



SuperStack[®] II PS Hub User Guide

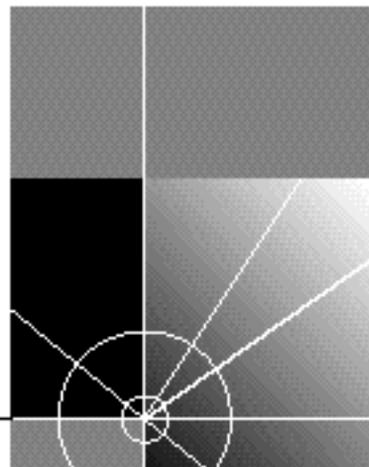
3C16405 — PS Hub 40 12-port

3C16406 — PS Hub 40 24-port

3C16450 — PS Hub 50 24-port

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

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IMPORTANT SAFETY INFORMATION



WARNING: Warnings contain directions that you must follow for your personal safety. Follow all instructions carefully.

Please read the following safety information thoroughly before installing the PS Hub.

- Installation and removal of the unit must be carried out by qualified personnel only.
- Connect the unit to an earthed power supply to ensure compliance with European safety standards.
- The power cord set must be approved for the country where it will be used.
- The appliance coupler, that is, the connector to the device itself and not the wall plug, must have a configuration for mating with an EN60320/IEC320 appliance inlet.
- For U.S.A. and Canada:
 - The cord set must be UL-approved and CSA certified.
 - The minimum specification for the flexible cord is:
 - No. 18 AWG
 - Type SV or SJ
 - 3-conductor
 - The cord set must have a rated current capacity of at least 10A.
 - The attachment plug must be an earth-grounding type with a NEMA 5-15P (15A, 125V) or NEMA 6-15P (15A, 250V) configuration.
- For Denmark:
 - The supply plug must comply with section 107-2-D1, standard sheet DK2-1a or DK2-5a.

- For Switzerland:
 - The supply plug must comply with SEV/ASE 1011.
- It is essential that the mains socket outlet is installed near to the unit and is accessible. You can only disconnect the unit by removing the appliance coupler from the unit.
- This unit operates under SELV conditions (Safety Extra Low Voltage) according to IEC 950, the conditions of which are maintained only if the equipment to which it is connected is also operational under SELV.
- France and Peru only:
 - This unit cannot be powered from IT (impedance à la terre) supplies. If your supplies are of the IT type, this unit should be powered by 230V (2P+T) via an isolation transformer ratio 1:1, with the secondary connection point labelled Neutral, connected directly to Earth (Ground).
- U.K. only:
 - The PS Hub is covered by Ofcom General Approval, NS/G/12345/J/100003, for indirect connection to a public telecommunications system. This can only be achieved using the console port on the unit and an approved modem.
- Twisted Pair RJ45 ports: These are shielded RJ45 data sockets. They cannot be used as telephone sockets. Only connect RJ45 data connectors to these sockets. Either shielded or unshielded data cables with shielded or unshielded jacks can be connected to these data sockets.
- Sockets for Redundant Power System (RPS): Only connect a 3Com Redundant Power System to this socket. For details, follow the installation instructions in the manuals accompanying the Redundant Power System.

L'INFORMATION DE SÉCURITÉ IMPORTANTE



AVERTISSEMENT: Les avertissements contiennent les directions que vous devez suivre pour votre sécurité personnelle. Suivez toutes les directives avec soin.

Veillez lire à fond l'information de la sécurité suivante avant d'installer le PS Hub.

- L'installation et l'enlèvement de l'unité doivent être faits seulement par le personnel qualifié.
- Brancher l'unité à une source de courant mise à la terre pour assurer la conformité aux normes de sécurité européennes.
- Le cordon d'alimentation surmoulé doit être approuvé pour le pays auquel il sera utilisé.
- Le socle de connecteur, c'est-à-dire, le connecteur à l'appareil lui-même et non pas la prise murale, doit avoir une configuration pour le branchement avec une admission d'appareil EN60320/IEC320.
- Pour U.S.A. et le Canada:
 - Le cordon surmoulé doit être UL Certifié et CSA Certifié.
 - Les spécifications minimales pour le cordon souple sont:
 - No. 18 AWG
 - Type SV ou SJ
 - 3-conducteur
 - Le cordon surmoulé doit avoir une capacité de courant calculée au moins de 10A.
 - La fiche de fixation doit être un type mis à la terre avec une configuration NEMA 5-15P (15A, 125V) ou NEMA 6-15P (15A, 250V).

- C'est essentiel que le socle soit installé près de l'unité et soit accessible. Vous pouvez seulement débrancher l'unité en enlevant la fiche d'alimentation de la prise de courant.
- Cette unité marche sous les conditions SELV (Safety Extra Low Voltage) conformément à IEC950, ces conditions sont maintenues seulement si le matériel auquel elle est branchée, est aussi en exploitation sous SELV.
- Seulement Pour La France et Le Pérou:
 - Cette unité ne peut pas être mise en marche des sources de courant IT (Impédance à la terre). Si vos sources de courant sont de type IT, cette unité doit être alimentée par 230V (2P+T) via un rapport de transformation d'isolation de 1:1, avec un point de connexion secondaire étiqueté Neutre, branché directement à la Terre (à la Masse).
 - Les ports RJ45 de paire tordue: Ceux-ci sont les prises de courant de données RJ45 protégées. Ils ne peuvent pas être utilisés comme prises de courant téléphoniques. Brancher seulement les connecteurs RJ45 de données à ces prises de courant. Les câbles de données blindés ou non blindés, avec les jacks blindés ou non blindés, l'un ou l'autre, peuvent être branchés à ces prises de courant de données.
 - Socle Pour Alimentation Multiple: Brancher seulement une alimentation multiple de 3Com à cet socle. Suivre pour les détails les directives de l'installation dans le manual qui accompagne l'alimentation multiple.

WICHTIGE SICHERHEITSHINWEISE



WARNUNG: *Warnungen enthalten Anweisungen, die zur eigenen Sicherheit unbedingt zu beachten sind. Bitte befolgen Sie alle Anweisungen sorgfältig und genau.*

Bitte unbedingt vor dem Einbauen des PS Hub Einheit die folgenden Sicherheitsanweisungen durchlesen.

- Ein- und Ausbau des Gerätes ist **nur von Fachpersonal** vorzunehmen.
- Das Gerät an geerdete Stromversorgung anschließen, um eine Übereinstimmung mit den europäischen Sicherheitsbestimmungen zu gewährleisten.
- Der Anschlußkabelsatz muß mit den Bestimmungen des Landes übereinstimmen, in dem er verwendet werden soll.
- Die Anordnung der Gerätesteckvorrichtung, d.h. die Steckverbindung am Gerät selbst im Gegensatz zum Wandstecker, muß in den EN60320/IEC320 Zuführungsstecker am Gerät passen.
- Es ist wichtig, daß der Netzstecker sich in unmittelbarer Nähe zum Gerät befindet und leicht erreichbar ist. Das Gerät kann nur durch Herausziehen des Verbindungssteckers aus der Steckdose vom Stromnetz getrennt werden.
- Das Gerät wird mit Sicherheits-Kleinspannung nach IEC 950 (SELV = Safety Extra Low Voltage) betrieben. Angeschlossen werden können nur Geräte, die ebenfalls nach SELV betrieben werden.
- Gedrehte paarfache RJ45 Anschlüsse: Hierbei handelt es sich um abgeschirmte RJ45 Datenbuchsen, die nicht als Telefonbuchsen verwendbar sind. Nur RJ45 Datensteckverbinder an diese Buchsen anschließen. Diese Datenstecker können entweder mit abgeschirmten oder ungeschirmten Datenkabeln mit abgeschirmten oder ungeschirmten Klinkensteckern verbunden werden.

- Steckdose Für Redundant Power System: Nur ein 3Com Redundant Power System an diese Steckdose anschließen. Für weitere Angaben die genauen Einbauanweisungen im Handbuch zum Redundant Power System befolgen.

Die Einheit ist unter keinen Umständen an einen Wechselstrom Netzstecker (A.C.) anzuschließen, wenn dieser keine Erdung hat.

ABOUT THIS GUIDE

Introduction

This guide describes how to set up and manage these SuperStack® II PS Hubs:

- 3C16405 — PS Hub 40 12-port
- 3C16406 — PS Hub 40 24-port
- 3C16450 — PS Hub 50 24-port

Audience Description

This guide is intended for users who have networking experience. If you have used 3Com's SuperStack II range of products, you may already be familiar with using this kind of hub. We recommend that you read through this guide as the PS Hub has a number of important features which are described in this guide.

If you are familiar with the PS Hub and know how the PS Hub's port switching and segments work, you may only want to know how the PS Hub 40 and PS Hub 50 are different; refer to [Chapter 2](#).

When referring to both the PS Hub 40 and PS Hub 50 generally, this guide uses the term '**PS Hub**'.

For information on the Limited Warranty, refer to the "3Com Corporation Limited Warranty" [at the back of this guide](#).

A Quick Reference Guide accompanies this user guide, and provides a summary of some of the information in this user guide.



If there are Release Notes shipped with your product and the information in them differs from the information in this guide, follow the Release Notes.

How to Use This Guide

This table shows where to find specific information in this guide.

If you are looking for...	Turn to...
An introduction to the hub, workgrouping and segments	Chapter 1
Information on how the PS Hub 40 and PS Hub 50 are different from each other	Chapter 2
Information on installing and using the hub	Chapter 3
An introduction to load balancing and how it works	Chapter 4
Ways you can manage the hub and how to start your management session	Chapter 5
Information on using the Command Line Interface to set up the hub for management	Chapter 6
Information on using the web interface to manage the hub or stack of hubs	Chapter 7
Information on solving any problems	Chapter 8
The hub's dimensions, the standards it conforms to, and the cabling you can use with it	Appendix A
Information on using Quick Config Manager to manage the hub or stack of hubs	Appendix B
Information on installing and using the serial web utility	Appendix C
Information on using the agent upgrade utility	Appendix D
Technical support	Appendix E

Conventions

[Table 1](#) and [Table 2](#) list conventions that are used throughout this guide.

Table 1 Notice Icons

Icon	Notice Type	Alerts you to...
	Information note	Important features or instructions
	Caution	Risk of system damage, loss of data, or to personal safety.
	Warning	Risk of severe personal injury

Table 2 Text Conventions

Convention	Description
Syntax	<p>The word 'syntax' means you must evaluate the syntax provided and supply the appropriate values. Placeholders for values you must supply appear in angle brackets. Example:</p> <p>Change the password by using the following syntax:</p> <pre>password <string></pre> <p>In this example, you must supply a password string for <string>.</p>
Commands	<p>The word 'command' means you must enter the command exactly as shown in text and press the Return or Enter key. Example:</p> <p>To exit, enter the following command:</p> <p>Logout</p> <p> <i>This guide always gives the full form of a command in uppercase and lowercase letters. However, you can abbreviate commands by entering only the uppercase letters and the appropriate value. Commands are not case-sensitive.</i></p>
Screen displays	This typeface represents information as it appears on the screen.
The words 'enter' and 'type'	When you see the word 'enter' in this guide, you must type something, and then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says 'type'.
[Key] names	<p>Key names appear in text in one of two ways:</p> <ul style="list-style-type: none"> ■ Referred to by their labels, such as "the Return key" or "the Escape key" ■ Written with brackets, such as [Return] or [Esc]. <p>If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example:</p> <p>Press [Ctrl]+[Alt]+[Del].</p>
Menu commands and buttons	<p>Menu commands or button names appear in italics. Example:</p> <p>From the <i>Configure</i> menu, select <i>Community/Polling...</i></p>
Words in <i>italicized</i> type	Italics emphasize a point or denote new terms at the place where they are defined in the text.
Words in bold type	Bold text denotes key features.



1

ABOUT THE PS HUB

This chapter contains the following topics:

- Features and benefits of the PS Hub
- How the PS Hub can be used
- Using workgroups
- Description and example of the PS Hub segmentation
- How the PS Hub works

Introduction

The SuperStack® II PS Hub, as shown in [Figure 1-1](#), is a flexible managed Ethernet repeater which is very easy to set up and manage. It can be used to build a small network or to expand a larger, more established network.

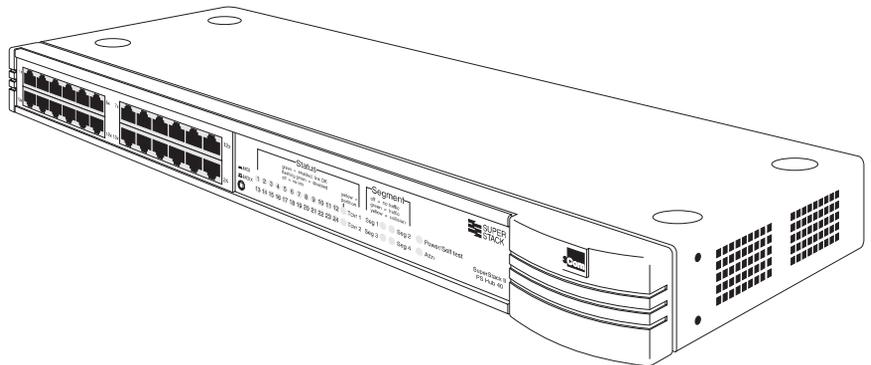


Figure 1-1 The PS Hub

The PS Hub is part of 3Com's SuperStack II PS Hub range, which incorporates many of the features from the successful SuperStack II range. SuperStack II products can be combined to create a network that can change and grow with your networking needs.

Features The PS Hub 40 and PS Hub 50 share many features:



NOTE: *These terms and features are described in this chapter and the following chapters.*

- 12 or 24 shielded twisted pair ports for easy connection to 10BASE-T networks. An MDI/MDIX switch allows you to cross-over one of these ports, for connection to other types of hubs and network equipment.
- One or two transceiver module slots, providing a choice of media options:
 - The PS Hub 40 has two 10Mbps transceiver module slots that can be fitted with 3Com 10Mbps transceiver modules.
 - The PS Hub 50 has one transceiver module slot that can be fitted with a 3Com 10Mbps or 100Mbps transceiver module.
- SuperStack II architecture — You can stack up to 10 hubs (six if free standing), giving you a possible 260 ports per stack.
- LEDs for quick viewing of hub and port status.
- Hot-swappable technology which allows hubs to be added and removed from a stack without affecting stack performance.
- Mounting brackets for easy installation into a standard 19 inch rack, or onto a table or wall.
- +5 Lifetime Limited Warranty — Please refer to the [“3Com Corporation Limited Warranty”](#) at the back of this guide for more information.

*Management
Features*

- Complete SmartAgent™ management which is built into each hub; no additional management cards are needed. When PS Hubs are stacked, the management is distributed between all hubs in the stack.
- Easy to use built-in management interfaces for configuration of your hub or stack locally or over the network:
 - A Command Line Interface for quick configuration of IP information for the hub.
 - A web interface for comprehensive management of the hub using any suitable web browser.
- Additional management software (supplied on the CD-ROM), including 3Com's Transcend® Quick Configuration Manager for Windows®.
- An implementation of SNMP for management over the network, using the IP protocol.
- Support for traps (messages) which can alert an SNMP network management station of any problems.
- Built-in security and resilience, which protects your network.
- Port switching — Allows you to build up workgroups by switching ports easily between the four internal segments. When stacked, all four segments are carried between the hubs by cascade cables.
- Automated load balancing — Configures the segments so that the traffic is distributed evenly across them, making the segments more efficient. It also analyses inter-segment traffic and moves frequently communicating ports to the same segment.

How You Can Use the PS Hub

The flexibility of the PS Hub allows it to be used in a number of ways. You can build up a network or expand a large, established network. For information on connecting and using your equipment, refer to [Chapter 3](#).

The PS Hub can be used on its own or in a stack with other PS Hubs. All PS Hubs have a useful feature called *port switching* which allows you to create workgroups within your stack. For information on this feature, refer to “Segments and Port Switching” on [page 1-8](#).

Building Up a Network

The PS Hub is ideal for building up a new network. It has its own built-in management and comes ready to use. The PS Hub range is totally scalable, enabling you to start with one hub and add to it as your network grows. You can connect your workstations and other network equipment to the PS Hub to build a small network, as shown in [Figure 1-2](#).

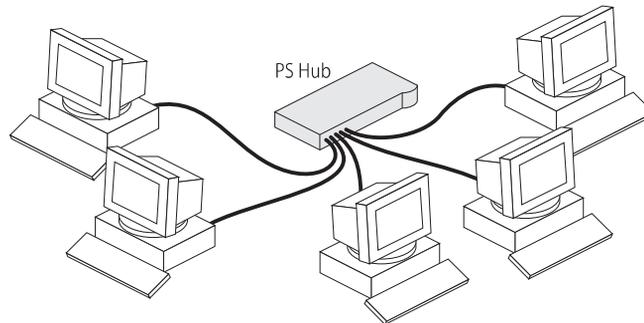


Figure 1-2 Building Up a Network

When your network grows, you can expand it easily by adding more PS Hubs. The PS Hub also has an MDI/MDIX switch which enables your network to expand further by connecting to other types of hubs, stacks and networking equipment, as shown in [Figure 1-3](#).

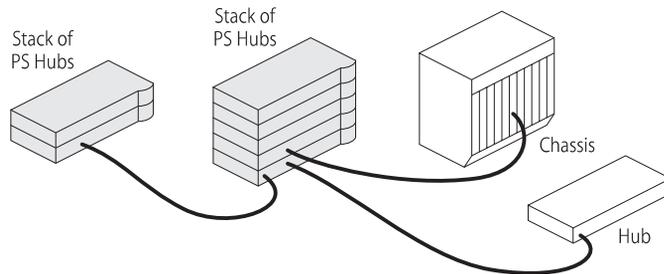


Figure 1-3 Connecting to Other Stacks and Hubs

Expanding an Existing Network

You can add PS Hubs to your existing network to expand the number of user connections. Each PS Hub has its own built-in management which is distributed throughout the PS Hubs in the stack. This provides fault tolerance because there is no single point of failure; all hubs have management capability (should they become isolated).

Figure 1-4 shows how PS Hubs can be added to an existing network (the network is a stack of SuperStack® II Hub 10 units in this example). The hubs create more ports now, and allow for further growth in the future. The PS Hubs are connected to a switch so that communication between them is controlled.

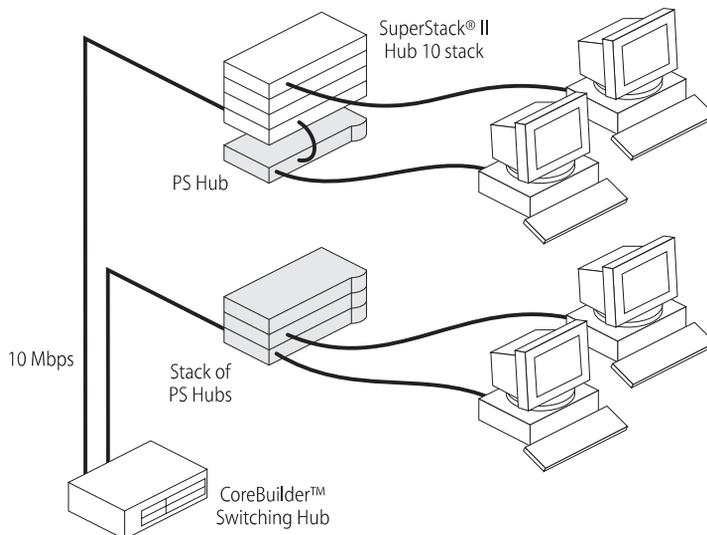


Figure 1-4 Expanding an Existing Network

Migrating to Higher Performance

The PS Hub is ideal for migrating your existing network to a higher performance network. Using its internal segments (each running at 10Mbps), you can build up separate workgroups within a PS Hub stack.

Having a PS Hub 50 in your PS Hub stack can extend the flexibility of your stack:

- The PS Hub 50 has an internal switch (called a *segment switch*) which can interconnect the segments in the stack so that the workgroups on the segments can communicate.
- The PS Hub 50 has a transceiver module slot which can be fitted with a 10Mbps or 100Mbps 3Com transceiver module, providing you with the option of having a 100Mbps network connection, for example 100BASE-TX or 100BASE-FX. This allows you to connect to 100Mbps networks or network equipment, for example a server.

For information on the differences between the PS Hub 40 and the PS Hub 50, refer to [Chapter 2](#).

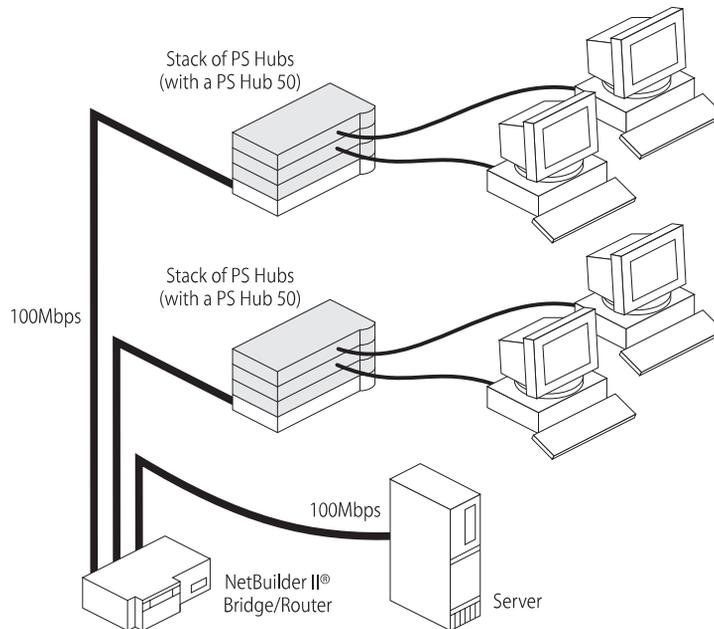


Figure 1-5 Migrating to a Higher Performance Network

Workgroups

An important feature of the PS Hub is that you can create *workgroups*.

What Are Workgroups?

A good way to organize your network is to neatly group your users in a logical way, called workgroups. For example, if your office consists of four departments, you can mirror this by having four workgroups, as shown in [Figure 1-6](#).

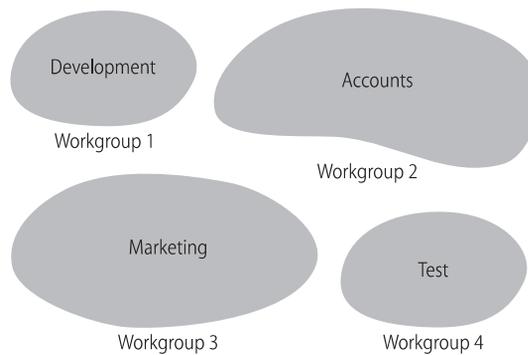


Figure 1-6 Workgroups

You can keep these workgroups separate from each other so that the communication is contained within each workgroup, or you can use the switching functionality of a PS Hub 50 to enable communication between the workgroups.

The workgroups are similar to the structure of your office, so it is easy for you to make changes to your network; adding and removing users, and moving users between workgroups.

The rest of this section describes how you can build up workgroups using your PS Hub.

Segments and Port Switching

The PS Hub has four separate internal repeaters (called *segments*) which you can use to create your workgroups. You can switch the hub's ports to any of these segments (called *port switching*). With the segments and port switching, you can easily create your workgroups.

How the PS Hub Segments Work

In a stack of PS Hubs, four segments are carried between the hubs by the cascade cables. These segments are four separate networks internal to the stack, as shown in [Figure 1-7](#).

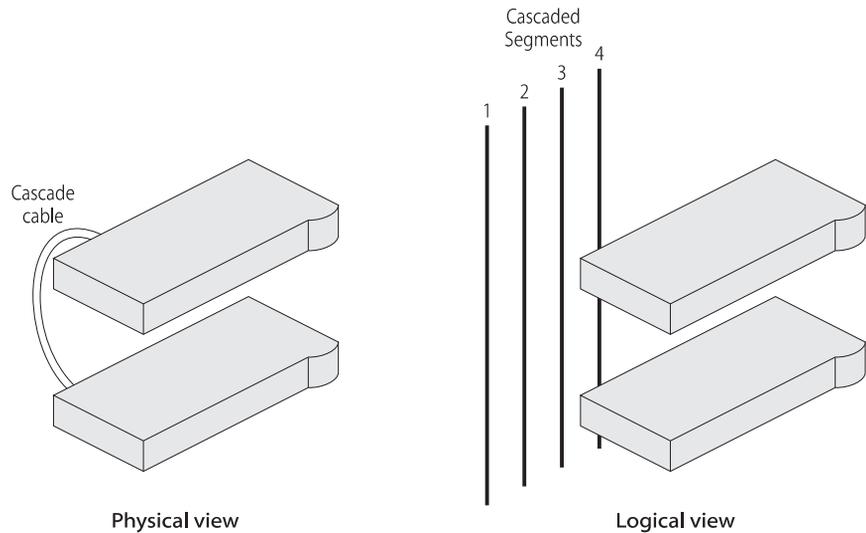


Figure 1-7 Cascaded Segments

Each PS Hub has four internal segments. These segments are separate internal repeaters, and can connect to or remain isolated from their associated cascaded segments, as shown in [Figure 1-8](#).

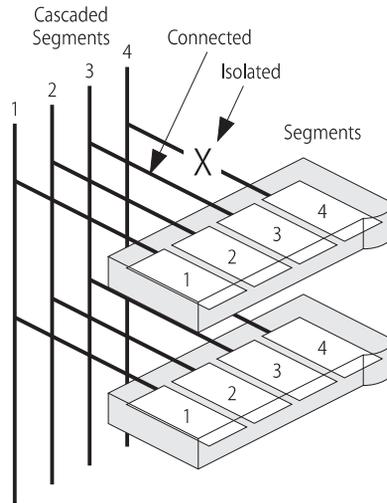


Figure 1-8 Internal Segments

You use management software to configure the segments. You can:

- Connect and isolate the segments from their associated cascaded segments.
- Switch the ports between the segments (port switching).

The ability to configure the segments allows you to create flexible workgroups, as shown in [Figure 1-9](#), which can change and grow with your needs.

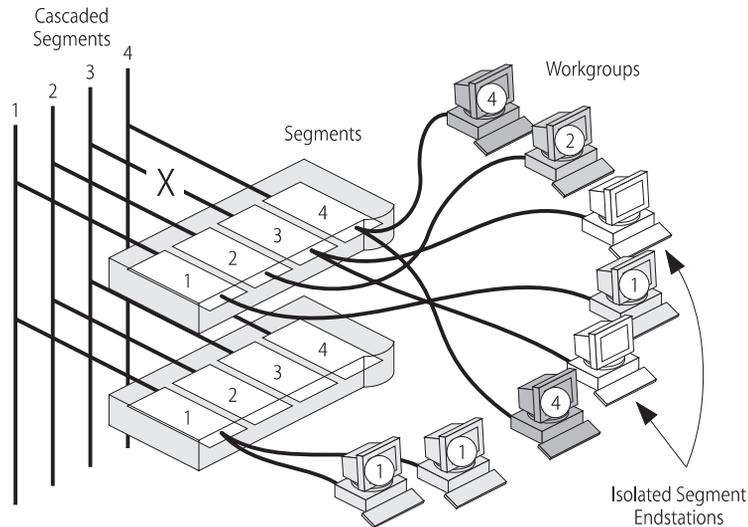


Figure 1-9 Workgroups

Benefits of Segments and Port Switching

The key to port switching is that you are not restricted by physical connections, and can create location and technology independent networks. This has many benefits:

- You can move users between segments easily — You simply switch the ports between the segments, as necessary, using management.
- The segments are carried throughout the stack — You can add hubs, when necessary, to extend the existing cascaded segments.
- Each segment is more efficient — Local network traffic is contained within each cascaded segment, so they avoid congestion from the other segments. You can increase the efficiency by using load balancing to configure the segments so that traffic is distributed evenly across them. You can use the web interface or Quick Config Manager to configure load balancing. For information on how load balancing works, refer to [Chapter 4](#).
- Total bandwidth is higher — Each segment runs at 10Mbps, so four separate segments per hub provides a total of 40Mbps per hub.
- Configuration of the segments can be performed remotely — As users are moved between the segments by port switching, no physical changes have to be made.

