

Version 7.05.300

NN46110-311 02.01

314708-F Rev 01

November 2007

Standard

600 Technology Park Drive
Billerica, MA 01821-4130

Nortel VPN Router Installation — VPN Router 2700

NORTEL

Copyright © 2007 Nortel Networks. All rights reserved.

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, the Nortel logo, the Globemark, 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.

Intel is a trademark of Intel Corporation.

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

Netscape and Netscape Navigator are trademarks of Netscape Communications Corporation.

All other trademarks are the property of their respective owners.

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 VPN Router 2700 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

Denan statement



警告

本製品を安全にご使用頂くため、以下のことにご注意ください。

- 接続ケーブル、電源コード、ACアダプタなどの部品は、必ず製品に同梱されております添付品または指定品をご使用ください。添付品・指定品以外の部品をご使用になると故障や動作不良、火災の原因となることがあります。
- 同梱されております付属の電源コードを他の機器には使用しないでください。上記注意事項を守らないと、死亡や大怪我など人身事故の原因となることがあります。

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 (VPN Router 2700) 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 (VPN Router 2700) 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

New in this release	15
Features	15
1000BASE-T (1000 GT) Ethernet card	15
How to get help	17
Finding the latest updates on the Nortel Web site	17
Getting help from the Nortel Web site	17
Getting help over the phone from a Nortel Solutions Center	18
Getting help from a specialist by using an Express Routing Code	18
Getting help through a Nortel distributor or reseller	19
Preface	21
Before you begin	21
Text conventions	22
Acronyms	22
Related publications	23
Printed technical manuals	24
Chapter 1	
Installing the Nortel VPN Router 2700 chassis	25
Description of the Nortel VPN Router 2700	25
Preparing to install the Nortel VPN Router 2700	26
Shipment contents	27
Additional equipment	28
Cables	28
Hardware for mounting the chassis in an equipment rack	28
Site requirements	28

Installing the chassis	29
Installing the chassis on a flat surface	29
Installing the chassis in an equipment rack	30
Rack-mount recommendations	30
Attaching the shelf in the equipment rack	30
Mounting the chassis in the equipment rack	32

Chapter 2

Cabling the VPN Router and turning the power on 35

Connecting communications cables	36
Connecting the power cord	38
Verifying a successful installation	39
Understanding the LEDs	40
Front panel LEDs	40
LEDs on the system 10/100BASE-TX Ethernet port	41
10/100BASE-TX Ethernet interface card LEDs	42
1000BASE-T (1000 GT) Ethernet interface card LEDs	42
1000BASE-T (1000 MT) Ethernet interface card LEDs	43
1000BASE-SX Ethernet interface card LED	44
56/64K CSU/DSU WAN interface card LEDs	45
ADSL WAN interface card LEDs	46
T1/E1 CSU/DSU WAN interface card LEDs	47
Quad T1/E1 CSU/DSU WAN interface card LEDs	48
Single V.35/X.21 WAN interface card LEDs	49
SSL VPN Module 1000 LEDs	50

Chapter 3

Configuring the management IP interface..... 51

Required information	52
Configuring the management IP address	53
Testing the configuration	57
Troubleshooting	58

Chapter 4	
Installing option cards and DIMMs	59
Shutting down the system to add or replace hardware	60
Removing the front bezel and top cover	61
Attaching the antistatic wrist strap	64
Installing and replacing option cards	65
Installing and replacing DIMMs	70
Appendix A	
Technical specifications	75
Chassis specifications	75
System ports	76
10/100BASE-TX Ethernet LAN port	76
Serial port	77
Modem cable specifications	78
Hardware option cards	79
VPN Router Security Accelerator cards	80
SSL VPN Module 1000	81
10/100BASE-TX Ethernet interface card	82
1000BASE-T (1000 GT) Ethernet interface card	83
1000BASE-T (1000 MT) Ethernet interface card	85
1000BASE-SX Ethernet interface card	87
56/64K CSU/DSU WAN interface card	88
ADSL WAN interface card	90
ISDN BRI interface card	91
T1/E1 CSU/DSU WAN interface card	92
Quad T1/E1 CSU/DSU WAN interface card	95
V.90 modem interface card	96
Single V.35/X.21 WAN interface card	96
HSSI WAN interface card	100
Index	103

Figures

Figure 1	Front view of the VPN Router 2700	26
Figure 2	Placement of rubber feet on the bottom of the chassis	29
Figure 3	Attaching the cage nuts to the rack	31
Figure 4	Installing the shelf in the equipment rack	31
Figure 5	Removing the front bezel	32
Figure 6	Replacing the front bezel	33
Figure 7	Rear view of the VPN Router 2700	37
Figure 8	Front panel LEDs	40
Figure 9	LEDs on the system LAN port	41
Figure 10	LEDs on the 10/100BASE-TX Ethernet interface card	42
Figure 11	LEDs on the 1000BASE-T (1000 GT) Ethernet interface card	42
Figure 12	LEDs on the 1000BASE-T (1000 MT) Ethernet interface card	43
Figure 13	LED on the 1000BASE-SX Ethernet interface card	44
Figure 14	LEDs on the 56/64K CSU/DSU WAN interface card	45
Figure 15	LEDs on the ADSL WAN interface card	46
Figure 16	LEDs on the T1/E1 CSU/DSU WAN interface card	47
Figure 17	LEDs on the quad T1/E1 CSU/DSU WAN interface card	48
Figure 18	LEDs on the single V.35/X.21 WAN interface card	49
Figure 19	LEDs on the SSL VPN Module 1000	50
Figure 20	Removing the front bezel	61
Figure 21	Removing the top cover	62
Figure 22	Location of option card slots and DIMMs on the system board	63
Figure 23	Location of the grounding jack for the antistatic wrist strap	64
Figure 24	Installing and removing an option card	68
Figure 25	Replacing the front bezel	69
Figure 26	Installing and removing a DIMM	72
Figure 27	10/100BASE-TX Ethernet connector	77
Figure 28	Serial cable (9-pin D-sub plug to RS-232-C modem plug)	78
Figure 29	Modem cable (9-pin D-sub plug to RS-232-C modem plug)	79

Figure 30	VPN Router Security Accelerator card	80
Figure 31	SSL VPN Module 1000	81
Figure 32	10/100BASE-TX Ethernet interface card	82
Figure 33	1000BASE-T (1000 GT) Ethernet interface card	84
Figure 34	1000BASE-T (1000 MT) Ethernet interface card	85
Figure 35	1000BASE-SX Ethernet interface card	87
Figure 36	56/64K CSU/DSU WAN interface card	88
Figure 37	ADSL WAN interface card	90
Figure 38	ISDN BRI S/T interface card or ISDN BRI U interface card	91
Figure 39	T1/E1 CSU/DSU WAN interface card	92
Figure 40	T1/E1 CSU/DSU WAN interface card (full-height card)	93
Figure 41	Quad T1/E1 CSU/DSU WAN interface card	95
Figure 42	V.90 modem interface card	96
Figure 43	Single V.35/X.21 WAN interface card	96
Figure 44	HSSI WAN interface card	100

Tables

Table 1	Items shipped with the VPN Router 2700	27
Table 2	Interfaces and cables for the VPN Router 2700	36
Table 3	Power cord requirements	38
Table 4	Front panel LED indicators	40
Table 5	LED indicators on the system 10/100BASE-TX Ethernet port	41
Table 6	LED indicators on the 10/100BASE-TX Ethernet interface card	42
Table 7	LED indicators on the 1000BASE-T (1000 GT) Ethernet interface card	43
Table 8	LED indicators on the 1000BASE-T (1000 MT) Ethernet interface card	43
Table 9	LED indicator on the 1000BASE-SX Ethernet interface card	44
Table 10	LED indicators on the 56/64K CSU/DSU WAN interface card	45
Table 11	LED indicators on the ADSL WAN interface card	46
Table 12	LED indicators on the T1/E1 CSU/DSU WAN interface card	47
Table 13	LED indicators on the quad T1/E1 CSU/DSU WAN interface card	48
Table 14	LED indicators on the single V.35/X.21 WAN interface card	49
Table 15	LED indicators on the SSL VPN Module 1000	50
Table 16	Supported option cards for the 2600 and 2700	65
Table 17	Installing other option cards with the SSL VPN Module 1000	66
Table 18	Physical, electrical, and environmental specifications	75
Table 19	10/100BASE-TX Ethernet port pinouts	77
Table 20	Multiple DB9 and DB25 connector pinouts	78
Table 21	Modem cable pinouts	79
Table 22	1000BASE-T (1000 GT) Ethernet pinouts	84
Table 23	1000BASE-T (1000 MT) Ethernet port pinouts	85
Table 24	56/64K CSU/DSU cable pinouts for crossover connection	89
Table 25	56/64K CSU/DSU cable pinouts for straight-through connection	89
Table 26	ADSL cable pinouts	90
Table 27	ISDN BRI S/T cable pinouts	91
Table 28	ISDN BRI U cable pinouts	92
Table 29	T1/E1 CSU/DSU cable pinouts for crossover connection	93

14 Tables

Table 30	T1/E1 CSU/DSU cable pinouts for straight-through connection	94
Table 31	V.90 modem cable pinouts	96
Table 32	V.35 cable pinouts	97
Table 33	X.21 cable pinouts	98
Table 34	T3 cable pinouts	100

New in this release

The following section details what's new in *Nortel VPN Router Installation—VPN Router 2700* (NN46110-311) for Release 7.05.300:

Features

See the following section for information about feature changes:

1000BASE-T (1000 GT) Ethernet card

The 1000BASE-T (1000 GT) Ethernet card replaces the 10/100BASE-TX Ethernet card. See [“1000BASE-T \(1000 GT\) Ethernet interface card” on page 83](#) and [“1000BASE-T \(1000 GT\) Ethernet interface card LEDs” on page 42](#).

How to get help

This chapter explains how to get help for Nortel products and services.

Finding the latest updates on the Nortel Web site

The content of this documentation was current at the time the product was released. To check for updates to the latest documentation and software for VPN Router 2700, go to:

www.nortel.com/support

Select Security & VPN and then, in the section called Virtual Private Networking (VPN), IPSEC, and SSL, click the appropriate VPN Router product.

Getting help from the Nortel Web site

The best way to get technical support for Nortel products is from the Nortel Technical Support Web site:

www.nortel.com/support

This site provides quick access to software, documentation, bulletins, and tools to address issues with Nortel products. From this site you can:

- download software, documentation, and product bulletins
- search the Technical Support site and the Nortel Knowledge Base for answers to technical issues
- sign up for automatic notification of new software and documentation for Nortel equipment
- open and manage technical support cases

Getting help over the phone from a Nortel Solutions Center

If you do not find the information you require on the Nortel Technical Support Web site, and you have a Nortel support contract, you can also get help over the phone from a Nortel Solutions Center.

In North America, call 1-800-4NORTEL (1-800-466-7835).

Outside North America, go to the following Web site to obtain the phone number for your region:

www.nortel.com/callus

Getting help from a specialist by using an Express Routing Code

To access some Nortel Technical Solutions Centers, you can use an Express Routing Code (ERC) to quickly route your call to a specialist in your Nortel product or service. To locate the ERC for your product or service, go to:

www.nortel.com/erc

Getting help through a Nortel distributor or reseller

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

Preface

The VPN Router 2700 is part of the Nortel VPN Router product family. Nortel VPN Router 2700 supports secure, reliable IP VPNs in a single, integrated hardware device. Throughout this guide, the VPN Router 2700 is also referred to as the *gateway*.

This guide provides instructions about how to install the VPN Router 2700 in an equipment rack and how to install and replace option cards and dual inline memory modules (DIMM). This guide also provides some initial configuration information and includes technical specifications for the VPN Router 2700.

For complete information about configuring and monitoring the VPN Router 2700, see the documentation on the software CD. For information about VPN Router documentation, see [“Related publications” on page 23](#).

Before you begin

This guide is intended for qualified service personnel who are installing the VPN Router 2700 for the first time or who need to install or replace any of the following field replaceable units (FRU):

- LAN, WAN, and serial interface cards
- VPN Accelerator cards (VPN Router Security Accelerator card and Hardware Accelerator card)
- SSL VPN Module 1000
- dual inline memory modules (DIMM)

Before you install the VPN Router 2700, install all network wiring on the premises using standard cable system practices.

