

Prestige 642

ADSL Bridge

User's Guide

Version 2.50

(September 2000)

ZyXEL

TOTAL INTERNET ACCESS SOLUTION

ADSL Bridge

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The following Equipment:

Product : ADSL over ISDN Router/Modem
 Model Number : PRESTIGE 642R-13, PRESTIGE 642M-13

RFI Emission: Limit class B according to EN 55022:1994
 Limits class A for harmonic current emission according to EN 61000-3-2:1995
 Limitation of voltage fluctuation and flicker in low-voltage supply system according to EN 61000-3-3:1995

Immunity : Generic immunity standard according to EN 50082-1:1997
 Electrostatic Discharge according to EN 61000-4-2:1995
 Contact Discharge: 4 kV, Air Discharge : 8 kV
 Radio-frequency electromagnetic field according to EN 61000-4-3:1995
 80 – 1000MHz with 1kHz AM 80% Modulation: 3V/m
 Electromagnetic field from digital telephones according to ENV 50204:1995
 900 ±5MHz with 200Hz rep. Frequency, Duty Cycle 50%
 Electrical fast transient/burst according to EN 61000-4-4:1995
 AC/DC power supply: 1kV, Data/Signal lines : 0.5kV
 Surge immunity test according to EN 61000-4-5:1995
 AC/DC Line to Line: 1kV, AC/DC Line to Earth : 2kV
 Immunity to conducted disturbances, Induced by radio-frequency fields: EN 61000-4-6:1995
 0.15 – 80MHz with 1kHz AM 80% Modulation: 3V/m
 Power frequency magnetic field immunity test according to EN 61000-4-8:1993
 3A/m at frequency 50Hz
 Voltage dips, short interruptions and voltage variations immunity test according to EN 61000-4-11:1994
 30% Reduction @ 10ms, 60% Reduction @100ms, >95%Reduction @5000ms

The following importer/manufacturer is responsible for this declaration:

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31.08.2000
 Date

Technical Manager
 Position/ Title
[Signature]
 Legal Signature



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The following Equipment:

Product : ADSL MODEM / Router
Model Number : PRESTIGE 642M-11, PRESTIGE 642M-12,
PRESTIGE 642R-11, PRESTIGE 642R-12

RFI Emission: Limit class A according to EN 50081-1:1992
Limit class A for harmonic current emission according to EN 61000-3-2:1995
Limitation of voltage fluctuation and flicker in low-voltage supply system according to EN 61000-3-3:1995

Immunity : Generic immunity standard according to EN 50082-1:1997
Electrostatic Discharge according to EN 61000-4-2:1995
Contact Discharge: 4 kV, Air Discharge : 8 kV
Radio-frequency electromagnetic field according to EN 61000-4-3:1995
80 - 1000MHz with 1KHz AM 80% Modulation: 3V/m
Electromagnetic field from digital telephones according to ENV 50204:1995
500 ±5MHz with 200Hz rep. Frequency Duty Cycle 50%
Electrical fast transient/burst according to EN 61000-4-4:1995
AC/DC power supply: 1kV, Data/Signal lines : 0.5kV
Surge immunity test according to EN 61000-4-5:1995
AC/DC Line to Line: 1kV, AC/DC Line to Earth: 2kV
Immunity to conducted disturbances, induced by radio-frequency fields: EN 61000-4-6:1995
0.15 - 80MHz with 1KHz AM 80% Modulation: 3V/m
Power frequency magnetic field immunity test according to EN 61000-4-8:1993
3 A/m at frequency 50Hz
Voltage dip, short interruptions and voltage variations immunity test: according to EN 61000-4-11:1994
30% Reduction @ 10ms, 60% Reduction @100ms, >95%Reduction @5000ms

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Name (Full Name)
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Date

ZyXEL European Techn. Support
Position: Title
Manfred Recla
Legal Signature **ZYXEL Communications Services GmbH.**

Thalstasse 125a/2/2/4
A-1160 Wien • AUSTRIA
Tel.: 01 / 494 86 77-0
Fax: 01 / 494 86 78

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Per FCC Part 2 Section 2. 1077(a)



The following equipment:

Product Name : ADSL MODEM/ Router
Trade Name : ZyXEL Communications Corporation
Model Number : PRESTIGE 642M-11, PRESTIGE 642M-12, PRESTIGE 642R-11, PRESTIGE 642R-12

It's herewith confirmed to comply with the requirements of FCC Part 15 Rules.

Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

The result of electromagnetic emission has been evaluated by QuicTek EMC laboratory (NVLAP Lab. Code : 200347-0) and showed in the test report. (Report No. : QTK-003H008F)

It is understood that each unit marketed is identical to the device as tested, and Any changes to the device that could adversely affect the emission Characteristics will require retest.

The following importer / manufacturer is responsible for this declaration:

Company Name : ZyXEL Communications Corp.
Company Address : 1650 Miraloma Avenue Placentia, CA 92870
Telephone : (714) 632-0882 Facsimile : (714) 632-0858

Person is responsible for marking this declaration:

Gordon Yang
Name (Full name)

Vice President
Position / Title

7/10/00
Date


Legal Signature

Federal Communications Commission (FCC) Interference Statement

This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions:

- ◆ This device may not cause harmful interference.
- ◆ This device must accept any interference received, including interference that may cause undesired operations.

This equipment has been tested and found to comply with the limits for a CLASS B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

If this equipment does cause harmful interference to radio/television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Notice 1

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2

Use of shielded RS-232 cables is required to ensure compliance with FCC Part 15, and it is the responsibility of the user to provide and use shielded RS-232 cables.

ZyXEL Limited Warranty

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Please register your Prestige (fast, easy online registration at www.zyxel.com) for free future product updates and information.

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If you have questions about your ZyXEL product(s) or desire assistance, please contact ZyXEL Communications Corporation offices worldwide, in any one of the following ways. Our ftp sites are also available for software and ROM upgrades.

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Preface

About Your ADSL Bridge

Congratulations on your purchase of the Prestige 642 ADSL Bridge.

The Prestige 642 is an ADSL bridge used for Internet access via an ADSL line. It can run upstream maximum rate at 640kbps and downstream rate at 8Mbps. The rate selection depends on the copper category, distance and central side configuration. We will refer to the Prestige 642 as the P642 or simply the Prestige from now on.

The P642's 10/100M auto-negotiating LAN interface enables fast data transfer of either 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.

