

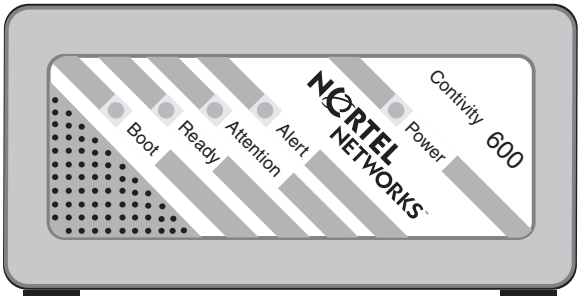


Table 4 describes the LEDs on the Contivity 600 front panel.

Table 4 Front panel LED indicators

LED	Indicator	Description
Power	On	The gateway is receiving DC power.
	Off	The gateway is not receiving DC power.
Alert	Red	A serious alarm condition exists that requires attention. A red alert usually indicates a hardware error. The red alert condition is described in the health check display.
Attention	Amber	A non-fatal alarm condition exists. The yellow alert condition is described in the health check display.
Ready	Green	The gateway has booted and is operational.
Boot	Amber	The gateway is booting and is in a non-ready state. If the Boot LED and the Ready LED light at the same time, the Contivity 600 is in recovery mode (see Chapter 5, “Using recovery mode,” on page 55).

For complete information about the health check, event log, and system log, see *Managing and Troubleshooting the Contivity Secure IP Services Gateway.*

LEDs on the system 10/100BASE Ethernet ports

Figure 4 shows the LEDs for the 10/100BASE Ethernet ports located on the rear of the Contivity 600.

Figure 4 LEDs on the system 10/100BASE Ethernet port

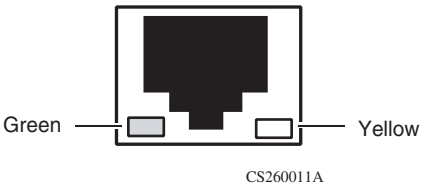


Table 5 describes the LEDs on the system 10/100BASE Ethernet ports.

Table 5 LED indicators on the system 10/100BASE Ethernet port

LED	Indicator	Description
Green	On	The LAN port is operating at 100 Mb/s.
	Off	The LAN port is operating at 10 Mb/s.
Yellow	On	The cable connections between the LAN port and the hub are good.
	Off	The cable connections between the LAN port and the hub are faulty.
	Flashing	The LAN port is sending or receiving network data. The frequency of the flashes increases with increased traffic.

10/100BASE Ethernet interface card LEDs

Figure 5 shows the LEDs on the 10/100BASE Ethernet interface card.

Figure 5 LEDs on the 10/100BASE Ethernet interface card

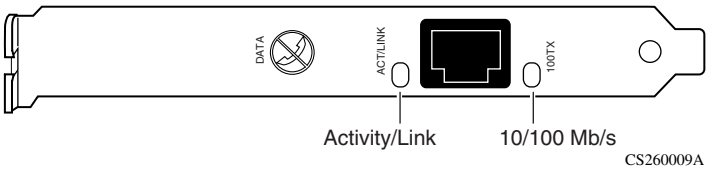


Table 6 describes the LEDs on the 10/100BASE Ethernet interface card.

Table 6 LED indicators on the 10/100BASE Ethernet interface card

LED	Indicator	Description
ACT/LINK	Steady Green or Flashing Green	The card is sending or receiving network data. The frequency of the flashes increases with increased traffic.
	Off	The card is not sending or receiving data.
10/100TX	Green	The port is operating at 100 Mb/s.
	Off	The port is operating at 10 Mb/s.

56/64K CSU/DSU WAN interface card LEDs

Figure 6 shows the LEDs on the 56/64K CSU/DSU WAN interface card.

Figure 6 LEDs on the 56/64K CSU/DSU WAN interface card

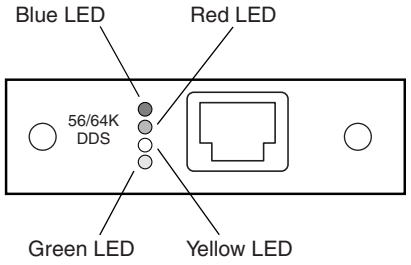


Table 7 describes the LEDs on the 56/64K CSU/DSU WAN interface card.

Table 7 LED indicators on the 56/64K CSU/DSU WAN interface card

LED	Description
Blue	Blue alarm LED is lit when receiving an upstream failure denoted by an alarm indication signal (AIS).
Red	Red alarm LED is lit when a loss-of-signal (LOS) or out-of-frame (OOF) condition is detected on the receive signal.
Yellow	Yellow alarm LED is lit when the far-end equipment is in the red alarm condition.
Green	Normal operation.

ADSL WAN interface card LEDs

Figure 7 shows the LEDs on the ADSL WAN interface card.

Figure 7 LEDs on the ADSL WAN interface card

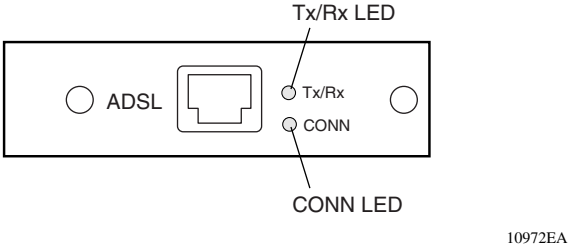


Table 8 describes the LEDs on the ADSL WAN interface card.

Table 8 LED indicators on the ADSL WAN interface card

CONN LED	Tx/Rx LED	Description
Steady green	Steady green	The ADSL interface card is not initialized; the software driver is not installed.
Off	Off	The ADSL interface card is initialized, but has not established a link with the ADSL network.
Flashing green	Off	The ADSL interface card is attempting to establish a link with the ADSL network.
Steady green	Off	The ADSL interface card has established a link with the ADSL network.
Steady green	Flashing green	The ADSL interface card is sending or receiving network data. (The LED may be dim.)

T1/E1 CSU/DSU WAN interface card LEDs

Figure 8 shows the LEDs on the T1/E1 CSU/DSU WAN interface card.

Figure 8 LEDs on the T1/E1 CSU/DSU WAN interface card

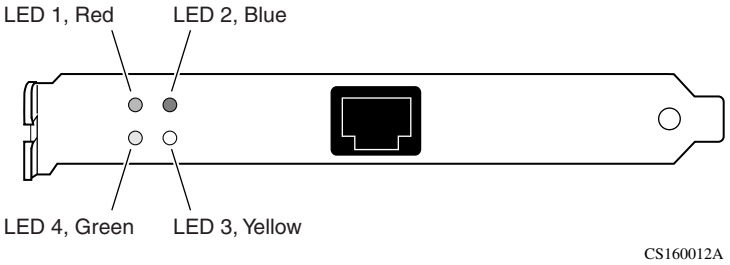


Table 9 describes the LEDs on the T1/E1 CSU/DSU WAN interface card.

Table 9 LED indicators on the T1/E1 CSU/DSU WAN interface card

LED	Indicator	Description
LED 1	Red	Red alarm LED is lit when a loss-of-signal (LOS) or out-of-frame (OOF) condition is detected on the receive signal.
LED 2	Blue	Blue alarm LED is lit when receiving an upstream failure denoted by an alarm indication signal (AIS).
LED 3	Yellow	Yellow alarm LED is lit when the far-end equipment is in the red alarm condition.
LED 4	Green	Normal operation.

