



# **3Com<sup>®</sup> Switch 4500 Family**

## Getting Started Guide

**Switch 4500 26-Port**  
**Switch 4500 50-Port**  
**Switch 4500 PWR 26-Port**  
**Switch 4500 PWR 50-Port**

**3Com Corporation**  
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**Marlborough, MA**  
**USA 01752-3064**

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# ABOUT THIS GUIDE

This guide provides all the information you need to install and use the following switches in their default state:

- Switch 4500 26-Port (3CR17561-91)
- Switch 4500 50-Port (3CR17562-91)
- Switch 4500 PWR 26-Port (3CR17571-91)
- Switch 4500 PWR 50-Port (3CR17572-91)

All procedures described in this guide apply to all models except where stated.

The guide is intended for use by network administrators who are responsible for installing and setting up network equipment; consequently, it assumes a basic working knowledge of LANs (Local Area Networks).

---

## Before You Start

The Release Notes provide important information about the current software release, including new features, modifications, and known problems. You should read the Release Notes before installing the Switch in your network.



*If the information in the Release Notes differ from the information in this guide, follow the instructions in the Release Notes.*

The latest versions of user guides and release notes are available in Adobe Acrobat Reader Portable Document Format (PDF) on the 3Com World Wide Web site:

<http://www.3com.com/>

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## Conventions

Table 1 lists conventions that are used throughout this guide.

**Table 1** Notice Icons

Icon	Notice Type	Description
	Information note	Information that describes important features or instructions
	Caution	Information that alerts you to potential loss of data or potential damage to an application, system, or device
	Warning	Information that alerts you to potential personal injury

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## Related Documentation

In addition to this guide, each Switch documentation set includes the following:

- *Switch 4500 Configuration Guide*  
This guide contains information on the features supported by your Switch and how they can be used to optimize your network.
- *Switch 4500 Quick Reference Guide*  
This guide contains:
  - a list of the features supported by the Switch.
  - a summary of the command line interface commands for the Switch. This guide is also available under the *Help* button on the web interface.
- *Switch 4500 Command Reference Guide*  
This guide provides detailed information about the web interface and command line interface that enable you to manage the Switch
- *Release Notes*  
These notes provide information about the current software release, including new features, modifications, and known problems. The Release Notes are supplied in hard copy with your Switch.

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- Document title
- Document part number (on the title page)
- Page number (if appropriate)

Example:

Part Number 10015034 Rev. AB

Switch 4500 Family Getting Started Guide

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# 1

## INTRODUCING THE SWITCH 4500 FAMILY

This chapter contains introductory information about the Switch 4500 and how it can be used in your network. It covers summaries of hardware and software features and also the following topics:

- About the Switch 4500
- Switch 4500 — Front View Detail
- Switch 4500 — Rear View Detail
- Default Settings

## About the Switch 4500

The Switch 4500 Family are mixed media devices. Table 2 summarizes what each Switch consists of:

**Table 2** Switch 4500 Family Hardware

Switch 4500 Family	10BASE-T\100BASE-TX Ports	10BASE-T\100BASE-TX PoE Ports	10BASE-T\100BASE-TX\1000BASE-T Ports	1000BASE-X SFP Ports	1000BASE-T SFP Transceiver	RJ-45 Console Port	-48V DC RPS Input
Switch 4500 26 Port	24		2*	2*		1	
Switch 4500 50 Port	48		2*	2*	2†	1	
Switch 4500 PWR 26 Port		24	2*	2*	2†	1	1
Switch 4500 PWR 50 Port		48	2*	2*	2†	1	1

\* Combo SFP and 10/100/1000 Ports

† 1000BASE-T SFP transceiver installed in last two 1000BASE-X SFP ports

The Switch 4500 Family provides workgroup connectivity at 10- and 100-Mbps, and high-speed Gigabit ports for stacking, uplinks to a backbone, or for server connections. With stacking, you can add additional Switch 4500s as your network grows while preserving ease of management.



*For information about using the software features of the Switch, refer to the "Command Reference Guide" on located on 3Com's Web site at [www.3com.com](http://www.3com.com).*

## Summary of Hardware Features

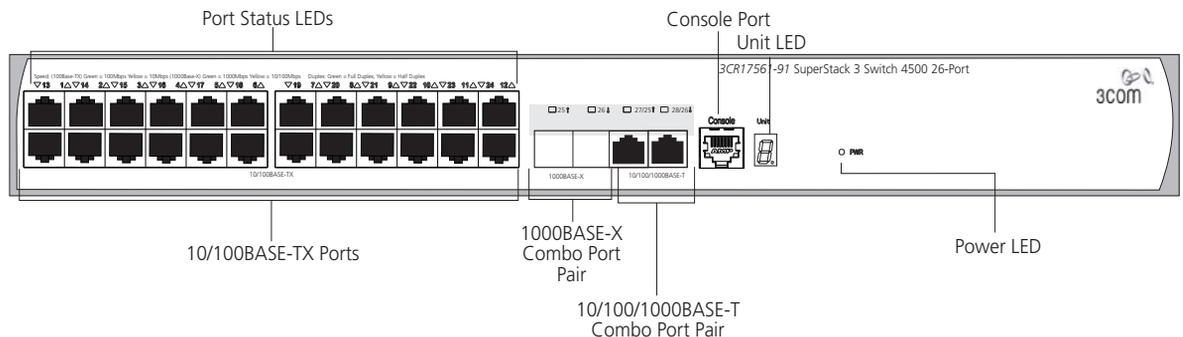
Table 3 summarizes the hardware features that are supported by the Switch 4500.

**Table 3** Hardware Features

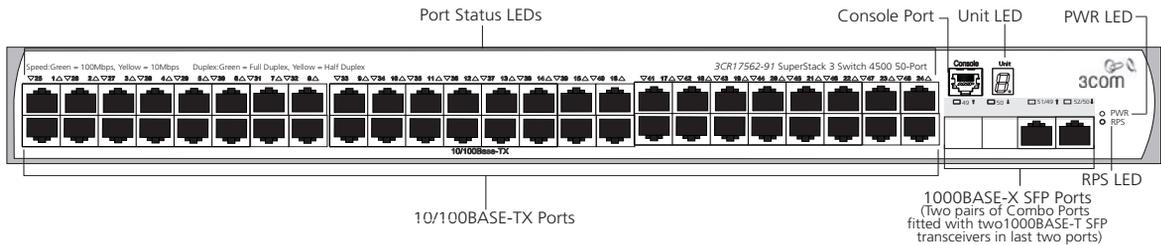
Feature	Switch 4500
<b>Addresses</b>	Up to 8,000 supported
<b>Auto-negotiation</b>	Supported on all non-SFP ports
<b>Forwarding Modes</b>	Store and Forward
<b>Duplex Modes</b>	Half and full duplex on all ports
<b>Auto MDI/MDIX</b>	Supported on all ports. If fiber SFP transceivers are used, Auto MDIX is not supported.
<b>Flow Control</b>	In full duplex operation all ports are supported
<b>Traffic Prioritization</b>	Supported (using the IEEE Std 802.1D, 1998 Edition): Eight traffic queues per port
<b>Power over Ethernet</b>	Supported on 10/100 ports (3CR17571-91 and 3CR17572-91 only)
<b>Ethernet and Fast Ethernet Ports</b>	Auto-negotiating 10BASE-T/100BASE-TX ports
<b>Gigabit Ethernet Ports</b>	Auto-negotiating 10BASE-T/100BASE-TX/1000BASE-T ports (3CR17561-91) only
<b>SFP Ethernet Ports</b>	Supports fiber Gigabit Ethernet short-wave (SX), long-wave (LX), long-haul (LH70) and copper (T) transceivers in any combination.
<b>RPS Supplemental PoE Power</b>	Connects to -48v DC supply (3CR17571-91 and 3CR17572-91 only)
<b>Mounting</b>	19-inch rack or stand-alone mounting

## Switch 4500 — Front View Detail

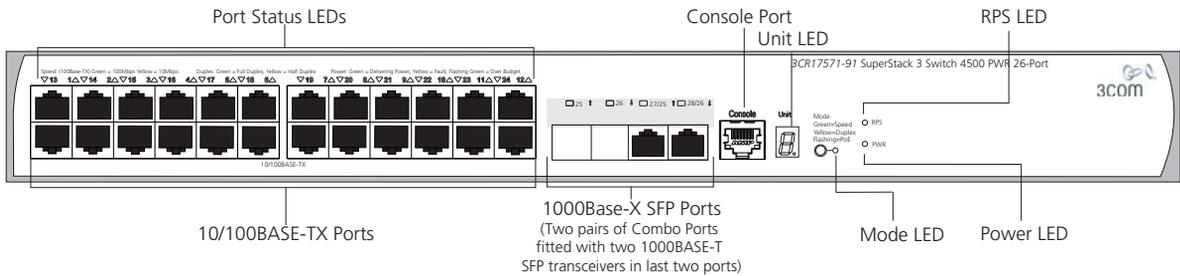
**Figure 1** Switch 4500 26-Port — front view



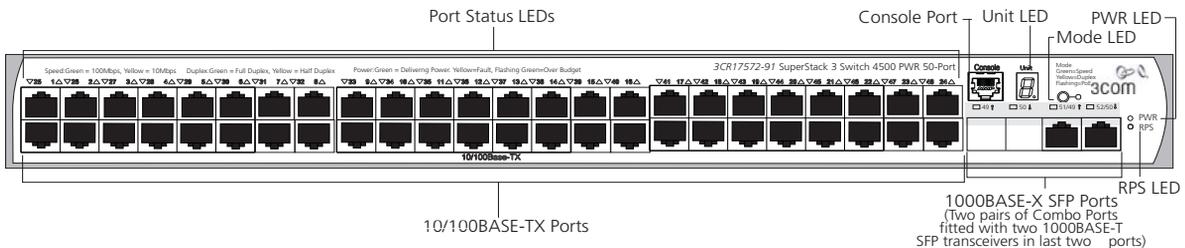
**Figure 2** Switch 4500 50-Port — front view



**Figure 3** Switch 4500 26-Port PWR - front view



**Figure 4** Switch 4500 50-Port PWR - front view



**WARNING: RJ-45 Ports.** These are shielded RJ-45 data sockets. They cannot be used as standard traditional telephone sockets, or to connect the unit to a traditional PBX or public telephone network. Only connect RJ-45 data connectors, network telephony systems, or network telephones to these sockets.

*Either shielded or unshielded data cables with shielded or unshielded jacks can be connected to these data sockets.*

### **10BASE-T/ 100BASE-TX Ports**

The Switch 4500 has 24 or 48 auto-negotiating 10BASE-T/100BASE-TX ports configured as Auto MDIX (cross-over). These ports automatically provide the appropriate connection. Alternatively, you can manually set these ports to 10BASE-T half-duplex, 10BASE-T full-duplex, 100BASE-TX half-duplex or 100BASE-TX full-duplex. The maximum segment length is 100 m (328 ft) over Category 5 twisted pair cable.

### **Gigabit Ports**

Switch 4500 10/100 Ethernet models support two simultaneous Gigabit connections. Each switch has four Gigabit ports, arranged in two pairs called “dual-personality combo port pairs.” Only one port in each pair can be active at a time.

The paired ports for the Switch 4500 26 Port and PWR 26 Port are:

- 25 and 27
- 26 and 28

The paired ports for the Switch 4500 50 Port and PWR 50 Port are:

- 49 and 51
- 50 and 52

By default, the ports are enabled as follows for the 26-Port switches:

- Port 25 = active; Port 27 = inactive
- Port 26 = active; Port 28 = inactive

By default, the ports are enabled as follows for the 50-Port switches:

- Port 49 = active; Port 51 = inactive
- Port 50 = active; Port 52 = inactive

To change which port is active, issue the `undo shutdown` command on the inactive port. This will enable the previously inactive port and disable its pair. Issuing this command will cause the switch to reboot.

A Gigabit connection can be either copper-based 1000Base-T or SFP-based fiber optic connection. On the Switch 4500 10/100 26 Port unit, there are two SFP slots and two 1000Base-T ports. On the Switch 4500 PWR 26 Port, 50 Port, and PWR 50 Port models all the physical Gigabit ports are SFP slots.

Two 1000Base-T SFP transceivers are included with these units. These SFP transceivers can be inserted in any of the four SFP slots to provide copper Gigabit connectivity. If you install these in the inactive ports, then you will need to issue the undo shutdown command on those ports to make them active.

SFP (Small Form Factor Pluggable, or mini-GBIC) ports support fiber Gigabit Ethernet short-wave (SX), long-wave (LX), long-haul (LH70) and copper (T) SFP Transceivers in any combination. This offers you the flexibility of using SFP transceivers to provide connectivity between the Switch and remote 1000 Mbps workgroups.

The default state for these ports is auto-negotiation enabled, where the speed, duplex and flow control modes are negotiated. As the speed and duplex modes are fixed by the media type, only the flow control is negotiated with the link partner. Alternatively, auto-negotiation can be disabled (except 1000BASE-T which auto-negotiation is mandatory) and the flow control setting can be manually configured.

**Console Port** The console port allows you to connect a terminal and perform remote or local out-of-band management. As the console port on the Switch is an RJ-45 port, you will need to connect an RJ-45 to DB9 converter cable to a standard null modem cable in order to connect a terminal.

**Unit LED** The Unit LED is a seven segment display visible on the front of the Switch. The Unit LED can be used to indicate the unit number in a fabric, POST test ID and software upgrade information. In the unlikely event of a hardware fault occurring, the Unit LED may be used to help diagnose the problem. For information on using the Unit LED for problem solving, see “Solving Problems Indicated by LEDs” on page 64

**LEDs** Table 4 lists LEDs visible on the front of the Switch, and how to read their status. For information on using the LEDs for problem solving, see “Solving Problems Indicated by LEDs” on page 64.