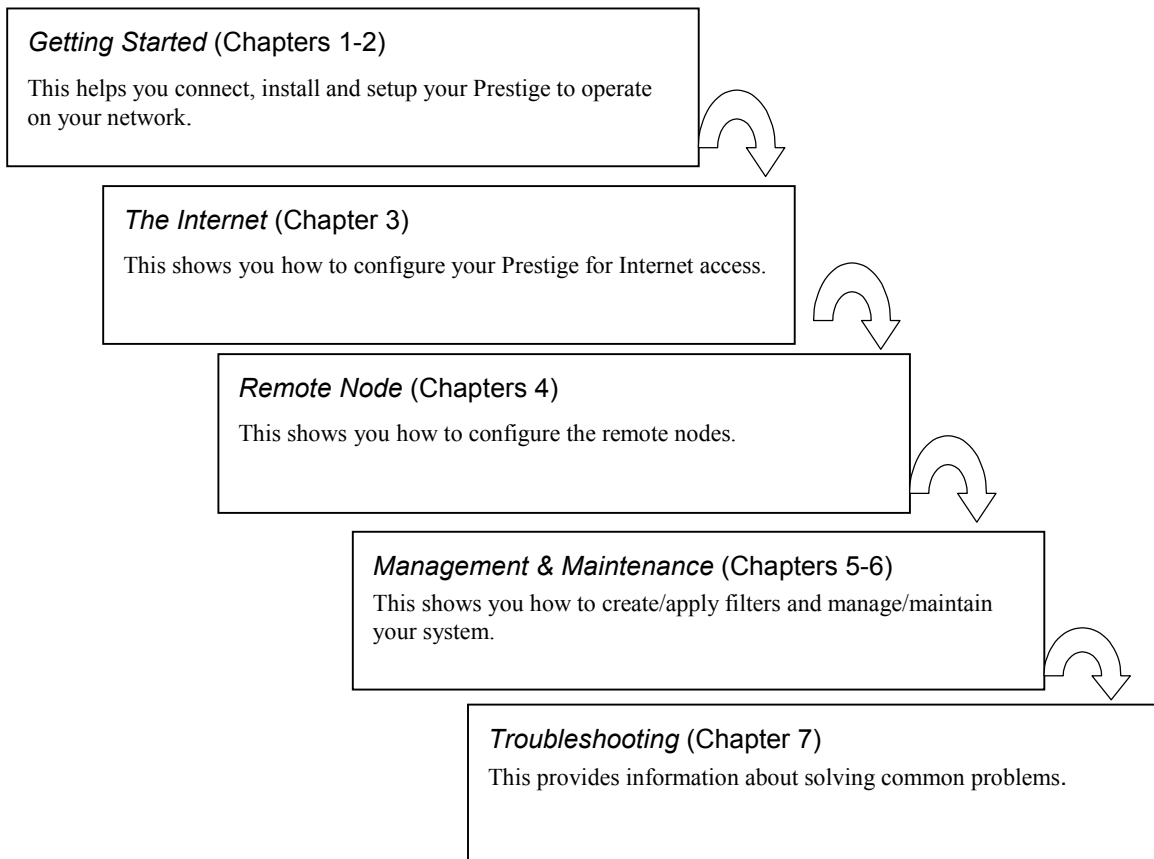
About This User's Guide

This user's guide covers all aspects of the Prestige 642 operations and shows you how to get the best out of the multiple advanced features of your ADSL Internet Access Router using the SMT. It is designed to guide you through the correct configuration of your Prestige 642 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.
- The 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

Structure of this Manual



The following section offers some background information on ADSL. Skip to Chapter 1 if you wish to begin working with your router right away.

What is DSL?

DSL (Digital Subscriber Line) enhances the data capacity of the existing twisted-pair wire that runs between the local telephone company switching offices and most homes and offices. While the wire itself can handle higher frequencies, the telephone switching equipment is designed to cut off signals above 4,000 Hz to filter noise off the voice line, but now everybody is searching for ways to get more bandwidth to improve access to the Web - hence DSL technologies!

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). Asymmetrical services (ADSL) are suitable for Internet users because more information is usually downloaded than uploaded. For example, a simple button click in a web browser can start an extended download that includes graphics and text.

As data rates increase, the carrying distance decreases. That means that users who are beyond a certain distance from the telephone company's central office may not be able to obtain the higher speeds. A DSL connection is a point-to-point dedicated circuit, meaning that the link is always up and there is no dialing required.

What is ADSL?

It is an asymmetrical technology, meaning that the downstream data rate is much higher than the upstream data rate. As mentioned, this works well for a typical Internet session in which more information is downloaded, e.g., from Web servers, than is uploaded. 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.

Chapter 1

Getting to Know Your ADSL Bridge

This chapter describes the key features and applications of the Prestige 642.

1.1 The Prestige 642 ADSL Bridge

Your Prestige integrates a high-speed 10/100Mbps LAN interface and one 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 642

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

- **Ease of Installation**

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

- **High Speed Internet Access**

The P642 ADSL Bridge can support downstream transmission rates of up to 8Mbps and upstream transmission rates of 832 Kbps. The P642 also supports rate management. Rate management allows ADSL subscribers to select an Internet access speed that best suit their needs and budget.

- **10/100Mbps Fast Ethernet LAN Interface**

The P642's 10/100M auto-negotiating LAN interface enables fast data transfer of either 10Mbps or 100Mbps in either half-duplex or full-duplex mode depending on your Ethernet network.

- **Protocols Supported**

- ◆ PPP (Point-to-Point Protocol) Bridge link layer protocol.
- ◆ Transparently bridging for unsupported network layer protocols.

- **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 642 supports VC-based and LLC-based multiplexing.

● Encapsulation

The Prestige 642 supports PPP (RFC 2364 - PPP over ATM Adaptation Layer 5) and RFC 1483 encapsulation over ATM.

● Full Network Management

- ◆ Accessing 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 filtering functions allows added network security and management.

1.3 Applications for the Prestige 642

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 (Digital Subscriber Line Access Multiplexer) 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.

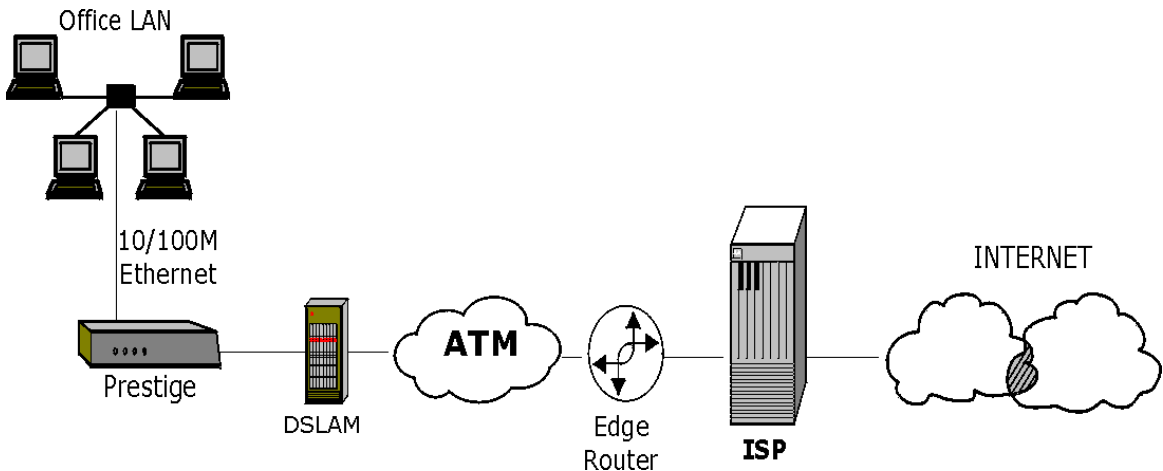


Figure 1-1 Internet Access Application

1.3.2 LAN to LAN Application

You can use the Prestige to connect two geographically dispersed networks over the ADSL line. A typical LAN-to-LAN application for your Prestige is shown as follows.

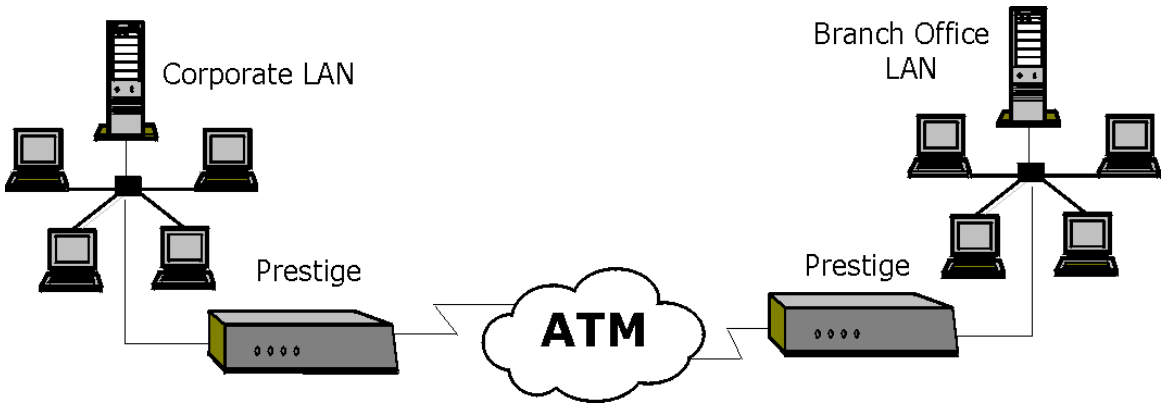


Figure 1-2 LAN-to-LAN Application

Chapter 2

Hardware Installation & Initial Setup

This chapter describes the physical features of the Prestige 642 and how to make the cable connections.

2.1 Front Panel LEDs of the P642

The LED indicators on the front panel indicate the operational status of the Prestige 642. The table below the diagram describes the LED functions:

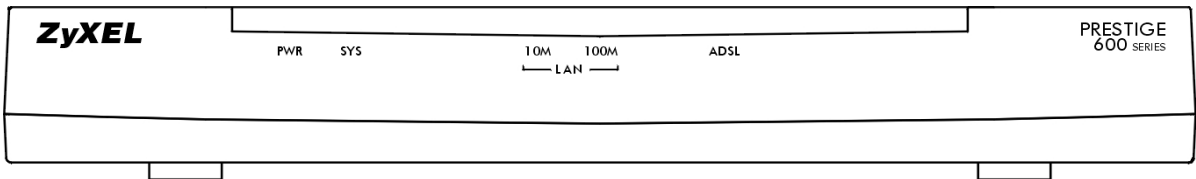


Figure 2-1 Prestige 642 Front Panel.

