Part No. 317086-C Rev 00
June 2004

600 Technology Park Drive
Billerica, MA 01821-4130

Installing the Contivity 1740

NORTEL NETWORKS™

Copyright © 2004 Nortel Networks

All rights reserved. June 2004.

The information in this document is subject to change without notice. The statements, configurations, technical data, and recommendations in this document are believed to be accurate and reliable, but are presented without express or implied warranty. Users must take full responsibility for their applications of any products specified in this document. The information in this document is proprietary to Nortel Networks Inc.

Trademarks

Nortel Networks, the Nortel Networks logo, the Globemark, Unified Networks, and Contivity are trademarks of Nortel Networks.

Adobe and Acrobat Reader are trademarks of Adobe Systems Incorporated.

Hi/fn and LZS are trademarks of Hi/fn, Inc.

HyperTerminal is a trademark of Hilgraeve, Inc.

Microsoft, Windows, and Windows NT are trademarks of Microsoft Corporation.

Netscape and Netscape Navigator are trademarks of Netscape Communications Corporation.

Ethernet is a trademark of Xerox Corporation.

The asterisk after a name denotes a trademarked item.

Statement of conditions

In the interest of improving internal design, operational function, and/or reliability, Nortel Networks Inc. reserves the right to make changes to the products described in this document without notice.

Nortel Networks Inc. does not assume any liability that may occur due to the use or application of the product(s) or circuit layout(s) described herein.

USA requirements only

Federal Communications Commission (FCC) Compliance Notice: Radio Frequency Notice

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.

European requirements only

EN 55 022 statement

This is to certify that the Nortel Networks Contivity 1740 is 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.

EC Declaration of Conformity

This product conforms (or these products conform) to the provisions of the R&TTE Directive 1999/5/EC.

Japan/Nippon requirements only

Voluntary Control Council for Interference (VCCI) statement

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Taiwan requirements

Bureau of Standards, Metrology and Inspection (BSMI) statement

警告使用者:

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

Canada requirements only

Canadian Department of Communications Radio Interference Regulations

This digital apparatus (Contivity 1740) 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

Cet appareil numérique (Contivity 1740) 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.

Nortel Networks Inc. software license agreement

This Software License Agreement (“License Agreement”) is between you, the end-user (“Customer”) and Nortel Networks Corporation and its subsidiaries and affiliates (“Nortel Networks”). PLEASE READ THE FOLLOWING CAREFULLY. YOU MUST ACCEPT THESE LICENSE TERMS IN ORDER TO DOWNLOAD AND/OR USE THE SOFTWARE. USE OF THE SOFTWARE CONSTITUTES YOUR ACCEPTANCE OF THIS LICENSE AGREEMENT. If you do not accept these terms and conditions, return the Software, unused and in the original shipping container, within 30 days of purchase to obtain a credit for the full purchase price.

“Software” is owned or licensed by Nortel Networks, its parent or one of its subsidiaries or affiliates, and is copyrighted and licensed, not sold. Software consists of machine-readable instructions, its components, data, audio-visual content (such as images, text, recordings or pictures) and related licensed materials including all whole or partial copies. Nortel Networks grants you a license to use the Software only in the country where you acquired the Software. You obtain no rights other than those granted to you under this License Agreement. You are responsible for the selection of the Software and for the installation of, use of, and results obtained from the Software.

1. Licensed Use of Software. Nortel Networks grants Customer a nonexclusive license to use a copy of the Software on only one machine at any one time or to the extent of the activation or authorized usage level, whichever is applicable. To the extent Software is furnished for use with designated hardware or Customer furnished equipment (“CFE”), Customer is granted a nonexclusive license to use Software only on such hardware or CFE, as applicable. Software contains trade secrets and Customer agrees to treat Software as confidential information using the same care and discretion Customer uses with its own similar information that it does not wish to disclose, publish or disseminate. Customer will ensure that anyone who uses the Software does so only in compliance with the terms of this Agreement. Customer shall not a) use, copy, modify, transfer or distribute the Software except as expressly authorized; b) reverse assemble, reverse compile, reverse engineer or otherwise translate the Software; c) create derivative works or modifications unless expressly authorized; or d) sublicense, rent or lease the Software. Licensors of intellectual property to Nortel Networks are beneficiaries of this provision. Upon termination or breach of the license by Customer or in the event designated hardware or CFE is no longer in use, Customer will promptly return the Software to Nortel Networks or certify its destruction. Nortel Networks may audit by remote polling or other reasonable means to determine Customer’s Software activation or usage levels. If suppliers of third party software included in Software require Nortel Networks to include additional or different terms, Customer agrees to abide by such terms provided by Nortel Networks with respect to such third party software.

2. Warranty. Except as may be otherwise expressly agreed to in writing between Nortel Networks and Customer, Software is provided “AS IS” without any warranties (conditions) of any kind. NORTEL NETWORKS DISCLAIMS ALL WARRANTIES (CONDITIONS) FOR THE SOFTWARE, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ANY WARRANTY OF NON-INFRINGEMENT. Nortel Networks is not obligated to provide support of any kind for the Software. Some jurisdictions do not allow exclusion of implied warranties, and, in such event, the above exclusions may not apply.

3. Limitation of Remedies. IN NO EVENT SHALL NORTEL NETWORKS OR ITS AGENTS OR SUPPLIERS BE LIABLE FOR ANY OF THE FOLLOWING: a) DAMAGES BASED ON ANY THIRD PARTY CLAIM; b) LOSS OF, OR DAMAGE TO, CUSTOMER’S RECORDS, FILES OR DATA; OR c) DIRECT, INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFITS OR SAVINGS), WHETHER IN CONTRACT, TORT OR OTHERWISE (INCLUDING NEGLIGENCE) ARISING OUT OF YOUR USE OF THE SOFTWARE, EVEN IF NORTEL NETWORKS, ITS AGENTS OR SUPPLIERS HAVE BEEN ADVISED OF THEIR POSSIBILITY. The forgoing limitations of remedies also apply to any developer and/or supplier of the Software. Such developer and/or supplier is an intended beneficiary of this Section. Some jurisdictions do not allow these limitations or exclusions and, in such event, they may not apply.

4. General

a. If Customer is the United States Government, the following paragraph shall apply: All Nortel Networks Software available under this License Agreement is commercial computer software and commercial computer software documentation and, in the event Software is licensed for or on behalf of the United States Government, the respective rights to the software and software documentation are governed by Nortel Networks standard commercial license in accordance with U.S. Federal Regulations at 48 C.F.R. Sections 12.212 (for non-DoD entities) and 48 C.F.R. 227.7202 (for DoD entities).

b. Customer may terminate the license at any time. Nortel Networks may terminate the license if Customer fails to comply with the terms and conditions of this license. In either event, upon termination, Customer must either return the Software to Nortel Networks or certify its destruction.

c. Customer is responsible for payment of any taxes, including personal property taxes, resulting from Customer's use of the Software. Customer agrees to comply with all applicable laws including all applicable export and import laws and regulations.

d. Neither party may bring an action, regardless of form, more than two years after the cause of the action arose.

e. The terms and conditions of this License Agreement form the complete and exclusive agreement between Customer and Nortel Networks.

f. This License Agreement is governed by the laws of the country in which Customer acquires the Software. If the Software is acquired in the United States, then this License Agreement is governed by the laws of the state of New York.

Contents

Preface 15

Before you begin 15
Text conventions 16
Acronyms 16
Related publications 17
How to get help 18

Chapter 1
Installing the Contivity 1740 chassis 19

Description of the Contivity 1740 19
Preparing to install the Contivity 1740 20
Shipment contents 21
Additional equipment 22
Cables 22
Hardware for mounting the chassis in an equipment rack 22
Site requirements 22
Installing the chassis 23
Installing the chassis on a flat surface 23
Installing the chassis in an equipment rack 24
Rack-mount recommendations 24
Attaching the shelf in the equipment rack 24
Mounting the chassis in the equipment rack 26

Chapter 2
Cabling the gateway and turning the power on 29

Connecting communications cables 30
Connecting the power cord 32
Verifying a successful installation 33

Understanding the LEDs 34
Front panel LEDs 34
LEDs on the system 10/100BASE Ethernet port 35
10/100BASE Ethernet interface card LEDs 36
1000BASE-T Ethernet interface card LEDs 36
1000BASE-SX Ethernet interface card LED 37
56/64K CSU/DSU WAN interface card LEDs 38
ADSL WAN interface card LEDs 39
T1/E1 CSU/DSU WAN interface card LEDs 40
Quad T1/E1 CSU/DSU WAN interface card LEDs 41
Single V.35/X.21 WAN interface card LEDs 42
SSL VPN Module 1000 LEDs 43

Chapter 3
Configuring the management IP interface. 45

Required information 46
Configuring the management IP address 47
Testing the configuration 51
Troubleshooting 53

Chapter 4
Installing option cards and DIMMs. 55

Shutting down the system to add or replace hardware 56
Removing the front bezel and top cover 57
Attaching the antistatic wrist strap 60
Installing and replacing option cards 61
Installing the SSL VPN Module 1000 with other option cards 62
Installing and replacing an option card 62
Installing and replacing DIMMs 65

Appendix A
Technical specifications 69

Chassis specifications 69
System ports 70
10/100BASE Ethernet LAN port 70

Serial port 71
Modem cable specifications 72
Hardware option cards 73
Contivity Security Accelerator (CSA) and Hardware Accelerator cards 74
SSL VPN Module 1000 75
10/100BASE Ethernet interface card 76
1000BASE-T Ethernet interface card 76
1000BASE-SX Ethernet interface card 78
56/64K CSU/DSU WAN interface card 79
ADSL WAN interface card 81
ISDN BRI interface card 82
T1/E1 CSU/DSU WAN interface card 84
Quad T1/E1 CSU/DSU WAN interface card 86
V.90 modem interface card 87
Single V.35/X.21 WAN interface card 87
Dual V.35 WAN interface card 91
HSSI WAN interface card 93

Index 95

Figures

Figure 1 Front view of the Contivity 1740 20
Figure 2 Placement of rubber feet on the bottom of the chassis 23
Figure 3 Attaching the cage nuts to the rack 25
Figure 4 Installing the shelf in the equipment rack 25
Figure 5 Removing the front bezel 26
Figure 6 Replacing the front bezel 27
Figure 7 Rear view of the Contivity 1740 31
Figure 8 Front panel LEDs 34
Figure 9 LEDs on the system 10/100BASE Ethernet port 35
Figure 10 LEDs on the 10/100BASE Ethernet interface card 36
Figure 11 LEDs on the 1000BASE-T Ethernet interface card 36
Figure 12 LED on the 1000BASE-SX Ethernet interface card 37
Figure 13 LEDs on the 56/64K CSU/DSU WAN interface card 38
Figure 14 LEDs on the ADSL WAN interface card 39
Figure 15 LEDs on the T1/E1 CSU/DSU WAN interface card 40
Figure 16 LEDs on the quad T1/E1 CSU/DSU WAN interface card 41
Figure 17 LEDs on the single V.35/X.21 WAN interface card 42
Figure 18 LEDs on the SSL VPN Module 1000 43
Figure 19 Welcome screen 52
Figure 20 Removing the front bezel 57
Figure 21 Removing the top cover 58
Figure 22 Location of option card and DIMM slots on the system board 59
Figure 23 Location of the grounding jack for the antistatic wrist strap 60
Figure 24 Installing and removing an option card 63
Figure 25 Replacing the front bezel 64
Figure 26 Installing and removing a DIMM 66
Figure 27 10/100BASE Ethernet connector 70
Figure 28 Modem cable (9-pin D-sub plug to RS-232-C modem plug) 72
Figure 29 SSL VPN Module 1000 75