**Table 4** LED Behavior

LED	Color	Indicates
<b>Unit LED</b>		
	Green	Power On Self Test (POST) is in progress. During POST a the test ID number appears in the Unit LED (seven segment display). or Software download is in progress. During software download, a clockwise cycling bar appears in the Unit LED.
	Green flashing	The Switch has failed POST. The Unit LED flashes the number of the test that has failed.
	Green flashing ‘f’	There has been a fan failure.
	Green flashing ‘t’	The Switch is over temperature and unit temperature is critical.
<b>PWR LED</b>		
	Green	The Switch is powered-up and operating normally.
	Green flashing	Self Test (POST) or Software Download is in progress.
	Yellow flashing	One or more ports have failed POST.
	Red	The Switch has failed its Power On Self Test.
	Off	The Switch is not receiving power or there is a fault with the Power Supply Unit.
<b>Mode LED (3CR17571-91 and 3CR17572-91 only)</b>		
Speed	Green	10/100 Port Speed and Activity, 1000 SFP Status and Activity, or Stack Status and Activity.
Duplex	Yellow	10/100 Duplex and Activity, 1000 SFP Duplex and Activity, or Stack Activity
PoE	Red	10/100 Port showing PoE Information

LED	Color	Indicates
<b>RPS LED (3CR17571-91 and 3CR17572-91 only)</b>		
	Green	AC and RPS supply connected.
	Yellow	AC failed or not connected. RPS supply is OK.
	Off	There is no RPS supply connected.
<b>10BASE-T/100-TX Port LEDs</b>		
Speed	Green	A high speed (100 Mbps) link is present, blinking off for every packet received or transmitted.
	Yellow	A low speed (10 Mbps) link is present, blinking off for every packet received or transmitted.
	Yellow Flashing	The port has failed POST.
	Off	No link is present.
Duplex (3CR17571-91 and 3CR17572-91 only)		
	Green	Full duplex, blinking off for every packet received or transmitted.
	Yellow	Half duplex, blinking off for every packet received or transmitted.
	Yellow flashing	The port has failed POST.
	Off	No link is present.
PoE (3CR17571-91 and 3CR171572 only)		
	Green	Power is being delivered to the port.
	Green flashing	Port power has exceeded limit or is unable to supply power due to unit being over budget.
	Yellow	PoE error, no power supplied on port.
	Yellow flashing	The port has failed post.
	Off	No power is being delivered.
<b>1000BASE-X SFP Port LEDs</b>		
Speed	Green	A high speed (1000 Mbps) link is present.
	Yellow Flashing	Port failed POST.
	Off	No link is present.
Duplex (3CR17571-91 and 3CR17572-91 only)		
	Green	Full duplex packets are being transmitted/received on the port.
	Yellow	Half duplex packets are being transmitted/received on the port.
	Yellow flashing	Port failed POST.
	Off	No link is present.

## Switch 4500 — Rear View Detail

Figure 5 Switch 4500 — rear view

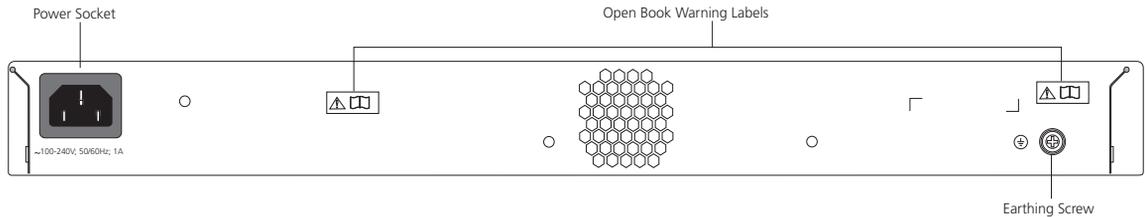
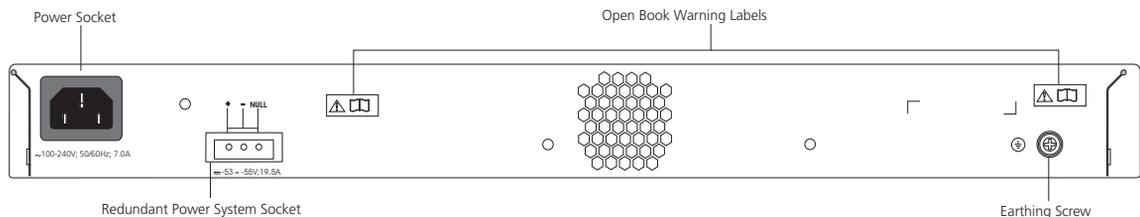


Figure 6 Switch 4500 PWR - rear view



### Power Socket

The Switch automatically adjusts its power setting to any supply voltage in the range 100-240 VAC.

### Open Book Warning Labels

Before installing or removing any components from the Switch 4500 or carrying out any maintenance procedures, you must read the safety information provided in Appendix A of this guide.



**AVERTISSEMENT:** Avant d'installer ou d'enlever tout composant des commutateurs de la gamme Switch 4500 ou d'entamer une procédure de maintenance, lisez les informations relatives à la sécurité qui se trouvent dans l'annexe A de ce guide.



**VORSICHT:** Bevor Sie Komponenten der Switch 4500-Baureihe installieren oder deinstallieren und bevor Sie Wartungsarbeiten ausführen, müssen Sie die in Anhang A dieses Handbuchs aufgeführten Sicherheitshinweise lesen.



**ADVERTENCIA:** Antes de instalar o extraer cualquier componente del Switch 4500 Family o de realizar tareas de mantenimiento, debe leer la información de seguridad facilitada en el Apéndice A de esta guía.



**AVVERTENZA:** Prima di installare o rimuovere qualsiasi componente dello Switch 4500 Family o di eseguire qualsiasi procedura di manutenzione, leggere le informazioni di sicurezza riportate nell'Appendice A di questa guida.



**OSTRZEŻENIE:** Przed instalacją lub usunięciem jakichkolwiek elementów z przełącznika z rodziny 4500 lub przeprowadzeniem prac konserwacyjnych należy zapoznać się z informacjami o bezpieczeństwie zawartymi w Załączniku A niniejszego podręcznika.

### Redundant Power System Socket

Provides supplemental power for PoE ports (up to 15.4w on all ports) and redundant power for powered devices and the Switch itself.

## Default Settings

Table 5 shows the default settings for the Switch 4500 Family:

**Table 5** Default Settings

Feature	Switch 4500
<b>Automatic IP Configuration</b>	Enabled
<b>Port Status</b>	Enabled
<b>Port Speed</b>	Auto-negotiated
<b>Duplex Mode</b>	Auto-negotiated
<b>Power over Ethernet</b>	Enabled (3CR17571-91 and 3CR17572-91 only)
<b>Flow Control</b>	Auto-negotiated
<b>Broadcast Storm Control</b>	Enabled
<b>Virtual LANs (VLANs)</b>	All ports belong to the untagged Default VLAN (VLAN 1) with IEEE Std 802.1Q-1998 learning operational
<b>Management VLAN</b>	Any VLAN for all units.
<b>Link Aggregation Control Protocol (LACP)</b>	Disabled per port
<b>IP Multicast Filtering</b>	Filtering enabled
<b>Rapid Spanning Tree Protocol</b>	Enabled
<b>Fast Start</b>	Enabled on front panel ports
<b>RMON Alarm</b>	Enabled

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<b>Feature</b>	<b>Switch 4500</b>
<b>Traffic Prioritization</b>	All ports prioritize NBX VoIP traffic (LAN and IP). All ports set to “best effort” for all other traffic.
<b>Port Security</b>	Disabled per port
<b>Configuration Save and Restore</b>	Disabled

---



# 2

## INSTALLING THE SWITCH

This chapter contains supplemental information on setting up your Switch 4500. These details are intended to be read together with the printed documents that accompany your switch.

---

### Package Contents

- Switch unit
- Unit Information Labels
- Warranty Information
- RPS Flyer
- Power Cord
- Console Cable (RJ-45)
- RPS -48V DC Connector and backshell (3CR17571-91 and 3CR17572-91 only)
  - RPS Connector Cable Tie
  - Earthing Lead
- 2 x Front securing brackets
- 4 x Screws
- 2 x Back securing brackets and 2 x Screws (3CR17571-91 and 3CR17572-91 only)
- 4 x Rubber feet
- Important Information Notice
- Safety and Regulatory Information

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## Important Steps Before Proceeding

Before proceeding, make sure to access the Switch 4500 information on 3Com's Web site at [www.3Com.com](http://www.3Com.com) and:

- Read the document entitled "3Com Switch Family Safety and Regulatory Information," which contains information on how to set-up your Switch 4500 and all the safety and regulatory warnings.
- Refer to the document entitled "Important Information" for instructions on how to retrieve the latest documentation and software for your switch.
- Set-up your switch in the desired location.
- Download the documentation to your local hard-drive or to an accessible server.

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## Connecting a Redundant Power Supply to your Switch 4500 PWR

The Switch 4500 PWR 26 and 50 port have a -48V DC Redundant Power Supply socket that can be used in addition to the standard AC connection of the switch. If you intend to use this DC connection, please read this section.



**WARNING:** *The installation of the Redundant Power Supply (RPS) should only be carried out by properly trained and qualified personnel.*



**WARNING:** *These instructions must be read in conjunction with the RPS flyer and the safety and installation instructions supplied with your RPS.*



**WARNING:** *When powering any Switch 4500 PWR from an RPS, the unit must be earthed (grounded). This can be achieved by either connecting the power cord to the unit or by connecting the earth terminal on the rear of the unit to a reliable electrical earth, or by connecting both. You must ensure that the earth connection is made before connecting the DC supply from the RPS.*

*3Com Switches which support -48V DC RPS inputs, that are PoE enabled, can only be powered by an RPS which complies with the isolation requirements of IEEE-Std 802.3af. Non PoE enabled switches do not have this restriction.*



**WARNING:** *A standard 'positive-earthed' -48V redundant power system suitable for use with telecommunications equipment should not be used*

*with the 3Com Power-over-Ethernet (PoE) network switches. In order to meet the IEEE 802.3af (PoE) specification, the -48V output must be isolated from earth (ground) and meet the isolation requirements in that specification.*



**WARNING:** Any RPS must be approved as a SELV output in accordance with IEC 60950-1/UL 60950-1/EN 60950-1.



**WARNING:** The characteristics of the Switch 4500 DC supply input are given in Appendix B on page 91.

The Switch 4500 PWR units can be powered in three different ways:

- **AC Mains only** — does not offer any power redundancy. If the AC mains supply or the AC power supply fail, the Switch will power off.
- **AC Mains and -48V DC (primary supply)** — the internal AC supply acts as the backup in the event of a DC power failure.
- **DC only** — the Switch does not need an AC supply and the resiliency is provided by the DC supply. This is useful in an environment where only DC power is available.

The RPS provides three main benefits to the customer:

- **Power Redundancy** — if a Switch is powered from the mains supply unit, a failure of the internal power supply will cause the Switch to fail. This can be overcome by connecting both the AC and DC RPS supplies to the Switch. Additional redundancy can also be added to the DC power by using (N+1) DC power supplies to further increase the availability of the system.
- **Uninterruptible Power** — the system allows easy connection and maintenance of batteries to the RPS shelf to further increase the availability of the system.
- **Additional Power to PoE Ports** — the internal AC Power Supply of a PoE Switch can provide enough power for most network applications. The RPS can be used to supplement additional power (up to a maximum of 15.4W), including full backup of all PoE devices on the network.

Table 6 below, outlines the behavior of the Switch when changes occur to the power system, such as removing the AC mains cable when the RPS is attached. The responses to the different power inputs are controlled by the Switch's internal power supply and not by the RPS.

**Table 6** Switch Power Inputs

Power Input before User Intervention	Power Input after User Intervention	Correct Response
AC mains and RPS	RPS only	The unit remains powered by the RPS.
AC mains and RPS	AC mains only	The unit is powered by the AC mains.  PoE dropped on all ports, however the unit does not reset. PoE restarts powered by the remaining power from the AC mains. PoE ports will be dropped depending on their preset priority level.  The total power available to the Switch may be less than when powered from the RPS. Some PoE ports may be dropped as they are unable to obtain the power they require.
RPS only	AC mains and RPS	The unit remains powered by the RPS.
AC mains	AC mains and RPS	The unit is powered by the RPS. PoE ports can be added.

### Specifying the Redundant Power System

3Com's redundant power solution allows the use of any off-the-shelf -48V DC RPS that meets the requirements defined in Appendix B on page 91.

For an approved vendor list, more details about purchasing the 3Com recommended RPS and a full set of requirements go to:

<http://www.3Com.com/RPS>

The 3Com recommended RPS generates -48V DC power using power supply units (or rectifiers). The outputs of the rectifier(s) are connected together so that the total -48V power available can be increased by adding additional rectifiers. For example, three 1500W rectifiers can provide up to 4500W. Hot removal or insertion of a rectifier will not affect the -48V DC output voltage.

Table 7 shows an example of the total power available from a number of 1500W rectifiers.



*A minimum of two rectifiers are required for each shelf to provide N+1 rectifier redundancy.*

**Table 7** Power Availability

	Rectifiers					
	1	2	3	4	5	6
<b>No Rectifier Redundancy</b>	1500W	3000W	4500W	6000W	7500W	9000W
<b>N+1 Rectifier Redundancy</b>	-	1500W	3000W	4500W	6000W	7500W

The -48V DC power distribution provides the mechanism to connect to the Switch 4500 PWR. The distribution consists of a number of circuit breakers and connection terminals for the positive (common) and negative -48V outputs. Each Switch 4500 PWR must be individually connected to a circuit breaker terminal.

A battery can also be connected to battery terminals prior to the DC power distribution to provide uninterrupted power in order to protect against the loss of AC mains power.

3Com’s RPS solution uses -48V DC power distribution. The RPS system provides bulk -48V DC power that is separately distributed to a number of network switches.

Each RPS consists of a shelf which can house from one to six rectifiers, a Distribution Module and a Management Module.

**Connecting the Switch to the Redundant Power System**

When connecting the RPS to the Switch, the circuit breaker and 2-core cable need to be matched to the power rating of the Switch. Table 8 shows the recommended circuit breaker and cable rating for the Switch 4500. The recommended cable length should not exceed 3 metres (9.84 feet).

**Table 8** Switch 4500 Circuit Breaker and Cable Ratings

	Circuit Breaker	Minimum 2-Core Cable Diameter
<b>Non PoE</b>	6A C type	18 AWG (solid or stranded cable)
<b>PoE</b>	25A C type	12 AWG (solid or stranded cable)



**WARNING:** RPS Manufacturers recommendations must be followed when connecting the cable to the RPS.



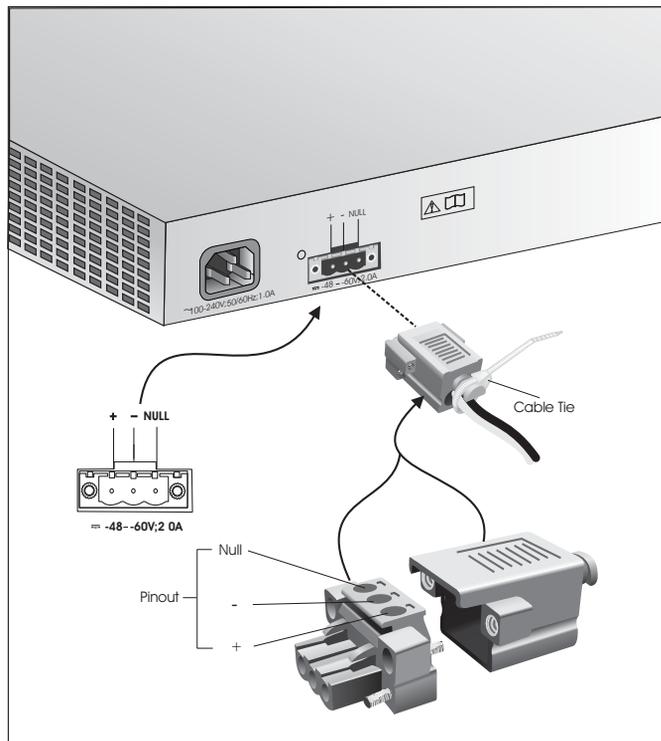
**WARNING:** Ensure that the circuit breaker in the RPS is in the open (off) position when connecting the cable to the RPS and the cable and connector to the Switch.