Text conventions

This guide uses the following text conventions:

<code>bold Courier text</code>	Indicates command names and options and text that you need to enter. Example: Use the show health command. Example: Enter terminal paging {off on} .
<i>italic text</i>	Indicates new terms and book titles.
<code>plain Courier text</code>	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
AES	Advanced Encryption Standard
AIS	alarm indication signal
CSU/DSU	channel service unit/digital service unit
DES	Data Encryption Standard
DIMM	dual inline memory module
DTE	data terminal equipment
FRU	field replacement unit
HSSI	High Speed Serial Interface
IP	Internet Protocol
IPsec	IP Security
LAN	local area network

LED	light emitting diode
LOS	loss of signal
OOF	out of frame
PCI	peripheral component interconnect
RoHS	Restriction of Use of Certain Hazardous Substances
SSL	Secure Sockets Layer
VPN	virtual private network
WAN	wide area network

Related publications

For complete information about configuring, monitoring, and managing the VPN Router 2700, formerly known as the Contivity Secure IP Services Gateway 2700, 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.
- *Nortel VPN Router Configuration — Basic Features* (NN46110-500) introduces the product and provides information about initial configuration.
- *Nortel VPN Router Security — Servers, Authentication, and Certificates* (NN46110-600) provides instructions for configuring authentication servers and services, as well as digital certificates.
- *Nortel VPN Router Security — Firewalls, Filters, NAT, and QoS* (NN46110-601) provides instructions for configuring the VPN Router Stateful Firewall, NAT, and VPN Router interface and tunnel filters.
- *Nortel VPN Router Configuration — Tunneling Protocols* (NN46110-503) provides instructions for configuring the tunneling protocols IPsec, L2TP, PPTP, and L2F.
- *Nortel VPN Router Configuration — Advanced Features* (NN46110-502) 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.

- *Nortel VPN Router Configuration — Routing* (NN46110-504) provides instructions for configuring RIP, OSPF, and VRRP, as well as instructions for configuring ECMP, routing policy services, and client address redistribution.
- *Nortel VPN Router Configuration — SSL VPN Services* (NN46110-501) provides instructions for configuring services on the SSL VPN Module 1000, including authentication, networks, user groups, and portal links.
- *Nortel VPN Router Using the Command Line Interface* (NN46110-507) provides syntax, descriptions, and examples for the commands that you can use to configure, manage, and monitor the gateway.
- *Nortel VPN Router Troubleshooting* (NN46110-602) provides information about backup and recovery, file management, upgrading software, and troubleshooting. This guide also provides instructions for monitoring gateway status and performance.
- *Nortel VPN Router Configuration — TunnelGuard* (NN46110-307) provides information about configuring and using the TunnelGuard feature.

Printed technical manuals

You can print selected technical manuals and release notes free, directly from the Internet. Go to www.nortel.com/documentation, 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 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 www.adobe.com to download a free copy of the Adobe Reader.

Chapter 1

Installing the Nortel VPN Router 2700 chassis

This chapter describes how to install the VPN Router 2700 chassis.



Note: Before you install the chassis, use standard cable system practices to install all the network wiring on the premises.

This chapter contains the following topics:

Topic	Page
Description of the Nortel VPN Router 2700	25
Preparing to install the Nortel VPN Router 2700	26
Installing the chassis	29

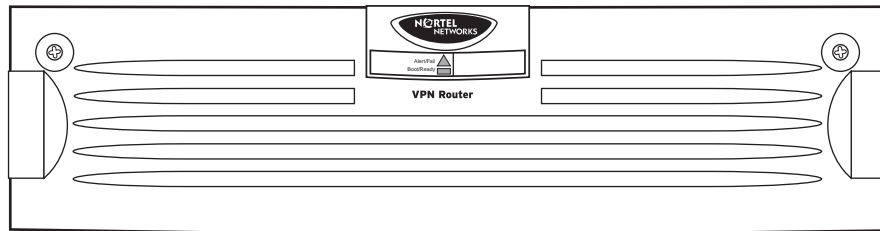
Description of the Nortel VPN Router 2700

You can use the VPN Router 2700 to provide scalable, secure, and robust Internet Protocol (IP) virtual private networks (VPN) across the public data network. The VPN Router 2700 uses the infrastructure of the Internet to replace traditional remote access gear.

The VPN Router 2700 provides routing, firewall, bandwidth management, encryption, authentication, and data integrity services to ensure secure tunneling across IP networks and the Internet. An individual user or group of users can be associated with a set of attributes that provide custom access to an extranet.

Figure 1 shows the front view of the VPN Router 2700.

Figure 1 Front view of the VPN Router 2700



CS260001B

The VPN Router 2700 chassis provides the following:

- one 10/100 Ethernet LAN port on the base system
- one serial port for out-of-band management of the VPN Router 2700
- four expansion peripheral component interconnect (PCI) slots that can contain interface cards, VPN Accelerator cards (VPN Router Security Accelerator card and Hardware Accelerator card), and the Secure Sockets Layer (SSL) VPN Module 1000
- one 10/100 Ethernet interface card installed in PCI slot 4
- 256 MB memory upgradable to 512 MB total

Preparing to install the Nortel VPN Router 2700

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 VPN Router 2700 contains a number of hardware accessories and other items.



Note: Nortel does not ship a power cord with the VPN Router 2750 unless you order one.

[Table 1](#) lists the hardware accessories and other items shipped with the VPN Router 2700.

Table 1 Items shipped with the VPN Router 2700

Quantity	Item	Description
1	Rack mount shelf	Used to support the chassis in an equipment rack
4	10-32 panhead screws	Secures the rack mount shelf to the equipment rack and the chassis to the shelf
4	10-32 panhead cage nuts	Used only 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	Used to direct 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	Used to connect the VPN Router 2700 to a PC or a local terminal
1	Nortel VPN Router Installation—VPN Router 2700 (this book)	Provides instructions for installing the chassis and hardware options
1	Recovery diskette	Used to restore the software image and file system
1	VPN Router software kit	Contains Nortel VPN Router 2700 software and documentation on CD
1	VPN client kit	Contains VPN Client software and documentation on CD

Inspect all items for shipping damage. If you detect any damage, do not install the VPN Router 2700. Call the Nortel Technical Solutions Center in your area (see [“How to get help”](#) on page 17).

Additional equipment

You need items that are not included in the VPN Router 2700 shipping container. Before you begin the installation, ensure that you have all the cables, tools, and other equipment that you need.

Cables

You need cables that are not included in the VPN Router 2700 shipping container. For information about which cables are shipped and which ones you can order, see [“Connecting communications cables” on page 36](#). If you do not have the proper cables, contact your network administrator.

Hardware for mounting the chassis in an equipment rack

To install the VPN Router 2700 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 VPN Router 2700.

Site requirements

The installation site must provide sufficient free space around the VPN Router 2700 to ensure proper ventilation and access for servicing. For information about the physical, electrical, and environmental requirements for the VPN Router 2700, see [“Chassis specifications” on page 75](#).

Installing the chassis

To install the VPN Router 2700, do one of the following:

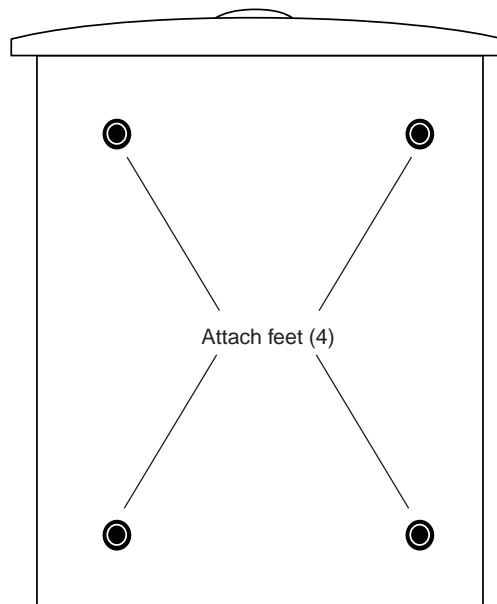
- Position the chassis on a flat, sturdy, horizontal surface.
- Mount the chassis in a standard equipment rack (see [“Installing the chassis in an equipment rack”](#) on page 30).

Installing the chassis on a flat surface

If you decide to place the VPN Router 2700 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 VPN Router 2700 and the cables that you attach to it.

The VPN Router 2700 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



CS160016A

Installing the chassis in an equipment rack

To mount the VPN Router 2700 in an equipment rack, you need the following equipment:

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

Rack-mount recommendations

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

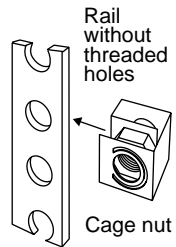
- Ensure that the internal temperature of the rack does not exceed the maximum recommended ambient temperature of 40°C (104°F).
- Do not block the power supply vents or otherwise restrict air flow when you install the chassis in a rack.
- Stabilize your rack so that it does not tip over under the weight of the gateway and other devices.
- Ensure that the electrical branch circuits can handle the VPN Router 2700 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 VPN Router 2700 ships with a rack-mount shelf to support the chassis in the equipment rack.

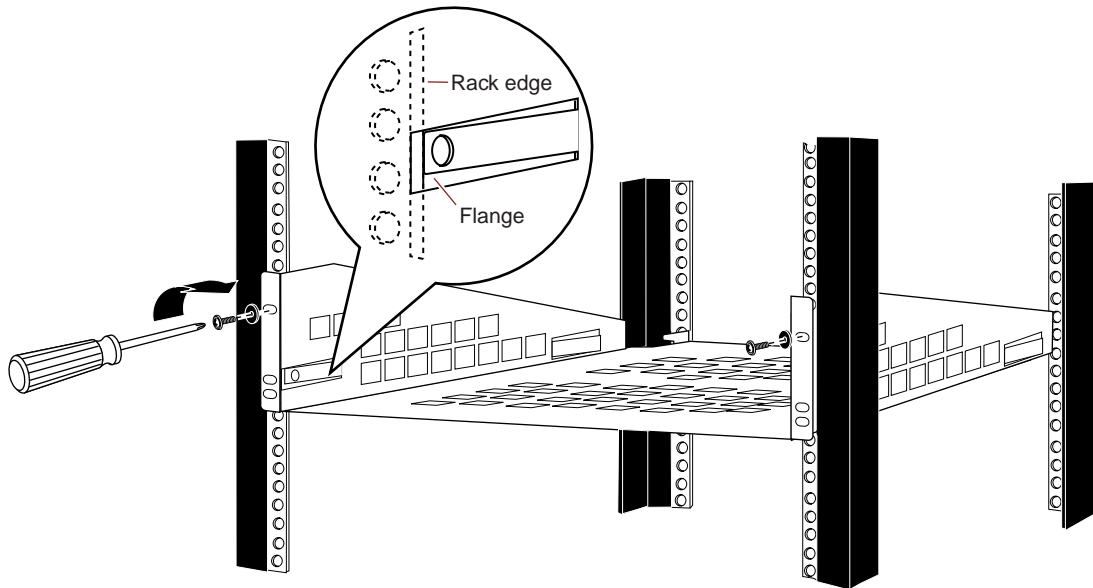
To attach the shelf to the inside of the equipment rack:

- 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 on page 31](#)).

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 Ensure 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](#)).

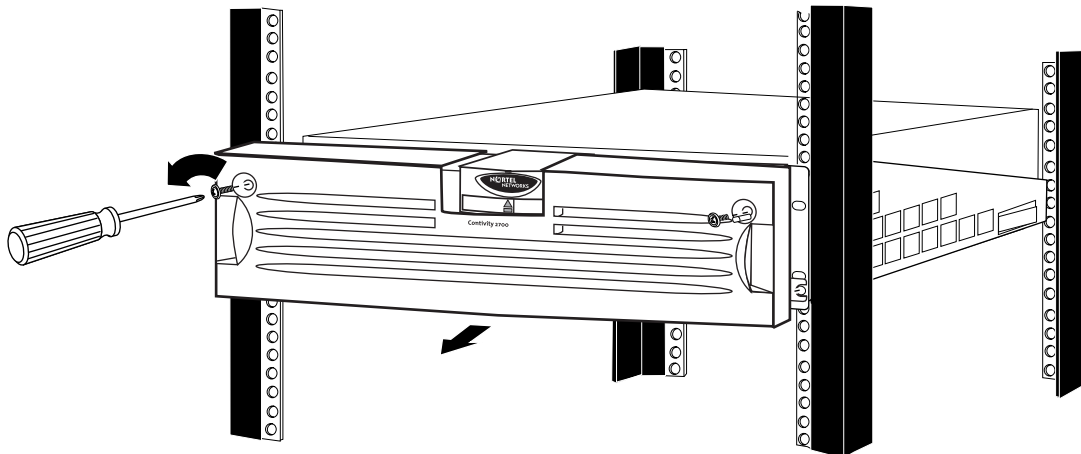
Mounting the chassis in the equipment rack

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

To install the VPN Router 2700 in the equipment rack:

- 1 Set the VPN Router 2700 on the rack-mount shelf.
- 2 Remove the front bezel from the VPN Router 2700 (Figure 5).
 - a Use the Phillips screwdriver to turn each of the two screws on the front bezel a quarter turn counterclockwise.

