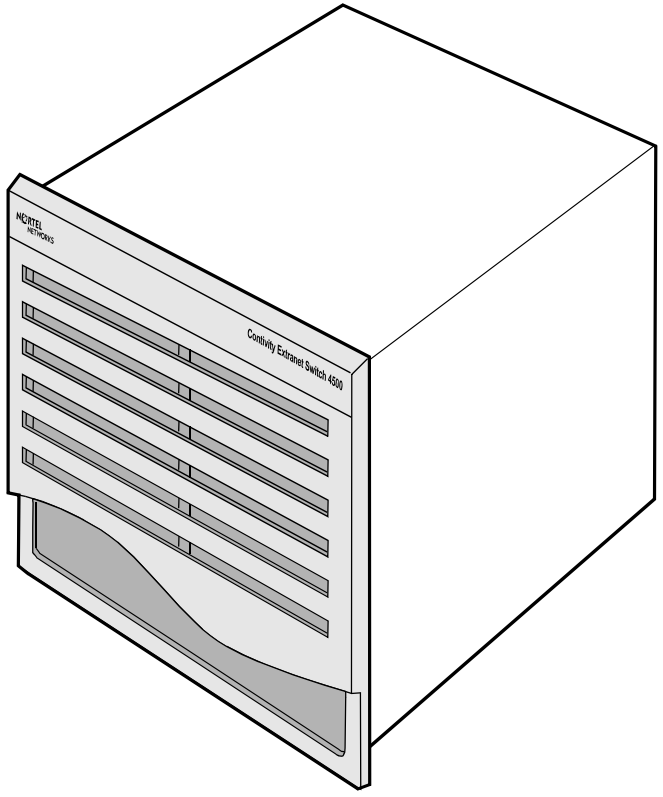
Getting Started with the Contivity Extranet Switch 4500



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NORTEL NETWORKS

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Contents

Preface

This guide takes you through the necessary tasks to get your Nortel Networks™ Contivity Extranet Switch 4500™ up and running. Topics include:

- Introducing the Contivity Extranet Switch
- Preparing Your Site
- Assigning a System Identity
- Managing the Switch
- Installing the Extranet Access Client
- Rack Mounting
- Changing Hardware Configurations

Complete details for configuring and monitoring the Switch are in *Managing the Contivity Extranet Switch.*

Warning: The Contivity Extranet Switch 4500 weighs about 60 pounds and should always be carried by two people.

Conventions

This guide refers to the Contivity Extranet Switch as the CES or the Switch. It assumes that you are familiar with Web browsers and their general operation.

Documentation

This document uses the following conventions to distinguish among notes of varying importance:

Note: *Take notice*. Notes contain helpful suggestions or references to materials contained in this document.

TIP: *Good idea*. A Tip is something that might be considered a good idea, whether for security reasons or because it will save you time or effort.

IMPORTANT: *Take particular notice*. Important references contain concepts or information that has bearing on other fields or situations (i.e., what you do here affects other fields or options elsewhere).

CAUTION: *Be careful*. In this situation, you might do something that could result in damage to the equipment or loss of data.

WARNING: *Danger*. You are in a situation that could cause bodily injury. Before working on equipment, beware of the hazards involved with electrical circuitry and standard practices for preventing accidents, such as disconnecting equipment from its power source.

Text

This guide uses the following text conventions:

italic text	Indicates new terms and book titles.

`screen text`	Indicates system output, for example, prompts and system messages.
	`Example:`
	`Set Nortel Networks Trap Monitor Filters`

arrow (→)	Shows menu paths. Example: Services → Available identifies the Switch services that are available.

User Interface

Help Button

Click the Help button that is located in the upper right of displays to learn about fields on a given page. Where appropriate, the information provides cause and effect of an action; otherwise, it might offer troubleshooting steps.

Related Publications

The following table lists the associated documentation that you will need to configure and manage your Switch and describes the document's objectives.

Related Publications

Document	Objective
Contivity Extranet Switch Release Notes	Provides the latest information, including known problems, workarounds, and special considerations.
Managing the Contivity Extranet Switch (included on the CD)	Provides complete details to configure, monitor, and troubleshoot your Switch.

Nortel Networks Technical Publications

You can print Nortel Networks technical manuals and release notes free, directly from the Internet. Go to *support.baynetworks.com/library/tpubs/*. Find the Nortel Networks product for which you need documentation. Then locate the specific category and model or version for your hardware or software product. Using Adobe Acrobat Reader, you can open the manuals and release notes, search for the sections you need, and print them on most standard printers. You can download Acrobat Reader free from the Adobe Systems Web site, *www.adobe.com*.

You can purchase Nortel Networks documentation sets, CDs, and selected technical publications through the Nortel Networks Collateral Catalog. The catalog is located at *support.baynetworks.com/catalog.html*:

- The “CD ROMs” section lists available CDs.
- The “Guides/Books” section lists books on technical topics.
- The “Technical Manuals” section lists available printed documentation sets.

Make a note of the part numbers and prices of the items that you want to order. Use the “Marketing Collateral Catalog description” link to place an order and to print the order form.

Nortel Networks Customer Service

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

If you purchased a Nortel Networks service program, contact one of the following Nortel Networks Technical Solutions Centers:

Technical Solutions Center	Telephone Number
United States and Canada	800-2LANWAN (800-252-6926); enter Express Routing Code (ERC): 176#
Valbonne, France	33-4-92-96-69-68
Sydney, Australia	61-2-9927-8800
Tokyo, Japan	81-3-5402-7041

Chapter 1
Introducing the Contivity Extranet Switch

The Switch

The Nortel Networks Contivity Extranet Switch 4500 provides scalable, secure, manageable extranet access for up to 5000 simultaneous users across the Public Data Network (PDN).

The Switch's features include the most popular tunneling protocols, IP Security (IPsec), Point-to-Point Tunneling Protocol (PPTP), Layer 2 Forwarding Tunneling Protocol (L2TP), and Layer 2 Forwarding (L2F). IPsec uses digital certificates, password-based keys, and tokens for authentication; PPTP, L2TP, and L2F use Challenge Handshake Authentication Protocol (CHAP) or Password Authentication Protocol (PAP) for authentication. The PPTP and L2TP implementations for the Switch support MS-CHAP authentication with 56- to 128-bit key encryption.

Figure 1-1 shows an intranet and an extranet.

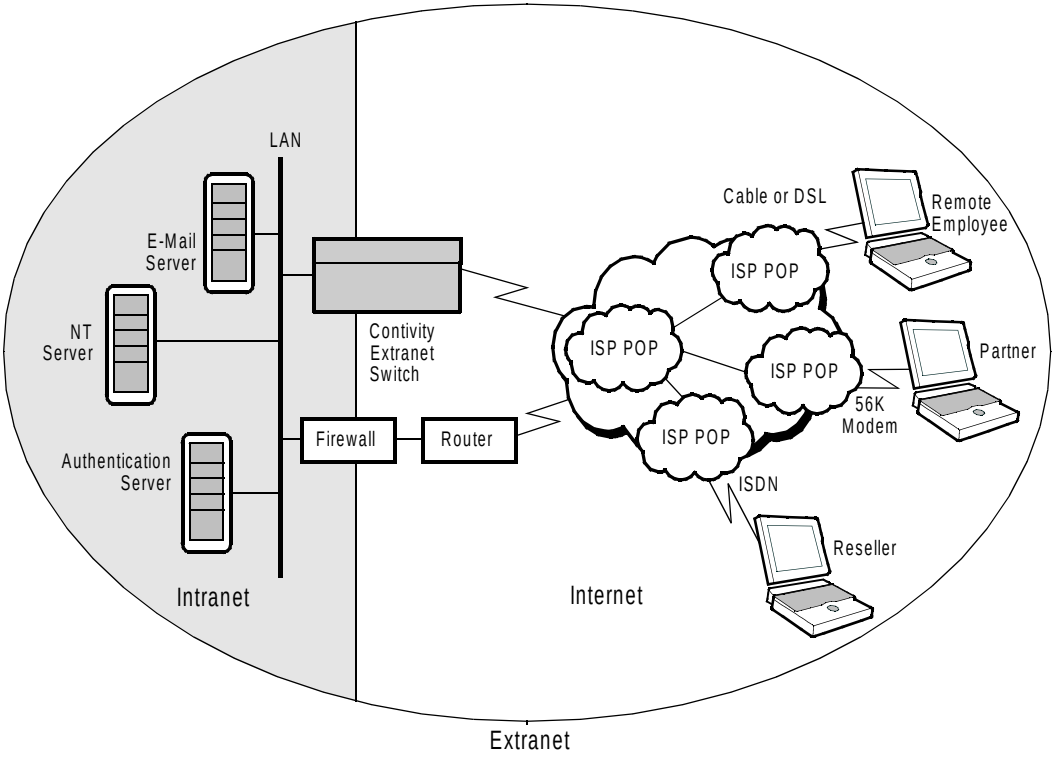

Figure 1-1. An Intranet and the Internet Make Up an Extranet

The Switch provides more security than traditional remote access schemes due to the combination of authorization, authentication, privacy, and access control on a per user basis. Additionally, the IPsec protocol and related Internet Security Association & Key Management Protocol (ISAKMP) and the Oakley key establishment protocol support further enhance the security offering.

For authentication and access control, the Switch supports an internal or external Lightweight Directory Access Protocol (LDAP) server, and external Remote Authentication Dial-In User Service (RADIUS) servers.

To restrict access, the Switch uses packet filtering based on Protocol ID, Direction, Source and Destination IP addresses, Source and Destination Ports, and TCP connection establishment.

The unique quality of service (QoS) mechanisms include call admission and packet forwarding priorities, and support for Resource ReSerVation Protocol (RSVP).

The HTML and Java Web management interface allows different Switch administrators to have different access rights, including configuration, status, and monitoring. The Switch offers RADIUS accounting support and extensive logging, including events, system, configuration, and security logs.

Figure 1-2 shows a front view of the Switch.

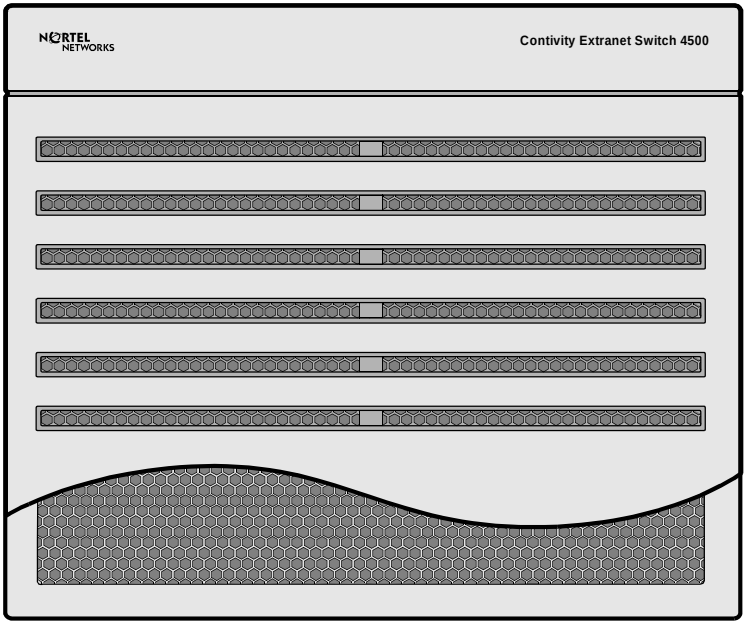

Figure 1-2. The Contivity Extranet Switch 4500, Front View

Components List

The following table lists all of the components and accessories of the Contivity Extranet Switch 4500.