**WARNING:** You must ensure that the positive terminal on the Switch is connected to the positive (common) terminal of the RPS and that the negative terminal on the Switch is connected to the negative (circuit breaker) terminal of the RPS.

Figure 7 shows how to connect the power supply to the RPS socket in the back of the Switch. Use the cable tie supplied with your Switch to support the cable at the rear of the RPS connector as shown.

**Figure 7** RPS Connection to the Switch



When the RPS is connected to the Switch, the circuit breaker in the RPS can be moved to the closed (on) position and the Switch will be powered by the -48V DC power.

The -48V DC power will take priority over the AC mains and will power the Switch if it is connected.

### Connecting the Earthing Cable

Use the earthing cable that accompanies your Switch if the length is suitable. Alternatively use the earthing cable specification as defined in Appendix B on page 91.



*The earthing cable is only required if the Switch is powered by the RPS only.*

The recommended cable length should not exceed 3 metres (9.84 feet).

### RPS LED

The RPS status LED on the front of the Switch 4500 PWR indicates the status of the RPS and AC supplies as shown in Table 9.

**Table 9** RPS LED Colors

Color	State
Green	AC and RPS supply connected.
Yellow	AC failed or not connected. RPS supply is ok.
Off	There is no RPS supply connected.

### Using Power over Ethernet

The Switch 4500 Power over Ethernet (PoE) units can supply power to any IEEE 802.3af compliant device through any of its 10/100 ports over a Category 5 or Category 5e Ethernet cable. The same cable connects the device to the network.

Power over Ethernet is a self-configuring protocol. When you plug a PoE compliant device into one of the ports on the Switch, the Switch will supply the power required to the device, providing that the total power budget for the Switch would not be exceeded by doing so.

A PoE Switch combines the functionality of a standard Ethernet Switch with a single power supply that can power multiple devices. Using a PoE Switch has the following advantages over an unpowered network:

- **Reduced Cabling** — a PoE (802.3af) compliant device which has its power supplied over its ethernet cable does not require a separate power supply. If, for example, the Switch is used to connect a 3Com 11 Mbps Wireless LAN Access Point 8500 to the network, then only a

network cable is required to provide both power and network connectivity.

- **Increased Reliability** — a device powered by a PoE Switch will be able to take advantage of the facilities available to the Switch. The Switch can be fitted with a redundant power supply or uninterruptible power supply, increasing its uptime.

The Switch supports resistor detection according to IEEE 802.3af and pre-standard detection methods.



*The Switch 4500 supports 3Com 802.3af equipment. For the latest list of supported devices, refer to the product page on the 3Com web site at <http://www.3com.com/>*

For further information on Power over Ethernet, refer to the Power over Ethernet Configuration chapter in the Configuration Guide available on 3Com's Web site. Power over Ethernet management is available using the web interface or the command line interface (CLI).

## The Power-up Sequence

The following sections describe how to get your Switch 4500 powered-up and ready for operation.

### Powering-up the Switch 4500

Use the following sequence of steps to power-up the Switch.

- 1 Plug the power cord into the power socket at the rear of the Switch.
- 2 Plug the other end of the power cord into your power outlet.

The Switch powers-up and runs through its Power On Self Test (POST), which takes approximately one minute.

### Checking for Correct Operation of LEDs

During the Power On Self Test, all ports on the Switch are disabled and the LEDs light. The PWR LED will flash green during the POST.

When the POST has completed, check the PWR LED to make sure that your Switch is operating correctly. Table 10 shows possible colors for the LED.

**Table 10** Unit Status Colors

Color	State
Green	The Switch is powered-up and operating normally.
Green flashing	Self Test (POST) or Software Download is in progress
Red	The Switch has failed its Power On Self Test (POST).
Off	The Switch is not receiving power.

If there is evidence of a problem, see “Solving Problems Indicated by LEDs” on page 64 for a list of suggested solutions.



**CAUTION:** *The Switch has no ON/OFF switch; the only method of connecting or disconnecting mains power is by connecting or disconnecting the power cord.*



**WARNING:** *The Switch 4500 PWR supports Power over Ethernet on 10/100 ports only. These ports should only be used for Ethernet wiring within the same building.*

### Choosing the Correct Cables for the 1000BASE-X SFP Ports

The 1000BASE-SX SFP transceiver supports a direct connection to a multi-mode fiber-optic cable. The 1000BASE-LX SFP transceiver supports a direct connection to single-mode and multi-mode fiber-optic cables. The 1000BASE-LH70 SFP transceiver supports a direct connection to a single-mode fiber-optic cable and the 1000BASE-T SFP transceiver uses Category 5 copper cabling with RJ-45 connectors and supports segment lengths of up to 100 m (328 ft). Table 14 shows the range for each connection:

**Table 11** 1000BASE-X SFP Port Cable Range

Fiber Type	Diameter (microns)	Modal Bandwidth (MHz . km)	Transmission Range in meters (in feet)
<b>1000BASE-SX</b>			
Multi-mode	62.5	160	2m - 220m (6.6 ft - 721.8 ft)
Multi-mode	62.5	200	2m - 275m (6.6 ft - 902.3 ft)
Multi-mode	50	400	2m - 500m (6.6 ft - 1640.5 ft)
Multi-mode	50	500	2m - 550m (6.6 ft - 1804.6 ft)
<b>1000BASE-LX</b>			
Multi-mode	62.5	500	2m - 550m (6.6 ft - 1804.6 ft)
Multi-mode	50	400	2m - 550m (6.6 ft - 1804.6 ft)
Multi-mode	50	500	2m - 550m (6.6 ft - 1804.6 ft)
Single-mode	9	-	2m - 10,000m (6.6 ft - 32, 810 ft)
<b>1000BASE-LH70</b>			
Single-mode	9 core	-	2m - 70 km (6.6 ft - 43 miles)

## SFP Operation

The following sections describes how to select and use an SFP transceiver in an SFP port.

### Approved SFP Transceivers

The following list of approved Gigabit Ethernet SFP transceivers is correct at the time of publication.

- 3CSFP91 SFP (1000BASE-SX)
- 3CSFP92 SFP (1000BASE-LX)
- 3CSFP93 SFP (1000BASE-T)
- 3CSFP93-4500 SFP (1000BASE-T)
- 3CSFP97 SFP (1000BASE-LH70)



*The 3CSFP93-4500 is approved for use in the Switch 4500 only.*

To access the latest list of approved SFP transceivers for the Switch on the 3Com Corporation World Wide Web site, enter this URL into your internet browser: **<http://www.3com.com/transceiver>**

1000BASE-SX, 1000BASE-LX, 1000BASE-LH70 or 1000BASE-T SFP transceivers must be matched with the correct cable type as follows:

- 1000BASE-SX SFP transceiver  
Use this transceiver to connect Gigabit Ethernet SFP ports on the Switch directly to a multimode fiber-optic cable.
- 1000BASE-LX SFP transceiver  
Use this transceiver to connect Gigabit Ethernet SFP ports on the Switch directly to a single-mode fiber-optic cable or to a multimode fiber using a conditional launch cable.
- 1000BASE-LH70 SFP transceiver  
Use this transceiver to connect Gigabit Ethernet SFP ports on the Switch directly to a single-mode fiber-optic cable.
- 1000BASE-T SFP transceiver  
This transceiver uses Category 5 copper cabling with RJ-45 connectors and supports segment lengths of up to 100 m (328 ft).



*If the SFP transceiver is faulty, it will not operate within the Switch. See "Solving Hardware Problems" on page 65.*



*3Com recommends that you only use Gigabit Ethernet SFPs supplied by 3Com. If the SFP transceiver is invalid it will not be recognized by the Switch.*

## Inserting an SFP Transceiver

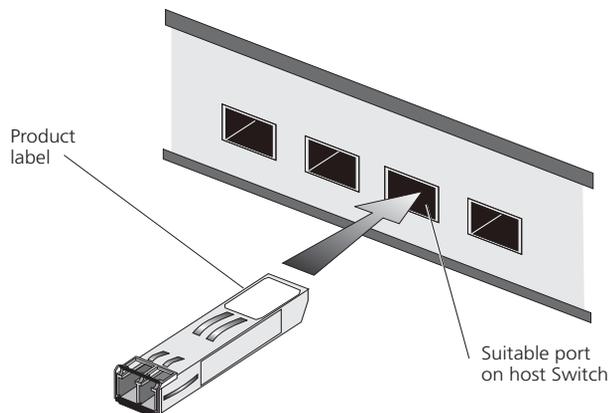
Use the following sequence of steps to activate the SFP ports:



*SFP transceivers are hot-insertable and hot-swappable. You can remove them from and insert them into an appropriate SFP port without having to power down the Switch.*

- 1 The SFP transceiver is keyed and there is only one way in which it can be installed correctly. It is not necessary to power-down your Switch.
- 2 Hold the transceiver so that the connector is toward you and the product label is visible. Ensure the wire release lever is closed (in the upright position).
- 3 Gently slide the transceiver into the SFP port until it clicks. If the transceiver does not click into place, remove it, turn it over and re-insert.
- 4 Remove the plastic protective cover if fitted.

**Figure 8** Inserting an SFP Transceiver



- 5 Check the LEDs on the front of the Switch to ensure that it is operating correctly. Refer to "LEDs" on page 17 for more information.

## Removing an SFP Transceiver

If you wish to remove the transceiver (it is not necessary to power-down your Switch):

- 1 Disconnect the cable from the transceiver.
- 2 Move the wire release lever downwards until it is pointing toward you.
- 3 Pull the wire release lever toward you to release the catch mechanism; the transceiver will then easily slide out.

## Packing and Shipping the Switch 4500

This section describes how to correctly package your Switch 4500 should you need to return the Switch to 3Com.

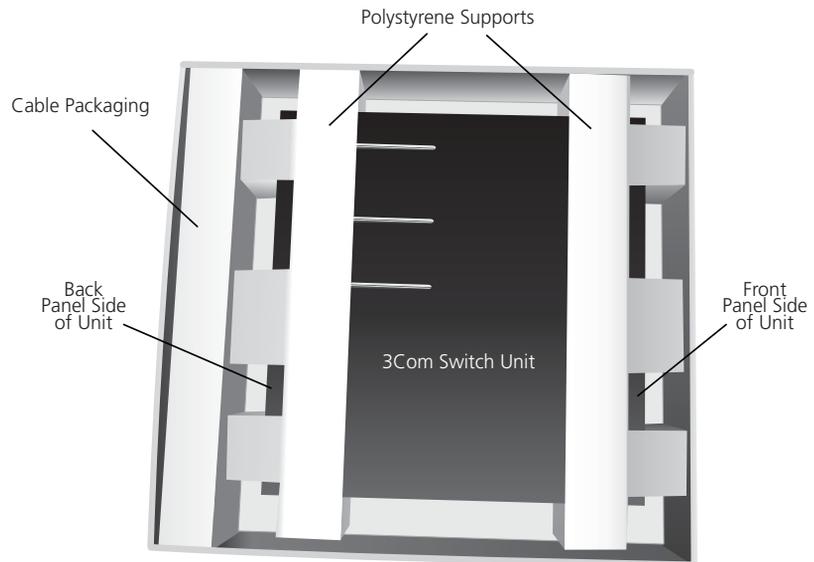


**WARNING:** *The unit should be packaged safely to ensure that you do not invalidate the repair.*

Follow these steps to ensure that you package your unit correctly:

- 1 Orientate your Switch so that the back panel is on the left side (looking down at the top of the unit) as shown in Figure 9.
- 2 Secure one of the polystyrene supports to the back panel side of the unit. Secure the other support to the front panel side of the unit.
- 3 Place the unit in the box with the back panel next to the cable packaging.

**Figure 9** Correct Orientation When Packing the Switch 4500



# 3

## SETTING UP FOR MANAGEMENT

To make full use of the features offered by your Switch, and to change and monitor the way it works, you have to access the management software that resides on the Switch. This is known as managing the Switch.

Managing the Switch can help you to improve the efficiency of the Switch and therefore the overall performance of your network.

This chapter explains the initial set up of the Switch and the different methods of accessing the management software to manage a Switch. It covers the following topics:

- Methods of Managing a Switch
- Setting Up Overview
- Manually Configuring IP Information
- Viewing Automatically Configured IP Information
- Setting Up Command Line Interface Management
- Setting Up Command Line Interface Management using SSH
- Setting Up Web Interface Management
- Setting Up SNMP Management V1 or V2
- Default Users and Passwords

## Methods of Managing a Switch

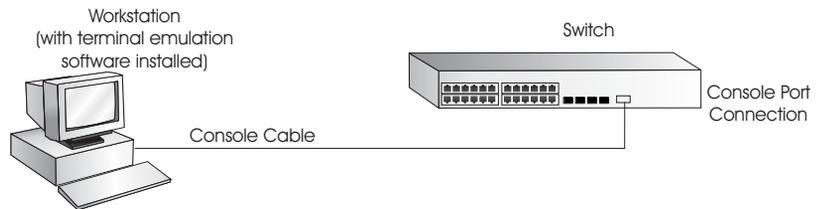
To manage your Switch you can use one of the following methods:

- Command line interface management
- Command line interface management using SSH
- Web interface management
- SNMP management

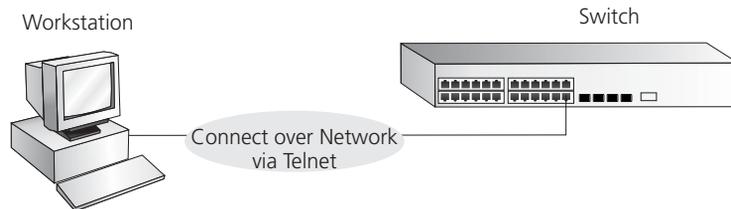
## Command Line Interface Management

Each Switch has a command line interface (CLI) that allows you to manage the Switch from a workstation, either locally via a console port connection (see Figure 10), or remotely over the network (see Figure 11).

**Figure 10** CLI Management via the Console Port



**Figure 11** CLI Management over the Network



Refer to “Setting Up Command Line Interface Management” on page 52.

There are two main views in the CLI:

**User View** — this view is shown when you first connect to the Switch and shows basic information about operation and statistics. The prompt for user view is `<4500>`.

**System View** — this view enables you to configure the system parameters. To display this view, from user view enter `system-view`. The prompt for system view is `[4500]`.

### Command Line Interface Management using SSH

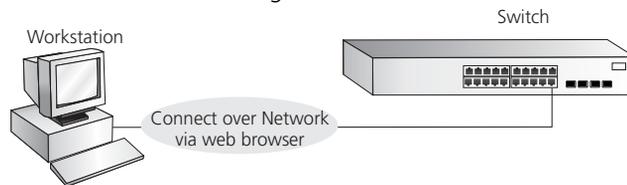
The Switch 4500 supports Secure Shell version 2.0 (SSHv2.0), allowing secure access to the Command Line Interface of the Switch.