Figure 30 10/100BASE Ethernet interface card 76
Figure 31 1000BASE-T Ethernet interface card 76
Figure 32 1000BASE-SX Ethernet interface card 78
Figure 33 56/64K CSU/DSU WAN interface card 79
Figure 34 ADSL WAN interface card 81
Figure 35 ISDN BRI S/T interface card 82
Figure 36 ISDN BRI U interface card 82
Figure 37 T1/E1 CSU/DSU WAN interface card 84
Figure 38 Quad T1/E1 CSU/DSU WAN interface card 86
Figure 39 V.90 modem interface card 87
Figure 40 Single V.35/X.21 WAN interface card 87
Figure 41 Dual V.35 WAN interface card 91
Figure 42 HSSI WAN interface card 93

Tables

Table 1 Items shipped with the Contivity 1740 21
Table 2 Interfaces and cables for the Contivity 1740 30
Table 3 Power cord requirements 32
Table 4 Front panel LED indicators 34
Table 5 LED indicators on the system 10/100BASE Ethernet port 35
Table 6 LED indicators on the 10/100BASE Ethernet interface card 36
Table 7 LED indicators on the 1000BASE-T Ethernet interface card 37
Table 8 LED indicator on the 1000BASE-SX Ethernet interface card 37
Table 9 LED indicators on the 56/64K CSU/DSU WAN interface card 38
Table 10 LED indicators on the ADSL WAN interface card 39
Table 11 LED indicators on the T1/E1 CSU/DSU WAN interface card 40
Table 12 LED indicators on the quad T1/E1 CSU/DSU WAN interface card 41
Table 13 LED indicators on the single V.35/X.21 WAN interface card 42
Table 14 LED indicators on the SSL VPN Module 1000 43
Table 15 Supported option cards for the Contivity 1740 61
Table 16 Physical, electrical, and environmental specifications 69
Table 17 10/100BASE Ethernet port pinouts 71
Table 18 Multiple DB9 and DB25 connector pinouts 71
Table 19 Modem cable pinouts 72
Table 20 1000BASE-T Ethernet port pinouts 77
Table 21 56/64K CSU/DSU cable pinouts for crossover connection 80
Table 22 56/64K CSU/DSU cable pinouts for straight-through connection 80
Table 23 ADSL cable pinouts 81
Table 24 ISDN BRI S/T cable pinouts 83
Table 25 ISDN BRI U cable pinouts 83
Table 26 T1/E1 CSU/DSU cable pinouts for crossover connection 85
Table 27 T1/E1 CSU/DSU cable pinouts for straight-through connection 85
Table 28 V.90 modem cable pinouts 87
Table 29 V.35 cable pinouts 88

Table 30 X.21 cable pinouts 89
Table 31 DB26-to-V.35 cable pinouts 92
Table 32 T3 cable pinouts 93

Preface

The Contivity* 1740 is part of the Nortel Networks* Contivity Secure IP Services Gateway product family. The Contivity Secure IP Services Gateways support secure, reliable IP VPNs in a single, integrated hardware device. Throughout this guide, the Contivity 1740 is also referred to as *the gateway.*

This guide provides instructions for installing the Contivity 1740 for the first time and for replacing any field replaceable unit (FRU). This guide also provides some initial configuration information and includes technical specifications for the Contivity 1740.

For complete information about configuring and monitoring the Contivity 1740, see the documentation on the software CD. (For information about Contivity documentation, see "Related publications" on page 17.)

Before you begin

This guide is intended for qualified service personnel who are installing the Contivity 1740 for the first time or who need to install or replace any of the following field replaceable units (FRUs):

- LAN, WAN, and serial interface cards
- Hardware accelerator card
- SSL VPN Module 1000
- Dual inline memory modules (DIMMs)

Before you install the Contivity 1740, 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
CSU/DSU	channel service unit/digital service unit
DIMM	dual inline memory module
DTE	data terminal equipment
HSSI	High Speed Serial Interface
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
SSL	Secure Sockets Layer
VPN	virtual private network
WAN	wide area network

Related publications

For complete information about configuring, monitoring, and managing the Contivity 1740, 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 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.
- *Configuring SSL VPN Services for the Contivity Secure IP Services Gateway* provides instructions for configuring services on the SSL VPN Module 1000, including authentication, networks, user groups, and portal links.

- *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.

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
Installing the Contivity 1740 chassis

This chapter describes how to install the Contivity 1740 chassis.

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:

Topic	Page
Description of the Contivity 1740	19
Preparing to install the Contivity 1740	20
Installing the chassis	23

Description of the Contivity 1740

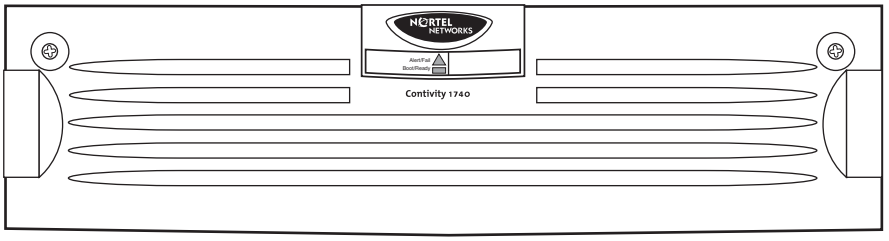
The Contivity 1740 enables scalable, secure, and robust IP VPNs across the public data network. The Contivity 1740 provides routing, firewall, bandwidth management, encryption, authentication, and data integrity services to ensure secure tunneling across IP networks and the Internet.

The Contivity 1740 is available in two models:

- Contivity 1740 with five tunnels
- Contivity 1740 with 500 tunnels (this model includes one 10/100 Ethernet* interface card installed in PCI slot 4)

Figure 1 shows the front view of the Contivity 1740.

Figure 1 Front view of the Contivity 1740



CS260001C

The Contivity 1740 chassis provides the following:

- One 10/100 Ethernet LAN port on the base system
- One serial port for out-of-band management of the Contivity 1740
- Four expansion PCI slots that can contain interface cards, a hardware accelerator card, and the SSL VPN Module 1000
- One 10/100 Ethernet interface card installed in PCI slot 4 (500-tunnel model)
- 128 MB memory upgradable to 256 MB total

Preparing to install the Contivity 1740

Before you begin the installation, verify that:

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

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

Shipment contents

In addition to the gateway and this guide, the shipping container for the Contivity 1740 contains a number of hardware accessories and other items (Table 1).

Note: Unless you specifically ordered a power cable, no power cable is shipped with the Contivity 1740.

Table 1 Items shipped with the Contivity 1740

Quantity	Item	Purpose
1	Rack mount shelf	Supports the chassis in the equipment rack
4	10-32 panhead screws	Secure the rack-mount shelf and the chassis to the equipment rack
4	10-32 panhead cage nuts	Used if the equipment rack does not have threaded rail holes
4	Rubber feet	Used to install the chassis on a surface
1	Antistatic wrist strap	Directs the discharge of static electricity from your body to the chassis to prevent damage to sensitive electronic components
1	Molded serial cable DB9/DB25-to-DB9/DB25	Connects the Contivity 1740 to a PC or to a local terminal
1	*Installing the Contivity 1740* (this book)	Provides instructions for installing the chassis and hardware options
1	Recovery diskette	Used to restore the software image and file system
1	Contivity software kit	Contains Contivity Secure IP Services Gateway software and documentation on CD
1	Contivity client kit	Contains Contivity VPN Client software and documentation on CD
1	Sheet of labels	Used to note IP address (apply to front bezel)

Inspect all items for shipping damage. If you detect any damage, do not install the Contivity 1740. Call the Nortel Networks Technical Solutions Center in your area (see "How to get help" on page 18).

Additional equipment

You may need items that are not included in the Contivity 1740 shipping container. Before you begin the installation, make sure that you have all the cables, tools, and other equipment that you need.

Cables

You will need cables that are not included in the Contivity 1740 shipping container. For information about which cables are shipped and which ones you can order, see "Connecting communications cables" on page 30. If you do not have the proper cables, contact your network administrator.

Hardware for mounting the chassis in an equipment rack

To install the Contivity 1740 in an equipment rack, you need a Phillips screwdriver and an equipment rack that meets the following specifications:

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

If the rack does not have threaded rail holes, you must use the cage nuts shipped with the Contivity 1740.

Site requirements

The installation site must provide sufficient free space around the Contivity 1740 to ensure proper ventilation and access for servicing. For information about the physical, electrical, and environmental requirements for the Contivity 1740, see Appendix A, "Technical specifications," on page 69.

Installing the chassis

To install the Contivity 1740, do one of the following:

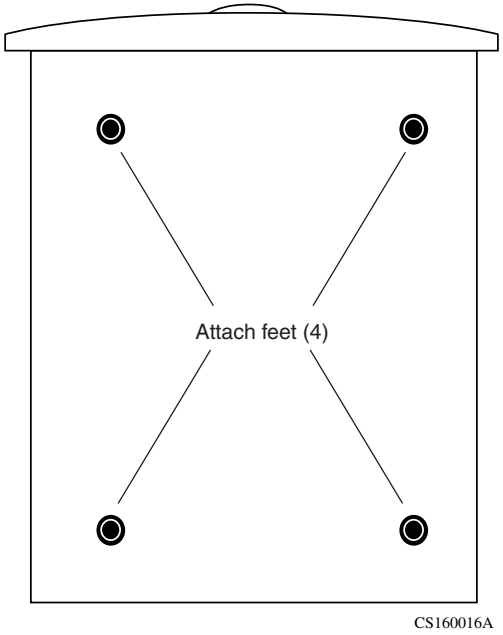
- Position the chassis on a flat, sturdy, horizontal surface.
- Mount the chassis in a standard equipment rack (see "Installing the chassis in an equipment rack" on page 24).

Installing the chassis on a flat surface

If you decide to place the Contivity 1740 on a flat surface, make sure that the surface is large enough for the gateway and sturdy enough to support the combined weight of the Contivity 1740 and the cables that you attach to it.

The Contivity 1740 accessory kit includes four rubber feet that can be attached to the bottom of the gateway. Figure 2 shows the placement of these rubber feet.

Figure 2 Placement of rubber feet on the bottom of the chassis



Installing the chassis in an equipment rack

To mount the Contivity 1740 in an equipment rack, you need the following equipment:

- Standard 19-inch equipment rack
- 4 screws (supplied with the chassis)
- 4 cage nuts (supplied with the chassis) if the rack does not have threaded rail holes
- #2 Phillips screwdriver

Rack-mount recommendations

When you mount the chassis in the rack, observe the following standard recommendations:

- The maximum recommended ambient temperature is 40°C (104°F). Make sure that the internal temperature of the rack does not exceed 40°C (104°F).
- Do not block the power supply vents or otherwise restrict air flow when installing the chassis in a rack.
- Stabilize your rack so that it does not tip over under the weight of the gateway and other devices.
- Make sure that the electrical branch circuits can handle the Contivity 1740 and other units in the rack before you install and turn on the gateway.
- Maintain a reliable earth-ground path in the rack system. The gateway is intended to connect to an earth ground.