Table 1-1. Contivity Extranet Switch 4500 Components

Description	Quantity
Extranet Switch 4500	1
Power Cords (optional, ordered separately)	0
Molded Serial Cable DB9/DB25-to-DB9/DB25	1
Contivity Extranet Switch CD-ROM	1
Recovery Diskette	1
IP Address Configuration Utility Diskette	1
Getting Started Guide (this book)	1
Release notes	1
Vertical Rack Mounting Brackets and Hardware	2
Horizontal Rack Mounting Brackets and Hardware	2

If for any reason you have not received all of the materials listed above, contact Nortel Networks Customer Service.

Chapter 2
Cabling the Switch

This chapter provides the following information:

- Connecting power
- WAN/LAN connections to:
  - 10/100BASE-TX LAN Interface
  - Dual V.35 Interface
  - Single V.35 Interface
  - T1 CSU/DSU Interface
  - T3 Interface
  - Hardware Accelerator/Encryption Card
- Serial interface connection
- Understanding the LEDs
- Power-On, Power-Off Sequences

This chapter describes the cables that you must use with the Switch, including pinouts for both LAN and WAN connections. Additionally, illustrations show the power connectors, the serial connector, and the LAN connector.The LAN/WAN port and 10/100BASE-TX LAN interface card LEDs are illustrated, and accompanying tables describe the LED status indicators.

Connecting the Cables

1. Connect the power cords to the back of the Switch and to the electrical outlet.
2. Connect the 10/100BASE-TX LAN RJ-45 connector to the Switch.
3. Optionally, connect the LAN or WAN card cables.

Figure 2-1 shows the back view of the Switch.

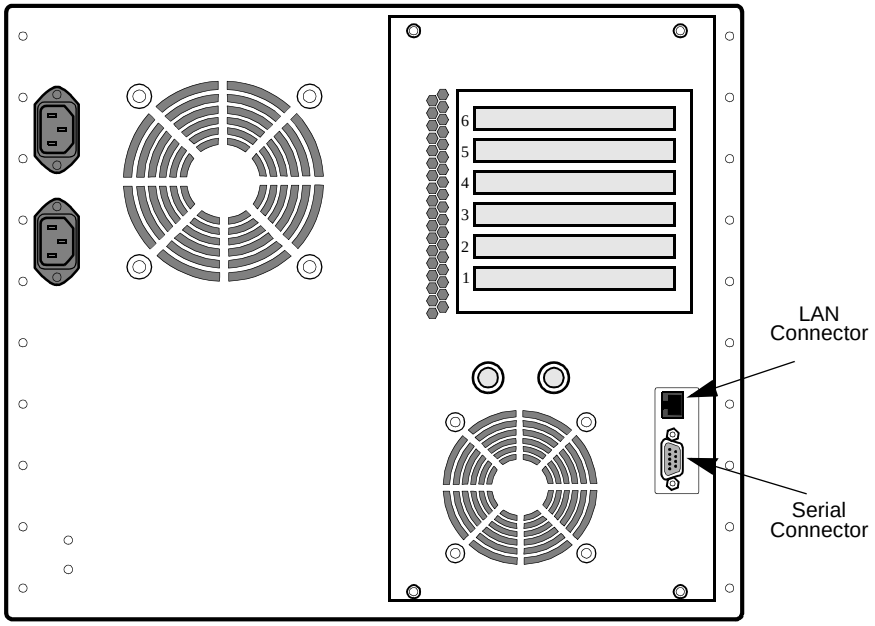

Figure 2-1. Extranet Switch 4500 Back View

Power Cord Requirements

WARNING:

1. Do not modify or use the AC power cord(s) if it is not the exact type that is required for your power outlet.
2. Connect the LAN/WAN and serial port cables before you plug the Switch's power cord into the outlet.

CAUTION: You should protect your Switch by plugging it into a surge suppressor. For power source redundancy, connect one power cord to a backup power supply, and the other power cord into the main power supply.

Current Rating

The power cord(s) must be rated for the available AC voltage, and must have a current rating that is at least 125 percent of the Switch's current rating (refer to Appendix A).

Wall Outlet Connector

The power cords must terminate in a male plug with appropriate grounding. The power cords must have certification marks from an acceptable regional agency.

Power Supply Connector

The connector that you plug into the Switch power supply AC receptacle must be an IEC 320, Sheet C13, female.

Cord Length and Flexibility

The power cords must be less than 4.5 meters (14.7 feet) long, and it must be a flexible HAR (harmonized) cord or VDE-certified cordage to comply with the Switch's safety certifications.

LAN Interface Connections

At least one LAN interface connection is for Web management.

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

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

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

LAN Speed Selection

The Switch automatically determines the speed of the LAN connection during startup. To change the speed, turn off the unit, connect to the desired LAN, and restart the unit.

Connector Pinouts

The LAN connectors on the Switch are RJ-45 straight-through. The following illustration shows the Switch connector's 10/100BASE-TX pinouts.

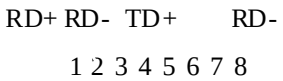

Figure 2-2. 10/100BASE-TX Pinouts

Dual V.35 WAN Interface (Optional)

The Dual V.35 WAN connectors are located on a PCI card that offers two separate DB26S connectors that provide the signals needed to interface to V.35 equipment. Included in the accessory box are two cables that map the DB26S signals to a standard V.35 connector. Figure 2-3 shows the Dual V.35 interface.

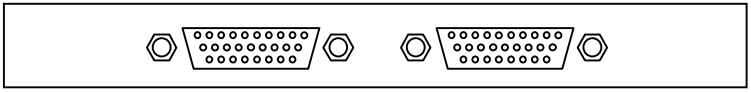

Figure 2-3. Dual V.35 WAN Interface

Table 2-1 shows the cable pinouts.

Table 2-1. DB26S-to-V.35 Cable Pinouts

DB26	Signal	V.35
1	GND	A
2	TDA	P
3	RDA	R
4	RTS	C
5	CTS	D
6	DSR	E
7	GND	B
8	DCD	F
9	RCB	X
11	ETB	W
12	TCB	AA
14	TDB	S
15	TCA	Y
16	RDB	T
17	RCA	V

20	DTR	H
24	ETA	U

Note that you will need a DSU/CSU (digital service unit/channel service unit) between the WAN connection and the Switch.

Single V.35 WAN Interface (Optional)

The Single V.35 WAN connector is located on a PCI card that offers a separate DB26S connector that provides the signals needed to interface to V.35 equipment. Included in the accessory box is a cable that maps the DB26S signals to a standard V.35 connector.

Table 2-2 shows the cable pinouts.

Table 2-2. DB26S-to-V.35 Cable Pinouts

DB26	Signal	V.35
1	Shield	A
2	TXDA	P
3	RXDA	R
4	RTSA	C
5	CTSA	D
6	DSRA	E
7	GND	B
8	DCDA	F
9	RXCB	X
10	DCDB	no conn
11	SCTEB	W
12	TXCB	AA
14	TXDB	S
15	TXCA	Y
16	RXDB	T
17	RXCA	V
18	LL	L
19	RTSB	no conn
20	DTRA	H
21	RL	N
22	DSRB	j
23	DTRB	no conn
24	SCTEA	U

25	TM	NN
26	M0<-SIGNAL GROUND	B
27	M1<-SIGNAL GROUND	B
28	M2	no conn

The following notes apply to the Single V.35 WAN Interface:

- You need a DSU/CSU (digital service unit/channel service unit) between the WAN connection and the Switch.
- At each end, 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.
- The term “no conn” means the wire is not connected to a pin in the 34-pin connector.
- Wires 12B, 13A, and 14B connect to pin B in the 34-pin connector.
- Unused pins in the 34-pin connector need not be present.
- Do not connect Shield to Signal Ground as these are separate signals.
- The pair suffix A or B refers to an individual wire within a twisted pair.

T1 CSU/DSU WAN Interface (Optional)

The T1 CSU/DSU WAN crossover cable crosses the blue pair with the orange pair. This is different from the commonly available crossover cable, which crosses the green pair with the orange pair. No cables are supplied with the T1 CSU/DSU. Table 2-3 shows the cable pinouts.

Table 2-3. T1 CSU/DSU Cable Pinouts

DB26S	Signal	T1 CSU/DSU
1	RXDA->TXDA	5
2	RXDB->TXDB	4
3	not used	3
4	TXDB<-RXDB	2
5	TXDA<-RXDA	1
6	not used	6
7	not used	7
8	not used	8

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

T3 Interface (Optional)

The Single T3 WAN connection is located on a PCI card which has a 50-pin SCSI II female connector that provides the signals needed to interface to a T3 modem or Modem Eliminator. Included in the accessory box is a cable, which maps the T3 signals out to a 50-pin SCSI II male connector. Figure 2-4 shows a T3 interface.

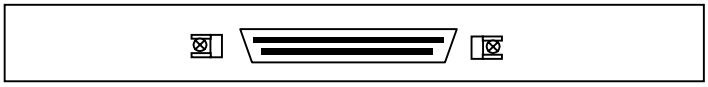

Figure 2-4. T3 Interface

Table 2-4 shows the cable pinouts.

Table 2-4. T3 Cable Pinouts

J1	Signal	J2
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
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

Hardware Accelerator Encryption Card

The Nortel Networks Hardware Accelerator Encryption card is an encryption, compression, and authentication processor card with a PCI interface. It provides high-speed processing of the compute-intensive algorithms supported by today's standard communications protocols. The card has a PCI revision 2.1-compliant interface, and contains onboard memory to store context information for all three engines.

This card adds high-speed encryption processing into a hardware system. All three processing engines on the card operate in parallel, increasing overall processing performance and reducing bus bandwidth issues. The Nortel Networks Hardware Accelerator Encryption card benefits include:

- PCI interface allows for easy integration into a system with PCI card slots
- Onboard memory stores state (key) information for all three processing engines
- Simultaneous multiple session support -- can store key information for up to 2048 sessions

Algorithms Supported:

- Encryption: DES, 3DES, RC4
- Encryption Modes: ECB, CBC, CFB, and OFB
- Compression: LZS and MPPC
- Authentication: SHA-1 and MD5

Protocols Supported:

- IPSec (ESP): DES, 3DES, SHA-1, MD5, LZS
- IPSec (AH): SHA-1, MD5, LZS
- PPTP: RC4, MPPC
- SSL: DES, 3DES, RC4
- PP: CCP with LZS, ECP with DES, 3DES
- L2TP: With IPSec encapsulation

Serial Interface Cable (Optional)

Nortel Networks ships a serial cable with the Switch. Optionally, you can provide the Switch with a Management IP Address, subnet mask, and default gateway address among other things via the Serial Interface (refer to page 3-6 for details). Nortel Networks, however, recommends that you use the IP Address Configuration Utility diskette for easy initial IP address configuration (refer to page 3-3 for details). Later, you can use the serial interface configuration menu to perform management functions that you might need if problems were to arise.

The serial cable provided with the Switch is a DB9/DB25-to-DB9/DB25. This provides a crossover (transmit-to-receive and receive-to-transmit). The DB9 connector goes into the Switch and the other DB9 or DB25 connector goes into your workstation. You should ignore the extra DB25 connection that is attached to the Switch. Table 2-5 shows the multiple cable DB-9/DB25 serial interface cable pinouts.

