

Prestige 642

PPPoE Modem

User's Guide

Version 2.50

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ZyXEL

TOTAL INTERNET ACCESS SOLUTION

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Online Registration

Do not forget to register your Prestige (fast, easy online registration at www.zyxel.com) for free future product updates and information.

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.

Note

CE and FC Certifications

For more information about your modem's Declaration of Conformity (DOC) please refer to www.zyxel.com.

Customer Support

Please have the following information ready when you contact customer support:

- Prestige model and serial number.
- Warranty information.
- Date that you received your Prestige.
- Brief description of the problem and the steps you took to solve it.

METHOD	EMAIL — SUPPORT	TELEPHONE	WEB SITE	REGULAR MAIL
REGION	EMAIL — SALES	FAX	FTP SITE	
WORLDWIDE	support@zyxel.com.tw	+886-3-578-3942	www.zyxel.com	ZyXEL Communications Corp., 6 Innovation Road II, Science-Based Industrial Park, HsinChu, Taiwan.
	support@europe.zyxel.com		www.europe.zyxel.com	
NORTH AMERICA	sales@zyxel.com.tw	+886-3-578-2439	ftp.europe.zyxel.com	ZyXEL Communications Inc., 1650 Miraloma Avenue, Placentia, CA 92870, U.S.A.
	support@zyxel.com	+1-714-632-0882	www.zyxel.com	
SCANDINAVIA	sales@zyxel.com	800-255-4101	ftp.zyxel.com	ZyXEL Communications A/S, Columbusvej 5, 2860 Soeborg, Denmark.
	support@zyxel.dk	+1-714-632-0858	www.zyxel.dk	
AUSTRIA	support@zyxel.dk	+45-3955-0700	www.zyxel.dk	ZyXEL Communications Services GmbH., Thaliastrasse 125a/2/2/4, A-1160 Vienna, Austria
	sales@zyxel.dk	+45-3955-0707	ftp.zyxel.dk	
GERMANY	support@zyxel.at	+43-1-4948677-0 0810-1-ZyXEL 0810-1-99935	www.zyxel.at	ZyXEL Deutschland GmbH., Adenauerstr. 20/A4, D-52146 Wuerselen, Germany.
	sales@zyxel.at	+43-1-4948678	ftp.zyxel.at Note: Austrian users with *.at domain only!	
GERMANY	support@zyxel.de	+49-2405-6909-0 0180-5213247 Tech Support hotline 0180-5099935 RMA/Repair hotline	www.zyxel.de	
	sales@zyxel.de	+49-2405-6909-99	ftp.europe.zyxel.com	

Table of Contents

Copyright	ii
ZyXEL Limited Warranty	iii
Federal Communications Commission (FCC) Interference Statement	iv
Customer Support	v
List of Figures	ix
List of Tables	x
Preface	xi
What is DSL?	xiii
Chapter 1 Getting to Know Your PPPoE Modem	1-1
1.1 The Prestige 642 PPPoE Modem	1-1
1.2 Features of the Prestige 642 PPPoE Modem	1-1
1.3 Applications for the Prestige 642 PPPoE Modem	1-3
1.3.1 Internet Access	1-3
Chapter 2 Hardware Installation & Initial Setup	2-1
2.1 Front Panel LEDs of the P642	2-1
2.2 Rear Panel and Connections of the P642	2-2
2.2.1 Connecting the ADSL Line	2-2
2.2.2 Connecting a Computer to the Prestige 10/100M LAN Port	2-2
2.2.3 Connecting the Power Adapter to your Prestige	2-2
2.2.4 Connecting the Console Port	2-3
2.3 Additional Installation Requirements	2-3
2.4 Connecting a POTS Splitter	2-3
2.5 Telephone Microfilters	2-4
2.6 Default Settings	2-5
2.7 Turning On the Prestige	2-5
Chapter 3 Web Configurator	3-1
3.1 Introduction	3-1
3.2 Login and Welcome Screens	3-2
3.2.1 About the Login Screen	3-2
3.2.2 About the Welcome Screen	3-2
3.3 Wizard Setup Screen	3-3
3.3.1 Wizard Setup — PPPoE Modem Screen	3-4
3.3.2 Wizard Setup — Modem Screen	3-6
3.3.3 Wizard Setup — Final Wizard Screen	3-8
3.4 Advanced Setup	3-8
3.4.1 Advanced Setup — System Administration Screen	3-9
3.4.2 Advanced Setup — System Date & Time Screen	3-10
3.4.3 Advanced Setup — Ethernet Screen	3-11

3.4.4	Advanced Setup — SUA (Single User Account) Applications.....	3-13
3.4.5	Advanced Setup — Internet Security.....	3-16
3.5	Maintenance.....	3-17
3.5.1	Maintenance — System Status.....	3-17
3.5.2	Maintenance — System Statistics.....	3-19
3.5.3	Maintenance — Diagnostic Screen.....	3-21
3.6	Logout Screen.....	3-22
3.6.1	About the Logout Screen.....	3-22
Chapter 4	Command Line Interface.....	4-1
4.1	Getting Started.....	4-1
4.1.1	Initial Screen.....	4-1
4.1.2	Entering A Password.....	4-1
4.2	Command Structure.....	4-2
4.2.1	Conventions for Using CI Commands.....	4-2
4.2.2	Using Abbreviated CI Commands.....	4-3
4.2.3	General CI Command Usage.....	4-3
4.3	CI Commands.....	4-4
4.3.1	Set Related CI Commands.....	4-4
4.3.2	Set Related CI Commands — Examples.....	4-5
4.3.3	Show Related CI Commands.....	4-6
4.3.4	Show Related CI Commands — Example.....	4-6
4.3.5	Sys Related CI Commands.....	4-7
4.3.6	Sys Related CI Commands — Examples.....	4-8
4.3.7	WAN Related CI Commands.....	4-11
4.3.8	WAN Related CI Commands — Examples.....	4-11
4.3.9	Device Related CI Commands.....	4-12
4.3.10	Device Related CI Commands — Example.....	4-13
4.3.11	IP Related CI Commands.....	4-13
4.3.12	IP Related CI Commands — Examples.....	4-14
Chapter 5	Firmware and Configuration File Maintenance.....	5-1
5.1	Filename Conventions.....	5-1
5.1.1	Firmware Development.....	5-2
5.2	Backup Configuration.....	5-2
5.2.1	Backup Configuration Using HyperTerminal.....	5-2
5.2.2	Backup Configuration Using FTP.....	5-3
5.3	Restore Configuration.....	5-4
5.3.1	Restore Configuration Using HyperTerminal.....	5-4
5.3.2	Restore Configuration Using FTP.....	5-5
5.4	Upload Firmware.....	5-5
5.4.1	Uploading the System Firmware.....	5-5
5.4.2	Xmodem Upload Using HyperTerminal.....	5-6

5.4.3	Uploading System Configuration File	5-6
5.5	TFTP File Transfer	5-7
5.5.1	Example: TFTP Command	5-8
5.6	FTP File Transfer.....	5-9
5.6.1	Uploading Firmware using FTP.....	5-9
5.6.2	Uploading the Configuration File using FTP.....	5-9
5.6.3	Using the FTP command from the DOS Prompt	5-10
Chapter 6	Troubleshooting	6-1
6.1	Problems Starting Up the Prestige	6-1
6.2	Problems With the WAN Interface	6-1
6.3	Problems with the LAN Interface	6-2
6.4	Problems Connecting to a Remote Node or ISP	6-2
Appendix A	VPI & VCI	A
Glossary	B
Index	I

List of Figures

Figure 1-1 Internet Access Application	1-3
Figure 2-1 Front Panel of the P642	2-1
Figure 2-2 Rear Panel Connections of the P642	2-2
Figure 2-3 Connecting a POTS Splitter	2-4
Figure 2-4 Connecting a Microfilter	2-5
Figure 3-1 Web Configurator Overview	3-1
Figure 3-2 Login Screen as seen in Netscape	3-2
Figure 3-3 Welcome Screen	3-3
Figure 3-4 Initial Wizard Screen	3-4
Figure 3-5 PPPoE Wizard Screen	3-5
Figure 3-6 Modem Wizard Screen	3-7
Figure 3-7 Final Wizard Screen	3-8
Figure 3-8 Advanced Setup — System Administration Screen	3-9
Figure 3-9 Advanced Setup — System Date & Time Screen	3-10
Figure 3-10 Advanced Setup — Ethernet Screen	3-12
Figure 3-11 Advanced Setup — SUA (Single User Account) Applications Screen	3-15
Figure 3-12 Advanced Setup — Internet Security Screen	3-16
Figure 3-13 Maintenance — System Status Screen	3-18
Figure 3-14 Maintenance — System Statistics Screen	3-20
Figure 3-15 Maintenance — Diagnostic Screen	3-21
Figure 3-16 Logout Screen	3-23
Figure 4-1 Power-On Display	4-1
Figure 4-2 Login Screen	4-1
Figure 4-3 Configuration and Management Prompt	4-2
Figure 5-1 Enter Debug Mode	5-3
Figure 5-2 Example: Backup Configuration	5-3
Figure 5-3 Enter Debug Mode	5-4
Figure 5-4 Example: Restore Configuration	5-4
Figure 5-5 Enter Debug Mode	5-5
Figure 5-6 Example: Xmodem Upload	5-6
Figure 5-7 Enter Debug Mode	5-7
Figure 5-8 Example: FTP Session	5-10