Figure 5 Removing the front bezel



CS260015B

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



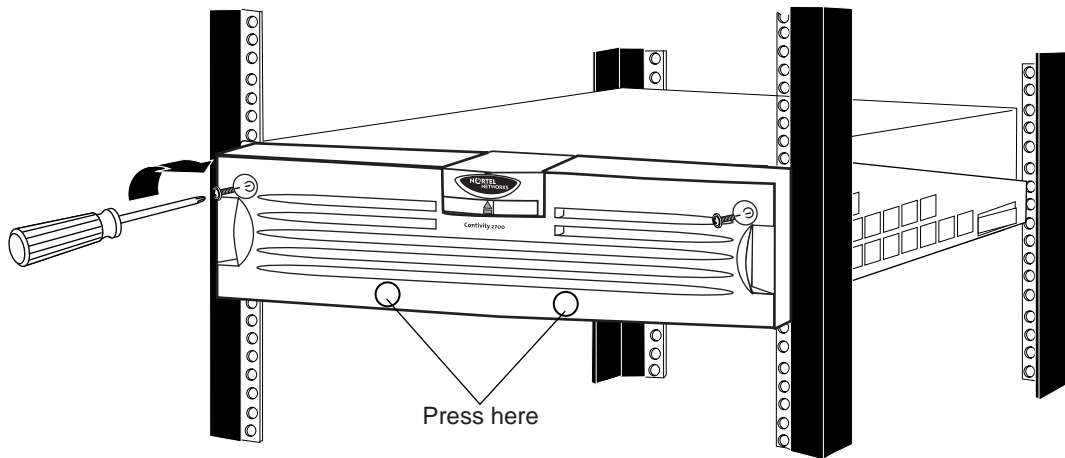
Caution: Risk of equipment damage

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

The first several times that you remove the front bezel, the bezel can stick 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 (Figure 4 on page 31).
- 4 Replace the front bezel (Figure 6).
 - a Hold the two handles on the bezel, and push it onto the chassis.
 - b Use the Phillips screwdriver to tighten the two screws that secure the bezel to the chassis.

Figure 6 Replacing the front bezel



CS260005B

Chapter 2

Cabling the VPN Router and turning the power on

This chapter provides information about how to connect communications cables and the power cord to the VPN Router 2700.



Caution: Connect the cables to the built-in Ethernet port and to the interfaces on the option cards that are installed in the VPN Router 2700 before you plug the power cord into the outlet.

This chapter contains the following topics:

Topic	Page
Connecting communications cables	36
Connecting the power cord	38
Verifying a successful installation	39
Understanding the LEDs	40



Caution: Route all cabling for all WAN, LAN, and serial connections inside the building environment.

Connecting communications cables

Gather the cables that you must attach to the VPN Router 2700.

[Table 2](#) lists the system ports and the ports provided on the optional interface cards that you can install in the VPN Router 2700. The table also indicates whether you can obtain cables for the ports from Nortel.

Table 2 Interfaces and cables for the VPN Router 2700

Interface	Cable available from Nortel		Contact supplier
	Included	Ordered separately	
10/100BASE-TX Ethernet system port			X
Serial port	X		
10/100BASE-TX Ethernet			X
10/100/1000BASE-X 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		

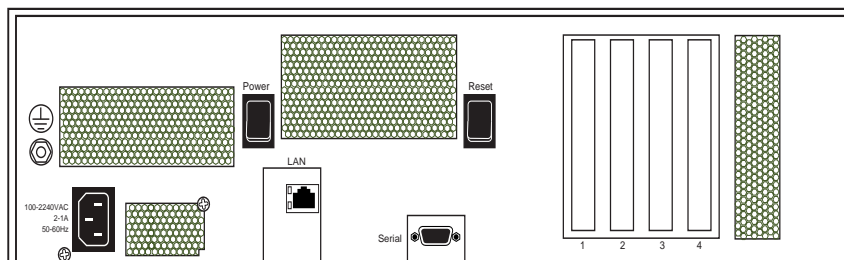
1 Order either the LC-to-LC cable or the LC-to-SC cable.

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 75.

Figure 7 shows the back of the VPN Router 2700. All interface cables and the power cord attach to the rear of the gateway.

Figure 7 Rear view of the VPN Router 2700



CS260002A

Connect the interface cables to the VPN Router 2700 in this order:

- 1 Connect the 10/100BASE-TX RJ-45 cable to the built-in 10/100BASE-TX Ethernet LAN port on the gateway (Figure 7).
- 2 If you plan to connect a terminal or PC to the gateway, connect the serial cable shipped with the VPN Router 2700 to the serial port (Figure 7).
- 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 VPN Router 2700 separately.



Caution: Risk of equipment damage

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 ([Figure 7 on page 37](#)).
- 2 Connect the power cord to the power outlet.



Caution: Risk of equipment damage

Protect the VPN Router 2700 by plugging it into a surge suppressor.

- 3 Press and release the power switch on the rear of the VPN Router 2700 ([Figure 7 on page 37](#)) and wait for the gateway to boot.

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 on page 40](#)).

The following sequence of LEDs occurs:

- 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 is complete, 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 VPN Router 2700, 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 51](#).)

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 38](#)).

If the VPN Router 2700 still does not boot, contact your local Nortel Technical Solutions Center (see [“How to get help” on page 17](#)).

Understanding the LEDs

This section describes the LEDs on the front panel of the VPN Router 2700 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 VPN Router 2700 has a lighted Nortel Networks logo and two LEDs (Figure 8). These LEDs indicate the status of the VPN Router 2700.

Figure 8 Front panel LEDs

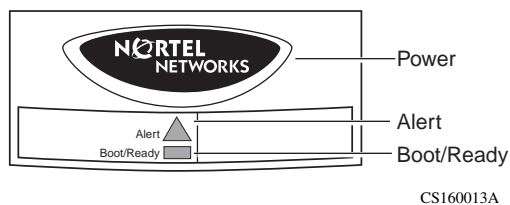


Table 4 describes the LEDs on the VPN Router 2700 front panel.

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 is complete and the gateway is in a state of readiness.

For complete information about the health check, event log, and system log, see *Nortel VPN Router Troubleshooting* (NN46110-602).

LEDs on the system 10/100BASE-TX Ethernet port

Figure 9 shows the LEDs for the 10/100BASE-TX Ethernet port located on the rear of the VPN Router 2700.

Figure 9 LEDs on the system LAN port

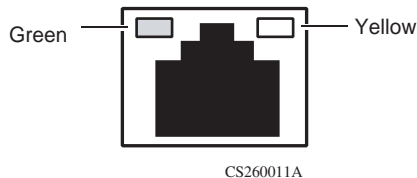


Table 5 describes the LEDs on the system 10/100BASE-TX Ethernet port.

Table 5 LED indicators on the system 10/100BASE-TX 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-TX Ethernet interface card LEDs

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

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

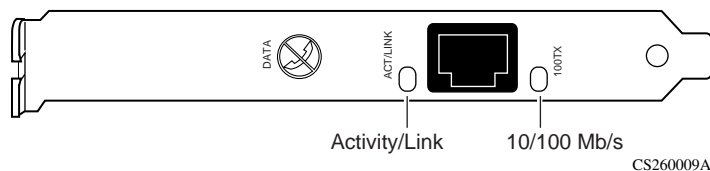


Table 6 describes the LEDs on the 10/100BASE-TX Ethernet interface card.

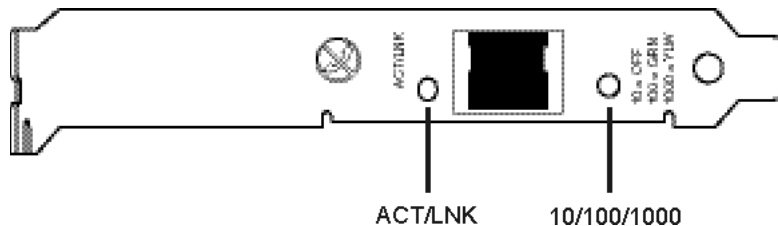
Table 6 LED indicators on the 10/100BASE-TX Ethernet interface card

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 (1000 GT) Ethernet interface card LEDs

The following figure shows the LEDs on the 1000BASE-T (1000 GT) Ethernet interface card.

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



The following table describes the LEDs on the 1000BASE-T (1000 GT) Ethernet interface card.

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

LED	Indicator	Description
ACT/LINK	Steady green	The port is connected to a valid link partner.
	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.
10/100/1000	Yellow	The port is operating at 1000 Mb/s.
	Green	The port is operating at 100 Mb/s.
	Off	The port is operating at 10 Mb/s.

1000BASE-T (1000 MT) Ethernet interface card LEDs

Figure 12 shows the LEDs on the 1000BASE-T (1000 MT) Ethernet interface card.

Figure 12 LEDs on the 1000BASE-T (1000 MT) Ethernet interface card

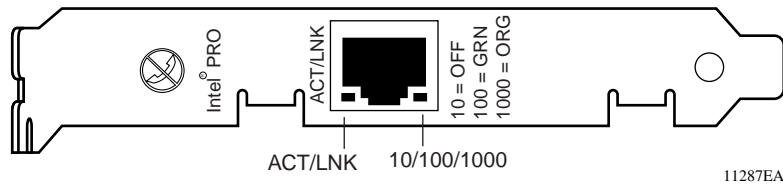


Table 8 describes the LEDs on the 1000BASE-T (1000 MT) Ethernet interface card.

Table 8 LED indicators on the 1000BASE-T (1000 MT) 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.

Table 8 LED indicators on the 1000BASE-T (1000 MT) Ethernet interface card

LED	Indicator	Description
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 13 shows the LED on the 1000BASE-SX Ethernet interface card.

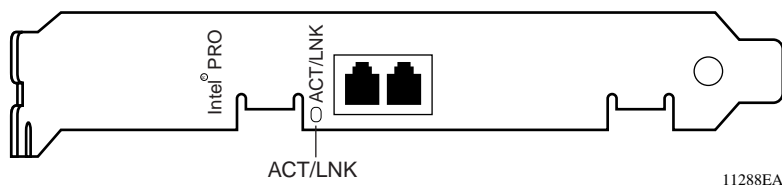
Figure 13 LED on the 1000BASE-SX Ethernet interface card

Table 9 describes the LED on the 1000BASE-SX Ethernet interface card.

Table 9 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 14 shows the LEDs on the 56/64K CSU/DSU WAN interface card.

Figure 14 LEDs on the 56/64K CSU/DSU WAN interface card

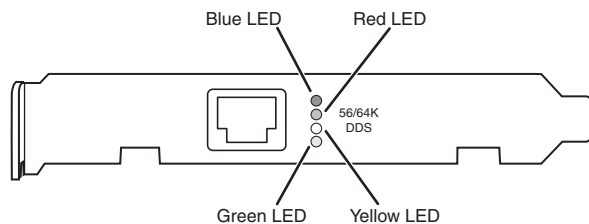


Table 10 describes the LEDs on the 56/64K CSU/DSU WAN interface card.

Table 10 LED indicators on the 56/64K CSU/DSU WAN interface card

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

ADSL WAN interface card LEDs

Figure 15 shows the LEDs on the ADSL WAN interface card.

Figure 15 LEDs on the ADSL WAN interface card

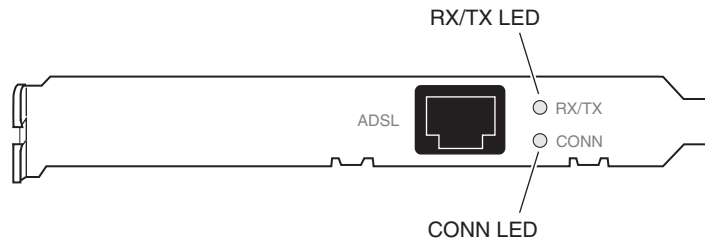


Table 11 describes the LEDs on the ADSL WAN interface card.

Table 11 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 can be dim.)