Table 2-5. Multi-DB-9 and DB-25 Connector Pinouts

Serial Port DB-9 Connector		**Serial Port DB-25 Connector**			**Serial Port DB-25 Connector**		**Serial Port DB-9 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

Understanding the LEDs

The **Power LED** is green when the power is on; if it is flashing, there is a hardware failure and you should contact Nortel Networks.

The **Hard Disk LED** is green, and when it flashes the Switch is either reading or writing to the disk.

The **LAN Port LED** is green, and when it flashes the Switch is either transmitting or receiving data.

Start the Switch and confirm that the interfaces are cabled properly by examining the two LEDs located adjacent to the RJ-45 connector of the LAN port, or the LEDs located on the card panel.

Figure 2-5 shows the private LAN Port LEDs. Look at the condition of the LEDs, then examine the corresponding LED table to better understand the indications.

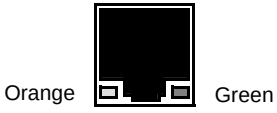

Figure 2-5. LAN Port LEDs

Table 2-6. LAN Port LED Indicators

LED	Indicator	Description
Orange	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.
Green (100)	On	The LAN port is operating at 100 Mb/s.
	Off	The LAN port is operating at 10 Mb/s.

Figure 2-6 shows the Single V.35 LEDs. Look at the condition of the LEDs, then examine the corresponding LED table to better understand the indications.

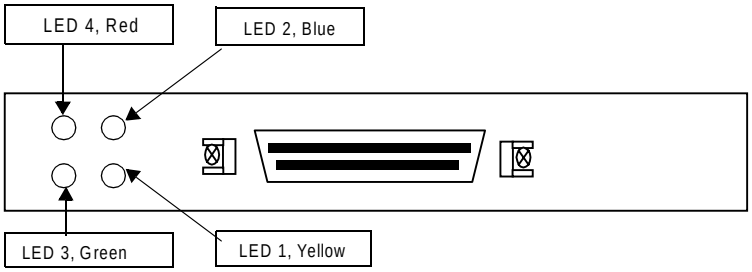

Figure 2-6. Single V.35 LEDs

Table 2-7. Single V.35 LED Indicators

LED	Description
LED1	Power is on to the adapter and the onboard microcode is loaded.
LED2	The signals CDC and DSR are on between the DSU and the adapter. LED2 detects receive link status.
LED3	Cable is detected.
LED4	No external transmit clock source is available.

Figure 2-7 shows the T1 CSU/DSU LEDs. Look at the condition of the LEDs, then examine the corresponding LED table to better understand the indications.

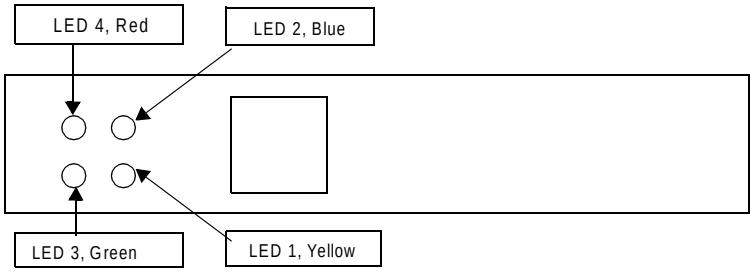

Figure 2-7. T1 CSU/DSU LEDs

Table 2-8. T1 CSU/DSU LED Indicators

LED	Description
LED1, Yellow	Yellow alarm LED is lit when the far-end equipment is in the red alarm condition.
LED2, Blue	Blue alarm LED is lit when receiving an upstream failure denoted by an alarm indication signal (AIS).
LED3, Green	Normal operation.
LED4, Red	Red alarm is lit when a loss-of-signal (LOS) or out-of-frame (OOF) condition is detected on the receive signal.

Figure 2-8 shows the PCI card 10/100BASE-TX public LAN LEDs. Look at the condition of the LEDs, then examine the corresponding LED table to better understand the indications.

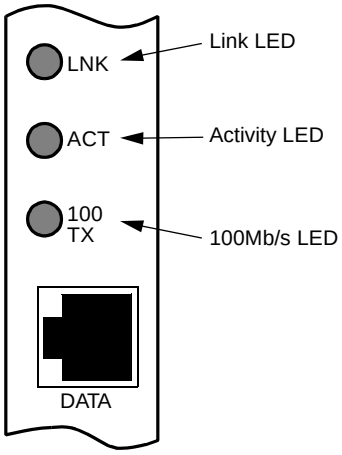

Figure 2-8. 10/100BASE-TX LAN LEDs

Table 2-9. 10/100BASE-TX LAN LED Card Indicators

LED	Indicator	Description
ACT/ LNK	On or Flashing	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 TX	On	Operating at 100 Mb/s.
	Off	Operating at 10 Mb/s.

Power-On, Power-Off Sequences

The following table indicates what is happening with the Switch during power-on and power-off sequences.

Table 2-10. Contivity Extranet Switch Power-on, Power-off Sequences

If the system is in this state	and the power switch is	the system does the following	Conditional effects
Off	Pressed for fewer than 4 seconds	Power On	None
On	Pressed and released	Power Off	Wait for a 3- to 5-second delay before powering off. Notes: 1. If the power switch is pressed several times the Switch will reboot, not power off. 2. If the Switch does not power down, press the power switch for 5 seconds and the Switch will shut down.

Chapter 3
Assigning a System Identity

This section describes how to assign a Management IP address, subnet mask, and optional default gateway address to your Switch. The Management IP address is used for all system services, such as HTTP, FTP, and SNMP. The Management IP address enables you to manage the Switch from a Web browser.

Table 3-1 describes the choices you have when first configuring the required Switch parameters.

The IP Address Configuration Utility diskette, which comes with your Switch, searches for the serial numbers of unconfigured Switches. It then displays a table for you to enter the Management IP address, subnet mask, and default gateway (optional).

To configure the Switch from the serial interface configuration menu, you must first connect the serial interface cable to the Switch. Then you can use a terminal emulation application to enter the Management IP address, subnet mask, and default gateway (optional).

Table 3-1. Initial Configuration Options

Initial Configuration Method	Result	Advantages/ Disadvantages
IP Address Configuration Utility (Recommended)	Sets Management IP Address, Subnet Mask, and Default Gateway (optional)	Utility diskette makes initial configuration easy
Serial Interface Configuration Menu (Optional)		Must connect the serial interface cable

Startup Configuration Requirements

This section describes the fields that you must complete with either the IP Address Configuration Utility or the serial interface configuration menu procedure.

Management IP Address

Enter a Management IP address for the system. You need this address to manage all system services, such as HTTP, FTP, and SNMP. This address must be accessible from one of the Switch's private physical interfaces. Therefore, the Management IP address must map to the same network as one of the private interfaces.

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, then the Management IP address must reside in the 10.2 network.

Carefully record the Management IP address. Later, during the Quick Start or the Guided Configuration, you will be asked to supply IP addresses for the physical interfaces.

Subnet Mask

The Subnet Mask defines how many bits of the IP Address represent the network the device is on and how many bits represent the host’s ID on the network.

The device uses the Subnet Mask to determine which IP Addresses are directly reachable on the network and which ones must be routed through a gateway. A sample IP Address is 10.2.3.3 with a Subnet Mask of 255.255.0.0. This indicates that all hosts with addresses 10.2.*n*.*n* are directly reachable.

Default Gateway

The Default Gateway is where packets are routed onto the private or public network if there is not a specific route in the routing table to the desired location.

IP Address Configuration Utility

Use this utility for the initial Switch configuration.

Requirements

To assign the Switch a Management IP address with this utility, you need:

- A PC running Windows 95®, Windows 98®, or Windows NT® with a functioning TCP/IP stack
- The PC running on the same subnet as the Switch you are configuring
- The PC connected to an operational network connection

If your environment does not match these requirements, then you must use the serial interface configuration.

To test the function of your TCP/IP stack, send a PING command to any host.

Running the IP Configuration Utility

The program *ExtNetIP.exe* is on a diskette labeled *IP Address Configuration Utility* that accompanies the Switch. You can copy the utility to your hard disk and execute it from there, or you can load it from the diskette drive. The *ExtNetIP.exe* program launches the IP Address Configuration Utility, which allows you to assign a Management IP address and subnet mask to the Switch. To run *ExtNetIP.exe*:

1. Remove the front bezel (refer to page 7-7).
2. Insert the diskette into the A: drive and select Start→Run, and then type:

   ```
   a:\ExtNetIP.exe
   ```

   or, open the “My Computer” icon on the desktop and open the “3½ Floppy (A:)” drive, and then double-click on the icon:

The following display appears while the program searches for an unconfigured Switch.

Figure 3-1. Serial Number Search Display

3. The program automatically enters the Serial Number for the first available Switch into the table of Contivity Switches.

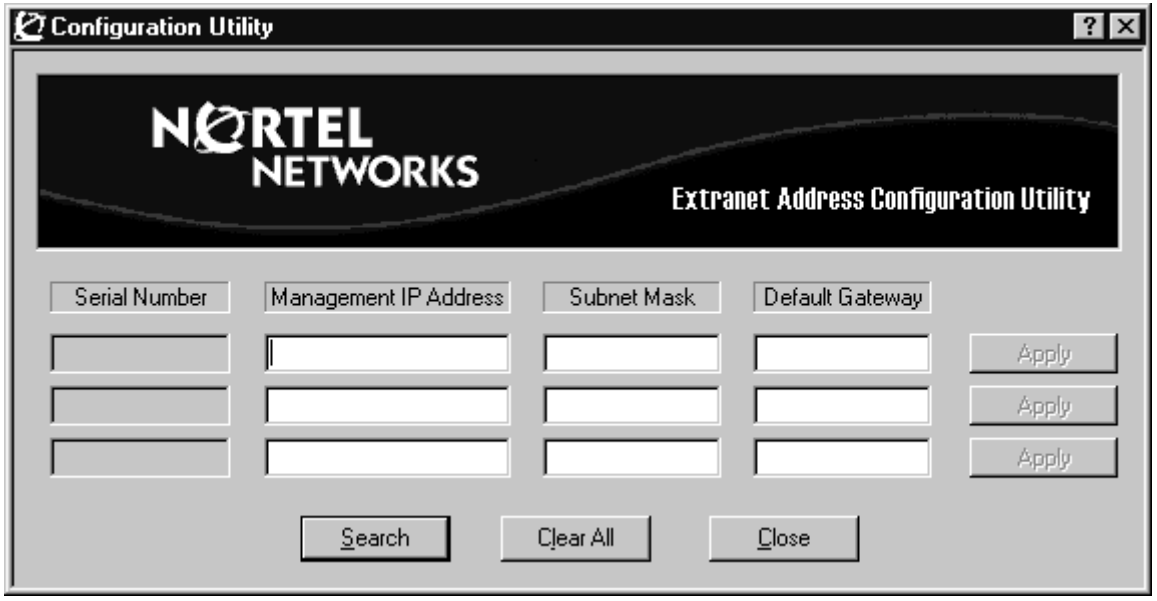

Figure 3-2. IP Address Configuration Utility Display

4. Assign a Management IP Address and Subnet Mask to the Switch; the Default Gateway address is optional and can be added later (refer to "Startup Configuration Requirements" on page 3-2 for descriptions of the required fields).

   If you have more than one Switch, click Search to automatically add the additional Switch serial numbers. To verify the switches that have been discovered, you can refer to the serial number on the bar code on the bottom of the Switch.

5. Click Apply to configure the Management IP Address, Subnet Mask, and Default Gateway on the Switch. The IP Address Configuration Utility display disappears.