Single V.35/X.21 WAN interface card LEDs

Figure 9 shows the LEDs on the single V.35/X.21 WAN interface card.

Figure 9 LEDs on the single V.35/X.21 WAN interface card

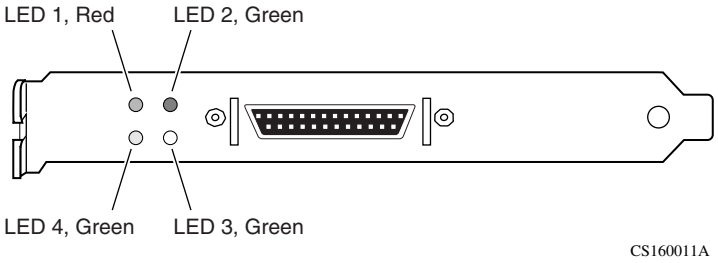


Table 10 describes the LEDs on the single V.35/X.21 WAN interface card.

Table 10 LED indicators on the single V.35/X.21 WAN interface card

LED	Indicator	Description
LED 1	Red	No external transmit clock source is available.
LED 2	Green	The signals CDC and DSR are on between the DSU and the adapter. LED 2 detects receive link status.
LED 3	Green	Power to the adapter is on and the onboard microcode is loaded.
LED 4	Green	Cable is detected.

Chapter 3
Configuring the management IP interface

This chapter describes how to configure a management IP address, subnet mask, and default gateway address on a newly installed Contivity 600. After you complete the procedures in this chapter, you will be able to configure and manage the Contivity 600 using a Web browser from a PC.

To configure the management IP address, you use the serial interface configuration menu. You must connect a PC or terminal to the serial port on the Contivity 600.

This chapter contains the following topics:

Required information

Before you configure the management interface, collect this information:

- IP address for the management interface

  The management IP address must be accessible from one of the private physical interfaces on the Contivity 600. For example, if you plan to assign IP address 10.2.3.3 with subnet mask 255.255.0.0 to the private physical interface, the management IP address must reside in the 10.2 network.

- Subnet mask

  The subnet mask specifies which IP addresses are directly reachable on the network and which ones must be routed through a gateway. For example, the IP address 10.2.3.3 with a subnet mask of 255.255.0.0 indicates that all hosts with addresses 10.2.*n*.*n* are directly reachable.

- Default gateway (optional)

  The default gateway routes packets to destinations for which there is no specific route in the routing table. You can configure a default gateway when you assign the management IP address, or you can configure it at a later time.

Note: Write down and save the management IP address. You will need it to configure the Contivity 600.

Configuring the management IP address

You use the serial interface to assign the Contivity 600 a management IP address and subnet mask so that you can then use a Web browser for management.

To configure the management IP address using the serial interface:

1. Turn on the terminal or PC.

   The terminal or PC should be configured as follows:

   - 9600 baud
   - 8 data bits
   - 1 stop bit
   - No parity
   - No flow control

2. Connect the serial cable (supplied with the Contivity 600) from the gateway's serial port to a terminal or to the communications port on a PC.

3. On the PC, start HyperTerminal* or another terminal emulation program and press Enter.

   The Welcome screen appears.

```
Welcome to the Contivity Secure IP Services Gateway
Copyright (c) 1999-2004 Nortel Networks, Inc.

Version:              V04_90.120
Creation date:        July 27, 2004, 20:51:06
Date:                 07/27/2004
Unit Serial Number:   317563

Please enter the administrator's user name:
```

4. Enter the default user name and password for the administrator.

   The factory default user name is *admin* and the default password is *setup*. The user name and password are case sensitive.

```
Please enter the administrator's user name: admin

Please enter the administrator's password: *****
```

The serial main menu appears.

```
Main Menu: System is currently in NORMAL mode.

1) Interfaces
2) Administrator
3) Default Private Route Menu
4) Default Public Route Menu
5) Create A User Control Tunnel (IPsec) Profile
6) Restricted Management Mode       FALSE
7) Allow HTTP Management            TRUE
8) Firewall Options
9) Shutdown
B) System Boot Options
P) Configure Serial Port
C) Controlled Crash
L) Command Line Interface
R) Reset System to Factory Defaults
E) Exit, Save and Invoke Changes

Please select a menu choice (1 - 9,B,P,C,L,R,E):
```

5 Type **1** and press Enter.

The Interface menu appears.

```
- Interface Menu

0) Slot 0, Port 1, Private LAN
     Interface IP Address =
     Subnet Mask = 0.0.0.0
     Speed/Duplex = AutoNegotiate

1) Slot 1, Port 1, Public LAN
     IP Address =
     Subnet Mask = 0.0.0.0
     Speed/Duplex = AutoNegotiate

R) Return to the Main Menu.

Please select a menu choice:
```

6 Type **0** and press Enter to configure the management IP address.

The default settings appear, followed by the prompt for the management IP address. The old management IP address field is blank on a new gateway.

```
0) Slot 0, Port 1, Private LAN
     Interface IP Address =
     Subnet Mask = 0.0.0.0
     Speed/Duplex = AutoNegotiate

   * Type 0.0.0.0 to delete.
   * Just type <CR> to skip.

Old Management IP Address =
New Management IP Address* =
```

7 At the New Management IP Address prompt, type the management IP address and press Enter.

The prompt for the interface IP address appears.

```
Old Interface IP Address =
New Interface IP Address* =
```

8 Enter the IP address for the private LAN or press Enter to skip this prompt.

The subnet mask prompt appears.

```
Old Subnet Mask = 0.0.0.0
New Subnet Mask =
```

9 At the New Subnet Mask prompt, type the subnet mask for the management IP address and press Enter.

The Speed/Duplex prompt appears.

10 Press Enter to leave the speed and duplex settings unchanged.

The Interface menu appears again with the changes you made.

```
- Interface Menu

0) Slot 0, Port 1, Private LAN
     Management IP Address = 47.33.245.66, (Subnet Mask =
     255.255.0.0)
     Interface IP Address = 47.33.245.64
     Subnet Mask = 255.255.0.0
     Speed/Duplex = AutoNegotiate

1) Slot 1, Port 1, Public LAN
     IP Address =
     Subnet Mask = 0.0.0.0
     Speed/Duplex = AutoNegotiate

R) Return to the Main Menu.

Please select a menu choice:
```

11 Type **R** and press Enter to return to the serial main menu.

12 From the serial main menu, type **E** and press Enter to save the new management IP address and mask and to exit the serial menu.

13 Go to the next section, "Testing the configuration," to verify that you can access the Contivity 600 from a Web browser.

For detailed information about configuring and managing the Contivity 600, refer to the documentation on the Contivity software CD.

Testing the configuration

After you assign a management IP address to the Contivity 600, start your Web browser to verify that you can access the gateway from the browser.

To manage the Contivity 600 using the GUI, your PC must be running one of the following browsers:

- Internet Explorer Version 5.5 or later
- Netscape* Navigator 4.79 or 6.2

To test the management IP address on the Contivity 600:

1. Open a Web browser.
2. In the URL field, enter **http://** followed by the management IP address that you assigned to the Contivity 600.

