

Prestige 645M

ADSL Bridge

User's Guide

Version 2.50

July 2001

ZyXEL

TOTAL INTERNET ACCESS SOLUTION

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- ◆ Loopback Test information.
- ◆ Warranty Information.
- ◆ Date you received your Product.
- ◆ Brief description of the problem and the steps you took to solve it.

METHOD	E-MAIL SUPPORT/ SALES	TELEPHONE/FAX	WEB SITE/ FTP SITE	REGULAR MAIL
LOCATION				
WORLDWIDE	support@zyxel.com.tw support@europe.zyxel.com sales@zyxel.com.tw	+886-3-578-3942 +886-3-578-2439	www.zyxel.com www.europe.zyxel.com ftp.europe.zyxel.com	ZyXEL Communications Corp., 6 Innovation Road II, Science- Based Industrial Park, HsinChu, Taiwan 300, R.O.C.
NORTH AMERICA	support@zyxel.com sales@zyxel.com	+1-714-632-0882 800-255-4101 +1-714-632-0858	www.zyxel.com ftp.zyxel.com	ZyXEL Communications Inc., 1650 Miraloma Avenue, Placentia, CA 92870, U.S.A.
SCANDINAVIA	support@zyxel.dk sales@zyxel.dk	+45-3955-0700 +45-3955-0707	www.zyxel.dk ftp.zyxel.dk	ZyXEL Communications A/S, Columbusvej 5, 2860 Soeborg, Denmark.
AUSTRIA	support@zyxel.at sales@zyxel.at	+43-1-4948677-0 +43-1-4948678	www.zyxel.at ftp.zyxel.at	ZyXEL Communications Services GmbH, Thaliastrasse 125a/2/2/4 A-1160 Vienna, Austria
GERMANY	support@zyxel.de sales@zyxel.de	+49-2405-6909-0 +49-2405-6909-99	www.zyxel.de	ZyXEL Deutschland GmbH, Adenauerstr. 20/A4 D-52146 Wuerselen, Germany
MALAYSIA	support@zyxel.com.my sales@zyxel.com.my	+603-795-44-688 +603-795-34-407	www.zyxel.com.my	Lot B2-06, PJ Industrial Park, Section 13, Jalan Kemajuan, 46200 Petaling Jaya Selangor Darul Ehasn, Malaysia

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Preface

About Your ADSL Internet Access Bridge

Congratulations on your purchase of the Prestige 645M ADSL Internet Access Bridge.

The Prestige 645M is an ADSL bridge used for Internet/LAN access via an ADSL line. We will refer to the Prestige 645M bridge as the P645M or simply the Prestige from now on.

The P645M can run upstream maximum transmission rates of 800 Kbps and downstream maximum transmission rates of 8Mbps. The actual rate depends on the type of ADSL service subscribed to, the copper category of your telephone wire and the distance from the central office. See the following sections for more background information on DSL and ADSL.

The P645M's 10/100M LAN interface enables fast data transfer of 10Mbps or 100Mbps in either half-duplex or full-duplex mode depending on your Ethernet network.

Your Prestige is easy to install and to configure. All functions of the Prestige are software configurable via the SMT (System Management Terminal) interface.

About This User's Guide

This user's guide covers all aspects of the Prestige 645M's operations and shows you how to get the best out of the multiple advanced features of your ADSL Internet Access Bridge using the SMT. It is designed to guide you through the correct configuration of your Prestige 645M for various applications.

Syntax Conventions

- “Enter” means for you to type one or more characters and press the carriage return. “Select” or “Choose” means for you to select one from the predefined choices.
- Full SMT menu titles and labels are in **Bold Times** font. The choices of a menu item are in **Bold Arial** font. A single keystroke is in Arial font and enclosed in square brackets, for instance, [ENTER] means the Enter, or carriage return, key; [ESC] means the Escape key.
- For brevity's sake, we will use “e.g.” as a shorthand for “for instance”, and “i.e.” as a shorthand for “that is” or “in other words” throughout this manual

What Is ADSL?

About ADSL

Asymmetric Digital Subscriber Line (ADSL) technology provides high-speed data access across regular phone lines (copper wires) by making use of previously unused frequency bandwidth above the voice band. By placing the ADSL signal above the frequency of voice signals, ADSL service is able to coexist on the same line with your telephone service. ADSL is asymmetric in the sense that it provides a higher downstream data rate transfer (up to 8Mbps), than in the upstream transfer (up to 832 Kbps). Asymmetric operation is ideal for typical home and small office use where files and information are downloaded more frequently than uploaded.

Advantages of ADSL

1. ADSL provides a private (unlike cable telephone and modem services where the line is shared), dedicated and secure channel of communications between you and your service provider.
2. Because your line is dedicated (not shared), transmission speeds are not affected by other users. With cable modems, transmission speeds drop significantly as more users go on-line because the line is shared.
3. ADSL is "always on" (connected). This means that there is no time wasted dialing up the service several times a day and waiting to be connected; ADSL is on standby, ready for use whenever you need it.

Chapter 1

Getting to Know Your Prestige

This chapter describes the key features and applications of your ADSL Internet Access Bridge.

1.1 Prestige 645M ADSL Internet Access Bridge

Your Prestige integrates a high-speed 10/100Mbps auto-negotiating LAN interface and a high-speed ADSL port into a single package. The Prestige is ideal for high-speed Internet browsing and making LAN-to-LAN connections to remote networks.

1.2 Features of the Prestige 645M

Your Prestige is packed with a number of features that give it the flexibility to provide a complete Internet access solution for almost any user.

PPPoE

The P645M supports the PPP over Ethernet ADSL standard. Activating PPPoE automatically enables the DHCP server.

Ease of Installation

Your Prestige is designed for quick, intuitive and easy installation. Physically, its compact size and lightness make it easy to position anywhere in your busy office.

High Speed Internet Access

The P645M ADSL bridge can support downstream transmission rates of up to 8Mbps and upstream transmission rates of 800 Kbps.

10/100Mbps Fast Ethernet LAN Interface

The P645M's 10/100M LAN interface enables fast data transfers of 10Mbps or 100Mbps in either half-duplex or full-duplex mode depending on your Ethernet network.

Protocols Supported

- ◆ TCP/IP (Transmission Control Protocol/Internet Protocol) network layer protocol.
- ◆ PPP (Point-to-Point Protocol) link layer protocol.
- ◆ DHCP Server

Networking Compatibility

Your Prestige is compatible with the major ADSL DSLAM (Digital Subscriber Line Access Multiplexer) providers, making configuration as simple as possible for you.

Multiplexing

The Prestige 645M supports VC-based and LLC-based multiplexing.

Encapsulation

The Prestige 645M supports PPP (RFC 2364 - PPP over ATM Adaptation Layer 5) and RFC 1483 encapsulation over ATM as well as PPP over Ethernet (RFC 2516).

Full Network Management

- ◆ SMT (System Management Terminal) through a telnet connection.

PAP and CHAP Security

The Prestige supports PAP (Password Authentication Protocol) and CHAP (Challenge Handshake Authentication Protocol). CHAP is more secure since the password is scrambled prior to transmission. However, PAP is readily available on more platforms.

Filters

The Prestige's packet filtering functions allow added network security and management.

Reset Button

The Prestige comes with a reset button built into the rear panel. Use this button to restore the factory default password to 1234, IP address to 192.168.1.1, subnet mask to 255.255.255.0 and DHCP server inactive.

1.3 Applications for the Prestige 645M

1.3.1 Internet Access

The Prestige is the ideal high-speed Internet access solution. Your Prestige supports the TCP/IP protocol, which the Internet uses exclusively. It is compatible with all major ADSL DSLAM providers. A DSLAM is a rack of ADSL line cards with data multiplexed into a backbone network interface/connection (e.g., T1, OC3, DS3, ATM or Frame Relay). Think of it as the equivalent of a modem rack for ADSL. A typical Internet Access application is shown below.

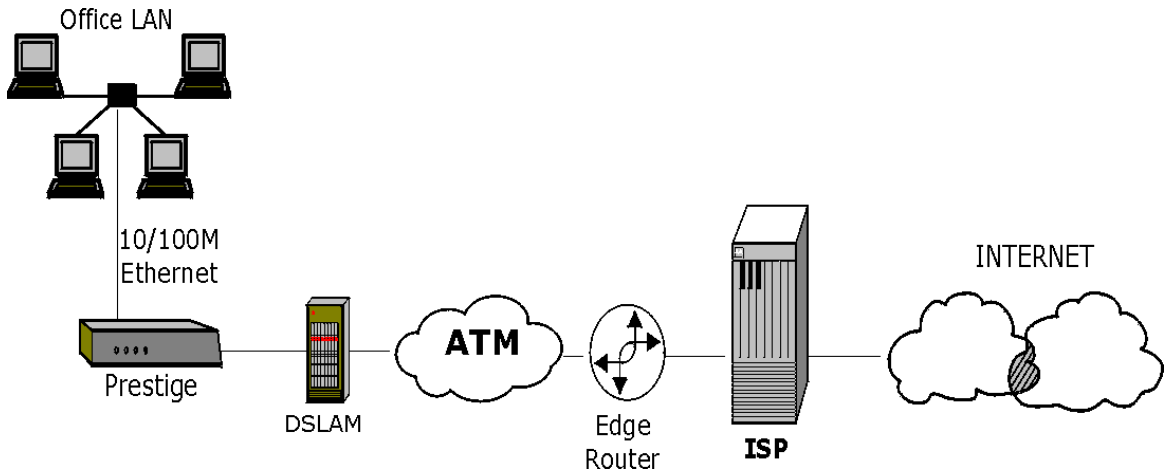


Figure 1-1 Internet Access Application

Chapter 2

Hardware Installation & Initial Setup

This chapter describes the physical features and cable connections of the Prestige and how to access and use the SMT interface for configuration.

2.1 Front Panel LEDs of the P645M

The LED indicators on the front panel indicate the operational status of the Prestige 645M. The table below the diagram describes the LED functions:

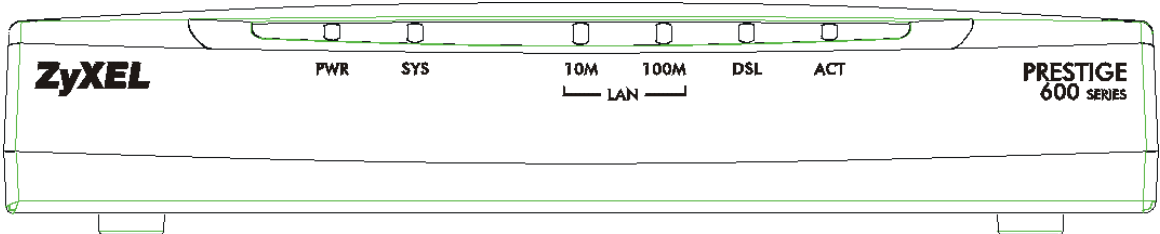


Figure 2-1 Prestige 645M Front Panel

Table 2-1 Front Panel LED Description

LED NAME	DESCRIPTION
PWR	The PWR (power) LED is on when power is applied to the Prestige.
SYS	A steady on SYS (system) LED indicates the Prestige is on and functioning properly while an off SYS LED indicates the system is not ready or has a malfunction. The SYS LED blinks when the system is rebooting.
LAN 10M	A steady light indicates a 10Mb Ethernet connection. The LED blinks when data is being sent/received.
LAN 100M	A steady light indicates a 100Mb Ethernet connection. The LED blinks when data is being sent/received.
DSL	The ADSL LED is on when the Prestige is connected successfully to a DSLAM. The LED blinks during ADSL line initialization. The LED is off when the link is down.
ACT	The ACT LED blinks during data transfer via the ADSL line. The LED is off when no data is being transferred on the ADSL line.

2.2 Prestige 645M Rear Panel and Connections

The following figure shows the rear panel connectors of your Prestige.