   When the Switch has completed updating its configuration with the Management IP Address, Subnet Mask, and optional Default Gateway, your default Web browser will automatically open to the Contivity Extranet Switch Welcome display.

6. Click Close to shut down the IP Address Configuration Utility.

Note: Before moving the Switch from one network to another, change the Management IP address, Subnet Mask, and Default Gateway. Otherwise, you will need to follow the Serial Interface Configuration procedure to access your Switch because it will not be accessible from a Web browser with an invalid address.

Serial Interface Configuration

Note: Use the IP Address Configuration Utility (refer to page 3-3) to configure the Switch with its initial IP address.

Alternatively, you can use the serial interface configuration menu to access the Switch via the serial interface of your PC. The serial interface configuration menu allows you to give the Switch a Management IP address, Subnet Mask, and Gateway IP Address so that you can use a Web browser for management.

Prerequisites

The terminal emulator on your PC must use the following communications parameters:

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

Procedure

1. Connect the serial cable from the Switch's serial cable port to a PC communications port.

   Turn on the Switch. It can take the system approximately 3 minutes to start up.

2. Using a terminal emulation program, such as Hyper Terminal, press Enter and then supply a user name and password. The factory default user name and password are:

   ```
   User name: admin
   Password:  setup
   ```

   A menu appears that allows you to enter the following:

   - Management IP address
   - IP subnet mask
   - Gateway IP address (optional)

A sample display follows:

```
Main Menu:
     1) Interfaces
     2) Administrator
     3) Private Default Route Gateway*   10.0.0.10
     4) Public Default Route Gateway*
     5) Create A User Management Tunnel (IPsec)
     6) Restricted Management Mode
     7) Allow HTTP Management            TRUE
     8) Check Point Firewall Options
     9) Shutdown
     P) Configure Serial Port
     C) Controlled Crash
     R) Reset System to Factory Defaults
     E) Exit, Save and Invoke Changes

        * Type 0.0.0.0 to delete.

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

Figure 3-3. Sample Serial Interface Display

3. Follow the screen prompts. Some of the descriptions of the fields required to complete this procedure are in the section "Startup Configuration Requirements" on page 3-2.

4. After you complete the configuration, type **E** to Exit. You can then manage the Switch from a Web browser.

   IMPORTANT: This Administrator's Password is also the Primary Administrator's Password. This password guarantees access to the Switch via the serial port or a Web browser.

Chapter 4
Managing the Switch

This chapter describes the recommended Web browsers and the default login and passwords you need to access the Contivity Switch and the Quick Start Configuration.

Recommended Web Browser Versions and Settings

Nortel Networks Extranet Manager uses Java, JavaScript, and HTML features. For the management interface to function properly, verify that your Web browser meets the following minimum requirements.

Platforms Supported

Windows 95, Windows 98, Windows NT, and Macintosh®.

Browser Versions

Microsoft Internet Explorer Version 4.0 or later is required.

Netscape Communicator Version 4.0 or later is required.

Display Setting

Verify that the system display color is set for 256 colors or greater.

Preparing for Configuration

To properly prepare for Installation and Configuration of the Contivity Extranet Switch, you should have the following items available:

- A Management IP Address for the system. You need this address to manage all system services, such as HTTP, FTP, and SNMP.
- An IP Address for the LAN port that is available on the system board.
- Any number of Public IP Addresses; e.g., one IP address for each Public LAN Interface.
- A plan to distribute IP addresses to clients when connections are requested; e.g., via a DHCP server or an internal client address pool (with an address pool you will need a range of IP addresses).
- An Authentication database: If you are not using internal authentication via the LDAP database, then make sure you have either the external LDAP or the RADIUS server(s) IP Address and password or Shared Secret (password).
- An external accounting server, such as RADIUS, with its IP Address and Shared Secret.
- Client dial-in: Prepare the clients for the type of tunneling protocol they will be using. The PPTP client application is available for Windows 95 on the Nortel Networks CD, and it comes with Windows 98 and Windows NT operating systems. Nortel Networks also provides the IPsec client on the Nortel Networks CD.
- A complete network topology of the “environment” in which you are testing the Switch, including the Switch, the default router address, and any other IP addresses that you think might be required.

Extranet Switch Welcome Display

The Welcome display allows you to enter any of the configuration areas for the Contivity Extranet Switch, including:

- Quick Start
- Guided Config
- Manage Switch
- Manage from Notebook

Before entering the configuration options, you should first register to activate licenses, warranties, and services.

Table 4-1 shows the alternatives you have when first configuring your Switch. Nortel Networks recommends that you begin with the Quick Start or the Guided Configuration. Once you are familiar with the Switch's navigation menu and capabilities, then you will want to select Manage Extranet Switch.

Table 4-1. Configuration Options

Configuration Type	Results
Quick Start	Configure and test a basic PPTP configuration
Guided Config	Structured Switch configuration and management
Manage Switch	Comprehensive Switch configuration and management
Manage from Notebook	Comprehensive Switch configuration and management using a compact interface designed for small displays