List of Tables

Table 2-1 Front Panel LED Description	2-1
Table 3-1 PPPoE Wizard Screen Description.....	3-6
Table 3-2 Modem Wizard Screen Description.....	3-7
Table 3-3 Advanced Setup — System Administration Screen Description.....	3-9
Table 3-4 Advanced Setup — System Date & Time Screen Description.....	3-11
Table 3-5 Advanced Setup — Ethernet Screen Description.....	3-13
Table 3-6 Common Services and Corresponding Port Numbers	3-14
Table 3-7 Advanced Setup — SUA (Single User Account) Applications Screen Description.....	3-15
Table 3-8 Advanced Setup — Internet Security Screen Description.....	3-17
Table 3-9 Maintenance — System Status Screen Description.....	3-18
Table 3-10 Maintenance — System Statistics Screen Description	3-20
Table 3-11 Maintenance — Diagnostic Screen Description.....	3-22
Table 4-1 Examples of Abbreviated CI Commands	4-3
Table 4-2 General CI Command Usage.....	4-3
Table 4-3 Set Related CI Commands.....	4-4
Table 4-4 Show Related CI Commands.....	4-6
Table 4-5 Sys Related CI Commands	4-7
Table 4-6 Sys Trcpacket Channel CI Command — Optional Subcommand Meanings	4-10
Table 4-7 WAN Related CI Commands	4-11
Table 4-8 Device Related CI Commands	4-12
Table 4-9 IP Related CI Commands	4-13
Table 5-1 Filename Conventions	5-2
Table 5-2 Third Party TFTP Clients — General Commands.....	5-8
Table 5-3 Third Party FTP Clients — General Fields	5-10
Table 6-1 Troubleshooting the Start-Up of your Prestige.....	6-1
Table 6-2 Troubleshooting the ADSL connection.....	6-1
Table 6-3 Troubleshooting the LAN Interface.....	6-2
Table 6-4 Troubleshooting a Connection to a Remote Node or ISP.....	6-2

Preface

About Your ADSL Modem

Congratulations on your purchase of the Prestige 642 Series ADSL Modem.

The Prestige 642 is an ADSL modem used for Internet access via an ADSL line. It can run upstream maximum rate at 832Kbps and downstream rate at 8Mbps. The rate selection depends on the copper category, distance and service provider configuration.

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 configure. All functions of the Prestige are software configurable via the Web Embedded Configurator. Use the CLI (Command Line Interface) as an alternate method of Prestige configuration.

About This User's Guide

This 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 System using the Web Embedded Configurator and the CLI. It is designed to guide you through the correct configuration of your Prestige 642 for various applications.

Related Documentation

Related documentation includes:

- A Packing List Card that lists all items that come with your Prestige.
- A Read Me First document that will help get your Prestige up and running right away. It contains detailed easy-to-follow instructions, Prestige default settings, handy checklists and information on setting up your computer.
- A Support CD. This CD includes:
 - This User's Guide.
 - Support Notes.
 - Supporting Software
 - Link to the ZYXEL Website for Product Registration.

General Syntax Conventions

- “Type” 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.
- Menu titles and labels are in **Bold Times** font. Predefined field choices are in **Bold Arial** font. Command and arrow keys are enclosed in square brackets. [ENTER] means the Enter, or carriage return key; [ESC] means the Escape key and [SPACE BAR] means the Space Bar.
- For brevity’s sake, we will use “e.g.,” as a shorthand for “for instance”, and “i.e.,” for “that is” or “in other words” throughout this manual.

The Prestige 642 may also be referred to as the Prestige or the P642 in this manual.

What is DSL?

DSL (Digital Subscriber Line) technology enhances the data capacity of the existing telephone line running 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 4,000Hz to filter noise from the voice line. DSL services are either symmetrical (traffic flows at the same speed in both directions) or asymmetrical (the downstream capacity is higher than the upstream capacity).

As the carrying distance increases, data rates decrease. 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 for DSL maximum transmission distances. 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?

ADSL is an asymmetrical technology, meaning that the downstream data rate is much higher than the upstream data rate. 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 PPPoE Modem

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

1.1 The Prestige 642 PPPoE Modem

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 PPPoE Modem

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

Ease of Installation

Your Prestige is designed for quick, intuitive and easy installation. Your Prestige weighs very little and is extremely compact making it easy to position anywhere in your busy office.

Web Configurator

Configuration and maintenance of the Prestige is easy with the Web Configurator. Your web browser must be Java and JavaScript enabled to use the web configurator.

High Speed Internet Access

The Prestige can support downstream transmission rates of up to 8Mbps and upstream transmission rates of 832 Kbps. The Prestige 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 Prestige'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.

ADSL Standards Supported

ANSI T1.413, Issue 2; G.dmt(G.992.1); G.lite(G.992.2)

ATM Forum UNI 3.1/ 4.0 PVC

Multiple Protocol over AAL5 (RFC1483)

PPP over Ethernet over AAL5

Protocols Supported

- The Prestige supports PPP over Ethernet (RFC 2516) and RFC 1483 encapsulation over ATM (idle timeout for PPPoE connections (100 seconds) may be altered via the web configurator).
- PPP (Point-to-Point Protocol) Bridge link layer protocol.
- IP Routing/Transparent Bridging
- DHCP Client, Server and Relay
- NAT/SUA for single IP address internet access
- RIP I and RIP II

Networking Compatibility

Your Prestige is compatible with the major ADSL DSLAM (Digital Subscriber Line Access Multiplexer) providers making configuration extremely simple.

Multiplexing

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

Full Network Management

- Command Line Interface.
- Telnet support (Password-protected telnet access to internal configuration manager).
- TFTP/FTP server, firmware upgrade and configuration backup/restore.
- F4/F5 OAM .

Diagnostic Capabilities

Your modem can perform self-diagnostic tests. These tests check the integrity of the following circuitry:

- FLASH memory, ADSL circuitry, RAM and the LAN port.

Security

Configure the following security features using the web configurator:

- The Prestige supports PAP (Password Authentication Protocol) and CHAP (Challenge Handshake Authentication Protocol). CHAP is more secure than PAP; however, PAP is available on more platforms.

- The Prestige has filtering functions that allow added network security and management. Default net bios filters are turned on when PPPoE is selected.

1.3 Applications for the Prestige 642 PPPoE Modem

1.3.1 Internet Access

The Prestige is the ideal high-speed Internet access solution. Your Prestige supports TCP/IP protocol, which the Internet commonly uses. 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.

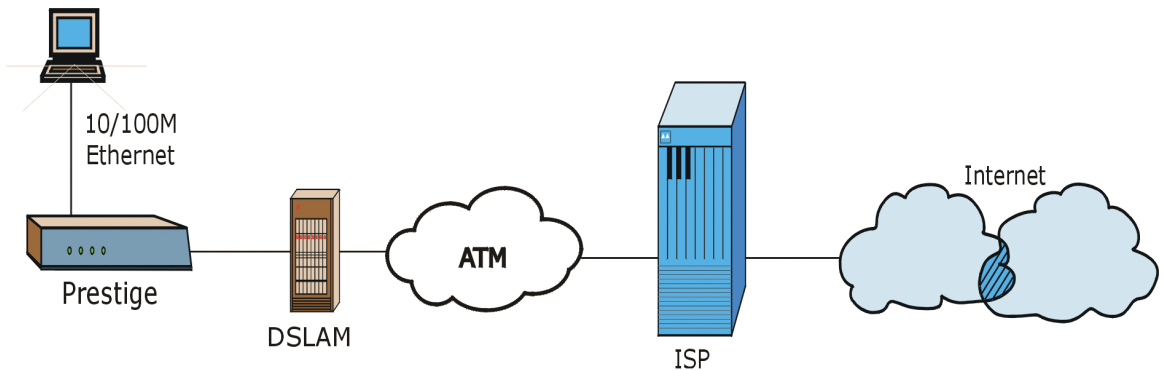


Figure 1-1 Internet Access Application

Chapter 2

Hardware Installation & Initial Setup

This chapter describes the physical features of the Prestige 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. The table below the figure describes the LED functions:

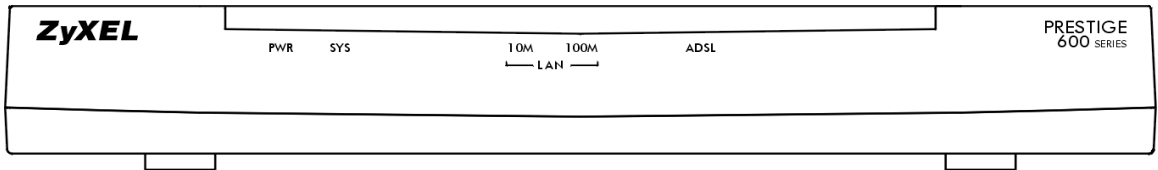


Figure 2-1 Front Panel of the P642

Table 2-1 Front Panel LED Description

LED	COLOR	STATUS	MEANING
PWR	Green	On	Power is applied to the Prestige.
SYS	Green	On Off Blinking	The Prestige is on and functioning properly. The system is not ready or has malfunctioned. The system is rebooting.
LAN 10M	Green	On Blinking	The Prestige has a successful 10Mb Ethernet connection. Data is being sent/received.
LAN 100M	Green	On Blinking	The Prestige has a successful 100Mb Ethernet connection. Data is being sent/received.
ADSL	Green	On Off Blinking	The Prestige is connected successfully to a DSLAM. The link is down. Data is being sent/received.