T1/E1 CSU/DSU WAN interface card LEDs

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

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

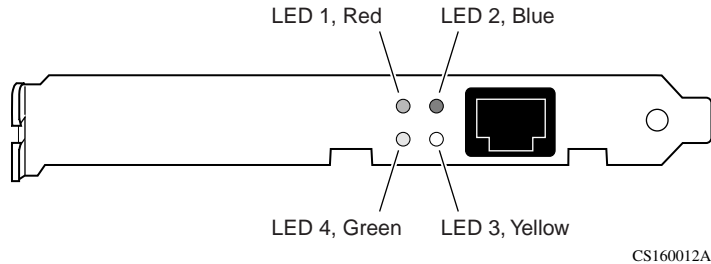


Table 12 describes the LEDs on the T1/E1 CSU/DSU WAN interface card.

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

LED	Indicator	Description
LED 1	Red	The 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	The blue alarm LED is lit when receiving an upstream failure denoted by an alarm indication signal (AIS).
LED 3	Yellow	The yellow alarm LED is lit when the far-end equipment is in the red alarm condition.
LED 4	Green	The green LED is lit when the condition is normal operation.

Quad T1/E1 CSU/DSU WAN interface card LEDs

Figure 17 shows the LEDs on the quad T1/E1 CSU/DSU WAN interface card.

Figure 17 LEDs on the quad T1/E1 CSU/DSU WAN interface card

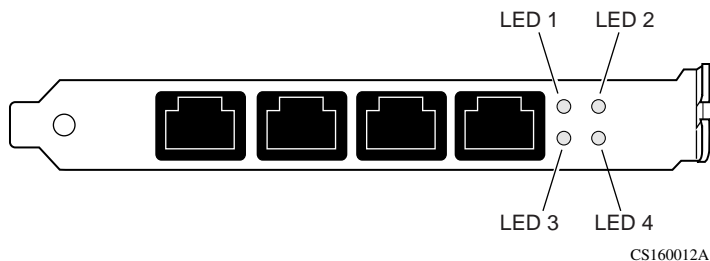


Table 13 describes the LEDs on the quad T1/E1 CSU/DSU WAN interface card.

Table 13 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 18 shows the LEDs on the single V.35/X.21 WAN interface card.

Figure 18 LEDs on the single V.35/X.21 WAN interface card

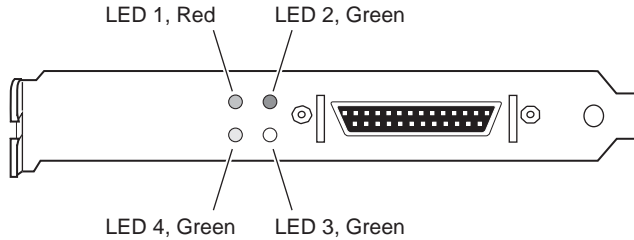


Table 14 describes the LEDs on the single V.35/X.21 WAN interface card.

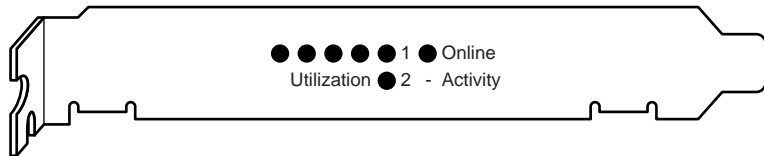
Table 14 LED indicators on the single V.35/X.21 WAN interface card

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 19 shows the LEDs on the SSL VPN Module 1000.

Figure 19 LEDs on the SSL VPN Module 1000



11356EA

Table 15 describes the LEDs on the SSL VPN Module 1000.

Table 15 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 VPN Router 2700. After you complete the procedures in this chapter, you can configure and manage the VPN Router 2700 using a Web browser from a PC.

To configure the management IP address, you use the serial interface configuration menu. You must connect a PC or terminal to the serial port on the VPN Router 2700.

This chapter contains the following topics:

Topic	Page
Required information	52
Configuring the management IP address	53
Testing the configuration	57
Troubleshooting	58

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 VPN Router 2700. 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 need it to configure the VPN Router 2700.

Configuring the management IP address

You use the serial interface to assign the VPN Router 2700 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.

Configure the terminal or PC as follows:

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

- 2 Connect the serial cable (supplied with the VPN Router 2700) 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 Nortel VPN Router screen appears.

```
Nortel VPN Router
Copyright (c) 1999-2005 Nortel Networks, Inc.
```

```
Version:           V07_0.024
Creation date:     Jul 6 2006, 08:23:16
Unit Serial Number: 510649
```

```
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.

- 0) Management Address
- 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 (0 - 9,B,P,C,L,R,E):

- 5** To configure the Interface IP address from the serial menu, type **1**, and press **Enter**.

The interface menu appears.

- Interface Menu

- 0) Slot 0, Port 2, Public LAN
 - IP Address =
 - Subnet Mask = 0.0.0.0
 - Speed/Duplex = AutoNegotiate
- 1) Slot 0, Port 1, Private LAN
 - IP Address =192.167.120.14
 - Subnet Mask = 255.255.255.0
 - Speed/Duplex = AutoNegotiate
- R) Return to the Main Menu.

Please select a menu choice:

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

The IP address prompt appears.

```
0) Slot 0, Port 2, Public LAN
   IP Address =
   Subnet Mask = 0.0.0.0
   Speed/Duplex = AutoNegotiate
```

*Type 0.0.0.0 to delete.

*Just type <CR> to skip.

```
Old IP address =
```

```
New IP address =
```

- 7** Type a new IP address, and press **Enter**.

The subnet mask prompt appears.

```
Old Subnet Mask = 0.0.0.0
```

```
New Subnet Mask =
```

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

The Speed/Duplex prompt appears.

- 9** Press **Enter** to leave the speed and duplex settings unchanged.

The Interface menu appears again with the changes you made.

```
0) Slot 0, Port 2, Public LAN
   IP Address =
   Subnet Mask = 0.0.0.0
   Speed/Duplex = AutoNegotiate
```

```
1) Slot 0, Port 1, Private LAN
   IP Address =192.167.120.14
   Subnet Mask = 255.255.255.0
   Speed/Duplex = AutoNegotiate
```