Following is a sample Extranet Switch Welcome display. Descriptions of each configuration option follow. A detailed checklist describes things you will need to properly configure your Switch. Then full details of the different procedures are described.

Complete details for configuring and monitoring the Switch are in the guide *Managing the Contivity Extranet Switch.*

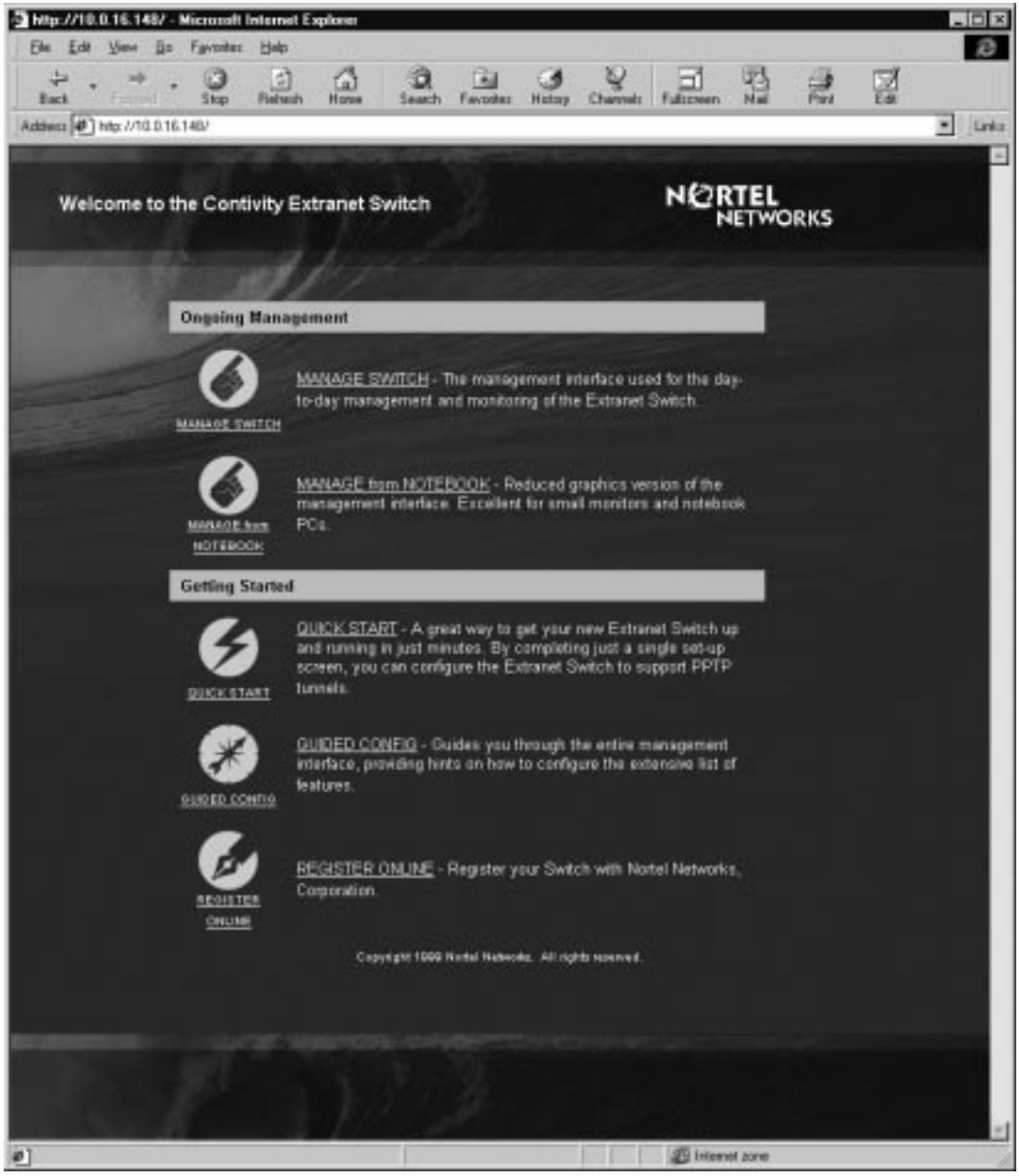

Figure 4-1. Welcome Display

Quick Start

Click to begin the Quick Start configuration. This option allows you to configure interfaces, set up PPTP tunnels for up to three users, and establish a connection to the Switch. If you prepare for the configuration (refer to "Preparing for Configuration" on page 4-2), the Quick Start can take as little as 15 minutes to complete.

Guided Config

Click to begin the Guided Configuration. This option allows access to all Configuration Management facilities. However, the design and structure of the Guided Configuration is best followed using the top-to-bottom layout provided. This approach walks you through the entire Navigational Menu from the Profiles to the Admin selections.

Each functional area begins with a summary of the objectives of the area and then steps you through the area (e.g., Profiles), one subsection at a time. Online context-sensitive help is available at each subsection to supplement the summary.

Provided you have the information required to set up the Switch, the Guided Configuration can to take 2 to 3 hours to complete, depending on how extensive your configuration will be.

Manage Switch

Click to begin a standard configuration and management session. This option allows access to all configuration management facilities. Nortel Networks recommends that you follow the Quick Start or Guided Configuration for your first configuration.

Manage from Notebook

Click to activate the notebook display mode. The Contivity Extranet Switch Manager then runs in notebook display mode, which better fits notebook displays.

Register Online

Click to register the Switch with Nortel Networks. It will only take a few minutes and it will give you access to the latest software and technical tips. Your Switch requires Internet access in order to register.

Logging in and Supplying a Password

Start up a Web browser and enter your Switch's Management IP Address. Select an option in the navigational menu and submenu, and then you are prompted for the Login and Password. Enter the system default Login and Password in lowercase characters, as follows:

Login: **admin**

Password: **setup**

IMPORTANT If you change your password and later need to access the Serial Interface Configuration, you must then enter the modified password. The factory default password is no longer valid in this case.

Also, make sure you change the default Administrator's Login and Password as soon as possible (refer to the Admin→Administrator display.) You should then guard the Login and Password carefully.

Quick Start Configuration Prerequisites

This screen displays a checklist for you to prepare for the Quick Start configuration. Assembling the information beforehand, and verifying that you can establish a PPTP Client session, makes Quick Start easy.

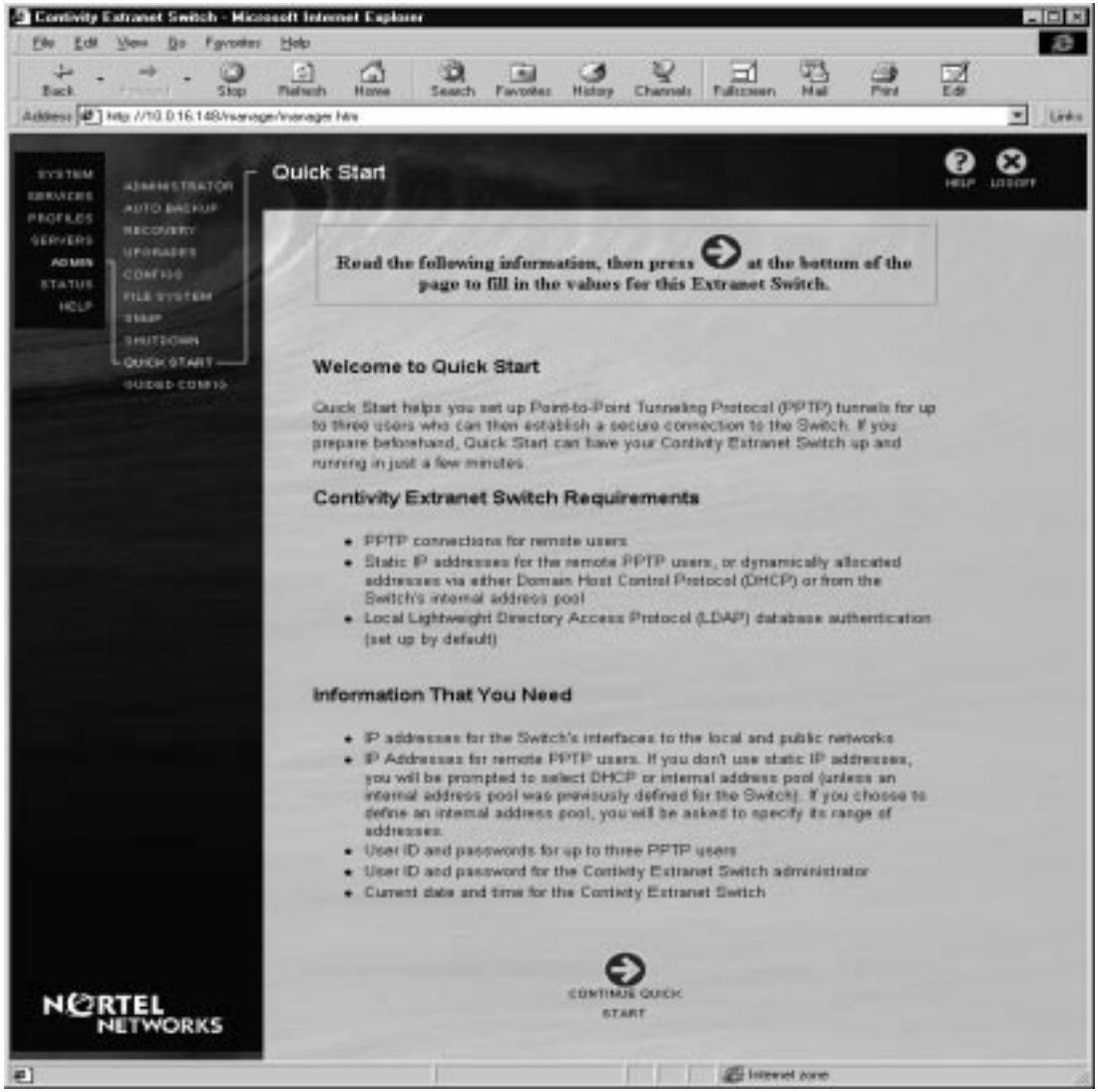

Figure 4-2. Quick Start Prerequisites Display

Required Environment

This section describes the environment you need for the Quick Start configuration. If this does not describe your environment, use the Guided Configuration.

Point-to-Point Tunnel Protocol (PPTP) tunnel access method

PPTP is a tunneling protocol supported by Nortel Networks, Microsoft, and other vendors. The PPTP client is available for Windows 95 on the Nortel Networks CD and comes with Windows 98 and Windows NT 4.0 and later.

Static IP addresses, Dynamic Host Configuration Protocol (DHCP) server address allocation, or an Internal Client Address Pool

A DHCP Server on the private LAN segment dynamically assigns IP addresses on behalf of remote users. The DHCP server is automatically discovered via broadcasting on the private interface that is associated with the Management IP Address. With an Internal Client Address Pool you will need a range of IP addresses.

Local Lightweight Directory Access Protocol (LDAP) database authentication

LDAP is a standard protocol for Internet directory services that is based on directory entries. A *directory service* is a central repository of user information. The local database is internal to the Switch.

An LDAP server and associated database will be set up locally on the Switch for the Quick Start procedure. Later, you can switch to a network-available external LDAP server using the LDAP Intermediate File (LDIF) data format.

Prerequisites

- IP configuration information (refer to "Preparing for Configuration" on page 4-2 for additional information).
  - Management IP Address for the Switch
  - Subnet Mask for the local subnet
- User IDs and Passwords
  - PPTP Users (up to three)
  - Administrator

Postconfiguration Testing

- A PPTP remote user dialing in from an external system.

Refer to the guide *Managing the Contivity Extranet Switch*, the Switch's online help, and the Microsoft PPTP documentation for additional information.

Configuration

This display allows you to add a LAN port IP Address and Subnet Mask, establish the tunnel as Private (your private LAN) or Public (public data networks), and configure up to three PPTP Users and an Administrator with User IDs and Passwords. Additionally, you can set the system's Date and Time.

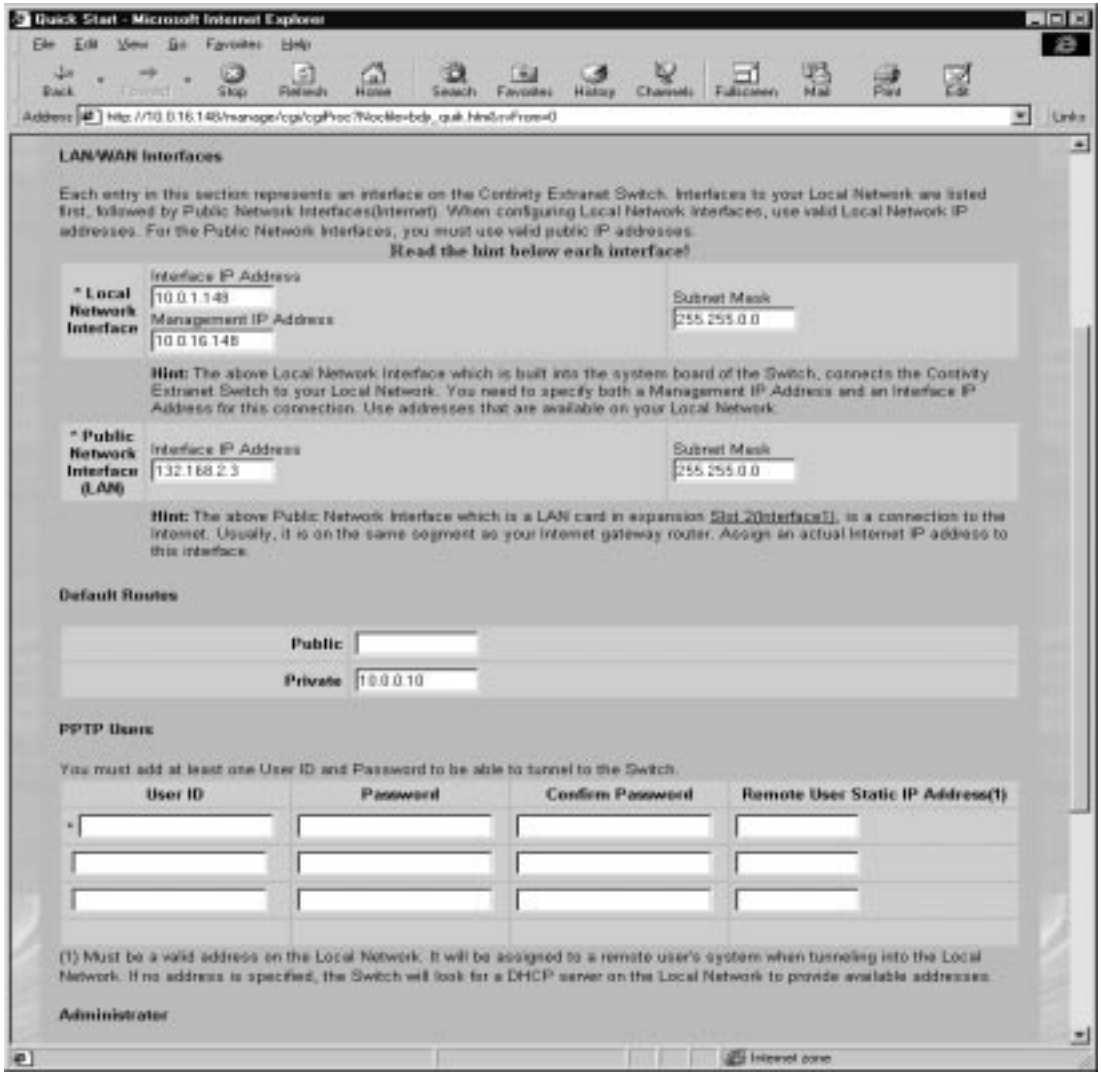

Figure 4-3. Quick Start Configuration Display

LAN/WAN Interfaces

Interfaces

Lists the Management IP Address, LAN port, and any LAN or WAN cards that you have installed in the Switch.

IP Address

Enter an IP address for each interface on the Switch, including the LAN port. These IP addresses are used for tunnel creation. The IP Address consists of 32 bits, which are written as four octets in dotted-decimal format. For example:

```
192.168.34.21
```

Note that the interface IP Address configuration information is required, not the Management IP Address, which you already configured through the initial IP Address configuration.

Subnet Mask

The Subnet Mask defines how many bits of the IP Address represent the network the device is on and how many bits represent the host's ID on the network.

The device uses the Subnet Mask to determine which IP Addresses are directly reachable on the network and which must be routed through a gateway. A sample IP Address is 10.2.3.3 with a Subnet Mask of 255.255.0.0. This indicates that all hosts with addresses 10.2.*n.n* are directly reachable.

Default Gateway

The Default Gateway is where packets are routed onto the private or public network if there is not a specific route in the routing table to the desired location. Enter a Default Gateway to LAN or WAN Interface cards, as necessary.

Type

Public

Indicates that this interface is attached to a Public data network like the Internet. On a Public interface, the Switch rejects nontunneled protocols and only accepts tunneled protocols like IPsec, PPTP, L2TP, and L2F, and the diagnostic protocol PING.

A host can send only enough packets to a Public interface to establish a tunnel connection. If the tunnel is not established before the preset maximum-number-of-packets-allowed counter is reached, then the packets from that host are discarded.

Private

Indicates that this interface is attached to the Private network and it can accept nontunneled networking protocols such as TCP/IP, FTP, HTTP, etc. The Private interface also accepts tunneled protocols (e.g., IPsec, PPTP, L2TP, and L2F) that can be used for secure management access to the Switch.

PPTP Users

User ID

Enter a User ID. The User ID works along with the password as the authentication mechanism when attempting to access your local LAN through the Switch.

Password

Enter a user Password. You should use a minimum of eight characters, including upper and lowercase letters and numbers. Avoid using common names and words found in the dictionary. For example, a password constructed as “AxSessPw4U” is much better than “dog” or “Barney.”

NOTE: Do not use a password of 16 pound signs (#).

Confirm Password

Reenter the assigned password to verify that you have typed the intended password correctly.

Remote User Static IP Address

Enter an IP Address to be assigned to this user when establishing a PPTP tunnel session. Note that this IP Address is unnecessary if you assign user IP addresses from either a DHCP server or an internal address pool.

Administrator

The Administrator Settings allow you to change the Primary Administrator User ID (UID) and Password. The Primary Administrator User ID and Password combination always has access to all displays and controls. This UID is also used to access the serial port and the recovery disk.

This Administrator's Password is also the Primary Administrator's Password. This password guarantees access to the Switch via the serial port or a Web browser. Note that there can be only one Primary Administrator.

User ID

Enter an appropriate User ID for the Primary Administrator. This UID has the privileges to modify and view all controls in the Switch.

Password

Enter a user Password for the Primary Administrator.

NOTE: Do not use a password of 16 pound signs (#).

Confirm Password

Reenter the assigned password for the Primary Administrator to verify that you have typed the intended password correctly.

Date and Time

Date

Enter the current month, day, and year (mm/dd/yyyy).

Time

Enter the current hour, minute, and seconds (hh:mm:ss) as displayed by a 24-hour clock (00:00:00 to 23:59:59).

Time Zone

Select the appropriate time zone. Time zones can be a critical factor in the usage of digital certificates.

Automatic Backup

The Automatic Backup display under the Manage configuration option allows you to configure regular intervals when your system files are saved to designated host backup file servers.

IMPORTANT: You should configure Automatic Backups immediately so that you will not lose system or configuration information in case of problems. You configure the Automatic Backup servers from the Admin→Automatic Backup display.

Chapter 5
Extranet Access Client Installation

Windows 95

To install the Nortel Networks Extranet Access Client onto a Windows 95 PC, copy and load the four files that are on the Nortel Networks Extranet CD in the Client folder onto your hard drive. International software users must go to the Microsoft Web site (*http://support.microsoftcom/support*) to get the MSDUN13 patch.

1. First, install *Msdun13.exe* (Microsoft Dial-up Networking update) by double-clicking on the file name. The installation is self-explanatory. You might need your Windows 95 CD (if the CD was not copied onto your drive). During the installation you will be asked to reboot your system *twice*.
2. Next, install *Wsockupd.exe* (Winsock update) if you are using the retail version of Windows 95. Reboot your system after installing the update. You now have the Microsoft PPTP tunneling client installed.
3. Complete the IPsec installation by running the *Eac_25d.exe* (Nortel Networks Extranet Access Client). The installation is self explanatory. You might need your Windows 95 CD-ROM (if the CD was not copied onto your drive). When prompted at the end of the installation, reboot your system.
4. If you do not care about operating within the Network Neighborhood, skip this step. To operate within the Network Neighborhood, enable the following items under the Network Control Panel (click the Start menu button, select Settings → Control Panel, then double-click on the Network icon to open the Network Control Panel).

a. Under the box titled, “The following network components are installed,” verify that the Client for Microsoft Networks is listed. If it is not, click on ADD, then select CLIENT, then click ADD again. Select Microsoft followed by Client for Microsoft Networks and finally the OK button. You will need your Windows 95 CD if it is not already copied onto your system.