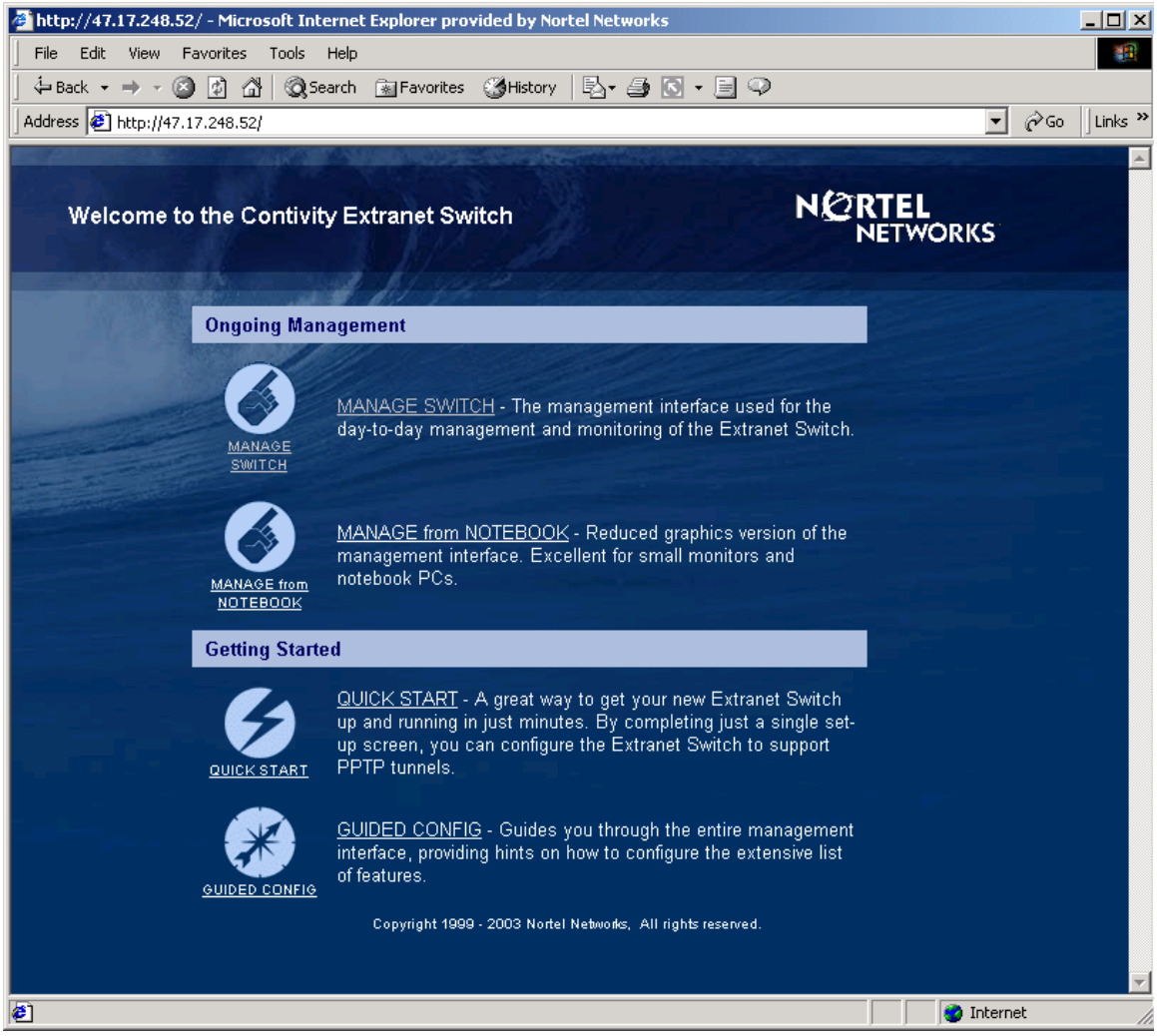
   For example, if the management IP address is 10.2.3.2, enter **http://10.2.3.2**.

   If the Welcome screen (Figure 10) appears, you correctly configured the management IP address for the Contivity 600.

Note: If the Welcome screen does not appear, see "Troubleshooting" on page 41.

3. Go to *Configuring Basic Features for the Contivity Secure IP Services Gateway* for information about configuring the Contivity 600.

Figure 10 Welcome screen



Troubleshooting

If you cannot connect to the Contivity 600 using your browser, check the following items:

- Make sure that you entered the correct IP address in the browser window.
- Type a known URL in the browser window to make sure that your network connection is good.
- Check that the management IP address that you configured is on the same subnet as the physical LAN attached to the gateway.
- Make sure that your PC is running a supported browser, either Internet Explorer Version 5.5 or later, or Netscape Navigator* 4.79 or 6.2.
- Check the physical connections on the Contivity 600, especially the LAN cable and the power cord.

If you still cannot connect to the Contivity 600 using a browser, connect a terminal or PC to the gateway with the serial cable and check the management IP address listed in the serial menu (see "Configuring the management IP address" on page 35). Reconfigure the management IP address if necessary.

If you cannot resolve the problem, contact the Nortel Networks Technical Solutions Center closest to you (see "How to get help" on page 16).

Chapter 4
Installing option cards and DIMMs

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 an interface card or DIMM, 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 power supply cable from the Contivity 600 DC input port.

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:

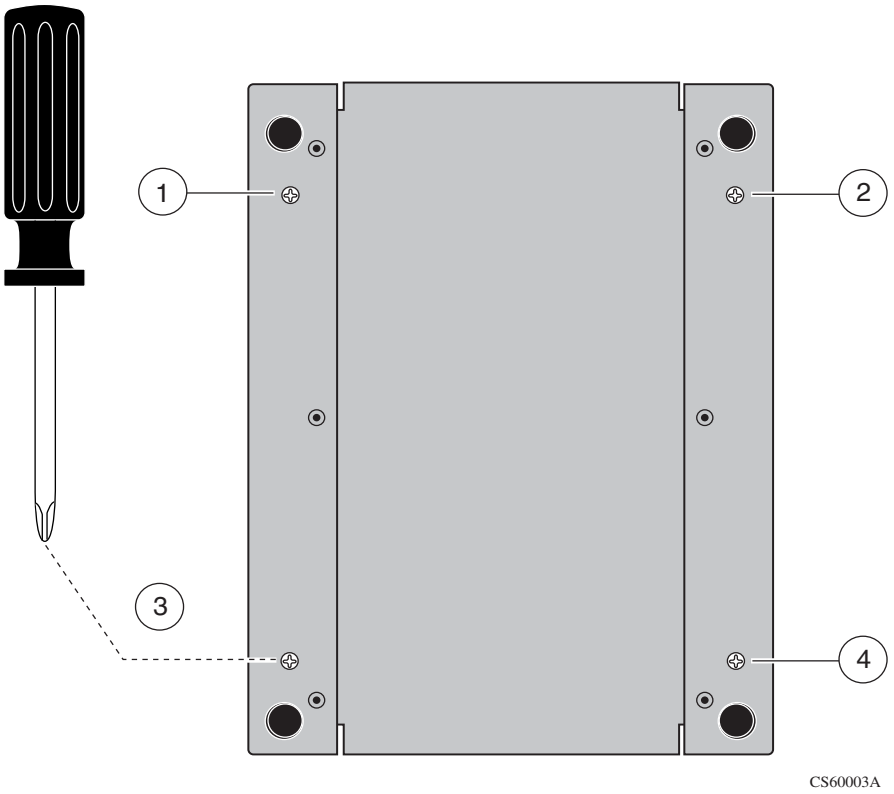
1. Shut down the Contivity 600 and then unplug it as described in "Shutting down the system to add or replace hardware" on page 44.