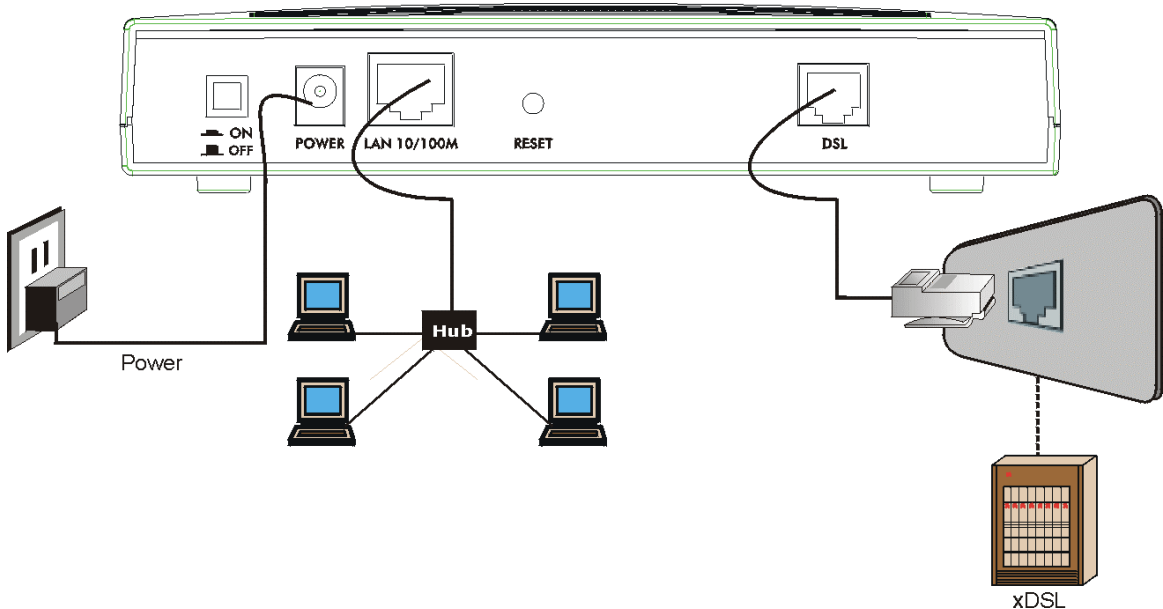


Figure 2-2 Prestige 645M Rear Panel Connections

2.2.1 Using the Reset Button

The reset button restores the default IP address of 192.168.1.1 and subnet mask of 255.255.255.0, as well as the default SMT password of **1234**. The DHCP server will also be reset to server inactive.

In order to prevent accidental use of the reset button, it only works as follows. To use the reset button, turn off the Prestige and insert a small pointed object (like a pen) into the reset hole to push the reset button. Next, turn on your Prestige and keep the reset button pressed for one minute.

2.2.2 Making the Connections

Step 1. Connecting the ADSL line

Connect the RJ-11 DSL port on the Prestige to a POTS splitter using the included ADSL cable (telephone wire). Connect the micro filter(s) (optional— see

Figure 2-4 Connecting the Microfilter between the wall jack and your telephone(s). The micro filters act as low pass filters (voice transmission takes place in the 0 to 4KHz bandwidth).

Step 2. Connecting a computer to the Prestige 10/100M LAN port

Be careful not to plug a RJ-11 connector into the RJ-45 port.

Ethernet 10Base-T/100Base-T networks use Shielded Twisted Pair (STP) cable with RJ-45 connectors that look like a bigger telephone plug with 8 pins. Use a crossover cable (red tag) to connect your Prestige 645M to a computer directly. Use a straight through Ethernet cable (white tag) to connect to an external hub and then connect one end of a straight through Ethernet cable (white tag) from the hub to the Network Interface Card (NIC) on the computer.

Step 3. Connecting the power adapter to your Prestige

Make sure that you use a P/N DV-121AACS (rated 12VAC 1.0A) or equivalent power supply.

Connect the power adapter to the power port on the rear panel of your Prestige.

2.3 Additional Installation Requirements

In addition to the contents of your package your computer must have a properly installed and enabled Ethernet 10Base-T/100Base-T NIC.

2.4 Connecting the POTS Splitter

You may purchase an optional POTS splitter for use with the Full Rate (G.dmt and ANSI T1.413) standards. One major difference between ADSL and dial-up modems is the need for a telephone splitter. This device keeps the telephone and ADSL signals separated, giving the capability to provide simultaneous Internet access and telephone service on the same line. Splitters also eliminate the destructive interference conditions caused by telephone sets. The telephone splitter has to be installed on the line at the point of entry to the residence.

Noise generated from a telephone in the same frequency range as the ADSL signal can be disruptive to the ADSL signal. In addition the impedance of a telephone when off-hook may be so low that it essentially shunts the strength of the ADSL signal. When a POTS splitter is installed at the entry point where the line comes into the home, it will filter the telephone signals before combining the ADSL and telephone signals transmitted and received. The issues of noise and impedance are eliminated with a single POTS splitter installation.

A telephone splitter can be installed as shown in the following figure.

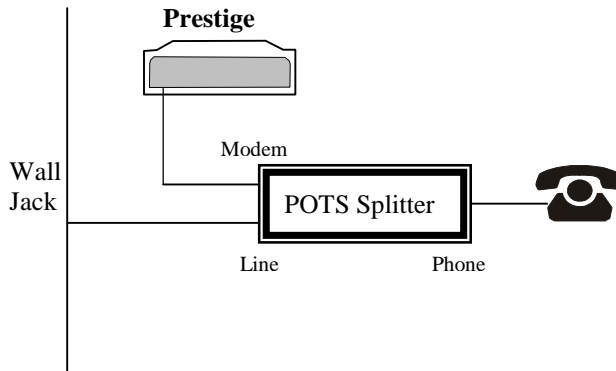


Figure 2-3 Connecting a POTS Splitter

- Step 4.** Connect the side labeled “Phone” to your telephone.
- Step 5.** Connect the side labeled “Modem” to your Prestige.
- Step 6.** Connect the side labeled “Line” to the telephone wall jack.

2.5 Telephone Microfilters

You may also opt to purchase telephone microfilters. Telephone voice transmissions take place in the lower frequency range, 0 - 4KHz, while ADSL transmissions take place in the higher bandwidth range, above 4KHz. ZyXEL provides a microfilter that acts as a low-pass filter for your telephone to ensure that ADSL transmissions do not interfere with your telephone voice transmissions.

- Step 1.** Connect a phone cable from the wall jack to the single jack end of the Y- Connector.
- Step 2.** Connect a cable from the double jack end of the Y-Connector to the “wall side” of the microfilter.
- Step 3.** Connect another cable from the double jack end of the Y-Connector to the Prestige.
- Step 4.** Connect the “phone side” of the microfilter to your telephone as shown in the following figure.

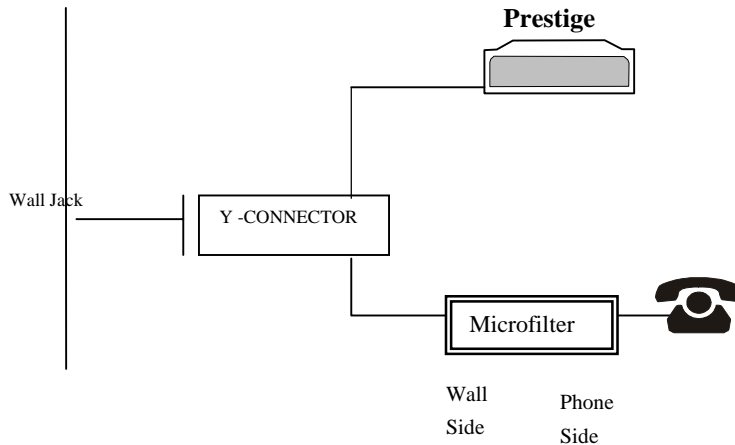


Figure 2-4 Connecting the Microfilter

2.6 Turning On Your Prestige

At this point, you should have connected the DSL port, the Ethernet port and the power port to the appropriate devices or lines. You can now turn on the Prestige by pushing the power button on. Refer to the Read Me First for instructions on setting up your computer. The following procedure details how to telnet into your Prestige.

Step 1. In Windows, click **Start** (usually in the bottom left corner), **Run** and then type “telnet 192.168.1.1” (the default IP address) and click **OK**.

Step 2. Enter the password

The login screen appears prompting you to enter the password, as shown below.

For your first login, enter the default password **1234**. As you type the password, the screen displays an (X) for each character you type.

Please note that if there is no activity for longer than 5 minutes after you log in, your Prestige will automatically log you out. You will have to telnet into the Prestige again.



Figure 2-5 Login Screen

2.7 Navigating the SMT Interface

The SMT (System Management Terminal) is the interface that you use to configure your Prestige.

Several operations that you should be familiar with before you attempt to modify the configuration are listed in the following table.

Table 2-2 Main Menu Commands

OPERATION	[PRESS]/<READ>	DESCRIPTION
Move down to another menu	[ENTER]	To move forward to a sub-menu, type in the number of the desired sub-menu and press [ENTER].
Move up to a previous menu	[ESC]	Press the [ESC] key to move back to the previous menu.
Move to a "hidden" menu	Press the [SPACE BAR] to change No to Yes then press [ENTER].	Fields beginning with "Edit" lead to hidden menus and have a default setting of No . Press the [SPACE BAR] to change No to Yes , then press [ENTER] to go to a "hidden" menu.
Move the cursor	[ENTER] or [Up]/[Down] arrow keys	Within a menu, press [ENTER] to move to the next field. You can also use the [Up]/[Down] arrow keys to move to the previous and the next field, respectively.
Enter information	Fill in, or press the [SPACE BAR] to select	You need to fill in two types of fields. The first requires you to type in the appropriate information. The second allows you to cycle through the available choices by pressing the [SPACE BAR].
Required fields	<? >	All fields with the symbol <?> must be filled in order be able to save the new configuration.
N/A fields	<N/A>	Some of the fields in the SMT will show a <N/A>. This symbol refers to an option that is Not Applicable.
Save your configuration	[ENTER]	Save your configuration by pressing [ENTER] at the message [Press ENTER to confirm or ESC to cancel]. Saving the data on the screen will take you, in most cases to the previous menu.
Exit the SMT	Type 99, then press [ENTER].	Type 99 at the main menu prompt and press [ENTER] to exit the SMT interface.

2.7.1 SMT Menu Overview

The following figure shows the titles and layout of the various SMT menu screens of your Prestige.

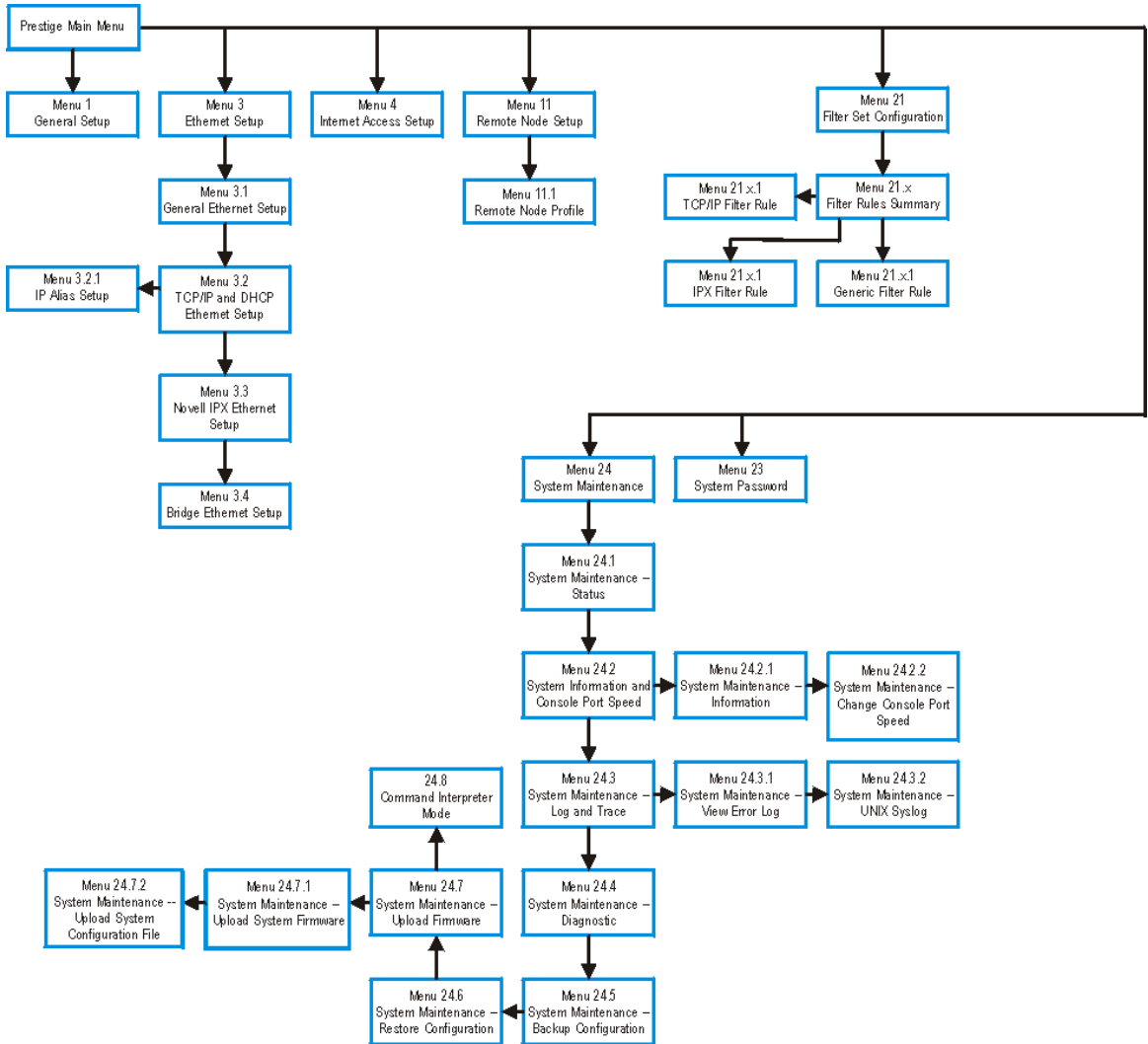


Figure 2-6 SMT Menu Overview

After you enter the password, the SMT displays the Main Menu, as shown next.