If you use SSH to administer your Switch and the network traffic is intercepted, no passwords or configuration information will be visible in the data. To securely administer the Switch using the Command Line Interface you need a third party SSH client.

### Web Interface Management

Each Switch has an internal set of web pages that allow you to manage the Switch using a Web browser remotely over an IP network (see Figure 12).

**Figure 12** Web Interface Management over the Network

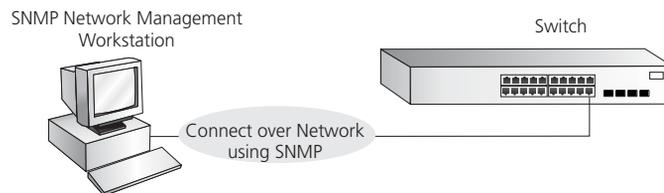


Refer to “Setting Up Web Interface Management” on page 54.

### SNMP Management

You can manage a Switch using any network management workstation running the Simple Network Management Protocol (SNMP) as shown in Figure 13. For example, you can use the 3Com Network Director software, available from the 3Com website.

**Figure 13** SNMP Management over the Network



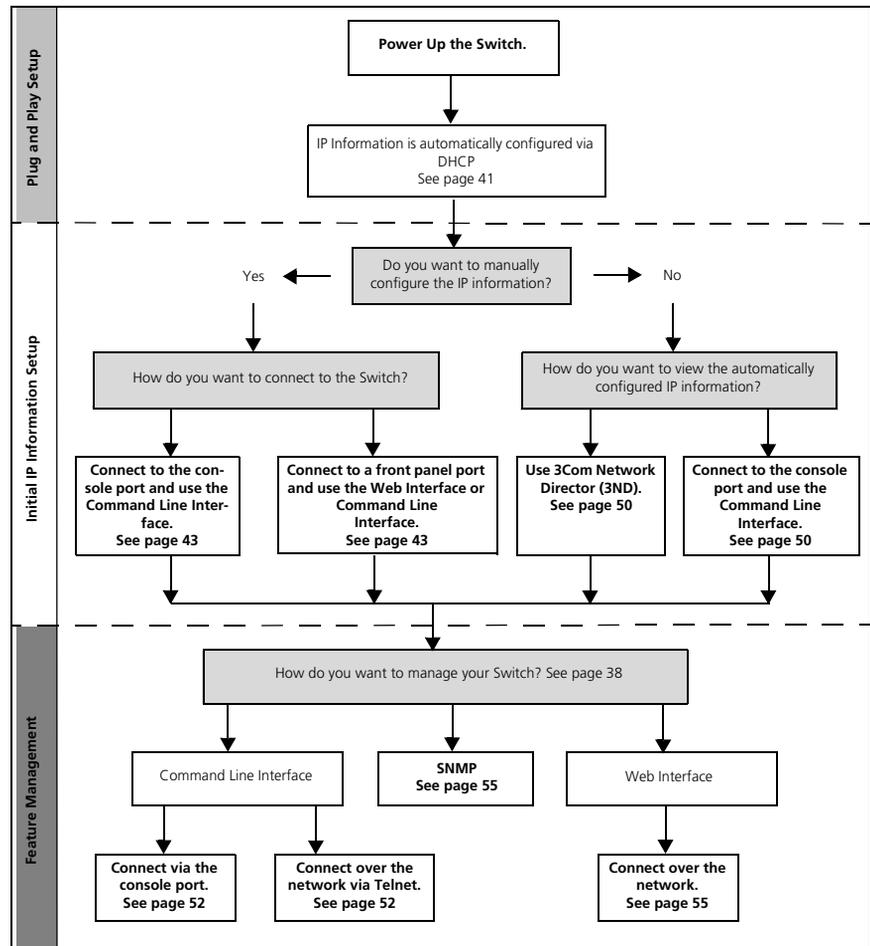
Refer to “Setting Up SNMP Management V1 or V2” on page 55.

## Setting Up Overview

This section gives an overview of what you need to do to get your Switch set up and ready for management when it is in its default state. The whole setup process is summarized in Figure 14. Detailed procedural steps are contained in the sections that follow. In brief, you need to:

- Configure IP information manually for your Switch or view the automatically configured IP information
- Prepare for your chosen method of management

**Figure 14** Initial Switch Setup and Management Flow Diagram





**CAUTION:** To protect your Switch from unauthorized access, you must change all three default passwords as soon as possible, even if you do not intend to actively manage your Switch. For more information on default users and changing default passwords, see “Default Users and Passwords” on page 56.

## IP Configuration

You can use one of the following methods to allocate IP information to your Switch (essential if you wish to manage your Switch across the network).

### Manual IP Configuration

When you configure the IP information, the Switch remembers the information that you enter until you change it again.

You should use the Manual IP configuration method if:

- you do not have a DHCP server on your network, or
- you want to remove the risk of the IP address ever changing, or
- your DHCP server does not allow you to allocate static IP addresses. (Static IP addresses are necessary to ensure that the Switch is always allocated the same IP information.)



*For most installations, 3Com recommends that you configure the Switch IP information manually. This makes management simpler and more reliable as it is not dependent on a DHCP server, and eliminates the risk of the IP address changing.*

To manually enter IP information for your Switch, work through the “Manually Configuring IP Information” section on page 43.

### Automatic IP Configuration via DHCP

By default the Switch tries to configure itself with IP Information without requesting user intervention. It tries to obtain an IP address from a DHCP server on the network.

When using automatic IP configuration it is important that the IP address of the Switch is static, otherwise you will not know what the IP address is and it will be difficult to manage. Most DHCP servers allow static IP addresses to be configured so that you know what IP address will be allocated to the Switch. Refer to the documentation that accompanies your DHCP server.



*For a detailed description of how automatic IP configuration operates, refer to the Configuration Guide available on 3Com's Web Site at [www.3com.com](http://www.3com.com).*

You should use the automatic IP configuration method if:

- your network uses DHCP to allocate IP information, or
- flexibility is needed. If the Switch is deployed onto a different subnet, it will automatically reconfigure itself with an appropriate IP address, instead of you having to manually reconfigure the Switch.



*If the Switch is not allocated with an automatic IP address, the IP configuration will be blank or shown as ' ' ' ' .*

If you use the automatic IP configuration method, you need to discover the automatically allocated IP information before you can begin management. Work through the "Viewing Automatically Configured IP Information" section on page 49.

### **Preparing for Management**

Once your Switch's initial set up is complete you can set up your chosen management method as described in "Methods of Managing a Switch" on page 38.



*For detailed information about the specific web interface operations and command line interface commands and problem solving, refer to the "Command Reference Guide" available on 3Com's Web site at [www.3com.com](http://www.3com.com).*

---

## Manually Configuring IP Information

You can manually configure the Switch IP information in the following ways:

- Connecting to the console port — connect a workstation using a console cable to the console port of the Switch. You can then manually enter IP information using the command line interface (CLI).
- Connecting to a front panel port — connect a workstation using an Ethernet cable to a front panel port of the Switch. You can then manually enter IP information using the web interface or the command line interface (CLI).

### Connecting to the Console Port

To set up your Switch manually you can make a connection to the console port, (this example describes a local connection to the console port, rather than one via a modem). You can do this whilst the Switch is offline, that is, before you connect the Switch to a network, or whilst the Switch is online, that is, connected to a network.

#### Pre-requisites

- A workstation with terminal emulation software installed, such as Microsoft Hyperterminal. This software allows you to communicate with the Switch via the console port directly.
- Documentation supplied with the terminal emulation software.
- The console cable (RJ-45) supplied with your Switch.



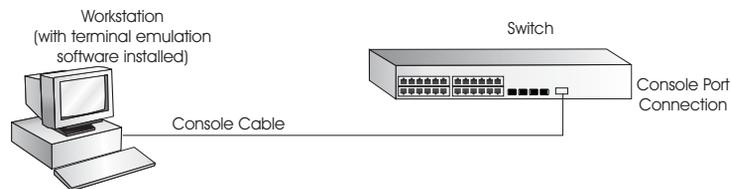
*You can find pin-out diagrams for the cable in Appendix A on page 87.*

- You need to have the following so that you can manually set up the Switch with IP information:
  - IP address
  - subnet mask
  - default gateway
  - management VLAN ID, normally set to the default value (1)

## Connecting the Workstation to the Switch

- 1 Connect the workstation to the console port using the console cable as shown in Figure 15.

**Figure 15** Connecting a Workstation to the Switch via the Console Port



To connect the cable:

- a Attach the RJ-45 connector on the cable to the console port of the Switch.
  - b Attach the other end of the cable to the workstation and tighten the retaining screws on the cable to prevent it from being loosened.
- 2 Open your terminal emulation software and configure the COM port settings to which you have connected the cable. The settings must be set to match the default settings for the Switch, which are:
    - 19,200 baud (bits per second)
    - 8 data bits
    - no parity
    - 1 stop bit
    - no hardware flow control

Refer to the documentation that accompanies the terminal emulation software for more information.

- 3 Power up the Switch. The Power on Self Test (POST) will now be performed.

## Setting Up the Switch with IP Information

You are now ready to manually set up the Switch with IP information using the command line interface.

- 1 The command line interface login sequence begins as soon as the Switch detects a connection to its console port.



*If the login prompt does not begin immediately, press Return a few times until it starts.*

- At the login and password prompts, enter **admin** as your user name and press *Return* and at the password prompt press *Return* again. If you have logged on correctly, <4500> should be displayed as shown in Figure 16.



Once you have logged in you will automatically be in User View.

**Figure 16** User View Login

```

*****
*           All rights reserved (1997-2005)           *
*   Without the owner's prior written consent,       *
*no decompiling or reverse-engineering shall be allowed.*
*****

Login authentication

Username:admin
Password:
<4500>
%Apr  5 17:22:13:289 2000 4500 SHELL/5/LOGIN:- 1 - admin(161.71.164.118) in unit
1 login_
    
```

- Enter the **system-view** command and *Enter*.



To confirm that you are in the System View, the following should be displayed:

```
[ 4500 ]
```

- Enter **interface vlan 1** and *Enter*.
- Enter the IP address and subnet mask for the Switch as follows:

```
ip address xxx.xxx.xxx.xxx mmm.mmm.mmm.mmm
```

and *Enter*.

(where xxx.xxx.xxx.xxx is the IP address and mmm.mmm.mmm.mmm is the subnet mask of the Switch)

- Select the **quit** command and enter the default gateway for the Switch:

```
ip route-static 0.0.0.0 0.0.0.0 xxx.xxx.xxx.xxx
```

(where xxx.xxx.xxx.xxx is the IP address of the default gateway)

- From the User View, enter the **save** command to save the configuration to your Switch as the configuration is not saved automatically when the Switch is powered down.

The initial set up of your Switch is now complete and the Switch is ready for you to set up your chosen management method. See “Methods of Managing a Switch” on page 38.

If you do not intend to use the command line interface via the console port to manage the Switch, you can disconnect the serial cable and close the terminal emulator software.

### Connecting to a Front Panel Port

To set up your Switch manually you can, alternatively, make a connection to a front panel port. To do this you will need an IP address, refer to “Viewing Automatically Configured IP Information” on page 49 for more information.



*The procedure described in this section assumes the unit has been powered up in standalone mode.*

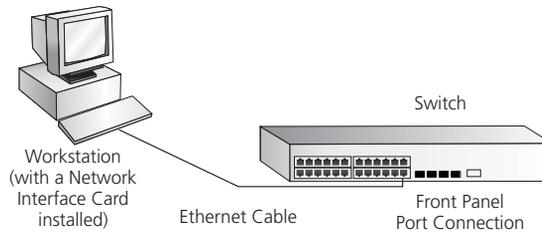
#### Pre-requisites

- A workstation running a suitable operating system — refer to “Choosing a Browser” on page 54.
- A Network Interface Card (NIC).
- A Category 5 twisted pair Ethernet cable with RJ-45 connectors at both ends.
- A suitable Web browser — refer to “Choosing a Browser” on page 54.
- Existing IP address of the Switch.
- You need to have the following so that you can manually set up the Switch with IP information:
  - IP address
  - subnet mask
  - default gateway
  - management VLAN ID, normally set to the default value (1)

## Connecting the Workstation to the Switch

- 1 Connect the workstation to a front panel port using an Ethernet cable as shown in Figure 17.

**Figure 17** Connecting a Workstation to the Switch via a Front Panel Port



To connect the cable:

- a Attach an RJ-45 connector at one end of the Ethernet cable to the Network Interface Card (NIC) in the workstation.
- b Connect the RJ-45 connector at the other end of the cable to one of the front panel ports on the Switch.



*Do not interconnect the Switch to any other unconfigured Switch.*

## Setting Up the Switch with IP Information

You are now ready to manually set up the Switch with IP information. You can do this using the Web interface or the command line interface (CLI) via telnet.

### Using the Web Interface

- 1 Power-up the Switch. This takes approximately one minute.
- 2 Open a suitable Web browser and enter the IP address of your Switch in the *Address* field.



*If there is no response, wait for one minute then re-enter the IP address.*



*If a pop up message appears displaying download and install simplified Chinese information, click Cancel.*

- 3 At the login and password prompts, enter **admin** as your user name and press *Return* and at the password prompt (default user name and password) press *Return* again. If you have logged on correctly, the Device View of the Switch is displayed.

- 4 To enter basic setup information for the Switch, select *Administration > IP Setup* and then follow the wizard through various system screens to enter the IP address and subnet mask that you want the Switch to use when it is connected to the network. The final page displays a summary of the information entered.
- 5 Select *Save Configuration* to save the configuration to your Switch.

The initial set up of your Switch is now complete and the Switch is ready for you to set up your chosen management method. See “Methods of Managing a Switch” on page 38.

### ***Using Command Line Interface via Telnet***

- 1 To start a Telnet session to the unit, click *Start* in Microsoft Windows 95/98/2000/NT/XP.
  - a Click *Run*.
  - b In the dialogue box that appears type the IP address of the unit, that is: **Telnet xxx.xxx.xxx.xxx**  
(where xxx.xxx.xxx.xxx is the IP address of the Switch)
  - c Click *OK*.
- 2 Press *Enter* to open a login prompt.



*If the login prompt does not begin immediately, press Return a few times until it starts.*

- 3 At the login and password prompts, enter **admin** as your user name and press *Return* at the password prompt. If you have logged on correctly, <4500> is displayed as shown in the example in Figure 18.