- There is extra security — Hub segments can be isolated from the cascaded segments, so that only workstations on the same hub segment can communicate with each other.
- Port switching enables you to extend any existing workgroups you may have, across the whole network infrastructure, including shared Ethernet workgroups.

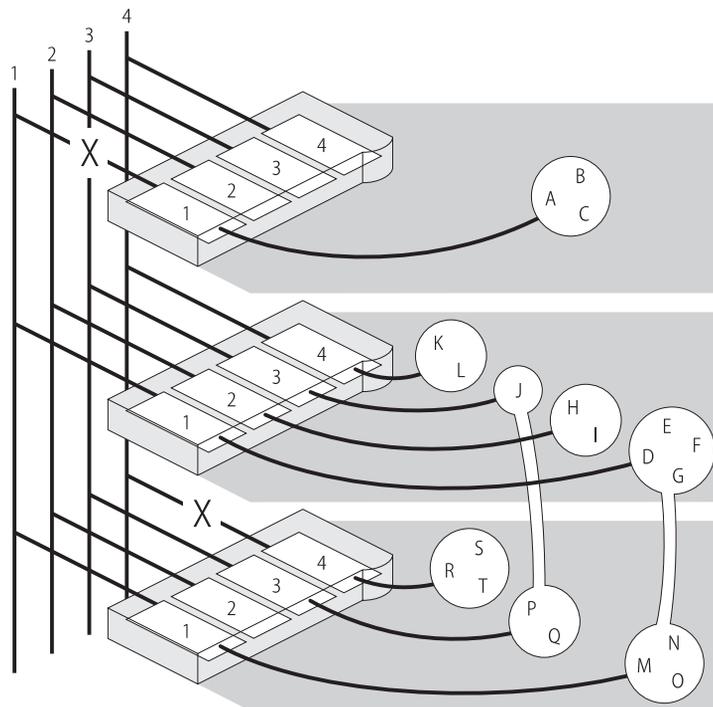
Workgroup Example

This example shows how a stack of three PS Hubs can easily create a network with the desired workgroups. [Table 1-1](#) shows how the users are grouped:

Table 1-1 Groupings

Hub	Development	Accounts	Marketing	Test	Isolated
Top					A, B, C
Middle	D, E, F, G	H, I	J	K, L	
Bottom	M, N, O		P, Q		R, S, T

[Figure 1-10](#) shows how the required workgroups are created using a stack of PS Hubs.

**Figure 1-10** Workgroup Example (see [Table 1-1](#))

Your workgroups are easy to change. [Table 1-2](#) shows several changes to the example, and the simple actions needed to implement the changes:

Table 1-2 Changes to the Workgroups

Change to workgroups	Hub affected	Action to implement change
A, B and C become part of Development (cascaded segment 1)	Top	Reconnect segment 1 to cascaded segment 1
R, S and T become part of Marketing (cascaded segment 3)	Bottom	Switch ports for R, S and T to segment 3
U and V are new users on the bottom hub and become part of Accounts	Bottom	Switch new ports for U and V to segment 2

[Figure 1-11](#) shows the workgroups after the changes have been made.

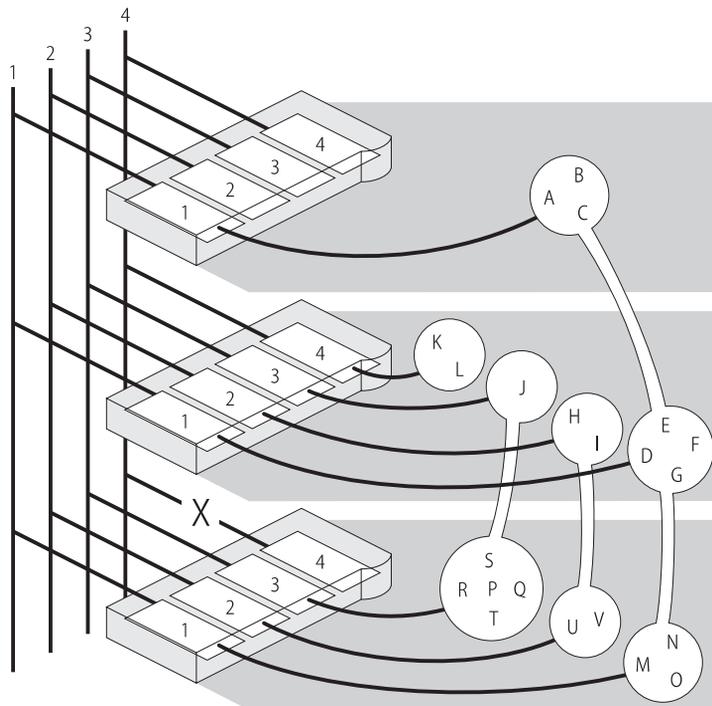


Figure 1-11 Workgroup Example After Changes

Port switching is independent of the physical connections, so it can be made quickly and easily, through either local or remote management.

If one of the PS Hubs in the example is a PS Hub 50, you can enable communication between the four cascaded segments in the stack, so that your workstations can communicate across the segments. For information on the PS Hub 50, refer to “PS Hub 50” on [page 2-2](#).

For information on the segment switch in the PS Hub 50, refer to “Segment Switch” on [page 2-2](#).

For information on load balancing, refer to [Chapter 4](#).

2

HOW THE PS HUBS DIFFER

This chapter contains the following topics:

- An overview of the differences between the PS Hub 40 and PS Hub 50
- How the PS Hub 50 segment switch and transceiver module slot work

Overview

This chapter describes how the PS Hub 40 and PS Hub 50 are different. However, they are both part of the PS Hub family and have many similar features. For information on these common features, refer to “Features” on [page 1-2](#).

[Table 2-1](#) shows a summary of the differences between the PS Hubs:

Table 2-1 Differences Between the PS Hubs

Features	PS Hub 40	PS Hub 50
Has the hub got an internal segment switch?	No	Yes
Number and type of transceiver module slots	2 x 10Mbps	1 x 10Mbps or 100Mbps

Apart from the differences shown in [Table 2-1](#), the PS Hubs have the same features.

PS Hub 40

The PS Hub 40 has two 10Mbps transceiver module slots. When fitted with transceiver modules, these ports can be port switched to any of the hub's four internal segments.

For information on what transceiver modules you can use, refer to "Using Transceiver Modules" on [page 3-12](#).

PS Hub 50

The main feature of the PS Hub 50 over the PS Hub 40 is that it has an internal *segment switch*.

Segment Switch

The segment switch is an additional part of the PS Hub 50 which links the stack's four cascaded segments. It provides switching between the four cascaded segments in the stack, so that the workstations on those cascaded segments can communicate across the segment switch. Using management, you can connect or isolate the segment switch from the cascaded segments, as shown in [Figure 2-1](#).

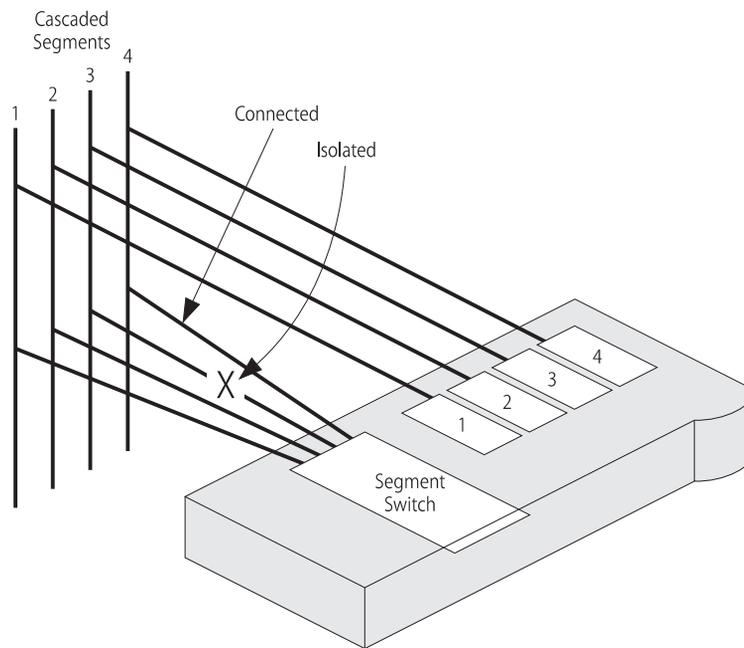


Figure 2-1 The PS Hub 50 Unit's Segment Switch

How Does the Segment Switch Work?

Information is passed around the network in small units, called *packets*. These packets contain various Ethernet addresses called *MAC addresses*, which are unique addresses that are permanently stored within each piece of network equipment:

- Source address — the MAC address of the equipment that sent the packet.
- Destination address — the MAC address of the equipment that the packet is intended for.

The network adapters in your workstations have a MAC address which is used to identify the workstations on the network. An example of a MAC address is '08004e0849d1'.

Using the source addresses, the PS Hub 50 unit's segment switch can *learn* which workstations are connected to each of the cascaded segments. This information is stored in a *switching database*, which is a list containing each source address together with the associated cascaded segment. Using this database, the segment switch can then selectively pass future packets to the relevant cascaded segment.

When the switch database is full, no new addresses are learnt. The segment switch regularly removes unused learnt addresses from the switch database (known as *ageing*), if they have not been used after 30 minutes (the ageing period). Using the web interface, you can make address entries permanent so that they are not removed by the ageing process.

The segment switch has the following features:

- Support for multiple PS Hub 50 units in the same stack.
- Switch database with a capacity of 500 workstation addresses.
- Self-selecting switch mode:
 - If a 100Mbps transceiver module is fitted, the segment switch is in *LOI* (Local Office Interconnect) mode — The 100Mbps transceiver module port behaves like a *downlink* port. A downlink port is a port that is typically connected to the rest of the network. All packets with an unknown destination address are forwarded to the downlink port only, and addresses are not learnt on this port.

- If a 10Mbps transceiver module is fitted or no transceiver module is fitted, the segment switch is in 802.1d Bridge mode — All packets with an unknown destination address are forwarded to all ports.

Default Settings

The PS Hub 50 comes ready to use with all of the cascaded segments connected to its segment switch (the default configuration). To isolate and connect segments, and to control the way the hub's segment switch works, you must manage the hub. For information on management, refer to [Chapter 5](#).

Multiple PS Hub 50 Units in a Stack

The PS Hub 50 has been designed so that you can have multiple PS Hub 50 units in the same stack. You may want to do this so that the cascaded segments are always switched, when:

- The stack is split.
- One of the PS Hub 50 units is removed or fails.

You could have two PS Hub 50 units in a stack of PS Hubs, one at the top and one at the bottom.

PS Hub 50 units automatically detect each other in the stack and configure themselves so that one of the hubs becomes the *active switch*, and the segment switches in all the other hubs are disabled. This is to reduce the possibility of loops in the stack. If a PS Hub 50 is removed from the stack or fails, the other hubs reconfigure themselves.

The process for detecting and reconfiguring is as follows:

- 1 If one hub has a 100Mbps transceiver module fitted, that hub becomes the active switch.
- 2 If more than one hub has a 100Mbps transceiver module fitted but only one has a link (is receiving information through its transceiver module port), that hub becomes the active switch.
- 3 If all PS Hub 50 units appear to be equal, the hub with the lowest unit number (the one nearest the bottom of the stack if connected correctly) becomes the active switch.



Only the active switch learns addresses and adds them to its switch database.

Fast Ethernet Resilience

The process that chooses the active switch (when there are multiple PS Hub 50 units in a stack) enables you to have a Fast Ethernet resilient link in your stack.

[Figure 2-2](#) shows a stack of two PS Hub 50 units, both with 100Mbps transceiver modules. Both transceiver modules have a connection and appear to be equal, so the bottom unit's segment is the active segment switch (and that transceiver module is used). If the connection to the bottom unit's transceiver module fails, the stack reconfigures so that the top unit's segment switch becomes the active segment switch.

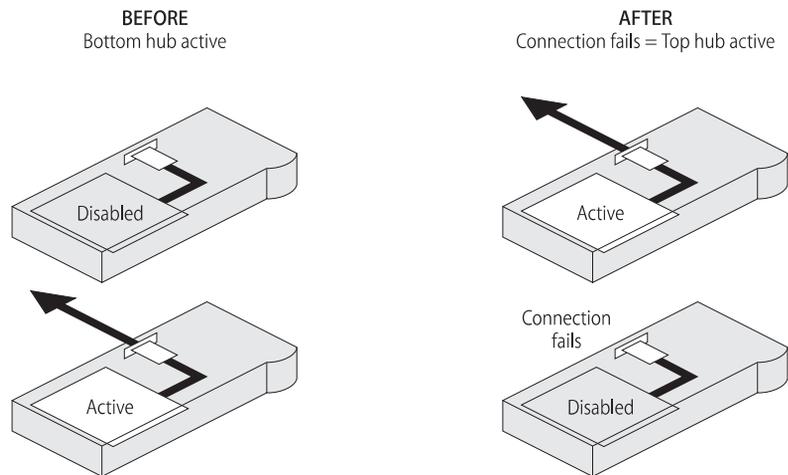


Figure 2-2 Fast Ethernet Resilience

PS Hub 50 Transceiver Module Slot

The PS Hub 50 unit's transceiver module can be fitted with a 3Com 10Mbps or 100Mbps transceiver module. The operation of the transceiver module slot differs when using either a 10Mbps or 100Mbps transceiver module:

- Packets with an unknown destination address are dealt with differently by the segment switch, refer to "How Does the Segment Switch Work?" on [page 2-3](#).
- The configuration of the transceiver module port is different.

For information on what transceiver modules you can use, refer to "Using Transceiver Modules" on [page 3-12](#).

Using a 10Mbps Transceiver Module

When a 10Mbps transceiver module is used, the PS Hub 50 allows you to port switch it to any of the hub's four internal segments (by default it is switched to segment 1), as shown in [Figure 2-3](#).

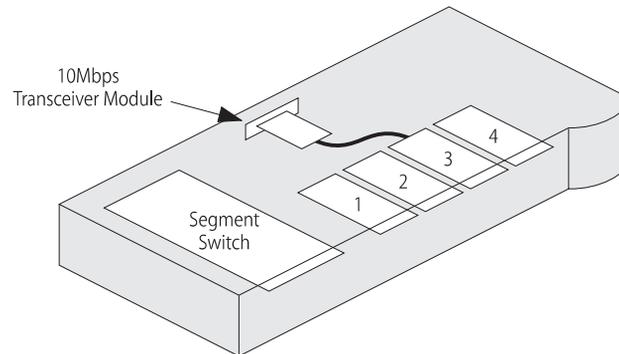


Figure 2-3 Using a 10Mbps Transceiver Module

Using a 100Mbps Transceiver Module

When a 100Mbps transceiver module is used, the PS Hub 50 automatically connects it to the hub's internal segment switch, as shown in [Figure 2-4](#).

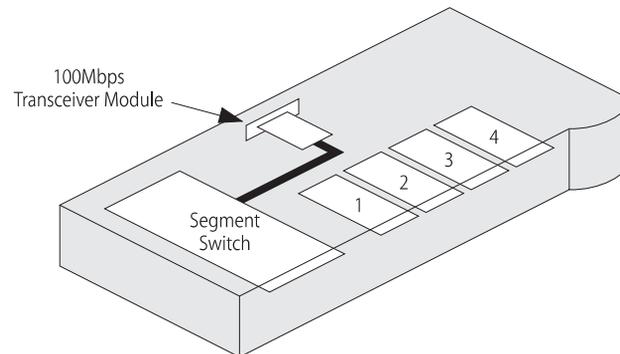


Figure 2-4 Using a 100Mbps Transceiver Module

Using a 100Mbps transceiver module to provide a 100Mbps network connection, gives you several options:

- You can have a fast downlink to a network server or the rest of your network.
- You can connect a 100Mbps network to your 10Mbps network, allowing you to migrate to a faster network in the future.

With multiple PS Hub 50 units, you can have a Fast Ethernet resilient link in your stack, refer to "Fast Ethernet Resilience" on [page 2-5](#).



3

USING THE PS HUB

This chapter contains the following topics:

- Description of the hub's LEDs and ports
- Positioning the hub
- Rack and wall mounting the hub
- Connecting PS Hubs together
- Connecting workstations and other equipment to the hub
- Spot Checks

LEDs and Ports

Figure 3-1 (over the page) shows the hub's diagnostic LEDs and easy to use ports. This diagram also appears on the Quick Reference Guide.

The LEDs:

- Show you how the hub and its ports are operating
- Show you how the hub's segments are operating
- Alert you to a potential problem with your network

The different types of ports are used for:

- Connecting workstations and other equipment to your hub
- Connecting your hub to other PS Hubs, to form a stack
- Connecting a management station to your hub for local management



CAUTION: Only connect a SuperStack® II Redundant Power System to the Redundant Power System socket.

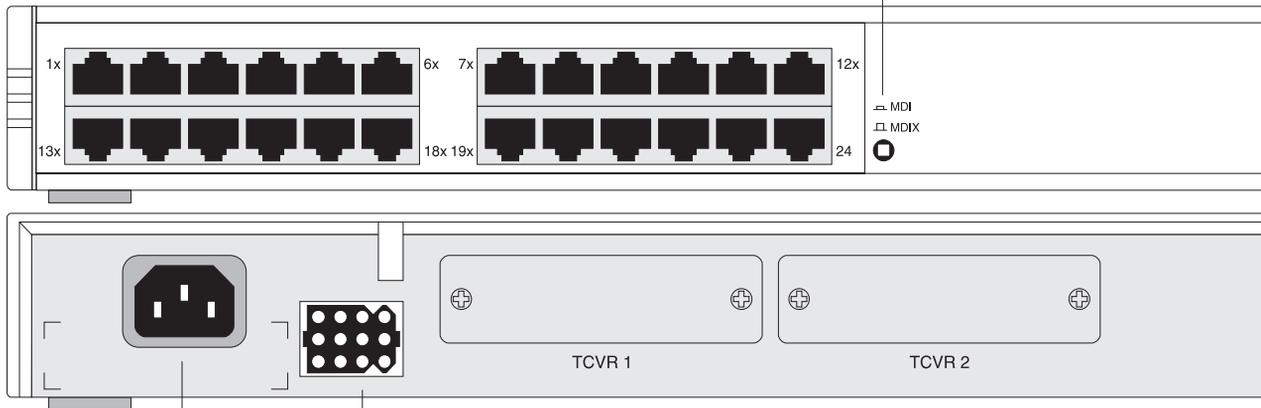
Do not remove the transceiver module blanking plate with the power still connected.

► **12 or 24 10BASE-T RJ45 ports**

Use 10BASE-T cable with RJ45 connectors. You can connect the PS Hub to any workstation or piece of equipment that has a 10BASE-T port. The last port (12 or 24) is affected by the MDI/MDIX switch, and can be used to link to a different hub or stack.

► **MDI/MDIX switch**

Affects the operation of the last port (port 12 or 24 depending on your hub). Refer to “Connecting Different Hubs and Stacks to Your Hub” on page 3-16.



► **Power socket**

Refer to “Important Safety Information” at the front of this guide, for correct selection of the power cord. The hub automatically adjusts to the supply voltage and can operate from 100–240V AC. You can power on your hubs in any order and make your port connections at any time.

► **Redundant Power System socket**

If you have a SuperStack® II Redundant Power System, connect it to this socket. For information about the Redundant Power System, refer to the manual that accompanies it.

► **Transceiver Module slots**

Refer to “Using Transceiver Modules” on page 3-12.

Figure 3-1 The LEDs and Ports (the PS Hub 40 is shown)

Status LEDs

Indicate the status of each port.

10BASE-T ports:

Green — the link between the port and the next piece of network equipment is OK.
Green flashing — the port has been disabled by management, or the port has partitioned due to a fault on that port.
Off — nothing is connected to the port.

PS Hub 40 transceiver module ports:

LEDs are the same as the 10BASE-T LEDs except that they light yellow when the port has partitioned (instead of flashing green).

PS Hub 50 transceiver module port:

100Mbps traffic LED lights green when 100Mbps packets are transmitted to and from the port. Status LED is the same as the 10BASE-T LEDs.

Segment LEDs

Indicate the status of the hub's internal segments.

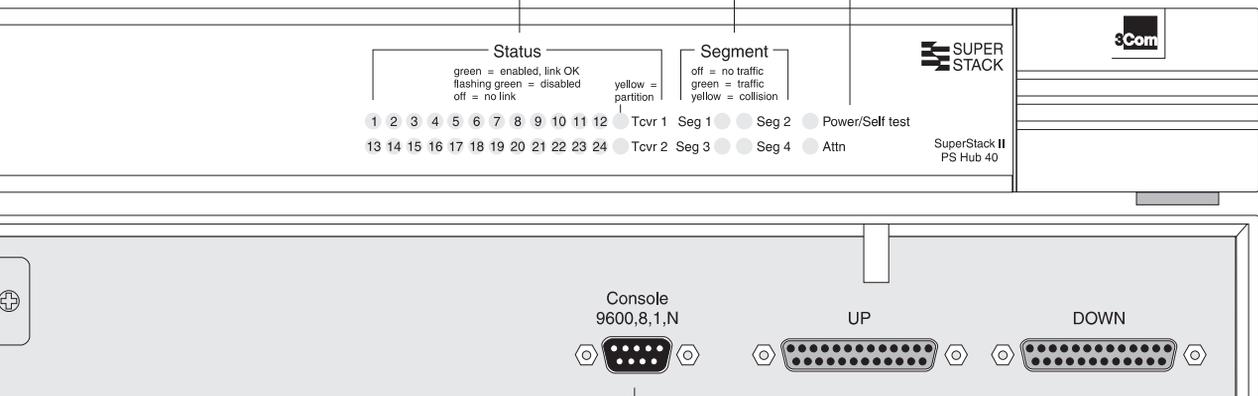
Green — there is network activity on the segment.
Yellow — there is a collision on the segment. Collisions are part of normal network operation.
Off — there is no network activity on the segment.

Power/Self Test LED

Green — the hub is powered on and is operational.
Green flashing — the hub is performing its self test, or a software download is in progress.
Yellow — the hub failed its self test, refer to Chapter 8.
Off — the hub is powered off.

Attn LED

By default this LED is off. You can light this LED to help identify the unit if it is part of a stack. To do this, use the Unit Status page in the web interface; refer to "Unit Status" on page 7-11.

**Console port**

Used to connect your management station to the hub for local management. For information on making a management connection, refer to Chapter 5.

Cascade ports

Used for connecting the hub to other PS Hubs to create a stack. Start with the bottom hub, and use cascade cables to connect the UP port on each hub to the DOWN port on the hub directly above it. For more information on using these ports, refer to "Connecting PS Hubs Together (Stacking)" on page 3-12.

Before You Start

Your PS Hub comes with:

- One power cord for use with the PS Hub
- Four standard height and two reduced height self-adhesive rubber feet
- Two mounting brackets and four screws
- Four self-adhesive labels
- One CD-ROM featuring:
 - The 3Com serial web utility (SLIP driver for Windows '95)
 - An agent upgrade utility
 - Transcend® Quick Configuration Manager for Windows
 - Transcend® Load Balancing Tool
 - Online help
 - Online versions of this user guide
- A Warranty Registration card for you to fill out and return
- A Quick Reference Guide

What Other Equipment Is Needed?

You may need to get some cables and other equipment for connecting your workstations and other hubs to the PS Hub. Your supplier should stock these cables and equipment. For information on how the cables' pins are connected, refer to "Cabling" on [page A-3](#).

Connecting Workstations

To connect workstations to your hub, you need:

- One 'Straight-through' 10BASE-T cable for every workstation. We recommend you use shielded 10BASE-T cables. The maximum length you can use is 100m (328ft).



In order to comply with the 10BASE-T standard, ports designed for workstation connections have been marked with the graphical symbol 'x'. This denotes a crossover in the port's internal wiring, for example 1x, 2x, 3x...

For information on connecting workstations to your hub, refer to "Connecting Workstations to Your Hub" on [page 3-11](#).

Connecting PS Hubs (Stacking)

To connect another PS Hub 40 or PS Hub 50 to your hub using the cascade ports, you need:

- One cascade cable for each additional hub.



Cascade cables have resilience built into them which protects the internal segments and management communication that is carried between the hubs in the stack. You can increase this resilience by using SuperStack II PS Hub Hot Swap Cascade Units with the cascade cables, refer to “Using Hot Swap Cascade Units” on [page 3-15](#).

Cascade cables are available from your supplier in a variety of lengths, refer to “Cascade Connections” on [page A-6](#). For information on connecting another PS Hub to your hub, refer to “Connecting PS Hubs Together (Stacking)” on [page 3-12](#).

Connecting Different Hubs and Stacks

To connect different hubs or stacks to your hub, you need:

- One ‘Straight-through’ 10BASE-T cable for each unit or stack — if using the last port (port 12 or 24) and the MDI/MDIX switch.
- One ‘Crossover’ 10BASE-T cable for each unit or stack — if using any 10BASE-T port other than port 24.

For information on connecting a hub or stack to your hub, refer to “Connecting Different Hubs and Stacks to Your Hub” on [page 3-16](#).

Connecting Management Equipment

For information on what equipment you need to manage the hub, refer to [Chapter 5](#).

Positioning the PS Hub

When installing your PS Hub, ensure that:

- It is accessible and cables can be connected easily.
- It is out of direct sunlight and away from sources of heat.
- Cabling is away from power lines, fluorescent lighting fixtures, and sources of electrical noise such as radios, transmitters and broadband amplifiers.
- Water or moisture cannot enter the case of the unit.
- Air flow around the unit and through the vents in the side of the case is not restricted. We recommend you provide a minimum of 25.4mm (1in.) clearance.
- Free standing hubs are not stacked more than six high, and that cables are supported so that they cannot pull the stack over.
- No objects are placed on top of any hub or stack.

Using the Rubber Feet

Four standard height and two reduced height self-adhesive rubber feet are supplied with the hub.



Do not apply the feet if you intend to rack or wall mount the hub.

Usage of the feet depends on where the PS Hub is placed:

- If the hub is going to be placed on top of a flat surface or another PS Hub, use the four standard height feet.
- If the hub is going to be placed on top of a LinkBuilder® FMS™ II hub or other SuperStack II unit, use two standard height feet towards the front, and the two reduced height feet towards the rear.



CAUTION: *If the hub is to be part of a free standing stack, apply the feet to each marked corner area on the underside of the hub. If the free standing stack contains different size hubs, ensure that the larger hubs are at the bottom of the stack.*

Using the Labels

A sheet of four labels is supplied with the hub. Some labels have already been attached to the hub.

The labels on the bottom of the hub show:

- The product number, serial number and MAC (Ethernet) address of the hub.
- The safety approvals to which the hub conforms.

The labels on the rear of the hub show:

- The product number of the hub.
- The power safety information.

The four labels left on the sheet are for you to use as necessary. Depending on how you are going to position the hub, you may want to stick the labels in a more accessible place; on the top or on the front of the hub, for example. All four labels have the name, product number, serial number and MAC (Ethernet) address of the hub printed on them.



CAUTION: Do not stick the labels over any of the vents on the sides of the hub.

Rack and Wall Mounting

Two mounting brackets and four screws are supplied with the hub. These are used for rack mounting and wall mounting the hub.



CAUTION: *Disconnect all cables from the hub(s) before continuing. Remove the self-adhesive rubber feet from the underside of the hub, if already fitted.*

Rack Mounting

The hub is 1U high and fits a standard 19in. rack.

To rack mount the hub:

- 1 Place the hub the right way up on a hard, flat surface with the front facing towards you.
- 2 Locate a mounting bracket over the mounting holes on one side of the hub, as shown in Figure 3-2.