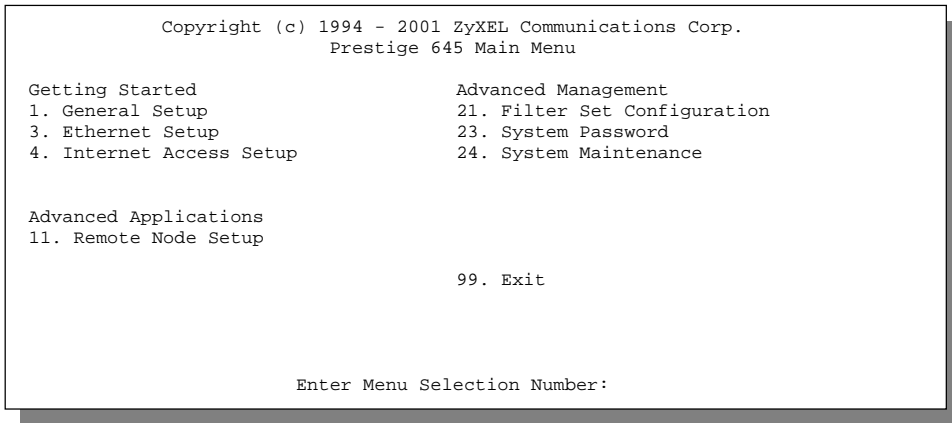


Figure 2-7 SMT Main Menu

2.7.2 System Management Terminal Interface Summary

Table 2-3 Main Menu Summary

#	MENU TITLE	DESCRIPTION
1	General Setup	Use this menu to set up general information.
3	Ethernet Setup	Use this menu to set up your LAN connection.
4	Internet Access Setup	This menu provides convenient set up for an Internet connection.
11	Remote Node Setup	Use this menu to configure the Remote Node(s) for LAN-to-LAN connection(s), including the Internet.
21	Filter Set Configuration	Use this menu to set up filters to provide security, etc.
23	System Password	Use this menu to change your password.
24	System Maintenance	This menu provides diagnostic, file transfer and other tools for maintaining your Prestige.
99	Exit	Use this to exit the SMT and return to a blank screen.

2.8 Changing the System Password

The first thing you should do is to change the default system password by following the steps below.

Step 1. Enter 23 in the main menu to open **Menu 23 - System Password** as shown next.

When the **Menu 23 System Password** appears, type your system password (1234 is the default when shipped) and press [ENTER].

```
Menu 23 - System Password

Old Password= ****
New Password= ****
Retype to confirm= ****

Enter here to CONFIRM or ESC to CANCEL:
```

Figure 2-8 Menu 23.1 - System Password (with all fields filled)

Step 2. Enter your new system password. You can use up to 30 alphanumeric characters. Do not use spaces, but dashes “-“ and underscores “_“ are accepted. Then press [ENTER].

Step 3. Re-type your new system password for confirmation and press [ENTER].

Note that as you type a password, the screen displays a (*) for each character you type.

If you forget your password, use the reset button to restore the default password of 1234. This will allow you to enter the SMT. Then use the above instructions to set a new password.

2.9 General Setup

Menu 1 - General Setup contains administrative and system-related information.

To enter menu 1 and fill in the required information, follow these steps:

Step 1. Enter 1 in the main menu to open **Menu 1 – General Setup**.

Step 2. The **Menu 1 - General Setup** screen appears, as shown below. Fill in the required fields marked [?] and turn on the individual protocols for your applications, as explained in the following table.

```
Menu 1 - General Setup

System Name= HAL
Location= branch
Contact Person's Name= JohnDoe

PPPoE Bridge= No

Press ENTER to Confirm or ESC to Cancel:
```

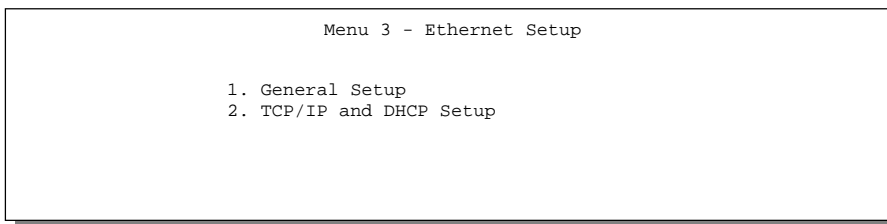
Figure 2-9 Menu 1 – General Setup

Table 2-4 General Setup Menu Fields

FIELD	DESCRIPTION	EXAMPLE
System Name	Choose a descriptive name for identification purposes. This name can be up to 30 alphanumeric characters long. Spaces are not allowed, but dashes "-" and underscores "_" are accepted.	HAL
Location (optional)	Enter the geographic location (up to 31 characters) of your Prestige.	branch
Contact Person's Name (optional)	Enter the name (up to 30 characters) of the person in charge of this Prestige.	JohnDoe
PPPoE Bridge	Turn on/off to enable/disable PPPoE functions. When Yes is selected, the DHCP field in menu 3.2 changes from Server Inact. to Server	No

2.10 Ethernet Setup

This section describes how to configure the Ethernet using **Menu 3 – Ethernet Setup**. From the main menu, enter 3 to open menu 3.

**Figure 2-10 Menu 3 - Ethernet Setup**

2.10.1 General Ethernet Setup

This menu allows you to specify filter set(s) that you wish to apply to the Ethernet traffic. You seldom need to filter Ethernet traffic; however, the filter sets may be useful to block certain packets, reduce traffic and prevent security breaches.

```
Menu 3.1 - General Ethernet Setup

Input Filter Sets:
  device filters=
Output Filter Sets:
  device filters=

Press ENTER to Confirm or ESC to Cancel:
```

Figure 2-11 Menu 3.1 - General Ethernet Setup

If you need to define filters, please read the chapter on configuring filters first, then return to this menu to define the filter sets.

- The factory configured filters in SMT menu 21.3 are designed to block incoming telnet from the WAN (DSL) port. Do not configure SMT menu 3.1 filter rules to block all telnet from the Ethernet. This would block the telnet connection from your computer to the Prestige.

Chapter 3

Internet Access

This chapter shows you how to configure the LAN as well as the WAN of your Prestige for Internet access.

3.1 Factory Ethernet Defaults

The Ethernet parameters of the Prestige are preset in the factory with the following values:

1. IP address of 192.168.1.1 with subnet mask of 255.255.255.0 (24 bits).
2. DHCP server inactive.

These parameters should work for the majority of installations. If the parameters are satisfactory, you can skip to 3.3 TCP/IP Ethernet Setup and DHCP to enter the DNS server address(es) if your ISP gives you explicit DNS server address(es). If you wish to use settings different from the factory defaults or to learn more about TCP/IP, please read on.

3.2 TCP/IP Parameters

3.2.1 IP Address and Subnet Mask

Similar to the way houses on a street share a common street name, the machines on a LAN also share one common network number.

Where you obtain your network number depends on your particular situation. If the ISP or your network administrator assigns you a block of registered IP addresses, follow their instructions in selecting the IP addresses and the subnet mask.

If the ISP did not explicitly give you an IP network number, then most likely you have a single user account and the ISP will assign you a dynamic IP address when the connection is established. If this is the case, it is recommended that you select a network number from 192.168.0.0 to 192.168.255.0 (ignoring the trailing zero). The Internet Assigned Number Authority (IANA) has reserved this block of addresses specifically for private use; please do *not* use any other number unless you are told otherwise. Let's say you select 192.168.1.0 as the network number; which covers 254 individual addresses, from 192.168.1.1 to 192.168.1.254 (zero and 255 are reserved). In other words, the first 3 numbers specify the network number while the last number identifies an individual computer on that network.

The subnet mask specifies the network number portion of an IP address. Your Prestige will compute the subnet mask automatically based on the IP address that you entered. You don't need to change the subnet mask computed by the Prestige unless you are instructed to.

3.2.2 Private IP Addresses

Every machine on the Internet must have a unique address. If your networks are isolated from the Internet, e.g., only between your two branch offices, you can assign any IP addresses to the hosts without problems. However, the Internet Assigned Numbers Authority (IANA) has reserved the following three blocks of IP addresses specifically for private networks:

10.0.0.0 - 10.255.255.255
172.16.0.0 - 172.31.255.255
192.168.0.0 - 192.168.255.255

You can obtain your IP address from the IANA, from an ISP, or have it assigned by a private network. If you belong to a small organization and your Internet access is through an ISP, the ISP can provide you with the Internet addresses for your local networks. On the other hand, if you are part of a much larger organization, you should consult your network administrator for the appropriate IP addresses.

Regardless of your particular situation, do not create an arbitrary IP address; always follow the guidelines above. For more information on address assignment, please refer to RFC 1597, *Address Allocation for Private Internets* and RFC 1466, *Guidelines for Management of IP Address Space*.

3.2.3 DHCP Configuration

DHCP (Dynamic Host Configuration Protocol) allows the individual clients (computers) to obtain the TCP/IP configuration at start-up from a centralized DHCP server. The Prestige has built-in DHCP server capability, inactive by default, which means it can assign IP addresses, an IP default gateway and DNS servers to Windows 98, Windows 2000 and other systems that support the DHCP client.

IP Pool Setup

The Prestige is pre-configured with a pool of 5 IP addresses ranging from 192.168.1.33 to 192.168.1.37 for the client machines. This leaves 31 IP addresses, 192.168.1.2 to 192.168.1.32 (excluding the Prestige itself which has a default IP of 192.168.1.1) for other server machines, e.g., server for mail, FTP, telnet, web, etc., that you may have.

DNS Server Address

DNS (Domain Name System) is for mapping a domain name to its corresponding IP address and vice versa, e.g., the IP address of *www.zyxel.com* is 204.217.0.2. The DNS server is extremely important because without it, you must know the IP address of a machine before you can access it. The DNS server addresses that you enter in the DHCP setup are passed to the client machines along with the assigned IP address and subnet mask.

There are two ways that an ISP disseminates the DNS server addresses. The first is for an ISP to tell a customer the DNS server addresses, usually in the form of an information sheet, when s/he signs up. If your ISP gives you the DNS server addresses, enter them in the **DNS Server** fields in **DHCP Setup**, otherwise, leave them blank.

Some ISP's choose to pass the DNS servers using the DNS server extensions of PPP IPCP (IP Control Protocol) after the connection is up. If your ISP did not give you explicit DNS servers, chances are the DNS servers are conveyed through IPCP negotiation. The Prestige supports the IPCP DNS server extensions through the DNS proxy feature.

If the **Primary** and **Secondary DNS Server** fields in **DHCP Setup** are not specified, i.e., left as 0.0.0.0, the Prestige tells the DHCP clients that it itself is the DNS server. When a computer sends a DNS query to the Prestige, the Prestige forwards the query to the real DNS server learned through IPCP and relays the response back to the computer.

Please note that DNS proxy works only when the ISP uses the IPCP DNS server extensions. It does not mean you can leave the DNS servers out of the DHCP setup under all circumstances. If your ISP gives you explicit DNS servers, make sure that you enter their IP addresses in the **DHCP Setup** menu. This way, the Prestige can pass the DNS servers to the computers and the computers can query the DNS server directly without the Prestige's intervention.

3.3 TCP/IP Ethernet Setup and DHCP

You will now use menu 3.2 to configure your Prestige for TCP/IP.

To edit menu 3.2, enter 3 in the main menu to open **Menu 3 - Ethernet Setup**. In menu 3, select 2 and press [ENTER]. The screen now displays **Menu 3.2 - TCP/IP and DHCP Ethernet Setup**, as shown next

Menu 3.2 - TCP/IP and DHCP Ethernet Setup

```

DHCP Setup:
  DHCP= Server
  Client IP Pool Starting Address= 192.168.1.33
  Size of Client IP Pool= 5
  Primary DNS Server= 0.0.0.0
  Secondary DNS Server= 0.0.0.0

TCP/IP Setup:
  IP Address= 192.68.1.1
  IP Subnet Mask= 255.255.255.0

Press ENTER to Confirm or ESC to Cancel:
    
```

Callouts from the image:

- First address in the IP Pool (points to 192.168.1.33)
- Size of the IP Pool (points to 5)
- If set to 0.0.0.0 the Prestige acts as a proxy DNS Server (points to the DNS server fields)

Figure 3-1 Menu 3.2 – TCP/IP and DHCP Ethernet Setup

Follow the instructions in the following table on how to configure the DHCP fields.