```
R) Return to the Main Menu.
```

```
Please select a menu choice:
```

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

10 To configure the management IP address, type **0** and press **Enter**.

The Management IP Address menu appears.

- Management IP Address Menu

M) Management IP Address =

R) Return to the Main Menu

Please select a menu choice (M,R):

11 Type **M**, and press **Enter**.

The Management IP Address prompt appears.

*Type 0.0.0.0 to delete.

*Just type <CR> to skip.

Old management IP address =

New management IP address =

12 Type the new management IP address, and press **Enter** to configure the management IP address.

The new IP management address appears in the Management IP Address menu.

- Management IP address menu

M) Management IP Address =192.167.120.13

R) Return to the Main Menu

Please select a menu choice (M,R):

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

The serial main menu appears.

14 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.

15 Go to the next section, [“Testing the configuration” on page 57](#), to verify that you can access the VPN Router 2700 from a Web browser.

For detailed information about configuring and managing the VPN Router 2700, refer to the documentation on the VPN Router software CD.

Testing the configuration

After you assign a management IP address to the VPN Router 2700, start your Web browser to verify that you can access the gateway from the browser.

To manage the VPN Router 2700 using the GUI, your PC must be running one of the following browsers:

- Windows 2000 and NT
 - Internet Explorer 6.0 or later
 - Mozilla 1.7 or later
 - Firefox (all versions)
 - Netscape 7.x, 8.0.x or 8.1.x
- Unix
 - Firefox 1.5 or later
 - Mozilla 1.7 or later
- Linux
 - Firefox 1.5 or later
 - Mozilla 1.7 or later

To test the management IP address on the VPN Router 2700:

- 1 Open a Web browser.
- 2 In the URL field, enter **http://** followed by the management IP address that you assigned to the VPN Router 2700.

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

If the Welcome screen appears, you correctly configured the management IP address for the VPN Router 2700.



Note: If the Welcome screen does not appear, see [“Troubleshooting” on page 58](#).

- 3 Go to *Nortel VPN Router Configuration — Basic Features* (NN46110-500) for information about configuring the VPN Router 2700.

Troubleshooting

If you cannot connect to the VPN Router 2700 using your browser, check the following items:

- Ensure 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.
- Ensure that your PC is running a supported browser (see [“Testing the configuration” on page 57](#)).
- Check the physical connections on the VPN Router 2700, especially the LAN cable and the power cord. VPN Router 2700

If you still cannot connect to the VPN Router 2700 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 53](#)). Reconfigure the management IP address if necessary.

If you cannot resolve the problem, contact the Nortel Technical Solutions Center closest to you (see [“How to get help” on page 17](#)).

Chapter 4

Installing option cards and DIMMs

This chapter provides instructions on how to install and replace the following field replaceable units (FRU) in the VPN Router 2700:

- LAN, WAN, and serial interface cards
- SSL VPN Module 1000
- VPN Accelerator cards (VPN Router Security Accelerator card and Hardware Accelerator card)
- Dual inline memory modules (DIMM)

This chapter contains the following topics:

Topic	Page
Shutting down the system to add or replace hardware	60
Removing the front bezel and top cover	61
Attaching the antistatic wrist strap	64
Installing and replacing option cards	65
Installing and replacing DIMMs	70

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 VPN Router 2700 and unplug it.



Warning: Risk of electric shock

Shut down the VPN Router 2700 as described in this section before you attempt to add or replace an option card or DIMM.

To shut down the VPN Router 2700:

- 1 Use the Web GUI or the command line interface (CLI) to shut down the gateway.
 - Web GUI: Choose Admin > Shutdown. Select the option to power off the gateway after shutdown.
 - CLI: Use the **reload** command to shut down the system. For example, enter **reload power-off disable-logins "Upgrade hardware"**
- 2 Wait for the system to shut down.
- 3 Disconnect the power cord from the power outlet, and then disconnect the cord from the VPN Router 2700.

The power receptacle is on the rear of the VPN Router 2700.



Warning: Risk of electric shock

Turn off the VPN Router 2700, 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 VPN Router 2700 using the Web GUI or the CLI and then unplug it as described in [“Shutting down the system to add or replace hardware” on page 60](#).

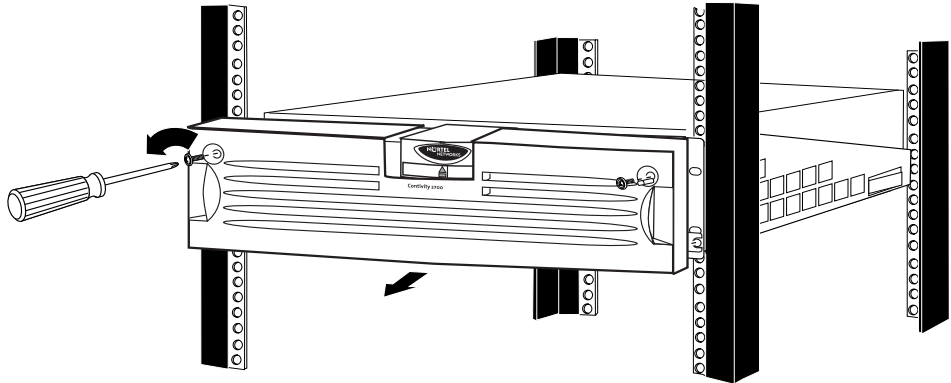


Warning: Risk of electric shock

Turn off the VPN Router 2700, and unplug the power cord before you attempt to remove or install an option card or DIMM.

- 2 Use a Phillips screwdriver to turn each of the two screws on the front bezel a quarter turn counterclockwise ([Figure 20](#)).

Figure 20 Removing the front bezel



CS260015B

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



Caution: Risk of equipment damage

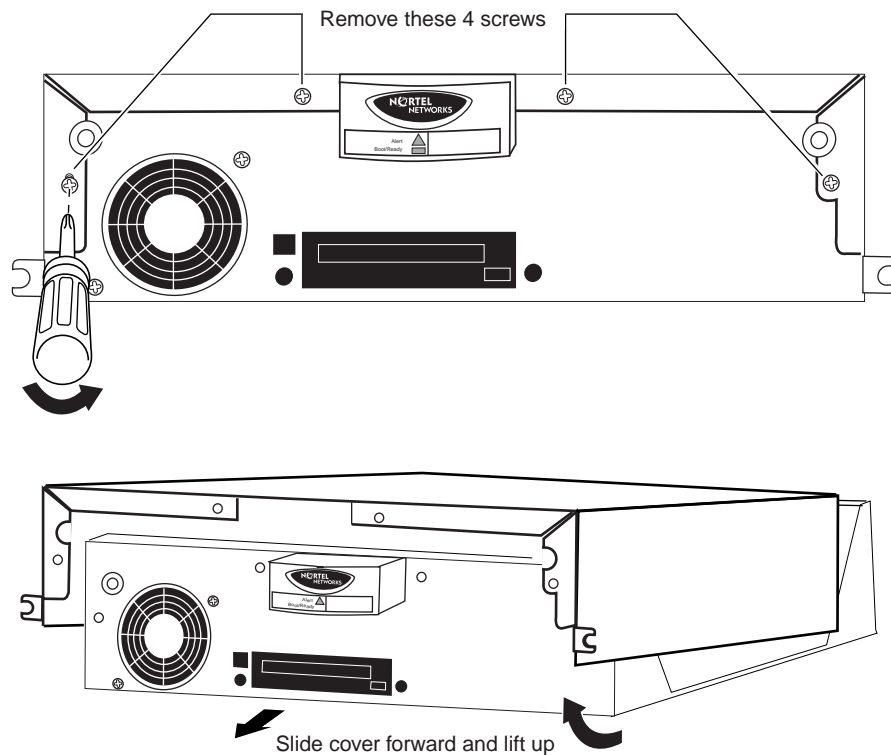
Do not use the piece with the Nortel Networks logo and the LEDs as a handle.

The first several times that you remove the front bezel, the bezel can stick because the ball studs and socket clips are new.

To remove the top cover:

- 1 If the gateway is in an equipment rack, remove it from the rack.
 - a At the front of the chassis, remove the two panhead screws that secure the bottom of the chassis to the equipment rack.
 - b Remove the VPN Router 2700 from the rack-mount shelf, and set it on a sturdy surface.
- 2 Use a Phillips screwdriver to remove the four screws that secure the cover to the chassis ([Figure 21](#)).

Figure 21 Removing the top cover



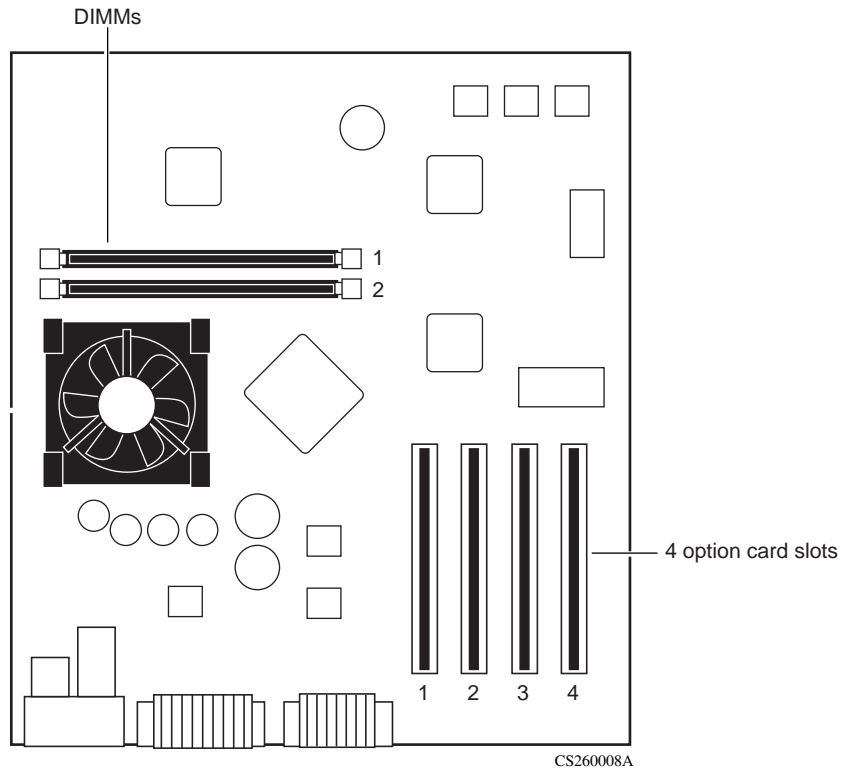
CS260006A

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

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

The VPN Router 2700 system board is now exposed. [Figure 22](#) shows the location of the option card slots and the DIMMs on the system board.

Figure 22 Location of option card slots and DIMMs on the system board



Warning: Risk of injury

Beware of danger if you incorrectly replace the battery. Replace the battery with the same type or an equivalent battery only, as recommended by the manufacturer's instructions. In spite of this warning, which is mandated for regulatory approval, you must not change the battery. If you suspect a dead battery, contact Nortel Customer Support.

Attaching the antistatic wrist strap

Nortel ships the VPN Router 2700 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 when you remove, install, or handle option cards and DIMMs.



Caution: Risk of equipment damage

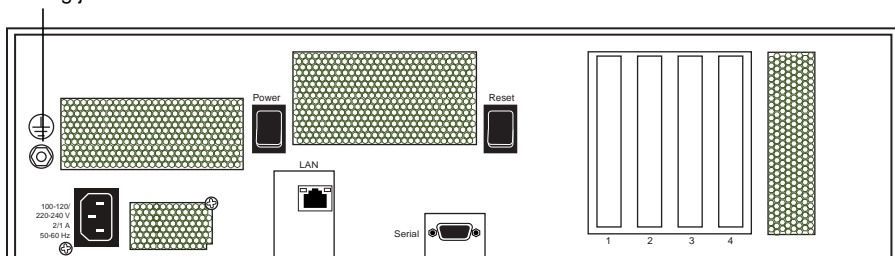
Electrostatic discharge can damage hardware. Follow the procedure in this section to protect your equipment from damage.

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 the strap 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

Grounding jack



CS260002A

Installing and replacing option cards

The VPN Router 2700 has four slots for option cards ([Figure 22 on page 63](#)). This section provides instructions on adding new option cards to the VPN Router 2700 or, if necessary, replacing an existing card.

[Table 16](#) lists the option cards that you can install in the VPN Router 2700..



Note: The 1000BASE-T (1000 GT) Ethernet interface card only operates at 10/100 Mbit/s on the VPN Router 2600.

[Table 16](#) lists the option cards that you can install in the VPN Router 2600 and 2700.

Table 16 Supported option cards for the 2600 and 2700

Option card	Maximum number	Restrictions
SSL VPN Module 1000 ¹	1	Install this card in slot 1 only.
VPN Router 2700 Security Accelerator ²	2	Install two cards of either type, or one card of each type. (But see Table 17 on page 66 .) Do not install a Hardware Accelerator card in slot 4.
Hardware Accelerator ³		
10/100BASE-TX Ethernet interface	4	
1000BASE-T (1000 GT) Ethernet interface ⁴	4	
1000BASE-T (1000 MT) interface (copper)	2	Install two 1000BASE-T (1000 MT) cards, two 1000BASE-SX cards, or one card of each type. (But see Table 17 on page 66 .)
1000BASE-SX interface (fiber)		
56/64K channel service unit/digital service unit (CSU/DSU) WAN interface ⁵	4	
Asymmetric digital subscriber line (ADSL) WAN interface ⁶	4	
ISDN BRI S/T or U interface ⁷	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	3	

Table 16 Supported option cards for the 2600 and 2700

Option card	Maximum number	Restrictions
V.90 modem interface	4	If an SSL VPN Module 1000 is in slot 1, do not install the V.90 modem interface card in slot 2.
Single V.35/X.21 WAN interface (full-height)	4	
Single V.35/X.21 WAN interface (half-height) ⁸	4	
HSSI WAN interface ⁹	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.

- 1 The VPN Router 2700 must be running Version 5.0 or later.
- 2 The VPN Router 2700 must be running Version 4.90 or later.
- 3 To support two Hardware Accelerator cards, the gateway must be running Version 4.76 or later.
- 4 The VPN Router 2700 must be running Version 5.05.330, 6.05.140 and later, 7.00.062, 7.05.100 and later, or 7.05.300 and later. The VPN Router 2600 supports 10/100 Mbps operation only.
- 5 The VPN Router 2700 must be running Version 5.0 or later.
- 6 The VPN Router 2700 must be running Version 4.90 or later.
- 7 The VPN Router 2700 must be running Version 4.80 or later.
- 8 The VPN Router 2700 must be running Version 4.80 or later.
- 9 The gateway must be running Version 4.76 or later, or the hardware revision must be at least 03.

[Table 17](#) provides additional guidelines for option card installation when an SSL VPN Module 1000 is installed in slot 1.

Table 17 Installing other option cards with the SSL VPN Module 1000

Option card	Restrictions with SSL VPN Module 1000 installed
VPN Router Security Accelerator	Only one VPN Router Security Accelerator card can be installed.
Hardware Accelerator	You can install two cards only if <i>none</i> of these cards is installed: <ul style="list-style-type: none"> • VPN Router Security Accelerator • 1000BASE-T or 1000BASE-SX • HSSI If a 1000BASE-T (1000 MT), 1000BASE-SX, Security Accelerator, or HSSI card is installed, only one Hardware Accelerator card can be installed.