2.2 Rear Panel and Connections of the P642

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

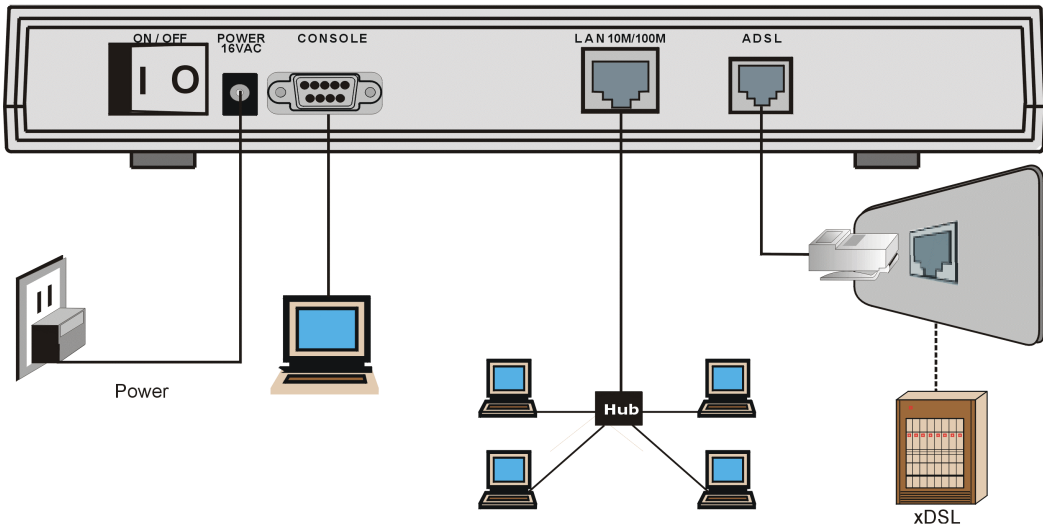


Figure 2-2 Rear Panel Connections of the P642

2.2.1 Connecting the ADSL Line

Connect the Prestige directly to the wall jack using the included ADSL cable. Connect a microfilter between the wall jack and your telephone(s) (see the *Connecting a Microfilter* figure). Microfilter(s) act as low pass filters (voice transmission takes place in the 0 to 4KHz bandwidth). A microfilter is an optional purchase.

2.2.2 Connecting a Computer 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 to a computer directly. Use a straight-through Ethernet cable (white tag) to connect to an external hub and then connect one end of a straight-through Ethernet cable (white tag) from the hub to the NIC (Network Interface Card) on the computer.

2.2.3 Connecting the Power Adapter to your Prestige

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

2.2.4 Connecting the Console Port

For the initial configuration of your Prestige, you need to use terminal emulator software on a computer 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 computer. 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.
- A computer equipped with communications software (for example, Hyper Terminal in Win98) 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 the telnet application.

2.4 Connecting a POTS Splitter

This is for the Prestige following the Full Rate (G.dmt) standard only. One major difference between ADSL and dial-up modems is the optional 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. A POTS splitter 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.

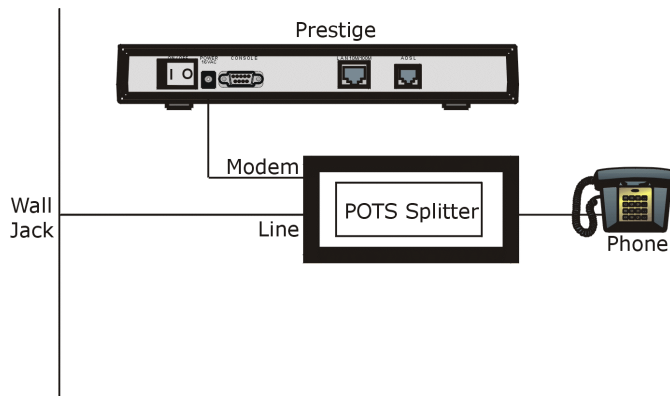


Figure 2-3 Connecting a POTS Splitter

- 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.

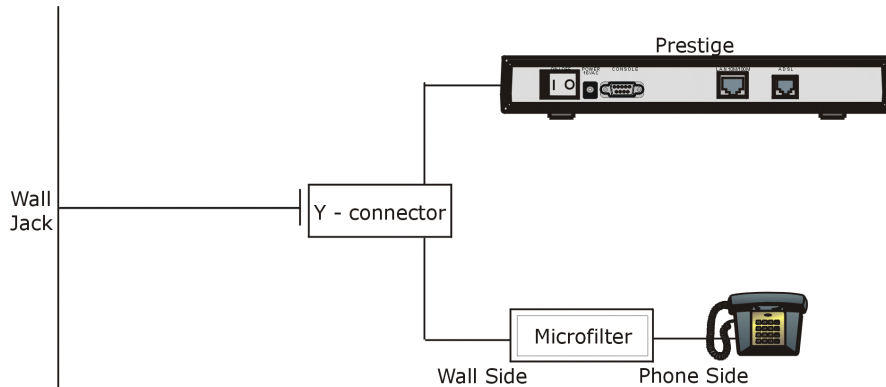


Figure 2-4 Connecting a Microfilter

2.6 Default Settings

Your Prestige is shipped with the following default settings:

- VPI: 8, VCI: 35
- WAN interface: PPPoE LLC mode
- Console port speed: 9600 bps
- DHCP: Server
- Password: “1234”

2.7 Turning On the 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. Execute the terminal emulation program if you plan to configure the Prestige with the Command Line Interface. Turn the power switch (located on the back of your Prestige) from **OFF** to **ON** to turn on your Prestige.

- Proceed to the *Introducing the Web Configurator* chapter if you want to configure the Prestige using the web configurator. This is the most user-friendly configuration method.
- Proceed to the *Command Line Interface* chapter if you want to configure the Prestige using the Command Line Interface.

Chapter 3

Web Configurator

This chapter shows you how to configure and maintain your Prestige using the web configurator.

3.1 Introduction

The web configurator is a user-friendly GUI (Graphic User Interface) that allows you to easily configure and maintain the Prestige. The figure shown next details the menus contained in the web configurator.

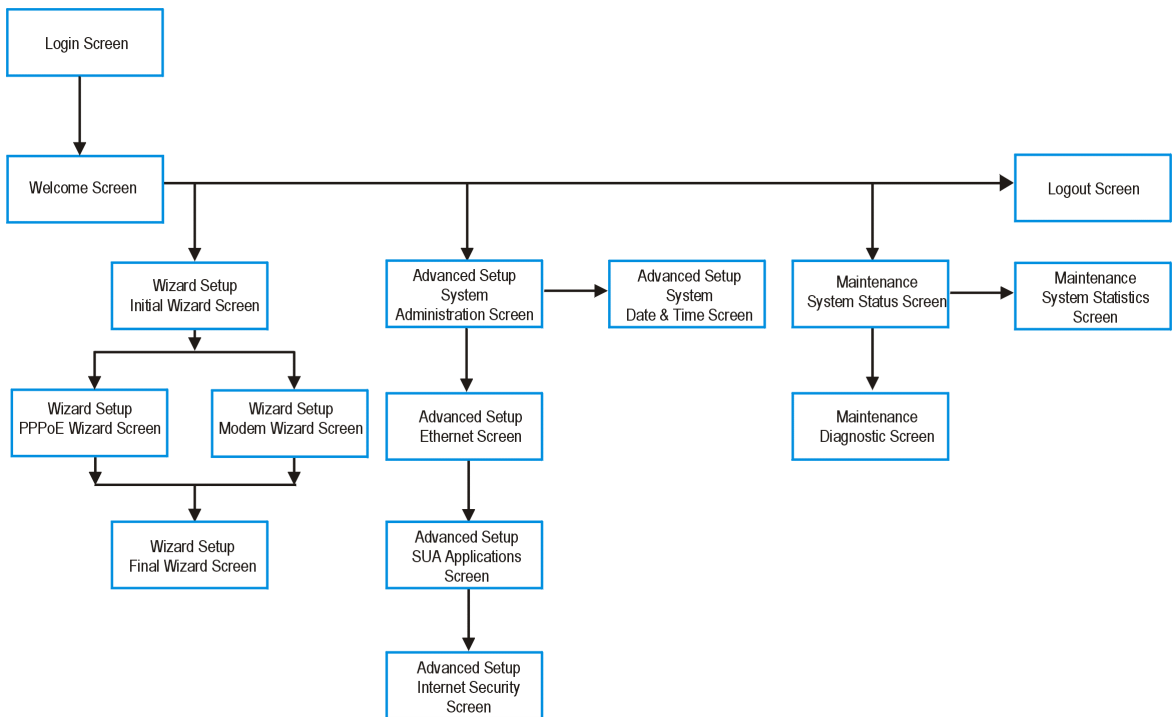


Figure 3-1 Web Configurator Overview

3.2 Login and Welcome Screens

Launch your web browser and enter 192.168.1.1 as the URL. This is the factory default IP address of the Prestige when shipped. You will see the following **Login** screen.



Figure 3-2 Login Screen as seen in Netscape

3.2.1 About the Login Screen

The default User Name and Password fields are "admin" and "1234" respectively.

The **Password** field is configurable; the **User Name** field is not.

The **Password** field is case sensitive.

The web configurator times out after five minutes of inactivity. The time out is not configurable via the web configurator.

Make sure that your web browser is Java and JavaScript enabled.

You can configure the Prestige via the Prestige web configurator or CLI (Command Line Interface) only.

You will not be able to access the Prestige web configurator from the WAN if you have applied a filter in on the LAN or block web service on the WAN.

3.2.2 About the Welcome Screen

After a successful login, you will see the **Welcome** screen shown next. When you are in a submenu and want to see all available menus, click on the **Main Menu** link (only visible when in a submenu) to return to the **Welcome** screen. If this is the first time configuring your Prestige you should click **Wizard Setup**.