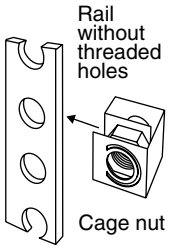
Attaching the shelf in the equipment rack

The Contivity 1740 ships with a rack-mount shelf to support the chassis in the equipment rack.

To attach the shelf to the inside of the equipment rack:

1. If the holes in the rack's vertical supports are not threaded, attach a cage nut in four locations at the front of the rack (Figure 3).

Figure 3 Attaching the cage nuts to the rack

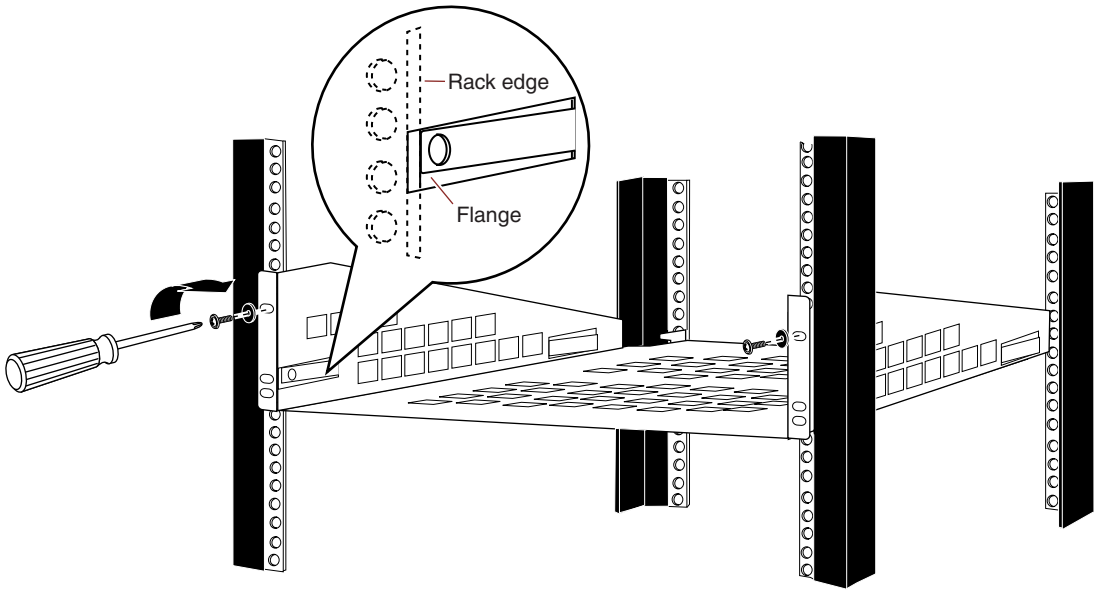


CS260003A

2 Position the rack-mount shelf inside the rack as shown in Figure 4.

3 Align the holes in the shelf with holes in the front of the rack.

Figure 4 Installing the shelf in the equipment rack



CS260003A

4 Make sure that the support flange snaps into place (Figure 4).

5 Insert one of the supplied panhead screws through the top hole on each side of the shelf into the hole in the rack and tighten the screws (Figure 4).

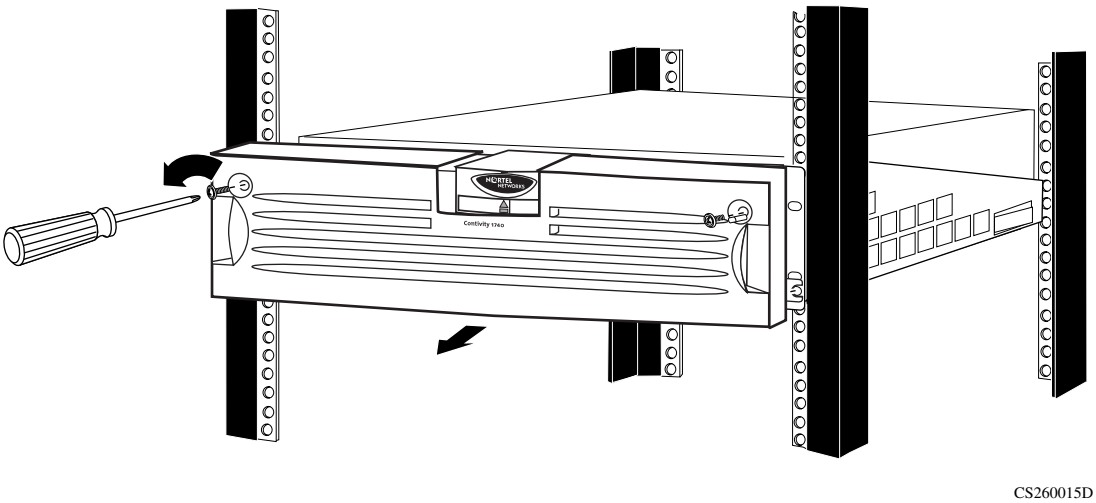
Mounting the chassis in the equipment rack

Nortel Networks recommends that two people install the chassis in the rack.

To install the Contivity 1740 in the equipment rack:

1. Set the Contivity 1740 on the rack-mount shelf.
2. Remove the front bezel from the Contivity 1740 (Figure 5).
   a. Using the Phillips screwdriver, turn each of the 2 screws on the front bezel a quarter turn counterclockwise.

Figure 5 Removing the front bezel



   b. 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.

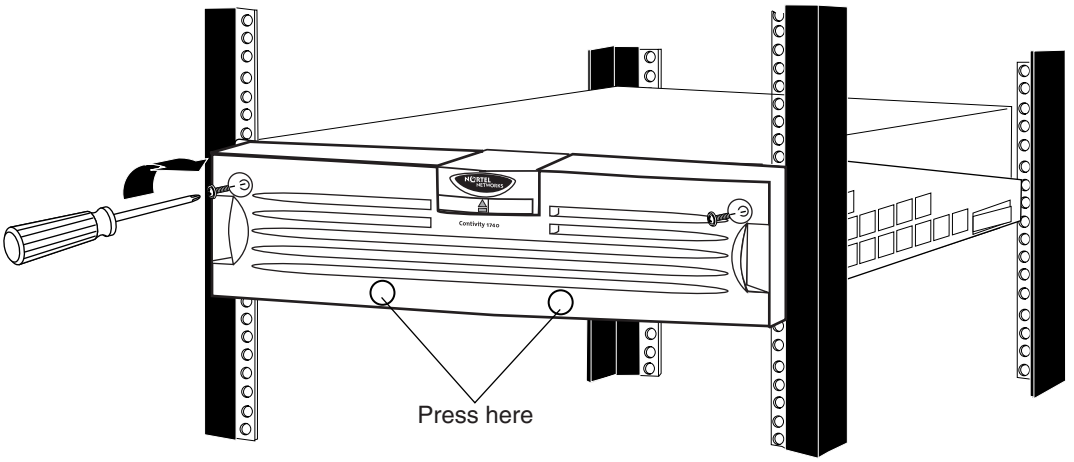
3 Insert one of the supplied panhead screws through the bottom hole on each side of the shelf into the hole in the rack and tighten the screws (see Figure 4 on page 25).

4 Replace the front bezel (Figure 6).

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

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

Figure 6 Replacing the front bezel



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 1740.

Caution: Connect the cables to the built-in Ethernet port and to the interfaces on the option cards installed in the Contivity 1740 before you plug the power cord into the outlet.

This chapter contains the following topics:

Topic	Page
Connecting communications cables	30
Connecting the power cord	32
Verifying a successful installation	33
Understanding the LEDs	34

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 1740.

Table 2 lists the system ports and the ports provided on the optional interface cards that you can install in the Contivity 1740. The table also indicates whether you can obtain cables for the ports from Nortel Networks.

Table 2 Interfaces and cables for the Contivity 1740

	Cable available from Nortel Networks		
Interface	**Included**	**Ordered separately**	**Contact supplier**
10/100 Ethernet system port			X
Serial port	X		
10/100BASE Ethernet			X
1000BASE-T Ethernet (copper)			X
1000BASE-SX Ethernet (fiber)		X[1]	
56/64K CSU/DSU WAN			X
ADSL WAN	X		
ISDN BRI			X
V.90 modem	X		
T1/E1 CSU/DSU WAN			X
Quad T1/E1 CSU/DSU WAN			X
Single V.35/X.21 WAN		X[2]	
Dual V.35 WAN	X		
HSSI WAN	X		

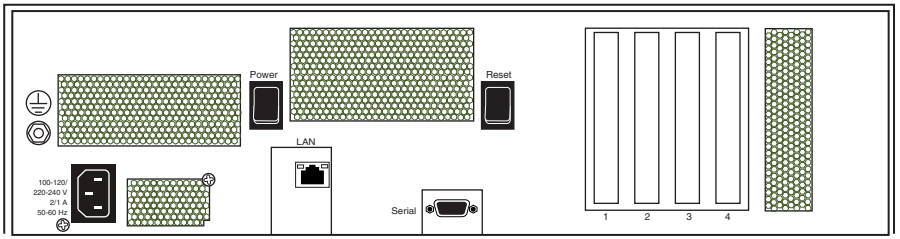
1 Order either the LC-to-LC cable or the LC-to-SC cable.

2 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 69.

Figure 7 shows the back of the Contivity 1740. All interface cables and the power cord attach to the rear of the gateway.

Figure 7 Rear view of the Contivity 1740



Connect the interface cables to the Contivity 1740 in this order:

1. Connect the 10/100BASE RJ-45 cable to the built-in 10/100BASE Ethernet LAN port on the gateway (see Figure 7 on page 31).
2. If you plan to connect a terminal or PC to the gateway, connect the serial cable shipped with the Contivity 1740 to the serial port (see Figure 7 on page 31).
3. Connect all other cables to the ports on the installed interface cards.

   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 1740 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 (2 A @ 100 VAC or 1A @ 220 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 gateway 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:

1. Connect the power cord to the AC receptacle on the back of the gateway (see Figure 7 on page 31).
2. Connect the power cord to the power outlet.

Caution: You should protect the Contivity 1740 by plugging it into a surge suppressor.

3. Press and release the power switch on the rear of the Contivity 1740 (see Figure 7 on page 31) and wait for the gateway to boot.

See the next section, "Verifying a successful installation."

Verifying a successful installation

After you connect the gateway to the power source and turn it on, you can verify a successful installation by checking the LEDs on the front panel (Figure 8).

The following sequence of LEDs should occur:

1. The power LED (the Nortel Networks logo) lights blue.
2. As the gateway boots, the Boot/Ready LED lights yellow.
3. When the boot process completes successfully, the Boot/Ready LED lights green, indicating that the gateway is operational.
4. The Alert/Fail LED lights yellow because the gateway is not configured.

   For a newly installed Contivity 1740, a yellow Alert/Fail LED does not indicate an alarm condition. After you configure the management IP address on the gateway, the Alert/Fail LED turns off. (See Chapter 3, "Configuring the management IP interface," on page 45.)

If the LEDs on the front panel light in this sequence, your installation is successful. If the LEDs do not light in this sequence, check that the bezel is on the gateway and that the power cord is properly attached to the power supply (see "Connecting the power cord" on page 32).

If the Contivity 1740 still does not boot, contact your local Nortel Networks Technical Solutions Center (see "How to get help" on page 18).