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 11).

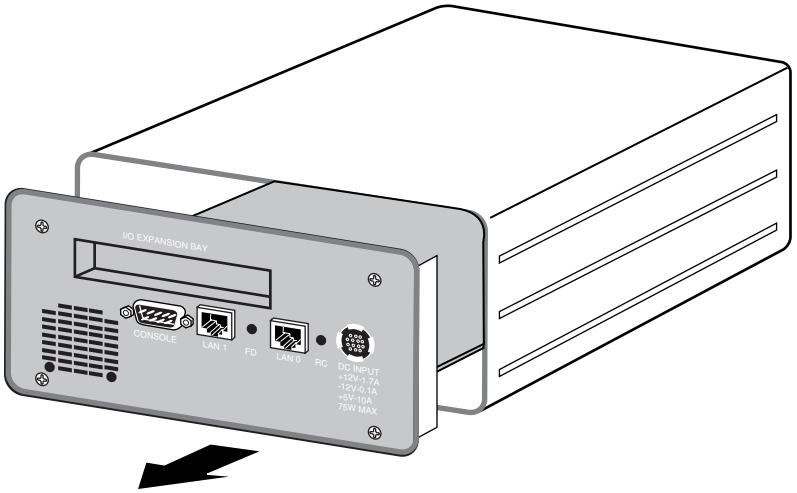
Figure 11 Removing the screws from the bottom of the Contivity 600



4 Grasp the rear of the chassis and firmly pull the chassis toward you to loosen it from the steel enclosure (Figure 12).

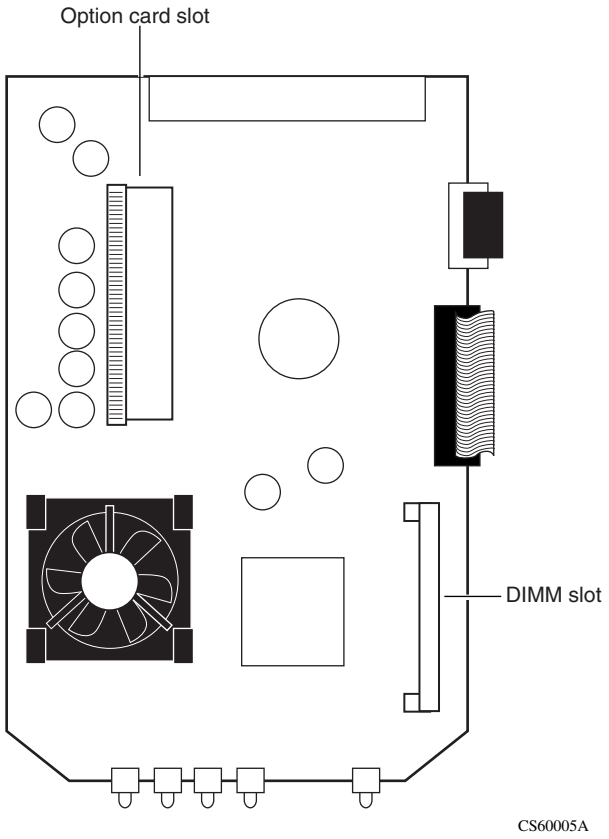
You can gently shake the chassis so that it slips outward and into your hand, or you can pull gently on the I/O expansion bay.

Figure 12 Removing the chassis from the steel enclosure



The system board is now exposed. Figure 13 shows the location of the option card slot and the DIMM slot on the Contivity 600 system board.

Figure 13 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 13 on page 47). 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
- 56/64K CSU/DSU WAN interface card (requires software Version 5.0 or later)
- 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 CSU/DSU WAN interface card (full-height card)
- T1/E1 CSU/DSU WAN interface card (half-height card; for E1 support, you must install the half-height 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 44.

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

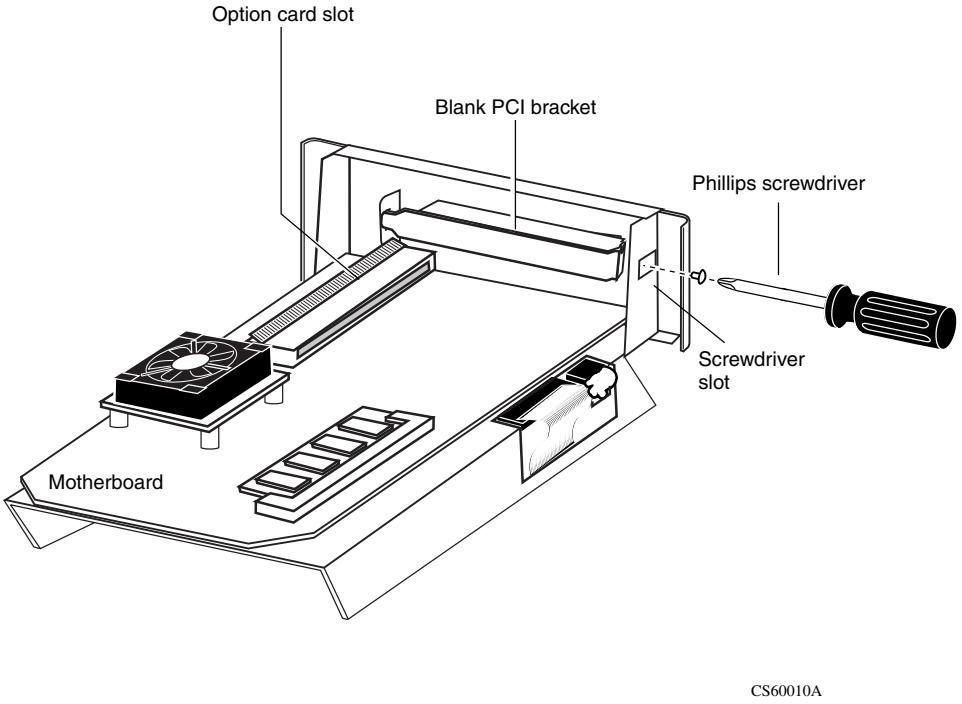
2 Remove the chassis from the steel enclosure (see "Opening the Contivity 600" on page 44).

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 14).