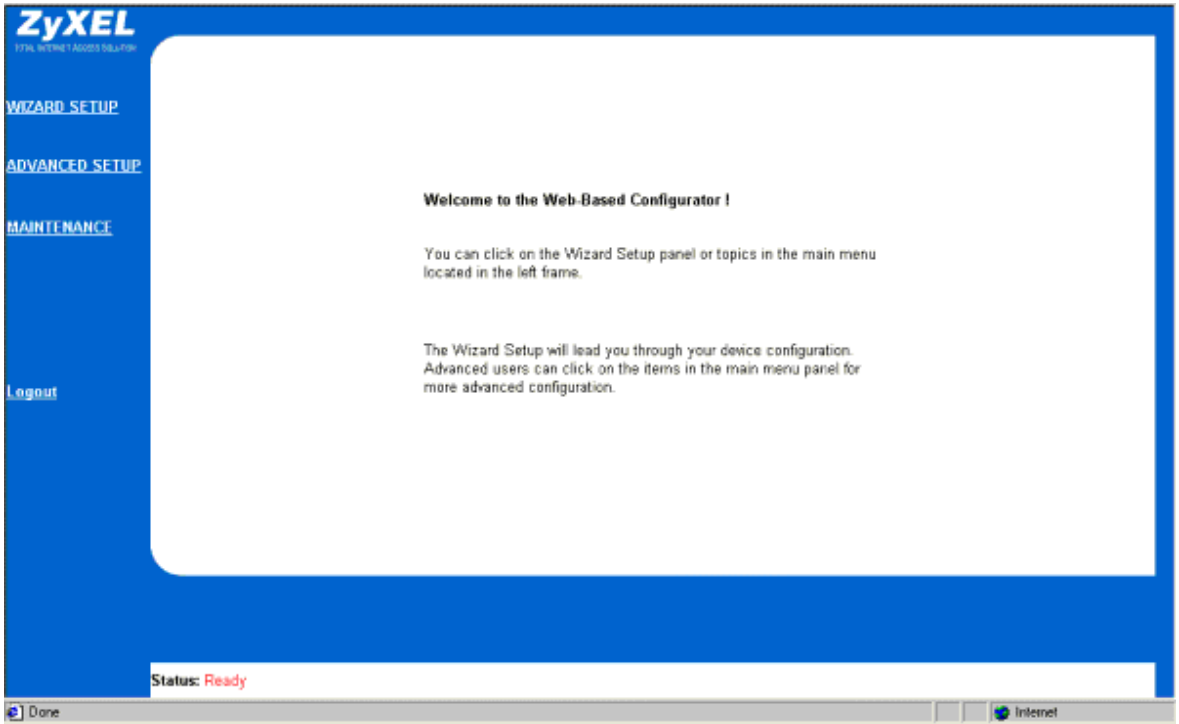


Figure 3-3 Welcome Screen

3.3 Wizard Setup Screen

Use the wizard setup for initial Prestige configuration. The Prestige comes with some default settings that should make configuration even easier.

Select **Modem** if you want your modem to function in bridge mode (you will need to download a VPN adapter later). Otherwise, select **PPPoE Modem** (default) as shown next.

Click **Next**.



Figure 3-4 Initial Wizard Screen

3.3.1 Wizard Setup — PPPoE Modem Screen

The screen shown next appears if you selected **PPPoE Modem** from the initial **Wizard** screen and allows you to enter Internet Access information in one screen. Before you configure your Prestige for Internet access, you need to collect your Internet account information from your ISP and telephone company. Refer to the next table for a list of required account information.

A Note about 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 then 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 then you should consult your network administrator for the appropriate IP addresses.

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

A Note about VPI and VCI Numbers

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 (0 to 31 is reserved for local management of ATM traffic). Please see the *VPI & VCI Appendix* for more information

ZyXEL
PPPoE Modem Wizard

MAIN MENU

LOGOUT

Wizard Setup

ISP Parameters for Internet Access

Modem Type	PPPoE Modem
Protocol	PPPoE
Multiplexing	LLC
Virtual Circuit ID	VC
VPI	8
VCI	35
Login Settings	
Service Name	
User Name	ChangeMe
Password	
Idle Timeout (sec)	100

Back Finish

Status: Ready

Done Internet

Figure 3-5 PPPoE Wizard Screen

Table 3-1 PPPoE Wizard Screen Description

FIELD LABEL	FIELD DESCRIPTION
Modem Type	This field reflects the type of modem you chose in the previous screen (READ ONLY).
Protocol	This field is dependent on the Modem Type field (READ ONLY) and reflects the protocol used by the modem selected in the previous screen.
Multiplexing	Select either VC or LLC . Obtain this information from your ISP.
Virtual Circuit ID	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 0 to 255 and for the VCI is 32 to 65535 (0 to 31 is reserved for local management of ATM traffic). VPI Enter the VPI assigned to you by your ISP. VCI Enter the VCI assigned to you by your ISP.
Login Settings	
Service Name	Type the name of your PPPoE service here. If you do not know your Service Name then leave this field blank.
User Name	Enter the login name that your ISP gives you. For PPPoE encapsulation this field must be of the form user@domain.xxx where the domain identifies your ISP.
Password	Enter the password associated with the User Name name above.
Idle Timeout (sec)	100 (default)
When you have finished, click Finish to save your customized settings and exit this screen or Back to return to the previous screen without saving.	

3.3.2 Wizard Setup — Modem Screen

The screen shown next appears if you selected **Modem** from the initial **Wizard** screen.

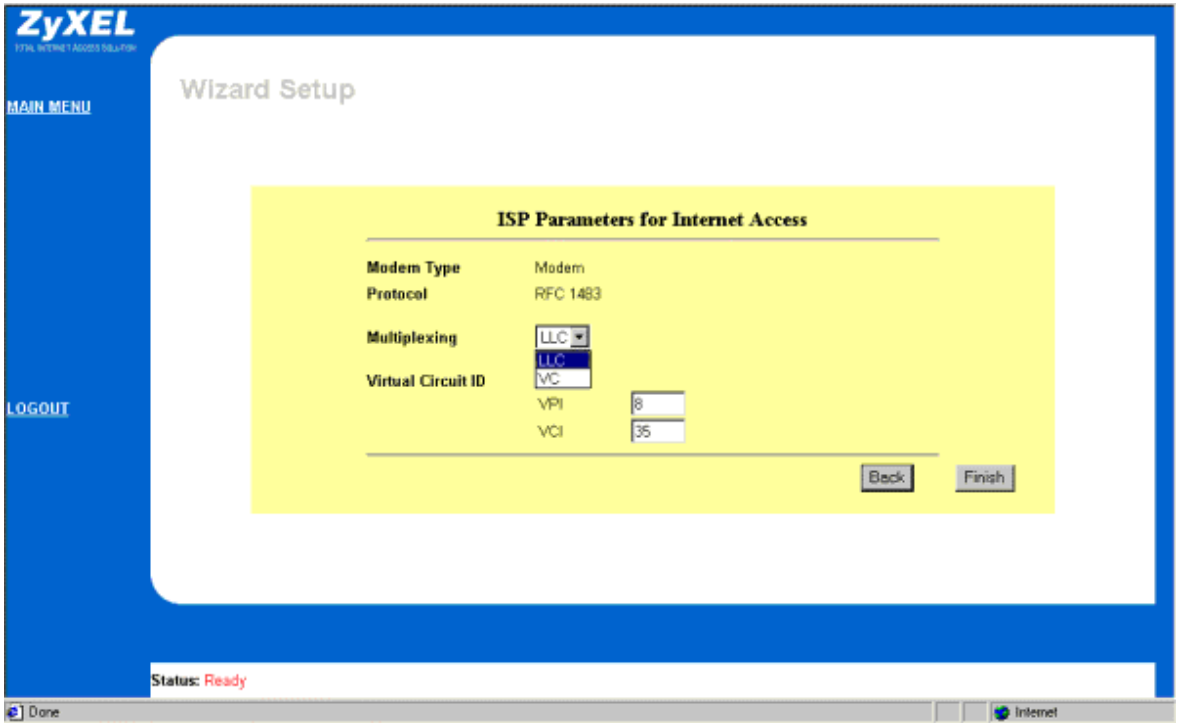


Figure 3-6 Modem Wizard Screen

Table 3-2 Modem Wizard Screen Description

FIELD LABEL	FIELD DESCRIPTION
Modem Type	This field reflects the type of modem you chose in the previous screen (READ ONLY).
Protocol	This field is dependent on the Modem Type field (READ ONLY).
Multiplexing	Select either VC or LLC . Obtain this information from your ISP.
Virtual Circuit ID	
VPI	Enter the VPI assigned to you by your ISP.
VCI	Enter the VCI assigned to you by your ISP.
When you have finished, click Finish to save your customized settings and exit this screen or Back to return to the previous screen without saving.	

3.3.3 Wizard Setup — Final Wizard Screen

After you configure your modem, you will see the final Wizard screen shown next.



Figure 3-7 Final Wizard Screen

Congratulations! You should now be set up to access the Internet. Test your Internet connection by clicking <http://www.zyxel.com> in the previous figure.

If there are any problems recheck all the parameters you entered in this Wizard. Make certain they are the same as what your ISP gave you. Also, check your cable connections and reboot if necessary. Please the *Troubleshooting* chapter of this manual for more detailed troubleshooting information.

3.4 Advanced Setup

Advanced setup allows you access to more advanced configuration. Use the **Advanced Setup** screens to configure **System Administration**, **Date and Time Settings**, **Ethernet**, **SUA (Single User Account) Applications** and **Internet Security**.

3.4.1 Advanced Setup — System Administration Screen

Click the **Advanced Setup** link to display the screen shown next.

Figure 3-8 Advanced Setup — System Administration Screen

Table 3-3 Advanced Setup — System Administration Screen Description

FIELD LABEL	FIELD DESCRIPTION
System Information	
System Name	Enter a descriptive name for identification purposes. It is recommended you enter your computer's "Computer name". This name can be up to 30 alphanumeric characters long. Spaces are not allowed, but dashes "-" and underscores "_" are accepted.
Location	Enter the geographic location (up to 31 characters) of your Prestige.
Administrator	Enter the name (up to 30 characters) of the person in charge of this Prestige.

FIELD LABEL	FIELD DESCRIPTION
<p>Password</p> <p>Old Password</p> <p>New Password</p> <p>Retype to confirm</p>	<p>Changing the system password is highly recommended.</p> <p>Type in your existing system password, i.e., 1234, the default password.</p> <p>Enter your new system password (up to 30 characters). Note that as you type a password, the screen displays a “*” for each character you type.</p> <p>Retype your new system password for confirmation.</p>
<p>When you have finished, click Apply to save these settings back to the Prestige or Reset to reset the fields in this screen.</p>	

3.4.2 Advanced Setup — System Date & Time Screen

Click the **Advanced Setup** link and then click the **Date & Time** tab to display the screen shown next.