b. Under the same box titled, “The following network components are installed,” make sure that NetBEUI is not installed. To verify this, scroll down through the list box and look for any lines that have NetBEUI in them. If there are any lines that include NetBEUI, click on the line, and then click on the Remove button. This forces the Network Neighborhood to use NetBIOS over TCP/IP, which is compatible with the Extranet Switch.

c. Under the Identity tab, configure the Workgroup to be the same as your company’s internal workgroup. For example, “Nortelnetworks.”

d. Next under the Identity tab, verify that the Computer Name is different from your PC at work. Otherwise, you would be attempting to log a second unit with the same name onto the network.

e. If you have made any changes in the Network Control Panel, click OK, and then reboot the system.

f. Double-click on the Extranet Connection Manager icon.

g. Enter a new Connection Profile Name.

h. Create a new Dial-up Connection.

i. Click the Tool button (next to the Dial-up Connection list box), select New, and follow the wizard.

j. Create a new Extranet Connection.

k. Click the Tool button (next to the Extranet Connection list box), select New IPsec Connection, and follow the wizard.

l. Click the Connect button.

Windows 98 and Windows NT 4.0

To install the Nortel Networks Extranet Access Client onto a Windows 98 PC or Windows NT 4.0 workstation, you must copy the Extranet Access Client (*Eac_25d.exe*) that is on the Contivity Extranet Switch CD in the Client folder onto your hard drive.

1. Install *Eac_25d.exe* by double-clicking on the program name. The installation is self explanatory. As prompted at the end of the installation, reboot your system.
2. If using the Extranet Access Client over a dial-up connection:
    - Windows 98: Under the Network Control Panel (from the Start menu, select Settings → Control Panel), select Add → Adaptor → Microsoft → Dial-up Adaptor.
    - Windows NT: Install the Remote Access Service under the Network Control Panel (from the Start menu, select Settings → Control Panel, then double-click on the Network icon to open the Network Control Panel). Select the Services tab and click on Add. Scroll down to select "Remote Access Service" and click OK.
3. Under the Protocols tab for Windows NT or under the Network Control Panel for Windows 98, verify that NetBEUI is not installed. If NetBEUI is listed, click on it, then click on the Remove button. This will force the Network Neighborhood to use NetBIOS over TCP/IP, which is compatible with the Switch. Click the OK button and reboot your system.
4. Double-click on the Extranet Connection Manager icon.
    a. Enter a new Connection Profile Name.
    b. Create a new Dial-up Connection.
    c. Click the Tool button (next to the Dial-up Connection list box), select New, and follow the wizard.
    d. Create a new Extranet Connection.
    e. Click the Tool button (next to the Extranet Connection list box), select New IPsec Connection, and follow the wizard.
    f. Click the Connect button.

Chapter 6
Rack Mounting

This chapter describes how to mount your Switch into a chassis rack. Following are standard rack-mounting considerations that Nortel Networks recommends:

- The maximum recommended ambient temperature is 40 degrees Centigrade. Make sure the internal temperature of the rack also does not exceed 40 degrees.
- Do not block the power supply vents or otherwise restrict airflow when installing the Switch into a rack.
- Stabilize your rack properly so that it does not tip over under the weight of the Switch and other devices.
- Make sure that the electrical branch circuits are capable of handling the Switch *and* other units in the rack before installing and turning on the Switch.
- Maintain a reliable Earthing path in the rack system. The Switch is intended to connect to an Earth ground.

Warning: The Contivity Extranet Switch 4500 weighs about 60 pounds and should always be carried by two people.

Mounting Brackets

Figure 6-1 shows mounting brackets being attached to a Switch in preparation of a rack-mount installation. Position the brackets with the rack-mount bracket facing outward (as shown below).

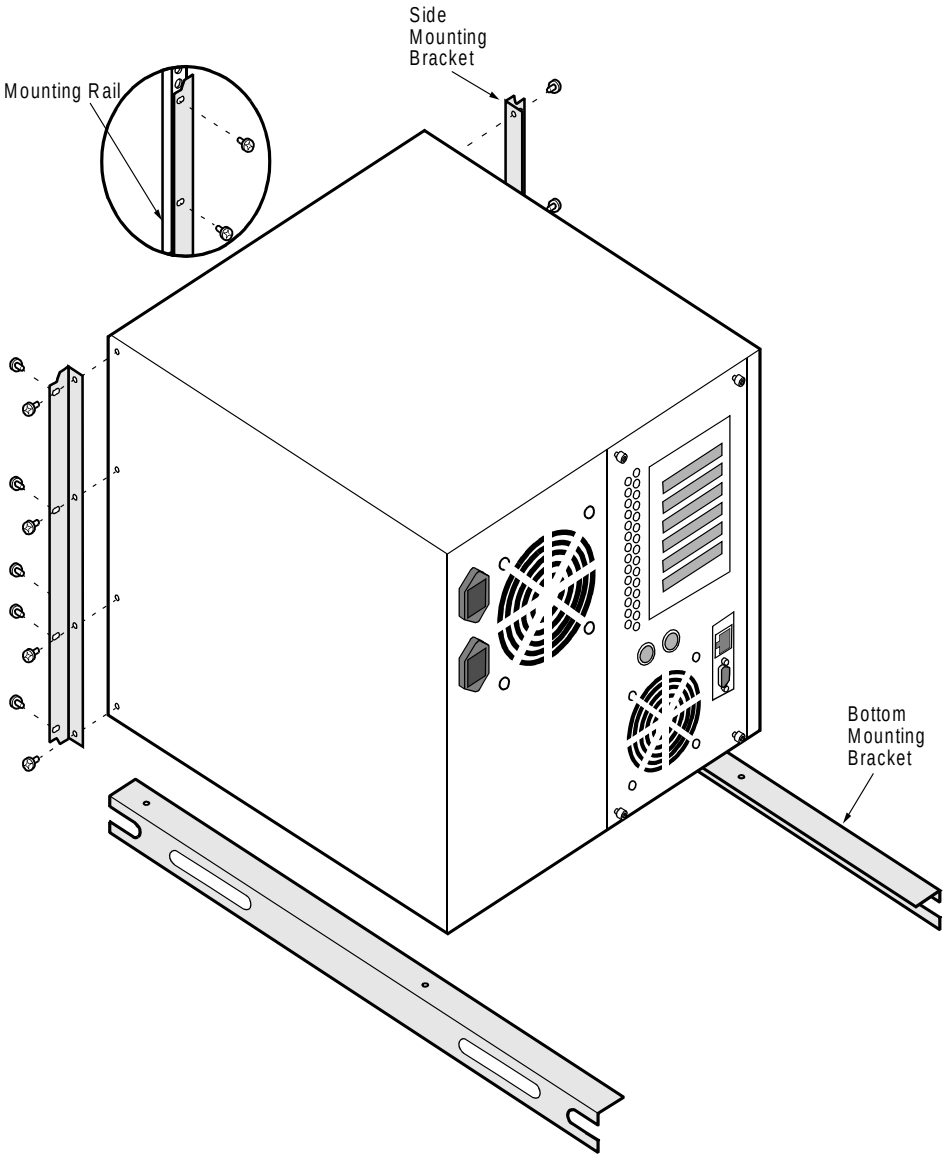

Figure 6-1. Bracket Installation for a Chassis Rack Mount

Rack-Mount Installation Procedure

You must have two people available when installing the rack-mount brackets. Use the rack-mounting hardware that came with your Switch to complete the following steps:

1. Install the long horizontal brackets onto the rack.
2. Install the vertical rack brackets onto the unit.
3. Slide the unit into the rack on top of the horizontal brackets.
4. Secure the unit's vertical rack-mount brackets to the vertical rack rails.

Chapter 7
Changing Hardware Configurations

This chapter describes how Nortel Networks trained service personnel can change existing hardware configurations, including:

- Installing LAN and WAN cards or adding memory
- Swapping out a power supply or hard disk drive

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

NOTE: Wear an antistaticband when handling electronic components for the Switch to avoid damaging them.

Warning: Turn off the Switch and unplug both power cords before installing LAN and WAN cards or system memory.

System Board

Figure 7-1 shows the Switch system board, including the DIMMs and option cards slots.

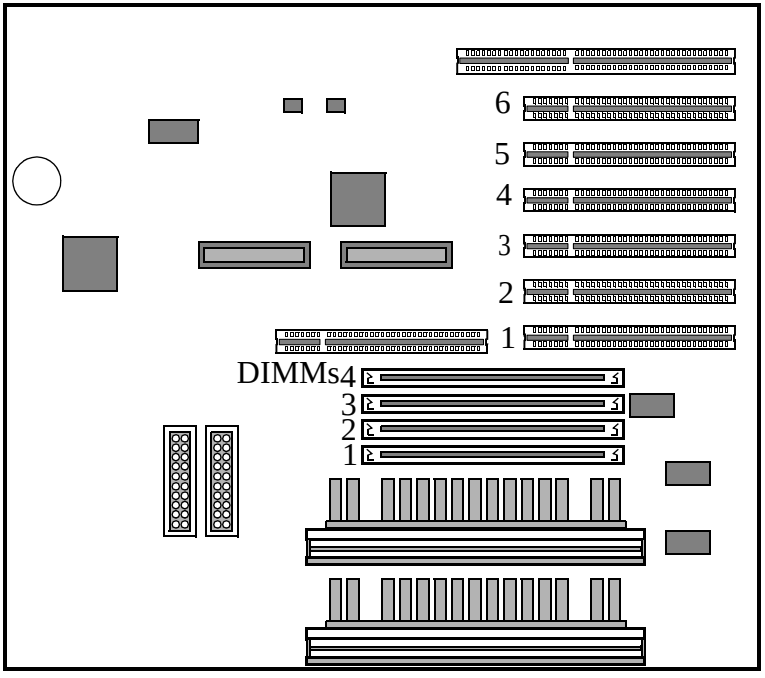

Figure 7-1. Switch's System Board

Warning: Personal injury could result if you incorrectly replace the battery. *This should be done by Nortel Networks trained service personnel only.* Replace with the same or an equivalent battery only, as recommended by the manufacturer. Also, dispose of used batteries according to the manufacturer's instructions.

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

Installing Option Cards

The following illustration shows you how install LAN or WAN option cards into the Switch. You can use Slots 1 to 6 for any mix of LAN and WAN cards; however, *you must populate the slots from Slot 1 to Slot 6, in that order.*

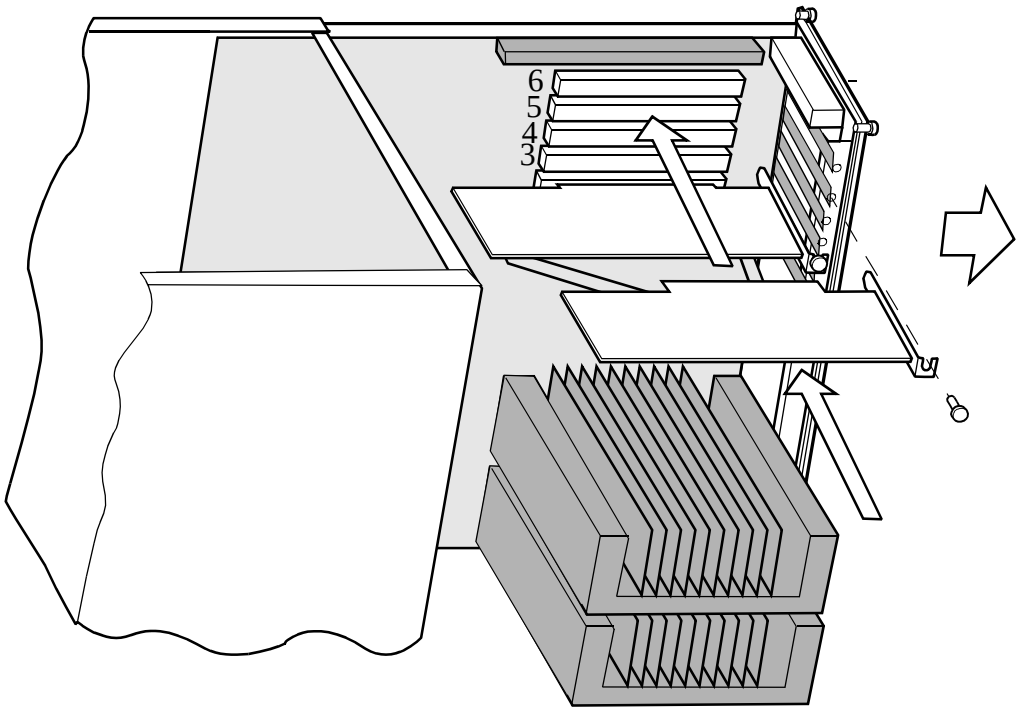

Figure 7-2. Installing LAN or WAN Cards

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