Table 17 Installing other option cards with the SSL VPN Module 1000 (continued)

Option card	Restrictions with SSL VPN Module 1000 installed
1000BASE-T or 1000BASE-SX interface	You can install two cards only if <i>none</i> of these cards is installed: <ul style="list-style-type: none"> • VPN Router Security Accelerator • Hardware Accelerator • HSSI If a VPN Router Security Accelerator, Hardware Accelerator, or HSSI card is installed, only one 1000BASE-T (1000 MT) or 1000BASE-SX card can be installed.
V.90 modem interface	Do not install this card in slot 2.
HSSI WAN interface	Only one HSSI card can be installed. Install this card in slot 3 if possible. Do not install this card in slot 4.

To install or replace an interface card or a VPN Accelerator card (VPN Router Security Accelerator card or Hardware Accelerator card):

- 1 Shut down the VPN Router 2700 using the Web GUI or the CLI, and then unplug it as described in [“Shutting down the system to add or replace hardware” on page 60](#).



Warning: Risk of electric shock

Turn off the VPN Router 2700 and unplug it before you attempt to install an option card.

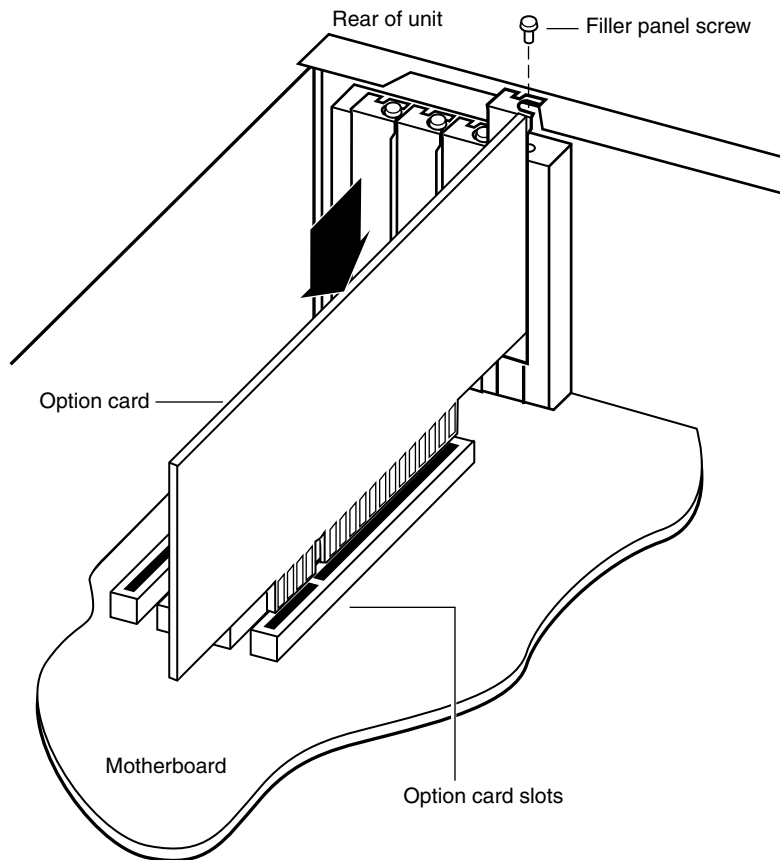
- 2 Remove the front bezel from the chassis, and then remove the chassis from the equipment rack (see [“Removing the front bezel and top cover” on page 61](#)).
- 3 Remove the top cover from the chassis (see [“Removing the front bezel and top cover” on page 61](#)).
- 4 Attach the antistatic wrist strap that was shipped with the VPN Router 2700 (see [“Attaching the antistatic wrist strap” on page 64](#)).
- 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

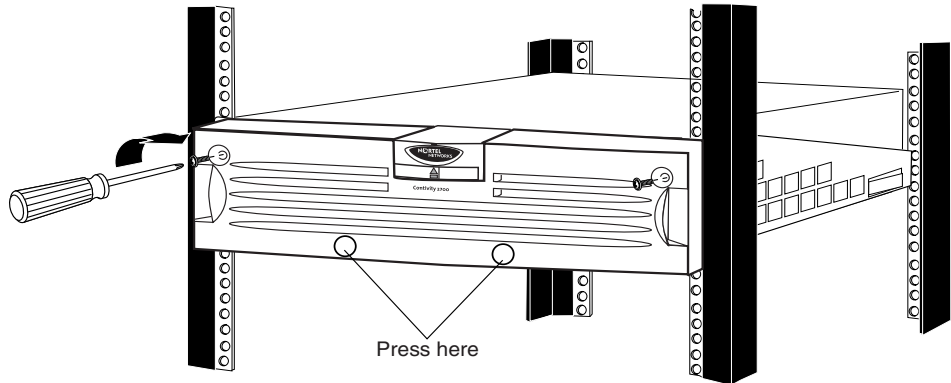


CS2600017A

- 7 Lower the new option card into the slot, and gently press the connector into the slot.
Seat the card firmly in the slot. If you do not seat the card properly, it does not work.
- 8 Replace the screw that secures the card to the slot (Figure 24).
- 9 Replace the top cover on the chassis (Figure 21 on page 62).
 - a Hold the cover at an angle and slide it onto the chassis.

- b** Insert the four screws that secure the cover to the chassis, and use a screwdriver to tighten them.
- 10** Do the following to mount the VPN Router 2700 in an equipment rack:
 - a** Set the VPN Router 2700 on the rack-mount shelf in the rack.
 - b** Insert one of the panhead screws through the bottom hole on each side of the shelf into the hole in the rack, and tighten the screws.
- 11** Replace the front bezel (Figure 25).
 - a** Hold the bezel by the two handles, and push it onto the chassis.
 - b** Use a screwdriver to tighten the two screws that secure the bezel to the chassis.

Figure 25 Replacing the front bezel



CS260005B

Installing and replacing DIMMs

The VPN Router 2700 has two slots for dual inline memory modules (DIMMs) ([Figure 22 on page 63](#)). Unless you ordered additional memory, Nortel ships the VPN Router 2700 with one 256 MB DIMM installed. You can upgrade memory in the gateway by installing a second 256 MB DIMM.



Caution: Use of a memory module not purchased from Nortel can render void your warranty or your service contract.

This section provides instructions on adding a second DIMM to the VPN Router 2700 or, if necessary, replacing an existing DIMM.



Caution: Install the same type of DIMM that is already installed in the gateway. For example, do not install a 128 MB DIMM in the VPN Router 2700.

To install or replace a DIMM:

- 1 Shut down the VPN Router 2700 using the Web GUI or the CLI, and then unplug it as described in [“Shutting down the system to add or replace hardware” on page 60](#).



Warning: Risk of electric shock

Turn off the VPN Router 2700 and unplug it before you attempt to install a DIMM.

- 2 Remove the front bezel from the chassis, and then remove the chassis from the equipment rack (see [“Removing the front bezel and top cover” on page 61](#)).
- 3 Remove the top cover from the chassis (see [“Removing the front bezel and top cover” on page 61](#)).

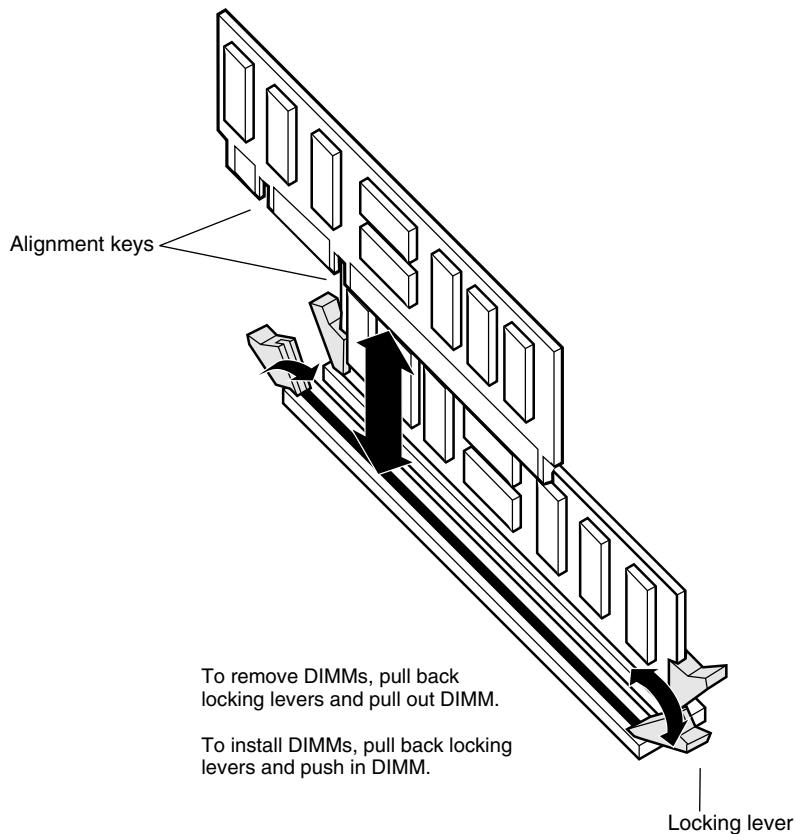
- 4 Attach the antistatic wrist strap that was shipped with the VPN Router 2700 (see [“Attaching the antistatic wrist strap” on page 64](#)).

**Caution: Risk of equipment damage**

Electrostatic discharge can damage VPN Router 2700 components.

- 5 To replace a DIMM, remove the installed DIMM as follows:
 - a Press down the locking lever on either side of the DIMM ([Figure 26 on page 72](#)).
 - 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 on page 72](#)).
- 7 Place the new or replacement DIMM in the slot ([Figure 26 on page 72](#)).
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 ([Figure 21 on page 62](#)).
 - a** Hold the cover at an angle, and slide it onto the chassis.
 - b** Insert the four screws that secure the cover to the chassis, and use a screwdriver to tighten the screws.
- 11** Do the following to install the VPN Router 2700 in an equipment rack:
 - a** Set the VPN Router 2700 on the rack-mount shelf in the rack.
 - b** Insert one of the panhead screws through the bottom hole on each side of the shelf into the hole in the rack and tighten the screws.

- 12** Replace the front bezel ([Figure 25 on page 69](#)).
 - a** Hold the bezel by the two handles, and push it onto the chassis.
 - b** Use the screwdriver to tighten the two screws that secure the bezel to the chassis.

Appendix A

Technical specifications

This appendix provides technical specifications for the VPN Router 2700 chassis and the VPN Router 2700 interfaces.

Chassis specifications

[Table 18](#) lists physical, electrical, and environmental specifications for the chassis.

Table 18 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

Table 18 Physical, electrical, and environmental specifications (continued)

Specification	Description
Operating altitude	7000 ft (2133.6 m) maximum
Storage altitude	40,000 ft (12,192 m) maximum

System ports

The VPN Router 2700 system board provides the following built-in interfaces:

- 10/100BASE-TX Ethernet LAN port
- serial port

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

10/100BASE-TX Ethernet LAN port

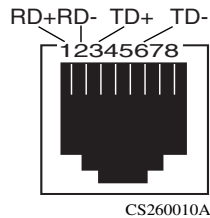
The system board provides one 10/100BASE-TX Ethernet LAN interface on the rear of the chassis. Use this LAN interface, which accommodates an RJ-45 straight-through cable, for Web management. Depending on whether you use the interface for 10BASE-T or 100BASE-TX operation, select cables for the interface 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.

Nortel recommends a maximum length of 100 meters for the cable segment 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-TX connector and the connector pinouts.

Figure 27 10/100BASE-TX Ethernet connector

[Table 19](#) provides the 10/100BASE-TX Ethernet port pinouts.

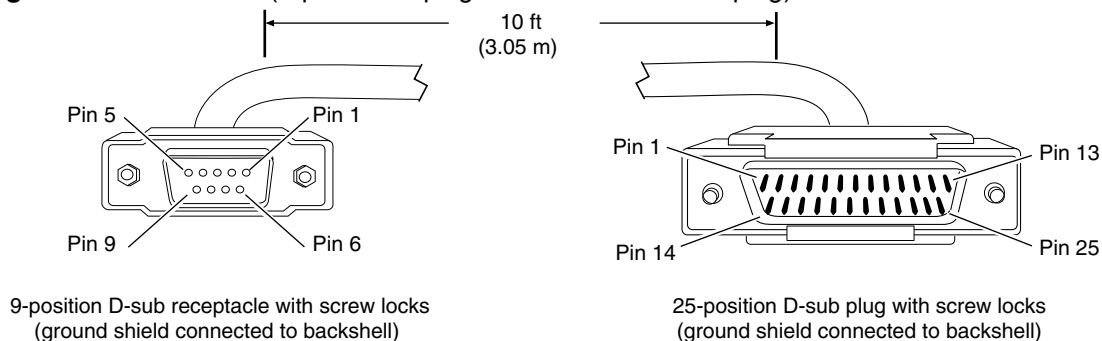
Table 19 10/100BASE-TX Ethernet port pinouts

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. Use the serial port to 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 51](#)).

The serial cable provided with the VPN Router 2700 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 ([Figure 28](#)).

Figure 28 Serial cable (9-pin D-sub plug to RS-232-C modem plug)

CAB0056A

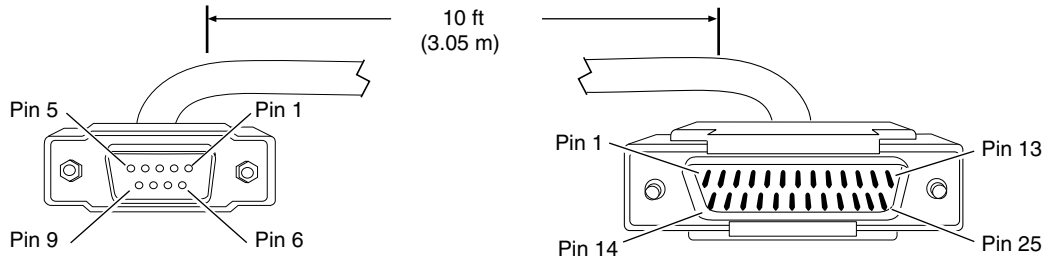
Table 20 provides the multiple DB9/DB25 serial interface cable pinouts.

Table 20 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 VPN Router 2700, you must obtain an appropriate modem cable. The modem cable must have a 9-pin D-sub plug that connects to the VPN Router 2700 serial port and a 25-pin D-sub plug that connects to the RS-232-C modem port (Figure 29).

Figure 29 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 21](#) provides the modem cable pinouts.

Table 21 Modem cable pinouts

Nortel 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 VPN Router 2700 provides four peripheral component interconnect (PCI) slots that support a combination of the following option cards:

- VPN Accelerator cards (VPN Router Security Accelerator [CSA] card and Hardware Accelerator card)
- SSL VPN Module 1000
- 10/100BASE-TX Ethernet interface card (nonRoHS-compliant)

- 10/100/1000BASE-X Ethernet interface card (RoHS-compliant)
- 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
- HSSI WAN interface card

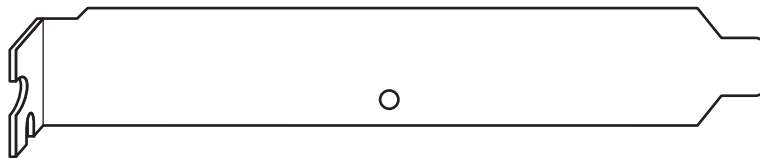
This section provides information about the option cards, including the connector and the cable pinouts for each supported network interface card.

VPN Router Security Accelerator cards

Nortel supports the VPN Router Security Accelerator option card that performs bulk encryption and compression algorithms for IPsec tunnel traffic.

Figure 30 shows the VPN Router Security Accelerator card.

Figure 30 VPN Router Security Accelerator card



The VPN Router Security Accelerator card uses a single Hifn 7854 chip for encryption and compression and has 64 MB of onboard RAM. It supports Advanced Encryption Standard (AES)-128 cryptography with SHA-1 authentication and triple Data Encryption Standard (DES) cryptography with either Message Digest 5 Algorithm (MD5) or Secure Hash Algorithm (SHA)-1 authentication.

The VPN Router Security Accelerator card is the successor to the Hardware Accelerator card. The Hardware Accelerator Hifn 7811 card has been discontinued effective January 2006 although Nortel still supports this card. Along with providing support for AES, the VPN Router Security Accelerator card provides increased encryption throughput and improved compression performance.



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

At startup, when you manually enable an accelerator card, or when 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.

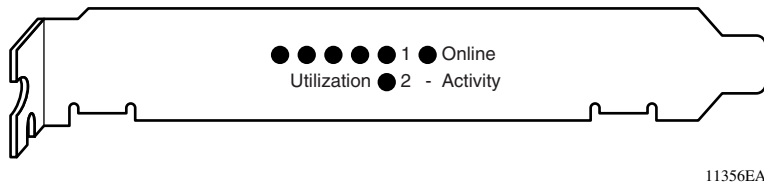
For more information about the VPN Router Security Accelerator card and the Hardware Accelerator card and instructions for configuring these cards, see the guide *Nortel VPN Router Configuration — Advanced Features* (NN46110-502).

SSL VPN Module 1000

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

Figure 31 shows the SSL VPN Module 1000.