Table 2-1 Front Panel LED 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 a malfunction. The system is rebooting when the SYS LED is blinking.
LAN 10M	A steady light indicates a 10Mb Ethernet connection. The LED will blink when data is being sent/received.
LAN 100M	A steady light indicates a 100Mb Ethernet connection. The LED will blink when data is being sent/received.
ADSL	The ADSL LED is on when the Prestige is connected successfully to a DSLAM. The LED blinks when data is being sent/received. The LED is off when the link is down.

2.2 Rear Panel and Connections of the P642

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

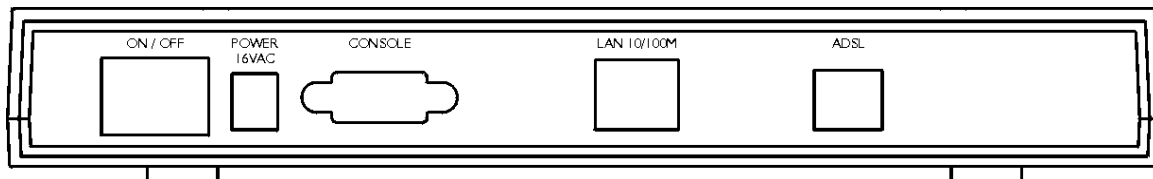


Figure 2-2 Prestige 642 Rear Panel

Step 1. Connecting the ADSL Line

Connect the Prestige directly to the wall jack using the included ADSL cable. Connect the micro filter(s) (supplied – see Figure 2-4 Connecting a 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 Workstation to the Prestige 10/100M LAN 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 the crossover cable (red tag) to connect your Prestige 642 to a computer directly. Use 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 NIC on the workstation.

Step 3. Connecting the Power Adapter to your Prestige

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

Step 4. Connecting the Console Port

For the initial configuration of your Prestige, you need to use terminal emulator software on a workstation and connect it to the Prestige through the console port. Connect the 9-pin end of the console cable (9-pin to 25-pin console cable supplied) to the console port of the Prestige and the 25-pin end to a serial port (COM1, COM2 or other COM port) of your workstation. You can use an extension RS-232 cable if the enclosed one is too short.

2.3 Additional Installation Requirements

In addition to the contents of your package, there are other hardware and software requirements you need before you can install and use your Prestige. These requirements include:

- A computer with Ethernet 10Base-T/100Base-T NIC (Network Interface Card).
- A computer equipped with communications software (for example, Hyper Terminal in Win95) configured to the following parameters:
 - VT100 terminal emulation.
 - 9600 Baud rate.

- No parity, 8 Data bits, 1 Stop bit.
- Flow Control set to None

After the Prestige has been successfully connected to your network, you can make future changes to the configuration through telnet application.

2.4 Connecting a POTS Splitter

This is for the P642's following the Full Rate (G.dmt) standard only. 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 them 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 purchase of a POTS splitter is optional.

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 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 is easy to install as shown in the following figure.

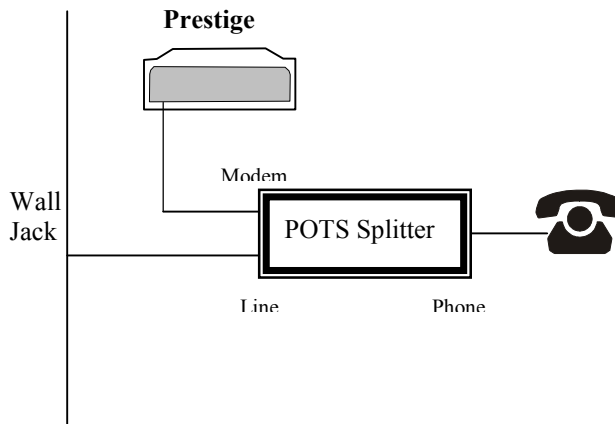


Figure 2-3 Connecting a POTS Splitter

- Step 1.** Connect the side labeled “Phone” to your telephone.
- Step 2.** Connect the side labeled “Modem” to your Prestige.
- Step 3.** Connect the side labeled “Line” to the telephone wall jack.

2.5 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. A microfilter acts as a low-pass filter, for your telephone, to ensure that ADSL transmissions do not interfere with your telephone voice transmissions. . The purchase of a telephone microfilter is optional.

- 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.

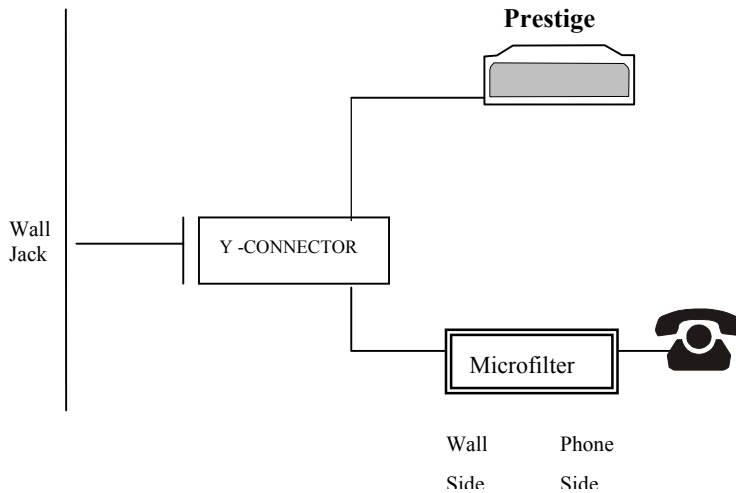


Figure 2-4 Connecting a Microfilter

2.6 Special Note for P642 ISDN Users

Please note that section 2.4 “**Connecting a POTS Splitter**” and sections 2.5 “**Telephone Microfilters**” of the P642 User’s Guide do **not** apply for P642 ISDN users.

The following is an example installation for the P642 with ISDN.

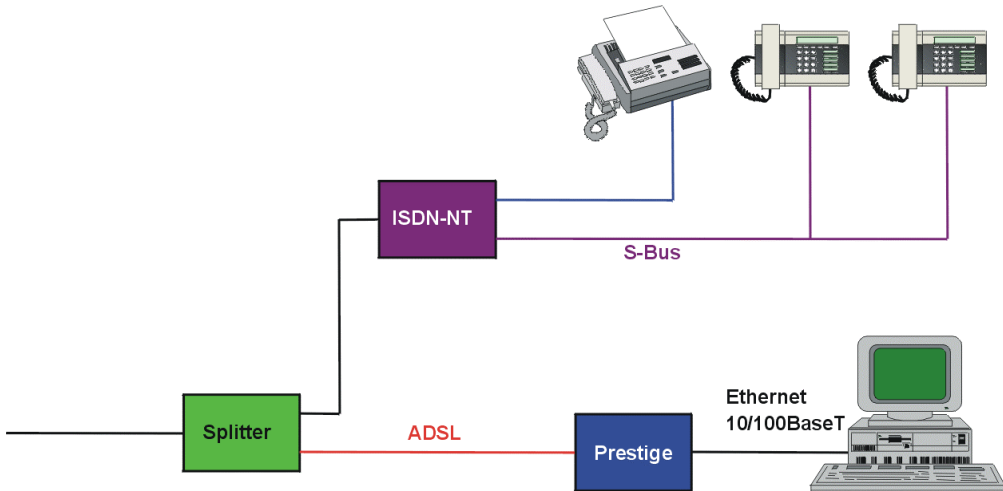


Figure 2-5 P642 with ISDN

2.7 Power Up Your Prestige

At this point, you should have connected the console port, the ADSL line, the Ethernet port and the power port to the appropriate devices or lines. You can now apply power to the Prestige by turning the switch on.

Step 1. Initial Screen

When you power on your Prestige, it performs several internal tests as well as line initialization. After the initialization, the Prestige asks you to press **Enter** to continue, as shown.

```
Copyright (c) 1994 - 2000 ZyXEL Communications Corp.
initialize ch =0, ethernet address: 00:a0:c5:01:23:45
WAN Channel init.....done
Loading ADSL modem F/W
.....done
Press ENTER to continue...
```

Figure 2-6 Power-On Display

Step 2. Entering Password

The login screen appears after you press Enter, 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 a (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 and will display a blank screen. If you see a blank screen, press [Enter] to bring up the login screen again.