Table 3-1 DHCP Ethernet Setup Menu Fields

FIELD	DESCRIPTION	EXAMPLE
DHCP Setup		
DHCP=	If it is set to Server , your Prestige can assign IP addresses, an IP default gateway and DNS servers to Windows 98, Windows 2000 and other systems that support the DHCP client. If set to None , the DHCP server will be disabled.	Server (default)
Client IP Pool Starting Address	This field specifies the first of the contiguous addresses in the IP address pool.	192.168.1.33
Size of Client IP Pool	This field specifies the size, or count, of the IP address pool.	5
Primary DNS Server	Enter the IP addresses of the DNS servers. The DNS servers are passed to the DHCP clients along with the IP address and the subnet mask.	
Secondary DNS Server		

Follow the instructions in the following table to configure TCP/IP parameters for the Ethernet port.

Table 3-2 TCP/IP Ethernet Setup Menu Fields

FIELD	DESCRIPTION	EXAMPLE
TCP/IP Setup		
IP Address	Enter the (LAN) IP address of your Prestige in dotted decimal notation	192.168.1.1 (default)

FIELD	DESCRIPTION	EXAMPLE
IP Subnet Mask	Your Prestige will automatically calculate the subnet mask based on the IP address that you assign. Unless you are implementing subnetting, use the subnet mask computed by the Prestige	255.255.255.0
When you have completed this menu, press [ENTER] at the prompt [Press ENTER to Confirm...] to save your configuration, or press [ESC] at any time to cancel.		

3.4 VPI & VCI

Be sure to use the correct Virtual Path Identifier (VPI) and Virtual Channel Identifier (VCI) numbers supplied by your telephone company. The valid range for the VPI is 1 to 255 and for the VCI is 32 to 65535 (1 to 32 is reserved for local management of ATM traffic). Please see the appendix on VPI and VCI for more information.

3.5 Multiplexing

There are two conventions to identify what protocols the virtual circuit (VC) is carrying. Be sure to use the multiplexing method required by your ISP.

3.5.1 VC-based multiplexing

In this case, by prior mutual agreement, each protocol is assigned to a specific virtual circuit, e.g., VC1 carries IP, VC2 carries IPX, etc. VC-based multiplexing may be dominant in environments where dynamic creation of large numbers of ATM VCs is fast and economical.

3.5.2 LLC-based multiplexing

In this case one VC carries multiple protocols with protocol identifying information being contained in each packet header. Despite the extra bandwidth and processing overhead, this method may be advantageous if it is not practical to have a separate VC for each carried protocol, e.g., if charging heavily depends on the number of simultaneous VCs.

3.6 Encapsulation

Be sure to use the encapsulation method required by your ISP. The Prestige supports the following methods.

3.6.1 PPP

Please refer to RFC 2364 for more information on PPP over ATM Adaptation Layer 5 (AAL5). Refer to RFC 1661 for more information on PPP.

3.6.2 RFC 1483

RFC 1483 describes two methods for Multiprotocol Encapsulation over ATM Adaptation Layer 5 (AAL5). The first method allows multiplexing of multiple protocols over a single ATM virtual circuit (LLC-based multiplexing) and the second method assumes that each protocol is carried over a separate ATM virtual circuit (VC-based multiplexing). Please refer to the RFC for more detailed information.

3.7 IP Address Assignment

A static IP is a fixed IP that your ISP gives you. A dynamic IP is not fixed. The ISP assigns you a different one each time.

3.7.1 Using PPP Encapsulation

If you have a dynamic IP, then the IP Address field is not applicable (N/A). If you have a static IP, then you *only* need to fill in the IP Address field.

3.7.2 Using RFC 1483 Encapsulation

In this case the IP Address Assignment *must* be static with the same requirements for the IP Address.

3.8 Internet Access Configuration

Menu 4 allows you to enter the Internet Access information in one screen. Menu 4 is actually a simplified setup for one of the remote nodes that you can access in menu 11. Before you configure your Prestige for Internet access, you need to collect your Internet account information from your ISP and telephone company.

Use the following table to record your Internet Account Information. Note that if you are using PPP encapsulation, then the only ISP information you need is a login name and password.

Table 3-3 Internet Account Information

Internet Account Information	Write your account information here
Telephone Company Information	
VPI (Virtual Path Identifier)	—
VCI (Virtual Channel Identifier)	—
ISP Information	
IP Address of the ISP's Gateway (Optional)	—
Login Name	—
Password for ISP authentication	—
Type of Multiplexing	—
Type of Encapsulation	—

From the main menu, enter 4 to go to **Menu 4 - Internet Access Setup**, as shown next. The following table contains instructions on how to configure your Prestige for Internet access.

```

Menu 4 - Internet Access Setup

ISP's Name= ChangeMe
Encapsulation= PPP
Multiplexing= LLC-based
VPI # = 8
VCI # = 35
My Login= N/A
My Password= N/A

Press ENTER to Confirm or ESC to Cancel:

```

Get the VPI and VCI from your telephone company and the other information from your ISP.

Figure 3-2 Internet Access Setup

Table 3-4 Internet Access Setup Menu Fields

FIELD	DESCRIPTION	EXAMPLE
ISP's Name	Enter the name of your Internet Service Provider, e.g., MyISP. This information is for identification purposes only.	MyISP
Encapsulation	Press the [SPACE BAR] to select the method of encapsulation used by your ISP. The choices are PPP or RFC 1483. Please see section 3.7 for related information.	PPP
Multiplexing	Press the [SPACE BAR] to select the method of multiplexing used by your ISP - either VC-based or LLC-based.	VC-based
VPI #	Enter the Virtual Path Identifier (VPI) that the telephone company gives you.	8 (default)
VCI #	Enter the Virtual Channel Identifier (VCI) that the telephone company gives you.	35 (default)
My Login	Enter the login name that your ISP gives you.	tarbuck
My Password	Enter the password associated with the login name above.	***

At this point, if all your settings are correct your Prestige should connect automatically to the Internet.

Chapter 4

Remote Node Configuration

This chapter is about parameters that are protocol independent. The protocol-dependent configuration will be covered in subsequent chapters.

A remote node is required for placing calls to a remote gateway. A remote node represents both the remote gateway and the network behind it across a WAN connection. Note that when you use menu 4 to set up Internet access, you are actually configuring one of the remote nodes.

4.1 Remote Node Setup

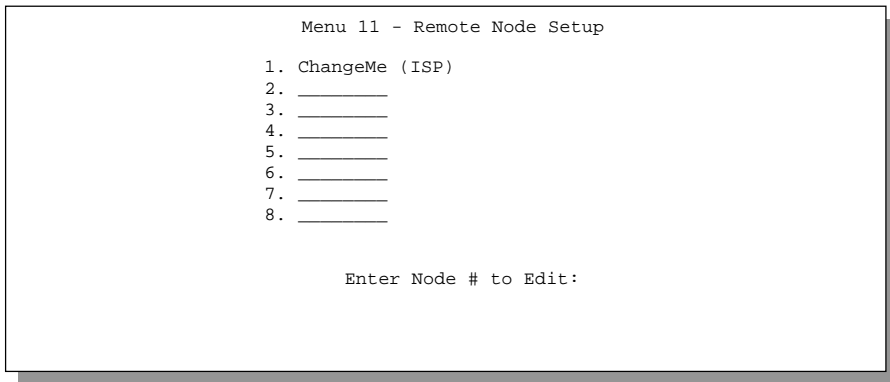
This section describes the protocol-independent parameters for a remote node.

4.1.1 Remote Node Profile

To configure a remote node, follow these steps:

Step 1. From the main menu, select menu option **11. Remote Node Setup**

Step 2. When menu 11 appears, as shown below, enter the number of the remote node that you wish to configure.



```
Menu 11 - Remote Node Setup

1. ChangeMe (ISP)
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

Enter Node # to Edit:
```

Figure 4-1 Menu 11 – Remote Node Setup

When **Menu 11.1 - Remote Node Profile** appears fill in the fields to define this remote profile. Descriptions and information about configuring the fields is given in the table that follows.

4.1.2 Encapsulation & Multiplexing Scenarios

For Internet Access you should use the encapsulation and multiplexing methods used by your ISP because there is no mechanism to automatically determine encapsulation/multiplexing. Selection of which encapsulation and multiplexing methods to use depends on how many VCs you have and how many different network protocols you need.

Scene 1. One VC, Multiple Protocols

PPP (RFC 2364) encapsulation with **VC-based** multiplexing is the best combination because the extra protocol identifying headers that **LLC-based** multiplexing use are unneeded. The **PPP** protocol already contains this information.

Scene 2. One VC, One Protocol (IP)

Selecting **RFC-1483** encapsulation with VC-based multiplexing requires the least amount of overhead (0 octets). However, if there is a potential need for multiple protocol support in the future, it may be safer to select **PPP** encapsulation instead of **RFC-1483**, so you don't need to reconfigure either machine when the time comes.

Scene 3. Multiple VCs

If you have an equal number (or more) of VCs than the number of protocols, then select **RFC-1483** encapsulation and **VC-based** multiplexing.

```
Menu 11.1 - Remote Node Profile

Rem Node Name= ChangeMe      Bridge:
Active= Yes                  Ethernet Addr Timeout(min)= 0
                              VPI #= 8
Encapsulation= PPP           VCI #= 35
Multiplexing= VC-based
Incoming:
  Rem Login= bucket          Filter Sets
  Rem Password=*****       Input Device Filters= 1,5,9,12
Outgoing:                   Output Device Filters= 6
  My Login= oscar
  My Password= *****
  Authen= CHAP/PAP

Press ENTER to CONFIRM or ESC to CANCEL:
```

Enter a unique name, up to eight characters, for the remote node.

Figure 4-2 Menu 11.1 Remote Node Profile

Table 4-1 Remote Node Profile Menu Fields

FIELD	DESCRIPTION	EXAMPLE
Rem Node Name	This is a required field [?]. Enter a descriptive name for the remote node, for example, "Changeme". This field can be up to eight characters. This name must be unique from any other remote node name.	Changeme
Active	Press the [SPACE BAR] to select either Yes or No . Inactive nodes are displayed with a minus sign (-) at the beginning of the name in menu 11.	No
Encapsulation=	PPP refers to RFC 2364, "PPP Encapsulation over ATM Adaptation Layer 5". If RFC 1483 ("Multiprotocol Encapsulation over ATM Adaptation Layer 5") is selected, then the Rem Login, Rem Password, My Login, My Password and Authen fields will not be applicable (N/A).	PPP
Multiplexing=	Press the [SPACE BAR] to select either VC-based or LLC-based multiplexing.	LLC-based
Incoming: Rem Login Name	Enter the login name that this remote node will use when it calls your Prestige. The login name in this field combined with the Rem Node Password will be used to authenticate this node.	bucket
Incoming: Rem Password	Enter the password used when this remote node calls your Prestige.	***
Outgoing: My Login	Enter the login name for your Prestige when it calls this remote node.	oscar
Outgoing: My Password	Enter the password for your Prestige when it calls this remote node.	***
Outgoing: Authen	This field sets the authentication protocol used for outgoing calls. Options for this field are: CHAP/PAP – Your Prestige will accept either CHAP or PAP when requested by this remote node. CHAP - accept CHAP only. PAP - accept PAP only.	CHAP/PAP

FIELD		DESCRIPTION	EXAMPLE
Bridge :	Ethernet Addr. Timeout (min)	In this field, enter the time (number of minutes) that you wish your Prestige 645M to retain the Ethernet Addr information in its internal tables while the line is down. If this information is retained, your Prestige 645M will not have to recompile the tables when the line is brought back up.	0
Bridge:	VPI #	Enter the Virtual Path Identifier (VPI) that the telephone company gives you.	8
Bridge:	VCI #	Enter the Virtual Path Channel (VCI) that the telephone company gives you.	35
Filter sets:	Input Device Filters	Use this to specify filter sets to apply to incoming traffic. You can specify up to four filter sets separated by commas. None are applied by default.	1, 5, 9, 12
Filter sets:	Output Device Filters	Use this to specify filter sets to apply to outgoing traffic. You can specify up to four filter sets separated by commas. None are applied by default.	6
Once you have completed filling in Menu 11.1 – Remote Node Profile , press [ENTER] at the message [Press ENTER to Confirm...] to save your configuration, or press [ESC] at any time to cancel.			

4.1.3 Outgoing Authentication Protocol

For obvious reasons you should generally employ the strongest authentication protocol possible. However, some vendors' implementation includes a specific authentication protocol in the user profile. It will disconnect if the negotiated protocol is different from that in the user profile, even when the negotiated protocol is stronger than specified. If you encounter a case where the peer disconnects right after a successful authentication, please make sure that you specify the correct authentication protocol when connecting to such an implementation.