Figure 31 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 the VPN Router 5000, 2700, 2750, and 1740 gateways running VPN Router Version 5.0 software. You must install the SSL VPN Module 1000 in slot 1 of the VPN Router 5000, 2700, 2750, or 1740.

The Nortel VPN Router 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 *Nortel VPN Router Configuration — SSL VPN Services* (NN46110-501).

10/100BASE-TX Ethernet interface card

The 10/100BASE-TX 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 32](#) shows the 10/100BASE-TX Ethernet interface card.

Figure 32 10/100BASE-TX Ethernet interface card



CS260009A

For information about the cables that you can connect to this interface and the cable pinouts, see [“10/100BASE-TX Ethernet LAN port” on page 76](#).

1000BASE-T (1000 GT) Ethernet interface card

The 1000BASE-T (1000 GT) Ethernet card replaces the 10/100BASE-TX Ethernet card (see the previous section). This card provides 10/100/1000 Mbit/s Ethernet services and supports autonegotiation. The card supports the IEEE 802.3ab standard and provides RJ-45/CAT 5 interconnection. It can operate in either full or half duplex mode at 10/100 Mbit/s, and in full duplex mode at 1 Gbit/s. At 1 Gbit/s, autonegotiation must be used.



Note: The 1000BASE-T (1000 GT) Ethernet interface card can only operate at 10/100 Mbit/s on the VPN Router 2600.

The VPN Router 2600 only supports 10/100 Mbit/s operation for the 1000BASE-T (1000 GT) Ethernet card. To ensure reliable speed/duplex operation on these platforms, Nortel recommends that both the interface and the attached devices are hard-coded to the appropriate matching 10/100 speed and duplex settings.

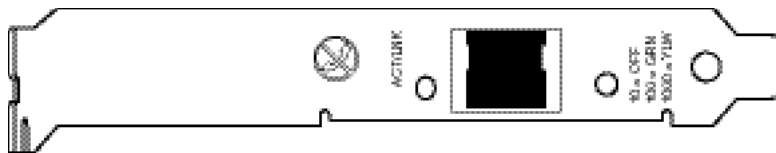
The 1000BASE-T (1000 GT) Ethernet card supports 10/100/1000 Mbit/s operation in the VPN Router 2700/2750.

For the 1000BASE-T (1000 GT) Ethernet interface card to be recognized by the system, the minimum required VPN Router operating software is:

- 5.05.330
- 6.05.140 and all subsequent versions
- 7.00.062
- 7.05.100 and all subsequent versions (FIPS branch)
- 7.05.300 and all subsequent versions

The 1000 GT card does not replace the high-performance 1000BASE-T 1000 MT card (see the following section).

The following figure shows the 1000BASE-T (1000 GT) Ethernet interface full-height card for VPN Router.

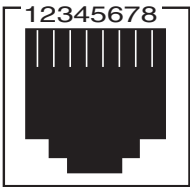
Figure 33 1000BASE-T (1000 GT) Ethernet interface card

Select cables for this card as follows. Keep in mind that this card is auto-negotiating and uses the highest possible data rate:

- For 1000BASE-T operation, use Category 5 four-pair Ethernet wiring. The cable must comply with the TIA 568 wiring specification. Nortel recommends a maximum length of 100 meters for the cable segment.
- 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. Nortel recommends a maximum length of 100 meters for the cable segment.
- For 10BASE-T operation, use Category 3, 4, or 5 twisted-pair wiring.

The following table provides the pinouts for the 1000BASE-T (1000 GT) Ethernet interface card..

Table 22 1000BASE-T (1000 GT) Ethernet pinouts

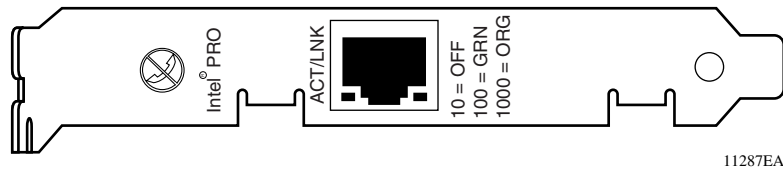
	Pin	Description
 <p data-bbox="451 1291 532 1308">CS260010A</p>	1	TP0+
	2	TP0-
	3	TP1+
	4	TP2+
	5	TP2-
	6	TP1-
	7	TP3+
	8	TP3-

1000BASE-T (1000 MT) Ethernet interface card

Use the 1000BASE-T (1000 MT) Ethernet interface card 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 34 shows the 1000BASE-T Ethernet interface card.

Figure 34 1000BASE-T (1000 MT) Ethernet interface card



The port on the 1000BASE-T (1000 MT) 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. Nortel recommends a maximum length of 100 meters for a cable segment.
- 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. Nortel recommends a maximum length of 100 meters for a cable segment.
- For 10BASE-T operation, use Category 3, 4, or 5 twisted-pair wiring.

Table 23 provides the 1000BASE-T (1000 MT) Ethernet port pinouts.

Table 23 1000BASE-T (1000 MT) Ethernet port pinouts

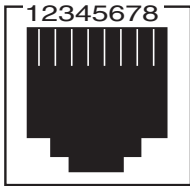
	Pin	Description
	1	TP0+
	2	TP0-
	3	TP1+
	4	TP2+
	5	TP2-
	6	TP1-

Table 23 1000BASE-T (1000 MT)Ethernet port pinouts

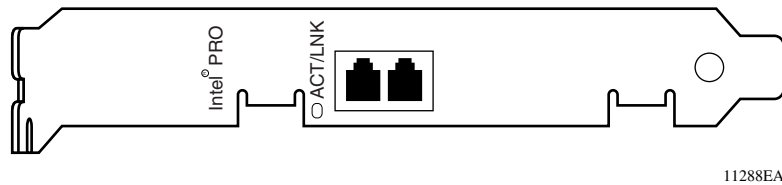
	Pin	Description
	7	TP3+
	8	TP3-

1000BASE-SX Ethernet interface card

The 1000BASE-SX Ethernet interface card implements short-wavelength (850 nm) laser transmissions. Use this interface card 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 35 shows the 1000BASE-SX Ethernet interface card.

Figure 35 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

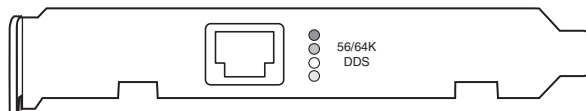
You can order a 10-foot MMF cable from Nortel:

- 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 36](#) shows the 56/64K CSU/DSU WAN interface card.

Figure 36 56/64K CSU/DSU WAN interface card



The connector on the 56/64K CSU/DSU WAN interface card accommodates an 8-pin RJ-48 modular patch cord. These cables are sold as Category 5, or Ethernet, cables.



Note: Nortel does not supply an interface cable with the 56/64K CSU/DSU WAN interface card.

Use cable that is 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. Nortel strongly recommends that you use factory-made patch cords.

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. Do not interchange the 56/64K CSU/DSU crossover cable and the Ethernet crossover cable.

[Table 24 on page 89](#) provides the 56/64K CSU/DSU cable pinouts for a crossover connection.

Table 24 56/64K CSU/DSU cable pinouts for crossover connection

Nortel termination		Remote termination	
Signal	Pin # to Pin #	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 operates properly if you do not connect pins 3, 4, 5, and 6.



Caution: For crossover connections, do not use Ethernet cable. If you use Ethernet cable, the link cannot be established.

[Table 25](#) provides the 56/64K CSU/DSU cable pinouts for a straight-through connection.

Table 25 56/64K CSU/DSU cable pinouts for straight-through connection

Nortel termination		Remote termination	
Signal	Pin # to Pin #	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

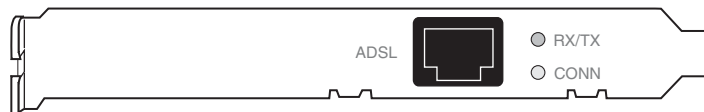
The ADSL Annex A and Annex B WAN interface cards have a single RJ-11 connector that provides the signals needed to interface to the digital subscriber line access multiplexer (DSLAM) and to telephone equipment.

Figure 37 shows the ADSL WAN interface card.



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

Figure 37 ADSL WAN interface card



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

Table 26 provides the ADSL port pinouts.

Table 26 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 38 shows the ISDN BRI S/T interface card or the ISDN BRI U interface card. Both interface cards look the same.

Figure 38 ISDN BRI S/T interface card or ISDN BRI U interface card



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



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

Table 27 provides the ISDN BRI S/T cable pinouts.

Table 27 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 28 provides the ISDN BRI U cable pinouts.

Table 28 ISDN BRI U cable pinouts

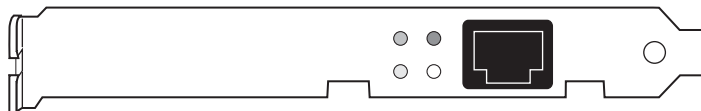
Pin	Function
1	N/C
2	N/C
3	N/C
4	U interface network connection (tip)
5	U interface network connection (ring)
6	N/C
7	N/C
8	N/C

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. Nortel ships this interface card as a half-height card and as a full-height card.

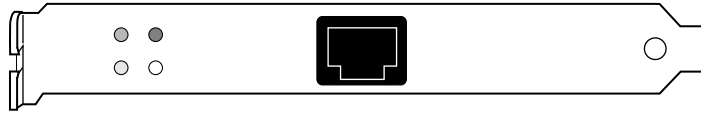
Figure 39 shows the T1/E1 CSU/DSU WAN interface card (half-height card).

Figure 39 T1/E1 CSU/DSU WAN interface card



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

Figure 40 on page 93 shows the T1/E1 CSU/DSU WAN interface card (full-height card).

Figure 40 T1/E1 CSU/DSU WAN interface card (full-height card)

CS160012A

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



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

Use cable that is wired in accordance with EIA-568-A wiring style. This wiring style ensures that a twisted pair inside the patch cord carries the transmit signal (pins 4 and 5) and the receive signal (pins 1 and 2). Nortel strongly recommends that you use factory-made patch cords.

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. Do not interchange the T1/E1 CSU/DSU crossover cable and the Ethernet crossover cable.

[Table 29](#) provides the T1/E1 CSU/DSU cable pinouts for a crossover connection.

Table 29 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

Table 29 T1/E1 CSU/DSU cable pinouts for crossover connection (continued)

Standard-wired end 8-pin male	Signal name	Pair number and conductor	Special-wired end 8-pin male
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 operates properly if you do not connect pins 3, 6, 7, and 8.



Caution: For crossover connections, do not use Ethernet cable. If you use Ethernet cable the T1/E1 CSU/DSU does not work to specifications. This condition can corrupt data.

[Table 30](#) provides the T1/E1 CSU/DSU cable pinouts for a straight-through connection.

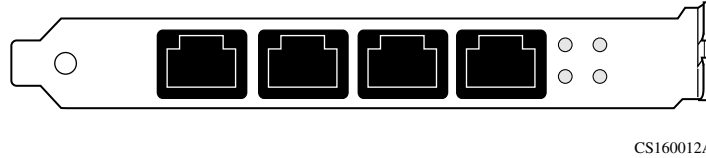
Table 30 T1/E1 CSU/DSU cable pinouts for straight-through connection

Nortel 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 41](#) shows the quad T1/E1 CSU/DSU WAN interface card.

Figure 41 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 sold as Category 5, or Ethernet, cables.



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

Use cables that are wired in accordance with EIA-568-A wiring style. This wiring style ensures that a twisted pair inside the patch cord carries the transmit signal (pins 4 and 5) and the receive signal (pins 1 and 2). Nortel strongly recommends that you use factory-made patch cords.

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. Do not interchange the T1/E1 CSU/DSU crossover cable and the Ethernet crossover cable.

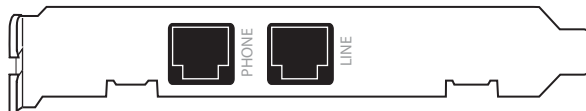
For information about the cable pinouts for a crossover connection, see [Table 29 on page 93](#). For information about the cable pinouts for a straight-through connection, see [Table 30 on page 94](#).

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 42](#) shows the V.90 modem interface card.

Figure 42 V.90 modem interface card



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

[Table 31](#) provides the V.90 modem port cable pinouts.

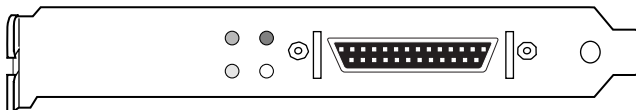
Table 31 V.90 modem cable pinouts