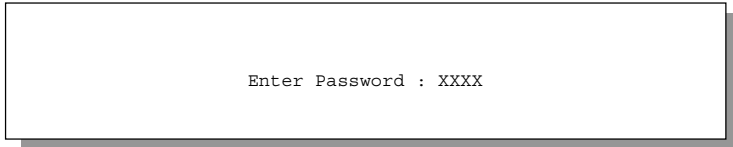


Figure 2-7 Login Screen

2.8 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 table below.

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 toggle	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.

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

```
Copyright (c) 1994 - 2000 ZyXEL Communications Corp.
Prestige 642 Main Menu

Getting Started
3. TCP/IP Ethernet Setup
4. Internet Access Setup

Advanced Applications
11. Remote Node Setup

Advanced Management
21. Filter Set Configuration
23. System Password
24. System Maintenance

99. Exit

Enter Menu Selection Number:
```

Figure 2-8 SMT Main Menu

2.8.1 System Management Terminal Interface Summary

Table 2-3 Main Menu Summary

#	Menu Title	Description
3	TCP/IP Ethernet Setup	Use this menu to set up your LAN connection.
4	Internet Access Setup	A quick and easy way to set up an Internet connection.
11	Remote Node Setup	Use this menu to set up the Remote Node for LAN-to-LAN connection, including Internet connection.
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 system status, diagnostics, software upload, etc.
99	Exit	To exit from SMT and return to a blank screen.

2.9 Changing the System Password

The first thing you should do before anything else 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 below.
- Step 2.** When the Submenu 23 System Password appears, type in your existing system password, i.e., 1234, and press [Enter].

```
Menu 23 - System Password

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

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

Figure 2-9 Menu 23.1 - System Password

- Step 3.** Enter your new system password (up to 30 characters), and press [Enter].
- Step 4.** 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.

2.10 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= P642
Location= branch
Contact Person's Name= JohnDoe

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

Figure 2-10 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.	P642
Location (optional)	Enter the geographic location (up to 31 characters) of your Prestige.	MyHouse
Contact Person's Name (optional)	Enter the name (up to 30 characters) of the person in charge of this Prestige.	JohnDoe

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).

These parameters should work for the majority of installations. If you wish to change 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 houses on a street that share a common street name, the machines on a LAN share one common network number, also.

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.

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 do otherwise.

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 assigned from 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.

Note: 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*.

3.3 TCP/IP Ethernet Setup

You will now use Menu 3 to configure your Prestige for TCP/IP.

To edit Menu 3, enter 3 to open the **Menu 3 - TCP/IP Setup** from the Main Menu.

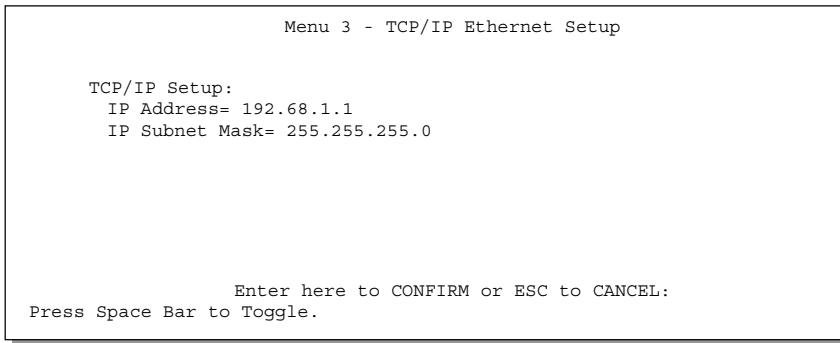


Figure 3-1 Menu 3 - TCP/IP Ethernet Setup

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

Table 3-1 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)
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 LANs & WANs

A LAN (Local Area Network) is a computer network limited to the immediate area, usually the same building or floor of a building. A WAN (Wide Area Network), on the other hand is an outside connection to another network or the Internet.

3.4.1 LANs, WANs and the Prestige

The actual physical connection determines whether the Prestige ports are LAN or WAN ports. There are two separate IP networks, one inside, the LAN network; the other outside, the WAN network as shown next.

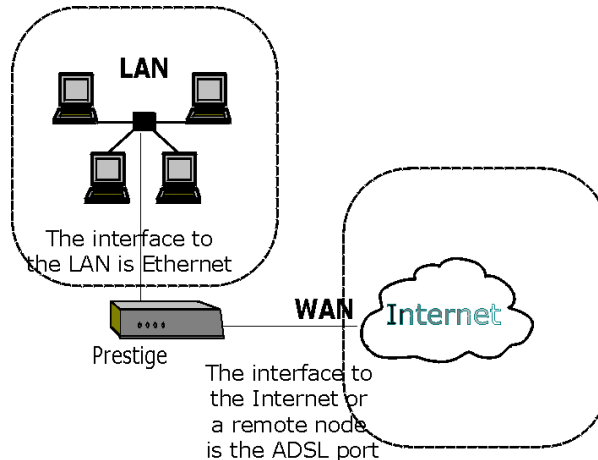


Figure 3-2 LAN & WAN

3.5 VPI & VCI

Be sure to use the correct Virtual Path Identifier (VPI) and Virtual Channel Identifier (VCI) numbers supplied by the 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 VPI & VCI in Appendix B for more information.

3.6 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.

3.6.1 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.

3.6.2 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.

3.7 Encapsulation

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

3.7.1 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.

3.7.2 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.

3.8 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 then the only ISP information you need is a login name and password.

Table 3-2 Internet Account Information

Internet Account Information	Write your account information here
Telephone Company Information	
VPI (Virtual Path Identifier)	—
VCI (Virtual Channel Identifier)	—
ISP Information	
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 displayed below. The following table contains instructions on how to configure your Prestige for Internet access.

```

Menu 4 - Internet Access Setup

ISP's Name= myISP
Encapsulation= RFC 1483
Multiplexing= LLC-based
VPI #= 0
VCI #= 33
My Login= N/A
My Password= N/A