Understanding the LEDs

This section describes the LEDs on the front panel of the Contivity 1740 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 1740 has a lighted Nortel Networks logo and two LEDs (Figure 8). These LEDs indicate the status of the Contivity 1740.

Figure 8 Front panel LEDs

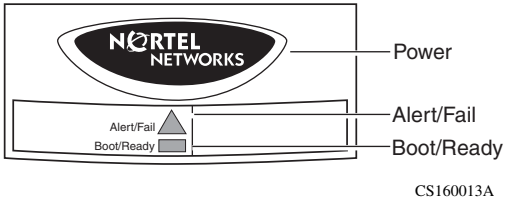


Table 4 describes the LEDs on the Contivity 1740 front panel.

Table 4 Front panel LED indicators

LED	Indicator	Description
Power (Nortel Networks logo)	On	The gateway is receiving AC power.
	Off	The gateway is not receiving AC power.
Alert/Fail	Yellow	A non-fatal alarm condition exists. The yellow alert condition is described in the health check display.
	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.
Boot/Ready	Yellow	The gateway is booting and is in a non-ready state.
	Green	The boot process has completed successfully and the gateway has reached a state of readiness.

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 port

Figure 9 shows the LEDs for the 10/100BASE Ethernet port located on the rear of the Contivity 1740.

Figure 9 LEDs on the system 10/100BASE Ethernet port

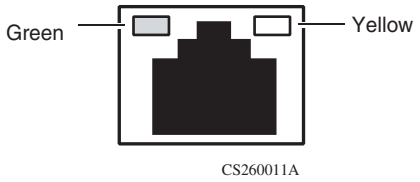


Table 5 describes the LEDs on the system 10/100BASE Ethernet port.

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

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

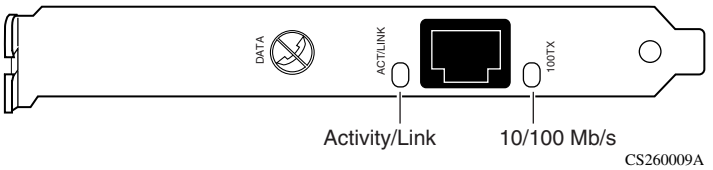


Table 6 describes the LEDs on the 10/100BASE Ethernet interface card.

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.

1000BASE-T Ethernet interface card LEDs

Figure 11 shows the LEDs on the 1000BASE-T Ethernet interface card.

Figure 11 LEDs on the 1000BASE-T Ethernet interface card

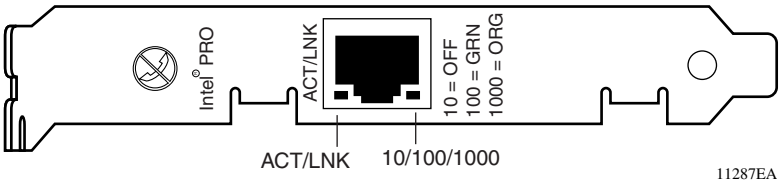


Table 7 describes the LEDs on the 1000BASE-T Ethernet interface card.

Table 7 LED indicators on the 1000BASE-T Ethernet interface card

LED	Indicator	Description
ACT/LNK	Steady green	The port is connected to a valid link partner.
	Flashing green	The LAN port is sending or receiving network data.
	Off	The port is not linked to a valid partner.
10/100/1000	Off	The LAN port is operating at 10 Mb/s.
	Green	The LAN port is operating at 100 Mb/s.
	Orange	The LAN port is operating at 1000 Mb/s.

1000BASE-SX Ethernet interface card LED

Figure 12 shows the LED on the 1000BASE-SX Ethernet interface card.

Figure 12 LED on the 1000BASE-SX Ethernet interface card

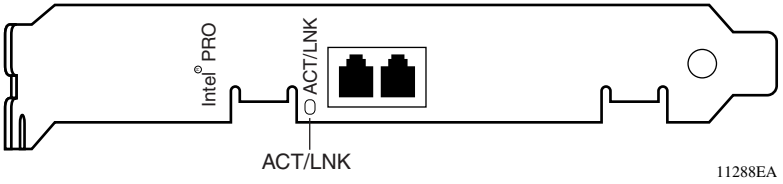


Table 8 describes the LED on the 1000BASE-SX Ethernet interface card.

Table 8 LED indicator on the 1000BASE-SX Ethernet interface card

LED	Indicator	Description
ACT/LNK	Steady green	The port is connected to a valid link partner.
	Flashing green	The LAN port is sending or receiving network data.
	Off	The port is not linked to a valid partner.

56/64K CSU/DSU WAN interface card LEDs

Figure 13 shows the LEDs on the 56/64K CSU/DSU WAN interface card.

Figure 13 LEDs on the 56/64K CSU/DSU WAN interface card

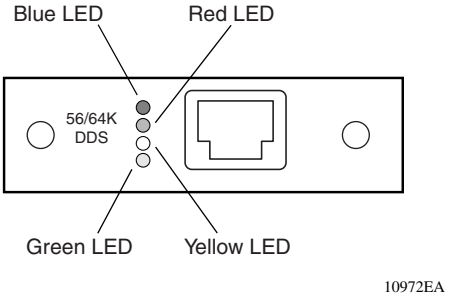


Table 9 describes the LEDs on the 56/64K CSU/DSU WAN interface card.

Table 9 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 14 shows the LEDs on the ADSL WAN interface card.

Figure 14 LEDs on the ADSL WAN interface card

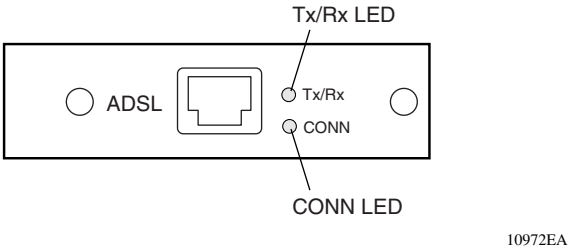


Table 10 describes the LEDs on the ADSL WAN interface card.

Table 10 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 15 shows the LEDs on the T1/E1 CSU/DSU WAN interface card.

Figure 15 LEDs on the T1/E1 CSU/DSU WAN interface card

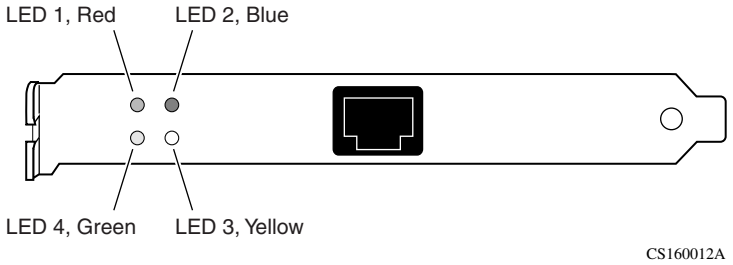


Table 11 describes the LEDs on the T1/E1 CSU/DSU WAN interface card.

Table 11 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.

Quad T1/E1 CSU/DSU WAN interface card LEDs

Figure 16 shows the LEDs on the quad T1/E1 CSU/DSU WAN interface card.

Figure 16 LEDs on the quad T1/E1 CSU/DSU WAN interface card

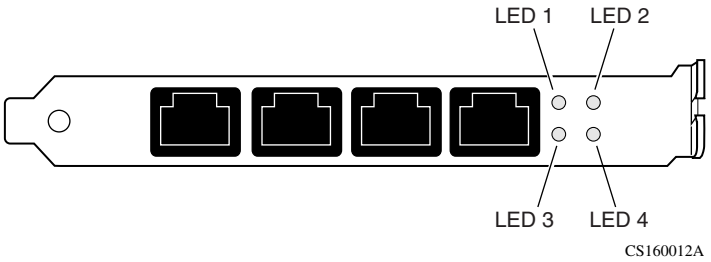


Table 12 describes the LEDs on the quad T1/E1 CSU/DSU WAN interface card.

Table 12 LED indicators on the quad T1/E1 CSU/DSU WAN interface card

LED	Indicator	Description
LED 1	Off	Port 1 is disabled.
	On	Port 1 is enabled and operating normally.
	Flashing	Port 1 is enabled and in an alarm state (red, yellow, or blue).
LED 2	Off	Port 2 is disabled.
	On	Port 2 is enabled and operating normally.
	Flashing	Port 2 is enabled and in an alarm state (red, yellow, or blue).
LED 3	Off	Port 3 is disabled.
	On	Port 3 is enabled and operating normally.
	Flashing	Port 3 is enabled and in an alarm state (red, yellow, or blue).
LED 4	Off	Port 4 is disabled.
	On	Port 4 is enabled and operating normally.
	Flashing	Port 4 is enabled and in an alarm state (red, yellow, or blue).

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

Figure 17 shows the LEDs on the single V.35/X.21 WAN interface card.

Figure 17 LEDs on the single V.35/X.21 WAN interface card

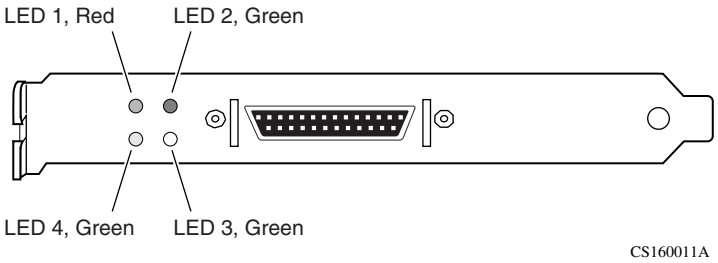


Table 13 describes the LEDs on the single V.35/X.21 WAN interface card.

Table 13 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.

SSL VPN Module 1000 LEDs

Figure 18 shows the LEDs on the SSL VPN Module 1000.

Figure 18 LEDs on the SSL VPN Module 1000

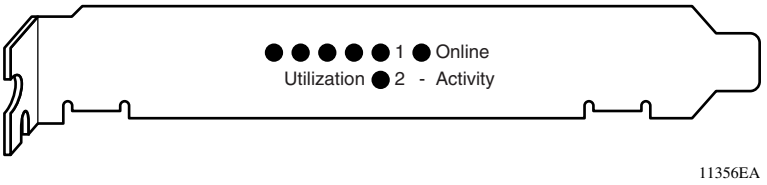


Table 14 describes the LEDs on the SSL VPN Module 1000.

Table 14 LED indicators on the SSL VPN Module 1000

LEDs	Indicator	Description
Online	Steady green	The SSL VPN Module 1000 is operating normally.
	Yellow	A reset occurred on the SSL VPN Module 1000.
	Off	The SSL VPN Module 1000 is not receiving power.
Activity LED 1	Steady green	The SSL VPN Module 1000 is operating normally.
	Flashing green	Activity is occurring on the SSL VPN Module 1000.
	Yellow	A reset occurred on the SSL VPN Module 1000.
Activity LED 2	—	Not used. (This LED is often lit, but it has no meaning.)
Utilization (4 LEDs)	Steady green	Together, these four LEDs indicate an approximate average level of CPU utilization. When one LED is lit, CPU utilization is approximately 25%; when two LEDs are lit, CPU utilization is approximately 50%.
	Blinking in unison	The SSL VPN Module 1000 is idle.

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 1740. After you complete the procedures in this chapter, you will be able to configure and manage the Contivity 1740 using a Web browser from a PC.