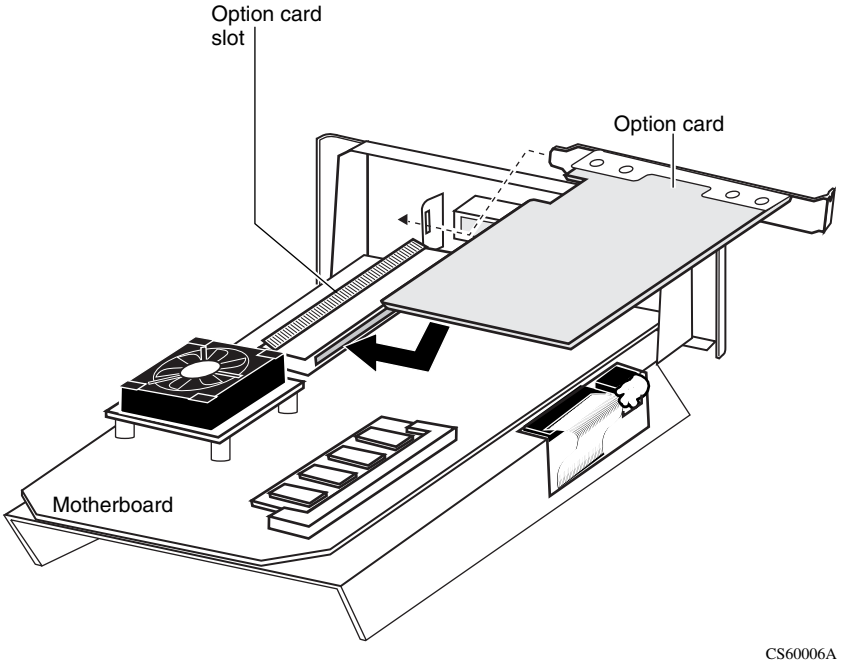
Figure 14 Removing the blank bracket from the option card slot



5 Slide the option card into the option card slot (Figure 15).

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

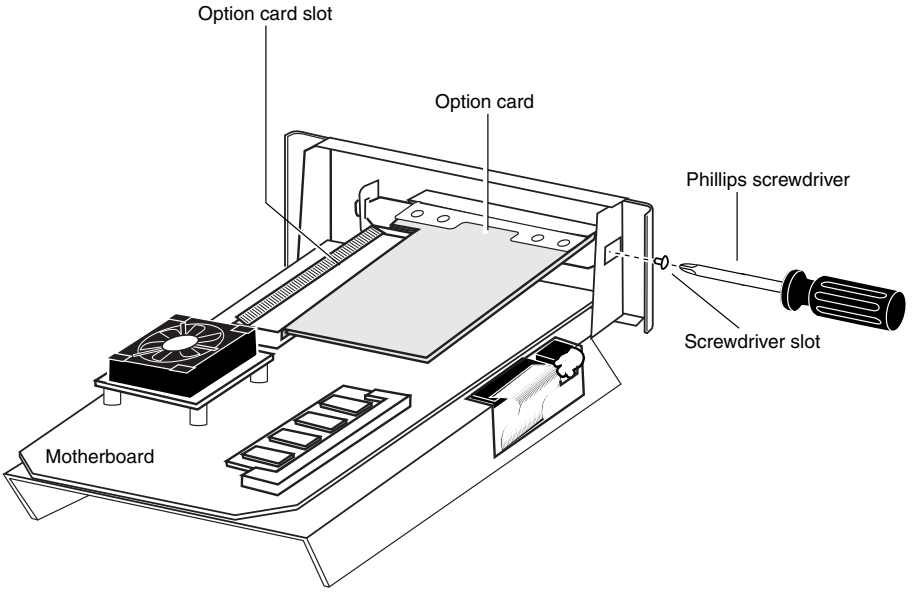
Figure 15 Inserting the option card



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.

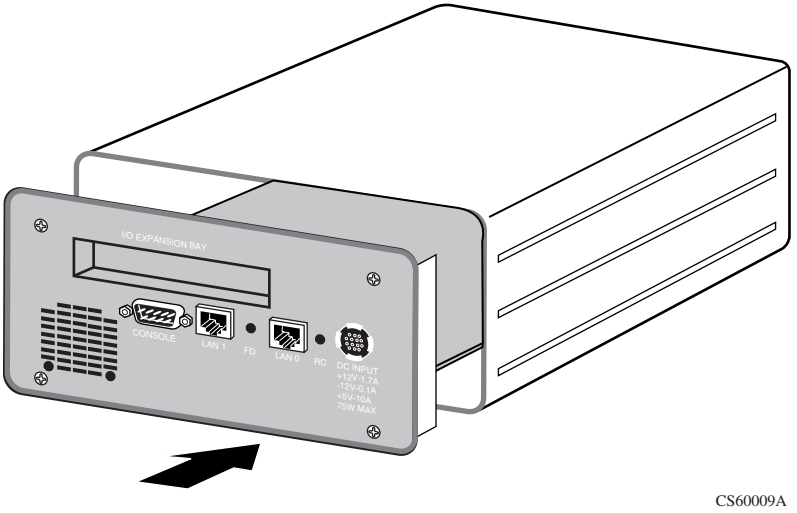
6 Replace the screw at the right end of the PCI bracket (Figure 16).

Figure 16 Securing the option card in the slot



7 Slide the chassis into the steel enclosure (Figure 17).

Figure 17 Replacing the chassis in the steel enclosure



8 Replace the 4 Phillips screws that secure the bottom panel to the chassis (see Figure 11 on page 45).

9 Connect the cables to the system ports and to the option card port.

10 Plug the cable attached to the external power supply into the receptacle labeled “DC Input” on the rear of the Contivity 600.

11 If necessary, plug the female end of the power cord into the external power supply pack.

12 Plug the other end of the power cord into a surge protector, then plug the surge protector (or the power cord) into the power outlet.

The Contivity 600 should begin to boot.

Note: The Contivity 600 has no power switch. Connecting the Contivity 600 to a power supply turns the gateway on.

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 44.

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 44).

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 13 on page 47).

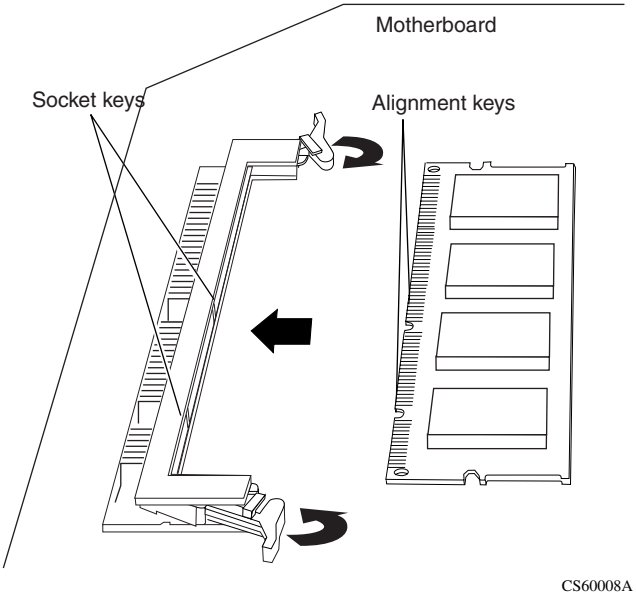
5 Pull the locking levers back to release the DIMM. It will snap up from the circuit board.

6 Pull the DIMM out of the slot.

7 Insert the new DIMM into the slot at a 45 degree angle (Figure 18).

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

Figure 18 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 17 on page 51).

10 Replace the 4 Phillips screws that secure the bottom panel to the chassis (see Figure 11 on page 45).

11 Connect the cables to the system ports and to the option card port.

12 Plug the cable attached to the external power supply into the receptacle labeled “DC Input” on the rear of the Contivity 600.