Press ENTER to confirm or ESC to cancel:

```

Get this information from the telephone company. Get the other information from your ISP.

Figure 3-3 Internet Access Setup

Table 3-3 Internet Access Setup Menu Fields

Field	Description	Options/E.G.
ISP's Name	Enter the name of your Internet Service Provider, e.g., myISP. This information is for identification purposes only.	e.g., MyISP
Encapsulation	Press the spacebar to select the method of encapsulation used by your ISP. Please see section 3.7 for related information.	PPP RFC 1483
Multiplexing	Press the [Space Bar] to select the method of multiplexing used by your ISP - either VC-based or LLC-based .	VC-based LLC-based
VPI #	Enter the Virtual Path Identifier (VPI) that the telephone company gives you.	e.g., 0
VCI #	Enter the Virtual Channel Identifier (VCI) that the telephone company gives you.	e.g., 33
My Login	Enter the login name that your ISP gives you.	e.g., tarbuck
My Password	Enter the password associated with the login name above.	*****

Chapter 4

Remote Node Configuration

In this chapter, we discuss how to configure a remote node.

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

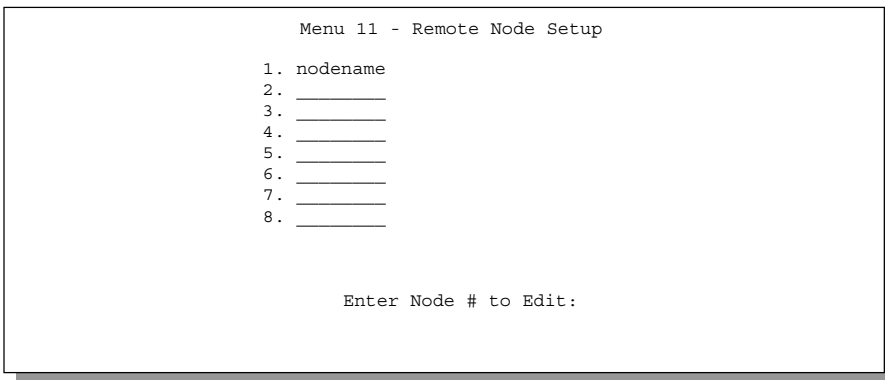
This section describes the protocol-independent parameters for a remote node.

4.1.1 Remote Node Profile

To configure a remote node, follow these steps:

Step 1. From the Main Menu, select menu option **1. 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. nodename
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 as described in the table that follows to define this remote profile. The Remote Node Profile Menu Fields table shows how to configure the Remote Node Menu.

4.1.2 Encapsulation & Multiplexing Scenarios

For Internet Access you should use the encapsulation and multiplexing methods used by your ISP. For a LAN-to-LAN application, e.g., branch office and corporate headquarters, prior mutual agreement on methods used is necessary 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. Here are some examples of combinations.

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 uses is unneeded. The **PPP** protocol already contains this information.

Scene 2. One VC, One Protocol (IP)

Select **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= nodename      Bridge:
Active= Yes                  Ethernet Addr Timeout(min)= 0
                              VPI #= 1
                              VCI #= 35

Encapsulation= RFC 1483
Multiplexing= VC-based
Incoming:                    Filter Sets:
  Rem Login=                  Input Device Filters=
  Rem Password=*****        Output Device Filters=

Outgoing:
  My Login= oscar
  My Password= *****
  Authen= CHAP/PAP

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

Enter a unique name of less than 8 characters for the remote name.

Figure 4-2 Menu 11.1 Remote Node Profile

Table 4-1 Remote Node Profile Menu Fields

Field	Description	Options
Rem Node Name	This is a required field ([?]). Enter a descriptive name for the remote node, for example, Corp. This field can be up to eight characters. This name must be unique from any other remote node name.	
Active	Press the spacebar to toggle between Yes and No . Inactive nodes are displayed with a minus sign (-) at the beginning of the name in Menu 11.	Yes/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, Edit PPP Options and Authen fields will not be applicable (N/A).	PPP, RFC 1483
Multiplexing=	Press the spacebar to the select the multiplexing method.	VC-based 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.	
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.	
My Password	Enter the password for your Prestige when it calls this remote node.	
Authen	This field sets the authentication protocol used for outgoing calls. Options for this field are: <ul style="list-style-type: none"> ● 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 CHAP PAP

Field	Description	Options
<p>Bridge</p> <p>Ethernet Addr Timeout (min)</p> <p>VPI#</p> <p>VCI#</p>	<p>In this field, enter the time (number of minutes) that you wish your Prestige 642 to retain the Ethernet Addr information in its internal tables while the line is down. If this information is retained, your Prestige 642 will not have to recompile the tables when the line is brought back up.</p> <p>Select a different PVC by changing the VPI, VCI numbers. Enter the Virtual Path Identifier (VPI) number for this PVC.</p> <p>Enter the Virtual Channel Identifier (VCI) number for this PVC.</p>	
<p>Filter Sets:</p> <p>Input Device Filters=</p> <p>Output Device Filters=</p>	<p>Specify the filter set(s) to apply to the incoming and outgoing traffic between this remote node and the Prestige. You can specify up to 4 filter sets separated by comma, e.g., 1, 5, 9, 12, in each filter field. The default is no filters. Note that spaces are accepted in this field. For more information on defining the filters, see the chapter on <i>Filter Configuration</i>.</p> <p>Specify the incoming filter sets here.</p> <p>Specify the outgoing filter sets here.</p>	
<p>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.</p>		

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. The P642 ADSL Bridge has device filters only. The device filters are applied to the raw packets that appear on the wire. They are applied at the point when the Prestige is receiving and sending the packets; i.e. the interface. The interface can be an Ethernet, or any other hardware port.

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. 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.

The following diagram illustrates the logic flow when executing a filter rule.

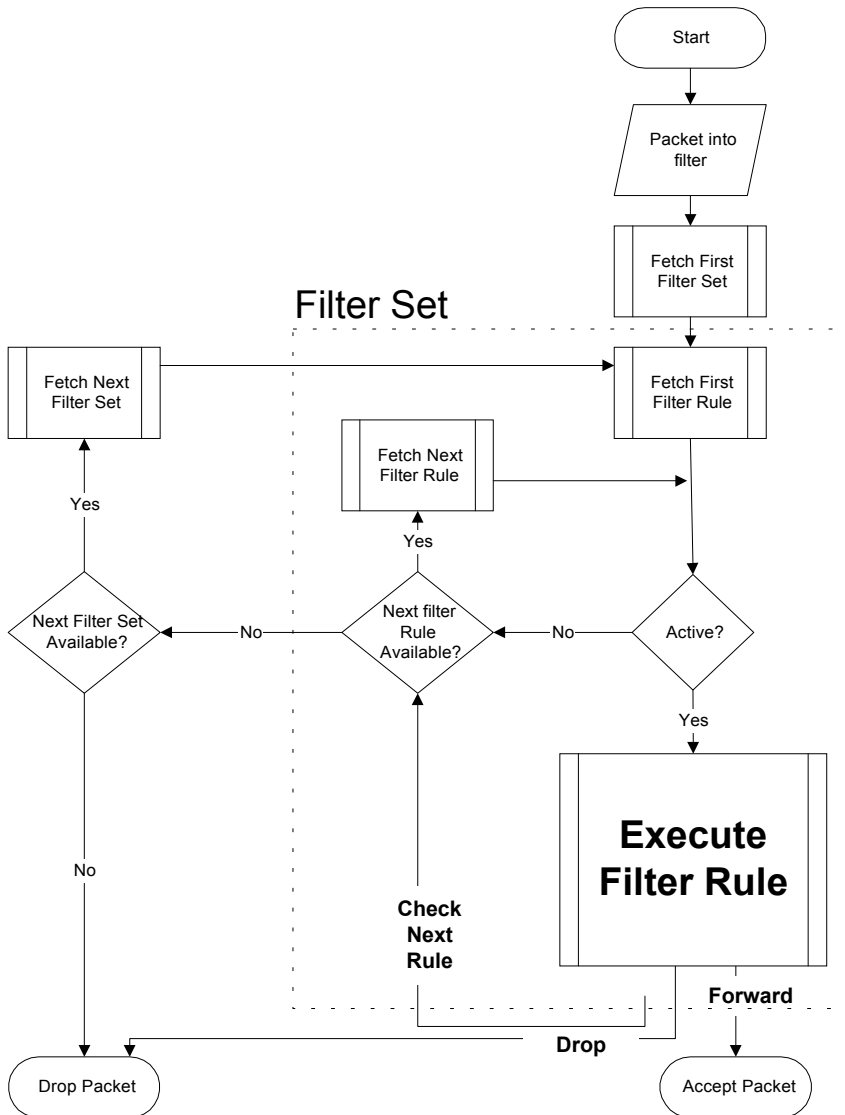


Figure 5-1 Filter Rule Process

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 sets, follow this procedure:

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

Figure 5-2 Menu 21 - Filter Set Configuration

```

Menu 21 - Filter Set Configuration

Filter          Filter
Set #          Set #
-----          -----
1             7
2             8
3             9
4             10
5             11
6             12

Comments          Comments
-----          -----
test              _____
                 _____
                 _____
                 _____
                 _____
                 _____

Enter Filter Set Number to Configure=
Edit Comments= test
Press ENTER to CONFIRM or ESC to CANCEL:

```

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.

```

Menu 21.1 - Filter Rules Summary
# A Type          Filter Rules          M m n
-----
1 Y Gen  Off=128, Len=4, Mask=789abcde, Value=789abcde      N F D
2 N
3 N
4 N
5 N
6 N

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

```

Figure 5-3 Filter Rules Summary

5.2.1 Filter Rules Summary Menu

This 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.

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

Abbreviations	Description	Display
#	Refers to the filter rule number (1-6).	
A	Refers to Active.	[Y] means the filter rule is active. [N] means the filter rule is inactive.
Type	Refers to the type of filter rule. This shows GEN for generic, meaning device filter rule.	[GEN] for Generic
Filter Rules	The filter rule parameters are displayed here (see below).	
M	Refers to More. [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.	[Y] [N]

Abbreviations	Description	Display
	[N] means you can now specify an action to be taken i.e., forward the 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 protocol dependent filter rules abbreviation are listed as follows:

- If the filter type is GEN (generic, i.e., device), the following abbreviations listed in the following table will be used.

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.

There is one type of filter rule, **Device** for the P642 ADSL Bridge.

5.3.1 Generic Filter Rule

This section shows you how to configure a generic filter rule.

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.

To configure a generic rule, select Generic Filter Rule in the Filter Type field and press Enter to open **Menu 21.1.2 - Device Filter Rule**, as shown next.