4.1.4 Bridging in General

Bridging bases the forwarding decision on the MAC (Media Access Control), or hardware address, while routing does it on the network layer (IP or IPX) address. Bridging allows the Prestige to transport packets of network layer protocols.

Chapter 5

Filter Configuration

This chapter shows you how to create and apply filter(s).

5.1 About Filtering

Your Prestige uses filters to decide whether or not to allow passage of a packet. Data filters are divided into incoming and outgoing filters, depending on the direction of the packet relative to a port. These filters are further subdivided into device and protocol filters, which are discussed later. Data filtering can be applied on either the WAN side or the Ethernet side.

For incoming packets, your Prestige applies data filters only. Packets are processed depending upon whether a match is found. The following sections describe how to configure filter sets.

The Filter Structure of the Prestige

A filter set consists of one or more filter rules. Usually, you would group related rules, e.g., all the rules for Telnet, into a single set and give it a descriptive name. The Prestige allows you to configure up to twelve filter sets with six rules in each set, for a total of 72 filter rules in the system. You cannot mix device filter rules and protocol filter rules within the same set.

You can apply up to four filter sets to a particular port to block multiple types of packets. With each filter set having up to six rules, you can have a maximum of 24 rules active for a single port.

5.2 Configuring a Filter Set

To configure a filter set, follow this procedure:

Step 1. Enter 21 from the main menu to open **Menu 21 - Filter Set Configuration**.

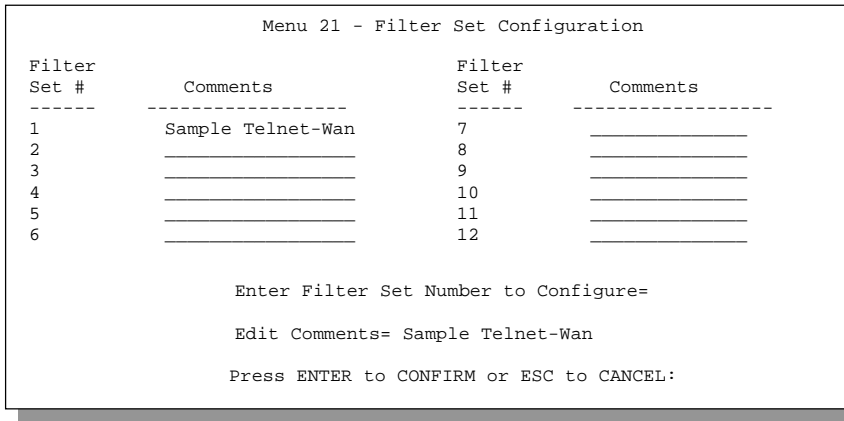


Figure 5-1 Menu 21 - Filter Set Configuration

- Step 2.** Enter the index of the filter set you wish to configure (no. 1-12) and press [ENTER].
- Step 3.** Enter a descriptive name or comment in the Edit Comments field and press [ENTER].
- Step 4.** Press [ENTER] at the message: [Press ENTER to Confirm] to open **Menu 21.1 - Filter Rules Summary**.

5.2.1 Filter Rules Summary Menu

The next screen shows a summary of the existing rules in an example filter set. The following tables contain a brief description of the abbreviations used in menu 21.1.

```

Menu 21.1 - Filter Rules Summary

# A Type                Filter Rules                M m n
- - - - -
1 Y IP    Pr=6, SA=0.0.0.0, DA=0.0.0.0, DP=23    N D F
2 N
3 N
4 N
5 N
6 N

Enter Filter Rule Number (1-6) to Configure: 1
    
```

Figure 5-2 Example Telnet Filter Rules Summary

Table 5-1 Abbreviations Used in the Filter Rules Summary Menu

ABBREVIATIONS	DESCRIPTION	DISPLAY
#	Refers to the filter rule number (1-6).	
A	Shows whether the rule is active or not.	[Y] means the filter rule is active. [N] means the filter rule is inactive.
Type	Refers to the type of filter rule.	[GEN] = Generic.
Filter Rules	The filter rule parameters will be displayed here (see below).	
M	Refers to More . More in a set behaves like a logical AND i.e., the set is only matched if ALL rules in it are matched. [Y] means an action can not yet be taken as there are more rules to check, which are concatenated with the present rule to form a rule chain. When the rule chain is complete an action can be taken. [N] means you can now specify an action to be taken i.e., forward the	[Y] means there are more rules to check. [N] means there are no more rules to check.

ABBREVIATIONS	DESCRIPTION	DISPLAY
	packet, drop the packet or check the next rule. For the latter, the next rule is independent of the rule just checked. If More is Yes , then Action Matched and Action Not Matched will be N/A .	
M	Refers to Action Matched . [F] means to forward the packet immediately and skip checking the remaining rules.	[F] means to forward the packet. [D] means to drop the packet. [N] means check the next rule.
N	Refers to Action Not Matched . [F] means to forward the packet immediately and skip checking the remaining rules.	[F] means to forward the packet. [D] means to drop the packet. [N] means check the next rule.

- The abbreviations listed in the following table will be used for GEN (generic) filters.

Table 5-2 Abbreviations Used If Filter Type Is GEN

Abbreviation	DESCRIPTION
Off	Offset
Len	Length

Refer to the next section for information on configuring the filter rules.

5.3 Configuring a Filter Rule

To configure a filter rule, enter its number in **Menu 21.1 - Filter Rules Summary** and press [ENTER] to open menu 21.1.1 for the rule.

5.3.1 Generic Filter Rule

This section shows you how to configure a generic filter rule. The purpose of generic rules is to allow you to filter non-IP packets.

For generic rules, the Prestige treats a packet as a byte stream. You specify the portion of the packet to check with the Offset (from 0) and the Length fields, both in bytes. The Prestige applies the Mask (bit-wise ANDing) to the data portion before comparing the result against the Value to determine a match. The Mask and Value are specified in hexadecimal numbers. Note that it takes two hexadecimal digits to represent a byte, so if the length is 4, the value in either field will take 8 digits, e.g., FFFFFFFF.

```

Menu 21.1.1 - Generic Filter Rule

Filter #: 1,1
Filter Type= Generic Filter Rule
Active= No
Offset= 0
Length= 0
Mask= N/A
Value= N/A
More= No           Log= None
Action Matched= Check Next Rule
Action Not Matched= Check Next Rule

Press ENTER to Confirm or ESC to Cancel:

```

Figure 5-3 Menu 21.1.1 - Generic Filter Rule

The following table describes the fields in the generic filter rule menu.

Table 5-3 Generic Filter Rule Menu Fields

FIELD	DESCRIPTION	EXAMPLE
Filter #	This is the filter set, filter rule co-ordinates, i.e., 2,3 refers to the second filter set and the third filter rule of that set.	2,3
Active	Select Yes to turn on the filter rule or No to turn the filter rule off.	Yes
Offset	Enter the starting byte of the data portion in the packet that you wish to compare. The range for this field is from 0 to 255.	0 (default)
Length	Enter the byte count of the data portion in the packet that you wish to compare. The range for this field is 0 to 8.	0 (default)
Mask	Enter the mask (in Hexadecimal) to apply to the data portion before comparison.	
Value	Enter the value (in Hexadecimal) to compare with the data portion.	
More	If Yes , a matching packet is passed to the next filter rule before an action is taken; otherwise the packet is disposed of according to the action fields. If More is Yes , then Action Matched and Action Not Matched will be N/A .	Yes
Log	Select the logging option from the following: None – No packets will be logged. Action Matched - Only packets that match the rule parameters will be logged.	None

FIELD	DESCRIPTION	EXAMPLE
	<p>Action Not Matched - Only packets that do not match the rule parameters will be logged.</p> <p>Both – All packets will be logged.</p>	
Action Matched	Select the action for a matching packet: Check Next Rule, Forward or Drop .	Forward
Action Not Matched	Select the action for a packet not matching the rule: Check Next Rule, Forward or Drop .	Drop
<p>Once you have completed filling in Menu 21.1.1 - Generic Filter Rule, press [ENTER] at the message [Press ENTER to Confirm] to save your configuration, or press [ESC] to cancel. This data will now be displayed on Menu 21.1 - Filter Rules Summary.</p>		

5.4 Applying a Filter and Factory Defaults

This section shows you where to apply the filter(s) after you design it (them).

5.4.1 Ethernet traffic

You seldom need to filter Ethernet traffic; however, the filter sets may be useful to block certain packets, reduce traffic and prevent security breaches. Go to menu 3.1 (shown below) and enter the number(s) of the filter set(s) that you want to apply as appropriate. You can choose up to four filter sets (from twelve) by entering their numbers separated by commas, for example, 2, 4, 7, 9. The Prestige does not have any of the default filters applied to the Ethernet port when it is shipped.

```

Menu 3.1 - General Ethernet Setup

Input Filter Sets:
device filters=

Output Filter Sets:
device filters=

Press ENTER to Confirm or ESC to Cancel:

```

Figure 5-4 Filtering Ethernet traffic

5.4.2 Remote Node Filters

Go to Menu 11.1 and enter the number(s) of the filter set(s) as appropriate. You can cascade up to four filter sets by entering their numbers separated by commas.

```
Menu 11.1 - Remote Node Profile

Rem Node Name= ChangeMe      Bridge:
Active= Yes                  Ethernet Addr Timeout(min)= 0
                              VPI #= 8
                              VCI #= 35

Encapsulation= PPP
Multiplexing= VC-based
Incoming:
  Rem Login= bucket          Filter Sets
  Rem Password=*****       Input Device Filters= 1,5,9,12
Outgoing:                   Output Device Filters= 6
  My Login= oscar
  My Password= *****
  Authen= CHAP/PAP

Press ENTER to CONFIRM or ESC to CANCEL:
```

Specify up to
4 filters
separated by
commas.

Figure 5-5 Filtering Remote Node Traffic

Chapter 6

System Maintenance

This chapter covers the diagnostic tools that help you to maintain your Prestige.

The diagnostic tools include diagnostics, updates on system status, port status and upgrades for the system software. This chapter describes how to use these tools in detail.

Select menu 24 in the main menu to open **Menu 24 - System Maintenance**, as shown below.

```
Menu 24 - System Maintenance

1. System Status
2. System Information and Console Port Speed
4. Diagnostic
5. Backup Configuration
6. Restore Configuration
7. Upload Firmware
8. Command Interpreter Mode

Enter Menu Selection Number:
```

Figure 6-1 Menu 24 - System Maintenance

6.1 System Status

The first selection, System Status, gives you information on the status and statistics of the ports, as shown below. System Status is a tool that can be used to monitor your Prestige. Specifically, it gives you information on your ADSL line status, number of packets sent and received.

To get to the System Status, enter number 24 to go to **Menu 24 - System Maintenance**. From this menu, select number 1. System Status. There are two commands in **Menu 24.1 - System Maintenance - Status**. Entering 1 resets the counters and [ESC] takes you back to the previous screen.

The table below describes the fields present in **Menu 24.1 - System Maintenance - Status**. It should be noted that these fields are READ-ONLY and are meant to be used for diagnostic purposes.

Please note that displaying this screen degrades system performance.

```

Menu 24.1 - System Maintenance - Status

Node-Lnk  Status      TxPkts      RxPkts      Errors  Tx  B/s      Rx  B/s      Up Time
1-1483    Up                1462        1567         0       0   222      211      2:15:16
2         N/A                0           0           0       0    0        0        0:00:00
3         N/A                0           0           0       0    0        0        0:00:00
4         N/A                0           0           0       0    0        0        0:00:00
5         N/A                0           0           0       0    0        0        0:00:00
6         N/A                0           0           0       0    0        0        0:00:00
7         N/A                0           0           0       0    0        0        0:00:00
8         N/A                0           0           0       0    0        0        0:00:00

Ethernet:
  Status: 10M/Full Duplex  Tx Pkts: 1583  Line Status: Up
  Collisions: 0           Rx Pkts: 1521  Upstream Speed: 608 kbps
                               Downstream Speed: 4000 kbps

CPU Load = 4.25%

Press Command:
COMMANDS: 1-Reset Counters  ESC-Exit
    
```

Figure 6-2 Menu 24.1 - System Maintenance – Status

The following table describes the fields present in **Menu 24.1 - System Maintenance - Status**.

Table 6-1 System Maintenance - Status Menu Fields

FIELD	DESCRIPTION
Node-Lnk	This is the remote node index number and link type. Link types are: PPP and RFC 1483 .
Status	Shows the status of the remote node.
TxPkts	The number of packets transmitted to this remote node.
RxPkts	The number of packets received from this remote node.
Errors	The number of error packets on this connection.
Tx B/s	Shows the transmission rate in bytes per second.
Rx B/s	Shows the receiving rate in bytes per second.
Up Time	Time this channel has been connected to the remote node.
Ethernet	
Status	Shows the current status of the LAN.
Tx Pkts	The number of transmitted packets to the LAN.
Rx Pkts	The number of received packets from the LAN.
Collision	Number of collisions.