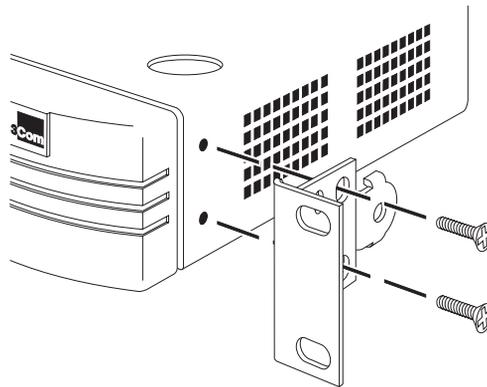


Figure 3-2 Locating the Brackets for Rack Mounting

- 3 Insert the two screws and fully tighten with a suitable screwdriver.
- 4 Repeat the two previous steps for the other side of the hub.
- 5 Insert the hub into the 19in. rack and secure with suitable screws (not provided).

Wall Mounting You can wall mount up to two hubs.

To fit the brackets to one hub, for wall mounting:

- 1 Place the hub the right way up on a hard, flat surface with the front facing towards you.
- 2 Locate a mounting bracket over the mounting holes on one side of the hub, as shown in Figure 3-3.

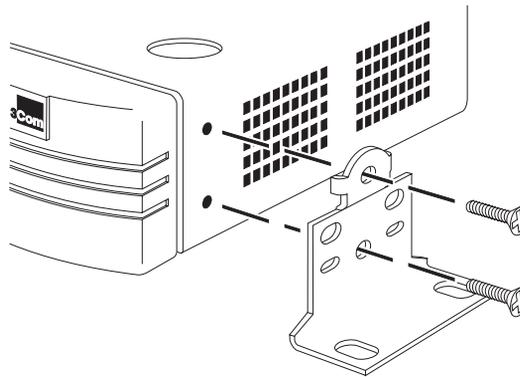


Figure 3-3 Locating the Brackets for Wall Mounting One Hub

- 3 Insert the two screws and fully tighten with a suitable screwdriver.
- 4 Repeat the two previous steps for the other side of the hub.

To fit the brackets to two hubs, for wall mounting:

- 1 Stack the hubs the right way up on a hard, flat surface with the front facing towards you.
- 2 Locate two mounting brackets over the mounting holes on one side of the hubs, as shown in Figure 3-4.

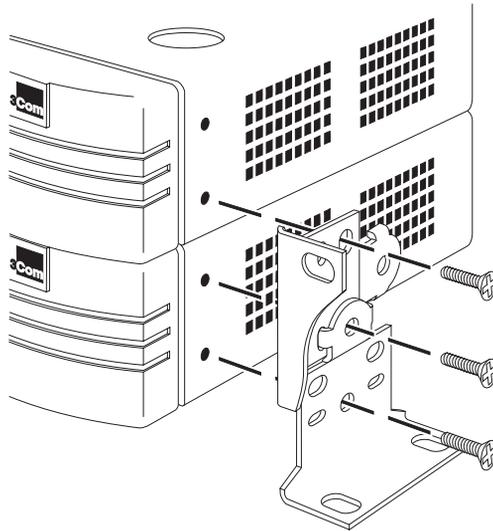


Figure 3-4 Locating the Brackets for Wall Mounting Two Hubs

- 3** Insert the three screws and fully tighten with a suitable screwdriver.
- 4** Repeat the two previous steps for the other side of the hubs.

To wall mount the hub(s):

- 1** Ensure that the wall you are going to use is smooth, flat, dry and sturdy. If necessary, attach a piece of plywood securely to your wall. Ensure that the plywood is large enough to mount the hub(s) on.
- 2** Position the hub(s) against the wall (or plywood) ensuring that the ventilation holes face sideways.

Mark on the wall the position of the screw holes for both wall brackets. Drill the four holes.

- 3** Using suitable fixings and screws (not provided), attach the hub(s) securely to the wall (or plywood).

Connecting Workstations to Your Hub

This section describes how to connect workstations to the hub using the 10BASE-T RJ45 ports.



WARNING: Ensure you have read the Important Safety Information section carefully before you start.

ACHTUNG: Versichern Sie sich, daß Sie den Abschnitt mit den wichtigen Sicherheitshinweisen gelesen haben, bevor Sie das Gerät benutzen.

AVERTISSEMENT: Assurer que vous avez lu soigneusement la section de L'information de Sécurité Importante avant que vous commenciez.



CAUTION: Always wait about 5 seconds between powering off and powering on the hub, to ensure that the hub performs a full reset.

Connecting workstations to your hub is easy. Connect them using 10BASE-T cables to any of the hub's 10BASE-T RJ45 ports. To connect a 10BASE-T cable, simply slot the connector into the relevant RJ45 port. When the connector is fully in, its latch locks it in place. To disconnect the cable, push the connector's latch in and remove it.

The hub detects all port connections, so you can start using your network immediately. When you need more ports, simply add more PS Hubs.



In order to comply with the 10BASE-T standard, ports designed for workstation connections have been marked with the graphical symbol 'x'. This denotes a crossover in the port's internal wiring, for example 1x, 2x, 3x...



If you are using the last port (port 12 or 24) to connect a workstation, ensure the MDI/MDIX switch is set to MDIX.

Using Transceiver Modules

Depending on your hub, the PS Hub has one or two transceiver module slots, providing a choice of media options.

PS Hub 40

The PS Hub 40 has two 10Mbps transceiver module slots that can be fitted with 3Com 10Mbps transceiver modules.



CAUTION: *The only transceiver modules that can be used in the PS Hub 40 unit's transceiver module slots are 3Com 10Mbps transceiver modules.*



You cannot use two AUI Transceiver Modules or Bridge MicroModules at the same time.

PS Hub 50

The PS Hub 50 has one transceiver module slot that can be fitted with a 3Com 10Mbps or 100Mbps transceiver module.



You cannot use an AUI Transceiver Module or Bridge MicroModule. The operation of the transceiver module in the PS Hub 50 is determined by the type of transceiver module you use; refer to "PS Hub 50 Transceiver Module Slot" on [page 2-6](#).

Connecting PS Hubs Together (Stacking)

You can increase the number of ports in your network by connecting additional PS Hub 40 and PS Hub 50 units to your hub, to form a *stack* (this process is called *stacking*). The four cascaded segments are carried through the stack, enabling you to switch the ports on all of the hubs between the four segments.

You can stack up to 10 units (if they are rack mounted) or six units (if they are free standing).



CAUTION: *Do not have a free standing stack of more than six hubs. When you connect workstations and other equipment to the stack, ensure that all cables are supported and cannot pull the stack over. If installing the PS Hub in a stack of mixed SuperStack II units, the PS Hub must be installed above the deeper units.*



For conformance with Ethernet rules, you can only have four repeaters in series. For a stack of more than one PS Hub, any path through the stack counts as going through two logical repeaters.

About Cascade Cables

Cascade cables are used to connect the PS Hubs to form a stack. These cables carry the stack's cascaded segments and distributed management information; the stack will not work with any other cables. Cascade cables are available from your supplier, and come in a variety of lengths, refer to "Cascade Connections" on [page A-6](#).



You can use a maximum of 6m (19.6ft) of cascade cabling between the top and bottom hubs in the stack.

Stack Resilience and Hot Swap Functionality

Cascade cables have built-in resilience and hot swap functionality:

- Up to three units within the stack can be powered off without affecting the operation of the other units in the stack.
- The units within a stack automatically reconfigure when a unit is added or removed from the stack.

However, if a cascade cable is disconnected, the stack splits into two isolated stacks. The units within the stack(s) automatically reconfigure when a cascade cable is connected or disconnected.

Hot Swap Cascade Units

You can increase the resilience of the stack by using 3Com Hot Swap Cascade Units (3C16430) with the cascade cables. These units can be fitted to any PS Hub and provide total hot swap functionality.

The stack is held together even if units fail or are removed, added, or powered off. For more information on how the Hot Swap Cascade Units work, refer to the documentation that accompanies them.

Hot Swap Cascade Units are available from your supplier, refer to "Cascade Connections" on [page A-6](#).

Using Cascade Cables To connect PS Hubs together, using Cascade cables:

- 1 Position the units as required; rack mounting or wall mounting them as necessary.
- 2 Starting with the bottom unit, using a cascade cable:
 - Connect the cable's connector marked UP to the UP port on the unit.
 - Connect the cable's connector marked DOWN to the DOWN port on the unit directly above it.

Secure the cable in place by tightening its captive screws as tight as possible by hand.

- 3 Continue up the stack, repeating step 2 for each unit, as shown in Figure 3-5.

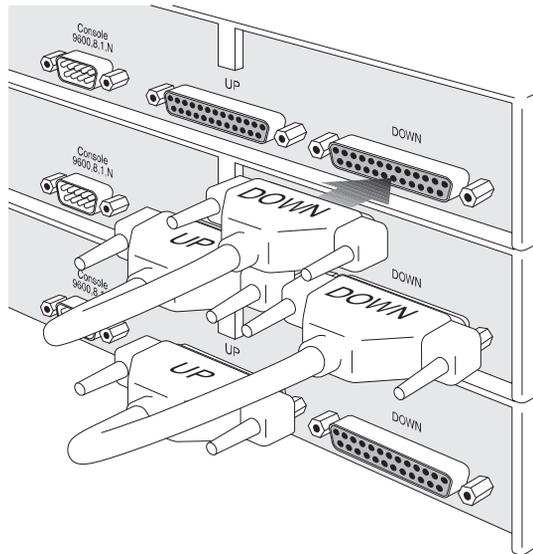


Figure 3-5 Connecting PS Hubs Together

Using Hot Swap Cascade Units

To connect PS Hubs together, using Hot Swap Cascade Units:

- 1 Position the units as required; rack mounting or wall mounting them as necessary.
- 2 Connect the Hot Swap Cascade Units with cascade cables:
 - Connect the cables' connectors marked UP to the UP ports on the Hot Swap Cascade Units.
 - Connect the cables' connectors marked DOWN to the DOWN ports on the Hot Swap Cascade Units.

Secure the cables by tightening the cables' captive screws as tight as possible by hand.

- 3 Starting at the bottom, connect the bottom Hot Swap Cascade Unit to the UP and DOWN port of the unit. Secure the Hot Swap Cascade Unit in place by tightening its long captive screws as tight as possible by hand.
- 4 Continue up the stack, repeating step 3 for each unit, as shown in Figure 3-6.

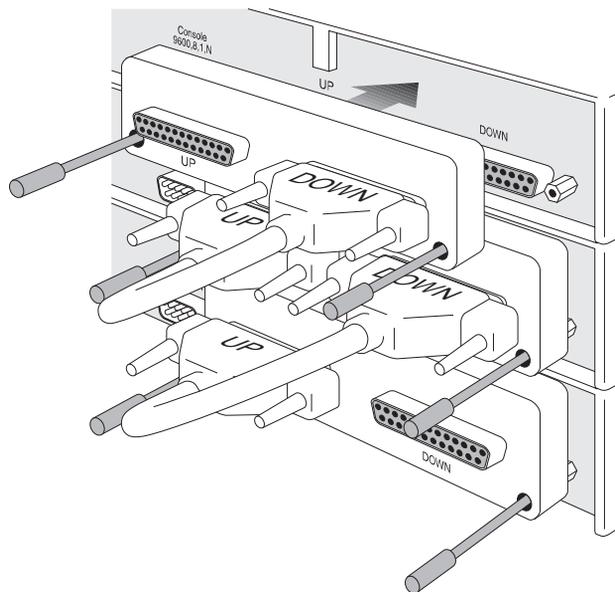


Figure 3-6 Connecting PS Hubs Together Using Hot Swap Cascade Units

Connecting Different Hubs and Stacks to Your Hub



You can connect the PS Hub to different hubs and stacks (for example a stack of SuperStack II Hub 10 units), giving you flexibility when creating a new network, or expanding an existing network.

In order to conform with Ethernet rules, you can only have four repeaters in series. For a stack of more than one PS Hub, any path through the stack counts as going through two logical repeaters.

Each of the PS Hub's 10BASE-T ports are internally crossed (MDIX). The type of cable and ports used must be correct for the connection to work:

- You can use 'Straight-through' 10BASE-T cable to connect a crossover (MDIX) port to an uncrossed (MDI) port.
- You can use 'Crossover' 10BASE-T cable to connect two crossover (MDIX) ports.

The last port (port 12 or 24) on the PS Hub can be either crossed or uncrossed. The MDI/MDIX switch affects the port's state:

- If the switch is IN, the port is uncrossed (MDI).
- If the switch is OUT, the port is crossed (MDIX).

Figure 3-7 shows a SuperStack II Hub 10 connected to the PS Hub. A 'Straight-through' cable is used, and one of the SuperStack II Hub 10 unit's crossed (MDIX) ports is connected to port 24 on the PS Hub (note that the MDI/MDIX switch is IN, so the port is uncrossed).

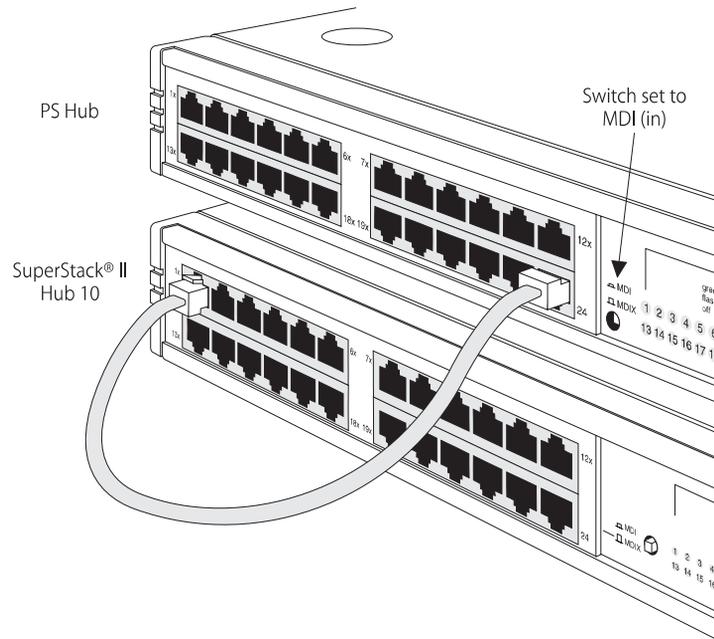


Figure 3-7 Correct Hub Connections Using the Port 24 and the MDI/MDIX Switch

Powering On the Units

When you have connected all of your equipment together, you are ready to use your network.

You can power on the unit or the units in the stack in any order, and can make your port connections at any time. After powering on the hub, its Power/Self Test LED flashes for a few seconds while the hub performs its self test. Afterwards, the LED lights green. If it does not, refer to “Solving Problems With the Hub” on [page 8-2](#).

Any information that you configure for the unit using management, is retained when you power off the unit.

Spot Checks

At frequent intervals, visually check that:

- Case vents are not obstructed
- Cabling is secure and not pulled taut

If you suspect there is a problem, refer to [Chapter 8](#).

4

LOAD BALANCING

This chapter contains the following topics:

- An overview of load balancing
- How load balancing works

Overview

The PS Hub has a very useful feature called *load balancing* which can be used to configure segments in a stack of PS Hubs. The aim of load balancing is to increase total throughput across the segments in a stack, providing more efficient segments.



As load balancing configures segments in a stack, you cannot perform workgrouping at the same time. In effect, the segments participating in load balancing are a single, high-capacity workgroup.

For load balancing to work properly, there must be either:

- A PS Hub 50 in the stack
- A switch connected to the hubs in the stack

How Does Load Balancing Work?

The load balancing feature monitors the traffic levels in the stack. At regular intervals or when it reaches a predefined traffic level (whichever you have configured), the stack starts load balancing. Here are the steps it performs:

- 1 The PS Hubs work out which internal segments and cascaded segments are connected by a switch (either through the PS Hub 50 unit's segment switch or an external switch). It does this because the load balancing feature will only move ports between segments that they currently communicate with (so that no workstations become isolated).

Figure 4-1 shows an example of a stack (with a PS Hub 50) that is to be load balanced. The segments that can be load balanced have been indicated.

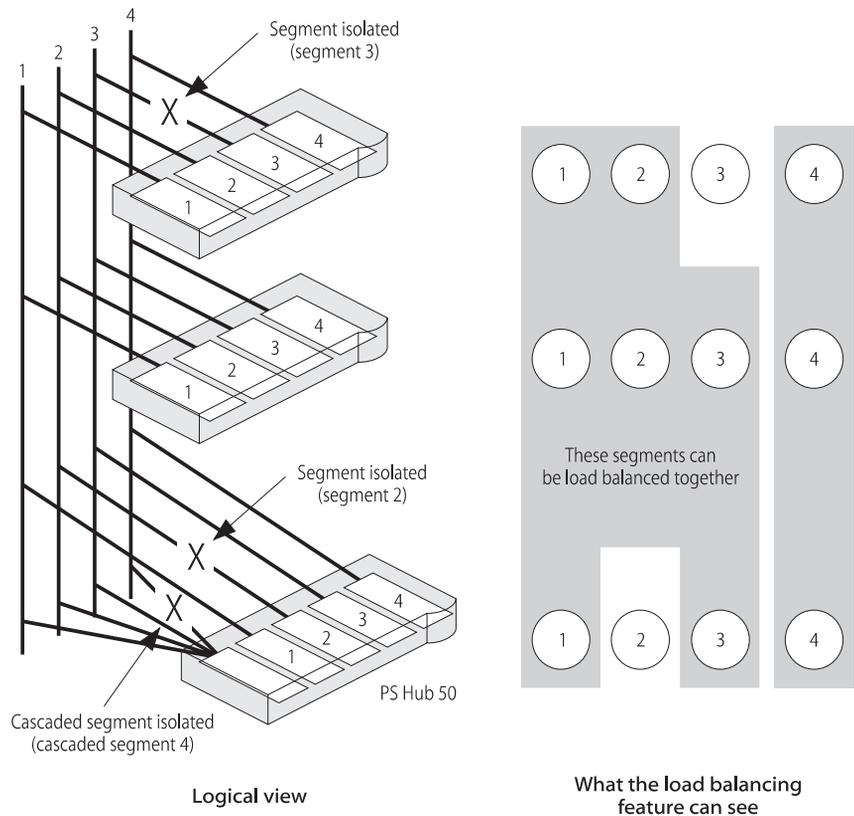


Figure 4-1 Example of Load Balancing

- 2 The load balancing feature notes:
 - Any ports or segments that have been *fixed* — Through management you can fix ports and segments that you do not want load balancing to move.
 - Any ports that are connected to external switches.

These segments and ports will not be moved by load balancing. However, traffic generated by these ports and segments will still be considered by the load balancing feature, when it works out what other ports it will move.
- 3 The load balancing feature works out how it can configure the segments. It attempts to:
 - Have frequently communicating ports on the same segment.
 - Reduce the total traffic utilization across the segments.
- 4 If some benefit will be gained from the new configuration, the load balancing feature completes the operation by moving the ports between the segments as required.

Using an External Switch

The best way to interconnect the cascaded segments in a stack of PS Hubs is to use a PS Hub 50. However, if you want to connect two or more segments using an external switch, you must connect the switch to the PS Hub's 10BASE-T or transceiver module ports and then port switch those ports to the relevant segments.

For information on using your switch, refer to the documentation that accompanies it.

Performing Load Balancing

You can configure the load balancing feature through management (it is disabled by default). For information on initiating the load balancing feature using the web interface, refer to "Load Balancing" on [page 7-20](#). For information on setting it up using the Load Balancing Tool (which is launched from within Quick Config Manager), refer to "Load Balancing" on [page B-18](#).



5

MANAGING THE PS HUB

This chapter contains the following topics:

- The management tasks you can perform
- What you can use to manage your stack
- How you can make a management connection to your stack

Introduction

Network management is not required to make the PS Hub work, but allows you to change the way it works and to monitor what is happening to the segments and the rest of the network. There are many features that can improve the operation of the hub or stack.

A stack of PS Hubs is treated as a single manageable entity, and the management is distributed. This guide uses the word '**stack**' to refer to a stack of one or more PS Hubs, and '**management station**' to refer to the piece of equipment you are using to manage the stack (for example a computer).



If the stack is connected and configured as recommended, the bottom hub in the stack is unit number 1, the next hub up is unit number 2, and so on.



*All PS Hubs must be running agent software version 2.00 or later for them to have the functionality mentioned in this user guide (for example the web interface, CLI and load balancing). However, PS Hubs that are running earlier agent software **are** compatible with newer PS Hubs but do **not** have the newer functionality. You can use Quick Configuration Manager to see what versions of management software are on the units in the stack, and to upgrade the stack; refer to "Upgrading a Stack" on [page B-28](#).*

Why Manage Your Stack?

With management, you can change and view the way the stack or network operates in the following way:

- Display a graphical representation for the stack to quickly view the status of each hub and its ports.
- Display general information for the stack or hubs.
- Graphically display network information for the stack's cascaded segments.
- Enable and disable ports, and switch them between segments.
- Perform load balancing so that the traffic is distributed evenly across the segments in the stack, resulting in more efficient segments.
- Configure security for the ports, including specifying what equipment is allowed to communicate through the ports on the hub.
- Set up resilience; specify a backup connection that takes over should a main connection fail.
- View statistics.
- Configure the console port for connection to a modem.
- Configure user management access levels.
- Upgrade the management software in the stack with any future agent software upgrade.
- Configure the stack to send messages (called *traps*) to an SNMP network management application (for example, Transcend® Enterprise Manager) if certain conditions arise — you cannot configure this using the web interface.
- Perform remote monitoring using RMON — not manageable using the web interface or Quick Config Manager.
- Restart the hub to refresh its statistics and use any new configurations.
- Initialize the hub to return it to its factory settings (IP information is retained).

How You Can Manage Your Stack

A stack of PS Hubs is treated as a single manageable entity, and the management is distributed. Any network address information (IP information) that you configure for a hub, can be used to access the stack.

The PS Hub has two built-in management interfaces which you can access locally (through the hub's console port) or remotely (over the network):

- A Command Line Interface (CLI) — can be used to set up the stack with network address information.
- A web interface — provides easy management of the stack from any suitable web browser.

There is also a management application called Transcend Quick Configuration Manager, referred to as '**Quick Config Manager**' in this guide, that is supplied on the CD-ROM. It runs under Microsoft Windows® and provides an easy-to-use graphical management system.

Command Line Interface

The PS Hub's Command Line Interface (CLI) is a simple text-based user interface which allows you to configure some network information for your hub. The CLI provides just a subset of the web interface's functionality but is intended as a quick setup tool, to get your hub ready for management over the network. You can use a Terminal or Terminal emulator to access the CLI.

Web Interface

The PS Hub's web interface provides easy management of the stack. It behaves in a similar way to a web site on the World Wide Web in that you access it using a web browser. You use its different pages to change the network information in your stack and perform different management tasks.

SNMP Network Management

The web interface and CLI built into your PS Hub allow you to manage the stack. However, as your network grows, you may need a more powerful SNMP network management application that will control all of your managed units and stacks. Whether your network is large or small, its ongoing performance, growth and security are only as good as its management system.

3Com produces a range of powerful graphical SNMP network management applications (for example Transcend Enterprise Manager for Windows) that give you total control over your entire 3Com network from a single management station.

Using intelligent 3Com software distributed throughout the network, 3Com's Transcend management applications support all of today's platforms and manage a wide variety of 3Com products.

For further information about which Transcend management application can benefit your growing network, call your local sales office; refer to [Appendix E](#).

Methods of Management

There are many ways you can connect your management station to the stack, as shown in Figure 5-1. You can manage the stack:

- Through the console port (known as *out-of-band* management):
 - Using a web browser
 - Using a terminal emulator
 - Using a terminal
 - Using Quick Config Manager
- Over the network (known as *in-band* management):
 - Using an SNMP network management application
 - Using a web browser
 - Using a terminal emulator (over Telnet)
 - Using Quick Config Manager (Windows® '95 and Windows NT®)



If you are going to manage the stack over the network, the quickest way to set it up with the necessary network information is to connect to one of the PS Hubs locally and use the CLI.

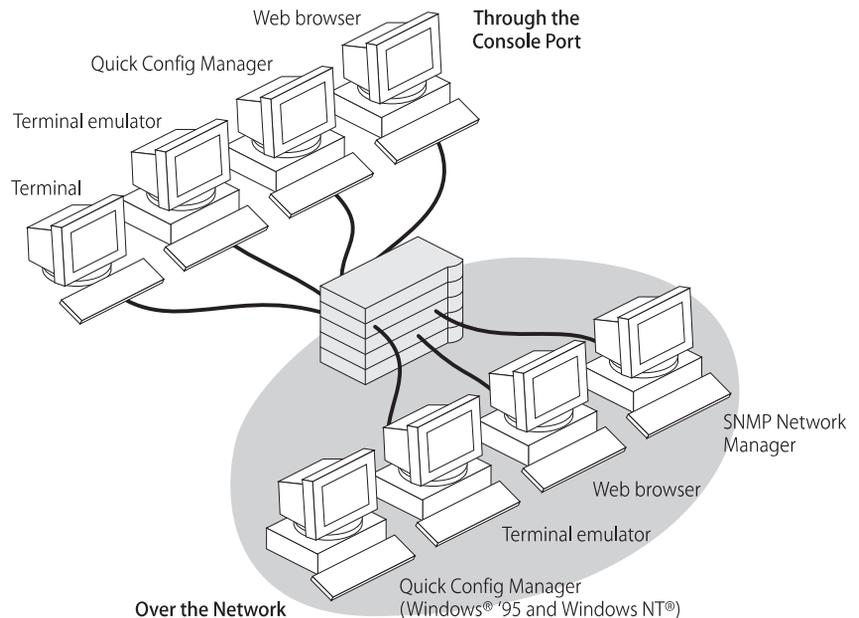


Figure 5-1 Different Management Connections to the Stack

Requirements for Managing Over the Network

When managing your stack over the network, you must remember that (regardless of your method of management):

- The hub or stack must be correctly configured with IP information. You must make a direct management connection through the console port to do this (or use a BOOTP server).



IP addresses are unique, no two hubs must have the same IP address. If you have no previous knowledge of IP, refer to “IP Addresses” on [page 5-7](#).

If you have a BOOTP server, it can automatically assign your network equipment, including the PS Hubs, with IP information so that it can be communicated with and managed over the network. Refer to the documentation that accompanies your BOOTP server for more information.

- Any IP information configured for a hub in a stack can be used to access the whole stack. If the stack is physically split in two, the IP information remains with the hub and is used by its half; the other half has no IP information so it becomes unmanageable over the network. You can configure more than one hub in a stack with IP information. We recommend you do this for the top and bottom hubs to obtain redundant management capabilities (should the stack split).
- IP must be correctly set up for your management station.
- You can manage the hub or stack over the network, through any of the ports. However, for the communication to work over the network, the port through which your communication reaches the stack must be connected to segment 1 (either directly or indirectly) of the hub with the IP address configured. If you are going to use load balancing to configure your segments, it is a good idea to fix this port to segment 1.
- You can manage a mixed stack of PS Hub 40 and PS Hub 50 units. If you have multiple PS Hub 50 units, only one of the hubs' segment switch will be active, refer to “Multiple PS Hub 50 Units in a Stack” on [page 2-4](#).

IP Addresses If you are uncertain about what IP addresses to assign your equipment, contact your network administrator.

To operate correctly, each device on your network (for example a hub or management station) must have a unique IP address (if one is configured). IP addresses have the format $n.n.n.n$ where n is a decimal number between 0 and 255. An example IP address is '191.1.1.8'.

The IP address can be split into two parts:

- The first part ('191.1' in the example) identifies the network on which the device resides.
- The second part ('1.8' in the example) identifies the device within the network.

If your network is internal to your organization only, you may use any arbitrary IP address. We suggest you use addresses in the series 191.1.1.X where X is a number between 1 and 254. Use the default SLIP address of 192.168.101.1.

If your network has a connection to the external IP network, you must apply for a registered IP address. This 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.