**Figure 18** User View Login via Telnet

```

*****
*      All rights reserved (1997-2005)      *
*      Without the owner's prior written consent,      *
*no decompiling or reverse engineering shall be allowed.*
*****

Login authentication

Username:admin
Password:
<4500>
%Apr  5 17:22:13:289 2000 4500 SHELL/5/LOGIN:- 1 - admin<161.71.164.118> in unit
1 login_

```

- 4 Enter the **system-view** command and *Enter*.
- 5 Enter **interface vlan 1** and *Enter*.
- 6 Enter the IP address and subnet mask for the Switch as follows:  
**ip address xxx.xxx.xxx.xxx mmm.mmm.mmm.mmm**  
 (where xxx.xxx.xxx.xxx is the IP address and mmm.mmm.mmm.mmm is the subnet mask of the Switch)
- 7 Enter the default gateway for the Switch:  
**ip route-static 0.0.0.0 0.0.0.0 xxx.xxx.xxx.xxx**  
 (where xxx.xxx.xxx.xxx is the IP address of the default gateway)
- 8 From the User View, enter the **save** command to save the configuration to your Switch as the configuration is not saved automatically when the Switch is powered down.

The initial set up of your Switch is now complete and the Switch is ready for you to set up your chosen management method. See “Methods of Managing a Switch” on page 38.

---

## Viewing Automatically Configured IP Information

If you allow the Switch to automatically configure its own IP information you need to discover and view the IP information before you can begin to manage the Switch. You can discover the IP information in two ways:

- Using 3Com Network Director — this application will auto-discover the Switch and display the automatically allocated IP information assigned to the Switch.

- Connecting to the Console Port — connect a workstation using a console cable to the console port of the Switch. You can then view the IP information automatically assigned to the Switch using the command line interface (CLI).

**Using 3Com Network Director** You can use the 3Com Network Director application (available from the 3Com website) to discover the automatically allocated IP information.

- 1 Connect your Switch to the network.
- 2 Power-up the Switch and wait for two minutes.
- 3 Launch 3Com Network Director and run the Auto-discovery wizard.

3Com Network Director will auto-discover the new Switch and display the IP information that has been automatically allocated to the Switch.



*Most DHCP and BootP servers allow static IP addresses to be configured so that you know what IP address the Switch will be given. Refer to the documentation that accompanies your DHCP or BootP server.*



*If your network does not have a DHCP or BootP server, the workstation running 3Com Network Director must be on the same subnet as the Switch, because Auto-IP addresses are non-routable.*

### Connecting to the Console Port

Alternatively, you can view the automatically configured IP information via the command line interface (CLI) through a connection to the console port. (This example describes a local connection to the console port, rather than a remote one via a modem.) For further information on connecting via the console port see “Connecting the Workstation to the Switch” on page 44.

#### Viewing IP Information via the Console Port

You are now ready to view the automatically allocated IP information using the command line interface.

- 1 Connect your Switch to the network using the Ethernet cable. As soon as a network connection is made the Switch begins the automatic IP configuration process.



*The automatic IP configuration process usually completes within one minute.*

- 2 The command line interface login sequence begins as soon as the Switch detects a connection to its console port.



If the login prompt does not begin immediately, press *Return* a few times until it starts.

- 3 At the login and password prompts, enter **admin** as your user name and press *Return* at the password prompt. If you have logged on correctly, <4500> is displayed as shown in the example in Figure 19.

**Figure 19** User View Login

```

*****
* All rights reserved (1997-2005) *
* Without the owner's prior written consent, *
*no decompiling or reverse-engineering shall be allowed.*
*****

Login authentication

Username:admin
Password:
<4500>
%Apr 5 17:22:13:289 2000 4500 SHELL/5/LOGIN:- 1 - admin<161.71.164.118> in unit
1 login_

```

- 4 Enter **display ip interface br** to view a summary of allocated IP addresses.

The initial set up of your Switch is now complete and the Switch is ready for you to set up your chosen management method. See “Methods of Managing a Switch” on page 38.

If you do not intend to use the command line interface via the console port to manage the Switch, you can logout, disconnect the serial cable and close the terminal emulator software.

---

## Setting Up Command Line Interface Management

This section describes how you can set up command line interface management using a local console port connection or over the network.

### User Interface Overview

User interface configuration is provided by the Switch to configure and manage the port data. There are two types of user interfaces:

AUX User Interface — used to log in to your Switch via the console port. A fabric can have up to eight AUX user interfaces.

VTY User Interface — used to Telnet to the Switch. The Switch can have up to five VTY user interfaces.

### CLI Management via the Console Port

To manage a Switch using the command line interface via the local console port connection:

- 1 Ensure you have connected your workstation to the console port correctly as described in “Connecting to the Console Port” on page 43.
- 2 Your Switch is now ready to continue being managed and/or configured through the CLI via its console port.

### CLI Management over the Network

To manage a Switch using the command line interface over a network using Telnet:

- 1 Ensure you have already set up the Switch with IP information as described in “Methods of Managing a Switch” on page 38.
- 2 Check that you have the IP protocol correctly installed on your management workstation. You can check this by trying to browse the World Wide Web. If you can browse, the IP protocol is installed.
- 3 Check you can communicate with the Switch by entering a **ping** command at the DOS prompt in the following format:

```
c:\ ping xxx.xxx.xxx.xxx
```

(where xxx.xxx.xxx.xxx is the IP address of the Switch)

If you get an error message, check that your IP information has been entered correctly and the Switch is powered up.

- 4 To open a Telnet session via the DOS prompt, enter the IP address of the Switch that you wish to manage in the following format:

```
>telnet xxx.xxx.xxx.xxx
```

(where xxx.xxx.xxx.xxx is the IP address of the Switch)



*If opening a Telnet session via third party software you will need to enter the IP address in the format suitable for that software.*

- 5 At the login and password prompts, enter **admin** as your user name and press Return at the password prompt (or the password of your choice if you have already modified the default passwords).



*If the login prompt does not display immediately, press Return a few times until it starts.*

- 6 If you have logged on correctly, the Switch you wish to manage is displayed as <4500> (as shown in l on page 45).

## Setting Up Command Line Interface Management using SSH

This section describes how you can set up Command Line Interface management using SSH over a network.

To manage a Switch using the command line interface over a network using SSH:

- 1 Ensure you have already set up the Switch with IP information as described in “Methods of Managing a Switch” on page 38.
- 2 Check that you have the IP protocol correctly installed on your management workstation. You can check this by trying to browse the World Wide Web. If you can browse, the IP protocol is installed.
- 3 Check you can communicate with the Switch by entering a **ping** command at the DOS prompt in the following format:

```
c:\ ping xxx.xxx.xxx.xxx
```

(where xxx.xxx.xxx.xxx is the IP address of the Switch)

If you get an error message, check that your IP information has been entered correctly and the Switch is powered up.



*The switch automatically generates a host key pair when it is powered up for the first time, or after any reset to factory defaults. Host key generation may take a while, during which time SSH connections to the switch will be refused.*

- 4 Install an SSH client application on the workstation you want to use to access the switch.



*3Com recommends the following SSH clients; PuTTY, OpenSSH and SSH Communications Security Corp Secure Shell.*

- 5 Open an SSH session and access the Switch using the Switch's IP address and port number.



*The first time you connect to the switch the client will ask you to confirm that the host key is correct for the device.*

- 6 The Switch and the SSH client will authenticate each other and a secure connection will be established.

- 7 Enter your usual username and password to access the CLI commands.



*For increased security please change the default password when using SSH for the first time.*



*For further information on generating a host key on your switch and transferring keys to the Switch using TFTP server please refer to the Configuration Guide that is supplied with your Switch.*

## Setting Up Web Interface Management

This section describes how you can set up web interface management over the network.

### Pre-requisites

- Ensure you have already set up the Switch with IP information as described in “Methods of Managing a Switch” on page 38.
- Ensure that the Switch is connected to the network using a Category 5 twisted pair Ethernet cable with RJ-45 connectors.
- A suitable Web browser.

### Choosing a Browser

To display the web interface correctly, use one of the following Web browser and platform combinations:

**Table 12** Supported Web Browsers and Platforms

	Windows 2000	Windows XP	Windows Server 2003	Red Hat Linux 9	Solaris 7/9
Netscape 7.1	✓	✓	✗	✗	✓
Internet Explorer 5.5	✓	✓	✓	✗	✗
Internet Explorer 6.0	✓	✓	✓	✗	✗
Mozilla 1.4	✗	✗	✗	✓	✓

For the browser to operate the web interface correctly, JavaScript™ and Cascading Style Sheets must be enabled on your browser. These features are enabled on a browser by default. You will only need to enable them if you have changed your browser settings.

### Web Management Over the Network

To manage a Switch using the web interface over an IP network:

- 1 Check that you have the IP protocol correctly installed on your management workstation. You can check this by trying to browse the World Wide Web. If you can browse, the IP protocol is installed.
- 2 Check you can communicate with the Switch by entering a **ping** command at the DOS prompt in the following format:  

```
c:\ ping xxx.xxx.xxx.xxx
```

 (where xxx.xxx.xxx.xxx is the IP address of the Switch)  
 If you get an error message, check that your IP information has been entered correctly and the Switch is powered up.
- 3 Open your web browser and enter the IP address of the Switch that you wish to manage in the URL locator, for example, in the following format:  

```
http://xxx.xxx.xxx.xxx
```
- 4 At the login and password prompts, enter **admin** as your user name and press Return at the password prompt (or the password of your choice if you have already modified the default passwords).
- 5 Click on the *Device View* button to display the web management options.

---

### Setting Up SNMP Management V1 or V2

Any network management application running the Simple Network Management Protocol (SNMP) can manage a Switch if:

- The correct Management Information Bases (MIBs) are installed on the management workstation.
- The management workstation is connected to the Switch using a port in VLAN 1 (the Default VLAN). By default, all ports on the Switch are in VLAN 1.



*You can use the 3Com Network Director application that is available from the 3Com website to provide SNMP management for your Switch. If you use 3Com Network Director it automatically loads the correct MIBs and necessary files onto your workstation.*

- Pre-requisites**
- Documentation supplied with the SNMP network management application software.

The default read community string is **public**. To change this setting in System View, enter **display snmp community**.

The default write community string is **private**. To change this setting in System View, enter **display snmp community**.



*To manage your Switch using an SNMP network management application, you need to specify SNMP community strings for the users defined on the Switch. You can do this using the command line interface **system management snmp community** command — refer to the command line interface section of the “SuperStack 4 Switch Command Reference Guide” for more information.*



*SNMP V3 is on as default. All commands are in snmp menu in System View.*

---

## Default Users and Passwords

If you intend to manage the Switch using the web interface or the command line interface, or to change the default passwords, you need to log in with a valid user name and password. The Switch has three default user names, and each user name has a different password and level of access. These default users are listed in Table 13.



**CAUTION:** *To protect your Switch from unauthorized access, you must change all three default passwords as soon as possible, even if you do not intend to actively manage your Switch.*

**Table 13** Default Users

User Name	Default Password	Access Level
monitor	monitor	monitor — the user can view all manageable parameters, except special/security features, but cannot change any manageable parameters
manager	manager	manager — the user can access and change the operational parameters but not special/security features
admin	(no password)	security — the user can access and change all manageable parameters



*Use the admin default user name (no password) to login and carry out initial Switch setup.*

To set a password for the admin user in the CLI, enter the following from system view:

```
[4500]local-user admin <cr>  
[4500-luser-admin]password simple xxxxxxxx
```

(where **xxxxxxx** is your chosen password).

Save the configuration in the User View.



*For information on the lost password procedure please refer to the Configuration Guide that is supplied with your Switch.*



# 4

## CREATING A STACK

This chapter contains the information you need to create a stack. It covers the following topics:

- How To Interconnect Units
- Guidelines For Interconnecting Units
- Unit Numbering within the Stack

---

### How To Interconnect Units

Up to eight 3Com Switch 4500 units can be interconnected to create a stack and then treated as a single manageable unit with one IP address.

You can interconnect your Switches to create a stack using a standard 1000 Mbps Ethernet connection.



*You can only create a stack by interconnecting a 3Com Switch 4500 with other 3Com Switch 4500s.*



*This section assumes you have either set up your units for management as detailed in Chapter 3 "Setting Up for Management" or that you are using a console cable connected to the console port to set up and allocate IP addresses and so on.*



*3Com recommends that you do not physically connect the cables on your stack ports until you have carried out the initial configuration of the stack ports as detailed below.*

- 1 Ensure that the Switch units that you wish to interconnect have the latest software agent installed. You can use the **display version** command to check this.
- 2 Enable the 'up port' and the 'down port' on each Switch to operate in stack mode using the following CLI command. From the System View enter **stack-port gigabitethernet 1/0/51 enable**, for example.



*As with all Switch 4500 CLI commands, the format for entering a port-specific command is x/y/z, where x = unit number, y = module number (in the case of the Switch 4500 this will always be 0), z = port number.*

- 3 Connect the stack-enabled 'up' port on one Switch 4500 unit to the stack-enabled 'down' port on another Switch 4500 unit using the appropriate connection method for your Switch.
- 4 Save all configuration settings. From the User View, enter the **save** command to save the configuration to your Switch.

---

## Guidelines For Interconnecting Units



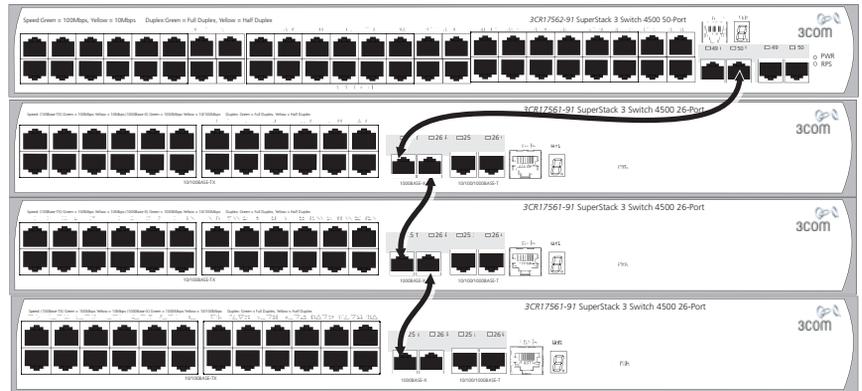
This section offers some guidelines for creating a stack. Using these guidelines will help prevent problems arising when setting up your stack.

*The 3Com Switch 4500 supports stacking by daisy-chaining from unit to unit over standard Gigabit Ethernet connections. Resilient stacking, with a return loop from bottom to top of a stack, is not supported and will disable stack operation.*

- The maximum number of Switch units that can be interconnected is eight.
- You can only create a stack by interconnecting a 3Com Switch 4500 with other 3Com Switch 4500s.
- Stacking is only supported using Gigabit ports.
- The stacking connections must be from one combo port pair on a unit to the opposite combo port pair on the next unit. Refer to Figure 20 to see how this looks in a stack of units.
- The stacking ports must be configured for "fabric mode" before they can be used for stacking. By default, fabric mode is enabled for ports 25/26 and 49/50. The configuration can be changed to move fabric mode to the other port pair; this requires a reboot of the system.
- 3Com strongly recommends that you upgrade all Switches to be interconnected to the latest software agent.
- 3Com recommends that you remove the configuration file from a Switch unit that has previously been used elsewhere in your network before you interconnect to an existing unit. If you do not do this, problems may be caused by conflicting Switch configurations. Use the **dir** command from the User View to display the configuration files stored on the Switch and locate the `[filename].cfg` file. Do **NOT** under any circumstances remove the `3comoscfg.def` file (this is the default configuration file).