13 If necessary, plug the female end of the power cord into the external power supply pack.

14 Plug the other end of the power cord into a surge protector, then plug the surge protector (or the power cord) into the power outlet.

The Contivity 600 should begin to boot.

Note: The Contivity 600 has no power switch. Connecting the Contivity 600 to a power supply turns the gateway on.

Chapter 5
Using recovery mode

The Contivity 600 does not have a floppy disk drive, so the software image is built into the onboard flash operating system. Recovery mode on the Contivity 600 is also built into the flash operating system. You use recovery mode to restore software to a Contivity 600.

Some Web pages refer to “the recovery diskette” or “the diskette.” In the case of the Contivity 600, “the diskette” is a virtual diskette. In all other respects, recovery mode on a Contivity 600 works the same way that it does on Contivity gateways that have floppy disk drives.

Note: In addition, the Contivity 600 does not have a Reset button. If you need to reset a Contivity 600, you remove power from the gateway and then restore power.

To enter recovery mode:

1. Plug in the console cable, the LAN 0 cable, and the DC input cable from the Contivity 600 power supply (see Figure 2 on page 23).
2. Start HyperTerminal (or another terminal emulation program) on your PC and connect to the console port of the Contivity 600.
3. Apply AC power to the power supply.
4. Press the RC (recovery) switch on the rear of the Contivity 600 by inserting a paper clip into the hole marked “RC” on the rear of the chassis (see Figure 2 on page 23). The RC switch is located between the LAN 0 cable and the DC input cable.

On your console you will see the BIOS banner and the Nortel Networks Contivity banner. You will then observe the unit execute its power-on self-test. You can press the switch anytime during the power tests. A momentary press is all that is required. You do not need to hold the button down.

Note: After executing the power-on self-test, the console displays the message `Booting recovery image`.

Booting the recovery image takes approximately 40 seconds. After the recovery image boots, the Contivity 600 displays the welcome message, the recovery image version, and a prompt for you to enter the administrator's user name. At this point you are in recovery mode.

5 Enter a management IP address, subnet mask, and gateway if they are not already assigned. You do this from the console menu after logging in as an administrator.

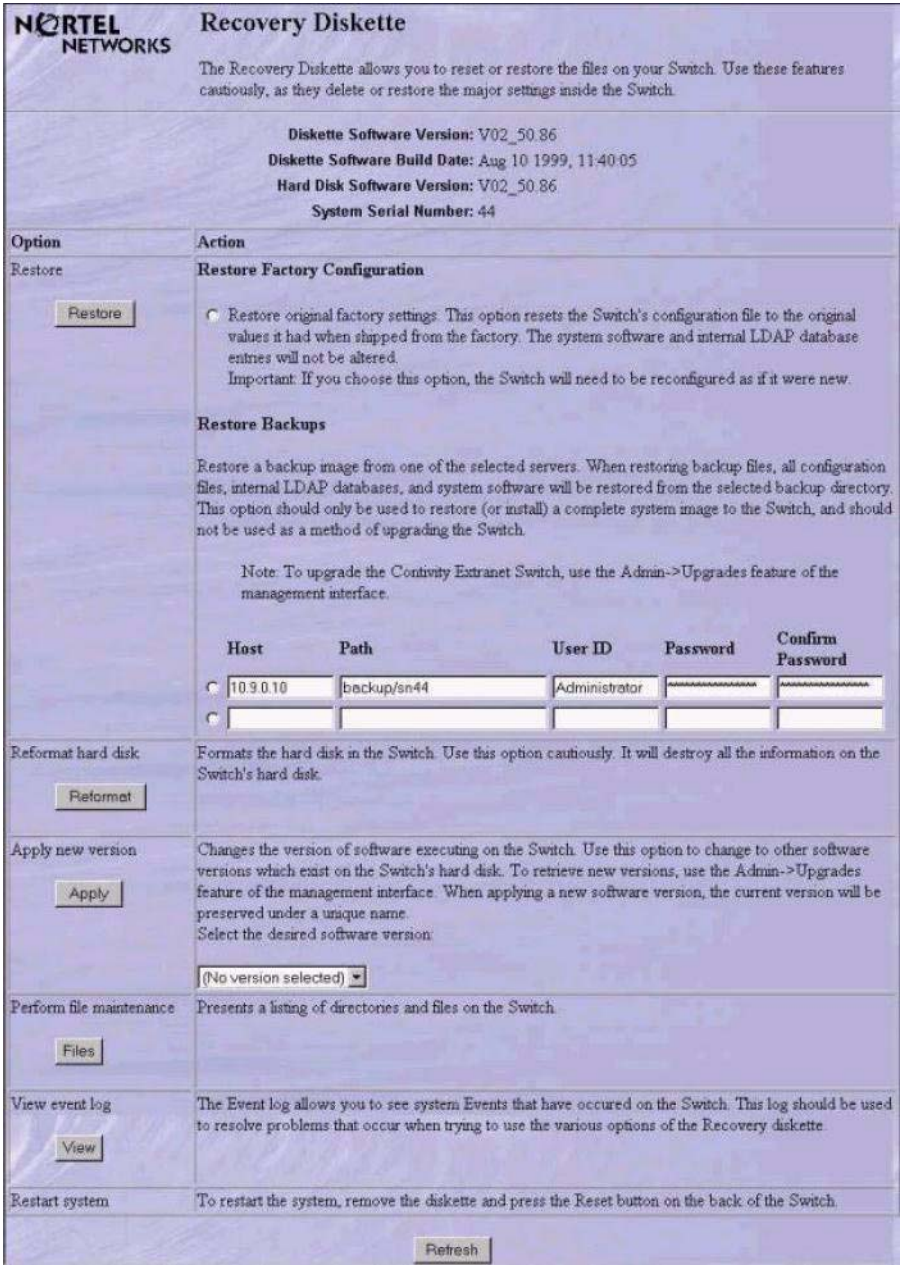
Once the unit has a management IP address, you can manage the unit from the Web interface.

Note: The switch marked FD is reserved for future use. Pressing this switch has no effect.

From the Web browser, enter the management IP address of the Contivity 600. The Recovery Diskette screen appears (Figure 19). From this screen, you can perform the following tasks:

- Restore the factory default configuration or the backup configuration.
- Reformat the hard disk of the Contivity 600.
- Apply a new software version to the Contivity 600.
- Perform file maintenance.
- View the Event log.
- Restart the system.

Figure 19 Recovery Diskette screen



1 Restore the configuration:

To restore the factory default configuration or the backup configuration, do one of the following:

- Restore the factory default configuration by selecting Restore Factory Configuration, then clicking Restore to return the Contivity 600 to its original factory default configuration. This option erases data contained in flash memory and also in the configuration file.

Warning: Selecting this option requires you to rebuild your entire configuration again from scratch.

A message specifies the result of the Factory Configuration reset action.

- Or, you can restore the gateway's previously backed-up configuration by clicking Restore. If you previously chose to automatically back up the file systems, then the Backup Server Host (or IP address) and Path Name, User ID, and Password appear in the table.

  Choose the Partial Backup option to restore the configuration files, log files, or system files from a partial backup.