Use this screen to manually configure the current time and date

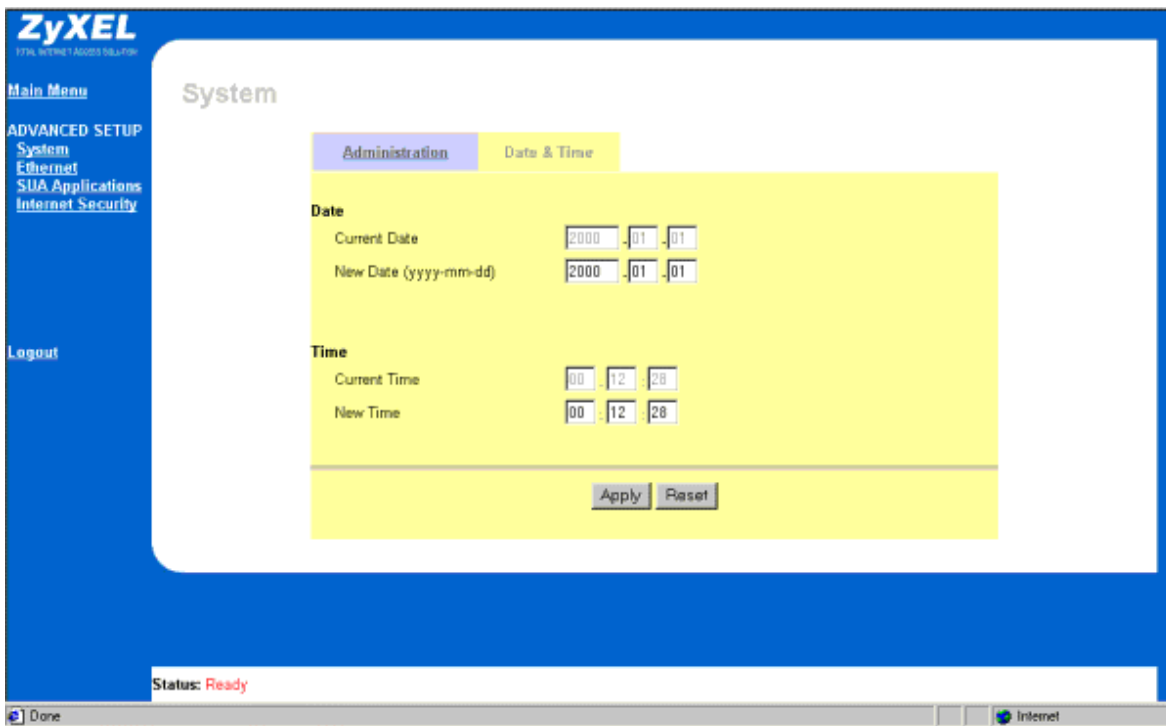


Figure 3-9 Advanced Setup — System Date & Time Screen

Table 3-4 Advanced Setup — System Date & Time Screen Description

FIELD LABEL	FIELD DESCRIPTION
Date	
Current Date	This read-only field displays the current date.
New Date	Enter the new date in year, month and day and format.
Time	
Current Time	This read-only field displays the current time.
New Time	Enter the new time in hour, minute and second format.
When you have finished, click Apply to save these settings back to the Prestige or Reset to reset the fields in this screen.	

3.4.3 Advanced Setup — Ethernet Screen

Click the **Advanced Setup** link and then click the **Ethernet** link to display the screen shown next.

DHCP

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

IP Pool Setup

The Prestige is pre-configured with a pool of 32 IP addresses starting from 192.168.1.33 to 192.168.1.64 for the client computers. This leaves 31 IP addresses, 192.168.1.2 to 192.168.1.32 (excluding the Prestige itself which has a default IP of 192.168.1.1), for other server computers, e.g., server for mail, FTP, telnet, web, etc., that you may have.

DNS

DNS Server Address DNS (Domain Name System) is for mapping a domain name to its corresponding IP address and vice versa, e.g., the IP address of www.zyxel.com is 204.217.0.2. The DNS server is extremely important because without it, you must know the IP address of a computer before you can access it. The DNS server addresses that you enter in the DHCP setup are passed to the client computers along with the assigned IP address and subnet mask. There are two ways that an ISP disseminates the DNS server addresses. The first is for an ISP to tell a customer the DNS server addresses, usually in the form of an information sheet, when s/he signs up. If your ISP does give you the DNS server addresses, enter them in the DNS Server fields in DHCP Setup, otherwise, leave them blank. If the Primary and Secondary DNS Server fields in DHCP Setup are not specified, i.e., left as 0.0.0.0, the Prestige tells the DHCP clients that it itself is the DNS server. When

a computer sends a DNS query to the Prestige, the Prestige forwards the query to the real DNS server learned through IPCP and relays the response back to the computer. Please note that DNS proxy works only when the ISP uses the IPCP DNS server extensions. It does not mean you can leave the DNS servers out of the DHCP setup under all circumstances.

IP Address

If the ISP did not explicitly give you an IP network number, then you most likely have a single user account and the ISP will assign you a dynamic IP address when the connection is established. If this is the case, it is recommended that you select a network number from 192.168.0.0 to 192.168.255.0 (ignoring the trailing zero) and you must enable the Single User Account feature of the Prestige (it is enabled by default).

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.

ZyXEL
TOTAL INTERNET ACCESS SOLUTION

Main Menu

ADVANCED SETUP
System
Ethernet
SUA Applications
Internet Security

Logout

Ethernet

DHCP

DHCP

Client IP Pool Starting Address

Size of Client IP Pool

Primary DNS Server

Secondary DNS Server

Remote DHCP Server

TCP/IP

IP Address

IP Subnet Mask

Status: Ready

Done Internet

Figure 3-10 Advanced Setup — Ethernet Screen

Table 3-5 Advanced Setup — Ethernet Screen Description

FIELD LABEL	FIELD DESCRIPTION
DHCP DHCP Client IP Pool Starting Address Size of Client IP Pool	As above. If set to Server , your Prestige can assign IP addresses, an IP default gateway and DNS servers to Windows and other systems that support the DHCP client. If set to None , the DHCP server will be disabled. If set to Relay , the Prestige acts as a surrogate DHCP server and relays DHCP requests and responses between the remote server and clients. Enter the IP address of the actual, remote DHCP server in the Remote DHCP Server field in this case. When DHCP is used, the following items need to be set: This field specifies the first of the contiguous addresses in the IP address pool. This field specifies the size or count of the IP address pool.
Primary DNS Server Secondary DNS Server Remote DHCP Server	Enter the IP addresses of the DNS servers. The DNS servers are passed to the DHCP clients along with the IP address and the subnet mask. As above. If Relay is selected in the DHCP field above then enter the IP address of the actual remote DHCP server here.
TCP/IP IP Address IP Subnet Mask	Enter the IP address of your Prestige in dotted decimal notation, for example, 192.168.1.1 (factory default). 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.
When you have finished, click Apply to save these settings back to the Prestige or Reset to reset the fields in this screen.	

3.4.4 Advanced Setup — SUA (Single User Account) Applications

Click the **Advanced Setup** link and then click the **SUA Applications** link to display the screen shown next.

Single User Account

Typically, if there are multiple users on the LAN that want concurrent access to the Internet, you must lease a block of legal or globally unique IP addresses from an ISP. The Single User Account (SUA) feature lets you enjoy the same benefits as having multiple legal addresses, but only pay for one IP address, thus saving significantly on subscription fees (check with your ISP before you enable this feature). The IP address for the SUA can be either fixed or dynamically assigned by the ISP. In addition, you can designate servers, e.g., a web server and a Telnet server, on your local network and make them accessible to the outside world (see

below). If you do not define a server, SUA offers the additional benefit of firewall protection. If no server is defined, all incoming inquiries will be filtered out by your Prestige, thus preventing intruders from probing your network. Your Prestige accomplishes address sharing by translating the internal LAN IP addresses to a single address that is globally unique on the Internet. For more information on IP address translation, refer to *RFC 1631 - The IP Network Address Translator (NAT)*.

Multiple Servers behind SUA

Even though SUA makes your whole inside network appear as a single computer to the outside world, A service is identified by the port number; the following table shows the most common services and their corresponding port numbers.

Table 3-6 Common Services and Corresponding Port Numbers

SERVICES	PORT NUMBER
FTP (File Transfer Protocol)	21
Telnet	23
SMTP (Simple Mail Transfer Protocol)	25
DNS (Domain Name System)	53
HTTP (Hyper Text Transfer Protocol or WWW Web)	80
PPTP (Point-to-Point Tunneling Protocol)	1723

So, if you have a web server at IP address 192.168.1.2 and a FTP server at IP address 192.168.1.3, then you need to specify port 80 (web) for the server at IP address 192.168.1.2 and port 21 (FTP) for the FTP server at IP address 192.168.1.3.

A server can support more than one service, e.g., a server can provide both FTP and DNS service, while another provides only web service. Furthermore, since you need to specify the IP address of a server in the Prestige, a server must have a fixed IP address and not be a DHCP client whose IP address potentially changes each time it is turned on.

In addition to servers for specific services, SUA supports a default server. A service request that does not have a server explicitly designated for it is forwarded to the default server. If the default server is not defined, the service request is simply discarded. To make a server visible to the outside world, specify the port number of the service in the **Port Number** field and the inside IP address of the server in the **Server IP Address** field.

The Prestige has some of the more popular applications already pre-configured. Select an application from the drop-down list box and the corresponding port number should display in the **Port Number** field. To configure a different application not already pre-configured, choose **Manual** and then enter the port number in the **Port Number** field.