FIELD	DESCRIPTION
WAN Line Status	Shows the current status of the ADSL line which can be Up, Down, Wait for Init or Initializing .
Upstream Speed	Shows the ADSL line upstream speed.
Downstream Speed	Shows the ADSL line downstream speed
CPU Load	Specifies the percentage of CPU utilization.
Press Command	
1 - Reset Counters	Press 1 to reset all the above statistics to 0.
ESC - Exit	Press [ESC] to go back to menu 24.

6.2 System Information and Console Port speed

System information list important data about your Prestige and its firmware.

Console port speed is included for use by qualified technical support personnel, do not configure it.

Menu 24.2 System Information and Console Port Speed is as follows.

```

Menu 24.2 - System Information and Console Port Speed

1. System Information
2. Console Port Speed

```

Figure 6-3 System Information and Console Port Speed

Press 1 to display the next screen, **Menu 24.2.1 - System Maintenance - Information**.

```

Menu 24.2.1 - System Maintenance - Information

Name: ChangeMe
Routing:
ZyNOS F/W Version: V.250(EK.0) | 7/5/2001
ADSL Chipset Vendor: Alcatel, Version 3.7.119
Standard: Multi-Mode

LAN

Ethernet Address:00:a0:c5:02:34:56
IP Address: 192.168.1.1
IP Mask: 255.255.255.0
DHCP: Server

Press ESC or RETURN to Exit:
    
```

Figure 6-4 System Maintenance - Information

Table 6-2 Fields in System Maintenance - Information

FIELD	DESCRIPTION
Name	Displays the system name of your Prestige. This information can be modified in Menu 1 - General Setup .
Routing	Refers to the routing protocol used.
ZyNOS F/W Version	Refers to the ZyNOS (ZyXEL Network Operating System) firmware version and date created. ZyNOS is a registered trademark of ZyXEL Communications Corporation.
ADSL Chipset Vendor	Displays the vendor of the ADSL chipset and ADSL modem software version.
Version	Refers to the ANSI Version.
Standard	Refers to the ADSL standard in use. Full rate G.dmt and ANSI T1.413 allow rates up to 8 Mbps downstream and 832 Kbps upstream and require the use of a telephone splitter. The reduced rate G.Lite provides up to 1.536 Mbps downstream and 512 Kbps upstream and does not require a telephone splitter. Multi-Mode allows the standard to be negotiated automatically.
Ethernet Address	Refers to the Ethernet MAC (Media Access Control) of your Prestige.
IP Address	This is the IP address of the Prestige in dotted decimal notation.
IP Mask	This shows the subnet mask of the Prestige.
DHCP	This field shows the DHCP setting (None , Server , or Server Inact.) of the Prestige.

6.3 Diagnostic

The diagnostic facility allows you to test the different aspects of your Prestige to determine if it is working properly. Menu 24.4 allows you to choose among various types of diagnostic tests to evaluate your system, as shown. Follow the procedure below to get to the diagnostic functions.

Figure 6-5 Menu 24.4 - System Maintenance - Diagnostic

```

Menu 24.4 - System Maintenance - Diagnostic

ADSL                               System
 1. Reset ADSL                       21. Reboot System
                                       22. Command Mode

TCP/IP
12. Ping Host

Enter Menu Selection Number:

Host IP Address= N/A

```

Step 1. From the main menu, enter 24 to open **Menu 24 - System Maintenance**.

Step 2. From this menu, enter 4 to open **Menu 24.4 - System Maintenance - Diagnostic**.

The following table describes the diagnostic tests available in menu 24.4 for your Prestige and the connections.

Table 6-3 System Maintenance Menu Diagnostic

FIELD	DESCRIPTION
Reset ADSL	This command re-initializes the ADSL link to the telephone company.
Ping Host	This diagnostic test pings the host, which determines the functionality of the TCP/IP protocol on both systems and the links in between.
Reboot System	This option restarts the Prestige.
Command Mode	This option allows you to enter the command mode. This mode allows you to diagnose and test your Prestige using a specified set of commands.

6.4 Command Interpreter Mode

The Command Interpreter (CI) is a part of the main system firmware. The CI provides much of the same functionality as the SMT, while adding some low-level setup and diagnostic functions. The CI can be

entered from the SMT by selecting menu 24.8. Access is by Telnet. For more detailed information on CI commands see the Support Notes on the Supporting CD. Enter 8 from **Menu 24 - System Maintenance**. A list of valid commands can be found by typing “help” or “?” at the command prompt. Type “exit” to return to the SMT main menu when finished.

```
Enter Menu Selection Number: 8

Copyright (c) 1994 - 2001 ZyXEL Communications Corp.
Ras> ?
Valid commands are:
Sys      exit      device      ether
wan      poe       pptp       ip
ppp      bridge     hdap
```

Figure 6-6 Command mode

Chapter 7

Configuration and Firmware File Maintenance

This chapter tells you how to backup and restore your configuration file as well as upload new firmware and configuration files.

7.1 Filename Conventions

The configuration file (often called the romfile or rom-0) contains the factory default settings in the menus such as password, DHCP Setup, TCP/IP Setup, etc. It arrives from ZyXEL with a rom filename extension. Once you have customized the Prestige's settings, they can be saved back to your computer under a filename of your choosing.

ZyNOS (ZyXEL Network Operating System sometimes referred to as the "ras" file) is the system firmware and has a "bin" filename extension. With many ftp and tftp clients, the filenames are similar to those seen next.

```
ftp> put firmware.bin ras
```

This is a sample ftp session showing the transfer of the computer file " firmware.bin" to the Prestige.

```
ftp> get rom-0 config.cfg
```

This is a sample ftp session saving the current configuration to the computer file config.cfg.

If your [t]ftp client does not allow you to have a destination filename different than the source, you will need to rename them as the Prestige only recognizes "rom-0" and "ras". Be sure you keep unaltered copies of both files for later use.

The following table is a summary. Please note that the internal filename refers to the filename on the Prestige and the external filename refers to the filename not on the Prestige, that is, on your computer, local network or ftp site and so the name (but not the extension) will vary. After uploading new firmware see the **ZyNOS F/W Version** field in **Menu 24.2.1 - System Maintenance - Information** to confirm that you have uploaded the correct firmware version.

Table 7-1 Filename Conventions

FILE TYPE	INTERNAL NAME	EXTERNAL NAME	DESCRIPTION
Configuration File	Rom-0	*.rom	This is the configuration filename on the Prestige. Uploading the rom-0 file replaces the entire ROM file system, including your Prestige configurations, system-related data (including the default password), the error log and the trace log.
Firmware	Ras	*.bin	This is the generic name for the ZyNOS firmware on the Prestige.

7.2 Backup Configuration

Option 5 from **Menu 24 - System Maintenance** allows you to backup the current Prestige configuration to your computer. Backup is highly recommended once your Prestige is functioning properly. FTP is the preferred method, although TFTP can also be used.

Please note that the terms “download” and “upload” are relative to the computer. Download means to transfer from the Prestige to the computer, while upload means from your computer to the Prestige.

7.2.1 Backup Configuration Using FTP

Enter 5 in **Menu 24 - System Maintenance** to get the following screen.

```
Menu 24.5 - Backup Configuration

To transfer the configuration file to your workstation, follow the procedure
below:

1. Launch the FTP client on your workstation.
2. Type "open" and the IP address of your router. Then type "root" and
   SMT password as requested.
3. Locate the 'rom-0' file.
4. Type 'get rom-0' to back up the current router configuration to your
   workstation.

For details on FTP commands, please consult the documentation of your FTP
client program. For details on backup using TFTP (note that you must remain
in the menu to back up using TFTP), please see your router manual.

Press ENTER to Exit:
```

Figure 7-1 Menu 24.5 — Backup Configuration

7.2.2 Using the FTP command from the DOS Prompt

- Step 1.** Launch the FTP client on your computer.
- Step 2.** Enter “open” and the IP address of your Prestige.
- Step 3.** Press [ENTER] when prompted for a username.
- Step 4.** Enter “root” and your SMT password as requested. The default is 1234.
- Step 5.** Enter “bin” to set transfer mode to binary.
- Step 6.** Use “get” to transfer files from the Prestige to the computer, for example, “get rom-0 config.rom” transfers the configuration file on the Prestige to your computer and renames it “config.rom”. See earlier in this chapter for more information on filename conventions.
- Step 7.** Enter “quit” to exit the ftp prompt.

```
331 Enter PASS command
Password:
230 Logged in
ftp> bin
200 Type I OK
ftp> get rom-0 zyxel.rom
200 Port command okay
150 Opening data connection for STOR ras
226 File received OK
ftp: 327680 bytes sent in 1.10Seconds 297.89Kbytes/sec.
ftp> quit
```

Figure 7-2 FTP Session Example

The following table describes some of the commands that you may see in third party FTP clients.

Table 7-2 General Commands for Third Party FTP Clients

COMMAND	DESCRIPTION
Host Address	Enter the address of the host server.
Login Type	Anonymous. This is when a user I.D. and password is automatically supplied to the server for anonymous access. Anonymous logins will work only if your ISP or service administrator has enabled this option. Normal. The server requires a unique User ID and Password to login.
Transfer Type	Transfer files in either ASCII (plain text format) or in binary mode.
Initial Remote Directory	Specify the default remote directory (path).
Initial Local Directory	Specify the default local directory (path).

FTP over WAN will not work if you have applied a filter in menu 11.1 (WAN) to block Telnet service.

7.2.3 Backup Configuration Using TFTP

The Prestige supports the up/downloading of the firmware and the configuration file using TFTP (Trivial File Transfer Protocol) over LAN. Although TFTP should work over WAN as well, it is not recommended.

To use TFTP, your computer must have both telnet and TFTP clients. To backup the configuration file, follow the procedure shown next:

- Step 1.** Use telnet from your computer to connect to the Prestige and log in. Because TFTP does not have any security checks, the Prestige records the IP address of the telnet client and accepts TFTP requests only from this address.
- Step 2.** Put the SMT in command interpreter (CI) mode by entering 8 in **Menu 24 – System Maintenance**.
- Step 3.** Enter command “sys stdio 0” to disable the SMT timeout, so the TFTP transfer will not be interrupted. Enter command “sys stdio 5” to restore the five-minute SMT timeout (default) when the file transfer is complete.
- Step 4.** Launch the TFTP client on your computer and connect to the Prestige. Set the transfer mode to binary before starting data transfer.

Step 5. Use the TFTP client (see the example below) to transfer files between the Prestige and the computer. The file name for the configuration file is “rom-0” (rom-zero, not capital o).

Note that the telnet connection must be active and the SMT in CI mode before and during the TFTP transfer. For details on TFTP commands (see following example), please consult the documentation of your TFTP client program. For UNIX, use “get” to transfer from the Prestige to the computer and “binary” to set binary transfer mode.

7.2.4 Example: TFTP Command

The following is an example tftp command:

```
TFTP [-i] host get rom-0 config.rom
```

where “i” specifies binary image transfer mode (use this mode when transferring binary files), “host” is the Prestige IP address, “get” transfers the file source on the Prestige (rom-0 name of the configuration file on the Prestige) to the file destination on the computer and renames it config.rom.

The following table describes some of the fields that you may see in third party TFTP clients.

Table 7-3 General Commands for Third Party TFTP Clients

COMMAND	DESCRIPTION
Host	Enter the IP address of the Prestige. 192.168.1.1 is the Prestige’s default IP address when shipped.
Send/Fetch	Use “Send” to upload the file to the Prestige and “Fetch” to back up the file on your computer.
Local File	Enter the path and name of the firmware file (*.bin extension) or configuration file (*.rom extension) on your computer.
Remote File	This is the filename on the Prestige. The filename for the firmware is “ras” and for the configuration file, is “rom-0”.
Binary	Transfer the file in binary mode.
Abort	Stop transfer of the file.

TFTP over WAN will not work if you have applied a filter in menu 11.1 (WAN) to block Telnet service.

7.3 Restore Configuration

Menu 24.6 -- System Maintenance - Restore Configuration allows you to restore the configuration via FTP or TFTP to your Prestige. The preferred method is FTP. Note that this function erases the current configuration before restoring the previous back up configuration; please do not attempt to restore unless you have a backup configuration stored on disk. To restore configuration using FTP or TFTP is the same as

uploading the configuration file, please refer to the following sections on FTP and TFTP file transfer for more details. The Prestige restarts automatically after the file transfer is complete.

```
Menu 24.6 - Restore Configuration

To transfer the firmware and the configuration file, follow the procedure
below:

1. Launch the FTP client on your workstation.
2. Type "open" and the IP address of your router. Then type "root" and
   SMT password as requested.
3. Type "put backupfilename rom-0" where backupfilename is the name of
   your backup configuration file on your workstation and rom-spt is the
   Remote file name on the router. This restores the configuration to your
   bridge.
4. The system reboots automatically after a successful file transfer.

For details on FTP commands, please consult the documentation of your FTP
client program. For details on restoring using TFTP (note that you must
remain on this menu to restore using TFTP), please see your router
manual.

Press ENTER to Exit:
```

Figure 7-3 Menu 24.6 — Restore Configuration

7.4 Uploading Firmware and Configuration Files

Menu 24.7 - System Maintenance - Upload Firmware allows you to upgrade the firmware and the configuration file.