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 43](#) shows the single V.35/X.21 WAN interface card.

Figure 43 Single V.35/X.21 WAN interface card



CS160011A

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. With this cable, the WAN adapter can function as DTE (data terminal equipment).

[Table 32](#) provides the V.35 cable pinouts. [Table 33 on page 98](#) provides the X.21 cable pinouts. (The pair suffix A or B refers to an individual wire within a twisted pair.)

Table 32 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 32 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 33](#) provides the X.21 cable pinouts. (The pair suffix A or B refers to an individual wire within a twisted pair.)

Table 33 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 33 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

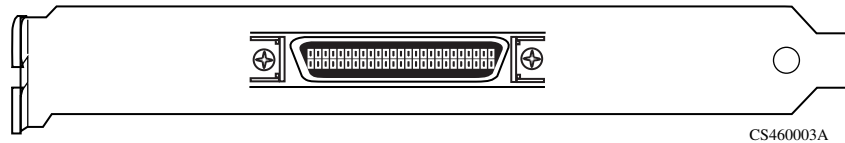
The following notes apply to the single X.21 cable:

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.

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 44](#) shows the HSSI WAN interface card.

Figure 44 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 34](#) provides the T3 cable pinouts.

Table 34 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 34 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

Numerics

- 10/100BASE Ethernet interface card
 - installing 65
- 10/100BASE-TX Ethernet interface card
 - cable specifications 76
 - connector 76
 - described 82
 - LEDs 42
- 10/100BASE-TX system LAN port
 - cable specifications 76
 - connector 76
 - LEDs 41
- 1000BASE-SX Ethernet interface card
 - cable specifications 87
 - connector 87
 - described 87
 - installing 65
 - LEDs 44
- 1000BASE-T (1000 GT) Ethernet interface card 83
 - LEDs 42
- 1000BASE-T (1000 MT) Ethernet interface card
 - LEDs 43
- 1000BASE-T Ethernet interface card
 - cable specifications 85
 - connector 85
 - described 85
 - installing 65
- 56/64K CSU/DSU WAN interface card
 - cable pinouts 89
 - connector 88
 - described 88
 - installing 65
 - LEDs 45

A

- AC power cord
 - connecting 38
 - ordering 27
 - requirements 38
- accelerator cards, hardware encryption
 - described 80
 - installing 65
- accessories, hardware, shipped with the gateway 27
- acronyms 22
- ADSL WAN interface card
 - cable pinouts 90
 - connector 90
 - described 90
 - installing 65
 - LEDs 46
- antistatic wrist strap, attaching 64

B

- bezel, front
 - removing 32, 61
 - replacing 33, 69
- browsers, supported 57

C

- cables
 - available from Nortel Networks 36
 - connecting to the gateway 37
 - ordering 36
 - power. *See* AC power cord
 - technical specifications
 - 1000BASE-SX connector 87

- 1000BASE-T connector 85
- 100BASE-TX connector 76
- 10BASE-T connector 76
- 56/64K CSU/DSU WAN interface 88
- ADSL WAN interface 90
- HSSI WAN interface 100
- ISDN BRI interface 91
 - modem 78
- quad T1/E1 CSU/DSU WAN interface 95
- serial interface 77
- single V.35/X.21 WAN interface 97
- T1/E1 CSU/DSU WAN interface 93
- V.90 modem interface 96

cables, technical specifications

- 1000BASE-T connector 84

cage nuts, when used 28, 30

Category 5 wiring requirements 76, 84, 85

chassis

- installing 29
- removing
 - front bezel 32, 61
 - top cover 62
- replacing
 - front bezel 33, 69
 - top cover 68
- specifications 75

configuring the management IP address 53

connecting

- cables 37
- power cord 38
- serial cable to the gateway 53
- to the gateway using a browser 57

connectors

- 10/100BASE-TX Ethernet interface card 82
- 10/100BASE-TX system LAN port 76
- 1000BASE-SX Ethernet interface 87
- 1000BASE-T Ethernet interface 85
- 56/64K CSU/DSU WAN interface 88
- ADSL WAN interface 90
- HSSI WAN interface 100
- ISDN BRI S/T interface 91
- quad T1/E1 CSU/DSU WAN interface 95

- single V.35/X.21 WAN interface 96
- T1/E1 CSU/DSU WAN interface 92
- V.90 modem interface 96

conventions, text 22

cover, top

- removing 62
- replacing 68

D

default gateway, defined 52

DIMMs (dual inline memory modules), installing 70

dual V.35 WAN interface card

- installing 65

E

electrical specifications 75

encryption accelerator cards, hardware

- described 80
- installing 65

environmental specifications 75

equipment rack, specifications 28

Ethernet interface cards

- installing 65
- specifications
 - 10/100BASE-TX 82
 - 1000BASE-SX 87
 - 1000BASE-T 85

F

field replaceable units (FRU), installing 59

front bezel

- removing 32, 61
- replacing 33, 69

front panel LEDs 40

G

gateway, default, defined 52

Gigabit Ethernet interface cards

- installing 65
- specifications
 - 1000BASE-SX 87
 - 1000BASE-T 85

GUI, Web-based 57

H**Hardware Accelerator card**

- described 80
- installing 65

hardware accessories shipped with the gateway 27

hardware option cards

- installing 65
- specifications 79
- See also* VPN Router Security Accelerator card, Ethernet interface card, Hardware Accelerator card, serial interface cards, SSL VPN Module 1000, WAN interface cards

help

- by phone 18
- latest Web update 17
- Nortel Web site 17
- through Nortel distributor 18, 19
- using Express Routing Code 18

help, How to get 17

HSSI WAN interface card

- cable pinouts 100
- connector 100
- installing 65

I

installing DIMMs 70

installing option cards 65

installing the chassis

- in an equipment rack 30
- on a flat surface 29
- prerequisites 26

interfaces, option card, technical specifications 79

interfaces, system, technical specifications 76

Internet Explorer, supported versions 57

IP address for managing the gateway. *See* management IP address

ISDN BRI S/T interface card

- cable pinouts 91
- connector 91
- installing 65

ISDN BRI U interface card

- cable pinouts 92
- installing 65

L**LAN interface cards**

- installing 65
- LEDs
 - 10/100BASE-TX Ethernet 42
 - 1000BASE-SX Ethernet 44
 - 1000BASE-T (1000 GT) Ethernet 42
 - 1000BASE-T (1000 MT) Ethernet 43
- specifications
 - 10/100BASE-TX 82
 - 1000BASE-SX 87
 - 1000BASE-T 85

LAN port, system

- cable specifications 76
- connector 76
- LEDs 41

LEDs

- 10/100BASE-TX Ethernet interface card 42
- 10/100BASE-TX system LAN port 41
- 1000BASE-SX Ethernet interface card 44
- 1000BASE-T (1000 GT) Ethernet interface card 42
- 1000BASE-T (1000 MT) Ethernet interface card 43
- 56/64K CSU/DSU WAN interface card 45
- ADSL WAN interface card 46
- front panel 40
- quad T1/E1 CSU/DSU WAN interface card 48
- single V.35/X.21 WAN interface card 49
- SSL VPN Module 1000 50
- T1/E1 CSU/DSU WAN interface card 47

used to verify correct installation 39

M

main menu, serial interface 54

management IP address

configuring 53

defined 52

troubleshooting configuration of 58

verifying 57

mask, subnet, defined 52

memory modules, adding and replacing 70

modem cable pinouts 79

N

Netscape Navigator, supported versions 57

NT-1 device, required for ISDN BRI S/T 91

O

option cards

installing 65

specifications 79

See also VPN Router Security Accelerator card, Ethernet interface cards, Hardware Accelerator card, serial interface cards, SSL VPN Module 1000, WAN interface cards

P

physical specifications 75

pinouts

10/100BASE-TX Ethernet connector 76

1000BASE-SX Ethernet interface 87

1000BASE-T Ethernet interface 85

56/64K CSU/DSU WAN interface 89

ADSL WAN interface 90

HSSI WAN interface 100

ISDN BRI S/T interface 91

ISDN BRI U interface 92

modem cable 79

quad T1/E1 CSU/DSU WAN interface 93

serial interface cable 77

single V.35 WAN interface 97

single X.21 WAN interface 98

T1/E1 CSU/DSU WAN interface 93

V.90 modem interface 96

plug, AC power, specifications 38

power cord

connecting 38

ordering 27

requirements 38

powering down the gateway 60

processor cards, *See* VPN Router Security

Accelerator card, Hardware Accelerator card, SSL VPN Module 1000

publications

hard copy 24

related 23

Q

quad T1/E1 CSU/DSU WAN interface card

connector 95

described 95

installing 65

LEDs 48

pinouts 93

R

rack, equipment, specifications 28

rack-mount considerations 30

rack-mount shelf 30

requirements, site 28

RJ-45, pinouts 76, 85

S

serial cable, connecting to the gateway 53

serial interface

cable pinouts 77

described 77

using to configure the management IP address 53

- serial interface cards
 - installing 65
 - specifications
 - ISDN BRI 91
 - V.90 modem 96
 - serial main menu 54
 - shelf for rack-mount installation 30
 - shipment contents 27
 - shutting down the gateway 60
 - single V.35/X.21 WAN interface card
 - connector 96
 - installing 65
 - LEDs 49
 - V.35 pinouts 97
 - X.21 pinouts 98
 - site requirements 28
 - specifications
 - chassis 75
 - equipment rack 28
 - option cards 79
 - serial port 77
 - system ports 76
 - SSL VPN Module 1000
 - described 81
 - installing 65
 - LEDs 50
 - subnet mask, defined 52
 - system LAN port
 - cable specifications 76
 - connector 76
 - LEDs 41
 - system ports, specifications 76
- T**
- T1/E1 CSU/DSU WAN interface card
 - cable pinouts 93
 - connector 92
 - installing 65
 - LEDs 47
 - T3 HSSI WAN interface card
 - See* HSSI WAN interface card
 - technical publications 24
 - technical specifications 75
 - testing connectivity to the gateway 57
 - text conventions 22
 - top cover
 - removing 62
 - replacing 68
 - troubleshooting the management IP address 58
 - turning off the gateway 60
- U**
- user interface, Web 57
- 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 96
 - connectors 96
 - installing 65
 - verifying a successful installation 39
 - verifying the management IP interface 57
 - VPN Router 2700
 - configuring management IP address for 51
 - connecting cables to 35
 - connecting power cord 38
 - description 25
 - installing option cards and DIMMs 59
 - installing the chassis 29
 - shipment contents 27
 - shutting down 60
 - technical specifications 75
 - verifying a successful installation 39
 - verifying connectivity 57
 - VPN Router 2700 and 2600
 - option cards

supported in VPN Router 2700 65

VPN Router Security Accelerator card

described 80

installing 65

W

WAN interface cards

installing 65

LEDs

56/64K CSU/DSU 45

ADSL 46

quad T1/E1 CSU/DSU 48

single V.35/X.21 49

T1/E1 CSU/DSU 47

specifications

56/64K CSU/DSU 88

ADSL 90

HSSI 100

quad T1/E1 CSU/DSU 95

single V.35/X.21 96

T1/E1 CSU/DSU 92

Web interface to the gateway 57

wiring requirements, Category 5 76, 84, 85

wrist strap, antistatic, attaching 64

X

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

WAN interface card