To configure the management IP interface, you use the serial interface configuration menu. You must connect a PC or terminal to the serial port on the Contivity 1740.

This chapter contains the following topics:

Topic	Page
Required information	46
Configuring the management IP address	47
Testing the configuration	51
Troubleshooting	53

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 1740. 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 1740.

Configuring the management IP address

You use the serial interface to assign the Contivity 1740 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 1740) 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_90.155
Creation date:        May 27, 2004, 20:51:06
Date:                 05/27/2004
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 1740 from a Web browser.

For detailed information about configuring and managing the Contivity 1740, refer to the documentation on the Contivity software CD.

Testing the configuration

After you assign a management IP address to the Contivity 1740, start your Web browser to verify that you can access the gateway from the browser.

To manage the Contivity 1740 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 1740:

1. Open a Web browser.
2. In the URL field, enter **http://** followed by the management IP address that you assigned to the Contivity 1740.

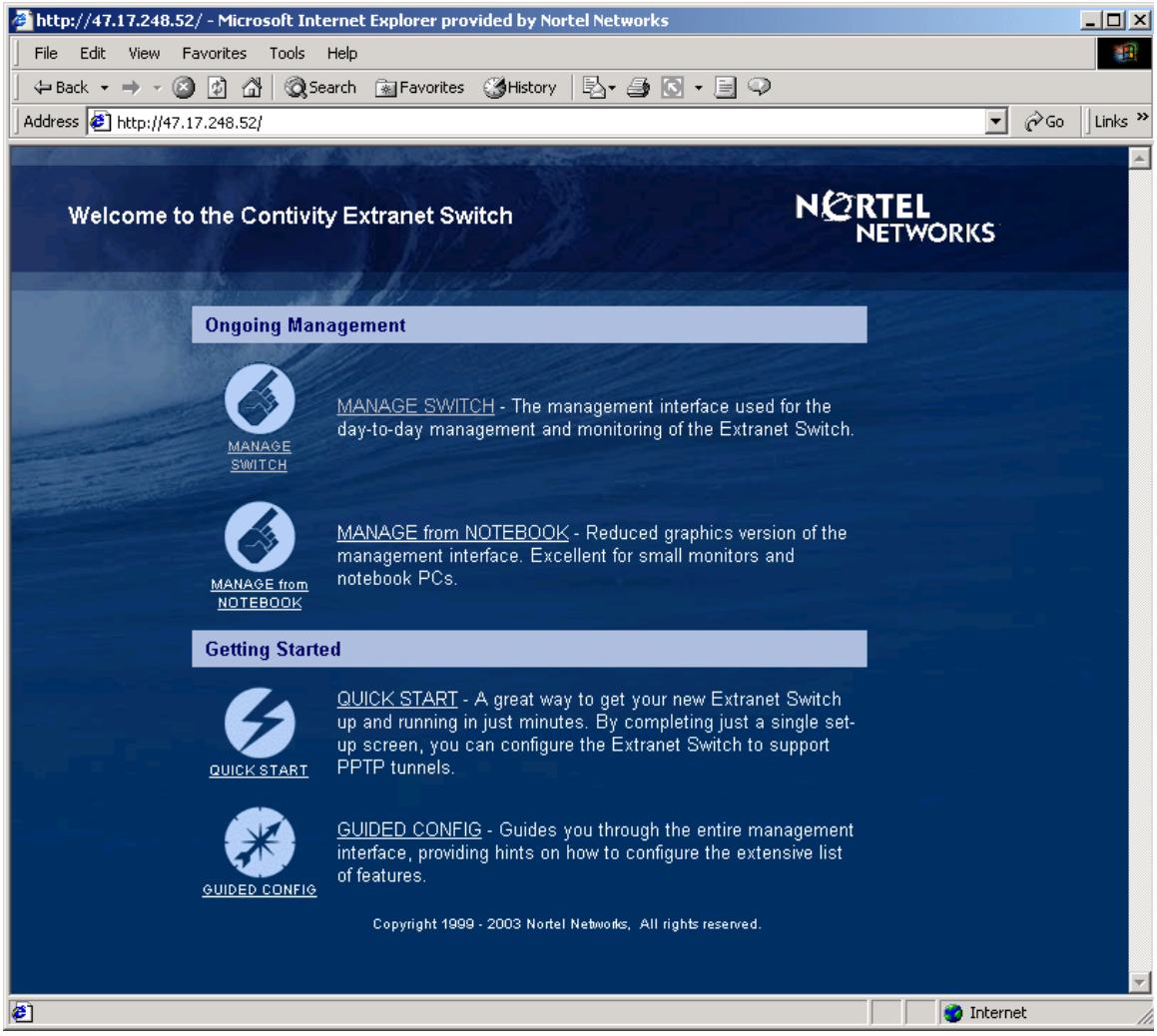
   For example, if the management IP address is 10.2.3.2, enter **http://10.2.3.2**.

   If the Welcome screen (Figure 19) appears, you correctly configured the management IP address for the Contivity 1740.

Note: If the Welcome screen does not appear, see "Troubleshooting" on page 53.

3. Go to *Configuring Basic Features for the Contivity Secure IP Services Gateway* for information about configuring the Contivity 1740.

Figure 19 Welcome screen



Troubleshooting

If you cannot connect to the Contivity 1740 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* 4.7 or later.
- Check the physical connections on the Contivity 1740, especially the LAN cable and the power cord.

If you still cannot connect to the Contivity 1740 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 47). 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 18).

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 1740:

- LAN, WAN, and serial interface cards
- SSL VPN Module 1000
- Hardware accelerator card
- Dual inline memory modules (DIMMs)

This chapter contains the following topics:

Topic	Page
Shutting down the system to add or replace hardware	56
Removing the front bezel and top cover	57
Attaching the antistatic wrist strap	60
Installing and replacing option cards	61
Installing and replacing DIMMs	65

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 (see Figure 7 on page 31).

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.

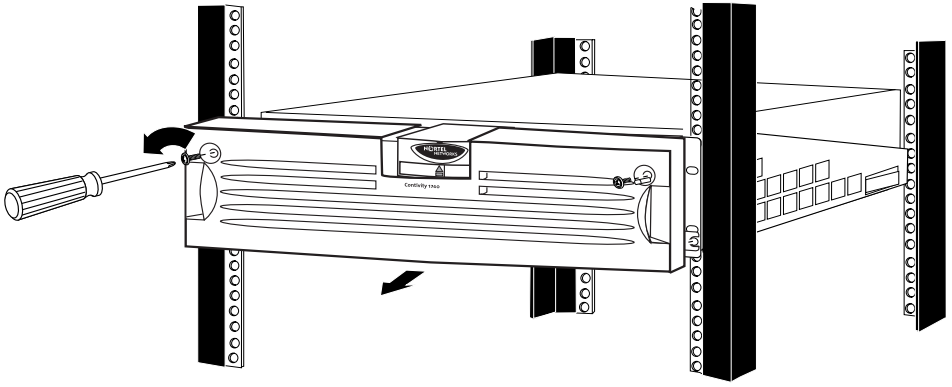
To remove the front bezel:

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 56.

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 20).

Figure 20 Removing the front bezel



CS260015D

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

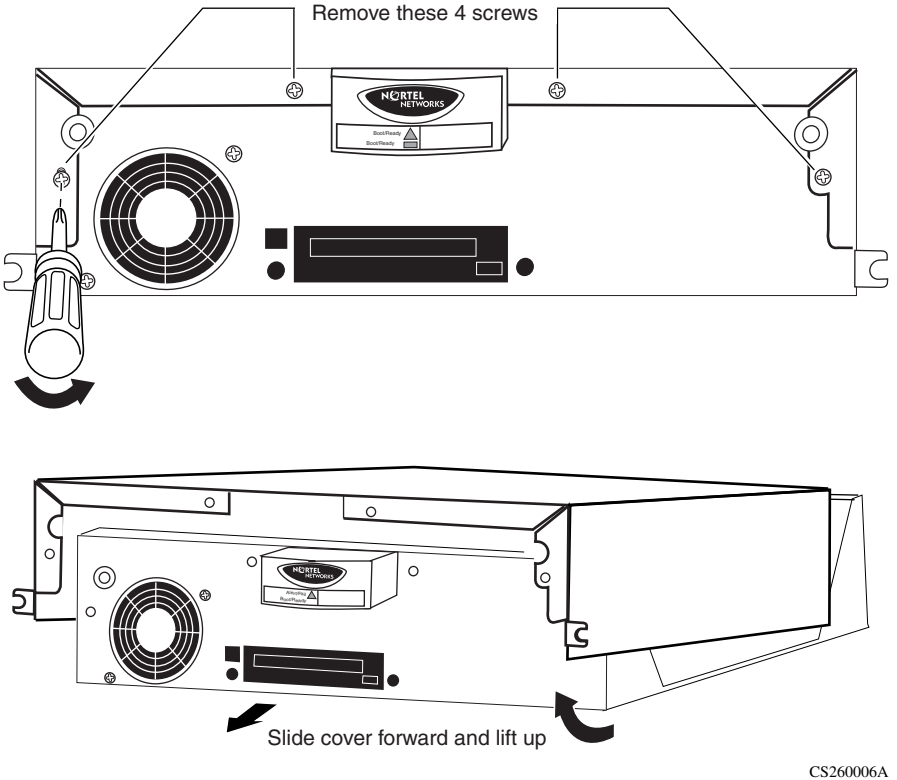
Caution: Do not use the piece with the Nortel Networks logo and the LEDs as a handle.

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 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 21).

Figure 21 Removing the top cover

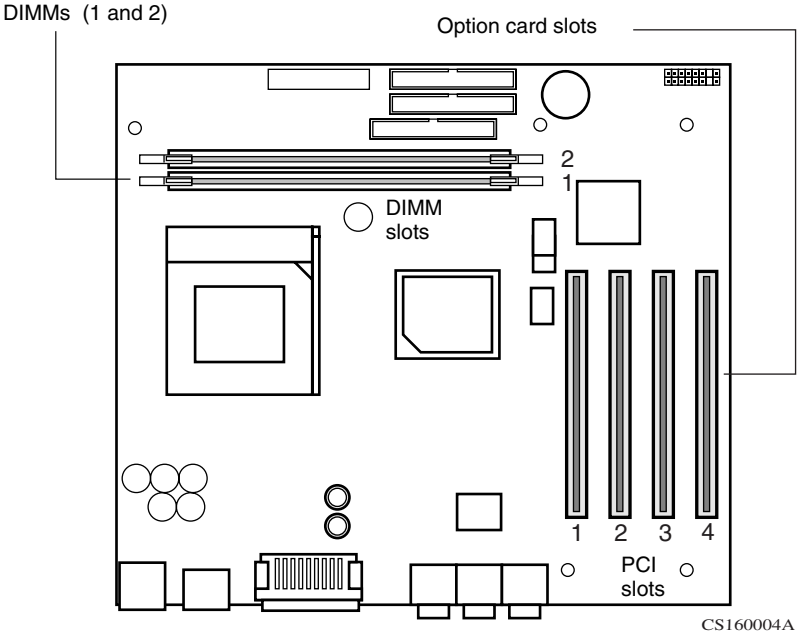


3. Slide the top cover forward approximately 1/4 inch.

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

The Contivity 1740 system board is now exposed. Figure 22 shows the location of the option card and DIMM slots on the system board.

Figure 22 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.