  Click the radio button of the preferred backup server. The backed-up file system, including software image and configuration files, from the latest backup copy residing on the designated server will be restored onto the hard drive of your gateway.

  You can use the same backup server for multiple gateways. Each gateway creates a unique directory based on its serial number. The following example shows the host, path, and serial number:

  ```
  C:/software/backup/v101/SN01001
  ```

  The serial number is used to differentiate backup configurations from multiple gateways that are saved on the same backup server. The serial number uniquely identifies each gateway's backup data.

  A blank row in the server backup field always appears to allow you to manually enter a backup server in case you did not configure automatic backup server locations.

- Alternatively, you can restore a new factory default software image and file system to the Contivity 600 hard disk. Specify the name or address and path of the network file server onto which the software from the Nortel Networks CD has been installed.

Note: This option will restore the disk to an operable but "clean" condition (for example, configuration values will be at factory defaults).

To view your gateway's serial number when the gateway is operational, click Status > System from the navigational menu. The serial number is also listed on the bar code label on the back of the gateway.

2 Click Reformat your Switch's Hard Disk if you must reformat the hard disk, for example if you:

— Have problems restoring your configuration that are not caused by the network or the file/backup server from which the file restoration is being retrieved.

— Want to reconfigure the Contivity 600 from scratch.

Caution: Selecting this option will completely erase all information that previously resided on the hard disk.

A message indicates whether the reformatting of the hard disk was successful.

3 Click the list box to view the available software image and file systems that are stored on the remote disk and select the image version that you want to activate.

4 Click Files to display the File Maintenance screen, which allows you to view the entire hard disk file system.

5 Click View to display the Event Log beneath the Recovery Diskette display. This is especially useful if a Restore operation fails.

6 Reset the system after recovery operation by unplugging the unit. Either AC or DC power may be interrupted momentarily to accomplish this. Then reposition your Web browser to the management IP address, and press Reload or Refresh from your browser menu to access the management page of the software running on the hard disk.

Appendix A
Technical specifications

This appendix provides technical specifications for the Contivity 600 chassis and its interfaces.

Chassis specifications

Table 11 lists physical, electrical, and environmental specifications for the chassis.

Table 11 Physical, electrical, and environmental specifications

Specification	Description
Physical	
Height	4 in. (10.16 cm)
Width	8 in. (20.32 cm)
Depth	10.75 in. (27.30 cm)
Weight	7 lbs. (3.175 kg)
Electrical	
Voltage	100–240 VAC
Current	1.9 A
Frequency	47–63 Hz
Environmental	
Operating temperature	32–110°F (0–45°C)
Relative humidity	10–90% noncondensing

System ports

The Contivity 600 system board provides the following built-in interfaces:

- 10/100BASE Ethernet LAN ports
- Serial port

This section provides information about the 10/100BASE Ethernet LAN ports and the serial port on the system board.

10/100BASE Ethernet LAN port

The system board provides two 10/100BASE Ethernet LAN interfaces on the rear of the chassis. (LAN 0 is generally used for Web management, and LAN 1 is generally used as a public LAN.) These interfaces accommodate an RJ-45 straight- through cable. 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.

Figure 20 shows the 10/100BASE Ethernet connector and its pinouts.

Figure 20 10/100BASE Ethernet connector

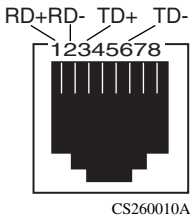


Table 12 provides the 10/100BASE Ethernet port pinouts.

Table 12 10/100BASE Ethernet port pinouts

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

Serial port

The system board provides a serial port on the rear of the chassis to enable out-of-band management. Using the serial port, you can assign the management IP address and subnet mask to the newly installed gateway (for more information, see Chapter 3, “Configuring the management IP interface,” on page 33).

The serial cable provided with the Contivity 600 is a DB9/DB25-to-DB9/DB25 cable. This cable provides a crossover connection (transmit-to-receive and receive-to-transmit). The DB9 connector goes into the gateway and the other DB9 or DB25 connector goes into your workstation.

Table 13 provides the multiple DB9/DB25 serial interface cable pinouts.

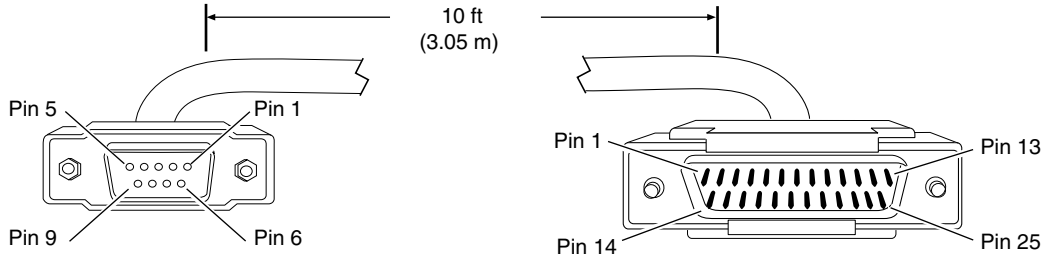
Table 13 Multiple DB9 and DB25 connector pinouts

Serial port DB9 connector		**Serial port DB25 connector**			**Serial port DB25 connector**		**Serial port DB9 connector**	
Pinout	Signal	Pinout	Signal		Pinout	Signal	Pinout	Signal
2	RXD	3	TXD	>	2	RXD	3	TXD
3	TXD	2	RXD	>	3	TXD	2	RXD
4	DTR	20	DSR	>	6	DTR	6	DSR
5	Ground	7	Ground	>	7	Ground	5	Ground
6	DSR	6	DTR	>	20	DSR	4	DTR
7	RTS	4	RTS	>	5	CTS	8	CTS
8	CTS	5	CTS	>	4	RTS	7	RTS

Modem cable specifications

If you need to connect a modem to a Contivity 600, you must obtain an appropriate modem cable. The modem cable must have a 9-pin D-sub plug that connects to the Contivity 600 serial port and a 25-pin D-sub plug that connects to the RS-232-C modem port (Figure 21).

Figure 21 Modem cable (9-pin D-sub plug to RS-232-C modem plug)



9-position D-sub receptacle with screw locks (ground shield connected to backshell)

25-position D-sub plug with screw locks (ground shield connected to backshell)

CAB0056A

Table 14 provides the modem cable pinouts.

Table 14 Modem cable pinouts

Nortel Networks termination		**Modem termination**	
Signal	**Pin # to Pin #**		**Signal**
Data Carrier Detect	1	8	Data Carrier Detect
Transmit Data (TXD)	2	2	Transmit Data (TXD)
Receive Data (RXD)	3	3	Receive Data (RXD)
Data Set Ready	4	6	Data Set Ready
Data Terminal Ready	6	20	Data Terminal Ready
Clear to Send	7	5	Clear to Send
Request to Send	8	4	Request to Send

Hardware option cards

The Contivity 600 has one expansion PCI slot that supports any of the following option cards:

- 10/100BASE Ethernet interface card
- 56/64K CSU/DSU WAN interface card
- ADSL WAN interface card
- ISDN BRI S/T or U interface card
- T1 CSU/DSU WAN interface card (full-height card)
- T1/E1 CSU/DSU WAN interface card (half-height card)
- Single V.35/X.21 WAN interface card
- V.90 modem interface card

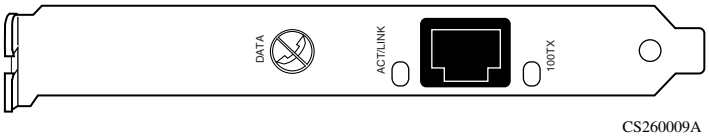
This section provides information about the option cards, including the connector and the cable pinouts for each supported network interface card. For instructions on installing an option card, see Chapter 4, “Installing option cards and DIMMs,” on page 43.