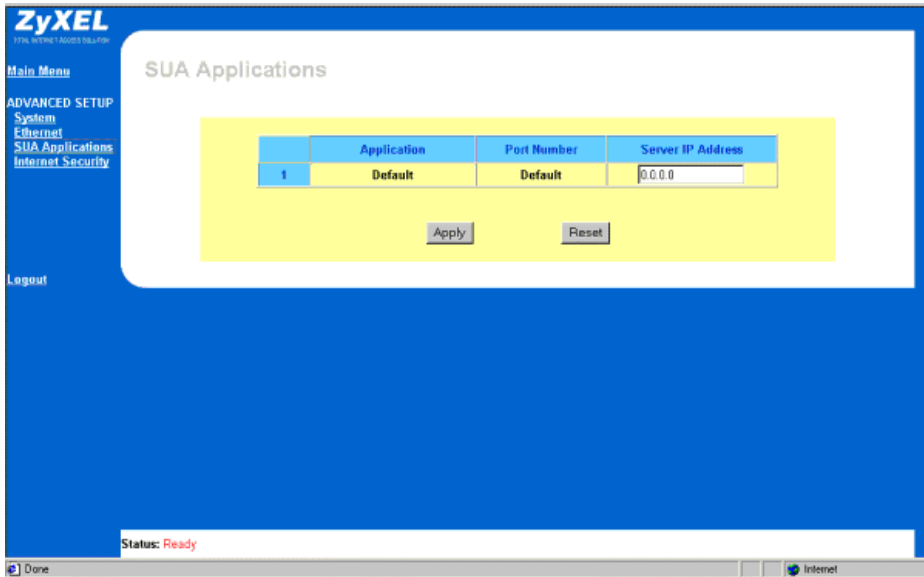


Figure 3-11 Advanced Setup — SUA (Single User Account) Applications Screen

Table 3-7 Advanced Setup — SUA (Single User Account) Applications Screen Description

APPLICATIONS	PORT NUMBER	SERVER IP ADDRESS
HTTP - Hyper Text Transfer Protocol or WWW Web	80	Enter the inside IP address of the server here.
FTP - File Transfer Protocol	21	Enter the inside IP address of the server here.
Telnet - a common login and terminal emulation protocol used on the Internet.	23	Enter the inside IP address of the server here.
POP3 - Post Office Protocol is an Internet mail server protocol that provides an incoming message storage system. The current version is called POP3.	110	Enter the inside IP address of the server here.
NetMeeting_1 - this is a popular Internet chat program. Two port numbers must be configured - one for audio and one for video.	1720	Enter the inside IP address of the server here.
NetMeeting_2	1503	Enter the inside IP address of the server

APPLICATIONS	PORT NUMBER	SERVER IP ADDRESS
		here.
StarCraft - this is a popular Internet gaming program.	6112	Enter the inside IP address of the server here.
Manual - choose this option to configure an application not already pre-configured.	Enter the port number for this application.	Enter the inside IP address of the server here.

When you have finished, click **Apply** to save these settings back to the Prestige or **Reset** to reset the fields in this screen.

3.4.5 Advanced Setup — Internet Security

Click the **Advanced Setup** link and then click the **Internet Security** link to display the screen shown next. Use this screen to configure your security settings.

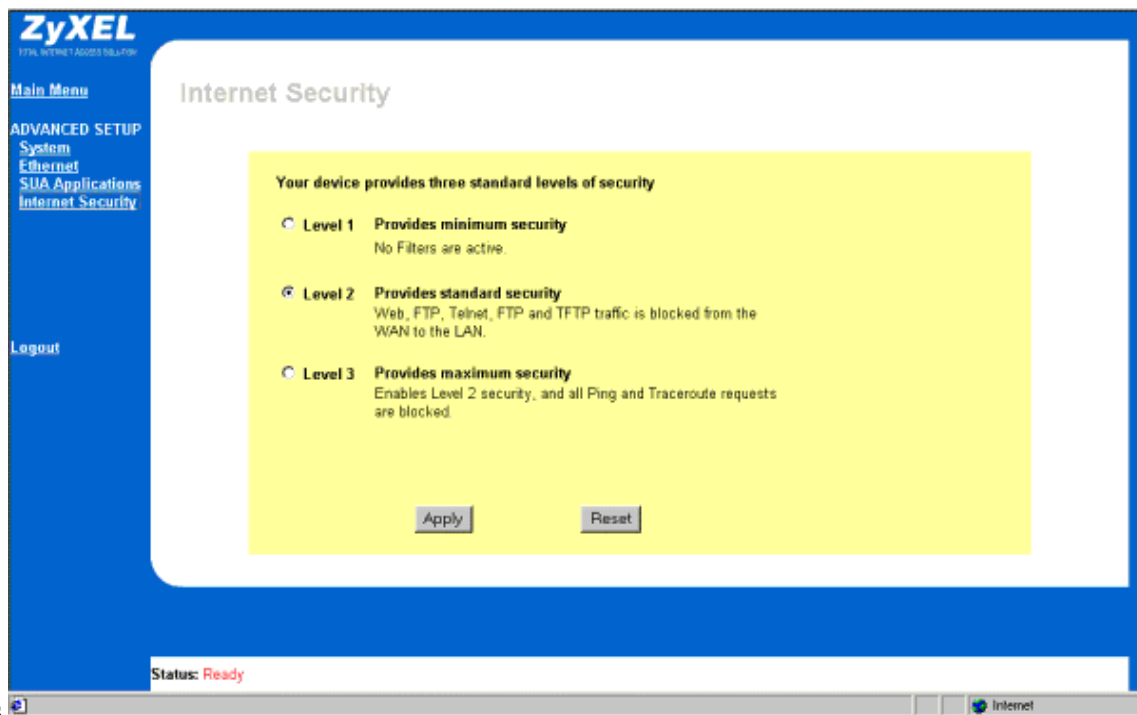


Figure 3-12 Advanced Setup — Internet Security Screen

Select one of three levels of security.

Table 3-8 Advanced Setup — Internet Security Screen Description

SECURITY LEVEL	DESCRIPTION
Level 1	Level 1 applies <i>no security</i> - no packet filters are applied to the LAN and/or remote node. Remote configuration using TELNET, and HTTP is allowed. FTP and TFTP file transfer is also possible as are Ping and Traceroute (using ICMP). Pre-configured packet filters still exist but they are not applied.
Level 2	Level 2 security applies filter rules to prevent incoming (to the Prestige) telnet and FTP/TFTP sessions as well as stop outgoing NetBIOS calls to the remote node (ISP). A PPPoE filter that filters out all packets except PPOE packets going out from the Prestige to the ISP or remote node is also applied.
Level 3	Level 3 security applies an additional filter (in addition to Level 2 security filters) that drops all incoming ICMP packets. Many discovery tools such as Ping and Traceroute use ICMP packets.
When you have finished, click Apply to save these settings back to the Prestige or Reset to reset the fields in this screen.	

3.5 Maintenance

Use the Maintenance link to access tools to diagnose and monitor the LAN and WAN status of your Prestige.

3.5.1 Maintenance — System Status

Click the **Maintenance** link and then click the **System Status** link to display the screen shown next. Use this screen to view system status.

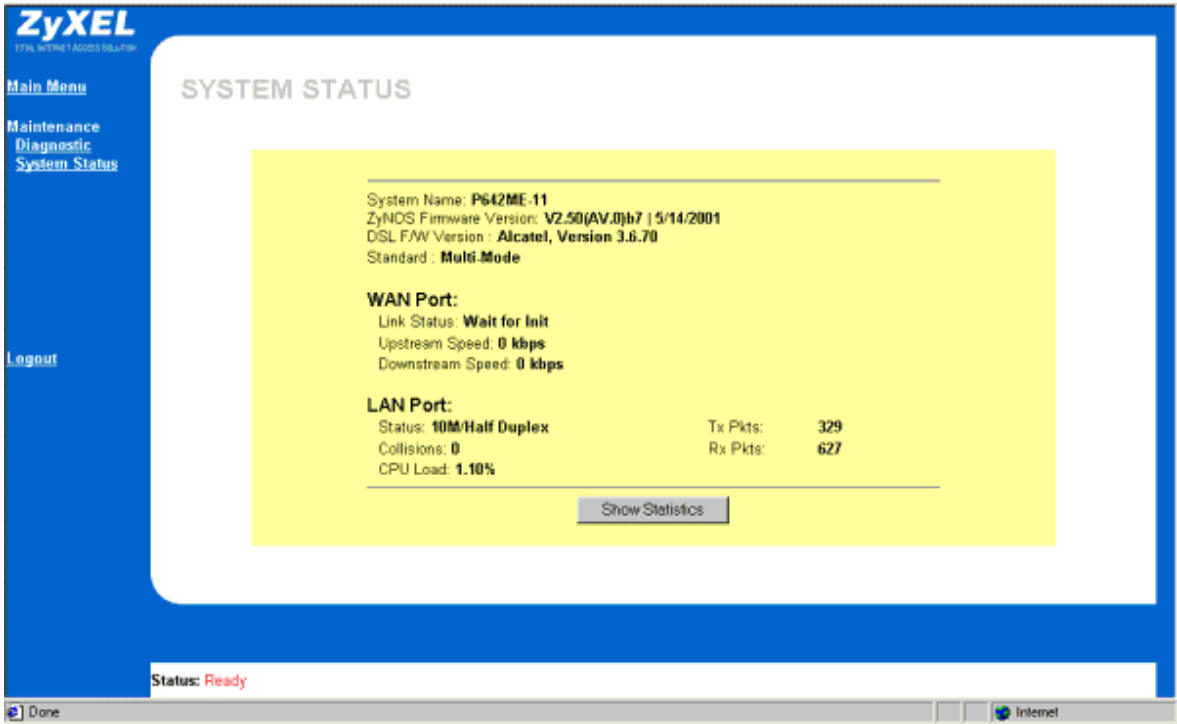


Figure 3-13 Maintenance — System Status Screen

This screen shows you the status of your Prestige. These fields are READ-ONLY and are meant to be used for diagnostic purposes only.