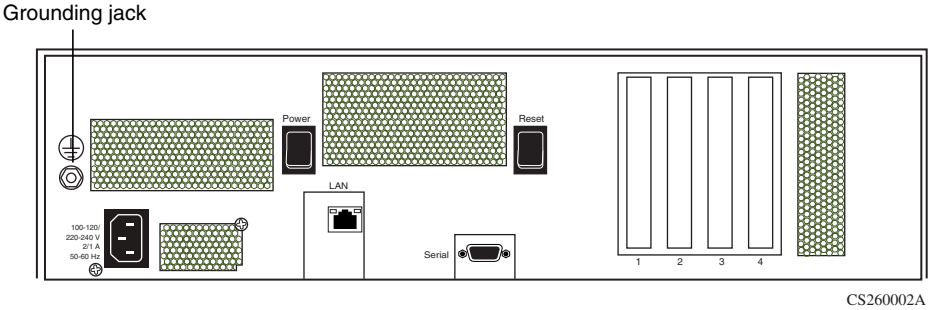
You must wear an antistatic wrist strap on your arm whenever you remove, install, or handle option cards and DIMMs.

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 23).

Figure 23 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 22 on page 59). This section provides instructions on adding new option cards to the Contivity 1740 or, if necessary, replacing an existing card.

Table 15 lists the option cards that you can install in the Contivity 1740.

Table 15 Supported option cards for the Contivity 1740

Option card	Maximum number	Restrictions
SSL VPN Module 1000[1]	1	Install this card in slot 1 only.
Contivity Security Accelerator (CSA)[2]	1	Install one CSA or one Hardware Accelerator card. Do not install a Hardware Accelerator card in slot 4.
Hardware Accelerator		
10/100 Ethernet interface	4	
1000BASE-T interface (copper)[2]	2	Install two 1000BASE-T cards, two 1000BASE-SX cards, or one card of each type. (But see "Installing the SSL VPN Module 1000 with other option cards" on page 62.)
1000BASE-SX interface (fiber)[2]		
56/64K CSU/DSU WAN interface[1]	4	
ADSL WAN interface[2]	4	
ISDN BRI S/T or U interface[3]	4	
T1 CSU/DSU WAN interface (full-height)	4	For E1 support, you must install the half-height interface card.
T1/E1 CSU/DSU WAN interface (half-height)	4	
Quad T1/E1 CSU/DSU WAN interface[1]	3	
V.90 modem interface[3]	4	If an SSL VPN Module 1000 is installed in slot 1, do not install the V.90 modem interface card in slot 2.
Single V.35/X.21 WAN interface	4	
HSSI WAN interface	2	Do not install in slot 4; install in slot 3 or 1 if possible. If an SSL VPN Module 1000 is installed, you can install only one HSSI WAN interface card.
Dual V.35 WAN interface[4]	4	

1 The Contivity 1740 must be running Version 5.0 or later.

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

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

4 This option card is no longer available for purchase.

Installing the SSL VPN Module 1000 with other option cards

If an SSL VPN Module 1000 is installed in the Contivity 1740, the following restrictions on other option cards apply:

- You cannot install a V.90 modem interface card in slot 2.
- Only one HSSI WAN interface card can be installed. Do not install this card in slot 4; if possible, install it in slot 3.
- You can install two 1000BASE-T/1000BASE-SX interface cards only if none of these option cards is installed:
  - Contivity Security Accelerator
  - Hardware Accelerator
  - HSSI WAN interface

  If a CSA, Hardware Accelerator, or HSSI WAN interface card is installed, you can install only one 1000BASE-T or 1000BASE-SX interface card.

Installing and replacing an option card

To install or replace an interface card or a hardware 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 56.

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

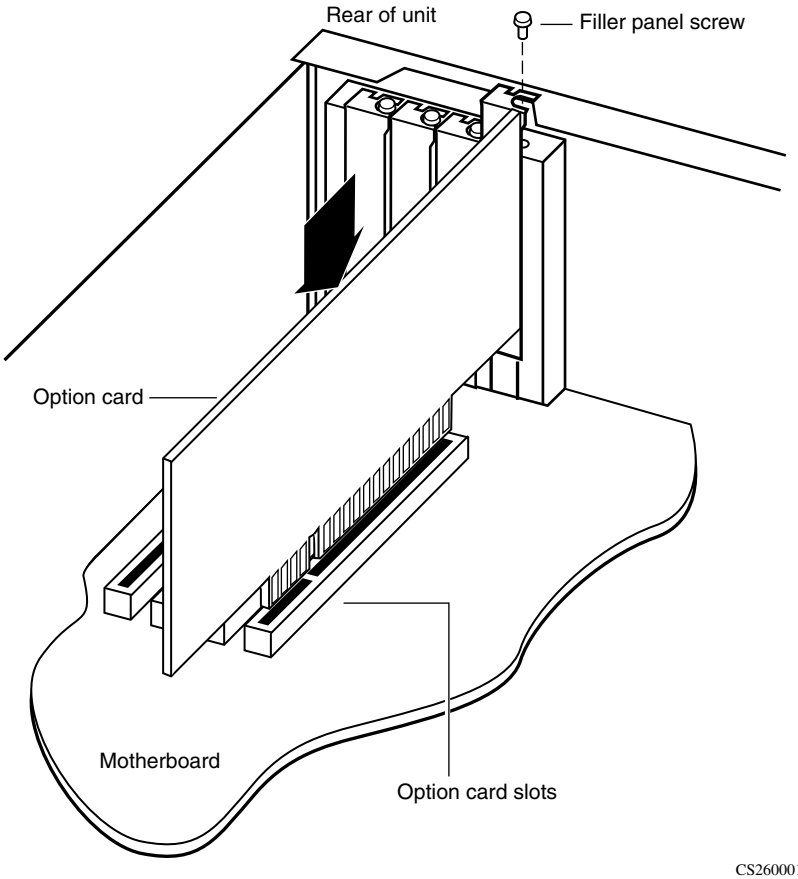
2. Remove the front bezel from the chassis, then remove the chassis from the equipment rack (see "Removing the front bezel and top cover" on page 57).
3. Remove the top cover from the chassis (see "Removing the front bezel and top cover" on page 57).
4. Attach the antistatic wrist strap that was shipped with the Contivity 1740 (see "Attaching the antistatic wrist strap" on page 60).

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 24).

Figure 24 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 24).

9 Replace the top cover on the chassis (see Figure 21 on page 58).

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.

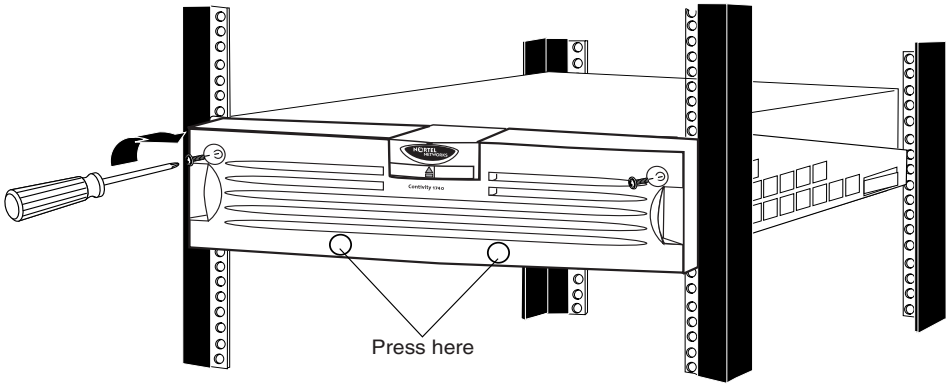
b Insert one of the panhead screws through the bottom hole on each side of the shelf into the hole in the rack and tighten the screws (see Figure 4 on page 25).

11 Replace the front bezel (Figure 25).

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 25 Replacing the front bezel



Installing and replacing DIMMs

The Contivity 1740 has two slots for dual inline memory modules (DIMMs) (see Figure 22 on page 59). 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 56.

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

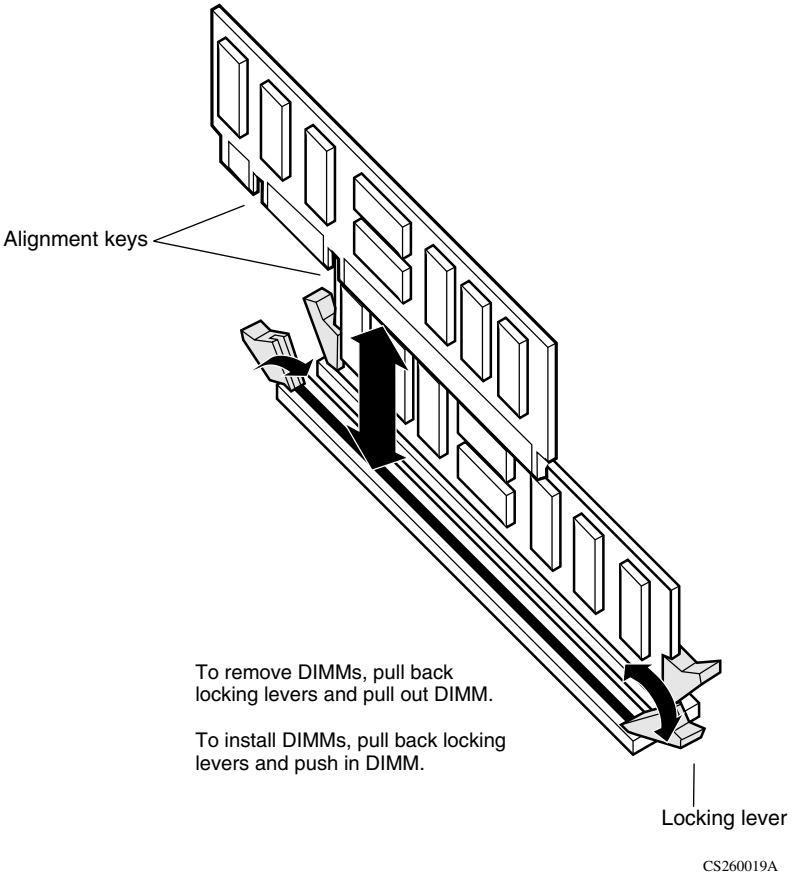
2. Remove the front bezel from the chassis, then remove the chassis from the equipment rack (see "Removing the front bezel and top cover" on page 57).
3. Remove the top cover from the chassis (see "Removing the front bezel and top cover" on page 57).
4. Attach the antistatic wrist strap that was shipped with the Contivity 1740 (see "Attaching the antistatic wrist strap" on page 60).

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 26).
   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 26).
7. Place the new or replacement DIMM in the slot (Figure 26).

   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 26 Installing and removing a DIMM



10 Replace the top cover on the chassis (see Figure 21 on page 58).

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 (see Figure 4 on page 25).

12 Replace the front bezel (see Figure 25 on page 64).

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

This appendix provides technical specifications for the Contivity 1740 chassis and its interfaces.

Chassis specifications

Table 16 lists physical, electrical, and environmental specifications for the chassis.