Obtaining a Registered IP Address

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

Network Solutions
Attn.: InterNIC Registration Service
505 Huntmar Park Drive
Herndon
VA 22070
USA

Telephone: (1) (703) 742 4777

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

Command Line Interface (CLI)

The CLI allows you to configure a limited set of parameters for the hub. You can access the CLI:

- Through the console port
- Over the network

This section has information on accessing the CLI. For more information on using the CLI, refer to [Chapter 6](#).

Through the Console Port

[Table E-1](#) shows the settings for the hub's console port.

Table E-1 Console Port Settings

Data bits (character size)	8
Stop bit	1
Parity	None

You can access the console port through a direct local connection, or you can set up a remote connection using a modem.

The terminal or management station (with the terminal emulator) connected to the console port must use the same settings. By default, the hub has auto-configuration enabled which will change the hub's console port settings to match those of the connected equipment and automatically detect the baud rate (line speed). The hub can auto-detect a maximum baud rate of 19200.

You need to use a null modem cable for connecting your terminal or management station directly to the console port. This should be available from your supplier. There are a variety of null modem cables that you can use. For an example of one of these, refer to "Console Cable" on [page A-4](#).

If you are using a modem in your setup, you need to use a modem cable. For an example of one of these, refer to "Modem Cable" on [page A-5](#). For information on setting up a connecting to the modem, refer to the documentation that accompanies the modem.

To connect your equipment:

- 1 Connect the serial port on your terminal or management station to the console port on the PS Hub, using a null modem cable.
- 2 Ensure that the terminal or management station's serial port settings match those of the console port on the PS Hub.

Using a Terminal Emulator

You can use the terminal emulator that comes with Microsoft Windows to access the hub's CLI:

- Windows '95 and Windows NT (version 4 or later) have a program called 'HyperTerminal'.
- Other versions of Windows have a program called 'Terminal'.



For other types of management stations and operating systems, refer to the documentation that accompanies your terminal emulator for information on how to use it.

HyperTerminal

HyperTerminal can usually be found from the Windows *Start* menu, in *Programs, Accessories*. To start a HyperTerminal session (after connecting to the hub's console port):

- 1 Double-click on the 'Hypertrm.exe' icon to start the application.
The Connection Description dialog box appears.
- 2 Enter a dummy name in the *Name* field and click *OK*.
The Phone Number dialog box appears.
- 3 Select the serial port that you are using to connect to the hub, in the *Connect using* field.
The COM Properties dialog box appears.
- 4 Configure the data bits to '8', stop bit to '1', parity to 'none', and click *OK*.
- 5 Click in the main HyperTerminal window and press [Return] several times to start the communication.

Terminal Terminal can usually be found from the *Main* window, in the *Accessories* program group. To start a Terminal session (after connecting to the hub's console port):

- 1 Double-click on the 'Terminal' icon to start the application.
- 2 If the Default Serial Port dialog box appears, select the serial port that you are using to connect to the hub and click *OK*.
- 3 From the *Settings* menu in the main Terminal window, select *Terminal Emulation*.

The Terminal Emulation dialog box appears.

- 4 Select 'DEC VT-100 (ANSI)' and click *OK*.
- 5 From the *Settings* menu, select *Communications*.

The Communications dialog box appears.

- 6 Configure the data bits to '8', stop bit to '1', parity to 'none', and click *OK*.
- 7 Click in the main Terminal window and press [Return] several times to start the communication.

Over the Network

You can access the CLI over a TCP/IP network using Telnet. To run Telnet, you need a suitable terminal or management station running a terminal emulator.

You can have multiple CLI management sessions at the same time. If a connection is lost inadvertently, the connection is closed by the hub after about 30 minutes of inactivity.



You can manage the hub or stack over the network, through any of the ports. However, for the communication to work over the network, the port through which your communication reaches the stack must be connected to segment 1 (either directly or indirectly) of the hub with the IP address configured.

Using a Telnet Terminal Emulator

You can use the Telnet terminal emulator that comes with Microsoft Windows '95 (called 'Telnet') to access the hub's CLI.



To open the Telnet session, you must specify the IP address of the hub you want to manage. For other types of management stations and operating systems, refer to the documentation that accompanies your Telnet terminal emulator for information on how to do this.

Telnet The Telnet application ('Telnet.exe') can usually be found in the *Windows* directory on your PC. To start a Telnet session:

- 1 Run the 'Telnet.exe' application.
The Telnet application's window appears.
- 2 From the *Connect* menu, select *Remote System*.
The Connect dialog box appears.
- 3 Type the IP address of the stack in the *Host name* field, select 'telnet' for the *Port* field, and select 'vt-100' for the *TermType* field.
- 4 Click *Connect*.

Web Interface

You can manage the PS Hub using its web interface. You can access the web interface:

- Through the console port
- Over the network

This section has information on accessing the web interface. For more information on using the web interface, refer to [Chapter 7](#).

Through the Console Port

You can access the web interface through the hub's console port, using a management station running *SLIP* (Serial Line Interface Protocol).



If your management station is running Windows '95, you must use the 3Com serial web utility that is supplied on the CD-ROM. This is a SLIP driver that sets up SLIP access for web interface management. To install and use the serial web utility, refer to [Appendix C](#).

You need to use a null modem cable for connecting your management station directly to the console port. This should be available from your supplier. There are a variety of null modem cables that you can use. For an example of one of these, refer to "Console Cable" on [page A-4](#).

Over the Network

You must have an IP stack on your management station, so that you can manage over a TCP/IP network. An easy way to check this is that if you have access to the Internet and can download web pages from it, your management station has already got an IP stack.

Which Web Browsers are Supported?

For fully operational management, your web browser must support:

- Java
- Frames
- HTML 3.2

Suitable web browsers are Netscape Navigator™ Version 3.0 or Microsoft Internet Explorer Version 3.0.

Configuring Your Browser

Before you use your web browser to access the web interface, you must make one small configuration change to it, so that it always downloads the latest version of a page.

To do this for Netscape Navigator:

- 1 Start Netscape Navigator.
- 2 From the *Options* menu, select *Network Preferences*.
The preferences dialog box appears.
- 3 Check the 'Every Time' checkbox.
- 4 Click *OK*.

To do this for Microsoft Internet Explorer:

- 1 Start Microsoft Internet Explorer.
- 2 From the *View* menu, select *Options*.
The Options dialog box appears.
- 3 Select the *Advanced* tab, and in the Advanced property sheet click *Settings*.
- 4 Check the 'Every visit to the page' checkbox.
- 5 Click *OK*.

Quick Config Manager

You can manage the PS Hub using Quick Config Manager. You can manage the hub:

- Through the console port
- Over the network — Windows '95 and Windows NT (version 4 or later) only

You can perform similar management functions using Quick Config Manager as you can using the web interface.

Through the Console Port

You need to use a null modem cable for connecting your management station directly to the console port. This should be available from your supplier. There are a variety of null modem cables that you can use. For an example of one of these, refer to "Console Cable" on [page A-4](#).

Connect one end of the null modem cable to the console port on the hub, and the other to the serial (RS232) port on your management station with Quick Config Manager installed.



When using Quick Config Manager with Windows '95 and managing through the console port, you must first disable FIFO buffers in the Advanced Port Settings window in Windows '95. To do this:

- 1 In the Windows '95 environment, select *My Computer*.
- 2 Select (in turn): *Control Panel, System, Device Manager, Ports, COM1* (or whatever COM port you are using instead), *Port Settings, and Advanced*.

The Advanced Port Settings window appears.

- 3 Uncheck the Use FIFO Buffers checkbox.
- 4 Click *OK* for the Advanced Port Settings window, and all of the windows that were opened in order to access the window.

When you have made your connection and installed Quick Config Manager, you are ready to manage the stack. Quick Config Manager uses COM 1 as the default serial port on your management station. If you want to change this, refer to "Running Quick Config Manager" on [page B-4](#).

Over the Network

You must have an IP stack on your management station, so that you can manage over a TCP/IP network.



You can manage the hub or stack over the network, through any of the ports. However, for the communication to work over the network, the port through which your communication reaches the stack must be connected to segment 1 (either directly or indirectly) of the hub with the IP address configured.

For information on installing and using Quick Config Manager, refer to [Appendix B](#).

6

USING THE COMMAND LINE INTERFACE

This chapter describes how to use the Command Line Interface (CLI). The CLI is a quick and simple interface that is built-in to the hub, which allows you to enter various IP address settings, reset it and initialize it. The web interface and Quick Config Manager can perform most of the tasks that the CLI can do.

You would normally use the CLI if you have many hubs that you want to set up quickly with IP address information, for eventual management using an SNMP network management application.

Simple help is provided with each command in the Command Line Interface.

Ensure that your terminal or management station (which has the terminal emulator) has been appropriately set up for your particular management method and that any necessary connections have been made, refer to "Command Line Interface (CLI)" on [page 5-8](#).

If you have any problems using the CLI, refer to "Solving Problems With the Command Line Interface" on [page 8-3](#).

Accessing the CLI

By default, the hub automatically configures the baud rate of its console port to operate with the connected management station or terminal, provided the parity, stop bits and character size are identical to the connected management station or terminal. You may need to perform the wake-up procedure to initiate the communication. To do this, press [Return] several times at the management station or terminal.

The login sequence for the CLI begins as soon as the hub detects a connection to its console port, or as soon as a Telnet session is started.

Initial Access The login prompt `login:` is displayed.

As the initial user, enter the default user name `admin` and press [Return] at the `password:` prompt. The first time you access the CLI, the password is null.



We recommend that when you have accessed the stack, you change the default passwords for the user levels (if you have not already done so) by logging in as the different user levels.

Logging On At subsequent logins, enter your user name. If the user name is valid, the `password:` prompt appears. You must enter your password correctly before you can continue with your management session.

If you have logged on correctly, the initial menu appears. If you have not logged on correctly, the message `incorrect password` appears and the login sequence starts again.

Default User Names and Passwords

Table 6-1 shows the default users that can access the hub and their level of access. We recommend that setting a password is the first task you carry out on the hub. Setting a password prevents unauthorized management access to the hub or stack.

Table 6-1 Default Users

User Name	Default Password	Access Level
monitor	monitor	Monitor — this user can view but not change all manageable parameters
manager	manager	Manager — this user can access and change the operational parameters but not special/security features
security	security	Security — this user can access and change all manageable parameters
admin		Admin — this level is the same as Security

Logging Off At the top level of the CLI, if you enter the command `logout`, the management session is terminated.

Automatic Logout

As a security measure, a management session will be terminated if there is a period of inactivity lasting longer than 30 minutes.

After the session has terminated, the first key that you press returns you to the login prompt.

Using the CLI Menus

When you log on to the CLI correctly, the top-level menu is displayed, as shown in [Figure 6-1](#). The unit description, unit name and unit number are shown (PS Hub 50 and Marketing(1)) in this example).

```
Menu options: -----3Com SuperStack II,PS Hub 50-----
ip                - Administer IP
logout            - Logout of Command Line Interface
system           - Administer system-level functions

Type q to return to the previous menu or ? for help.
-----Marketing(1)-----
Select menu option :
```

Figure 6-1 Top-level menu

Use the CLI by selecting options from this menu and from the others below it. Each menu option is accompanied by a brief description of what that option does.

CLI Menu Structure

[Figure 6-2](#) shows the menu/command structure for the CLI.

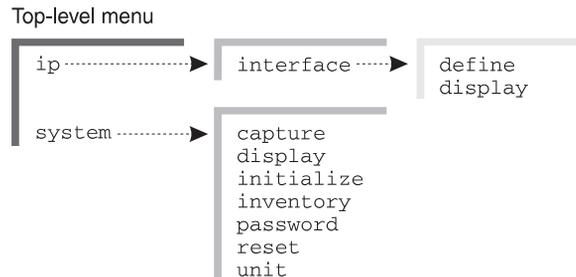


Figure 6-2 CLI Menu Structure

From the top-level menu, you can access two sub-menus:

- **IP Menu** — From here, you can configure IP parameters.
- **System Menu** — From here, you can view system configuration, configure CLI parameters, change your password, reset and initialize the hub.

Navigating the Menus and Entering Commands

You can navigate the menus using any of the following methods:

- Following the menu hierarchy — at the `Select menu option:` prompt, type your selected menu name and press [Return]. The screen changes to show the next level of menus available or the list of commands available within your selected menu.
- Entering multiple menu names on the same line — if you are familiar with the menu structure you can enter successive menus on the same line at the `Select menu option:` prompt. For example, to display the system configuration, the CLI would read:

```
Select menu option: system display
```

- Abbreviated commands — for speedy navigation of the menus, you need only enter enough characters to uniquely identify the menu you want at the prompt. For example, to display system configuration, the CLI would read:

```
Select menu option: sy di
```

As you navigate through the menus, the prompt changes to display your current position in the hierarchy. For example, if you are in the interface sub-menu of the system menu, ready to enter your next option, the prompt reads:

```
Select menu option (system) :
```

Entering Commands

When you reach the menu level containing the specific command you want to enter, you are prompted for a command name. Commands can also be entered at the end of the menu string. Where applicable, default values for commands are shown in parentheses after the prompt. If you press the [Return] key for a command with such a value, the hub continues to use that value.

Returning to the Previous Menu

You can return to the previous menu, by entering `q` at the prompt.

Returning to the Top-level Menu

You can return to the top-level menu by pressing the [Esc] key.

Obtaining Help

You can get help at any time by entering `?` at the prompt.

Quick Guide to the Commands

Table 6-2 lists all of the commands available from the CLI and shows you briefly what each one does and the pages in this chapter that describes how to use the commands.

Table 6-2 Commands

Command	What does it do?	Description can be found on...
define	Sets IP and SLIP parameters	page 6-8
(ip) display	Displays IP and SLIP parameters	page 6-9
capture	Enables/disables RMON Filter capture	page 6-12
(system) display	Displays administration information for the hub	page 6-9
initialize	Configures the stack back to default settings	page 6-11
inventory	Lists the units in the stack	page 6-10
password	Changes the password of the current user	page 6-7
reset	Simulates powering off and powering on the stack	page 6-10
unit	Accesses another unit in the stack	page 6-11

Commands

The remaining sections in this chapter detail the management functions that can be carried out from the CLI.

Changing the Password

We recommend that setting a password is the first task you carry out on the hub. Setting a password prevents unauthorized management access to the hub or stack.



If you forget your password while logged out of the hub, refer to “Solving Problems With the Command Line Interface” on [page 8-3](#).

To set a new password or change an existing password:

- 1 At the top-level menu, enter:

```
system password
```

- 2 You are prompted for your old password:

```
old password:
```

If this is the first time you are setting a password, press [Return] without entering any text. If you already have a password set up, then enter the password.

- 3 The prompt changes to show:

```
Enter new password:
```

Enter your new password. The prompt asks you to confirm your new password by entering it again.

The CLI displays a message to tell you that your password has successfully changed.

Setting the IP Configuration

Before you can manage the hub over the network, you must assign it an IP address and subnet mask. You may also need to enter a default router (sometimes known as the default gateway) address. The default router is the router (if you have one) which is used by the stack to communicate with other networks. For serial management, you may need to configure the SLIP address and SLIP subnet mask.



If you have no previous knowledge of IP, refer to “IP Addresses” on page 5-7. If you change any of these values, you may need to re-access the hub using the new values.

To enter new IP settings:

- 1 At the top-level menu, enter:

```
ip interface define
```

- 2 You are prompted for the hub's IP address:

```
Enter IP address [0.0.0.0]:
```

Enter a valid IP address for the Hub.

- 3 You are prompted for the hub's subnet mask:

```
Enter subnet mask [255.255.255.0]:
```

Enter a subnet mask.

- 4 You are prompted for a default router address:

```
Enter default gateway [0.0.0.0]:
```

Enter a default gateway address or press [Return] if it's not needed.

- 5 You are prompted for a SLIP address:

```
Enter SLIP address [192.168.101.1]:
```

Enter a SLIP address or press [Return] if it's not needed.

- 6 Finally, you are prompted for a SLIP subnet mask:

```
Enter SLIP subnet mask [255.255.255.0]:
```

Enter a SLIP subnet mask or press [Return] if it's not needed.

Viewing the Configuration

You can use the display command to show current configuration information for your hub or stack.

Displaying the Hub Configuration

At the top-level menu, enter:

```
system display
```

The CLI displays information similar to this example:

```
3Com PS Hub 50 (3C16450)
```

```
Unit Name: Marketing
```

```
Location: Top floor
```

```
Contact: James
```

```
Time since reset: 2 days, 3 hours, 10 minutes
```

```
Operational Version: 1.00   Boot Version: 1.00
```

```
Hardware Version: 1.00
```

```
Serial Number: 2103332
```

This information is in the hub's MIB (Management Information Base) and is read-only. You can change the Unit name, Location and Contact using the web interface.

If a problem occurs and you need advice from your support representative, you may be asked for some of the information shown on this screen.

Displaying the IP Configuration

At the top-level menu, enter:

```
ip interface display
```

The CLI displays the IP address, subnet mask, default router address, SLIP address and SLIP subnet mask for the hub.

Displaying the Stack Configuration

The inventory commands allows you to list the units in the stack.

At the top-level menu, enter:

```
system inventory
```

The CLI displays information similar to this example:

Position	Description	Name	State
1	PS Hub 50	Marketing	Unit Operational
2	PS Hub 40	Accounts	Unit Operational
3	PS Hub 40	Development	Unit Operational

Where:

- Position — The position of the unit in the stack; if the stack is correctly connected and configured as recommended, the bottom unit in the stack is unit number 1, the next unit is unit number 2, and so on.
- Description — The type of unit.
- Name — The name that you have assigned to the unit.
- State — The current operating status of the unit:
 - Unit Operational — Indicates that the unit is operating normally.
 - Unit Loading — Indicates that there is a process taking place, for example a software upgrade.

Resetting the Stack

Resetting the stack simulates powering off and powering on the stack. You may want to do this if you want to reset the stack's statistics counters.



CAUTION: *Performing a reset may cause some of the data being transmitted over the network to be lost. It also clears the non-permanent addresses in the PS Hub 50 unit's switch database.*

To reset the stack:

- 1 At the top-level menu, enter:


```
system reset
```
- 2 The CLI asks you to confirm the reset. Enter **y** if you wish to proceed, or **n** if you want to stop the reset.

Initializing the Stack

Initializing the stack causes it to return to its factory default settings. You may want to do this if the stack has been previously used in a different part of your network, and its settings are incorrect for its new environment.



CAUTION: *Initializing the stack removes all configuration information including security, resilient links and passwords. However, IP, SLIP and default router information is retained to ensure you can continue management communication with the stack over the network.*

To initialize the stack:

- 1 At the top-level menu, enter:
system initialize
- 2 The CLI asks you to confirm the initialize. Enter **y** if you wish to proceed, or **n** if you want to stop the initialize.



The stack's passwords return to the default passwords.

Configuring Another Unit in the Stack

The unit command allows you log on to another unit in the stack without disconnecting from the current unit.

To configure another unit:

- 1 At the top-level menu, enter:
system unit

You are prompted for the unit's number (note that the command displays the number of the unit that you are currently configuring):

```
Select unit (1):
```

- 2 Enter the unit's number.

When you have finished configuring the unit, simply log out to return to the previous unit.

**Enabling and
Disabling RMON
Filter Capture**

You can enable or disable RMON Filter capture. By default this is enabled. You may wish to disable this if you have no requirement to perform RMON packet monitoring and wish to increase the security of your network.

To configure RMON Filter capture:

- 1 At the top-level menu, enter:
system capture
- 2 Enable or disable RMON Filter capture as required.

7

MANAGEMENT USING THE WEB INTERFACE

This chapter describes how to use the web interface. If you have any problems using the web interface, refer to “Solving Problems With the Web Interface” on [page 8-4](#).

Accessing the Web Interface

You can access the web interface for the stack either through the console port or over the network. Ensure that your management station has been appropriately set up for your particular management method and that any necessary connections have been made, refer to “Web Interface” on [page 5-12](#).



If you want to access the web interface through a serial link from a Windows® '95 management station (connected to the console port of a hub in the stack), you must use the 3Com serial web utility (SLIP Driver); refer to [Appendix C](#).

Any number of people can access the web interface over the network, at the same time. There is a password panel to prevent unauthorized management of the stack.

To access the web interface:

- 1 Start your web browser.
- 2 In the browser, select the option for opening a location.

- 3 In the browser's open location window or area, enter the web address URL (Uniform Resource Locator) for the stack.

The web address URL for a stack is in the format:

```
http://nnn.nnn.nnn.nnn/
```

Where *nnn.nnn.nnn.nnn* is:

- The SLIP address for the stack, which is '192.168.101.1' by default, if managing through the console port
- The IP address for the stack, if managing over the network

For example, to access a stack with an IP address of '191.1.1.8' you would enter:

```
http://191.1.1.8/
```

- 4 When the browser has located the stack, a password panel is displayed, as shown in [Figure 7-1](#). Enter your user name and password as requested.



Figure 7-1 Password Panel

If no passwords have been configured for the stack, the default password for the security level of user is 'security'. The user names and passwords are the same as those that you use to access the CLI. For a list of the user names and the default passwords, refer to "Default User Names and Passwords" on [page 6-3](#).



We recommend that when you have accessed the stack, you change the default passwords for the user levels (if you have not already done so) by logging in as the different user levels.

If you forget your password while logged out of the stack, refer to "Solving Problems With the Web Interface" on [page 8-4](#).

When the correct user name and password have been entered, the front page of the web interface may be displayed, as shown in [Figure 7-2](#). If this is the first time that the stack has been accessed using the web interface, the first page of the Getting Started pages is displayed. For information on how to use the Getting Started pages, refer to “Getting Started” on [page 7-18](#).

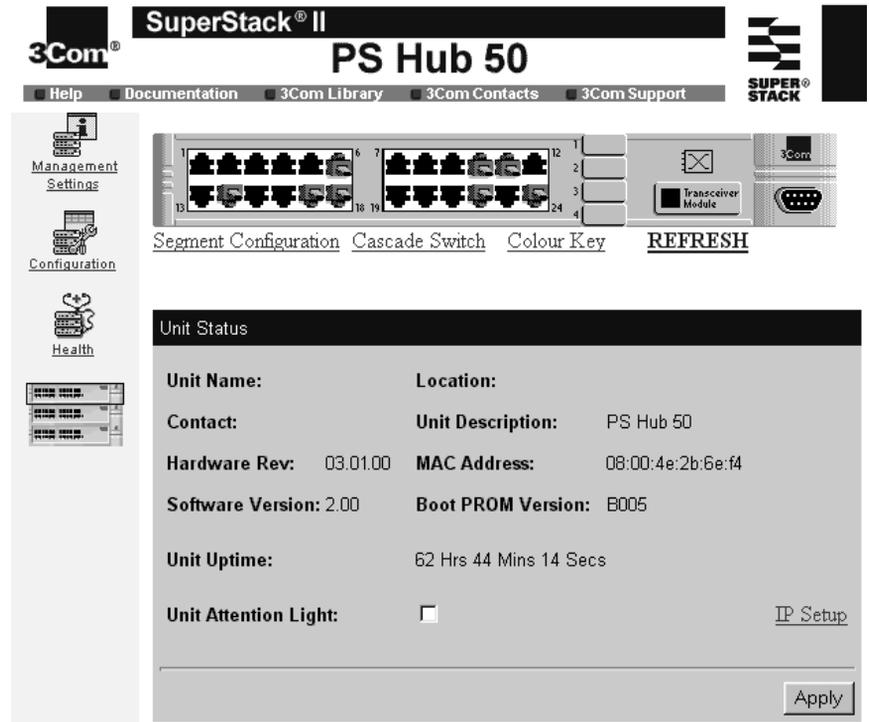


Figure 7-2 The Web Interface’s Front Page

You are now ready to manage the stack.

If you are unable to access the web interface, refer to “Solving Problems With the Web Interface” on [page 8-4](#).



While managing the stack, you can use your web browser to look at other web pages or interfaces, and then simply use the back button to re-access to the web interface. You do not need to re-enter your user name and password when doing this.

About the Web Interface

The web interface has been designed so that it is easy to use. It is made up of three areas, as shown in [Figure 7-3](#); the banner, side bar (always displayed) and page (changes to show the different information about the stack).

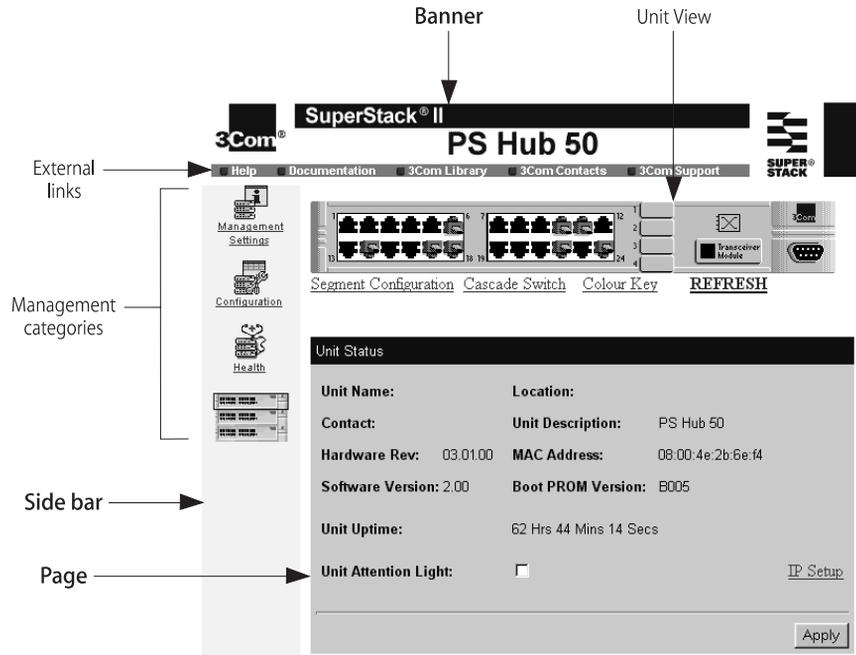


Figure 7-3 Components of the Web Interface

General Components

If you click on the:

- Management categories (on the side bar) — The page area changes to show different management information about the stack, for example network addresses and graphs.
- External links (on the banner) — The web browser displays general information which is external to the web interface, for example help and contact information.

Management Categories

[Table 7-1](#) shows the management categories that are on the side bar.

Table 7-1 Management Categories



Management Settings — Displays information about the stack's management settings.



Configuration — Displays information about the configuration of some of the stack's features.



Health — Displays statistics for the stack's segments (only available if there is a PS Hub 50 in the stack).



Stack icon — Selecting a unit displays information about the unit, including the Unit View and unit information, as shown in [Figure 7-3](#).

External Links

[Table 7-2](#) shows the external links that appear on the banner. You can also click on the 3Com logo to display the 3Com web site.

Table 7-2 General Icons

Help	Displays the online help system for the web interface.
Documentation	Displays the online version of this user guide.
3Com Library	Displays the 3Com online library from the 3Com web site.
3Com Contracts	Displays the 3Com contact page from the 3Com web site.
3Com Support	Displays the 3Com customer support page from the 3Com web site.



NOTE: Before you can use the online help system and online version of this user guide, you may need to copy the files from the CD-ROM onto your management station, refer to “Online Help System and Documentation” on [page 7-9](#).

If you do not have a connection to the Internet, your web browser is unable to display 3Com pages from the external links (3Com Library, 3Com Contacts, 3Com Support).

Page Components

When you click on the management categories or stack icon, the page area changes to show various kinds of information. A page can consist of these components:

- **Fields** — Display current values and allow you to enter new values if required.
- **Checkboxes** — Show whether options are enabled (checked) or disabled (unchecked). Click on the checkboxes to change them.
- **Action buttons** — Affect the information in the fields and checkboxes for that page.
- **Page links** — Link to other pages of information within the same management category.

Web Interface Map

Figure 7-4 shows how the pages in the web interface are linked. The page number under each box is where the description is in this chapter.