Table 3-9 Maintenance — System Status Screen Description

FIELD LABEL	FIELD DESCRIPTION
System Name	This field displays the system name you entered in the system screen.
ZyNOS Firmware Version	<p>ZyNOS (ZyXEL Network Operating System) is the name of the Prestige firmware. This file is also named "ras" on the Prestige.</p> <p>This field displays the firmware version number and the date it was released.</p> <p>You should periodically check the zyxel.com web site for new firmware releases. Check this field to make sure your firmware is current or a new firmware upload is successful.</p>

FIELD LABEL	FIELD DESCRIPTION
DSL F/W Version	This field shows the chipset and chipset version that your Prestige uses.
Standard	This field denotes the ADSL standard your Prestige uses. Possible standards include g.dmt, g.lite, t1.413 and multimode. This field cannot be changed via the web configurator.
WAN Port Link Status Upstream Speed Downstream Speed	 This field shows the current status of the ADSL line. This field will display either Up, Down, Wait for Init or Initializing. This field shows the ADSL line upstream speed. This field shows the ADSL line downstream speed.
LAN Port Status Collisions CPU Load	 This field shows the current status of the LAN. This field shows the number of collisions on this port. This field specifies the percentage of CPU utilization.
Show Statistics	Click this button to see performance statistics such as number of packets sent and number of packets received for each port.

3.5.2 Maintenance — System Statistics

Click the **Show Statistics** button in the **System Status** screen to display the screen shown next. Use this screen to display performance statistics.

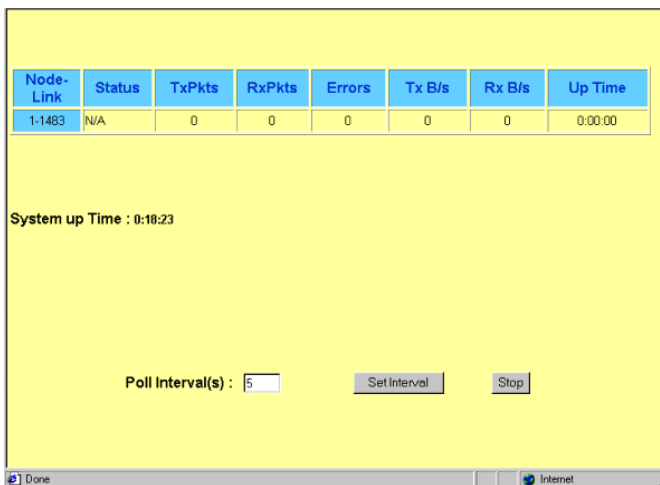


Figure 3-14 Maintenance — System Statistics Screen

This screen shows you statistics for the ISP node. Note that these fields are READ-ONLY and are meant to be used for diagnostic purposes.

Table 3-10 Maintenance — System Statistics Screen Description

FIELD	FIELD DESCRIPTION
Node-Link	This field displays the remote node index number and link type. Link types are PPP, ENET and 1483 .
Status	Shows the port speed and duplex setting if you're using Ethernet encapsulation.
TxPkts	Displays the number of packets transmitted on this port.
RxPkts	Displays the number of packets received on this port.
Errors	Displays the number of error packets on this port.
Tx B/s	Displays the number of bytes transmitted in the last second.
Rx B/s	Displays the number of bytes received in the last second.
Up Time	Displays the elapsed time this port has been up.
System up Time	This field displays the elapsed time your system has been on.
Poll Interval(s)	Type the time interval for the browser to refresh system statistics. The default is 5 seconds.

FIELD	FIELD DESCRIPTION
Set Interval	Click this button to apply the new poll interval you entered in the Poll Interval field above.
Stop	Click this button to stop the browser from refreshing system statistics.

3.5.3 Maintenance — Diagnostic Screen

Click the **Maintenance** link and then click the **Diagnostic** link to display the screen shown next. Use this screen to view diagnostics.

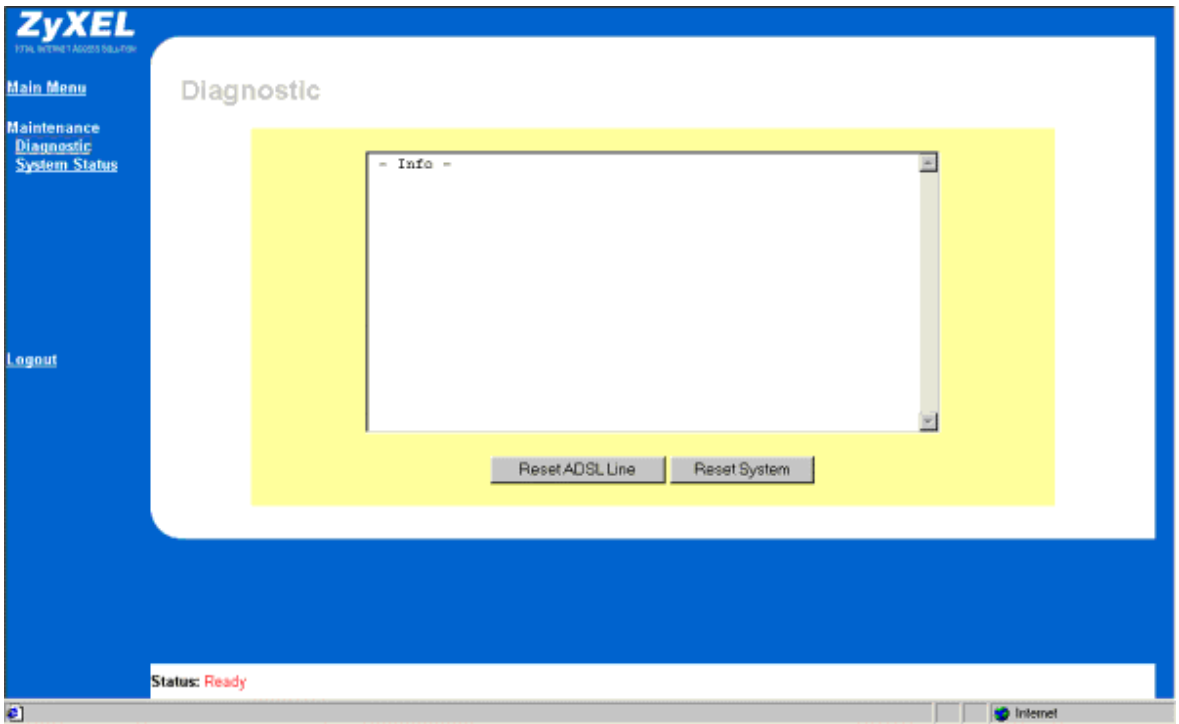


Figure 3-15 Maintenance — Diagnostic Screen

This read-only screen displays information to help you identify problems with the Prestige.

Table 3-11 Maintenance — Diagnostic Screen Description

BUTTON	DESCRIPTION
Reset ADSL Line	Click this button to reinitialize the ADSL line. The large text box above then displays the progress and result of this operation, for example; "Start to reset ADSL Loading ADSL modem F/W... Reset ADSL Line Successfully!"
Reset System	Click this button to reboot the Prestige. A warning dialog box is then displayed asking if you're sure you want to restart the system. Click "OK" to proceed.

3.6 Logout Screen

3.6.1 About the Logout Screen

Click the **Logout** link to quit the web configurator and to see the screen shown next.

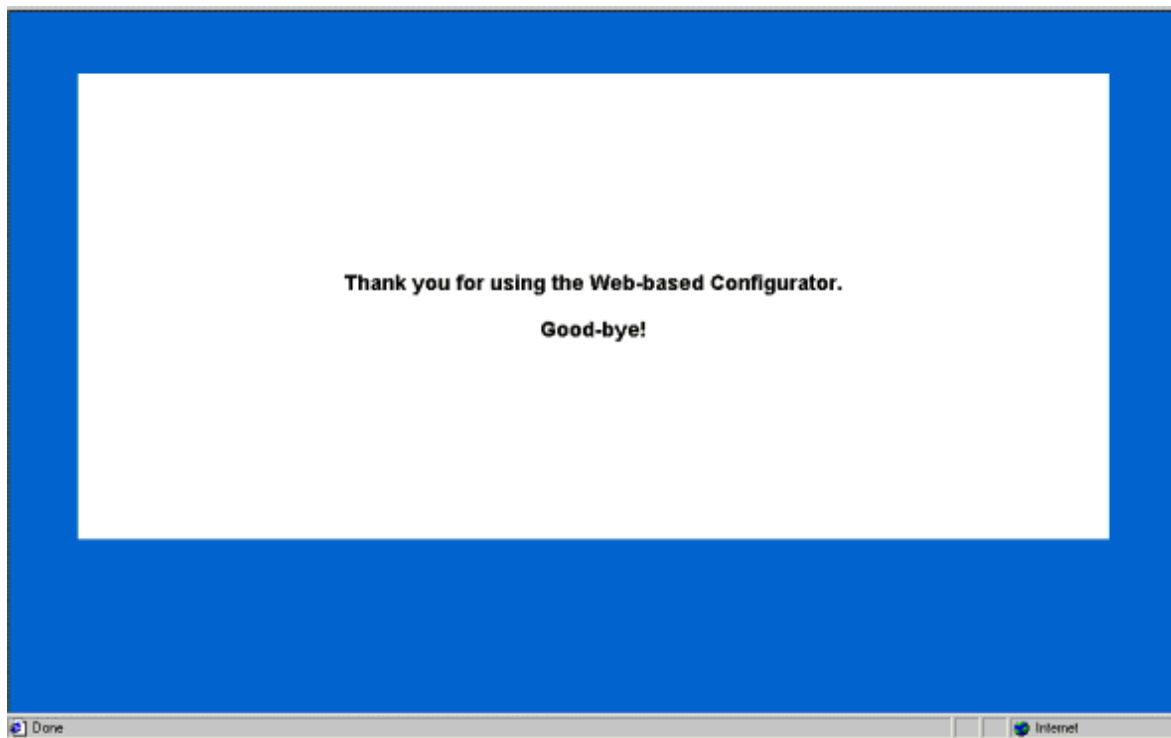


Figure 3-16 Logout Screen

Congratulations! Configuration of your Prestige using the web configurator is complete. For alternative configuration using the Command Line Interface (CI or CLI) see the *Command Line Interface* chapter.