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 22 shows the 10/100BASE Ethernet interface card.

Figure 22 10/100BASE Ethernet interface card

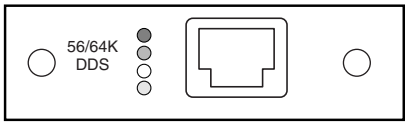


For information about the cables that you can connect to this interface and the cable pinouts, see “10/100BASE Ethernet LAN port” on page 62.

56/64K CSU/DSU WAN interface card

The 56/64K CSU/DSU WAN interface card has a single RJ-48 connector that provides the signals needed to interface to network equipment. Figure 23 shows the 56/64K CSU/DSU WAN interface card.

Figure 23 56/64K CSU/DSU WAN interface card



10972EA

The connector on the 56/64K 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 56/64K 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 1 and 2) and the receive signal (pins 7 and 8) are carried on a twisted pair inside the patch cord. The use of factory-made patch cords is strongly recommended.

You connect the 56/64K 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 56/64K CSU/DSU crossover cable and the Ethernet crossover cable are not interchangeable.

Table 15 provides the 56/64K CSU/DSU cable pinouts for a crossover connection.

Table 15 56/64K CSU/DSU cable pinouts for crossover connection

Nortel Networks termination		Remote termination	
Signal	**Pin # to Pin #**		**Signal**
Transmit tip	1	7	Receive tip
Transmit ring	2	8	Receive ring
not used	3	3	not used
not used	4	4	not used
not used	5	5	not used
not used	6	6	not used
Receive tip	7	1	Transmit tip
Receive ring	8	2	Transmit ring

The cable will operate properly if pins 3, 4, 5, and 6 are not connected.

Caution: For crossover connections, do not use Ethernet cable. The link will not be established.

Table 16 provides the 56/64K CSU/DSU cable pinouts for a straight-through connection.

Table 16 56/64K CSU/DSU cable pinouts for straight-through connection

Nortel Networks termination		Remote termination	
Signal	**Pin # to Pin #**		**Signal**
Transmit tip	1	1	Transmit tip
Transmit ring	2	2	Transmit ring
not used	3	3	not used
not used	4	4	not used
not used	5	5	not used
not used	6	6	not used
Receive tip	7	7	Receive tip
Receive ring	8	8	Receive ring

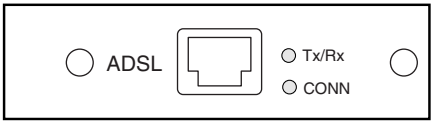
ADSL WAN interface card

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 24 shows the ADSL WAN interface card.

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

Figure 24 ADSL WAN interface card



10972EA

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

Table 17 provides the ADSL port pinouts.

Table 17 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 S/T interface to the ISDN network, you must attach an external NT-1 device to the RJ-45 connector.)

Figure 25 shows the ISDN BRI S/T interface card.

Figure 25 ISDN BRI S/T interface card

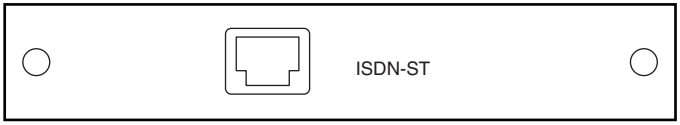
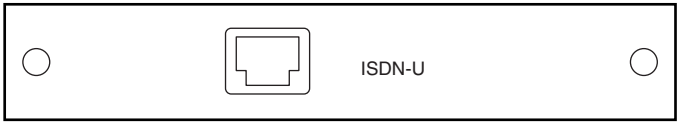


Figure 26 shows the ISDN BRI U interface card.

Figure 26 ISDN BRI U interface card



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 18 provides the ISDN BRI S/T cable pinouts.

Table 18 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 19 provides the ISDN BRI U cable pinouts.

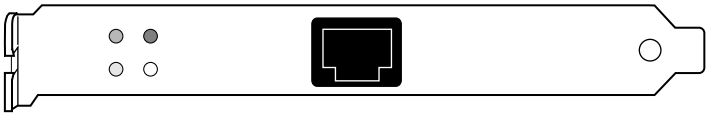
Table 19 ISDN BRI U cable pinouts

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 27 shows the T1/E1 CSU/DSU WAN interface card. This interface card ships as a half-height card and as a full-height card.

Figure 27 T1/E1 CSU/DSU WAN interface card



CS160012A

Note: For E1 service, you must install the half-height version of the T1/E1 CSU/DSU WAN interface card.

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 the T1/E1 CSU/DSU WAN interface cable with the 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 20 provides the T1/E1 CSU/DSU cable pinouts for a crossover connection.

Table 20 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 21 provides the T1/E1 CSU/DSU cable pinouts for a straight-through connection.

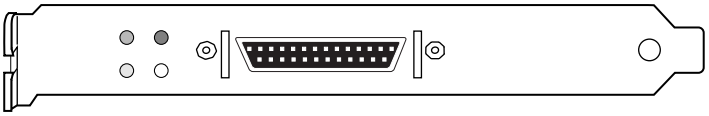
Table 21 T1/E1 CSU/DSU cable pinouts for straight-through connection

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

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 28 shows the single V.35/X.21 WAN interface card.

Figure 28 Single V.35/X.21 WAN interface card



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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 22 provides the V.35 cable pinouts. Table 23 on page 75 provides the X.21 cable pinouts. (The pair suffix A or B refers to an individual wire within a twisted pair.)

Table 22 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

Table 22 V.35 cable pinouts (continued)

Standard-wired end 28-pin male	Signal name	Pair number and conductor	Special-wired end 34-pin male	Notes
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	
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 23 provides the X.21 cable pinouts. (The pair suffix A or B refers to an individual wire within a twisted pair.)

Table 23 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	
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

Table 23 X.21 cable pinouts (continued)

Standard-wired end 28-pin male	Signal name	Pair number and conductor	Standard-wired end 15-pin male	Notes
1	SHIELD	pair 14A	1	Note 4,5
7	SIGNAL GROUND	pair 14B	8	Note 3,5

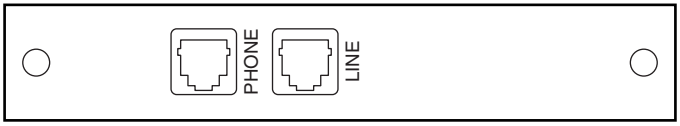
The following notes apply to the single X.21 cable:

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.

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 29 shows the V.90 modem interface card.

Figure 29 V.90 modem interface card



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

Table 24 provides the V.90 modem port cable pinouts.

Table 24 V.90 modem cable pinouts

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

Index

Numbers

A

B

C

D

E

F

G

H

I

L

M

N

O

P

R

S

T

U

V

W

X