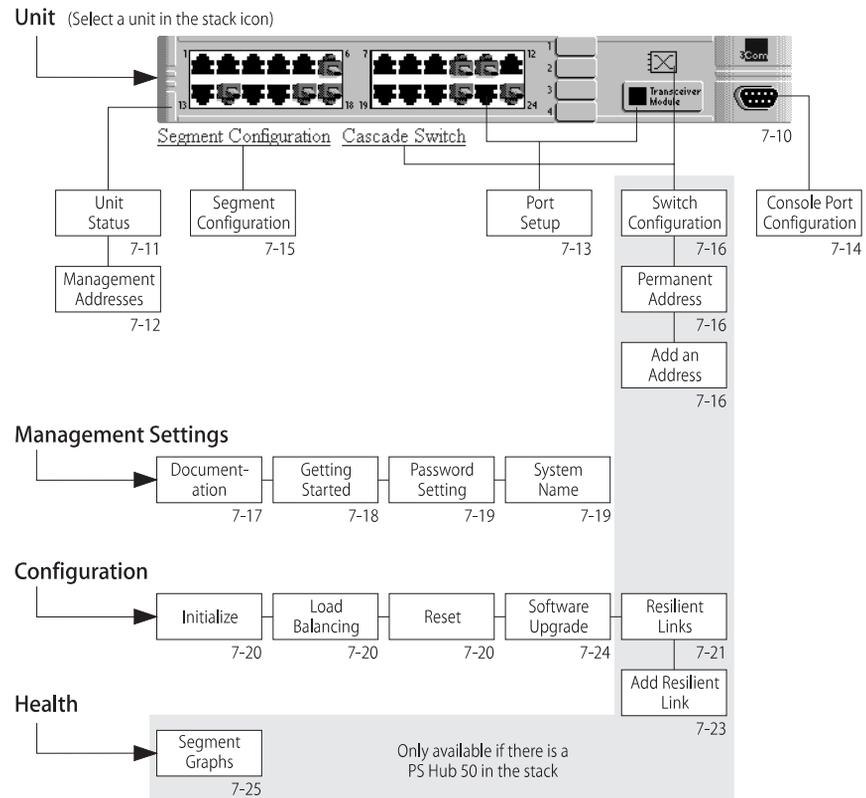


Figure 7-4 Web Interface Map

Using the Web Interface

To display management category pages:

- 1 Click on the management category (on the side bar) that you require.
The page area changes to show a row of page links and the first page in that category, as shown in [Figure 7-5](#). You can make changes to the information on the current page and click *Apply* when finished.

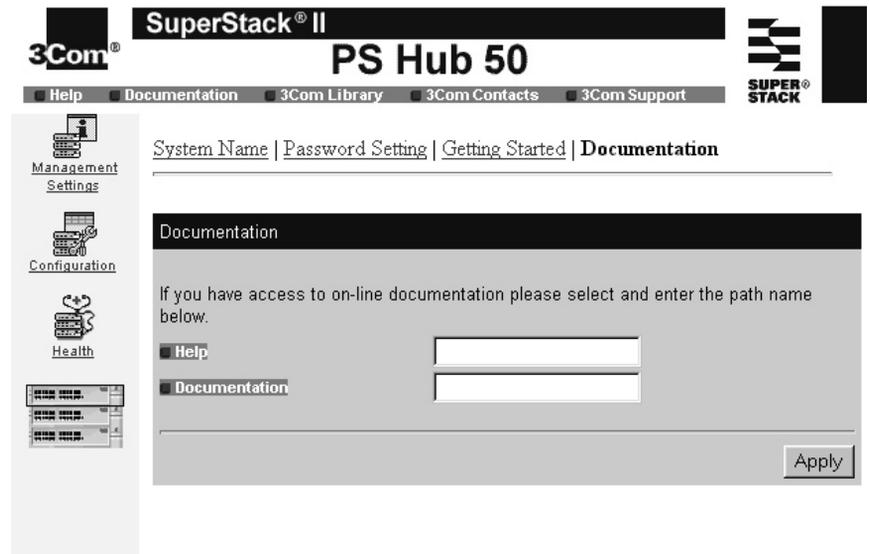


Figure 7-5 Management Category Page

- 2 To display another page in that management category, click on the link in the row of links.
The page area changes to show the new page.
- 3 Make changes to the information on the page as necessary (click *Apply* when finished) and choose another when ready. When you have finished, simply choose another management category from the side bar.

Unit View and Unit Pages

- 1 Click on the unit in the stack icon.

The page area changes to show the Unit View and the Unit Status page. You can make changes to the information on the current page and click *Apply* when finished.

- 2 To display another page, click on part of the Unit View or the links underneath it, as shown in [Figure 7-6](#).

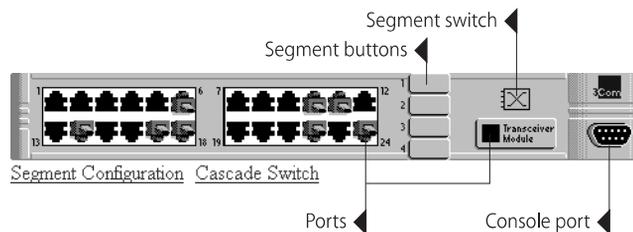


Figure 7-6 Areas of the Unit View

If you click on:

- The unit (but not on a port or button) — The Unit Status page is redisplayed.
- A 10BASE-T or transceiver module port — The Port Setup page is displayed for that port.
- The console port — The Console Port Configuration page is displayed.
- *Segment Configuration* — The Segment Configuration page is displayed.
- The segment switch or *Cascade Switch* — The Switch Configuration page is displayed (only available for a PS Hub 50).

If you click on one of the segment buttons, the Unit View highlights the ports (with a blue surround) that are part of that segment.

- 3 You can make changes to the information on the page (click *Apply* when finished) and choose another when ready. When you have finished, simply choose another management category from the side bar.

For more information on the Unit View, refer to “Unit View” on [page 7-10](#).

User Access Levels For information on what the different user levels can manage, refer to “Default User Names and Passwords” on [page 6-3](#).

Exiting the Web Interface You can exit from the web interface at any time by closing your web browser.

Online Help System and Documentation

The CD-ROM supplied with the PS Hub has an online help system and online documentation which can be used with the web interface:

- The online help system is in web format (HTML) so when it is launched, it appears in a secondary window in your web browser.
- The online documentation is an online version of this user guide in two formats; web format (HTML) and portable document file format (PDF). The version that gets launched from the web interface is the web format.

To use the online help system and user guide:

- 1 Decide how you want the web interface to access the files:
 - Copy the files onto your management station’s local drive or place the CD-ROM in a your management station’s CD-ROM drive.
 - Copy the files onto a network drive or place the CD-ROM in a network CD-ROM server.
 - Copy the files onto a web server.
- 2 Copy **all** of the files into a chosen directory (if required). On the CD-ROM, the files are in these directories:
 - Help system — **Agent\version\Help**
 - Documentation — **Agent\version\Docs**
- 3 In the Documentation page (in the Management Settings category), specify the location of the online files. For information on how to do this, refer to “Documentation” on [page 7-17](#).



The web interface always tries to point to the address you give it. If you have the online files on your management station’s local drive, when other users try to access the files, the web interface will try to point to your files on their management stations, which may or may not exist. For this reason, it is a good idea to use a network drive or network CD-ROM server that is accessible to everyone who is going to use the web interface, so that the files are always in the same drive and directory for all users.

Unit Pages

This section describes the fields that appear on the pages in the Unit category. The first page displayed is the Unit Status page.

Unit View The Unit View is a graphical version of the unit, as shown in [Figure 7-7](#).



[Segment Configuration](#) [Cascade Switch](#)

Figure 7-7 Unit View

To refresh the Unit View (to show any new changes), click *REFRESH*. If the Unit View fails to show the latest port changes after a refresh, you must make a small configuration change to your web browser; refer to “Configuring Your Browser” on [page 5-12](#).

Port Status

The 10BASE-T and transceiver module ports (if transceiver modules are fitted) are color coded and show these conditions:

- Black — The port is enabled.
- Green — The port is enabled and has a connection.
- Gray — The port has been disabled by management.
- Red — The port has partitioned (disabled itself to prevent a network loop).

Identifying Which Ports Belong to a Segment

To view which ports belong to a segment, click on the segment button on the Unit View. The graphic changes and ports that are members of that segment are highlighted with a dark blue surround.

To move a port to a different segment, use the Port Setup page for that port; refer to “Port Setup” on [page 7-13](#).

The Segment Switch

The Unit View for a PS Hub 50 shows the segment switch. If it is green, it is the active segment switch. If it is gray, it is disabled. To configure the segment switch, use the Switch Configuration page; refer to “Switch Configuration” on [page 7-16](#).

Unit Status This page provides detailed information about the unit:

Unit Name The name configured for the stack.

Location Where the stack is located.

Contact The person to contact if there is a problem with the stack.



The Unit Name can be configured using the System Name page (in the Management Settings category), refer to "System Name" on [page 7-19](#). The Location and Contact can be configured using Quick Config Manager or an SNMP network management application.

Unit Description The unit's product name.

Hardware Rev The version of hardware inside the unit.

MAC Address The unit's MAC (Ethernet) address.

Software Version The version of management software that the unit is running.

Boot PROM Version The version of software on the Boot PROM inside the unit.

Unit Uptime The time that has elapsed since the unit was last reset, initialized or powered on.

Unit Attention Light A checkbox for you to light the Attn LED, to help identify the unit in the stack.

To display the Management Addresses page, click *IP Setup* at the bottom of the Unit Status page.

Management Address

This page specifies a unique IP address for the stack, as shown in [Figure 7-8](#).



If you have no previous knowledge of IP, refer to “IP Addresses” on [page 5-7](#). If you change any of these values, you may need to re-access the hub using the new values.

Management Addresses

Please enter a unique IP address for the device

IP Address :

Enter a suitable network mask.

Network Mask :

If a default router exists on your network, type in the IP address below.

Default Router :

BOOTP : Off On

Figure 7-8 Management Address Page

The fields are:

IP Address Provides a box for you to type the IP address of the stack.

Network Mask Provides a box for you to type the subnet mask for the IP address.

Default Router Provides a box for you to type the IP address of the default router (if you have one) which is used by the stack to communicate with other networks.

BOOTP [Disabled](#) / Enabled

Specifies whether you want your BOOTP server (if you have one) to automatically allocate the stack an IP address and subnet mask.

Port Setup This page specifies the port state (enable or disable), link state, partition state and the segment to which the port is attached, as shown in [Figure 7-9](#).

Port 24 Setup

Connector Type: RJ45 Link State: Present

Port State: Partition State: Not Partitioned

Attached to:

Figure 7-9 Port Setup Page

The fields are:

Connector Type Shows the type of cable connected to the port.

Link State Shows the state of the link for a twisted pair (10BASE-T) port. If the port is a transceiver module port, this field may be blank.

Port State Enabled / Disabled

Specifies whether the port can repeat information to and from the network.



If the port is part of a resilient link, you cannot enable or disable the port. You must first delete the resilient link. For more information on resilient links, refer to “What are Resilient Links?” on [page 7-22](#).

Partition State Shows whether the port is on and repeating traffic, or has automatically partitioned (isolated itself). If the port has partitioned check the cabling at both the port and any devices connected to the port, and check for network loops.

Attached to Shows the segment of which the port is a member. To make the port a member of a different segment, simply select the segment. A port only communicates with its segment if it is enabled.



The Partition State and Attached To fields are not displayed for a 100Mbps transceiver module port (in a PS Hub 50).

Console Port Configuration

This page configures the console port.

The PS Hub's console port is already correctly configured by default, for direct connection to a management station. Only alter these default settings if you are connecting a modem to the console port.



CAUTION: Do not change any of these settings unless you fully understand what you are doing. Incorrect settings may lock you out from the hub's console port when you select *Apply*, and you may have to contact your supplier for information on recovering management communication if you cannot access the unit over the network.



If you want to change the settings but are unsure of the correct settings to use, refer to the user documentation that accompanies your terminal or modem.

The fields are:

Console connection Terminal / Modem

Specifies what you are connecting directly to the console port. If you are connecting to a modem, select Modem, otherwise leave as Terminal (management station).

Port Speed 1200 / 2400 / 4800 / 9600 / 19200 / 38400 / AutoConfig

Specifies the baud rate of your management station or modem. The stack hub can automatically configure its baud rate to work with your management station or modem. Leave this field as *Autoconfig* if you require auto-configuration.

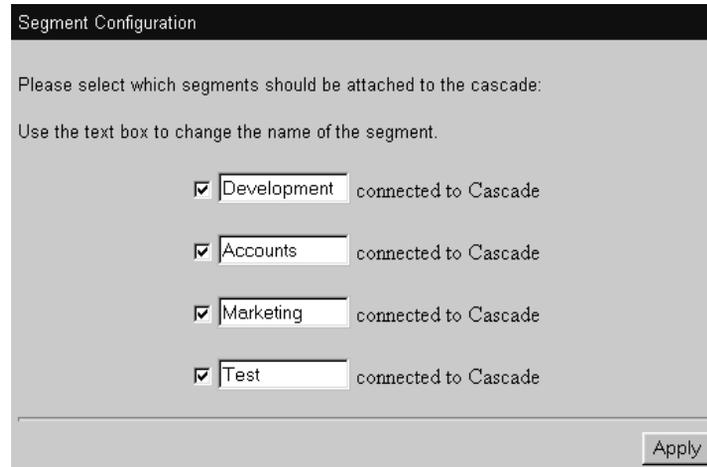
Flow Control None / Xon/Xoff / Hardware RTS/CTS

Specifies the flow control option that corresponds to your management station or modem.

Segment Configuration

This page configures the segments in the hub, as shown in [Figure 7-10](#). You can:

- Connect or isolate the segments from their associated cascaded segments.
- Name the segments.



The screenshot shows a dialog box titled "Segment Configuration". Inside, there is a header bar with the title. Below the header, the text reads: "Please select which segments should be attached to the cascade." followed by "Use the text box to change the name of the segment." There are four rows, each with a checked checkbox, a text input field containing a segment name, and the text "connected to Cascade". The segment names are "Development", "Accounts", "Marketing", and "Test". At the bottom right of the dialog box is an "Apply" button.

Figure 7-10 Segment Configuration

To view which ports belong to a segment, click on the segment button on the Unit View. The graphic changes and ports that are members of that segment are highlighted with a dark blue surround.

To move a port to a different segment, use the Port Setup page for that port; refer to "Port Setup" on [page 7-13](#).

Switch Configuration

This page is used to select which cascaded segments the active segment switch is attached to. Click on the checkboxes to connect or isolate the switch as necessary.



This functionality is only available for the PS Hub 50.

For information on the segment switch, refer to “How Does the Segment Switch Work?” on [page 2-3](#).

To add or edit the permanent address entries in the active segment switch’s database, click *Permanent Address Management*. The Permanent Address Management page is displayed.

Permanent Address Management

This page is used to add or edit permanent addresses in the active segment switch’s database, as shown in [Figure 7-11](#).

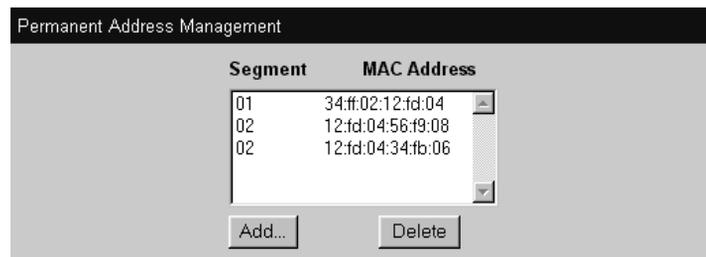


Figure 7-11 Permanent Address Management Page

The fields are:

MAC Address The MAC address of the device.

Segment The cascaded segment to which the device is connected.

Adding and Deleting Permanent Addresses

To add a permanent address to the switch database, click *Add*. The Add a Permanent Address page is displayed. Enter the MAC address of the device and the cascaded segment to which the device is connected, and then click *Add Address to Switch Port*.

To delete a permanent address from the switch database, click on the entry in the list and then click *Delete*. The permanent address is made non-permanent. Non-permanent addresses are removed from the segment database (known as *ageing*) if they are not used.

Management Settings Pages

This section describes the fields that appear on the pages in the Management Settings category. The first page displayed is the Documentation page.

Documentation

This page specifies the directories or URL's that are used to access the online help system and documentation, as shown in [Figure 7-12](#).



For more information on how to set up the online help system and online documentation, refer to "Online Help System and Documentation" on [page 7-9](#).

A screenshot of a web-based configuration page titled "Documentation". The page has a dark header bar with the title. Below the header, there is a light gray background with the text: "If you have access to on-line documentation please select and enter the path name below." There are two radio buttons: "Help" and "Documentation". The "Documentation" radio button is selected. To the right of each radio button is a text input field. At the bottom right of the form is an "Apply" button.

Figure 7-12 Documentation Page

The fields are:

Help Specifies where the online help system can be found. Enter the appropriate directory or web address. Examples are:

- `file://f:/help/default.htm`
- `http://yournetwork.com/help/default.htm`

Documentation Specifies where the online documentation can be found. Enter the appropriate directory or web address. Examples are:

- `file://f:/documentation/manual.htm`
- `http://yournetwork.com/docs/manual.htm`

Getting Started

The Getting Started pages are a series of pages which set up basic information for the stack. You are asked:

- For a descriptive name for the stack.
- If you want to allocate the stack IP information or leave the allocation to a BOOTP server on your network (if you have one). A BOOTP server automatically allocates IP addresses to all equipment on your network.

If you chose to allocate the IP information, you are asked:

- For an IP address and subnet mask for the selected unit.
- For an IP address for a default router — You may have a default router which you want the hub to use to communicate with other networks.
- The file path or web address (URL) for the online help system and documentation files.
- To enter a new password (you can leave it blank if you don't want to change it).



If you have no previous knowledge of IP, refer to “IP Addresses” on [page 5-7](#).

You do not have to use the Getting Started pages to configure this information, as it can all be configured using other pages in the web interface.

If you have already configured some of this information for the stack, it appears in the appropriate fields on the pages.

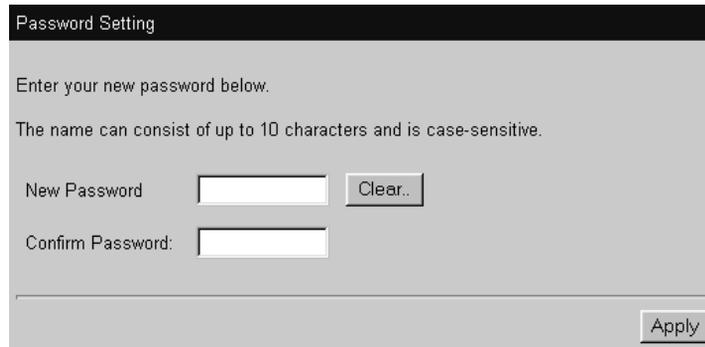
When you have entered the information in a page, click *Apply* to display the next page. You can use the back button of your web browser to return to a previous page. When you display the last page, click *Finish* to accept the changes you have made and to exit from the Getting Started pages.



If you have changed any of the IP information, you may need to re-access the web interface using the new IP address.

Password Setting

This page changes the password for the user level that you are using, as shown in [Figure 7-13](#). The passwords that you type do not appear on the screen.



Password Setting

Enter your new password below.

The name can consist of up to 10 characters and is case-sensitive.

New Password

Confirm Password:

Figure 7-13 Password Setting Page

The fields are:

New Password Type the new password you want to use.

Confirm Password Retype the password for confirmation.

System Name

This page allows you to enter a name for the stack. Use a descriptive name, for example 'First floor stack'.

The name that you specify for the stack appears on some of the CLI and web interface pages.

Configuration Pages

This section describes the fields that appear on the pages in the Configuration category. The first page displayed is the Initialization page.

Initialize This page is used to initialize the stack. Initializing the stack causes it to return to its factory default settings. You may want to do this if the stack has been previously used in a different part of your network, and its settings are incorrect for its new environment.



CAUTION: *Initializing the stack removes all configuration information including security, resilient links and passwords. However, IP, SLIP and default router information is retained to ensure you can continue management communication with the stack over the network.*



The stack's passwords return to the default passwords.

Load Balancing

This page is used to initiate the load balancing feature in the stack.

For information on load balancing, refer to [Chapter 4](#). You can configure the stack's load balancing feature by using the Load Balancing Tool; refer to "Load Balancing" on [page B-18](#).

The stack may take some time to complete the load balancing operation.



The load balancing feature will not work if Load Balancing has been disabled by using the Load Balancing Tool.

Load Balancing works by monitoring traffic levels, so the stack only starts to benefit from it when it has been powered on for a few hours, and Load Balancing has been enabled for a few hours.

Reset

This page is used to reset the stack. Resetting the stack simulates powering on and powering off the stack. You may want to do this if you want to reset the stack's statistics counters.



CAUTION: *Performing a reset may cause some of the data being transmitted over the network to be lost. It also clears the non-permanent addresses in the PS Hub 50 unit's switch database.*

Resilient Links This page shows the resilient links that have been set up for the stack, as shown in [Figure 7-14](#).



This page is only available if there is a PS Hub 50 in the stack.

Only 10BASE-T and fiber optic ports (if there are fiber optic transceiver modules fitted to hubs in the stack) can be part of a resilient link. However, you can have Fast Ethernet Resilience in your stack with multiple PS Hub 50 units. For more information, refer to “Fast Ethernet Resilience” on [page 2-5](#).

Resilient Links		
Main Link	Standby Link	Pair State
Unit 1 Port 4 OK,	Unit 1 Port 20 OK,	Operational
Unit 1 Port 14 Failed,	Unit 1 Port 19 OK,	Operational
-----End of List-----		

Buttons: Add... Delete Swap

Figure 7-14 Resilient Links Page

The fields are:

Main Link Shows the hub and port number of the main link, and the state of the link.

Standby Link Shows the hub and port number of the standby link, and the state of the link.

Pair State Shows whether the resilient link pair is operational or not. When operational either the main port or the standby port can repeat traffic.

What are Resilient Links?

You can make the network more robust by adding *resilience* to it. When a link fails all communication between equipment on each side of the link is lost. To ensure important communication is not lost, the network needs to be reinstated immediately which could be very inconvenient for the network manager. If a spare link was configured to automatically pick up when the broken link failed, the network would appear to function normally to the user. At worst, a few packets would be corrupted or lost.

This is the concept of resilience. One link is on standby (called the *standby* link) waiting to take over if another link (called the *main* link) fails. This pair is called a *resilient link pair*. The resilient link ports can be on different hubs in the stack, and any network devices can be at the other ends of the links.

When the network is in use, the stack that has been used to set up the resilient link pair, monitors the state of both the main link and the standby link. If the main link fails, the standby link becomes active.

You can use the Resilient Links page to view the status of the links. If you have an SNMP network management application, you can configure the hub to send *traps* (messages) to the SNMP network management application, if the states of the links change.

Resilient Link Pairs

To set up a resilient link pair, you need to manage the stack that both links in the pair are connected to. The number of resilient link pairs you can set up is only restricted by the number of ports you have in the stack.

When you set up the resilient link pair, you need to specify the ports that the main link and standby link are connected to.



Load Balancing does not move ports that are part of a resilient link pair.

Resilient Link Rules

Always follow these rules when setting up a resilient link pair:

- Only 10BASE-T and fiber optic ports (if the hub has a fiber optic transceiver module fitted) can be part of a resilient link.
- Configure the resilient link pair at only one end of the link. In other words, only one stack controls each resilient link pair you set up.
- Each resilient link pair can only have one main link and one standby link (the ports used can be on different hubs in the stack).
- Each link must not belong to more than one resilient link pair.
- For a port that is part of a resilient link pair:
 - Do not disable the link pulse generation (you cannot disable this using the web interface or Quick Config manager).
 - Do not enable security for the port.



If you have more than two stacks there are a number of ways you can use resilience when linking them. Remember to connect the stacks correctly for both links, refer to "Connecting Different Hubs and Stacks to Your Hub" on [page 3-16](#).

If the main link fails, the standby link becomes active.

Adding, Deleting and Swapping Links

To add a resilient link pair to the list, click *Add*. The Add Resilient Link page is displayed.

To delete a resilient link pair from the list, click on the entry in the list and then click *Delete*. The resilient link pair is deleted, and the current active link remains enabled and the standby link is cancelled.

To swap the main and standby ports for a resilient link pair in the list, click on the entry in the list and then click *Swap*.

Add Resilient Link

This page is used for adding resilient links to the stack. Choose on the main link and click *Next*, and then choose the standby link and click *Next*. The resilient link pair appear in the list on the Resilient Links page.

Software Upgrade

This page is used to upgrade the management software on the hubs in the stack with a new agent software upgrade, as shown in [Figure 7-15](#). You must copy the new software upgrade into the appropriate directory on the TFTP server that the server has been configured to look in. For information on how to use your TFTP server, refer to the documentation that accompanies it.



When a hub is upgraded, any configurations that have been made to it are maintained. Upgrading a stack of hubs may take up to 5 minutes for each hub.

Software Upgrade

Filename:

Server Address:

Applying the upgrade will cause a reset to the device, which will the become unreachable for a few minutes while the upgrade proceeds.

Apply Cancel

Figure 7-15 Software Upgrade Page

The fields are:

Filename Type the filename of the upgrade file. Do not enter a path. The file name format is:

- PS Hub 40 software upgrade — **pshxx_yy.bin**
- PS Hub 50 software upgrade — **psfxx_yy.bin**

Where *xx_yy* is the version of agent software. You can specify multiple file names (separated by spaces), to upgrade PS Hub 40 and PS Hub 50 units in the stack at the same time, for example:

psh02_00.bin psf02_00.bin

Server Address Enter the address of the TFTP server that has the software upgrade on it.

Health Pages

This section describes the fields that appear on the Segment Graph page in the Health category.

Segment Graph

This page shows two graphs for a segment in a unit in the stack. The first graph shows information for the last hour, the second graph shows information for the last 48 hours, as shown in [Figure 7-16](#).



This page is only available if there is a PS Hub 50 in the stack.

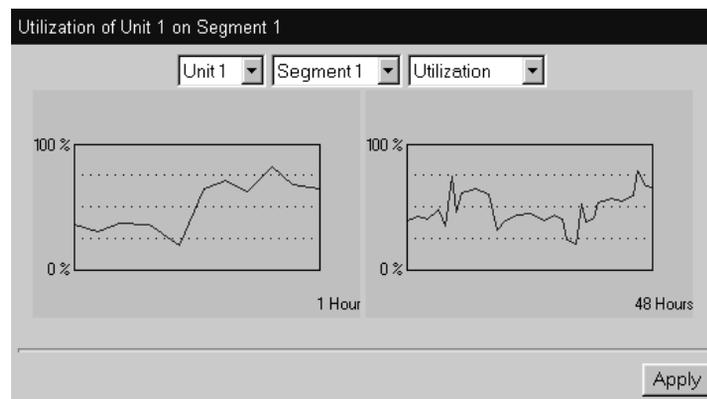


Figure 7-16 Segment Graphs Page

The fields are:

Unit Specifies the unit that has the segment.

Segment Specifies the segment that the graphs are displayed for.

Graph Type Specifies the type of graph that is displayed:

- Utilization — Shows the utilization of the segment as a percentage.
- Total Errors — Shows the amount of packets which have errors.





PROBLEM SOLVING

The PS Hub has been designed to aid you when detecting and solving possible problems with your network. These problems are rarely serious, the cause is usually a disconnected or damaged cable, or incorrect configuration. If this chapter does not solve your problem, contact your supplier for information on what to do next.

Perform these actions first:

- Ensure all equipment is powered on.
- Power each hub off, wait about 5 seconds and then power them on so they perform a self test. The self test only takes a few seconds, during which the Power/Self Test LED flashes.



If you have a problem using Quick Config Manager, refer to “Solving Problems With Quick Config Manager” on [page B-29](#).

If you have a problem with the serial web utility, refer to “Solving Problems With the Serial Web Utility” on [page C-4](#).

If you have a problem using the agent upgrade utility, refer to “Solving Problems With the Agent Upgrade Utility” on [page D-3](#).