- When a port is operating in stack mode it will no longer be configurable in the normal way, that is, you cannot control port features such as auto-negotiation, VLANs, static addresses, STP, Aggregated Links, Resilient Links, and so on. However, it is possible to specify the stack VLAN.

**Figure 20** Stack example (using 4 units)



## Unit Numbering within the Stack

When a stack is created using the Switch 4500 the unit numbering can be determined in two ways.

- You can manually assign unit IDs 1 to 8 to specific units using the `change[self-unit, unit-id] to [1-8, auto-numbering]` command from the System View. If you manually assign unit IDs to a Switch via the `change` command the IDs will be retained after a power cycle.

If you add a unit to a stack that has previously been manually configured with a unit ID and this conflicts with an ID already within the stack, then the Switch with the lowest MAC address assumes the ID in question and the other unit will automatically renumber.



*3Com recommends that you manually assign the unit IDs within the stack if you wish to have predictability of knowing which units have which IDs at all times.*

- Stack topology is 'discovered' and the units auto-number their IDs.

Adding and removing units from the stack does not cause any renumbering to occur and the stack will continue to work normally.

Renumbering only occurs when the stack is next power cycled if the units are configured to auto-number.

The unit LEDs will display the unit number in the stack, from 1 to 8.

If you are having problems, refer to “Solving Stack Formation Problems” on page 69.

# 5

## PROBLEM SOLVING

This chapter helps you to diagnose and solve problems you may have with the operation of your Switch. There is also an explanation of IP addressing and upgrading software.

The topics covered are:

- Solving Problems Indicated by LEDs
- Solving Hardware Problems
- Solving Communication Problems
- Solving Stack Formation Problems

If you experience a problem that is not listed here, it may be included in the Support section of the Switch 4500 Command Reference Guide available on 3Com's Web site at [www.3com.com](http://www.3com.com).

For Technical Support information, see Appendix C.

---

## Solving Problems Indicated by LEDs

If the LEDs on the Switch indicate a problem, refer to the list of suggested solutions below.

### **The PWR LED does not light**

Check that the power cable is firmly connected to the Switch and to the supply outlet. If the connection is secure and there is still no power, you may have a faulty power cord or an internal fault. Firstly, check the power cord by:

- testing it in another device.
- connecting a working power cord to the 'problem' device then contact your supplier for advice.

### **On powering-up, the PWR LED lights Red**

The Switch unit has failed its Power On Self Test (POST) because of an internal problem. The fault type will be indicated on the unit LEDs. Contact your supplier for advice.

### **On powering-up, the PWR LED is flashing yellow**

A port has failed and has been automatically disabled. You can verify this by checking that the Port LED is quickly flashing Yellow. If a port fails, the Switch passes its Power On Self Test and continues to operate normally.

### **A Port LED is flashing yellow**

The port has failed and has been automatically disabled. The Switch passes its Power On Self Test and continues to operate normally, even if one or more ports are disabled.

### **A link is connected and yet the Port LED does not light**

Check that:

- The Switch and the device at the other end of the link (or cable) are connected securely.
- The devices at both ends of the link are powered-up
- The quality of cable is satisfactory
- Auto-negotiation settings are the same at both ends.

Auto-negotiation problems will occur with 10BASE-T or 100BASE-T where auto-negotiation is disabled and incorrect cables are being used (cross-over or straight)

Auto-negotiation problems will occur with fiber if:

- The Receiver (RX) and Transceiver (TX) cable connectors are swapped
- Fibers are broken
- Auto-negotiation differs at either end (a link appears at the 'fixed' end and not at the auto-negotiation end)

---

## Solving Hardware Problems

In the rare event of your Switch unit experiencing a hardware failure, refer to the list of suggested solutions below.

### A fan failure warning message is received

Your Switch has a fan monitoring system that will generate fan failure warning messages. Fan failure could potentially reduce the lifetime of the Switch. The monitoring system polls the fan status at periodic intervals while the unit is powered up.

If one fan has failed in the Switch, a warning message will be generated in the following ways:

- **Unit LED** — the seven segment display will show a green flashing 'f'.
- **RMON Trap** — if configured, an RMON trap is generated and sent to the management workstation.
- **Command Line Interface** — an indication of a general hardware failure is provided through the Top level menu displayed when logging on to the CLI. For more detailed information about the failure select the **display logbuffer** command.
- **Web interface** — an indication of fan failure is provided through the Device Summary table for the specific unit. In addition all Summary tables turn red to indicate the fan failure.

If a fan failure warning message is generated:

- 1 Power off the unit.
- 2 Check that the air vents are not obstructed.

- 3 Power cycle the unit. To do this, remove and reconnect the AC mains supply. If the unit has no AC main supply, remove and reconnect the DC RPS supply.
- 4 If another fan failure warning message is generated via the Command Line Interface or the Web interface, return the unit to 3Com.

### **Unit fails, no SNMP fan failure message is received**

- 1 Power cycle the unit. To do this, remove and reconnect the AC mains supply. If the unit has no AC mains supply, remove and reconnect the DC RPS supply.
- 2 Check the command line interface (**display logbuffer** command) to determine whether a thermal shutdown has occurred.
- 3 If no, return the unit:  
If yes, check that:
  - The air vents are not obstructed.
  - The ambient temperatures and environmental conditions meet those specified in Appendix B.
- 4 Power cycle the unit. If a further thermal shutdown occurs, and all environmental conditions are satisfactory, return the unit to 3Com.

### **Error message indicating that the SFP transceiver is invalid**

The Switch has identified that the SFP does not meet the minimum requirements for the Switch and has disabled the port. To correct this problem, completely remove the SFP and replace it with a 3Com approved SFP. See “Approved SFP Transceivers” on page 34.

### **Error message indicating that the SFP transceiver is faulty**

To correct this problem, completely remove the SFP and then reinsert it. Alternatively, insert another identical SFP. If the problem persists, contact 3Com Technical Support.

## Solving Communication Problems

If you experience communication problems with the Switch, ensure that:

- The Switch IP address and Management VLAN ID has been configured.
- If the Switch is separated from your management application by a router, ensure that the default gateway IP address within the Switch is the same as the IP address of the router.
- The Switch's IP address has been entered correctly in your network management application (such as 3Com Network Director).

The following is a brief overview of IP addressing, and how to obtain a registered IP address.

### IP Addressing

To be managed correctly, each device on your network (for example a Switch or Hub) must have a unique IP address. IP addresses have the format  $n.n.n.n$  where  $n$  is a decimal number between 0 and 255. An example IP address is 192.168.100.8.

The IP address is split into two parts:

- The first part ('192.168.100' in the example) identifies the network on which the device resides
- The second part ('.8' in the example) identifies the device within the network

The natural subnet mask for this example is 255.255.255.0.



*If your network has a connection to the external IP network, that is, you access the Internet, you must apply for a registered IP address.*

### How do you obtain a registered IP Address?

The IP registration system ensures that every IP address used is unique; if you do not have a registered IP address, you may be using an identical address to someone else and your network will not operate correctly.

InterNIC Registration Services is the organization responsible for supplying registered IP addresses. The following contact information is correct at time of publication:

World Wide Web site: **<http://www.internic.net>**

If your IP network is internal to your organization only, that is, you do not access the Internet, you may use any arbitrary IP address as long as it is not being used by another device on your network. 3Com suggests you use addresses in the range 192.168.0.0 to 192.168.255.255 with a subnet mask of 255.255.255.0.



*These suggested IP addresses are part of a group of IP addresses that have been set aside specially for use 'in house' only.*

### **A device is connected to a Switch 4500 PWR but power is not being supplied**

If power is not being supplied to a device connected to a Switch 4500 PWR, you should do the following checks:

- Check that the device is compliant with the 802.3af standard ref. [18].  
The 4500 PWR will only supply power through the front panel port to 802.3af compliant devices.
- Check that power budget for the Switch has not been exceeded.

If the power budget has been exceeded, then by default, the powered device connected to the Power over Ethernet port with the lowest priority port will lose power. However, if all the devices connected to the Switch have equal priority levels, then the port with the highest number will lose power.

By default, the Switch will allow a device to receive power as long as Power over Ethernet power supply has 18 watts spare in its power budget. If this much power is not available, the device will not be powered (unless it has a higher priority than existing powered ports) and a PoE fault will be reported for that port. If enough power subsequently becomes available, the port will be powered.

- Check that the port has not had a power limit imposed on it.

---

## **Solving Stack Formation Problems**

If you are having problems with correctly forming a stack, first ensure that Spanning Tree is enabled. If it is enabled, do the following:

- 1** Power off all units in the stack.
- 2** Check all the cable connections in the stack.
- 3** Check the ports have been enabled as stack ports.
- 4** Power on all units in the stack.



# 6

## UPGRADING SOFTWARE

This chapter describes how to upgrade software to your Switch 4500. It covers the following topics:

- The Contents of the Executable File
- Upgrading from the Command Line Interface
- Upgrading from the Bootrom Interface
- Bootrom Upgrade

---

## The Contents of the Executable File

The self extracting executable file (xxxxxxx.exe — where xxxxxxx is the file name of your Switch) contains the following:

- End User License
- Release Notes
- Application Software
- Web Software
- Bootrom Software
- Bundled File used with 3ND upgrade wizard — e.g.  
s3n03\_01\_04s56NetMan.zip

Bundled files with the extension NetMan.zip, can be used to upgrade your Switch using the 3Com Network Director Agent Update. Any attempt to upgrade individual .web, .btm or .app files using 3Com Network Director will fail. These files should be used to upgrade your Switch as described below.

Any attempt to upgrade the Switch directly with xxxxxxx.exe and xxxxxxxNetMan.zip will fail. The individual .web, .btm or .app files should be used to upgrade your Switch as described below.



*The Switch 4500 ships with software supporting 56-bit encryption. Check on [www.3Com.com](http://www.3Com.com) for more recent software or to access the available 168-bit encryption version (where allowed by applicable laws).*

---

## Upgrading from the Command Line Interface

This section describes how to upgrade files to your Switch from the Command Line Interface (CLI).

### Introduction

Before upgrading the software to your Switch from the CLI, it is important to check the contents of the flash to ensure that there is enough space to download the new files.



*The flash space needed for the new files is approximately 5.5 MB.*

- 1 To check the contents of the flash, logon to your Switch either via a telnet connection or directly via the console to display the User View in the CLI and enter the following:

```
dir unit1>flash:
```

A file list similar to the following is displayed:

```
Directory of unit1>flash:/
0  -rw-  714784  Apr 02 2005 01:36:16  s3p03_01_00.zip
1  -rw-   11043  Apr 02 2005 01:37:17  3ComOScfg.def
2  -rw-   11427  Apr 02 2005 00:01:01  3ComOScfg.cfg
3  -rw-  4529259  Apr 02 2005 01:39:57  s3n03_01_00s168.app

15367 KB total (10215 KB free)
```

- 2 You can check the contents of the flash for the remaining units in the fabric by entering:

```
dir unit2>flash:
dir unit3>flash:
dir unit4>flash:
dir unit5>flash:
dir unit6>flash:
dir unit7>flash:
```

The file list should contain one of each file type (**.zip**, **.def**, **.cfg** and **.app**).

- 3 Any additional files should be considered for deletion to allow maximum space for downloading the new files. To delete a file from the list enter:

```
delete/unreserved unit1>flash:/filename
```

To delete files from the list for the remaining units in a fabric, replace **unit1** with **unit2** (on the next line) and so on for each Switch in the fabric.

- 4 The **/unreserved** option will cause the file to be deleted from both the flash and the recycle-bin. To check that deleted files have been removed from the recycle-bin enter the following:

```
reset recycle-bin unit1>flash:/
```

If the recycle-bin is empty the following is displayed:

```
% File can't be found "unitN>flash:/"
```

To check that deleted files have been removed from the recycle-bin for the remaining units in a fabric, replace **unit1** with **unit2** and so on for each Switch in the fabric.

**Backup** The following steps enable you to backup each Switch in the fabric:

- 1 To back up the default configuration file on each Switch in the fabric, enter:

```
copy unit1>flash:/3ComOScfg.def
unit1>flash:/030100cfg.def
```

Replace **unit1** with **unit2** and so on for each Switch in the fabric.

- 2 To back up the active configuration file on each Switch in the fabric, enter:

```
copy unit1>flash:/3ComOScfg.cfg
unit1>flash:/030100cfg.cfg
```

Replace **unit1** with **unit2** and so on for each Switch in the fabric.

- 3 To back up the Web user interface file on each Switch in the fabric, enter:

```
copy unit1>flash:/s3p03_01_00.web
unit1>flash:/030100http.zip
```

Replace **unit1** with **unit2** and so on for each Switch in the fabric.

**TFTP** To upgrade software to your Switch via TFTP do the following:

- 1 To download the application file, enter:

```
tftp aaa.aaa.aaa.aaa get s3n03_01_00s168.app
```

(where aaa.aaa.aaa.aaa is the IP address of the TFTP server)

**s4n** indicates the Switch filename, see Table 14 for further details:

**Table 14** Switch 4500 Filenames

Filename Prefix	Switch
s3n	SuperStack 3 Switch 4500 software
s3o	SuperStack 3 Switch 4500 bootrom software

- 2 To download the Web user interface file, enter:

```
tftp aaa.aaa.aaa.aaa get s3p03_01_00.web
```

- 3 To download the default configuration file, enter:

```
tftp aaa.aaa.aaa.aaa get 3ComOScfg.def
```

- 4 To download the bootrom file, enter:

```
tftp aaa.aaa.aaa.aaa get s3o002_012_000.btm
```



*The bootrom firmware may not require upgrading for every software upgrade, therefore there may not be a new bootrom (.btm) file to download.*

### File Distribution

The following commands enable you to distribute your downloaded files to the remaining Switches in the fabric:

- 1 To copy the new software file to each Switch in the fabric, enter:

```
copy unit1>flash:/s3n03_01_00s168.app unit2>flash:/
```

Replace **unit2** with **unit3** and so on for each Switch in the fabric.

- 2 To copy the new default configuration file to each Switch in the fabric, enter:

```
copy unit1>flash:/3ComOScfg.def unit2>flash:/
```

Replace **unit2** with **unit3** and so on for each Switch in the fabric.

- 3 To copy the new Web user interface file to each Switch in the fabric, enter:

```
copy unit1>flash:/s3p03_01_00.web unit2>flash:/
```

Replace **unit2** with **unit3** and so on for each Switch in the fabric.

- 4 To copy the new Bootrom firmware file to each Switch in the fabric, enter:

```
copy unit1>flash:/s3o002_012_000.btm unit2>flash:/
```

Replace **unit2** with **unit3** and so on for each Switch in the fabric.

### Command Line Interface Switch Setup

- 1 To set the Switch to boot from the new software you have downloaded, enter the following:

```
boot boot-loader unit1>flash:/s3n03_01_00s168.app
```

To set the remaining Switches in the fabric to boot from the new software, replace **unit1** with **unit2** and so on for each Switch in the fabric.