Table 16 Physical, electrical, and environmental specifications

Specification	Description
Physical	
Height	5.25 in. (13.335 cm)
Width	17 in. (43.18 cm)
Depth	21 in. (53.34 cm)
Weight	28 lbs. (12.7 kg)
Electrical	
Voltage	100–120 VAC; 220–240 VAC
Current	2 A @ 100 VAC; 1 A @ 220 VAC
Frequency	50–60 Hz
Environmental	
Operating temperature	32–104°F (0–40°C)
Storage temperature	-40–185°F (-40–85°C)
Operating humidity	10–90% noncondensing
Storage humidity	10–95% noncondensing
Operating altitude	7000 ft (2133.6 m) maximum
Storage altitude	40,000 ft (12,192 m) maximum

System ports

The Contivity 1740 system board provides the following built-in interfaces:

- 10/100BASE Ethernet LAN port
- Serial port

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

10/100BASE Ethernet LAN port

The system board provides one 10/100BASE Ethernet LAN interface on the rear of the chassis. This LAN interface, which accommodates an RJ-45 straight-through cable, is generally used for Web management. 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 27 shows the 10/100BASE connector and its pinouts.

Figure 27 10/100BASE Ethernet connector

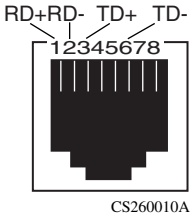


Table 17 provides the 10/100BASE Ethernet port pinouts.

Table 17 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 45).

The serial cable provided with the Contivity 1740 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 18 provides the multiple DB9/DB25 serial interface cable pinouts.

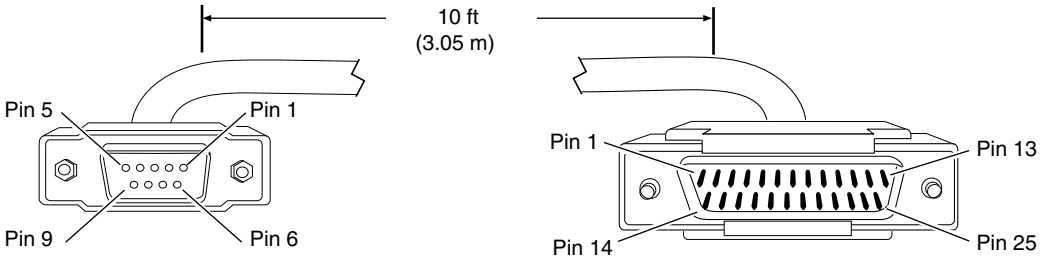
Table 18 Multiple DB9 and DB25 connector pinouts

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 1740, you must obtain an appropriate modem cable. The modem cable must have a 9-pin D-sub plug that connects to the Contivity 1740 serial port and a 25-pin D-sub plug that connects to the RS-232-C modem port (Figure 28).

Figure 28 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 19 provides the modem cable pinouts.

Table 19 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 1740 provides four PCI slots that support a combination of the following option cards:

- Contivity Security Accelerator and Hardware Accelerator cards
- SSL VPN Module 1000
- 10/100BASE Ethernet interface card
- 1000BASE-T Ethernet interface card
- 1000BASE-SX Ethernet interface card
- 56/64K CSU/DSU WAN interface card
- ADSL WAN interface card
- ISDN BRI interface card
- T1 CSU/DSU WAN interface card (full-height card)
- T1/E1 CSU/DSU WAN interface card (half-height card)
- Quad T1/E1 CSU/DSU WAN interface card
- V.90 modem interface card
- Single V.35/X.21 WAN interface card
- Dual V.35 WAN interface card
- HSSI WAN interface card

This section 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 card is set offline.

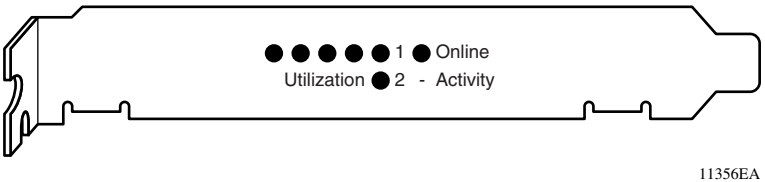
For more information about the Contivity Security Accelerator card and the Hardware Accelerator card and instructions for configuring these cards, see the guide *Configuring Advanced Features for the Contivity Secure IP Services Gateway.*

SSL VPN Module 1000

The SSL VPN Module 1000 provides complete SSL VPN processing capability to the Contivity gateway. This module provides a unified solution for IPsec and remote access SSL VPN.

Figure 29 shows the SSL VPN Module 1000.

Figure 29 SSL VPN Module 1000



The SSL VPN Module 1000 has no external access: all traffic to and from the SSL VPN Module 1000 card occurs over an internal high-speed link.

The SSL VPN Module 1000 is supported on Contivity 5000, 2700, and 1740 gateways running Contivity Version 5.0 software. You must install the SSL VPN Module 1000 in slot 1 of the Contivity 5000, 2700, or 1740.

The Contivity gateway distinguishes between the services that it provides and the services that the SSL VPN Module 1000 provides and immediately forwards the appropriate traffic to the SSL VPN module.

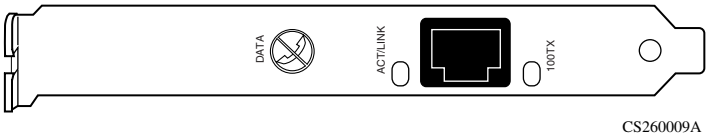
Note: For complete information about the SSL VPN Module 1000 and instructions for configuring it, see *Configuring SSL VPN Services on the Contivity Secure IP Services Gateway.*

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 30 shows the 10/100BASE Ethernet interface card.

Figure 30 10/100BASE Ethernet interface card



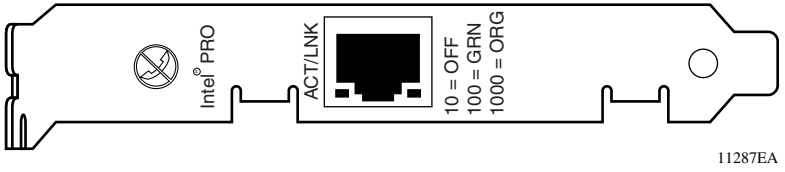
For information about the cables that you can connect to this interface and the cable pinouts, see "10/100BASE Ethernet LAN port" on page 70.

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 31 shows the 1000BASE-T Ethernet interface card.

Figure 31 1000BASE-T Ethernet interface card

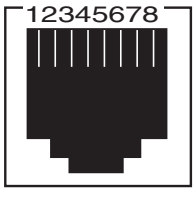


The port on the 1000BASE-T Ethernet interface card accommodates an RJ-45 straight-through cable. Select cables for this port as follows:

- 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 20 provides the 1000BASE-T Ethernet port pinouts.

Table 20 1000BASE-T Ethernet port pinouts



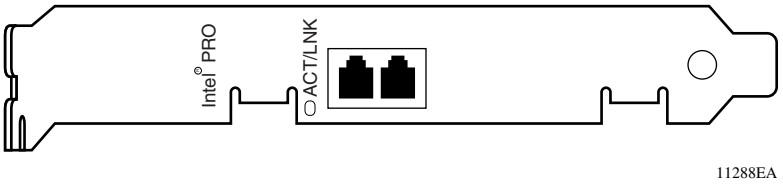
Pin	Description
1	TP0+
2	TP0-
3	TP1+
4	TP2+
5	TP2-
6	TP1-
7	TP3+
8	TP3-

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 32 shows the 1000BASE-SX Ethernet interface card.

Figure 32 1000BASE-SX Ethernet interface card



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

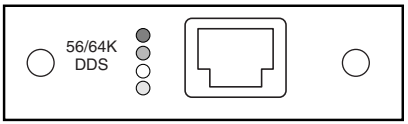
You can order a 10-foot MMF cable from Nortel Networks:

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

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 33 shows the 56/64K CSU/DSU WAN interface card.

Figure 33 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 21 provides the 56/64K CSU/DSU cable pinouts for a crossover connection.

Table 21 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 22 provides the 56/64K CSU/DSU cable pinouts for a straight-through connection.

Table 22 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

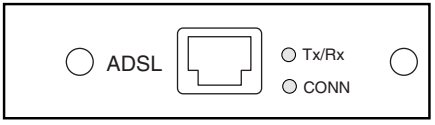
ADSL WAN interface card

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 34 shows the ADSL WAN interface card.

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

Figure 34 ADSL WAN interface card



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

Table 23 provides the ADSL port pinouts.

Table 23 ADSL cable pinouts

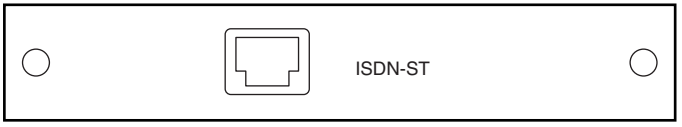
Pin	Function
1	N/C
2	Tip
3	Ring
4	N/C

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 35 shows the ISDN BRI S/T interface card.

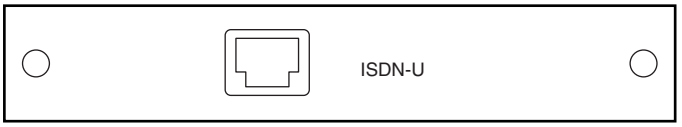
Figure 35 ISDN BRI S/T interface card



10972EA

Figure 36 shows the ISDN BRI U interface card.

Figure 36 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 24 provides the ISDN BRI S/T cable pinouts.

Table 24 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 25 provides the ISDN BRI U cable pinouts.

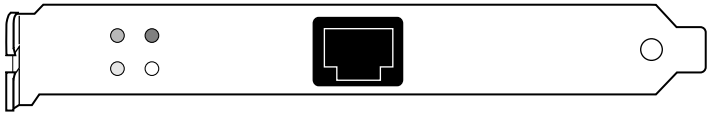
Table 25 ISDN BRI U cable pinouts

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 37 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 37 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 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 26 provides the T1/E1 CSU/DSU cable pinouts for a crossover connection.

Table 26 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 27 provides the T1/E1 CSU/DSU cable pinouts for a straight-through connection.

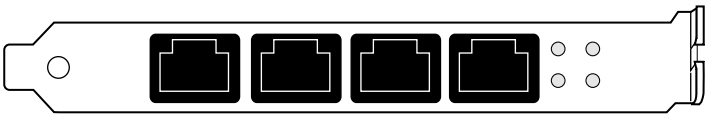
Table 27 T1/E1 CSU/DSU cable pinouts for straight-through connection

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 38 shows the quad T1/E1 CSU/DSU WAN interface card.

Figure 38 Quad T1/E1 CSU/DSU WAN interface card



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.

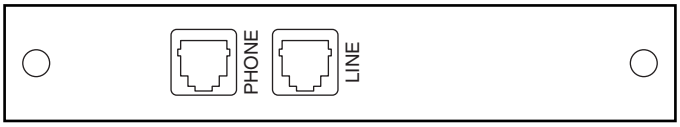
- For a straight-through connection, you can use a standard Category 5 (Ethernet) straight-through cable.
- For a crossover connection, you cannot use a standard Category 5 crossover cable. The T1/E1 CSU/DSU crossover cable and the Ethernet crossover cable are not interchangeable.

For information about the cable pinouts for a crossover connection, see Table 26 on page 85. For information about the cable pinouts for a straight-through connection, see Table 27 on page 85.

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 39 shows the V.90 modem interface card.

Figure 39 V.90 modem interface card



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

Table 28 provides the V.90 modem port cable pinouts.