Isolating a Problem

A good way of isolating a problem is to see whether it occurs on a particular port only. This can be done by:

- Using a different port to see if the problem still exists.
- Using management to view how a port has been set up. In particular, see if the port is:
 - Partitioned because of a network loop
 - Disabled by management
 - Part of a resilient link pair
 - Performing security

Solving Problems With the Hub

Power LED not lit. Check your power cord connection. If the connection is secure and there is still no power, you may have a faulty power cord which needs replacing with another PS Hub power cord. If you have another PS Hub, try that hub's power cord with this hub to isolate whether the fault is with the power cord or the hub.

Power LED yellow. The hub has failed its self-test due to an internal problem, you need to contact your supplier.

Port Status LED yellow (PS Hub 40) or flashing green (PS Hub 50) for a 10Mbps transceiver module port. It is likely that there is a loop in your network which has caused this port to partition. Examine your connections and remove the loop. Each piece of equipment needs only one connection to your stack.

Port Status LED flashing green for a 10BASE-T port. It is likely that there is a loop in your network which has caused this port to partition. Examine your connections and remove the loop. Each piece of equipment needs only one connection to your stack.

Port Status LED not lit for a port that has a connection. There is a problem with this connection. Check you are using a 'Straight-through' 10BASE-T cable which is properly connected at both ends, is not damaged, and that the equipment it is connected to is powered on and operating correctly.

Link between two PS Hubs not working. Check your stack connections; follow the information given in "Connecting PS Hubs Together (Stacking)" on [page 3-12](#).

Link between two stacks not working. Check your hub connections; follow the information given in "Connecting Different Hubs and Stacks to Your Hub" on [page 3-16](#). It is likely an MDI/MDIX switch is incorrectly set.

Segment LEDs constantly lit. There may be a network loop caused by connecting the segments with:

- An external switch in addition to the segment switch in a PS Hub 50.
- Multiple external switches.

To remove this loop, either disable some of the ports that connect the external switch to the segments, or isolate the active segment switch in the PS Hub 50 from the cascaded segments.

Transceiver module not working. Check the Status LED for the transceiver module slot. There is a problem if the LED is yellow (PS Hub 40) or flashing green (PS Hub 50 10Mbps transceiver module). It may be for these reasons:

- It could be that the transceiver module is incorrectly fitted (highly possible if it is a coaxial transceiver module), refer to the manual that accompanies your transceiver module.
- It could be that a port has partitioned due to a loop in your network. Examine your connections and remove the loop. Each piece of equipment needs only one connection to your stack.
- It could be that SQE test is enabled for the transceiver module. Ensure that it is disabled on the transceiver module.

Solving Problems With the Command Line Interface

The initial Login prompt does not display. Check that your terminal or terminal emulator is correctly configured to operate as a standard terminal. If this doesn't work, try configuring it to operate as a VT100 terminal.

For console port access, check you have performed the wake-up procedure correctly, by pressing [Return] several times.

Check the settings on your terminal or emulator. The parity must be set to 'none', the stop bit '1' and the data bits (character size) '8'. The management facility's auto-configuration works only with speeds from 1200 to 19200 baud.

If you still cannot access the hub, reset the hub using Quick Config Manager and retry the wake-up procedure. If this does not work, initialize the hub.

You forget your password. Contact your supplier.

Solving Problems With the Web Interface

The web browser cannot access the stack. Check that:

- The stack's IP address, subnet mask and default router are correctly configured, refer to "Giving the Stack an IP Address" on [page B-9](#).
- The stack has been reset.
- Web Access has not been disabled for the access level you are using to manage the stack. Use the Access Information panel of the General Info dialog box in Quick Config Manager, refer to [Appendix B](#).
- For management communication to work over the network, the port through which your communication reaches the stack must be connected to segment 1 (either directly or indirectly) of the hub with the IP address configured. For information, refer to "Requirements for Managing Over the Network" on [page 5-6](#).

The web browser cannot access the stack over a serial link from a Windows '95 management station. You must use the 3Com serial web utility (SLIP Driver), refer to [Appendix C](#).

The web browser can no longer access the stack. Check that the port through which you are trying to access the stack has not been disabled. If it is enabled, check the connections and network cabling at the port. Try accessing the stack through a different port. If you can now access the stack, a problem with the original port is indicated, or it has been switched from segment 1 to another segment. Re-examine the connections and cabling.

Possibly there is a network problem preventing you from accessing the stack over the network. Try accessing the stack through the console port of one of the hubs, and reset the stack.

Some of the web interface is not displayed in the web browser after downloading. This is probably due to large amounts of traffic over the network. Either reload (download) the web interface, or click in the part of the web interface that has not displayed and select the reload frame option in your web browser.

The Unit View does not display the latest port states. Every time you want to change the port states or want to update the Unit View, simply click *REFRESH* (underneath the Unit View). If the Unit View fails to show the latest port changes after a refresh, you must make a small configuration change to your web browser; refer to "Configuring Your Browser" on [page 5-12](#).

Solving Problems With an SNMP Network Management Application

The SNMP network management application cannot access the stack. Check that:

- The stack's IP address, subnet mask and default router are correctly configured, refer to "Giving the Stack an IP Address" on [page B-9](#).
- The stack has been reset.
- The stack's IP address is correctly recorded by the management application. For information on how to do this, refer to the documentation accompanying the application.
- SNMP Access has not been disabled for the access level you are using to manage the stack. Use the Access Information panel of the General Info dialog box in Quick Config Manager, refer to [Appendix B](#).
- For management communication to work over the network, the port through which your communication reaches the stack must be connected to segment 1 (either directly or indirectly) of the hub with the IP address configured. For information, refer to "Requirements for Managing Over the Network" on [page 5-6](#).

Traps are not received by the SNMP network management application. Check that the address of the management station is entered in the stack. You can do this using Quick Config Manager; refer to "Giving the Stack an IP Address" on [page B-9](#).

The SNMP network management application can no longer access the stack. Check that the port through which you are trying to access the stack has not been disabled. If it is enabled, check the connections and network cabling at the port. Try accessing the stack through a different port. If you can now access the stack, a problem with the original port is indicated, or it has been switched from segment 1 to another segment. Re-examine the connections and cabling.

Possibly there is a network problem preventing you from accessing the stack over the network. Try accessing the stack through the console port of one of the hubs, and reset the stack.

If you still cannot access the hub, use the Access Information panel of the General Info dialog box in Quick Config Manager to check if SNMP access is enabled, refer to [Appendix B](#).





DIMENSIONS, STANDARDS AND CABLING

Dimensions and Operating Environment

Table A-1 and Table A-2 show the specifications for the PS Hub.

Table A-1 Dimensions, Power and Operating Environment For All PS Hubs

Height	43.6mm	1.7in.
Width	440mm	17.4in.
Depth	168.5mm	6.7in.
Operating temperature	0 – 50° C	32 – 122° F
Humidity	0 – 90%	(non-condensing)
AC line frequency	50/60 Hz	
Input voltage	100 – 240V AC	
Current rating	1A (maximum)	

Table A-2 Weight and Power Consumption

	3C16405	3C16406	3C16450
Weight	2Kg / 4.4lb	2.1Kg / 4.6lb	2.2Kg / 4.8lb
Power consumption	26W	29W	35W
Heat dissipation	90 BTU/hr	103 BTU/hr	124 BTU/hr

BABT Approval (for U.K. Users Only)

The PS Hub is covered by Oftel General Approval, NS/G/12345/J/100003, for indirect connection to a public telecommunications system. This can be achieved using the console port and an approved modem.

Standards

Table A-3 shows the standards the PS Hub conforms to.

Table A-3 Standards

Functional	ISO 8802/3
	IEEE 802.3
Safety	EN 60950
	UL 1950
	CSA 22.2 #950
EMC emissions	EN 55022 Class B*
	FCC Part 15 subpart B Class A
	ICES-003 Class A
	VCCI Class 2*
	AS/NZS 3548 Class B*
EMC immunity	EN 50082-1
Environmental	EN 60068 (IEC 68)
Reliability	The product meets a minimum calculated MTBF of 60,000 hours using MIL 217 at 25° C (77° F)

* Category 5 screened cables must be used to ensure compliance with the Class B/Class 2 requirements of this standard. The use of unscreened cables (Category 3 or 5) complies with the Class A/Class 1 requirements.

Refer to “EMC Statements” at the back of this User Guide for conditions of operation.

Cabling

This section shows the pin-outs for the various cables that are used with the PS Hub. These cables are available from your supplier.

10BASE-T Cable

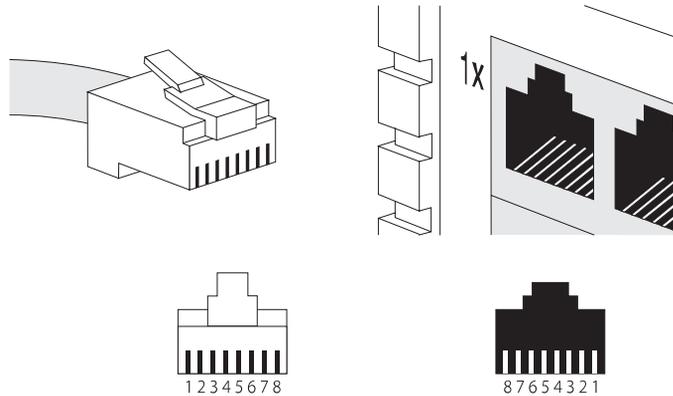


Figure A-1 Pin Numbering for 10BASE-T

Straight-through

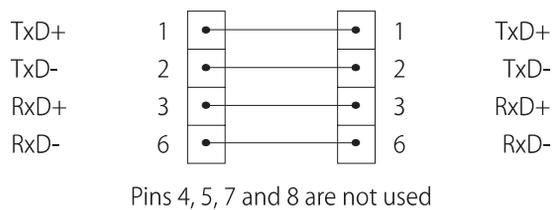


Figure A-2 Straight-through 10BASE-T Cabling

Crossover

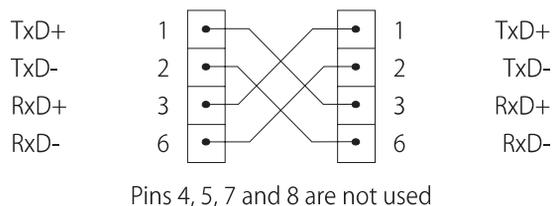


Figure A-3 Crossover 10BASE-T Cabling

Console Cable

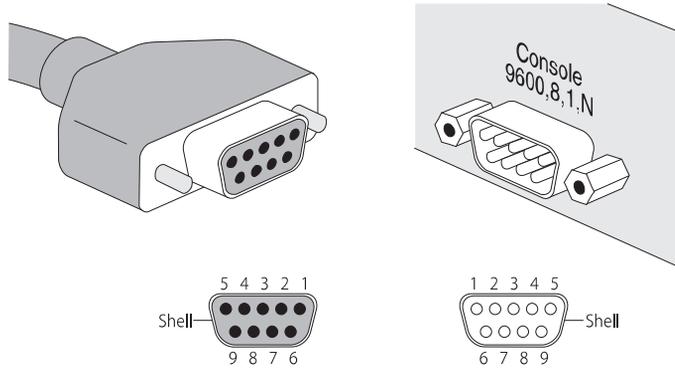


Figure A-4 Pin Numbering for Console

Examples of Null Modem Cables You Can Use

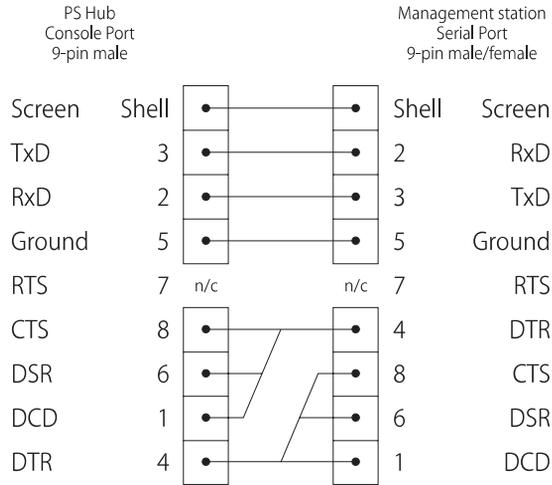


Figure A-5 Example of Null Modem Cabling for 9-pin Management Station

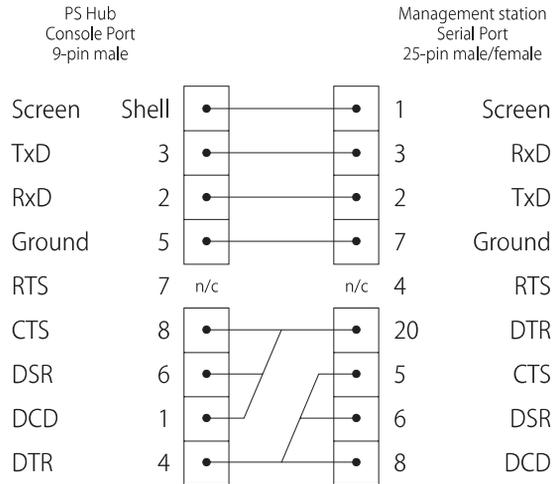


Figure A-6 Example of Null Modem Cabling for 25-pin Management Station

Modem Cable

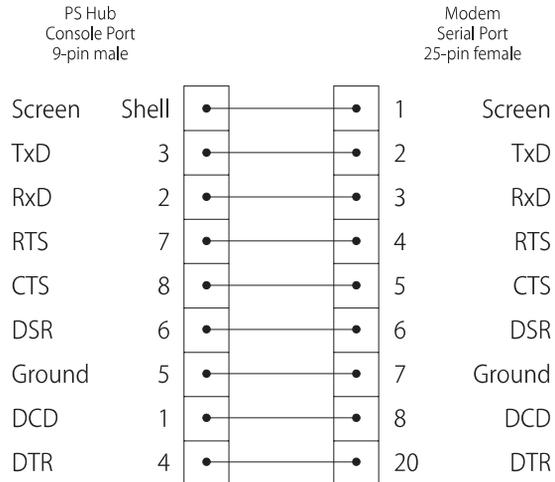


Figure A-7 Example of Modem Cabling for 25-pin Management Station

Cascade Connections

Cascade cables are available in a range of lengths from your supplier. Hot Swap Cascade Units are also available. [Table A-4](#) shows the product numbers and the lengths of these items.

Table A-4 Cascade Cables and Units

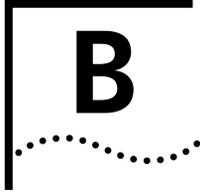
Number	Cable	Length	
3C16420	Cascade cable	0.3m	11.8in.
3C16421	Cascade cable	1m	39.5in.
3C16422	Cascade cable	3m	118.6in.
3C16430	Hot Swap Cascade Unit		

Management Settings

[Table A-5](#) shows the settings you need to set your management station's serial port to, if you are managing the PS Hub directly through its console port.

Table A-5 Management Station Settings

Data bits (character size)	8
Stop bit	1
Parity	None



MANAGEMENT USING QUICK CONFIG MANAGER

This appendix describes how to install and use Quick Config Manager. For an overview of what you can do when managing the stack, refer to “Why Manage Your Stack?” on [page 5-2](#).



Quick Config Manager has a comprehensive help system that has the same useful information as this appendix. Many of the features in Quick Config Manager are also available using the web interface, and they work in a similar way.

If you want to know how to use a feature that is not documented in this appendix, refer to the Quick Config Manager help files. To invoke the help files, simply select Help from the Quick Config Manager menu bar.

Quick Config Manager uses a familiar Windows interface with point and click operation. To use Quick Config Manager effectively, you need to be familiar with Microsoft Windows. Refer to the documentation that accompanies Microsoft Windows, for more information on how to use the interface.

Quick Config Manager can only manage one stack at a time.



Quick Config Manager cannot perform remote monitoring using RMON, and remote polling.

If you have any problems using Quick Config Manager, refer to “Solving Problems With Quick Config Manager” on [page B-29](#).

What's new There are some new and updated windows and dialog boxes in Quick Config Manager since the previous version (3.00). This is mainly to include the new PS Hub 50 functionality:

- Zoom View (updated)
- Access Information (updated)
- Switch Configuration (new)
- Software Upgrade (updated)
- Launch Load Balancing Tool (new)

Installing Quick Config Manager and the Load Balancing Tool

This section has information on what you need to install Quick Config Manager and how to install it. The Load Balancing Tool is installed by the Quick Config Manager installation program.

Installation Requirements

Quick Config Manager and the Load Balancing Tool require an IBM compatible PC with at least a 486/33 processor. Your system must also include:

- Microsoft Windows 3.1 or later
or Windows '95
or Windows NT.

The Load Balancing Tool only installs and runs on a Windows '95 or Windows NT system.

- MS-DOS 5.0 or later (not needed for Windows '95).
- Minimum of 13MB available hard disk space.
- Minimum of:
 - 8MB RAM for Windows 3.1 or later.
 - 16MB RAM for Windows '95 or Windows NT.

All RAM above the first megabyte must be configured as extended memory.

- CD-ROM drive.
- VGA color monitor or higher.
- Mouse.
- Console port capable of 9600 baud, no parity, 8 data bits (character size), 1 stop bit.

Installation Procedure

Quick Config Manager can be installed on its own or onto a workstation that already has other Transcend management applications installed.



CAUTION: Do not install Quick Config Manager in the same directory as any previously installed Transcend management applications. Quick Config Manager and the Load Balancing Tool are installed in subdirectories (QCM and LOADBAL) under the default directory of C:\TRANSCND. You can change the default directory during installation if required.



If you have an earlier version of Quick Config Manager on your system, you can simply install this version over it.

The installation program is a standard Windows based installation. To install Quick Config Manager:

- 1 Start Microsoft Windows.



If you already have an existing Transcend management application running, ensure that it is closed down.

- 2 Insert the CD-ROM into your CD-ROM drive.
- 3 Depending on your version of Windows:
 - Select *Run* from the *Start* menu — Windows '95 and Windows NT (version 4 or later).
 - Select *Run* from the *File* menu — other versions of Windows.
- 4 In the *Run* dialog box, type **drive:\TRANSCND\QCM\SETUP** (where **drive** is the letter of your CD-ROM drive) and click *OK*.

The installation program starts and checks your system configuration. Choose which installation you want and enter any information that's requested. The installation program reports when installation is complete.

When the Quick Config Manager installation is complete, it has its own program group called Transcend. If other Transcend management applications are present, the existing Transcend program group now includes Quick Config Manager.

Running Quick Config Manager

Whenever you want to start the Quick Config Manager application, double-click on the Quick Configuration Manager icon.



CAUTION: Do not run Quick Config Manager in parallel with any other Transcend management application.

Before you can manage the stack, you must make a management connection to the stack. If you are going to manage over a serial link from your management station, Quick Config Manager uses COM1 as the default serial port. You can change this by editing the following line under the [slip] subsection of the QUICKMGR.INI file:

```
SerialAttrib=COM1:9600,n,8,1
```

Editing it to **SerialAttrib=COM2:9600,n,8,1** changes the default serial port to COM2.

Before Managing with Quick Config Manager, you must ensure that your management equipment and the hub have been set up, refer to “Quick Config Manager” on [page 5-13](#).

Configuring Multiple Stacks

There is a special feature which enables you to refresh your management communication when connecting your management station to different stacks. This means that you do not need to close and re-open Quick Config Manager, which is particularly useful if you have many separate stacks that need configuring or monitoring.

To do this:

- 1 Make your serial connection to the new stack.
- 2 From the *File* menu, select *Reset View*.

Quick Config Manager closes any windows that are open in preparation for the new management session.

Selecting Your Management Access Method (Windows '95 and Windows NT only)

Windows '95 and Windows NT allow you to manage the stack over the network (in-band) using Quick Config Manager. To manage the stack over the network, the stack must have an IP address and IP must be configured on your management station. Refer to the Windows '95 or Windows NT documentation for information on configuring IP for your management station.

To select the communication method you want Quick Config Manager to use:

- 1 From the *File* menu, select *Device Access*.

Quick Config Manager displays the Device Access dialog box, as shown in Figure B-1.



Figure B-1 Device Access Dialog Box

- 2 Select the access method.
- 3 Enter the IP Address of the stack, if network access is required.
- 4 Click *OK*.

Quick Config Manager performs a Reset View. The access method and IP address are stored and used the next time Quick Config Manager is run.

Quick Config Manager Window Map

Figure B-2 (over the page) shows how all of the Quick Config Manager windows are accessed. This diagram also appears on the Quick Reference Guide. The numbers at the top right-hand side of the windows refer to the pages in this chapter that describe the windows.

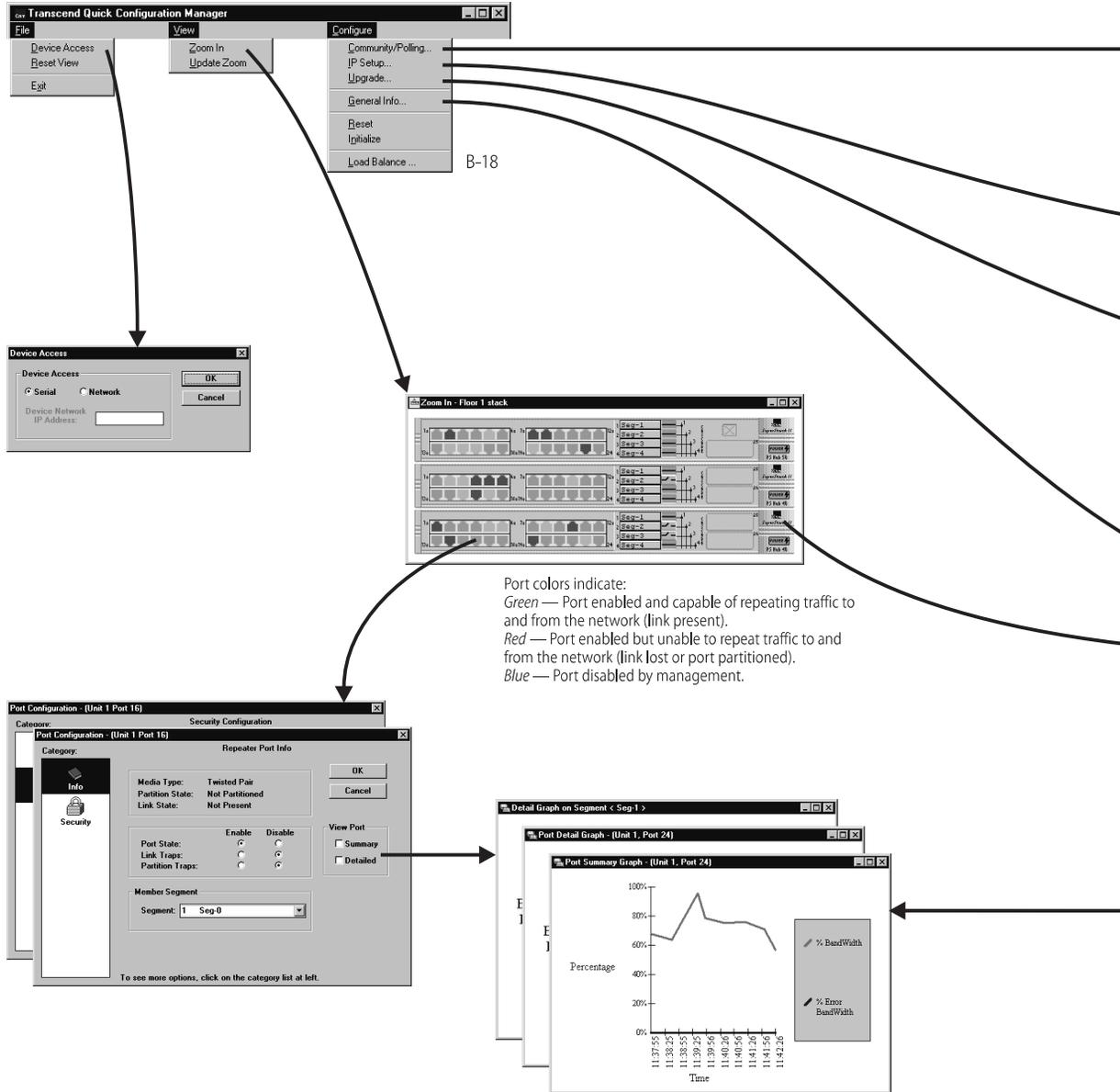
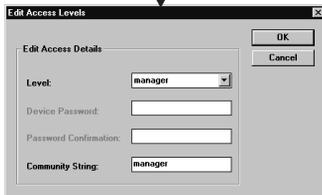
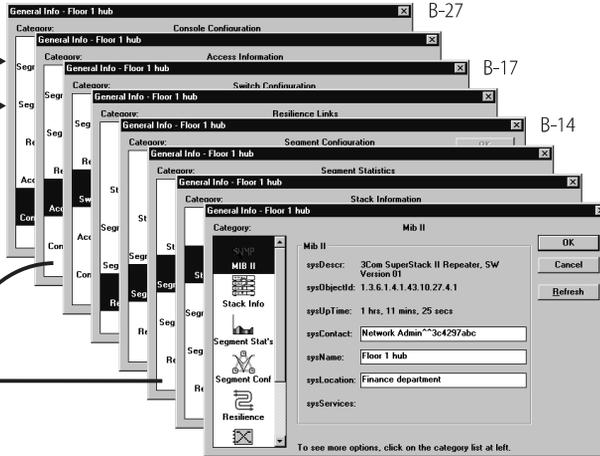
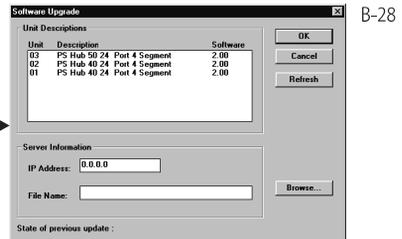
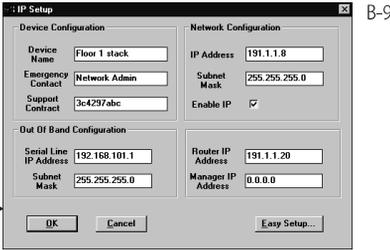
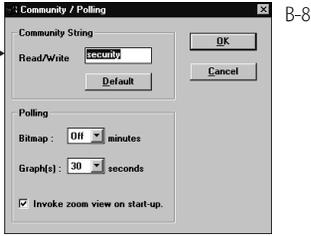


Figure B-2 Quick Config Manager Window Map



Accessing the Stack

The PS Hub uses *community strings* as a security measure, to check management access to the stack. The community string you use must match one of the community strings configured for the stack. Quick Config Manager remembers the last community string used. The default community string is *security* which allows you to view and configure the stack's information. We recommend you change the community string as soon as possible for security reasons (use the Edit Access Levels dialog box), but ensure you remember the community string as you cannot manage the hub without it.

To enter the community string:

- 1 From the *Configure* menu, select *Community/Polling*.

Quick Config Manager displays the Community/Polling dialog box, as shown in Figure B-3.

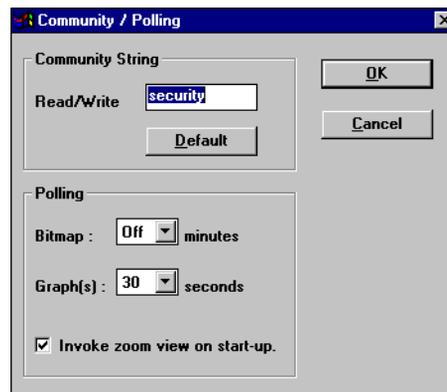


Figure B-3 Community/Polling Dialog Box

- 2 Enter the community string in the box.
- 3 Click *OK*.



Changes made to this dialog box only take effect for new windows. Any graphs or zoom view windows that are already open will continue to use the old values. Close these windows and reopen them to use the new values.

Giving the Stack an IP Address

You can configure the stack with an IP address and other address information, enabling it to communicate over (become part of) an IP network.



The stack does not need an IP address to make Quick Config Manager work with it over a serial connection.

You need to give the stack an IP address if you want to manage it over the network using:

- An SNMP network manager, for example Transcend Enterprise Manager.
- Quick Config Manager (Windows '95 and Windows NT only).
- The web interface.
- The Command Line Interface (over Telnet).