- 2 To set the Switch to load the new bootrom firmware, enter:

```
boot bootrom unit1>flash:/s3o002_012_000.btm
```

To set the remaining Switches in the fabric to load the new bootrom firmware, replace **unit1** with **unit2** and so on for each Switch in the fabric.

- 3 You will now need to reboot the fabric for the changes to take effect. The Switch will upgrade the bootrom firmware and boot from the specified software .app file.

The files that you have saved in the backup phase should be deleted once the upgrade has completed successfully.

#### **FTP (via a network port)**

To upgrade software to your Switch via FTP do the following:

- 1 Enter the following command from User View:

```
ftp aaa.aaa.aaa.aaa
```

(where aaa.aaa.aaa.aaa is the IP address of the FTP server)

If the FTP server has been successfully located, the following information is displayed:

```
Trying...
Press CTRL+K to abort
Connected
```

Information on your FTP server is displayed, logon with your username and password.

- 2 To download the configuration file, enter:

```
get 3ComOScfg.def
```

The following information is displayed if the download has been successful:

```

200 PORT command successful.
150 Opening ASCII mode data connection for
vrpcfg.def(10986 bytes).....226 Transfer complete.

FTP: 10986 byte(s) received in 8.046 second(s) 1000.00
byte(s)/sec.

```

- 3 Enter **quit** to exit.

**XModem (via the console cable)** To upgrade software to your Switch via XModem do the following:

- 1 From the User View, enter:

```
xmodem get unit1>flash:/3ComOScfg.def
```

The following information is displayed:

```

      **** WARNING ****
xmodem is a slow transfer protocol limited to the
current speed
settings of the auxiliary ports.
During the course of the download no exec input/output
will be available!

Proceed?[Y/N]y
Destination filename [unit1>flash:/vrpcfg.def]?
Before pressing ENTER you must choose 'YES' or
'NO' [Y/N]:

```

- 2 Enter **y** to display the following message:

```

Download with XMODEM protocol...
...C..

```

- 3 As the file is downloading, start the XModem send file process with terminal emulation software, such as Microsoft Hyperterminal.

When the file download is complete the message Download successful! is displayed.

- 4 Repeat steps 1 to 3 for each of the remaining files.

---

## Upgrading from the Bootrom Interface

This section describes how to upgrade your Switch from the Bootrom Interface.

### Introduction

When the Switch is running the initial boot phase via the console, the following prompt is displayed with a five second countdown timer:

```
Press CTRL-B to enter Boot Menu... 4
```

followed by a password prompt:

```
password:
```

- 1 Select *Enter* (the default is no password) to display the following boot menu:

```
BOOT MENU
```

1. Download application file to flash
2. Select application file to boot
3. Display all files in flash
4. Delete file from flash
5. Modify bootrom password
6. Enter bootrom upgrade menu
7. Skip current configuration file
8. Set bootrom password recovery
9. Set switch startup mode
0. Reboot

```
Enter your choice(0-9):
```

- 2 Enter the appropriate menu number to select a specific option.

Before upgrading the software to your Switch from the Bootrom Interface it is important to check the contents of the flash to ensure that there is enough space to download the new files.

- 3** Select option 3 from the Boot Menu. A file list similar to the following is displayed:

```

Boot menu choice: 3
File Number      File Size(bytes) File Name
=====
1                4                snmpboots
2                151              private-data.txt
3(*)             4649088          s3n03_01_00s168.app
4                576218           s3p03_01_03_0024.zip
5                10301            3comoscfg.def
6                10369            3comoscfg.cfg
7                10369            [test.cfg]

```

```

Free Space: 10469376 bytes
The current application file is s3n03_01_00s168.app
(*)-with main attribute; (b)-with backup attribute
(*b)-with main and backup attribute

```

This option displays all the files in flash and also indicates the file that the Switch is currently set to boot from (marked with an asterix). A 'b' by the file number indicates the file is a backup boot file.

The files which are required by the Switch are:

```

s3p03_01_0024.zip
3comoscfg.def
3comoscfg.cfg
s3n03_01_00s168.app

```



*The s3n03\_01\_00s168.app file is the boot software. The name of this file will vary depending on the Switch type and the release version.*



*If the filename is in brackets, for example [test.cfg], this indicates that the file has been deleted from the CLI but is still present in the recycle-bin.*

Any additional files should be considered for deletion to allow maximum space for downloading the new files.

- 4** To delete a file from the list select option 4 from the Boot Menu and select the file number you wish to delete.

**TFTP** To upgrade software to your Switch via TFTP, do the following:

- 1 From the Boot Menu, select option 1 (Download application file to flash) to display the following:

```
1. Set TFTP protocol parameter
2. Set FTP protocol parameter
3. Set XMODEM protocol parameter
0. Return to boot menu
```

Enter your choice(0-3):

- 2 Select option 1 to display the following:

```
Load File name:
Switch IP address:
Server IP address:
```

- 3 Enter the file name, Switch IP address and Server IP address to display the following:

Are you sure to download file to flash? Yes or No(Y/N)

- 4 Enter **y** and the following information is displayed to indicate the file is downloading:

```
Attached TCP/IP Interface to netdrv0
Attaching network interface lo0...done
Loading.....done
Free flash Space: 10456064 bytes
Writing flash....done!
```

Please input the file attribute (main/backup/none):none  
done!

- 5 Repeat steps 1 to 4 for each of the remaining files.

**FTP** To upgrade software to your Switch via FTP, do the following:

- 1 From the Boot Menu, select option 1 (Download application file to flash) to display the following:

```
1. Set TFTP protocol parameter
2. Set FTP protocol parameter
3. Set XMODEM protocol parameter
0. Return to boot menu
```

Enter your choice(0-3):

- 2 Select option 2 to display the following:

```
Load File name:
Switch IP address:
```

```
Server IP address:
FTP User Name:
FTP User Password:
```

- 3 Enter the file name, Switch IP address, Server IP address and FTP user name and password to display the following:

```
Are you sure to download file to flash? Yes or No(Y/N)
```

- 4 Enter **y** and the following information is displayed to indicate the file is downloading:

```
Loading.....done
Free flash Space: 10456064 bytes
Writing flash.....done!
Please input the file attribute (main/backup/none):none
done!
```

- 5 Repeat steps 1 to 4 for each of the remaining files.

**XModem** To upgrade software to your Switch via XModem, do the following:

- 1 From the Boot Menu, select option 1 (Download application file to flash) to display the following:

```
1. Set TFTP protocol parameter
2. Set FTP protocol parameter
3. Set XMODEM protocol parameter
0. Return to boot menu
```

```
Enter your choice(0-3):
```

- 2 Select option 3 to display the following:

```
Please select your download baudrate:
```

```
1. 9600
2.*19200
3. 38400
4. 57600
5. 115200
0. Return
```

```
Enter your choice(0-5):
```

- 3 Select option 2 to set the baudrate to 19200.

You will also need to change the baudrate on Hyperterminal to 19200 bps and select XModem protocol.

- 4 Press *Enter* to start the download. The following information is displayed:

```
Now please start transfer file with XMODEM protocol
If you want to exit, Press <Ctrl+X>
Loading...CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
```

- 5 As the file is downloading, start the XModem send file process with terminal emulation software, such as Microsoft Hyperterminal.

When the download is complete, the following information is displayed:

```
Please input the file attribute (main/backup/none):none
done!
```

- 6 Repeat steps 1 to 5 for each of the remaining files.

### Bootrom Upgrade

This section describes how to indicate which file the Switch is to boot from once the software has been loaded.

- 1 From the Boot menu, select option 2 to display the following:

```
Select applicaton file to boot:
1. set application file to boot
2. set configuration files
3. set web files
0. return
```

Enter your choice (0-3):

- 2 Select option 2 to display a file list similar to the following:

```
Boot menu choice: 2
File Number   File Size(bytes) File Name
=====
1(*)           4649088          s3n03_01_00s168.app

Free Space: 10491904 bytes
The current application file is s3n03_01_00s168.app
(*)-with main attribute;(b)-with backup attribute
(*b)-with both main and backup attribute
```

Please input the file number to change:

An asterisk (\*) indicates the current main boot file.

A similar screen will be displayed for the configuration files and the web files.

In each case, the file is given the attribute "main" or "backup"

**Bootrom Upgrade via TFTP**

To upgrade the bootrom firmware from the Boot menu via TFTP do the following:

- 1 From the Boot menu, select option 6 to display the bootrom upgrade menu as shown:

```

Bootrom update menu:
1. Set TFTP protocol parameter
2. Set FTP protocol parameter
3. Set XMODEM protocol parameter
0. Return to boot menu
    
```

Enter your choice(0-3):

- 2 Select option 1 to display the following:

```

Load File name:
Switch IP address:
Server IP address:
    
```

- 3 Enter the file name, Switch IP address and Server IP address to display the following:

Are you sure to update your bootrom? Yes or No(Y/N)

- 4 Enter **y** and the following information is displayed to indicate the file is downloading:

```

Attached TCP/IP interface to netdrv0
Attaching network interface Io0...done
Loading.....
.....done
Bootrom updating.....done!
    
```

**Bootrom Upgrade via FTP**

To upgrade the bootrom firmware from the Boot menu via FTP do the following:

- 1 From the Boot menu, select option 6 to display the bootrom upgrade menu as shown:

```

Bootrom update menu:
1. Set TFTP protocol parameter
2. Set FTP protocol parameter
3. Set XMODEM protocol parameter
0. Return to boot menu
    
```

Enter your choice(0-3):

- 2 Select option 2 to display the following:

```
Load File name:
Switch IP address:
Server IP address:
FTP User Name:
FTP User Password:
```

- 3 Enter the file name, Switch IP address, Server IP address, FTP user name and password to display the following:

```
Are you sure to update your bootrom? Yes or No(Y/N)
```

- 4 Enter **y** and the following information is displayed to indicate the file is downloading:

```
Attached TCP/IP interface to netdrv0
Attaching network interface Io0...done
Loading.....done
.....done
Bootrom updating.....done!
```

**Bootrom Upgrade via XModem**

To upgrade the bootrom firmware from the Boot menu via XModem do the following:

- 1 From the Boot Menu, select option 6 to display the following:

- 1. Set TFTP protocol parameter
- 2. Set FTP protocol parameter
- 3. Set XMODEM protocol parameter
- 0. Return to boot menu

```
Enter your choice(0-3):
```

- 2 Select option 3 to display the following:

```
Please select your download baudrate:
```

- 1. 9600
- 2.\*19200
- 3. 38400
- 4. 57600
- 5. 115200
- 0. Return

```
Enter your choice(0-5):
```

- 3 Select option 2 to set the baudrate to 19200.

You will also need to change the baudrate on Hyperterminal to 19200 bps and select XModem protocol.



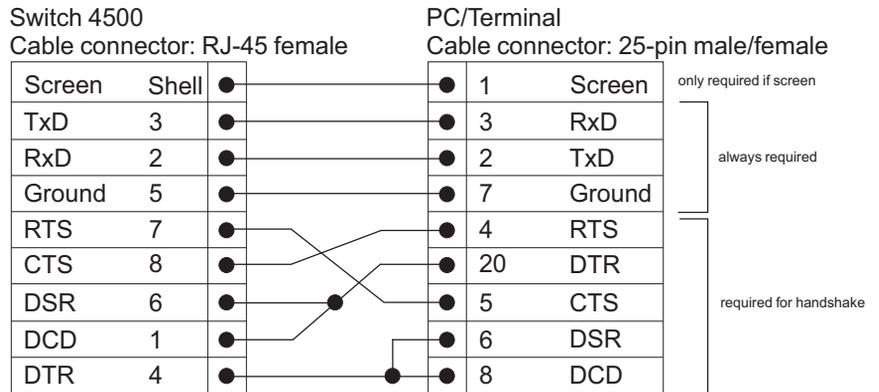


# A

## PIN-OUTS

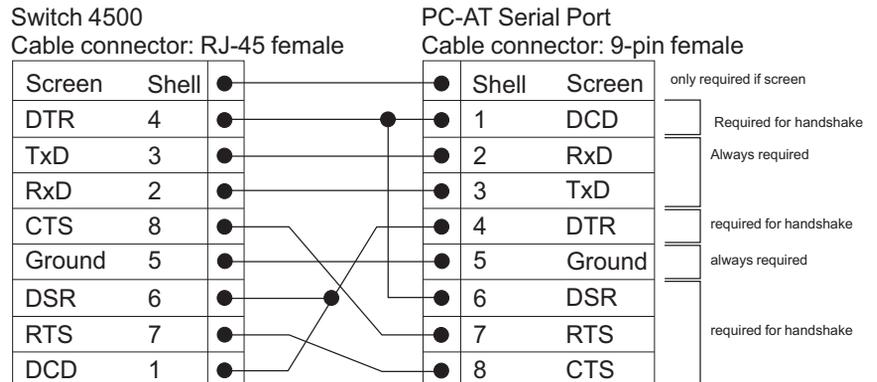
### Null Modem Cable

RJ-45 to RS-232 25-pin



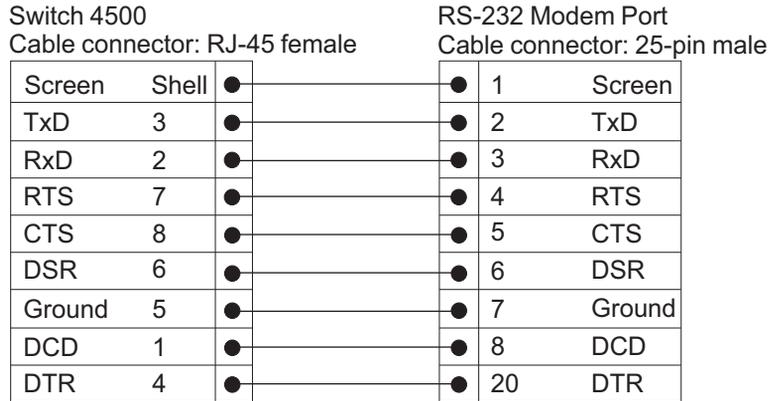
### PC-AT Serial Cable

RJ-45 to 9-pin



**Modem Cable**

RJ-45 to RS-232 25-pin



**Ethernet Port RJ-45  
Pin Assignments**

10/100 and 1000BASE-T RJ-45 connections.