WARNING!
**PLEASE WAIT A FEW MINUTES FOR THE PRESTIGE TO RESTART AFTER
FIRMWARE OR CONFIGURATION FILE UPLOAD. INTERRUPTING THE UPLOAD
PROCESS MAY PERMANENTLY DAMAGE YOUR PRESTIGE.**

```
Menu 24.7 -- System Maintenance - Upload Firmware

1. Upload System Firmware
2. Upload System Configuration File

Enter Menu Selection Number:
```

Figure 7-5 Menu 24.7 — System Maintenance — Upload Firmware

The configuration data, system-related data, the error log and the trace log are all stored in the configuration file. Please be aware that uploading the configuration file replaces everything contained within.

7.4.1 Firmware Upload

FTP is the preferred method for uploading the firmware and configuration. To use this feature, your computer must have an FTP client.

When you telnet into the Prestige, you will see the following screens for uploading firmware and the configuration file using FTP.

```
Menu 24.7.1 - System Maintenance - Upload System Firmware

To upload the system firmware, follow the procedure below:

1. Launch the FTP client on your workstation.
2. Type "open" and the IP address of your system. Then type "root" and
   SMT password as requested.
3. Type "put firmwarefilename ras" where "firmwarefilename" is the name
   of your firmware upgrade file on your workstation and "ras" is the
   remote file name on the system.
4. The system reboots automatically after a successful firmware upload.

For details on FTP commands, please consult the documentation of your FTP
client program. For details on uploading system firmware using TFTP (note
that you must remain on this menu to upload system firmware using TFTP),
please see your manual.

Press ENTER to Exit:
```

Figure 7-6 Menu 24.7.1 — Upload System Firmware

7.4.2 Configuration File Upload

You see the following screen when you telnet into menu 24.7.2.

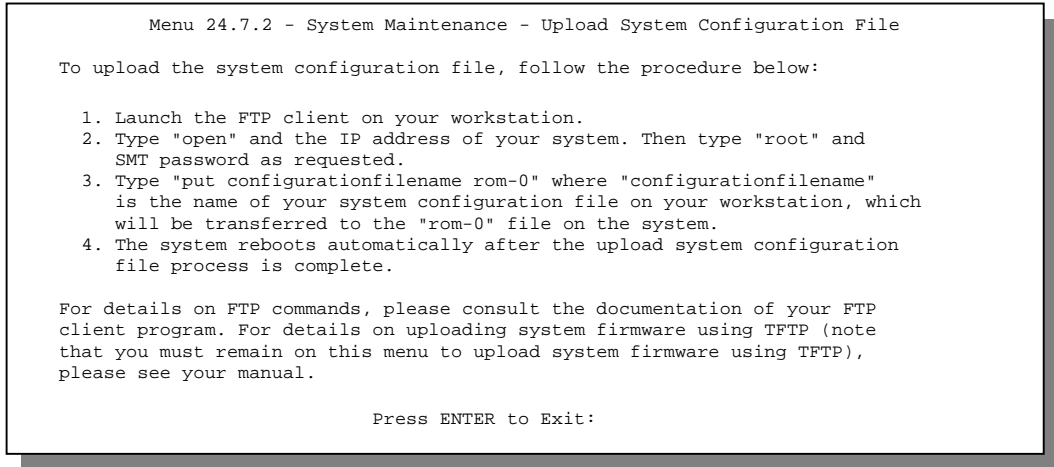


Figure 7-7 Menu 24.7.2 — System Maintenance

To transfer the firmware and the configuration file, follow these examples:

7.4.3 Using the FTP command from the DOS Prompt Example

- Step 1.** Launch the FTP client on your computer.
- Step 2.** Enter “open” and the IP address of your Prestige.
- Step 3.** Press [ENTER] when prompted for a username.
- Step 4.** Enter “root” and your SMT password as requested. The default is 1234.
- Step 5.** Enter “bin” to set transfer mode to binary.
- Step 6.** Use “put” to transfer files from the computer to the Prestige, e.g., put firmware.bin ras transfers the firmware on your computer (firmware.bin) to the Prestige and renames it “ras”. Similarly “put config.rom rom-0” transfers the configuration file on your computer (config.rom) to the Prestige and renames it “rom-0”. Likewise “get rom-0 config.rom” transfers the configuration file on the Prestige to your computer and renames it “config.rom.” See earlier in this chapter for more information on filename conventions.
- Step 7.** Enter “quit” to exit the ftp prompt.

```
331 Enter PASS command
Password:
230 Logged in
ftp> bin
200 Type I OK
ftp> put firmware.bin ras
200 Port command okay
150 Opening data connection for STOR ras
226 File received OK
ftp: 327680 bytes sent in 1.10Seconds 297.89Kbytes/sec.
ftp> quit
```

Figure 7-8 FTP Session Example

More commands that you may find in third party FTP clients, are listed earlier in this chapter.

FTP over WAN will not work if you have applied a filter in menu 11.1 (WAN) to block Telnet service.

7.4.4 TFTP File Upload

The Prestige also supports the up/downloading of the firmware and the configuration file using TFTP (Trivial File Transfer Protocol) over LAN. Although TFTP should work over WAN as well, it is not recommended.

To use TFTP, your computer must have both telnet and TFTP clients. To transfer the firmware and the configuration file, follow the procedure shown next:

- Step 1.** Use telnet from your computer to connect to the Prestige and log in. Because TFTP does not have any security checks, the Prestige records the IP address of the telnet client and accepts TFTP requests only from this address.
- Step 2.** Put the SMT in command interpreter (CI) mode by entering 8 in **Menu 24 – System Maintenance**.
- Step 3.** Enter the command “sys stdio 0” to disable the SMT timeout, so the TFTP transfer will not be interrupted. Enter command “sys stdio 5” to restore the five-minute SMT timeout (default) when the file transfer is complete.
- Step 4.** Launch the TFTP client on your computer and connect to the Prestige. Set the transfer mode to binary before starting data transfer.
- Step 5.** Use the TFTP client (see the example below) to transfer files between the Prestige and the computer. The file name for the firmware is “ras” and the configuration file is “rom-0” (rom-zero, not capital o).

Note that the telnet connection must be active and the SMT in CI mode before and during the TFTP transfer. For details on TFTP commands (see following example), please consult the documentation of your TFTP client program. For UNIX, use “get” to transfer from the Prestige to the computer, “put” the other way around, and “binary” to set binary transfer mode.

7.4.5 Example: TFTP Command

The following is an example tftp command:

```
TFTP [-i] host put firmware.bin ras
```

where “i” specifies binary image transfer mode (use this mode when transferring binary files), “host” is the Prestige’s IP address, “put” transfers the file source on the computer (firmware.bin – name of the firmware on the computer) to the file destination on the remote host (ras - name of the firmware on the Prestige).

Commands that you may see in third party TFTP clients are listed earlier in this chapter.

TFTP over WAN will not work if you have applied a filter in menu 11.1 (WAN) to block Telnet service.

Chapter 8

Troubleshooting

This chapter covers problems you may run into and possible remedies. After each problem description, some instructions are provided to help you diagnose and solve the problem.

8.1 Problems Starting Up the Prestige

Table 8-1 Troubleshooting the Start-Up of your Prestige

PROBLEM	CORRECTIVE ACTION
None of the LEDs are on when you turn on the Prestige	<p>Make sure that you have the correct AC adapter and that is plugged in and connected to the Prestige.</p> <p>If the error persists, you may have a hardware problem. In this case you should contact your vendor.</p>

8.2 Problems Telnetting into the Prestige

Table 8-2 Troubleshooting Telnet

PROBLEM	CORRECTIVE ACTION
Can't access the Prestige through telnet.	Check the LAN port and the other Ethernet connections.
	Check your computer's IP address, it should be in the same subnet as the Prestige.
	Use the reset button as follows to restore the IP address to 192.168.1.1, subnet mask to 255.255.255.0, DHCP server to inactive and the password to 1234.
	Turn the Prestige off. Use a pointed object to push the RESET button while you turn the Prestige back on. Keep the RESET button pressed for one minute.
	Set your computer to use a static IP address that is on the same subnet as the Prestige.

8.3 Problems With the WAN Interface

Table 8-3 Troubleshooting the ADSL connection

PROBLEM	CORRECTIVE ACTION
Initialization of the ADSL connection failed.	Check the cable connections between the ADSL port and the wall jack. The DSL LED on the front panel of the Prestige should be on.
	Check that your VPI, VCI, type of encapsulation and type of multiplexing settings are the same as what you collected from your telephone company and ISP.
	Restart the Prestige. If you still have problems, you may need to verify your VPI, VCI, type of encapsulation and type of multiplexing settings with the telephone company and ISP.

8.4 Problems With the LAN Interface

Table 8-4 Troubleshooting the LAN Interface

PROBLEM	CORRECTIVE ACTION
Can't ping any station on the LAN	Check the Ethernet LEDs on the front panel. A LAN LED should be on if the port is connected to a computer or hub. If they are off, check the cable connections between your Prestige and the computer or hub.
	Verify that the IP addresses of the Prestige and the computers are on the same subnet.

8.5 Problems Connecting to a Remote Node or ISP

Table 8-5 Troubleshooting a Connection to a Remote Node or ISP

PROBLEM	CORRECTIVE ACTION
Can't connect to a remote node or ISP	Check menu 4 to verify that the My Login and My Password fields have the proper entries.
	In menu 11.1, verify your login name and password for the remote node.
	If these steps fail, you may need to verify your login and password with your ISP.

Appendix A

VPI and VCI

ATM is a connection-oriented technology, meaning that it sets up virtual circuits over which end systems communicate. The terminology for virtual circuits is as follows:

- **VC (virtual channel)** Logical connections between end stations
- **VP (virtual path)** A bundle of VCs

Think of a VP as a cable that contains a bundle of wires. The cable connects two points, and wires within the cable provide individual circuits between the two points. In an ATM cell header, a **VPI** (Virtual Path Identifier) identifies a link formed by a virtual path and a **VCI** (Virtual Channel Identifier) identifies a channel within a virtual path. The **VPI** and **VCI** are identified and correspond to termination points at ATM switches as shown. Your telephone company should supply you with these numbers.

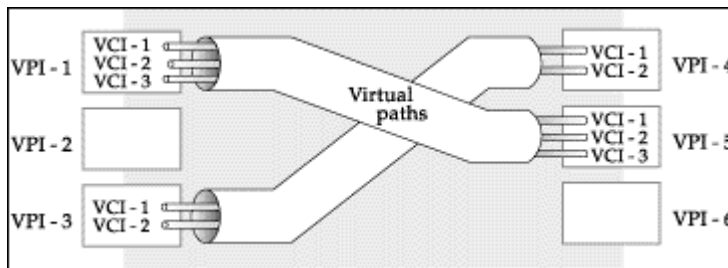


Diagram 1 VPI's & VCI's.