The following procedure is for Nortel Networks trained service personnel only.

1. Turn off the Switch and unplug it from its power source.
2. Unscrew the four screws securing the slide-out tray.
3. Pull out the tray by gripping it with the screws.
4. Remove the filler panel screw and pull out the slot filler panel.
5. Slide the option card into the intended slot. Make sure the card seats firmly and evenly into the card slot. If the card is not seated properly, it will not work. Populate the slots from Slot 1 to Slot 6, in that order.
6. Secure the option card into the tray with the slot filler panel screw.
7. Reverse Steps 3, 2, and 1, in that order.

Installing Additional DIMMs

The following illustration shows you how to unlock a Dual Inline Memory Module (DIMM), and remove or install it. Install a DIMM in the next available slot (i.e., if the DIMM # 1 slot is populated, then add the next DIMM to the DIMM # 2 slot).

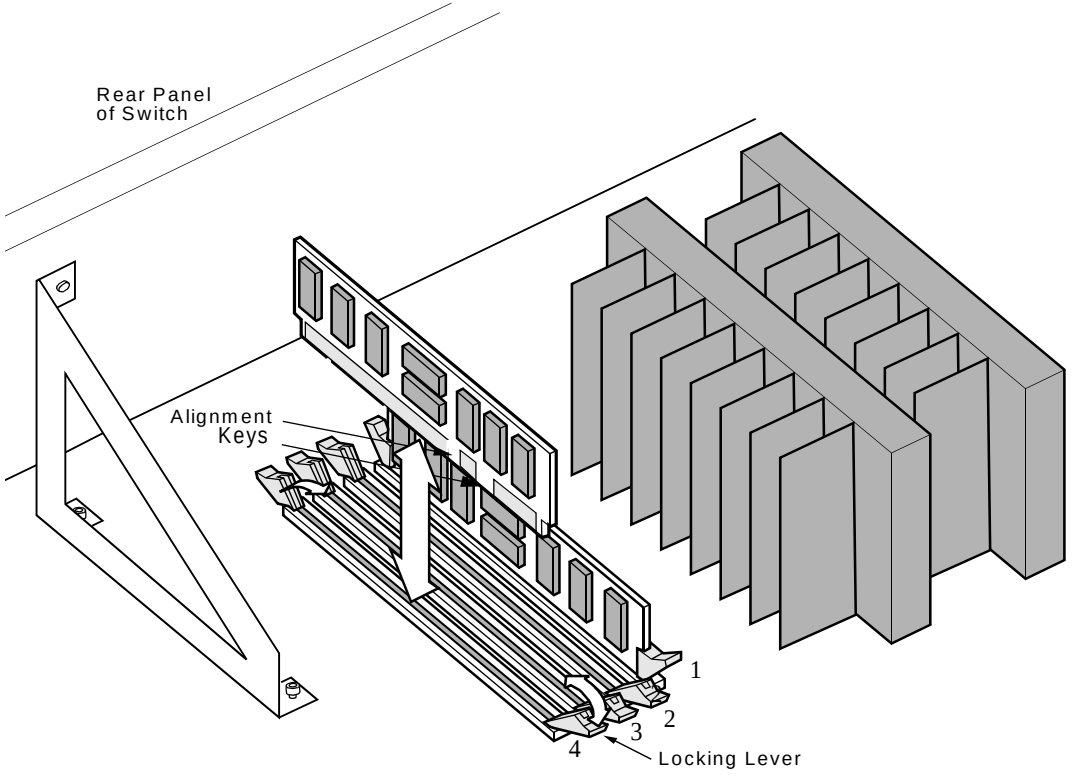

Figure 7-3. Installing Additional Memory

Follow these steps to install a DIMM into the Switch.

1. Remove the stabilization bracket by loosening the two secured captive screws and the rear Phillips screw.
2. Turn off the Switch.
3. Remove the power cords.
4. Unscrew the sliding tray at the back of the unit and pull it out using the thumb screws.
5. Press down the locking levers on both sides of the DIMM.
6. Pull the DIMM up to remove it from the slot.
7. Place a new DIMM in the next available slot, making sure to properly position the DIMM's alignment keys.
8. Pull up the locking levers on both sides of the DIMM, and snap the DIMM into its socket.

Memory Options

The Switch ships with 128 Mbits of memory installed. To increase the memory, contact your Nortel Networks sales representative.

Removing the Front Bezel

The following illustration shows you how to remove the front bezel from the Switch. You do not need to turn off the Switch to remove the front bezel when installing a power supply or hard disk drive.

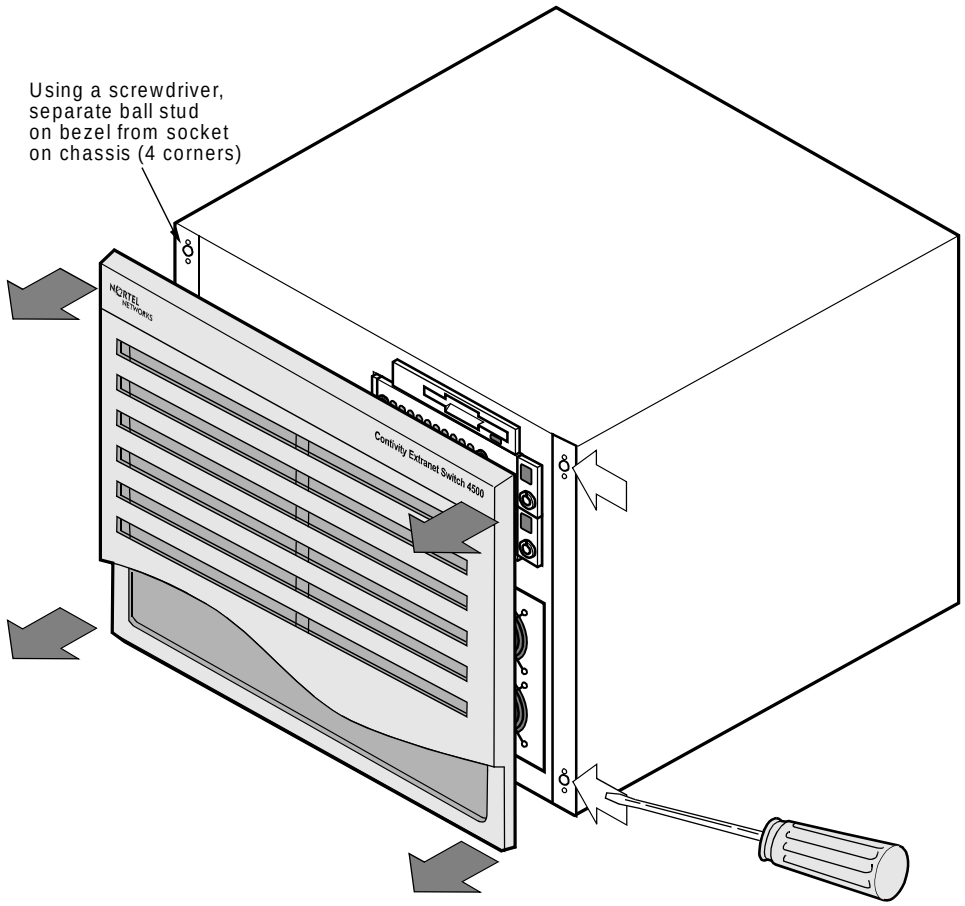

Figure 7-4. Front Bezel Removal

Remove the front bezel to:

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

The first few times you remove the front bezel it might seem to resist removal. This is simply because the pins and snaps are new. After a few times, removal is easier. Remove the Switch front bezel as follows:

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

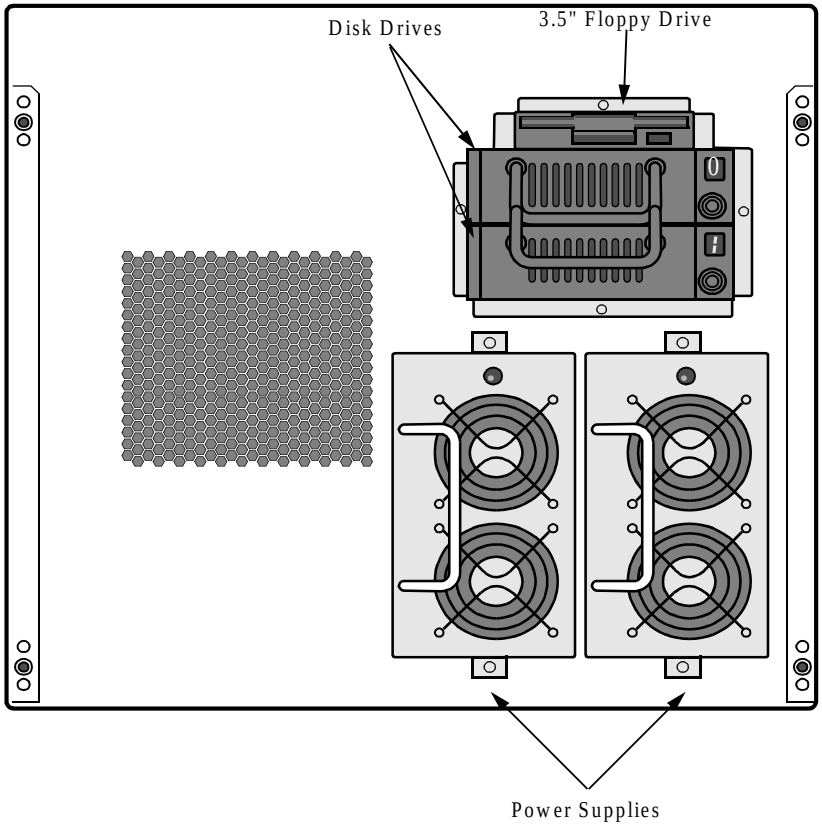

Figure 7-5. 4500 Front Components

Replacing a Power Supply

The following illustration shows you how to replace a hot-swappable power supply for the Switch.

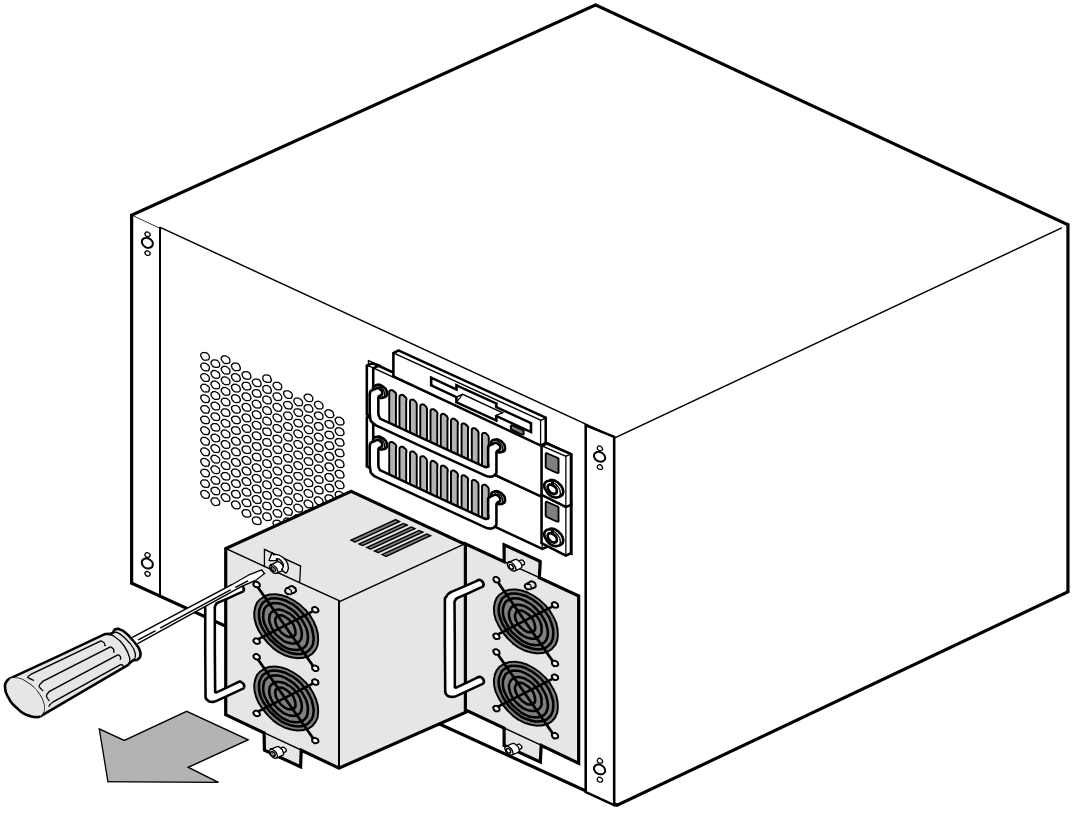

Figure 7-6. Removing the Power Supply

Remove the Switch front bezel (refer to page 7-7), then follow these steps:

1. Use a flat-head screwdriver to unscrew the top and bottom power supply screws.
2. Grab the handle and pull the power supply firmly, until the device disengages. Be careful of the sharp sheet-metal edges.
3. Insert the new power supply. Make sure the power supply seats firmly into its socket and is locked in.
4. Secure the power supply screws tightly with a screwdriver.
5. Replace the front bezel.

Installing a Hard Disk Drive

The following illustration shows you how to replace a hard disk drive for the Switch. *Hard disks are not hot-swappable*. When warm-swapping a disk drive, you must also perform the software steps cited below.

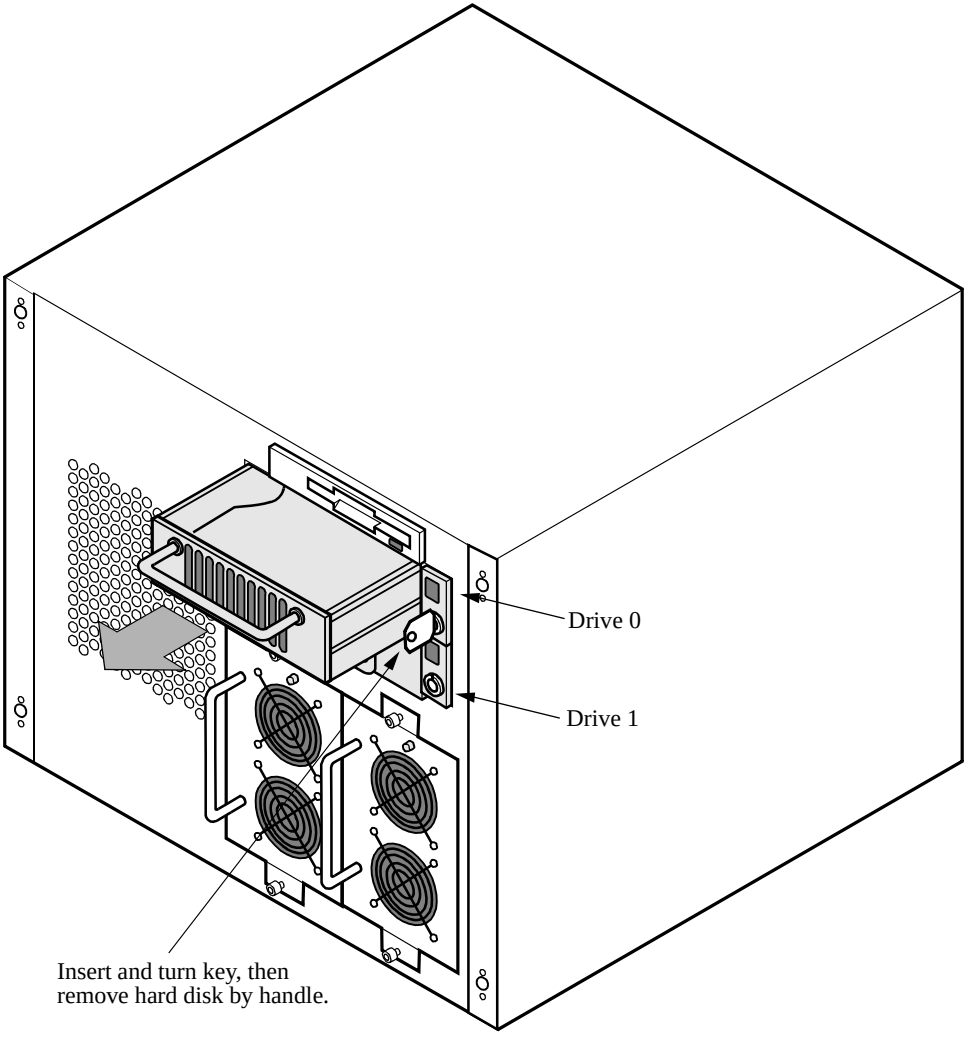

Figure 7-7. Removing the Hard Disk Drive

Software

1. Launch a Web browser to the Switch, and go to the Admin → File System display.
2. Click the button “Prepare selected device for removal.”

   This action saves any data that has not yet been saved to the hard disk from the disk cache.

Hardware

Remove the Switch front bezel (refer to page 7-7), then follow these steps:

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

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

2. Pull the handle to remove the hard disk drive.
3. Insert the replacement hard drive fully, and lock it by turning the key to the left. Make sure the hard disk drive LED shows the proper drive number.
4. Replace the front bezel.
5. Reload the software on the disk. Refer to the “Admin → Recovery” section in the guide *Managing the Contivity Extranet Switch.*

Software

1. Launch a Web browser to the Switch, and go to the Admin → File System display.
2. Click on the drive and click the “Enable” button.

Appendix A
Specifications

Physical Specifications and Operating Environment

Specification	Description
Physical	
Depth	17 in (43.2 cm)
Width	14 in (35.6 cm)
Weight	60 lb (27.2 kg)
Electrical	
Voltage	100 - 240 V~
Current	3.0 A
Frequency	50/60 HZ
Operating Environment	
Temperature	0 - 40 degrees C
Relative Humidity	
Operating	10 - 90% noncondensing

Appendix B
Special Notices

This appendix provides information on statements of conditions, the Nortel Networks Software License Agreement, and RADIUS attribution.

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.

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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.

EN 55 022 Statement

This is to certify that the Nortel Networks Contivity Extranet Switch 4500 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.

EC Declaration of Conformity

This product conforms (or these products conform) to the provisions of Council Directive 89/336/EEC and 73/23/EEC. The Declaration of Conformity is available on the Nortel Networks World Wide Web site at www.nortelnetworks.com.

Voluntary Control Council for Interference (VCCI) Statement

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This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

Canadian Department of Communications Radio Interference Regulations

This digital apparatus, the Contivity Extranet Switch 4500, 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, le Contivity Extranet Switch 4500, 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.

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RADIUS (Remote Authentication Dial-In User Service)

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