```

Menu 21.1.2 - Generic Filter Rule

Filter #: 1,1
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 5-4 Menu 21.1.2 - 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	Option
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.	
Active	Select Yes to turn on the filter rule.	Yes/No
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.	Default = 0
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.	Default = 0
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; else 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 / N/A
Log	Select the logging option from the following:	

Field	Description	Option
	<ul style="list-style-type: none"> ● None – No packets will be logged. ● Action Matched - Only packets that match the rule parameters will be logged. ● Action Not Matched - Only packets that do not match the rule parameters will be logged. ● Both – All packets will be logged. 	<p>None</p> <p>Action Matched</p> <p>Action Not Matched</p> <p>Both</p>
Action Matched	Select the action for a matching packet.	<p>Check Next Rule</p> <p>Forward</p> <p>Drop</p>
Action Not Matched	Select the action for a packet not matching the rule.	<p>Check Next Rule</p> <p>Forward</p> <p>Drop</p>

Once you have completed filling in Menu 21.1.2 – 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.

5.4 Example Filter

Let's look at an example filter. Please see our supporting disk for more example filters.

- Step 1.** Enter **21** from the Main Menu to open **Menu 21 - Filter Set Configuration**.
- Step 2.** Enter the index of the filter set you wish to configure (in this case, 1) and press [ENTER].
- Step 3.** Enter a descriptive name or comment in the **Edit Comments** field (in this case test) and press [ENTER].
- Step 4.** Press [ENTER] at the message: [Press ENTER to confirm] to open **Menu 21.1 - Filter Rules Summary**.
- Step 5.** Enter **1** to configure the first filter rule (the only filter rule of this set). Make the entries in this menu as shown in the following figure.

Menu 21.1.1 - Generic Filter Rule
Filter #: 1,1
Active= Yes
Offset= 128
Length= 4
Mask= 789abcde
Value= 789abcde
More= No Log= Action Matched
Action Matched= Forward
Action Not Matched= Drop

Press ENTER to Confirm or ESC to Cancel:

There are no more rules to check in this filter set.

Select **Forward** here so that the packet will be forwarded if the action is matched.

Select **Drop** here so that the packet will be dropped if the action is not matched.

This setting logs all packets that match these rule parameters

Select **Yes** to make the rule active.

This is the first byte of the data portion in the packet that you want to compare.

This is the length (in bytes) of the data portion in the packet that you want to compare.

The Mask is applied to the data portion before comparing the result against the Value to determine a match. It is specified in hexadecimal, and it takes two hexadecimal digits to represent a byte i.e., Length is 4, therefore there are 8 hex numbers.

Enter the value (in hex) to compare with the data portion.

Figure 5-5 Example Filter - Menu 21.1.1

When you press [ENTER] to confirm, you will see the following screen. Note that there is only one filter rule in this set.

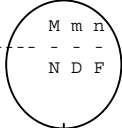
```

Menu 21.3 - Filter Rules Summary

# A Type                               Filter Rules
-----
1 Y Gen  Off=128, Len=4, Mask=789abcde, Value=789abcde
2 N
3 N
4 N
5 N
6 N

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

```



This shows you what you configured in the previous menu.

M = N means an action can be taken immediately. The action is to drop the packet (**m = D**) if the action is matched and to forward the packet immediately (**n = F**) if the action is not matched no matter whether there are more rules to be checked (there aren't in this example).

Figure 5-6 Example Filter Rules Summary - Menu 21.3

After you've created the filter set, you must apply it.

5.5 Applying a Filter

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

5.5.1 Remote Node Filters

Go to Menu 11.1 (shown next) 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= nodename      Bridge:
Active= Yes                  Ethernet Addr Timeout(min)= 0
                              VPI #= 1
                              VCI #= 35

Encapsulation= RFC 1483
Multiplexing= VC-based
Incoming:
  Rem Login=
  Rem Password=*****
Outgoing:
  My Login= oscar
  My Password= *****
  Authen= CHAP/PAP

Filter Sets:
  Input Device Filters=
  Output Device Filters=

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

Apply a filter by entering the filter set number here.

Figure 5-7 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 updates on system status, port status, log and trace capabilities 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 0 222 211 2:15:16
2 N/A 0 0 0 0 0 0:00:00
3 N/A 0 0 0 0 0 0:00:00
4 N/A 0 0 0 0 0 0:00:00
5 N/A 0 0 0 0 0 0:00:00
6 N/A 0 0 0 0 0 0:00:00
7 N/A 0 0 0 0 0 0:00:00
8 N/A 0 0 0 0 0 0:00:00

Ethernet:                               WAN:
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:
CMDS: 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 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.
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.

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:
Routing: BRIDGE
ZyNOS F/W Version: V.250(V.00M)b02 | 3/3/2000
ADSL Chipset Vendor: Alcatel, Version 1.5.2
ANSI Version: ANSI Issue 2

LAN

Ethernet Address:00:a0:c5:02:34:56
IP Address: 192.168.1.1
IP Mask: 255.255.255.0
DHCP: None

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	This field is BRIDGE only for this model.
ZyNOS F/W Version	Refers to the ZyNOS (ZyXEL Network Operating System) firmware version and date created. Note that M refers to Modem. ZyNOS is a registered trademark of ZyXEL Communications Corporation.
ADSL Chipset Vendor	Displays the vendor of the ADSL chipset and ADSL bridge software version.
ANSI Version	Refers to the ANSI Version.
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 is None only for this model.

6.1.1 Console Port Speed

You can change the speed of the console port through **Menu 24.2.2 – Console Port Speed**. Your Prestige supports 9600 (default), 19200, 38400, 57600, and 115200 bps for the console port. Use the space bar to select the desired speed in Menu 24.2.2, as shown in the following figure.


```
Menu 24.2.2 - System Maintenance - Console Port Speed

Console Port Speed: 115200

Press ENTER to Confirm or ESC to Cancel:
Press Space Bar to Toggle.
```

Figure 6-5 Menu 24.2.2 - System Maintenance - Console Port Speed

6.2 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.

```
Menu 24.4 - System Maintenance - Diagnostic

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

TCP/IP
 12. Ping Host

Enter Menu Selection Number:

Host IP Address= N/A
```

Figure 6-6 Menu 24.4 - System Maintenance - Diagnostic

Follow the procedure below to get to Diagnostic

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 reboots 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.

6.3 Filename conventions

The configuration file (often called the romfile or romfile-0) contains the factory default settings in the menus such as password, DHCP Setup, TCP/IP Setup etc. It arrives from ZyXEL with a name of P642.ROM or similar. Once you have customized the Prestige's setting, they can be saved back to PC/workstation under a filename of your choosing. Choose something meaningful, e.g. "MyP642.cfg".

The ZyNOS firmware file (sometimes referred to as the ras file) is the file that contains the ZyXEL Network Operating System firmware and usually is the router model name with a *.bin extension, e.g., P642.bin.

With serial (xmodem) transfer, the filenames on the PC are your choice. With many ftp and tftp clients, they are as well as seen next.

```
ftp> put P642.bin ras
```

This is a sample ftp session showing the transfer of the PC file "P642.bin" to the Prestige.

```
ftp> get rom-0 MyP642.cfg
```

This is a sample ftp session saving the current configuration to the PC file MyP642.cfg.

If your [t]ftp client does not allow you 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, i.e., on your workstation, local network or ftp site and so the name (but not the extension) will vary. The AT command is the command you enter after you press "Y" when prompted in the SMT menu to go into debug mode. After uploading new firmware see the **ZyNOS F/W Version** field in **Menu 24.2.1** (*Figure 6-4*) to check you have uploaded the correct firmware.

Table 6-4 Filename Conventions

File Type	Internal Name	External Name	Description	AT Command
Configuration File	Rom-0	*.rom	This is the device 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 baud rate and default password), the error log and the trace log.	ATLC
Firmware	Ras	*.bin	This is the Device name for the ZyNOS firmware on the Prestige.	ATUR

6.3.1 Resetting the Prestige

If you have forgotten your password or for some reason cannot access the SMT menu you will need to reinstall the configuration file. Uploading the configuration file replaces the current configuration file with the default configuration file, you will lose all configurations that you had before and the speed of the console port will be reset to the default of 9600bps with 8 data bit, no parity and 1 stop bit (8n1). The password will be reset to the default of 1234, also.