Appendix B

Power Adapter Specifications

NORTH AMERICAN PLUG STANDARDS	
AC Power Adapter Model	DV-121AACS
Input Power	AC120Volts/60Hz/23W
Output Power	AC12Volts/1.0A
Power Consumption	10 W
Safety Standards	UL, CUL (UL 1310, CSA C22.2 No.223)
EUROPEAN PLUG STANDARDS	
AC Power Adapter Model	DV-121AACUP-5716
Input Power	AC230Volts/50Hz/19W
Output Power	AC12Volts/1.0A
Power Consumption	10 W
Safety Standards	TUV, CE (EN 61558)
CHINESE PLUG STANDARDS	
AC Power Adapter Model	DV-121AACCP-5720
Input Power	AC220Volts/50Hz/18W
Output Power	AC12Volts/1.0A
Power Consumption	10 W
Safety Standards	CCEE (GB8898)

Glossary

10BaseT	The 10-Mbps baseband Ethernet specification that uses two pairs of twisted-pair cabling (Category 3 or 5): one pair for transmitting data and the other for receiving data.
ADSL	Asymmetrical Digital Subscriber Line is an asymmetrical technology, meaning that the downstream data rate is much higher than the upstream data rate. ADSL operates in a frequency range that is above the frequency range of voice services, so the two systems can operate over the same cable.
ARP	Address Resolution Protocol is a protocol for mapping an Internet Protocol address (IP address) to a physical machine address that is recognized in the local network.
ATM	Asynchronous Transfer Mode is a LAN and WAN networking technology that provides high-speed transfer. ATM uses fixed size packets of information called cells. These cells can be switched more quickly and efficiently than variable length packets because they are all regular and predictable with no need for dealing with different sizes of packets.
Backbone	A high-speed line or series of connections that forms a major pathway within a network.
Bandwidth	This is the capacity on a link usually measured in bits-per-second (bps)
Bit	(Binary Digit) -- A single digit number in base-2, in other words, either a 1 or a zero. The smallest unit of computerized data.
Byte	A set of bits that represent a single character. There are 8 bits in a Byte.
CDR	Call Detail Record. This is a name used by telephone companies for call related information.
CHAP	Challenge Handshake Authentication Protocol is an alternative protocol that avoids sending passwords over the wire by using a challenge/response technique
Client	A software program that is used to contact and obtain data from a Server software program on another computer. Each Client program is designed to work with one or more specific kinds of Server programs, and each Server requires a specific kind of Client. A Web Browser is a specific kind of Client
crossover Ethernet cable	A cable that wires a pin to its opposite pin, for example, RX+ is wired to TX+. This cable connects two similar devices, for example, two data terminal equipment (DTE) or data communications equipment (DCE) devices.
CSU/DSU	Channel Service Unit/Data Service Unit. CSUs (channel service units) and DSUs (data service units) are actually two separate devices, but they are used in conjunction and often combined into the same box. The devices are part of the hardware you need to connect

	<p>computer equipment to digital transmission lines). The Channel Service Unit device connects with the digital communication line and provides a termination for the digital signal. The Data Service Unit device, sometimes called a digital service unit, is the hardware component you need to transmit digital data over the hardware channel. The device converts signals from bridges, bridges, and multiplexors into the bipolar digital signals used by the digital lines. Multiplexors mix voice signals and data on the same line.</p>
DCE	<p>Data Communications Equipment is typically a modem or other type of communication device. The DCE sits between the DTE (data terminal equipment) and a transmission circuit such as a phone line.</p>
DHCP	<p>Dynamic Host Configuration Protocol automatically assigns IP addresses to clients when they log on. DHCP centralizes IP address management on central computers that run the DHCP server program. DHCP leases addresses for a period of time which means that addresses are made available to assign to other systems.</p>
DNS	<p>Domain Name System links names to IP addresses. When you access Web sites on the Internet, you can type the IP address of the site or the DNS name. When you type a domain name in a Web browser, a query is sent to the primary DNS server defined in your Web browser's configuration dialog box. The DNS server converts the name you specified to an IP address and returns this address to your system. From then on, the IP address is used in all subsequent communications.</p>
Domain Name	<p>The unique name that identifies an Internet site. Domain Names always have 2 or more parts, separated by dots. The part on the left is the most specific, and the part on the right is the most general.</p>
DRAM	<p>Dynamic RAM that stores information in capacitors that must be refreshed periodically.</p>
DSL	<p>Digital Subscriber Line technologies enhances the data capacity of the existing twisted-pair wire that runs between the local telephone company switching offices and most homes and offices. There are actually seven types of DSL service, ranging in speeds from 16 Kbits/sec to 52 Mbits/sec. The services are either symmetrical (traffic flows at the same speed in both directions), or asymmetrical (the downstream capacity is higher than the upstream capacity). DSL connections are point-to-point dedicated circuits, meaning that they are always connected. There is no dial-up. There is also no switching, which means that the line is a direct connection into the carrier's frame relay, ATM (Asynchronous Transfer Mode), or Internet-connect system.</p>
DSLAM	<p>A Digital Subscriber Line Access Multiplexer (DSLAM) is a network device, usually at a telephone company central office, that receives signals from multiple customer Digital Subscriber Line connections and puts the signals on a high-speed backbone line using multiplexing techniques. Depending on the product, DSLAM multiplexers connect DSL lines with some combination of asynchronous transfer mode ATM, frame relay, or IP</p>

	networks.
DTE	Originally, the DTE (data terminal equipment) was a dumb terminal or printer, but today it is a computer, or a bridge or bridge that interconnects local area networks.
EMI	ElectroMagnetic Interference. The interference by electromagnetic signals that can cause reduced data integrity and increased error rates on transmission channels.
Encapsulation	A process of putting information into packets. One layer encloses or encapsulates other layers of the packet; for example, TCP/IP uses encapsulation. A whole separate packet can even be encapsulated into another with a technique called IP tunneling.
Ethernet	A very common method of networking computers in a LAN. There are a number of adaptations to the IEEE 802.3 Ethernet standard, including adaptations with data rates of 10 Mbits/sec and 100 Mbits/sec over coaxial cable, twisted-pair cable, and fiber-optic cable. The latest version of Ethernet, Gigabit Ethernet, has a data rate of 1 Gbit/sec.
FAQ	(Frequently Asked Questions) -- FAQs are documents that list and answer the most common questions on a particular subject.
FCC	The FCC (Federal Communications Commission) is in charge of allocating the electromagnetic spectrum and thus the bandwidth of various communication systems.
Flash memory	The nonvolatile storage that can be electrically erased and reprogrammed so that data can be stored, booted, and rewritten as necessary.
Gateway	A gateway is a computer system or other device that acts as a translator between two systems that do not use the same communication protocols, data formatting structures, languages, and/or architecture.
Host	Any computer on a network that is a repository for services available to other computers on the network. It is quite common to have one host machine provide several services, such as WWW and USENET.
IANA	Internet Assigned Number Authority acts as the clearinghouse to assign and coordinate the use of numerous Internet protocol parameters such as Internet addresses, domain names, protocol numbers, and more. The IANA Web site is at http://www.isi.edu/iana .
ICMP	Internet Control Message Protocol is a message control and error-reporting protocol between a host server and a gateway to the Internet. ICMP uses Internet Protocol (IP) datagrams, but the messages are processed by the TCP/IP software and are not directly apparent to the application user.
internet	(Lower case i) Any time you connect 2 or more networks together, you have an internet.

Internet	(Upper case I) The vast collection of inter-connected networks that all use the TCP/IP protocols and that evolved from the ARPANET of the late 60's and early 70's. The Internet now (July 1995) connects roughly 60,000 independent networks into a vast global internet
Intranet	A private network inside a company or organization that uses the same kinds of software that you would find on the public Internet, but that is only for internal use.
IP	Internet Protocol: the IP (currently IP version 4, or IPv4), is the underlying protocol for routing packets on the Internet and other TCP/IP-based networks.
IPCP (PPP)	IP Control Protocol allows changes to IP parameters such as the IP address.
ISP	Internet Service Providers provide connections into the Internet for home users and businesses. There are local, regional, national, and global ISPs. You can think of local ISPs as the gatekeepers into the Internet.
LAN	Local Area Network is a shared communications system to which many computers are attached. A LAN, as its name implies, is limited to a local area. This has to do more with the electrical characteristics of the medium than the fact that many early LANs were designed for departments, although the latter accurately describes a LAN as well. LANs have different topologies, the most common being the linear bus and the star configuration.
MAC	On a local area network (LAN) or other network, the MAC (Media Access Control) address is your computer's unique hardware number. (On an Ethernet LAN, it's the same as your Ethernet address.) The MAC layer frames data for transmission over the network, then passes the frame to the physical layer interface where it is transmitted as a stream of bits.
Multi-plexing	A method that combines information from multiple connections into one connection for transfer over an ATM circuit.
NAT	Network Address Translation is the translation of an Internet Protocol address used within one network to a different IP address known within another network.
Network	Any time you connect 2 or more computers together so that they can share resources, you have a computer network. Connect 2 or more networks together and you have an internet.
NIC	Network Interface Card. A board that provides network communication capabilities to and from a computer system. Also called an adapter.
Node	Any single computer connected to a network
PAP	Password Authentication Protocol PAP is a security protocol that requires users to enter a password before accessing a secure system. The user's name and password are sent over the wire to a server, where they are compared with a database of user account names and passwords. This technique is vulnerable to wiretapping (eavesdropping) because the

	password can be captured and used by someone to log onto the system.
Port	An Internet port refers to a number that is part of a URL, appearing after a colon (:) right after the domain name. Every service on an Internet server listens on a particular port number on that server. Most services have standard port numbers, e.g. Web servers normally listen on port 80.
POTS	Plain Old Telephone Service is the analog telephone service that runs over copper twisted-pair wires and is based on the original Bell telephone system. Twisted-pair wires connect homes and businesses to a neighborhood central office. This is called the local loop. The central office is connected to other central offices and long-distance facilities.
PPP	Point to Point Protocol. PPP encapsulates and transmits IP (Internet Protocol) datagrams over serial point-to-point links. PPP works with other protocols such as IPX (Internetwork Packet Exchange). The protocol is defined in IETF (Internet Engineering Task Force) RFC 1661 through 1663. PPP provides bridge-to-bridge, host-to-bridge, and host-to-host connections.
PPPoE	PPPoE (Point-to-Point Protocol over Ethernet) relies on two widely accepted standards: PPP and Ethernet. PPPoE is a specification for connecting the users on an Ethernet to the Internet through a common broadband medium, such as a single DSL line, wireless device or cable modem. All the users over the Ethernet share a common connection, so the Ethernet principles supporting multiple users in a LAN combine with the principles of PPP, which apply to serial connections. From authentication, accounting and secure access to configuration management, PPPoE supports a broad range of existing applications and services.
PSTN	Public Switched Telephone Network was put into place many years ago as a voice telephone call-switching system. The system transmits voice calls as analog signals across copper twisted cables from homes and businesses to neighborhood COs (central offices); this is often called the local loop. The PSTN is a circuit-switched system, meaning that an end-to-end private circuit is established between caller and callee.
PVC	Permanent Virtual Circuit. A PVC is a logical point-to-point circuit between customer sites. PVCs are low-delay circuits because routing decisions do not need to be made along the way. Permanent means that the circuit is preprogrammed by the carrier as a path through the network. It does not need to be set up or torn down for each session.
RFC	An RFC (Request for Comments) is an Internet formal document or standard that is the result of committee drafting and subsequent review by interested parties. Some RFCs are informational in nature. Of those that are intended to become Internet standards, the final version of the RFC becomes the standard and no further comments or changes are permitted. Change can occur, however, through subsequent RFCs.

SAP	In NetWare, the SAP (Service Advertising Protocol) broadcasts information about available services on the network that other network devices can listen to. A server sends out SAP messages every 60 seconds. A server also sends out SAP messages to inform other devices that it is closing down. Workstations use SAP to find services they need on the network.
Server	A computer, or a software package, that provides a specific kind of service to client software running on other computers.
STP	Twisted-pair cable consists of copper-core wires surrounded by an insulator. Two wires are twisted together to form a pair, and the pair form a balanced circuit. The twisting prevents interference problems. STP (shielded twisted-pair) provides protection against external crosstalk.
Straight through Ethernet cable	A cable that wires a pin to its equivalent pin. This cable connects two dissimilar devices, for example, a data terminal equipment (DTE) and a data communications equipment (DCE) device. A straight through Ethernet cable is the most common cable used.
TCP	Transmission Control Protocol handles flow control and packet recovery and IP providing basic addressing and packet-forwarding services.
Telnet	Telnet is the login and terminal emulation protocol common on the Internet and in UNIX environments. It operates over TCP/IP networks. Its primary function is to allow users to log into remote host systems.
Terminal	A device that allows you to send commands to a computer somewhere else. At a minimum, this usually means a keyboard and a display screen and some simple circuitry.
Terminal Software	Software that pretends to be (emulates) a physical terminal and allows you to type commands to a computer somewhere else.
TFTP	Trivial File Transfer Protocol is an Internet file transfer protocol similar to FTP (File Transfer Protocol), but it is scaled back in functionality so that it requires fewer resources to run. TFTP uses the UDP (User Datagram Protocol) rather than TCP (Transmission Control Protocol).
UDP	UDP is a connectionless transport service that dispenses with the reliability services provided by TCP. UDP gives applications a direct interface with IP and the ability to address a particular application process running on a host via a port number without setting up a connection session.
URL	(Uniform Resource Locator) URL is an object on the Internet or an intranet that resides on a host system. Objects include directories and an assortment of file types, including text files, graphics, video, and audio. A URL is the address of an object that is normally typed in the

	Address field of a Web browser. The URL is basically a pointer to the location of an object.
VCI	A Virtual Channel Identifier is a number that denotes a particular logical connection between end stations (users or networks). See also, VPI.
VPI	A Virtual Path Identifier is a number that denotes a bundle of virtual channels. See also VCI.
WAN	Wide Area Networks link geographically dispersed offices in other cities or around the globe. Just about any long-distance communication medium can serve as a WAN link, including switched and permanent telephone circuits, terrestrial radio systems, and satellite systems.
WWW	(World Wide Web) -- Frequently used (incorrectly) when referring to "The Internet", WWW has two major meanings - First, loosely used: the whole constellation of resources that can be accessed using Gopher, FTP, HTTP, telnet, USENET, WAIS and some other tools. Second the universe of hypertext servers (HTTP servers).

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