**Table 10** Pin assignments

Pin Number	10/100	1000
<i>Ports configured as MDI</i>		
1	Transmit Data +	Bidirectional Data A+
2	Transmit Data –	Bidirectional Data A-
3	Receive Data +	Bidirectional Data B+
4	Not assigned	Bidirectional Data C+
5	Not assigned	Bidirectional Data C-
6	Receive Data –	Bidirectional Data B-
7	Not assigned	Bidirectional Data D+
8	Not assigned	Bidirectional Data D-

**Table 11** Pin assignments

<b>Pin Number</b>	<b>10/100</b>	<b>1000</b>
<i>Ports configured as MDIX</i>		
1	Receive Data +	Bidirectional Data B+
2	Receive Data -	Bidirectional Data B-
3	Transmit Data +	Bidirectional Data A+
4	Not assigned	Bidirectional Data A-
5	Not assigned	Bidirectional Data D+
6	Transmit Data -	Bidirectional Data D-
7	Not assigned	Bidirectional Data C+
8	Not assigned	Bidirectional Data C-



# B

# TECHNICAL SPECIFICATIONS

---

## Switch 4500 (26 Port)

---

<b>Physical Dimensions</b>	Height: 44 mm (1.7 in.) x Width: 440 mm (17.3 in.) x Depth: 274 mm (10.8 in.) Weight: 4.4kg (9.72 lbs)
----------------------------	---

---

### Environmental Requirements

Operating Temperature	0 ° to 40 °C (32 ° to 104 °F)
Storage Temperature	-10 ° to +70 °C (14 ° to 158 °F)
Operating Humidity	95% non-condensing
Standards	EN60068 to 3Com schedule (Package testing: paras 2.1, 2.2, 2.30, and 2.32. Operational testing: paras 2.1, 2.2, 2.30 and 2.13).

---

### Safety

Agency Certifications	UL 60950, EN60950, CSA 22.2 No. 60950, IEC 60950
-----------------------	--

---

### EMC

Emissions	CISPR 22 Class A, EN55022 Class A, FCC Part 15 Subpart B Class A, ICES-003 Class A, EN61000-3-2, EN61000-3-3
Immunity	EN 55024

---

<b>Power Consumption</b>	35 watts maximum
--------------------------	------------------

---

<b>Heat Dissipation</b>	120 BTU/hour maximum
-------------------------	----------------------

---

### Power Supply

#### AC

Line Frequency	50/60Hz
Input Voltage	100-240 VAC
Current Rating	1.0A (amps) maximum

---

---

## Switch 4500 (50 Port)

---

<b>Physical Dimensions</b>	Height: 44 mm (1.7 in.) x Width: 440 mm (17.3 in.) x Depth: 274 mm (10.8 in.) Weight: 4.7kg (10.9 lbs)
----------------------------	---

---

### Environmental Requirements

Operating Temperature	0 ° to 40 °C (32 ° to 104 °F)
Storage Temperature	-10 ° to +70 °C (14 ° to 158 °F)
Operating Humidity	95% non-condensing
Standards	EN60068 to 3Com schedule (Package testing: paras 2.1, 2.2, 2.30, and 2.32. Operational testing: paras 2.1, 2.2, 2.30 and 2.13).

---

### Safety

Agency Certifications	UL60950, EN60950, CSA 22.2 No. 60950, IEC 60950
-----------------------	---

---

### EMC

Emissions	CISPR 22 Class A, EN55022 Class A, FCC Part 15 Subpart B Class A, ICES-003 Class A, VCCI Class A, EN61000-3-2, EN61000-3-3
Immunity	EN 55024

---

<b>Power Consumption</b>	45 watts maximum
--------------------------	------------------

---

<b>Heat Dissipation</b>	155 BTU/hour maximum
-------------------------	----------------------

---

### Power Supply

#### AC

Line Frequency	50/60Hz
Input Voltage	100-240 VAC
Current Rating	1.0A (amps) maximum

---

---

**Switch 4500 PWR (26 Port)**


---

<b>Physical Dimensions</b>	Height: 44 mm (1.7 in.) x Width: 440 mm (17.3 in.) x Depth: 274 mm (10.8 in.) Weight: 4.4kg (9.72 lbs)
<b>Environmental Requirements</b>	
Operating Temperature	0 ° to 40 °C (32 ° to 104 °F)
Storage Temperature	-10 ° to +70 °C (14 ° to 158 °F)
Operating Humidity	95% non-condensing
Standards	EN60068 to 3Com schedule (Package testing: paras 2.1, 2.2, 2.30, and 2.32. Operational testing: paras 2.1, 2.2, 2.30 and 2.13).
<b>Safety</b>	
Agency Certifications	UL60950, EN60950, CSA 22.2 No. 60950, IEC 60950
<b>EMC</b>	
Emissions	CISPR 22 Class A, EN55022 Class A, FCC Part 15 Subpart B Class A, ICES-003 Class A, VCCI Class A, EN61000-3-2, EN61000-3-3
Immunity	EN 55024
<b>Power Consumption</b>	60 watts maximum (not including PoE load)
<b>Heat Dissipation</b>	205 BTU/hour maximum (not including PoE load)
<b>Power Supply</b>	
<b>AC</b>	
Line Frequency	50/60Hz
Input Voltage	100-240 VAC
Current Rating	7.0A (amps) maximum (at maximum PoE load)
<b>DC</b>	
Input Voltage	-53 - -55 VDC
Current Rating	12A (amps) maximum (at maximum PoE load)
Characteristics	SELV (Safety Extra Low Voltage), isolated from earth according to requirements of IEEE-Std 802.3af

---

---

**Switch 4500 PWR (50 Port)**


---

**Physical Dimensions**      Height: 44 mm (1.7 in.) x Width: 440 mm (17.3 in.) x Depth: 274 mm (10.8 in.)  
Weight: 4.7kg (10.9 lbs)

---

**Environmental Requirements**

Operating Temperature      0 ° to 40 °C (32 ° to 104 °F)  
Storage Temperature      -10 ° to +70 °C (14 ° to 158 °F)  
Operating Humidity      95% non-condensing  
Standards      EN60068 to 3Com schedule (Package testing: paras 2.1, 2.2, 2.30, and 2.32.  
Operational testing: paras 2.1, 2.2, 2.30 and 2.13).

---

**Safety**

Agency Certifications      UL60950, EN60950, CSA 22.2 No. 60950, IEC 60950

---

**EMC**

Emissions      CISPR 22 Class A, EN55022 Class A, FCC Part 15 Subpart B Class A,  
ICES-003 Class A, VCCI Class A,  
EN61000-3-2, EN61000-3-3  
Immunity      EN 55024

---

**Power Consumption**      70 watts maximum (not including PoE load)

---

**Heat Dissipation**      240 BTU/hour maximum (not including PoE load)

---

**Power Supply**

**AC**

Line Frequency      50/60Hz  
Input Voltage      100-240 VAC  
Current Rating      7.0A (amps) maximum (at maximum PoE load)

**DC**

Input Voltage      -53 - -55 VDC  
Current Rating      19.5A (amps) maximum (at maximum PoE load)  
Characteristics      SELV (Safety Extra Low Voltage), isolated from earth according to requirements  
of IEEE-Std 802.3af

---

Standards Supported	<b>SNMP</b>	<b>Terminal Emulation</b>
	SNMP protocol (RFC 1157) MIB-II (RFC 1213) Bridge MIB (RFC 1493) RMON MIB II (RFC 2021) Remote Monitoring MIB (RFC 1757) MAU MIB (RFC 2239) MIB II Traps (RFC 1215) RS232 (RFC 1659) Interfaces (RFC 2233) Ether-like MIB (RFC 2665) MAU MIB (RFC 2668) Bridge extensions (RFC 2674)	Telnet (RFC 854) <b>Protocols Used for Administration</b> UDP (RFC 768) IP (RFC 791) ICMP (RFC 792) TCP (RFC 793) ARP (RFC 826) TFTP (RFC 783) DHCP (RFC 2131, RFC 2132, RFC 1534) BOOTP (RFC 951, RFC 1497) Network Login (IEEE 802.1x) RADIUS (RFC 2618, 2620) Link aggregation (IEEE 802.3ad)

## RPS

<b>Safety Requirements</b>	The RPS shall comply with the following safety standards: EN60950, UL60950, CSA22.2 60950, IEC60950
<b>EMC</b>	
Emissions	CISPR 22 Class A, EN55022 Class A, FCC Part 15 Subpart B Class A, ICES-003 Class A, AS/NZS 3548 Class A, VCCI Class A, EN61000-3-2, EN61000-3-3
Immunity	EN 55024
<b>Output Specifications</b>	Must meet DC power supply specifications for each unit (as defined above).

## Earthing Lead

<b>Safety Requirements</b>	The Earthing Lead shall comply with the following safety standards: UL Subject 758, UL 1581 and CSA C22.2 No. 210 UL VW-1 and CSA FT1 Vertical Flame Test
<b>Voltage Rating</b>	600V
<b>AWG</b>	12
<b>Insulation Thickness</b>	0.4mm
<b>Insulation Colour</b>	Green/Yellow



# C

## OBTAINING SUPPORT FOR YOUR PRODUCT

---

### Register Your Product

Warranty and other service benefits start from the date of purchase, so it is important to register your product quickly to ensure you get full use of the warranty and other service benefits available to you.

Warranty and other service benefits are enabled through product registration. Register your product at <http://eSupport.3com.com/>. 3Com eSupport services are based on accounts that you create or have authorization to access. First time users must apply for a user name and password that provides access to a number of eSupport features including Product Registration, Repair Services, and Service Request. If you have trouble registering your product, please contact 3Com Global Services for assistance.

---

### Purchase Value-Added Services

To enhance response times or extend warranty benefits, contact 3Com or your authorized 3Com reseller. Value-added services like 3Com Express<sup>SM</sup> and Guardian<sup>SM</sup> can include 24x7 telephone technical support, software upgrades, onsite assistance or advance hardware replacement.

Experienced engineers are available to manage your installation with minimal disruption to your network. Expert assessment and implementation services are offered to fill resource gaps and ensure the success of your networking projects. More information on 3Com maintenance and Professional Services is available at <http://www.3com.com/>

Contact your authorized 3Com reseller or 3Com for a complete list of the value-added services available in your area.

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## Troubleshoot Online

You will find support tools posted on the 3Com web site at <http://www.3com.com/>

**3Com Knowledgebase** helps you troubleshoot 3Com products. This query-based interactive tool is located at <http://knowledgebase.3com.com> and contains thousands of technical solutions written by 3Com support engineers.

---

## Access Software Downloads

**Software Updates** are the bug fix / maintenance releases for the version of software initially purchased with the product. In order to access these Software Updates you must first register your product on the 3Com web site at <http://eSupport.3com.com/>

First time users will need to apply for a user name and password. A link to software downloads can be found at <http://eSupport.3com.com/>, or under the Product Support heading at <http://www.3com.com/>

**Software Upgrades** are the software releases that follow the software version included with your original product. In order to access upgrades and related documentation you must first purchase a service contract from 3Com or your reseller.

---

## Telephone Technical Support and Repair

To enable telephone support and other service benefits, you must first register your product at <http://eSupport.3com.com/>

Warranty and other service benefits start from the date of purchase, so it is important to register your product quickly to ensure you get full use of the warranty and other service benefits available to you.

When you contact 3Com for assistance, please have the following information ready:

- Product model name, part number, and serial number
- Proof of purchase, if you have not pre-registered your product
- A list of system hardware and software, including revision level
- Diagnostic error messages
- Details about recent configuration changes, if applicable

To send a product directly to 3Com for repair, you must first obtain a return authorization number (RMA). Products sent to 3Com, without authorization numbers clearly marked on the outside of the package, will be returned to the sender unopened, at the sender's expense. If your product is registered and under warranty, you can obtain an RMA number online at <http://eSupport.3com.com/>. First time users will need to apply for a user name and password.

---

## Contact Us

3Com offers telephone, e-mail and internet access to technical support and repair services. To access these services for your region, use the appropriate telephone number, URL or e-mail address from the list below.

Telephone numbers are correct at the time of publication. Find a current directory of contact information posted on the 3Com web site at <http://csoweb4.3com.com/contactus/>

Country	Telephone Number	Country	Telephone Number
<b>Asia, Pacific Rim Telephone Technical Support and Repair</b>			
Australia	1 800 678 515	Philippines	1235 61 266 2602 or
Hong Kong	800 933 486		1800 1 888 9469
India	+61 2 9424 5179 or	P.R. of China	800 810 3033
	000800 650 1111	Singapore	800 6161 463
Indonesia	001 803 61009	S. Korea	080 333 3308
Japan	00531 616 439 or	Taiwan	00801 611 261
	03 3507 5984	Thailand	001 800 611 2000
Malaysia	1800 801 777		
New Zealand	0800 446 398		
Pakistan	+61 2 9937 5083		
You can also obtain support in this region using the following e-mail: <a href="mailto:apr_technical_support@3com.com">apr_technical_support@3com.com</a>			
Or request a repair authorization number (RMA) by fax using this number:			+ 65 543 6348

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## Europe, Middle East, and Africa Telephone Technical Support and Repair

From anywhere in these regions, call: +44 (0)1442 435529

From the following countries, you may use the numbers shown:

Country	Telephone Number	Country	Telephone Number
Austria	01 7956 7124	Luxembourg	342 0808128
Belgium	070 700 770	Netherlands	0900 777 7737
Denmark	7010 7289	Norway	815 33 047
Finland	01080 2783	Poland	00800 441 1357
France	0825 809 622	Portugal	707 200 123
Germany	01805 404 747	South Africa	0800 995 014
Hungary	06800 12813	Spain	9 021 60455
Ireland	1407 3387	Sweden	07711 14453
Israel	1800 945 3794	Switzerland	08488 50112
Italy	199 161346	U.K.	0870 909 3266

You can also obtain support in this region using the following URL:

<http://emea.3com.com/support/email.html>

### Latin America Telephone Technical Support and Repair

Antigua	1 800 988 2112	Guatemala	AT&T +800 998 2112
Argentina	0 810 444 3COM	Haiti	57 1 657 0888
Aruba	1 800 998 2112	Honduras	AT&T +800 998 2112
Bahamas	1 800 998 2112	Jamaica	1 800 998 2112
Barbados	1 800 998 2112	Martinique	571 657 0888
Belize	52 5 201 0010	Mexico	01 800 849CARE
Bermuda	1 800 998 2112	Nicaragua	AT&T +800 998 2112
Bonaire	1 800 998 2112	Panama	AT&T +800 998 2112
Brazil	0800 13 3COM	Paraguay	54 11 4894 1888
Cayman	1 800 998 2112	Peru	AT&T +800 998 2112
Chile	AT&T +800 998 2112	Puerto Rico	1 800 998 2112
Colombia	AT&T +800 998 2112	Salvador	AT&T +800 998 2112
Costa Rica	AT&T +800 998 2112	Trinidad and Tobago	1 800 998 2112
Curacao	1 800 998 2112	Uruguay	AT&T +800 998 2112
Ecuador	AT&T +800 998 2112	Venezuela	AT&T +800 998 2112
Dominican Republic	AT&T +800 998 2112	Virgin Islands	57 1 657 0888

You can also obtain support in this region using the following:

Spanish speakers, enter the URL:

<http://lat.3com.com/lat/support/form.html>

Portuguese speakers, enter the URL:

<http://lat.3com.com/br/support/form.html>

English speakers in Latin America should send e-mail to:

[lat\\_support\\_anc@3com.com](mailto:lat_support_anc@3com.com)

### US and Canada Telephone Technical Support and Repair

1 800 876 3266

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