Turn off the Prestige and begin a Telnet session with the default console port settings. Turn on the Prestige again. When you see the message "Press Any key to enter Debug Mode within 3 seconds", press any key to enter debug mode. You should already have downloaded the correct file from your nearest ZyXEL FTP site. *See section 6.5 Restore Configuration* on page 6-8 for more information on how to transfer the configuration file to your Prestige.

6.4 Backup Configuration

Option 5 in **Menu 24 - System Maintenance** allows you to backup the current Prestige configuration to your workstation. Backup is highly recommended once your Prestige is functioning properly.

You must perform the backup and restore through the console port. Any serial communications program should work fine; however, you must use XMODEM protocol to perform the download/upload.

Step 1. Go to Menu 24.5 (shown next).

```
Ready to backup Configuration via Xmodem.  
Do you want to continue (y/n):
```

Figure 6-7 Backup Configuration

Step 2. Press “Y” to indicate that you want to continue. The following procedure is for the HyperTerminal program. The procedure for other serial communications programs should be similar. Click “Transfer”, then “Receive File” to display the following screen.

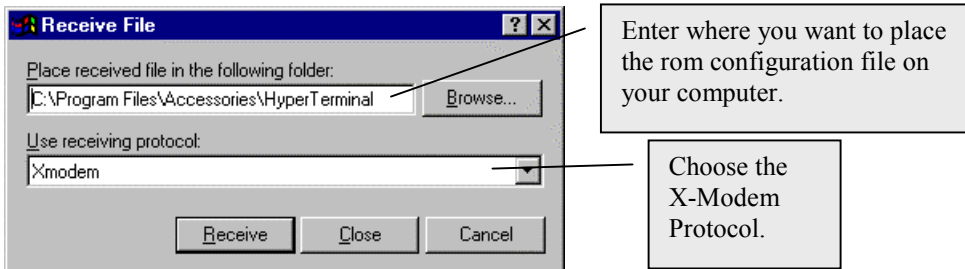


Figure 6-8 HyperTerminal Screen

Step 3. Enter where you want to place the rom configuration file on your computer, give it a suitable name, e.g., p642.rom (see section 6.3 *Filename conventions*) and make sure you choose the X-Modem Protocol. Then press “Receive”.

Step 4. After a successful backup you will see the following screen. Press any key to return to the SMT menu.

```
** Backup Configuration completed. OK.  
### Hit any key to continue.###
```

Figure 6-9 Successful Backup

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

6.5 Restore Configuration

Selecting option 6 from **Menu 24 - System Maintenance** to restore the configuration from your workstation to the Prestige. Again, you must use the console port and XMODEM protocol to restore the configuration.

Step 1. Go to Menu 24.6 (shown next).

```
Ready to restore Configuration via Xmodem.
Do you want to continue (y/n):
```

Figure 6-10 Restore Configuration

- Step 2.** Press “Y” to indicate that you want to continue. The following procedure is for the HyperTerminal program. The procedure for other serial communications programs should be similar.
- Step 3.** Click “Transfer”, then “Send File” to display the following screen.

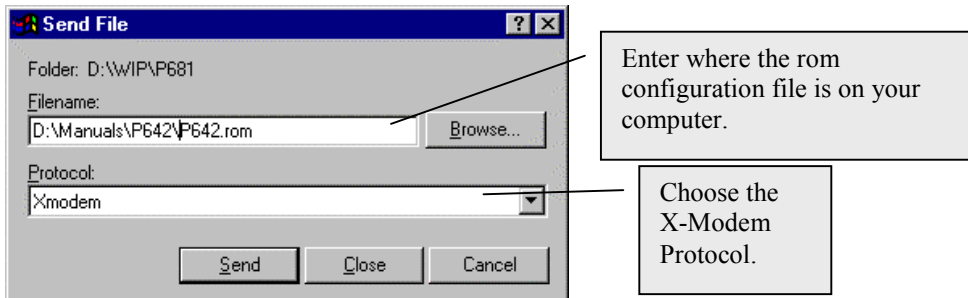


Figure 6-11 HyperTerminal Screen

- Step 4.** Enter where the rom configuration file is on your computer, and make sure you choose the X-Modem Protocol. Then press “Send”.
- Step 5.** After a successful restoration you will see the following screen. Press any key to return to reboot the system.

```
Save to ROM
Hit any key to start system reboot.
```

Figure 6-12 Successful Backup

Keep in mind that the configuration is stored in the flash ROM in the Prestige, so even if power failure should occur, your configuration is safe.

6.6 Upload Firmware

Menu 24.7 – System Maintenance - Upload Firmware allows you to upgrade the firmware and the configuration file via the console port. Note that this function erases the old data before installing the new one; please do not attempt to update unless you have the new firmware at hand. There are 2 components in the system: the router firmware and the configuration file, as shown below.

```
Menu 24.7 -- System Maintenance - Upload Firmware
  1. Upload System Firmware
  2. Upload System Configuration File

Enter Menu Selection Number:
```

Figure 6-13 Menu 24.7 - System Maintenance - Upload Firmware

6.6.1 Upload System Firmware

The firmware is the program that controls the functions of the Prestige. Menu 24.7.1 shows you the instructions for uploading the firmware. If you answer yes to the prompt, the Prestige will go into debug mode. Follow the procedure below to upload the firmware:

1. Enter “atur” after the “Enter Debug Mode” message.
2. Wait for the “Starting XMODEM upload” message before activating Xmodem upload on your terminal.
3. After successful firmware upload, enter “atgo” to restart the Prestige.

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

To upload system firmware:
  1. Enter "y" at the prompt below to go into debug mode.
  2. Enter "atur" after "Enter Debug Mode" message.
  3. Wait for "Starting XMODEM upload" message before activating
     Xmodem upload on your terminal.
  4. After successful firmware upload, enter "atgo" to restart the
     system.

Warning: Proceeding with the upload will erase the current router
firmware.

Do You Wish To Proceed: (Y/N)
```

Figure 6-14 Menu 24.7.1 - Upload System Firmware

6.6.2 Uploading System Configuration File

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.

Menu 24.7.2 shows you the instructions for uploading the configuration file. If you answer yes to the prompt, the Prestige will go into debug mode. Follow the procedure below to upload the configuration file:

1. Enter "atlc" after the "Enter Debug Mode" message.
2. Wait for the "Starting XMODEM upload" message before activating Xmodem upload on your terminal.
3. After successful firmware upload, enter "atgo" to restart the Prestige.

If you replace the current configuration file with the default configuration file, i.e., P642.rom, you will lose all configurations that you had before and the speed of the console port will be reset to the default of 9600 bps with 8 data bit, no parity and 1 stop bit (8n1). You will need to change your serial communications software to the default before you can connect to the Prestige again. The password will be reset to the default of 1234, also.

```

Menu 24.7.2 - System Maintenance - Upload System Configuration File

To upload system configuration file:
1. Enter "y" at the prompt below to go into debug mode.
2. Enter "atlc" after "Enter Debug Mode" message.
3. Wait for "Starting XMODEM upload" message before activating
Xmodem upload on your terminal.
4. After successful firmware upload, enter "atgo" to restart the
system.

Warning:
1. Proceeding with the upload will erase the current
configuration file.
2. The system's console port speed (Menu 24.2.2) may change when
it is restarted; Please adjust your terminal's speed accordingly. The
password (menu 23) may change also.
3. When uploading the DEFAULT configuration file, the console port speed
will be reset to 9600 bps and the password to "1234".