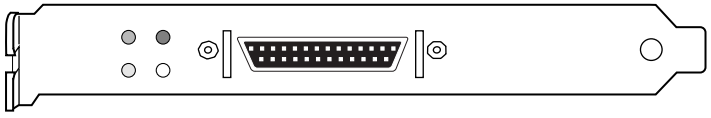
Table 28 V.90 modem cable pinouts

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

Figure 40 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 29 provides the V.35 cable pinouts. Table 30 on page 89 provides the X.21 cable pinouts. (The pair suffix A or B refers to an individual wire within a twisted pair.)

Table 29 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 29 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 30 provides the X.21 cable pinouts. (The pair suffix A or B refers to an individual wire within a twisted pair.)

Table 30 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 30 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:

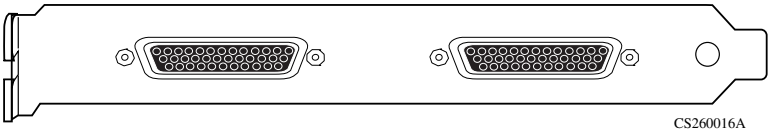
1. Wires of pair 4 connect to wires of pair 5, but not to any pins in the DA-15.
2. The term “no conn” means the wire is not connected to a pin in the 15-pin connector.
3. Wires 13B and 14B connect to pin 8 in the 15-pin connector.
4. At each end, the cable shield and connector shell must connect to 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 41 shows the dual V.35 WAN interface card.

Figure 41 Dual V.35 WAN interface card



Note: The dual V.35 WAN interface card is no longer available for purchase. Version 5.0 is the last release of Contivity software that will support the 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 describes 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 31 provides the DB26-to-V.35 cable pinouts.

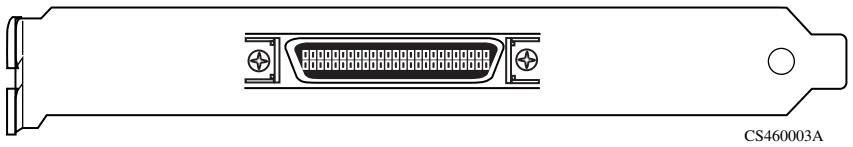
Table 31 DB26-to-V.35 cable pinouts

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 42 shows the HSSI WAN interface card.

Figure 42 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 32 provides the T3 cable pinouts.

Table 32 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 32 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

Index

Numbers

10/100BASE Ethernet interface card
cable specifications 70
connector 70
described 76
installing 61
LEDs 36
10/100BASE system LAN port
cable specifications 70
connector 70
LEDs 35
1000BASE-SX Ethernet interface card
cable specifications 78
connector 78
described 78
installing 61
LEDs 37
1000BASE-T Ethernet interface card
cable specifications 77
connector 76
described 76
installing 61
LEDs 36
56/64K CSU/DSU WAN interface card
cable pinouts 80
connector 79
described 79
installing 61
LEDs 38

A

AC power cord
connecting 32
ordering 21
requirements 32
accelerator cards, hardware encryption
described 74
installing 61
accessories, hardware, shipped with the gateway 21
acronyms 16
ADSL WAN interface card
cable pinouts 81
connector 81
described 81
installing 61
LEDs 39
antistatic wrist strap, attaching 60

B

bezel, front
removing 26, 57
replacing 27, 64
browsers, supported 51

C

cables
available from Nortel Networks 30
connecting to the gateway 31
ordering 30
power. *See* AC power cord
technical specifications
1000BASE-SX connector 78
1000BASE-T connector 77
100BASE-TX connector 70
10BASE-T connector 70
56/64K CSU/DSU WAN interface 79

cables *(continued)*
technical specifications *(continued)*
ADSL WAN interface 81
dual V.35 WAN interface 91
HSSI WAN interface 93
ISDN BRI interface 82
modem 72
quad T1/E1 CSU/DSU WAN interface 86
serial interface 71
single V.35/X.21 WAN interface 88
T1/E1 CSU/DSU WAN interface 84
V.90 modem interface 87
cage nuts, when used 22, 24
Category 5 wiring requirements 70, 77
chassis
installing 23
removing
front bezel 26, 57
top cover 58
replacing
front bezel 27, 64
top cover 64
specifications 69
configuring the management IP address 47
connecting
cables 31
power cord 32
serial cable to the gateway 47
to the gateway using a browser 51
connectors
10/100BASE Ethernet interface 76
10/100BASE system LAN port 70
1000BASE-SX Ethernet interface 78
1000BASE-T Ethernet interface 76
56/64K CSU/DSU WAN interface 79
ADSL WAN interface 81
dual V.35 WAN interface 91
HSSI WAN interface 93
ISDN BRI S/T interface 82
ISDN BRI U interface 82
quad T1/E1 CSU/DSU WAN interface 86
single V.35/X.21 WAN interface 87
T1/E1 CSU/DSU WAN interface 84
V.90 modem interface 87
Contivity 1740
configuring management IP address for 45
connecting cables to 29
connecting power cord 32
description 19
installing option cards and DIMMs 55
installing the chassis 23
shipment contents 21
shutting down 56
technical specifications 69
verifying a successful installation 33
verifying connectivity 51
Contivity Security Accelerator card
described 74
installing 61
conventions, text 16
cover, top
removing 58
replacing 64
customer support 18

D

default gateway, defined 46
DIMMs (dual inline memory modules),
installing 65
dual V.35 WAN interface card
connector 91
installing 61
pinouts 92

E

electrical specifications 69
encryption accelerator cards, hardware
described 74
installing 61
environmental specifications 69
equipment rack, specifications 22

Ethernet interface cards
installing 61
specifications
10/100BASE 76
1000BASE-SX 78
1000BASE-T 76

F

field replaceable units (FRUs), installing 55
front bezel
removing 26, 57
replacing 27, 64
front panel LEDs 34

G

gateway, default, defined 46
Gigabit Ethernet interface cards
installing 61
specifications
1000BASE-SX 78
1000BASE-T 76
GUI, Web-based 51

H

Hardware Accelerator card
described 74
installing 61
hardware accessories shipped with the gateway 21
hardware option cards
installing 61
specifications 73
See also Contivity Security Accelerator card, Ethernet interface cards, Hardware Accelerator card, serial interface cards, SSL VPN Module card, WAN interface cards
HSSI WAN interface card
cable pinouts 93
connector 93
installing 61

I

installing DIMMs 65
installing option cards 61
installing the chassis
in an equipment rack 24
on a flat surface 23
prerequisites 20
interfaces, option card, technical specifications 73
interfaces, system, technical specifications 70
Internet Explorer, supported versions 51
IP address for managing the gateway. *See* management IP address
ISDN BRI S/T interface card
cable pinouts 83
connector 82
installing 61
ISDN BRI U interface card
cable pinouts 83
connector 82
installing 61

L

LAN interface cards
installing 61
LEDs
10/100BASE Ethernet 36
1000BASE-SX Ethernet 37
1000BASE-T Ethernet 36
specifications
10/100BASE 76
1000BASE-SX 78
1000BASE-T 76
LAN port, system
cable specifications 70
connector 70
LEDs 35
LEDs
10/100BASE Ethernet interface card 36
1000BASE-SX Ethernet interface card 37
1000BASE-T Ethernet interface card 36

LEDs *(continued)*
56/64K CSU/DSU WAN interface card 38
ADSL WAN interface card 39
front panel 34
quad T1/E1 CSU/DSU WAN interface card 41
single V.35/X.21 WAN interface card 42
SSL VPN Module 1000 43
system LAN port 35
T1/E1 CSU/DSU WAN interface card 40
used to verify correct installation 33

M

main menu, serial interface 48
management IP address
configuring 47
defined 46
troubleshooting configuration of 53
verifying 51
mask, subnet, defined 46
memory modules, adding and replacing 65
modem cable pinouts 72

N

Netscape Navigator, supported versions 51
NT-1 device, required for ISDN BRI S/T 82

O

option cards
installing 61
specifications 73
See also Contivity Security Accelerator card, Ethernet interface cards, Hardware Accelerator card, serial interface cards, SSL VPN Module card, WAN interface cards

P

physical specifications 69
pinouts
10/100BASE Ethernet connector 70
1000BASE-SX Ethernet interface 78
1000BASE-T Ethernet interface 77
56/64K CSU/DSU WAN interface 80
ADSL WAN interface 81
dual V.35 WAN interface 92
HSSI WAN interface 93
ISDN BRI S/T interface 83
ISDN BRI U interface 83
modem cable 72
quad T1/E1 CSU/DSU WAN interface 85
serial interface cable 71
single V.35 WAN interface 88
single X.21 WAN interface 89
T1/E1 CSU/DSU WAN interface 85
V.90 modem interface 87
plug, AC power, specifications 32
power cord
connecting 32
ordering 21
requirements 32
powering down the gateway 56
processor cards, *See* Contivity Security Accelerator card, Hardware Accelerator card, SSL VPN Module 1000
product support 18
publications
hard copy 18
related 17

Q

quad T1/E1 CSU/DSU WAN interface card
cable pinouts 85
connector 86
described 86
installing 61
LEDs 41

R

rack, equipment, specifications 22

rack-mount considerations 24
rack-mount shelf 24
requirements, site 22
RJ-45, pinouts 70, 77

S

serial cable, connecting to the gateway 47
serial interface
  cable pinouts 71
  described 71
  using to configure the management IP address 47
serial interface cards
  installing 61
  specifications
    ISDN BRI 82
    V.90 modem 87
serial main menu 48
shelf for rack-mount installation 24
shipment contents 21
shutting down the gateway 56
single V.35/X.21 WAN interface card
  connector 87
  installing 61
  LEDs 42
  V.35 pinouts 88
  X.21 pinouts 89
site requirements 22
specifications
  chassis 69
  equipment rack 22
  option cards 73
  serial port 71
  system ports 70
SSL VPN Module 1000
  described 75
  installing 61
  LEDs 43
subnet mask, defined 46
support, Nortel Networks 18
system LAN port
  cable specifications 70
  connector 70
  LEDs 35
system ports, specifications 70

T

T1/E1 CSU/DSU WAN interface card
  cable pinouts 85
  connector 84
  installing 61
  LEDs 40
T3 HSSI WAN interface card. *See* HSSI WAN interface card
technical publications 18
technical specifications 69
technical support 18
testing connectivity to the gateway 51
text conventions 16
top cover
  removing 58
  replacing 64
troubleshooting the management IP address 53
turning off the gateway 56

U

user interface, Web 51

V

V.35 WAN interface card. *See* dual V.35 WAN interface card
V.35/X.21 WAN interface card. *See* single V.35/X.21 WAN interface card
V.90 modem interface card
  cable pinouts 87
  connectors 87
  installing 61

verifying a successful installation 33
verifying the management IP interface 51

W

WAN interface cards
  installing 61
  LEDs
    56/64K CSU/DSU 38
    ADSL 39
    quad T1/E1 CSU/DSU 41
    single V.35/X.21 42
    T1/E1 CSU/DSU 40
  specifications
    56/64K CSU/DSU 79
    ADSL 81
    dual V.35 91
    HSSI 93
    quad T1/E1 CSU/DSU 86
    single V.35/X.21 87
    T1/E1 CSU/DSU 84
Web interface to the gateway 51
Welcome screen 52
wiring requirements, Category 5 70, 77
wrist strap, antistatic, attaching 60

X

X.21 WAN interface card. *See* single V.35/X.21
  WAN interface card