Any IP information given to a hub in the stack is used by the whole stack. If the stack is physically split, the IP information remains with the hub and is used by its half, the other half has no IP information. You can configure more than one hub in a stack with IP information. Doing this, provides the stack with backup management, should the stack split or a hub fail.



If you have no previous knowledge of IP, refer to "IP Addresses" on [page 5-7](#).

The IP Setup dialog box has a useful Easy Setup option which takes you through the IP configuration process. The information that you enter during the Easy Setup process is the same as, and is entered into, the IP Setup dialog box.



If you are managing a stack of hubs, this dialog box shows and affects the settings of the hub which is unit number 1 in the stack (the bottom hub, if the stack is correctly configured). To make a different hub unit number 1, disconnect the stack in such a way that the required hub becomes the bottom hub. However, be very careful not to break the management connection.

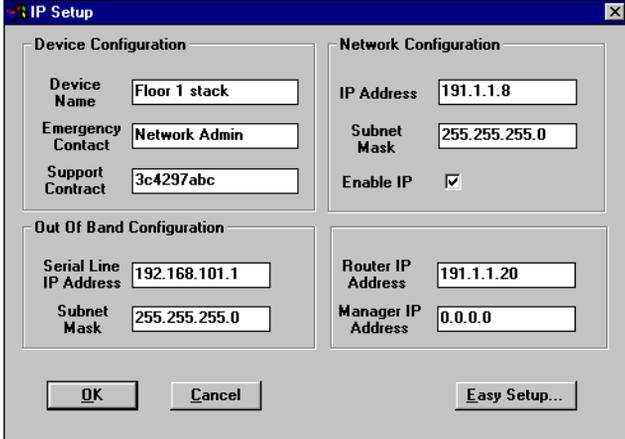
To display the IP Setup dialog box and view or configure the hub's address settings:

1 From the *Configure* menu, select *IP Setup*.

Quick Config Manager displays either the IP Setup dialog box or the Easy Setup Option, as shown in Figure B-4, depending on the IP information currently configured for the hub:

- If an IP address has been configured for the hub, and it is not 0.0.0.0, the IP Setup dialog box is displayed. If you have previously configured address information for the hub but want to go through the Easy Set-Up option again, you can start it by clicking on the *Easy Set-Up* button.
- If no previous IP information has been configured for the hub or the IP address is configured as 0.0.0.0, and the Enable IP box is checked, the Easy Setup option is started. If you want to enter information directly into the IP Setup dialog box or abort the Easy Setup process, select *Abort*.

The Easy Setup option asks you if you want to manually configure the hub for IP. If you have a BOOTP server that automatically allocates IP addresses, select *No*, otherwise select *Yes*.



Device Configuration		Network Configuration	
Device Name	Floor 1 stack	IP Address	191.1.1.8
Emergency Contact	Network Admin	Subnet Mask	255.255.255.0
Support Contract	3c4297abc	Enable IP	<input checked="" type="checkbox"/>
Out Of Band Configuration		Router IP Address	191.1.1.20
Serial Line IP Address	192.168.101.1	Manager IP Address	0.0.0.0
Subnet Mask	255.255.255.0		

Figure B-4 IP Setup Dialog Box

- 2 Enter the relevant information into the IP Setup dialog box or Easy Setup dialog boxes and click **OK** to exit the dialog boxes.
- 3 Reset the hub for any changes to take effect.

After resetting the hub, you may need to select *Reset View* from the *File* menu to restart communication using the new information.



CAUTION: Always make a note of any changes that you make to the settings on this dialog box.



If you are communicating with the stack over the network (Windows '95 and Windows NT only) and you change the IP address of the hub, you need to change the Device Network IP Address entry in the Device Access dialog box (refer to "Accessing the Stack" on [page B-8](#)) to continue managing the stack over the network.

If you are using SLIP (Quick Config Manager over the console port), ensure that Flow Control is not set to XON/XOFF (by default, it is set to None). Unless you need to connect to the stack through a modem, do not change the console port or SLIP default settings. For information on the console port, refer to "Changing the Console Port Settings" on [page B-27](#). If you require more information on SLIP, read the Internet Activities Board document RFC 155.

Quick Config Manager does not have a facility to receive traps.

Viewing the Stack

Quick Config Manager can display a graphical representation of the stack you are managing, with:

- The ports color coded to show their condition.
- Buttons showing the names of the segments, which can be used to show which ports are connected to the segments.
- Buttons showing whether the segments are connected or isolated from their respective cascade segments.

For information on segments and how they work, refer to “Segments and Port Switching” on [page 1-8](#).

To display the stack:

- From the *View* menu, select *Zoom In*.

Quick Config Manager displays a zoom view of the stack, as shown in Figure B-5. If the zoom view is already open, it is selected.

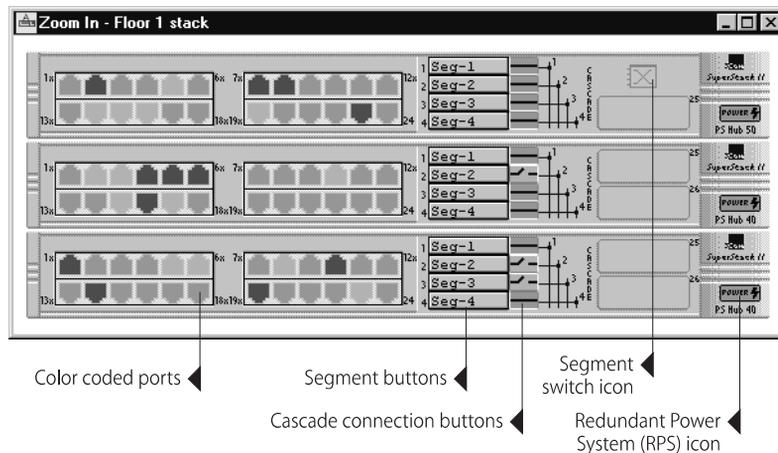


Figure B-5 Zoom View of the Stack



In the Community/Polling dialog box, you can specify whether the zoom view is invoked on starting Quick Config Manager, and how often the zoom view is polled (updated). If you want to update the zoom view immediately, without waiting for a poll, select Update Zoom from the View menu.

Port Colors and Icons

Port colors The port color coding shows these conditions:

- *Green* — Port enabled and capable of repeating traffic to and from the network (link present).
- *Red* — Port enabled but unable to repeat traffic to and from the network (link lost or port partitioned).
- *Blue* — Port disabled by management.

Segment Switch icon If you have a PS Hub 50 in the stack, its Segment Switch icon is:

- *Blue and white* — Active.
- *Gray* — Inactive.

RPS icon If a hub is connected to a Redundant Power System (RPS), an icon is shown on the right of the hub's graphical representation. It shows these conditions:

- *Green* — RPS active and no faults.
- *Red* — RPS active but has one or more faults.

Identifying the Ports that are Connected to a Segment

You can find out what ports in the stack are connected to a segment by clicking on that segment's name button on any of the hubs:

- If the hub's segment is isolated from the cascade segment, only ports that are connected to the hub's segment are highlighted.
- If the hub's segment is connected to the cascade segment, all other ports in the stack which are part of segments that are connected to the same cascade segment, are highlighted.

The ports (and any transceiver module ports) that are part of the segment, are highlighted with a dark blue surround. Click the name button again to turn off the highlighting.

Connecting or Isolating Segments from Their Cascade Segments

Next to each segment name button, is another button that shows if the segment is connected or isolated from its associated cascade segment:

- *Green with a solid line through it* — the segment is connected.
- *Blue with a broken line* — the segment is isolated.

Double-click the button to connect or disconnect the segment from the cascade segment.

Displaying Information for the Stack

You can display information for the stack by double-clicking on the zoom view:

- If you double-click on a port, the Port Configuration dialog box is displayed. This is used to display and configure information about a port.
- If you double-click on anything other than a port or button, the General Info dialog box is displayed. This is used to display and configure information about the stack.

Configuring Segments

You can use Quick Config Manager to set up the segments within the stack to create workgroups. For information on the segments and how they work, refer to “Segments and Port Switching” on [page 1-8](#).

If you want to use load balancing to configure your segments, refer to “Load Balancing” on [page B-18](#).

Quick Config Manager handles segments at two levels: the segments within each hub, and the cascade segments that run through the stack.



Refer to “Connecting or Isolating Segments from Their Cascade Segments” on [page B-14](#) for information on connecting and isolating segments from their associated cascade segments.

By default, all ports are assigned to segment 1.

Using the Segment Configuration panel, you can:

- Move the ports between the segments
- Name the segments



For management communication to work over the network, the port through which your communication reaches the stack must be connected to segment 1 of the hub with the IP address configured.

You can configure the segments for any of the hubs in the stack, regardless of the hub through which your management reaches the stack.

To configure the segments:

- 1 Do one of the following:
 - Double-click on the graphical representation of the stack (but not on a port).
 - From the *Configure* menu, select *General Info*.
- 2 In the General Info dialog box, select the *Segment Conf* category.

Quick Config Manager displays the Segment Configuration panel, as shown in Figure B-6.

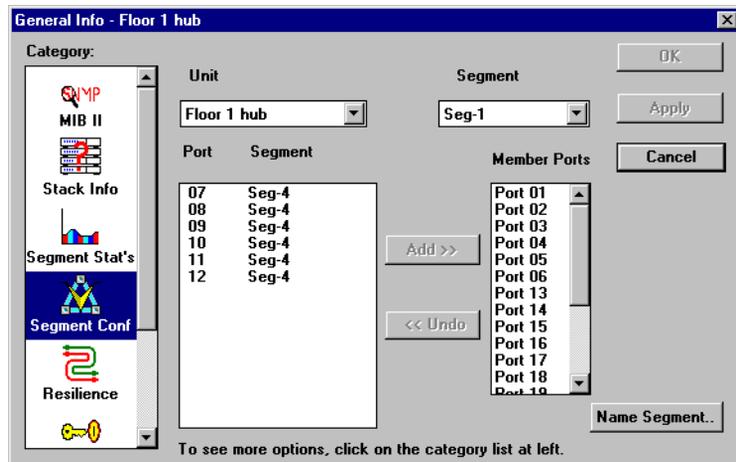


Figure B-6 Segment Configuration Panel

- 3 Using the Unit pull down list box, select the hub for which you want to configure segments.

The Unit pull down list box displays the name of the hub (if configured) or the number of the hub in the stack. In a correctly connected stack, the bottom hub is unit 1.

- 4 Using the Segment pull down list box, select the segment to which you want to move ports.
- 5 Highlight the ports in the Port Segment list and click *Add >>* to add them to the Segment Member Ports list.
- 6 Click *Apply* to confirm your changes **before** choosing any other hubs or segments for which you want to move ports.
- 7 Click *OK*.



In the unlikely event that you should lose your management connection while moving ports, simply close this dialog box, perform a Reset View and then re-enter this dialog box to continue moving ports.

If you have a Zoom View of the stack open, it is not automatically updated with the information you configured using this panel. To update the Zoom View, select Update Zoom from the View menu.

Unit Select the hub in the stack you want to configure segments for.

Segment Specify the segment in the hub that you want to configure.

Port Segment Select the ports you want to add to the segment. The list shows what segments the ports are currently members of.

Segment Member Ports Shows the ports that are members of the segment.

Add >> Adds the highlighted ports in the Port LAN list to the Segment Member Ports list.

<< Undo Moves the highlighted ports in the Segment Member Ports list from the segment, back to the Port Segment list, if these changes have not been written to the stack.

Name Segment Opens a dialog box which is used to configure the name for the segment, specified in the Segment field. The name of the segment appears on the hub's segment name button, on the graphical representation (zoom view) of the stack, and is limited to 8 characters.

Apply Writes changes to the stack without closing the panel. Use *Apply* if you want to configure another segment.

OK Writes changes to the stack and closes the panel.

Configuring the Segment Switch

All PS Hub 50 units have a segment switch. If you have multiple PS Hub 50 units in a stack, only one of the units has its segment switch enabled, called the *active segment switch*. You can use Quick Config Manager to connect or isolate the stack's active segment switch from the cascaded segments. For information on the PS Hub 50 unit's segment switch, refer to "Segment Switch" on [page 2-2](#).



This functionality in Quick Config Manager is not available if there is not a PS Hub 50 in the stack.

To configure the segment switch:

- 1 Do one of the following:
 - Double-click on the graphical representation of the stack (but not on a port).
 - From the *Configure* menu, select *General Info*.
- 2 In the General Info dialog box, select the *Switch Conf* category.

Quick Config Manager displays the Switch Configuration panel, as shown in Figure B-7.

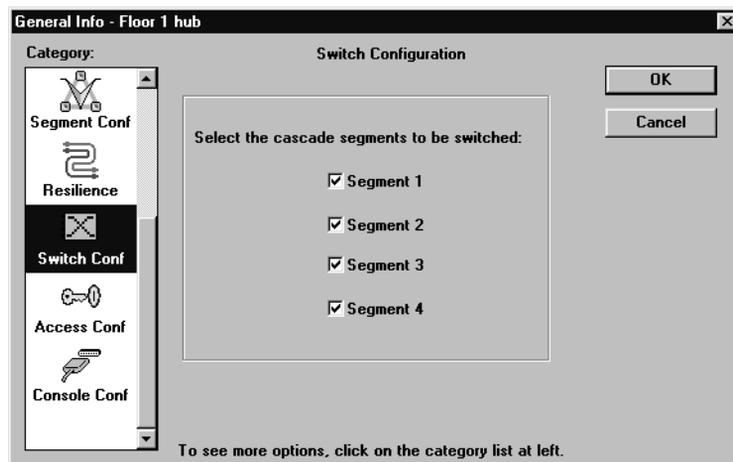


Figure B-7 Switch Configuration Panel

- 3 Use the checkboxes to connect or isolate the segment switch from the cascaded segments, as required.
- 4 Click *OK*.

Load Balancing

The PS Hub has a load balancing feature which you can use to move the ports between the segments in the stack for you. The aim of load balancing is to reduce total traffic across the segments. It does this by distributing the traffic between the segments, and keeping the stations that frequently communicate with each other on the same cascaded segment, which provides more efficient segments. If enabled, it works by continually monitoring the traffic through the stack, and then at regular intervals it moves the ports between the segments if it detects that some benefit will be gained.

For information on the benefits of load balancing, refer to [Chapter 4](#).

To configure load balancing, you use the Load Balancing Tool which is supplied with and is launched from Quick Config Manager. The Load Balancing Tool is installed on your management station by the Quick Config Manager installation program (if it is running Windows '95 or Windows NT).



The Load Balancing Tool only works when used over the network (in-band) from a Windows '95 or Windows NT management station.

The load balancing feature automatically detects any ports that are connected to switches and ensures that they are not moved. You can prevent other ports from being moved by *fixing* them. Note that their traffic levels are still taken into consideration when calculating the segment traffic, so they will still affect other ports being moved.

To display the load balancing window, select *Load Balance* from the *Configure* menu. Quick Config Manager launches the Load Balancing Tool, as shown in Figure B-8.

You can use the Load Balancing window to:

- View the current utilization for each of the segments in the stack.
- View a utilization history for the segments.
- Fix and unfix segments and ports.
- Enable or disable the automatic load balancing feature, change how often it occurs, and specify a threshold at which it occurs.
- Change the rate at which the utilization information is updated.
- Change the community name that is used to access the stack.

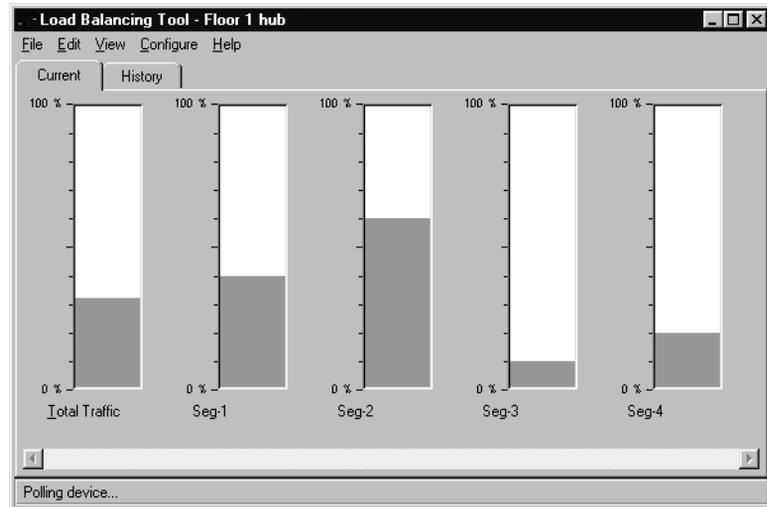


Figure B-8 Load Balancing Window



Because load balancing is part of the PS Hub, when you exit from the Load Balancing Tool, the load balancing feature continues to work as configured.

Menus The Load Balancing window has five menu items along the top. There is also a pull right menu that can be obtained by clicking on the right mouse button while the mouse pointer is over one of the segments.

These menu options are described in the rest of this section.

Changing the Community Name

When you launch the Load Balancing Tool, Quick Config Manager passes it the community string that it is using so that the Load Balancing Tool can access the stack.

If you ever change the community string in Quick Config Manager while the Load Balancing Tool is running in the background, you need to change the community string that the Load Balancing Tool uses. To do this:

- 1 From the *Configure* menu, select *Community*.
The Load Balancing Tool displays the Configure Community dialog box.
- 2 Enter the new community name and click *OK*.

Viewing Current Utilization

When the Load Balancing window is first displayed, the window shows the Current Utilization page, as shown in Figure B-9.

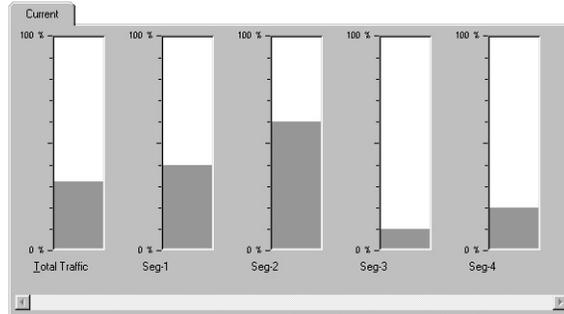


Figure B-9 Current Utilization Page

This page shows the current utilization both across the stack and on individual segments. Utilization refers to how much of the bandwidth is being used. There is one utilization bar for:

- Each cascaded and isolated segment — For example, if you have a stack with two isolated segments, as shown in Figure B-10, the Current Utilization page would have six separate segment bars (four for the cascaded segments, and two for the isolated segments).
- The total traffic — Represents the bandwidth being utilized across all segments in the stack, as a percentage of the total possible bandwidth for the stack. Note that this is not simply the sum of each individual segment's utilization.

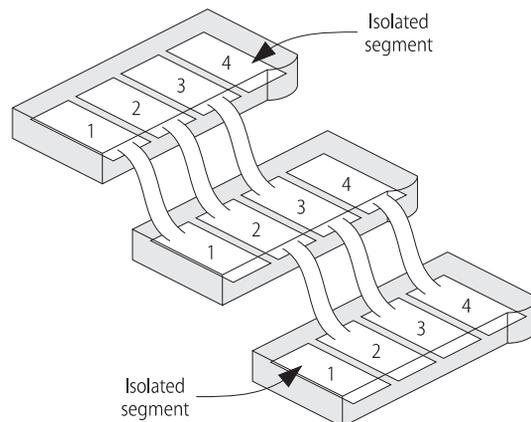


Figure B-10 Cascaded and Isolated Segments Example

Viewing Utilization History

If you click the *History* tab to the top of the panel, the Utilization History page is displayed, as shown in Figure B-11.

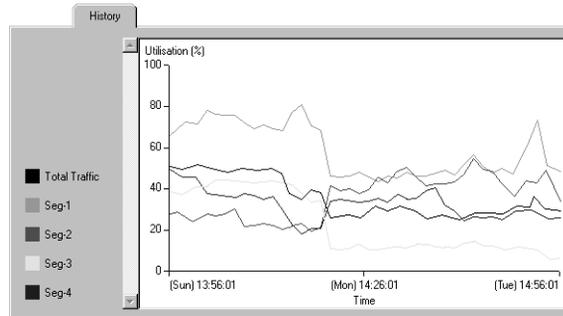


Figure B-11 Utilization History Page

This page shows a graph of the utilization history for:

- The total traffic that is being produced across all the segments in the stack — The utilization is the percentage of the total available bandwidth used to transmit valid and errored packets. It does not include bandwidth wasted due to collisions.
- All the cascaded and isolated segments.

The graph displays the values as percentages.

When the PS Hub is powered on, it starts recording the values for each segment. When you view the Utilization History page, information that has already been recorded is displayed. If the PS Hub has only just been powered on, the graph will not display much information. The graph is updated on each poll, if new information is available.



The PS Hub uses default RMON sessions to record the utilization history of the segments. If you delete any of these sessions using an SNMP Network Management Application, the PS Hub will be unable to record information for those segments and it will not be displayed by the Load Balancing Tool's Utilization History page.

How the Utilization History Graph Can Be Used

The Utilization History graph is very useful for showing you the positive changes in utilization of load balancing. You can view the utilization before and after load balancing was performed, as shown in Figure B-12.



The total traffic utilization will go down but segment utilization may not be distributed evenly. This is because load balancing tries to keep the stations that frequently communicate with each other on the same cascaded segment.

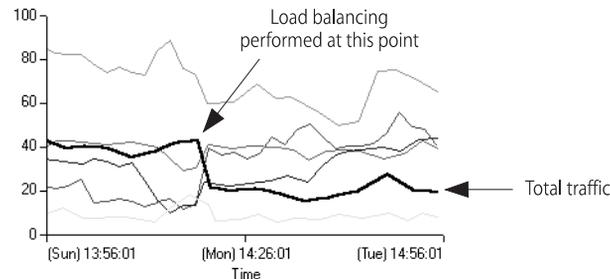


Figure B-12 Utilization Before and After Load Balancing

Polling

You can change the rate at which the Load Balancing Tool updates its utilization information (called *polling*). To do this:

- 1 From the *Configure* menu, select *Polling*.

The Load Balancing Tool displays the Polling dialog box.

- 2 Use the Enable Polling check box to enable or disable the polling of utilization information.

If the check box is unchecked, polling is disabled and the Poll Period field is disabled.

- 3 Use the Poll Period field to enter how many seconds you want between each poll for information. The poll period can be 1 – 9999 seconds.
- 4 Click *OK*.

Fixing and Unfixing Segments and Ports

You can fix segments and ports so that they are not moved by load balancing:

- Fixing a segment prevents any ports being moved to or from that segment.
- Fixing a port prevents that port from being moved to another segment.



Fixing ports or segments does not prevent you from moving the ports between segments yourself, using the web interface or Quick Config Manager. It just prevents the load balancing feature from doing it automatically.

You may want to fix segments that contain users that communicate frequently. You may also want to fix ports that have network equipment (other than workstations) connected directly to them. It is a good idea to fix ports that are:

- Used to connect your management station to the stack (this port must remain on segment 1).
- Connected to switches, servers and receivers of network traffic, for example printers.

Segments

To fix or unfix a segment:

- 1 Right-click on the segment's name or utilization bar.

A pull right menu appears next to the mouse pointer, which has *Fixed* and *Fixed Ports* options. If *Fixed* has a tick next to it, the segment is currently fixed. If it has not got a tick next to it, the segment is currently unfix.

- 2 Select *Fix* to make the segment fixed or unfix.

Ports

To fix or unfix a port or multiple ports:

- 1 Right-click on the segment's name or utilization bar for the segment that contains the port(s).
A pull right menu appears next to the mouse pointer.
- 2 Select *Fixed Ports*.

Quick Config Manager displays a Port Configuration dialog box for the segment, as shown in Figure B-13. The dialog box shows a list of all the ports in the stack that are part of that segment, and whether they are currently fixed or unfixed.

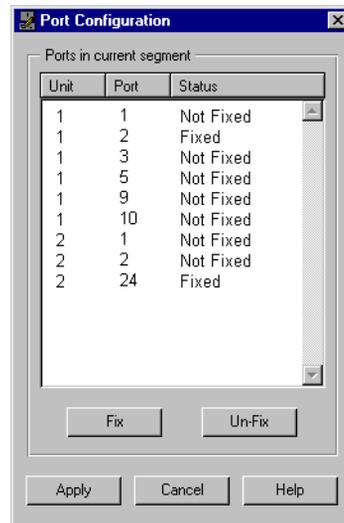


Figure B-13 Port Configuration Dialog Box For a Segment

- 3 Click on a port or on multiple ports (while dragging the mouse pointer over the entries, or using [Ctrl]) in the list to highlight the port(s), and then click *Fix* or *Unfix* to fix or unfix the port(s). Click *Apply* to send the changes to the unit in the stack **before** closing the dialog box.
- 4 Click *Cancel* to close the dialog box.

Performing Load Balancing

You can control many areas of the load balancing feature, including:

- Invoking the load balancing feature manually.
- Enabling or disable the automatic load balancing feature.
- Changing how often the automatic load balancing feature occurs (if enabled).
- Changing the reactive threshold for the load balancing process — if this level is exceeded on any segment, the load balancing feature is automatically invoked (if enabled).



Load Balancing works by monitoring traffic levels, so the stack only starts to benefit fully from it when it has been powered on for an hour, and Load Balancing has been enabled for an hour.

We recommend that you perform load balancing during quiet periods of network activity (possibly at night). To really benefit from load balancing it is a good idea not to perform load balancing too often. A suggested rate is every 24 hours.



CAUTION: *The equipment connected to the ports that are moved by load balancing must have their MAC addresses relearnt by the PS Hub 50 (or external switch), so a small amount of packet loss may occur while these addresses are relearnt.*

Invoking Load Balancing Manually

To invoke the load balancing feature manually:

- 1 Select *Balance Now* from the *Configure* menu.

The feature immediately starts to load balance the units in the stack.



This feature is not available if load balancing has been disabled.

- 2 Select *Refresh* from the *View* menu to update the information that is displayed in the Load Balancing Tool.

The stack may take some time to complete the load balancing operation, so you may not see changes straight away.

Enabling or Disabling the Automatic Load Balancing Feature

To enable or disable the automatic load balancing feature:

- 1 From the *Configure* menu, select *Load Balancing*.
Quick Config Manager displays the Load Balancing dialog box.
- 2 Use the Enable Load Balancing check box to enable or disable the automatic load balancing feature.
If the check box is unchecked, the feature is disabled and the Frequency and Balance At fields are disabled.
- 3 Use the Frequency field to enter how many hours you want between each automatic load balance.
- 4 Use the Balance At field to enter a the utilization level at which you want the load balancing feature to automatically start, should any segment exceed this level.
- 5 Click *Apply* to send the changes to the units in the stack **before** closing the dialog box.
- 6 Click *Cancel* to close the dialog box.



Setting both the Frequency and Balance At fields to '0' disables automatic load balancing, but the load balancing feature still collects data so that you can do a manual load balance at any time.

Changing the Console Port Settings

The PS Hub's console port is already correctly configured by default, for direct connection to a management station (terminal). Only alter these default settings if you are connecting a modem to the console port.



CAUTION: Do not change any of these settings unless you fully understand what you are doing. Incorrect settings may lock you out from the hub's console port when you select OK, and you will have to contact your supplier for information on recovering management communication.



Please note that:

- If you want to change the settings but are unsure of the correct settings to use, refer to the user documentation that accompanies your terminal or modem. If you change the settings by accident, click Cancel to exit from the panel without changing anything.
- If you are managing a stack of hubs, this panel shows and affects the settings of the hub which is unit number 1 in the stack (the bottom hub, if the stack is correctly configured). To make a different hub unit number 1, disconnect the stack in such a way that the required hub becomes the bottom hub. However, be very careful not to break the management connection.
- If you are using Quick Config Manager over the console port, it is best to have the Speed set to Auto Config.
- While changing the speed, Quick Config Manager's line speed may become out-of-sync with that of the hub. To resolve this problem, change the 'SerialAttrib' entry to **SerialAttrib=COM1:line speed,n,8,1** under the [slip] section of the QUICKMGR.INI file. Restart Quick Config Manager.