Do You Which To Proceed:(Y/N)

```

Figure 6-15 Menu 24.7.2 - System Maintenance - Upload System Configuration File

6.7 TFTP Transfer

In addition to the direct console port connection, 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 workstation must have both telnet and TFTP clients. To transfer the firmware and the configuration file, follow the procedure below:

- Step 1.** Use telnet from your workstation 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 workstation 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 workstation. The file name for the firmware is “`ras`” and for the configuration file, is “`rom-0`” (rom-zero, not capital o).

When you upload the firmware to the Prestige, it will reboot automatically when the file transfer is completed (the SYS LED will flash).

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 workstation, “`put`” the other way around, and “`binary`” to set binary transfer mode.

6.7.1 Example TFTP Command

The following is an example tftp command:

```
TFTP [-i] host put p642.bin ras
```

where “`i`” specifies binary image transfer mode (use this mode when transferring binary files), “`host`” is the Prestige IP address, “`put`” transfers the file source on the workstation (p642.bin – name of the firmware on the workstation) to the file destination on the remote host (ras - name of the firmware on the Prestige).

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

Table 6-5 Third Party TFTP Clients - General fields

Host	Enter the IP address of the Prestige. 192.168.1.1 is the Prestige default IP address when shipped.
Send/Fetch	Press "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.

6.8 Command Interpreter Mode

This option allows you to enter the command interpreter mode. A list of valid commands can be found by typing [help] at the command prompt. For more detailed information, check the ZyXEL Web site or send e-mail to the ZyXEL Support Group.

```

Enter Menu Selection Number: 8

Copyright (c) 1994 - 2000 ZyXEL Communications Corp.
ras> ?
Valid commands are:
sys                exit                device            ether
wan                ip                ppp              bridge
hdap

```

Figure 6-16 Command mode

6.9 Boot module commands

Prestige boot module commands with accompanying explanations are shown in the following table. For ATBAx, x denotes the number preceding the colon to give the console port speed following the colon in the list of numbers that follows; e.g. ATBA3 will give a console port speed of 9.6 Kbps. ATSE displays the seed that is used to generate a password to turn on the debug flag in the firmware. The ATSH command shows product related information such as boot module version, vendor name, product model, RAS code revision, etc.

```

===== Debug Command Listing =====

AT                just answer OK
ATHE              print help
ATBAx             change baudrate. 1:38.4k, 2:19.2k, 3:9.6k 4:57.6k 5:115.2k
ATENx,(y)         set BootExtension Debug Flag (y=password)
ATSE              show the seed of password generator
ATTI(h,m,s)       change system time to hour:min:sec or show current time
ATDA(y,m,d)       change system date to year/month/day or show current date
ATDS              dump RAS stack
ATDT              dump Boot Module Common Area
ATDUx,y           dump memory contents from address x for length y
ATWBx,y           write address x with 8-bit value y
ATWWx,y           write address x with 16-bit value y
ATWLx,y           write address x with 32-bit value y
ATRBx             display the 8-bit value of address x
ATRWx             display the 16-bit value of address x
ATRLx             display the 32-bit value of address x
ATGO(x)           run program at addr x or boot router
ATGR              boot router
ATGT              run Hardware Test Program
AT%Tx            Enable Hardware Test Program at boot up
ATBTx             block0 write enable (1=enable, other=disable)

ATLC              upload router configuration file to flash ROM

< press any key to continue >
ATUXx(,y)         xmodem upload from flash block x to y
ATERx,y           erase flash rom from block x to y
ATWFx,y,z         copy data from addr x to flash addr y, length z
ATXSx            xmodem select: x=0: CRC mode(default); x=1: checksum mode
ATLOa,b,c,d      Int/Trap Log Cmd

< press any key to continue >
ATRTw,x,y(z)     RAM test level w, from address x to y (z iterations)
ATWEa(,b,c,d)    write MAC addr, Country code, EngDbgFlag, FeatureBit to flash ROM
ATCUx            write Country code to flash ROM
ATCB             copy from FLASH ROM to working buffer
ATCL             clear working buffer
ATSB             save working buffer to FLASH ROM
ATBU             dump manufacturer related data in working buffer
ATSH             dump manufacturer related data in ROM
ATWMx            set MAC address in working buffer
ATCOx            set country code in working buffer
ATFLx            set EngDebugFlag in working buffer
ATSTx            set ROMRAS address in working buffer
ATSYx            set system type in working buffer
ATVDx            set vendor name in working buffer
ATPNx            set product name in working buffer
ATFEx,y,...      set feature bits in working buffer
ATMP             check & dump memMapTab
ATDOx,y          download from address x for length y to PC via XMODEM
ATTD             download router configuration to PC via XMODEM
ATUPx,y          upload to RAM address x for length y from PC via XMODEM
ATUR             upload router firmware to flash ROM

```

Figure 6-17 Boot module commands

Chapter 7

Troubleshooting

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

7.1 Problems Starting Up the Prestige

Table 7-1 Troubleshooting the Start-Up of your Prestige

Problem	Corrective Action	
None of the LEDs are on when you power on the Prestige	Check the connection between the AC adapter and the Prestige. If the error persists, you may have a hardware problem. In this case you should contact technical support.	
Cannot access the Prestige via the console port.	1. Check to see if the Prestige is connected to your computer's serial port.	
	2. Check to see if the communications program is configured correctly. The communications software should be configured as follows:	VT100 terminal emulation
		9600 bps
No parity, 8 Data bits, 1 Stop bit.		

7.2 Problems With the WAN Interface

Table 7-2 Troubleshooting the ADSL connection

Problem	Corrective Action
Initialization of the PVC connection failed.	Ensure that the cable is connected properly from the ADSL port to the wall jack. The ADSL 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. Reboot the Prestige. If you still have problems, you may need to verify these variables with the telephone company and/or ISP.

7.3 Problems with the LAN Interface

Table 7-3 Troubleshooting the LAN Interface

Problem	Corrective Action
Can't ping any station on the LAN	Check the Ethernet LEDs on the front panel. The LED should be on for a port that has a station connected. If it is off, check the cables between your Prestige and the station.
	Verify that the IP address and the subnet mask are consistent between the Prestige and the workstations.

7.4 Problems Connecting to a Remote Node or ISP

Table 7-4 Troubleshooting a Connection to a Remote Node or ISP

Problem	Corrective Action
Can't connect to a remote node or ISP	Check Menu 24.1 to verify the line status. If it indicates [down], then refer to the section on the line problems.
	In Menu 11.1, verify your login name and password for the remote node.

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.
100Base-T	Uses two pairs of twisted-pair wire with a maximum distance of 100 meters between hub and workstation.
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.
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 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, routers, and multiplexors into the bipolar digital signals used by the digital lines. Multiplexors mix voice signals and data on the same line.
DCE	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.

- DHCP** 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.
- DNS** 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.
- Domain Name** 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.
- DRAM** Dynamic RAM that stores information in capacitors that must be refreshed periodically.
- DSL** 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.
- DSLAM** 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 networks.
- DTE** Originally, the DTE (data terminal equipment) was a dumb terminal or printer, but today it is a computer, or a bridge or router 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.
- 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.
IPX	Internetwork Packet eXchange The native NetWare internetworking protocol is IPX (Internetwork Packet Exchange). Like IP (Internet Protocol), IPX is an internetworking protocol that provides datagram services.
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 communication 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.
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.
PNC	Prestige Network Commander, a Windows-based setup wizard for Prestige routers (not all).
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 router-to-router, host-to-router, and host-to-host connections.
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.

- RIP** Routing Information Protocol is an interior or intra-domain routing protocol that uses the distance-vector routing algorithms. RIP is used on the Internet and is common in the NetWare environment as a method for exchanging routing information between routers.
- 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.
- SNMP** System Network Management Protocol is a popular management protocol defined by the Internet community for TCP/IP networks. It is a communication protocol for collecting information from devices on the network.
- 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.
- SUA** Single User Account – The Prestige's SUA (Single User Account) feature allows multiple user Internet access for the cost of a single ISP account - see also NAT.
- 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** Virtual Channel Identifier Identifies virtual channels between users or between users and networks.
- VPI** Virtual Path Identifier Identifies virtual paths between users or between users and networks.
- WAN** Wide Area Network s 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).

Appendix

VPI & 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.

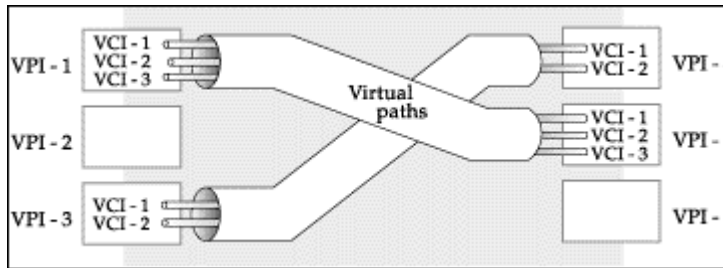


Diagram 1 VPI's & VCI's.

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