Upgrading a Stack

In the future, an upgrade may be issued which enhances the functionality of the PS Hub. Any such upgrade will be available on the 3Com Bulletin Board Service, refer to “3Com Bulletin Board Service” on [page E-1](#). Quick Config Manager allows you to upgrade a whole stack at a time, with any such upgrade.



When a hub is upgraded, any configurations that have been made to it are maintained. Upgrading a stack of hubs may take up to 5 minutes for each hub.

To upgrade the stack:

- 1 From the *Configure* menu, select *Upgrade*.

Quick Config Manager displays the Software Upgrade dialog box, as shown in [Figure B-14](#). This dialog box shows the units in the stack and the version of agent software that they are running. At the bottom of the dialog box, the state of the previous software upgrade is displayed (the text is grayed out if there is a unit in the stack that is running old agent software):

- Loading — One or more of the units in the stack are still upgrading.
- Success — The upgrade was successful.
- Failure (with a message) — One or more of the units failed to upgrade successfully.
- Status unknown — There has not been a recent upgrade.

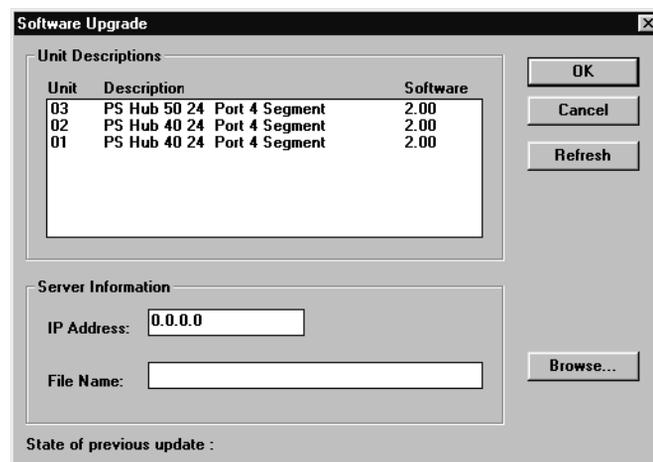


Figure B-14 Software Upgrade Dialog Box

- 2 Specify the IP address of the TFTP server that has the upgrade file on it.
- 3 Specify the file name.

Do not enter a path. The upgrade file must be in the appropriate directory on the TFTP server that the server has been configured to look in.

The file name format is:

- PS Hub 40 software upgrade — **pshxx_yy.bin**
- PS Hub 50 software upgrade — **psfxx_yy.bin**

Where *xx_yy* is the version of agent software. You can specify multiple file names (separated by spaces), to upgrade PS Hub 40 and PS Hub 50 units in the stack at the same time, for example:

psh02_00.bin psf02_00.bin

- 4 Click *OK*.

Solving Problems With Quick Config Manager

You cannot access the hub over a serial connection for the first time. There may be a number of reasons for this:

- For a successful local management connection, you need to use a standard null modem cable, and have the hub's console port set to 9600 baud or auto-configuration enabled. These are the default settings. For information on the console port settings, refer to "Changing the Console Port Settings" on [page B-27](#).
- It may be that you have made your management connection to a serial port, on your management station, which is not the port Quick Config Manager is using. Quick Config Manager uses COM1 as the default serial port. For information on changing this, refer to "Running Quick Config Manager" on [page B-4](#).
- When using Quick Config Manager with Windows '95 and managing through the console port, you must first disable FIFO buffers in the Advanced Port Settings window in Windows '95. For information on doing this, refer to "Through the Console Port" on [page 5-13](#).
- There may be another application running on your management station, that is using the management station's serial (COM) port, for example HyperTerminal.

You cannot access the hub over the network for the first time.

Check that:

- Your management station is correctly configured for IP.
- The port through which your communication reaches the stack must be connected to segment 1 (either directly or indirectly) of the hub with the IP address configured. For more information, refer to “Requirements for Managing Over the Network” on [page 5-6](#).

You lose your management connection while managing the

stack. If you have changed the community string of the access level that you are using, you must enter the new community string in the *Community/Polling* dialog box.

Reset the connection by selecting *Reset View* from the *File* menu.

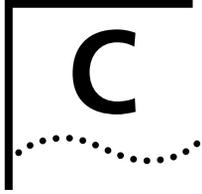
If this does not work, it may be that Quick Config Manager’s line speed has become unsynchronized with that of the hub. To resolve this problem, make Quick Config Manager use a different speed by changing the ‘SerialAttrib’ entry to `serialAttrib=COM1:line speed,n,8,1` under the [slip] section of the QUICKMGR.INI file, and restart Quick Config Manager.

You forget your community string. Contact your supplier.

You cannot access the stack using the web interface or CLI after changing the community string.

When you changed the community string using the Edit Access Levels dialog box, the *Device Password* and *Password Confirmation* fields were probably left blank, which has blanked the password. Log on to the web interface or CLI using the same user level but without a password, and change the password.

You cannot access the Load Balancing Tool. The Load Balancing Tool only installs and runs on a Windows ‘95 or Windows NT system, and only works when used over the network (in-band).



SERIAL WEB UTILITY

Introduction

If you are using a management station running Microsoft Windows® '95 and want to access the web interface through the PS Hub's console port, you must use the 3Com serial web utility (SLIP Driver) supplied on the CD-ROM that accompanies the hub.

Every time you want to access the web interface, use the serial web utility to set up the connection to the web interface; it launches your web browser and accesses the web interface using SLIP for you.

If you have any problems accessing the hub's web interface using the serial web utility, refer to "Solving Problems With the Serial Web Utility" on [page C-4](#).

Installing the Serial Web Utility

The serial web utility can be installed on to a management station that already has other Transcend management applications installed on it.

The default directory into which the serial web utility is installed is C:\Program Files\3Com\3Com Serial Web.

This can be changed during the installation if required.

The installation program is a standard Windows based installation. To install the serial web utility:

- 1 Start Windows '95.



If you already have an existing Transcend® management application running, ensure that it is closed down.

- 2 Insert the CD-ROM into your CD-ROM drive.
- 3 Select *Run* from the *Start* menu.

- 4 In the *Run* dialog box, type **drive:\Win95\Drivers\slip\SETUP** (where **drive** is the letter of your CD-ROM drive) and click *OK*.

The installation program starts and checks your system configuration; enter any information that's requested.



If the setup program cannot find specific files on your management station, it asks you to insert you Windows '95 CD-ROM. If it still cannot find the files, you must obtain them directly from Microsoft. Contact Microsoft for more information.

- 5 When the installation program has ensured all the relevant files are installed, it asks you to select the COM port. This is the serial port on your management station that you are going to use when connecting to the hub's console port.

If you click *Advanced*, the Advanced Configuration Parameters dialog box is displayed, showing all of the settings the serial web utility will use when it is run. These default settings are already correct for connection to the hub so you should not need to change them.

The fields are:

Connection name Allows you to enter a name for the connection.

Modem name Allows you to enter a name for the modem connection.

PC SLIP Address The SLIP address that is to be allocated to the management station. The default address is '192.168.101.2'.

Device URL The URL that the serial web utility uses to access the hub, which includes the hub's SLIP address. For example, the default SLIP address for the hub is '192.168.101.1' so the URL is:

http://192.168.101.1/

Flow Control None / XON/XOFF / Hardware RTS/CTS

Allows you to specify the flow control that the management station is to use.

Data bits, Stop bits and **Parity** are all fixed.

Speed 1200 / 2400 / 4800 / 9600 / 19200

Allows you to specify the baud rate that the management station is to use.

You also have the option of changing the *PC SLIP Address*, *Device URL*, *Flow Control* and *Speed* after the installation is complete.

- 6 When you have finished, the final installation dialog box is displayed informing you that the serial web utility has been installed on your management station. Click *Finish* to close the dialog box.
- 7 You are asked if you want to restart Windows '95 so that it can use the new settings you have configured. You must restart Windows '95 before running the serial web utility.

When you return to the Windows '95 desktop, the serial web utility shortcut ('Serial Web Management') created by the installation program is visible. The utility also has its own program group called 'Serial Web' under the default program group specified during the install, which contains:

- Serial Web Management — Launches the serial web utility.
- Serial Web Setup — Displays the Advanced Configuration Parameters dialog box, which allows you to view and change some of the settings the serial web utility uses when it is run.
- License agreement.

Using the Serial Web Utility

Every time you want to access the web interface through a serial link, make your management connection (refer to "Web Interface" on [page 5-12](#)) and use the serial web utility to set up your connection:

- 1 Either:
 - Double-click on the Serial Web Management shortcut.
 - Select the Serial Web Management program item in the Serial Web program group.
- 2 The serial web utility opens and asks you if you want to use the URL that has been set up. The URL includes the hub's SLIP address. For example, if the SLIP address for the hub is '192.168.101.1', the URL is:
http://192.168.101.1/
If you want to change the URL, click *URL*. If the URL is correct, click *OK*.
- 3 The serial web utility attempts to establish a connection.
If successful, the standard Windows '95 Dial-Up Networking dialog box is displayed, showing the various connection details. Your default web browser is then launched with the specified URL.

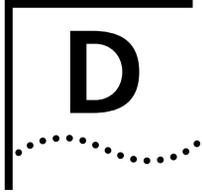
- 4 The connection is successful if the web interface's password panel is displayed. You are now ready to manage the hub or stack; refer to [Chapter 7](#).

Solving Problems With the Serial Web Utility

If you are unable to connect to the hub's web interface, it may be that:

- The hub is not turned on.
- You are not using a proper null modem cable, refer to "Examples of Null Modem Cables You Can Use" on [page A-4](#).
- The following settings are different on your hub and management station:
 - Flow control.
 - Speed (baud rate).
- The hub has automatically configured its communication speed, but you have subsequently changed the speed configured on your management station (the device only automatically configures the speed the first time it connects).
- You have selected the wrong COM port on your management station.

To change some of the settings for the management station, use the Advanced Configuration Parameters dialog box. To display this, select the Serial Web Setup program item in the Serial Web program group.



AGENT UPGRADE UTILITY

The CD-ROM supplied with the hub has an agent upgrade utility on it that can be used for upgrading the new version of agent software to the PS Hub.



NOTE: *You would only use this utility if a previous software upgrade has failed and you are unable to communicate with your hubs using the web interface or Quick Config Manager. At all other times you should use the web interface or Quick Config Manager to upgrade your hubs.*

If you have any problems using the agent upgrade utility, refer to "Solving Problems With the Agent Upgrade Utility" on [page D-3](#).

Using the Upgrade Utility

The upgrade utility works from an MS-DOS prompt. It upgrades one hub at a time.



Upgrading a hub may take up to 5 minutes.

To upgrade agent software to a hub:

- 1 Connect your PC's serial (COM) port to the hub's console port, using a null modem cable.
- 2 If you are using Microsoft Windows, exit out of it so that you are at the MS-DOS prompt.



This utility must be run from MS-DOS. It cannot be used from an MS-DOS Window within Microsoft Windows.

- 3 At the MS-DOS prompt, change your directory to the drive that is your CD-ROM drive.

4 Enter the upgrade command:

- PS Hub 40 software upgrade — **update pshxx_yy.bin**
- PS Hub 50 software upgrade — **update psfxx_yy.bin**

Where *xx_yy* is the version of agent software. The version of agent software on the CD-ROM is the current version that was in the hub originally. View the contents of the CD-ROM to see the filename for this version of agent software.

You can also use the following parameter with the upgrade command to specify the serial (COM) port to use for the PC. The default for this is COM 1:

-c 1 or **-c 2**

An example of the upgrade command with this parameter is:

update -c 1 pshxx_yy.bin

5 Power off the hub.

6 Press [Return].

7 Power on the hub immediately (within 5 seconds).

The utility transfers the agent software to the hub.

8 Repeat all of the steps for any other hubs that need upgrading.

Solving Problems With the Agent Upgrade Utility

If you have any problems using the upgrade utility, use the following actions to solve your problems.

An error occurred when the utility tried to connect through the PC's serial port. The serial port being used is not the same as the serial port specified in the upgrade command. Retry the command ensuring that you specify a value of '1' or '2' for the serial port.

An error occurred when the utility tried to communicate with the hub. There could be a number of reasons for this:

- The hub was not powered on within 5 seconds of pressing [Return] (step 7).
- The null modem cable is not connected to the hub's COM port.
- The null modem cable is not connected to the PC's serial port, or the serial port being used is not the same as the serial port specified in the upgrade command.
- The hub was not powered off and on as directed.

Retry the command ensuring that you follow all the steps.

An error occurred when the utility tried to open the agent software file for reading. There could be two reasons for this:

- The file specified in the upgrade command does not exist or is in a different directory to the one given. Check the filename and its location.
- You do not have read access for the file. Check the file's properties using Explorer (in Windows 95) or File Manager (in other versions of Windows).

The error message `USAGE: update [-c comport] filename` **is returned.** You have not specified the correct number of parameters for the upgrade command. Retry with the correct parameters.

An error occurred when the utility tried to transfer the file.

There could be a number of reason for this:

- The null modem cable has become disconnected from the hub or the PC during the file transfer. Reconnect the cable and start again.
- Power to the hub has been disrupted during the file transfer. Check the power connection to the hub and start again.
- An incorrect file has been specified and transferred to the hub. Check the filenames and start again.
- The utility must be run from MS-DOS. It cannot be used from an MS-DOS Window within Microsoft Window.



TECHNICAL SUPPORT

3Com provides easy access to technical support information through a variety of services. This appendix describes these services.

Information contained in this appendix is correct at time of publication. For the very latest, we recommend that you access 3Com Corporation's World Wide Web site.

Online Technical Services

3Com offers worldwide product support 24 hours a day, 7 days a week, through the following online systems:

- World Wide Web site
- 3Com Bulletin Board Service (3ComBBS)
- 3ComFactsSM automated fax service
- 3ComForum on CompuServe[®] online service

World Wide Web Site

Access the latest networking information on 3Com Corporation's World Wide Web site by entering our URL into your Internet browser:

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

This service features the latest information about 3Com solutions and technologies, customer service and support, news about the company, technical publications, *NetAge*[®] Magazine, and more.

3Com Bulletin Board Service

3ComBBS contains patches, software, and drivers for all 3Com products, as well as technical articles. This service is available through analog modem or digital modem (ISDN) 24 hours a day, 7 days a week.

Access by Analog Modem

To reach the service by modem, set your modem to 8 data bits, no parity, and 1 stop bit. Call the telephone number nearest you:

Country	Data Rate	Telephone Number
Australia	up to 14400 bps	61 2 9955 2073
Brazil	up to 14400 bps	55 11 547 9666
France	up to 14400 bps	33 1 6986 6954
Germany	up to 28800 bps	4989 62732 188
Hong Kong	up to 14400 bps	852 2537 5608
Italy (fee required)	up to 14400 bps	39 2 27300680
Japan	up to 14400 bps	81 3 3345 7266
Mexico	up to 28800 bps	52 5 520 7853
P. R. of China	up to 14400 bps	86 10 684 92351
Singapore	up to 14400 bps	65 534 5693
Taiwan	up to 14400 bps	886 2 377 5840
U.K.	up to 28800 bps	44 1442 438278
U.S.A.	up to 28800 bps	1 408 980 8204

Access by Digital Modem

ISDN users can dial in to 3ComBBS using a digital modem for fast access up to 56 Kbps. To access 3ComBBS using ISDN, use the following number:

408 654 2703

3ComFacts Automated Fax Service

3Com Corporation's interactive fax service, 3ComFacts, provides data sheets, technical articles, diagrams, and troubleshooting instructions on 3Com products 24 hours a day, 7 days a week.

Call 3ComFacts using your Touch-Tone telephone using one of these international access numbers:

Country	Telephone Number
Hong Kong	852 2537 5610
U.K.	44 1442 438279
U.S.A.	1 408 727 7021

Local access numbers are available within the following countries:

Country	Telephone Number	Country	Telephone Number
Australia	1800 678 515	Netherlands	06 0228049
Belgium	0800 71279	New Zealand	0800 446 398
Denmark	800 17319	Norway	800 11062
Finland	98 001 4444	Portugal	0505 442 607
France	05 90 81 58	Russia (Moscow only)	956 0815
Germany	0130 81 80 63	Singapore	800 6161 463
Hong Kong	800 933 486	Spain	900 964 445
Italy	1678 99085	Sweden	020 792954
Malaysia	1800 801 777	U.K.	0800 626403

3ComForum on CompuServe Online Service

3ComForum contains patches, software, drivers, and technical articles about all 3Com products, as well as a messaging section for peer support. To use 3ComForum, you need a CompuServe account.

To use 3ComForum:

- 1** Log on to your CompuServe account.
- 2** Type **go threecom**
- 3** Press [Return] to see the 3ComForum main menu.

Support from Your Network Supplier

If additional assistance is required, contact your network supplier. Many suppliers are authorized 3Com service partners who are qualified to provide a variety of services, including network planning, installation, hardware maintenance, application training, and support services.

When you contact your network supplier for assistance, have the following information ready:

- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

If you are unable to contact your network supplier, see the following section on how to contact 3Com.

Support from 3Com

If you are unable to receive support from your network supplier, technical support contracts are available from 3Com.

Contact your local 3Com sales office to find your authorized service provider using one of these numbers:

Regional Sales Office	Telephone Number
3Com Corporation	
P.O. Box 58145	800 NET 3Com or 1 408 764 5000
5400 Bayfront Plaza	408 764 5001 (fax)
Santa Clara, California	
95052-8145	
U.S.A.	
3Com Asia Limited	
Australia	61 2 9937 5000 (Sydney)
	61 3 9866 8022 (Melbourne)
P.R. of China	8610 68492568 (Beijing)
	86 21 63740220 Ext 6115 (Shanghai)
Hong Kong	852 2501 1111
India	91 11 644 3974
Indonesia	6221 572 2088
Japan	81 6 536 3303 (Osaka)
	81 3 3345 7251 (Tokyo)
Korea	822 2 319 4711
Malaysia	60 3 732 7910
New Zealand	64 9 366 9138
Philippines	632 892 4476
Singapore	65 538 9368
Taiwan (R.O.C.)	886 2 377 5850
Thailand	662 231 8151 4
3Com Benelux B.V.	
Belgium	32 2 725 0202
Netherlands	31 30 6029700
3Com Canada	
Calgary	403 265 3266
Montreal	514 683 3266
Ottawa	613 566 7055
Toronto	416 498 3266
Vancouver	604 434 3266
3Com European HQ	49 89 627320
3Com France	33 1 69 86 68 00

Regional Sales Office	Telephone Number
3Com GmbH	
Austria	43 1 513 4323
Czech Republic/Slovak Republic	420 2 21845 800
Germany	49 30 34 98790 (Berlin)
(Central European HQ)	49 89 627320 (Munich)
Hungary	36 1 250 83 41
Poland	48 22 6451351
Switzerland	41 31 996 14 14
3Com Ireland	353 1 820 7077
3Com Latin America	
U.S. Headquarters	408 326 2093
Northern Latin America	305 261 3266 (Miami, Florida)
Argentina	541 312 3266
Brazil	55 11 546 0869
Chile	562 633 9242
Colombia	571 629 4110
Mexico	52 5 520 7841/7847
Peru	51 1 221 5399
Venezuela	58 2 953 8122
3Com Mediterraneo	
Italy	39 2 253011 (Milan)
	39 6 5279941 (Rome)
Spain	34 1 383 17 00
3Com Middle East	971 4 349049
3Com Nordic AB	
Denmark	45 39 27 85 00
Finland	358 0 435 420 67
Norway	47 22 18 40 03
Sweden	46 8 632 56 00
3Com Russia	007 095 258 09 40
3Com Southern Africa	27 11 807 4397
3Com U.K. Ltd.	
	44 131 220 8228 (Edinburgh)
	44 161 873 7717 (Manchester)
	44 162 889 7000 (Marlow)

**Returning Products
for Repair**

Before you send a product directly to 3Com for repair, you must first obtain a Return Materials Authorization (RMA) number. Products sent to 3Com without RMA numbers will be returned to the sender unopened, at the sender's expense.

To obtain an RMA number, call or fax:

Country	Telephone Number	Fax Number
U.S.A. and Canada	1 800 876 3266, option 2	408 764 7120
Latin America	1 408 326 2927	408 764 7120
Europe, South Africa, and Middle East	44 1442 438125	44 1442 435822
Elsewhere	1 408 326 2926	1 408 764 7120

04/22/97

GLOSSARY

10BASE-T	The IEEE 802.3 specification for Ethernet over Twisted Pair (TP) cabling.
active segment switch	In a stack with multiple PS Hub 50 units, only one segment switch can be active (called the active segment switch), the other segment switches are disabled. See <i>segment switch</i> .
ageing	The process of removing unused learnt (non-permanent) addresses from the switch database.
bandwidth	Information capacity, measured in bits per second (bps), that a channel can transmit. The bandwidth of Ethernet is 10Mbps.
baud rate	The switching speed of a line. Also known as line speed.
BOOTP	The BOOTP protocol allows you to automatically map an IP address to a given MAC address each time a device is started. In addition, the protocol can assign the subnet mask and default gateway to a device.
bridge mode	One of the segment switch's operating modes which conforms to the IEEE 802.1d specification. Refers to the process of forwarding all packets with unknown addresses to all of the segments (except the segment that the packet was received from).
broadcast	A message sent to all destination devices on the network.
broadcast storm	Multiple simultaneous broadcasts that typically absorb available bandwidth and can cause network failure.
cascaded segments	The segments that run up and down the stack by the cascade cables, to which the PS Hubs' internal segments connect (or are isolated from).
console port	The port on the PS Hub accepting a terminal or modem connector. It changes the parallel arrangement of data within computers to the serial form used on data transmission links. This port is most often used for dedicated local management.

- Ethernet** A LAN specification developed jointly by Xerox, Intel and Digital Equipment Corporation (DEC). Ethernet networks operate at 10Mbps using CSMA/CD to run over cabling.
- HTTP** HyperText Transfer Protocol. The client/server protocol used to connect servers on the World Wide Web.
- Internet** The name given to a public network which spans the world and consists of thousands of pieces of network equipment. If you connect to the Internet, you can communicate with equipment and users across the world. The Internet uses a set of protocols called TCP/IP. The World Wide Web is part of the Internet.
- Intranet** The name given to a large private network. Many businesses have Intranets so their employees can exchange information between offices in many countries. Employees are often given access to the Internet but the Intranet is protected from external access by 'firewalls' (security restrictions imposed on incoming traffic).
- IP address** Internet protocol address. A unique identifier for a device attached to a network using TCP/IP. The address is written as four octets separated with full-stops (periods), and is made up of a network section, an optional subnet section and a host section.
- IPX** Internetwork Packet Exchange. A protocol allowing communication in a NetWare network.
- LAN** Local Area Network. A network of connected computing resources (for example workstations, printers, servers) covering a relatively small geographic area (usually not larger than a floor or building). Characterized by high data rates and low error rates.
- learnt address** An address in the switch database that has been learnt (stored) by the segment switch. Unused learnt addresses are removed from the switch database by the ageing process.
- line speed** See *baud rate*.
- load balancing** The process of configuring the segments in a stack of hubs so that utilization is balanced across all the segments in the stack. This produces more efficient segments, by distributing traffic evenly.

- LOI mode** Local Office Interconnect. One of the segment switch's operating modes. Refers to the process of forwarding all packets with unknown addresses to the 100Mbps port (the 100Mbps transceiver module).
- main port** The port in a resilient link that carries data traffic in normal operating conditions.
- MIB** Management Information Base. Stores a device's management characteristics and parameters. MIBs are used by Simple Network Management Protocol (SNMP) to contain attributes of their managed systems. The PS Hub contains its own internal MIB.
- multicast** Single packets copied to a specific subset of network addresses. These addresses are specified in the destination-address field of the packet.
- permanent address** An address in the switch database that has been made permanent. Permanent addresses are not removed from the switch database by the ageing process.
- protocol** A set of rules for communication between devices on a network. The rules dictate format, timing, sequencing and error control.
- resilience** Tolerance. For example, the PS Hub's cascaded cables make a stack of PS Hubs resilient because you can power off a unit without it affecting the other units in the stack. You can also build resilience into your network by having extra equipment and cabling that carries your traffic if other equipment and cabling fails. See *resilient link*.
- resilient link** A pair of ports that can be configured so that one will take over data transmission should the other fail. See also *main port* and *standby port*.
- RJ45** Standard 8-wire connector for IEEE 802.3 10BASE-T networks.
- RMON** Remote Monitoring. Subset of SNMP MIB II which allows monitoring and management capabilities by addressing up to ten different groups of information.
- RPS** Redundant Power System. Part of the SuperStack II product range, provides a backup source of power when connected to the PS Hub.

- segment switch** The internal switch in a PS Hub 50. It connects the four cascaded segments so that devices connected to the cascaded segments can communicate through the segment switch. The segment switch works by learning addresses and storing them in a switch database, which it can refer to and selectively forward on information. The PS Hub 50 unit's segment switch has two operating modes; LOI and bridge.
- segments** The separate networks within a PS Hub to which the ports can be switched. The segments can be connected to or isolate from the cascade segments (which extend the segments across other PS Hubs).
- SLIP** Serial Line Internet Protocol. A protocol which allows IP to run over a serial line connection.
- SmartAgent®** Intelligent management agents in devices and logical connectivity systems that reduce the computational load on the network management station and reduce management-oriented traffic on the network.
- SNMP** Simple Network Management Protocol. A protocol originally designed to be used in managing TCP/IP internets. SNMP is presently implemented on a wide range of computers and networking equipment and may be used to manage many aspects of network and end-station operation.
- stack** A group of hubs which are connected together in such a way that they function as a single logical repeater.
- standby port** The port in a resilient link that takes over data transmission if the main port in the link fails.
- switch** See *segment switch*.
- switch database** The database that the PS Hub 50 unit's segment switch uses to store addresses in so that it can refer to it when forwarding network traffic. The switch database can contain learnt addresses and permanent addresses.
- TCP/IP** A layered set of communications protocols providing Telnet terminal emulation, FTP file transfer, and other services for communication among a wide range of computer equipment.

- Telnet** A TCP/IP application protocol that provides a virtual terminal service, letting the user log in to another computer system and access a host as if the user were connected directly to the host.
- TFTP** Trivial File Transfer Protocol. Allows you to transfer files (for example software upgrades) from a remote device.
- Transcend®** 3Com's management system used to manage all of 3Com's networking solutions.
- UDP** User Datagram Protocol. An internet standard protocol that allows an application program on one device to send a datagram to an application program on another device.
- URL** Uniform Resource Locator. A URL is a unique address of a Web page. Using just the URL, your Web browser can find Web pages on the World Wide Web.
- VT100** A type of terminal which uses ASCII characters. VT100 screens have a text-based appearance.
- web** *See World Wide Web.*
- World Wide Web** The World Wide Web (often known as the 'Web') is a global network which is part of the Internet. It is made up of thousands of different 'Web pages' and 'Web sites' (collections of Web pages) which are inter-linked. These Web pages are electronic pages of text and graphics which can be viewed using a Web browser. Many businesses, non-profit organizations and individuals have created Web pages and sites which cover a wide range of information. All Web pages and sites have a unique URL so that they can be located.



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9/1/96

EMC STATEMENTS

FCC STATEMENT

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference to radio communications, in which case the user will be required to correct the interference at their own expense.

CSA STATEMENT

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

VCCI STATEMENT

この装置は、第二種情報処理装置(住宅地域又はその隣接した地域において使用されるべき情報処理装置)で住宅地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会(VCCI)基準に適合しております。

しかし、本装置をラジオ、テレビジョン受信機に近接してご使用になると、受信障害の原因となることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

INFORMATION TO THE USER

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the equipment with respect to the receiver.
- Move the equipment away from the receiver.
- Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

How to Identify and Resolve Radio-TV Interference Problems

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

In order to meet FCC emissions limits, this equipment must be used only with cables which comply with IEEE 802.3.