Chapter 4

Command Line Interface

This chapter shows you how to configure and maintain your Prestige using the command line interface.

The command line interface is an alternate way to configure the Prestige. If you want to configure your Prestige with the (more user-friendly) web configurator, refer to the previous chapter.

4.1 Getting Started

4.1.1 Initial Screen

When you turn on your Prestige, it performs several internal tests as well as line initialization. After initialization, press [ENTER] to continue, as shown next.

```
Copyright (c) 1994 - 2001 ZyXEL Communications Corp.
initialize ch =0, ethernet address: 00:a0:c5:01:23:45

HWSAR (FPGA) : programming (11969) ... done
HWSAR (FPGA) : testing ... done
Wan Channel init ..... done
Loading ADSL modem F/W
..... done
Press ENTER to continue...
```

Figure 4-1 Power-On Display

4.1.2 Entering A Password

The login screen appears after you press [ENTER], prompting you to type in your password, as shown next.

```
Enter Password : XXXX
```

Figure 4-2 Login Screen

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 five 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.

Press [ENTER], after you enter your password, to display the screen shown next.

```
Copyright (c) 1994 - 2001 ZyXEL Communications Corp.  
P642ME-11>
```

Figure 4-3 Configuration and Management Prompt

You are now ready to type in CI commands.

4.2 Command Structure

4.2.1 Conventions for Using CI Commands

General Conventions

- CI commands may be typed in a variety of ways depending on what you want to configure, display, etc. The conventions for typing in most CI commands are shown next.

```
command <interface|device> subcommand [parameter]  
command subcommand [parameter]  
?|help  
command ?|help  
command subcommand ?|help
```

Syntax Conventions

- CI command keywords are in regular `courier` font and should be typed in as they appear or in abbreviated form (see the next section).
- Required fields (parameters) in a CI command are enclosed in “<>” brackets. For example,
`P642ME-11> set ppp password <xxxxxxxx> <VC#>`
- Optional fields (parameters) in a CI command are enclosed in “[]” brackets. For example,
`P642ME-11>device dial [node#]`
- The “|” symbol is shorthand for the word “or”. For example, `sys log online [on|off]`

4.2.2 Using Abbreviated CI Commands

Some CI commands have abbreviated forms that allow quicker Prestige configuration (and fewer keystrokes). Type enough of a CI command to distinguish it from other CI commands. For example, typing the `sys v` CI command is the same as typing `sys version`. On the other hand, typing the `sys trc` CI command will cause the Prestige to temporarily hang because this command can't distinguish itself from `sys trcdisp`, `sys trc log` or `sys trcpacket` CI commands. Shown next, are some examples of abbreviated CI commands.

Table 4-1 Examples of Abbreviated CI Commands

CI COMMAND	ABBREVIATED CI COMMAND
wan ADSL opmod	wan ad op
sys version	sys ver
ip address	ip ad

4.2.3 General CI Command Usage

The table, shown next, lists general CI commands and how they may be used.

Table 4-2 General CI Command Usage

GENERAL CI COMMANDS	DESCRIPTION
set	The <code>set</code> commands allow you to configure options for a remote node and configure the local baudrate.
show	The <code>show</code> commands display remote node information.
system	The <code>sys</code> commands display system-related information.
wan	The <code>wan</code> commands display ADSL related information.
ip	The <code>ip</code> commands display TCP/IP protocol related information.
device	The <code>device</code> commands display channel related information.

4.3 CI Commands

The following sections list CI commands you may use with your system. Examples, after each table, denote proper command usage and describe what specific CI commands accomplish.

4.3.1 Set Related CI Commands

Table 4-3 Set Related CI Commands

CI COMMAND			PARAMETER(S)	DESCRIPTION
set	baudrate		<baudrate>	Set the baudrate of your device. Baudrate choices are 9600, 19200, 38400, 57600 or 115200.
set	mpoa	help		Display help options.
set	mpoa	mux	<VC LLC> <VC#>	Configure multiplexing type for a remote node.
set	mpoa	vpi	<value> <VC#>	Configure VPI for a remote node.
set	mpoa	vci	<value> <VC#>	Configure VCI for a remote node.
set	mpoa	assignip	<dynamic static> <IP address> <VC#>	Configure WAN IP address for a remote node.
set	mpoa	bridge	<VC#>	Turn on bridge mode.
set	mpoa	iproute	<VC#>	Turn on IP routing mode.
set	ppp	username	<xxxxxxxx> <VC#>	Configure user name for a remote node.
set	ppp	password	<xxxxxxxx> <VC#>	Configure password for a remote node.
set	pppoe	servicename	<xxxxxxxx> <VC#>	Configure service name for a remote node.
set	pppoe	on	<on>	Set PPPoE routing mode directly.
set	pppoe	off	<off>	Set into 1483 LLC bridge mode.

4.3.2 Set Related CLI Commands — Examples

Set Mpoa Mux Command

- The `set mpoa mux` command configures the multiplexing type for a remote node. The multiplexing type “vc” is configured for virtual circuit (remote node) 0, in the example shown next.

```
P642ME-11> set mpoa mux vc 0
```

Syntax:

```
P642ME-11> set mpoa mux <VC|LLC> <VC#>
```

where <VC|LLC> are types of multiplexing and <VC#> is the virtual circuit (remote node) number. The “<>” brackets specify a required field.

Set Mpoa VPI Command

- The `set mpoa vpi` command allows you to change the VPI (Virtual Path Identifier) for a virtual circuit (remote node). To set the VPI to 22 for virtual circuit (remote node) 0, see the example shown next.

```
P642ME-11> set mpoa vpi 22 0
```

Syntax:

```
P642ME-11> set mpoa vpi <value> <VC#>
```

where <value> is the VPI number and <VC#> is the virtual circuit (remote node) number.

Set PPP Password Command

- The `set ppp password` changes the PPP/PPPoE password of a remote node. To set the password to 12345678 for remote node 0, see the example shown next.

```
P642ME-11> set ppp password 12345678 0
```

Syntax:

```
P642ME-11> set ppp password <xxxxxxxx> <VC#>
```

where <xxxxxxxx> is your new password and <VC#> is the virtual circuit (remote node).

Set Baudrate Command

- The `set baudrate` command changes the console port speed to one of the following predefined baudrates: 9600, 19200, 38400, 57600 or 115200. In the example shown next, the console port speed is configured to 9600.

```
P642ME-11> set baudrate 9600
```

Change Console Speed to 9600. Then hit any key to continue

Syntax:

```
P642ME-11> set baudrate x
```

where x is the console port speed.

4.3.3 Show Related CI Commands

Table 4-4 Show Related CI Commands

CI Command			PARAMETER(S)	Description
show	mpoa	help		Display help information.
show	mpoa	status	[node#]	Display remote node status information.

4.3.4 Show Related CI Commands — Example

Show Mpoa Status Command

- The `show mpoa status` command displays the status of a node you select. To display the status of node 0, follow the example shown next.

```
P642ME-11> show mpoa status 0
Encapsulation = <empty>
Multiplexing = VC-based
Channel active = Yes
VPI/VCI value = 22/0
IP Routing mode= Yes
Bridge mode = No
IP address assignment type = Dynamic
```

Syntax:

```
P642ME-11> show mpoa status [node#]
```

where [node#] is the remote node you want to display. The “[]” brackets specify an optional field.

4.3.5 Sys Related CI Commands

Table 4-5 Sys Related CI Commands

CI COMMAND			PARAMETER(S)	DESCRIPTION
sys	cpu	display		Display CPU usage status.
sys	date		[year month date]	Display system date.
sys	domainname		[domain name]	Display domain name.
sys	edit		<filename>	Edit a system file.
sys	hostname			Display host name.
sys	hostname		<xxxxxxx>	Change host name.
sys	log	clear		Clear error log.
sys	log	disp		Display error log.
sys	log	online	[on off]	Turn on/off error log online display.
sys	quit			Exit menu.
sys	reboot			Reboot.
sys	stdio		[second]	Change terminal time out value.
sys	time		[min [sec]]	Display time or change time.
sys	trcdisp			Monitor (online) packets.
sys	trcdisp	parse		System will display the (online) protocol in detail. You must turn on the trclog switch before trcdisp will function (see below).
sys	trcdisp	brief		System will display (online) information summation.
sys	trcdisp	empty		System will display (online) raw data (binary information).
sys	trclog	switch	[on off]	Set system trace log.
sys	trclog	online	[on off]	Set on/off trace log online.
sys	trclog	level	[#]	Set trace level of trace log#: 1-10.
sys	trclog	type	<bitmap>	Set trace type of trace log.
sys	trclog	disp		Display trace log.

CI COMMAND			PARAMETER(S)	DESCRIPTION
sys	trclog	clear		Clear trace log.
sys	trcpacket	create	<entry> <size>	Create packet trace buffer.
sys	trcpacket	destroy		Destroy trace buffer.
sys	trcpacket	channel	<name> [none/incoming/ outgoing/ bothway]	Define what kind of packet you want to trace. The required parameter <name> equals enet0 or mpoa00.
sys	trcpacket	switch	[on off]	Turn (offline) packet trace on/off.
sys	trcpacket	disp		Display packet traced buffer.
sys	trcpacket	parse		Parse or analyze all (offline) packet contents.
		parse	[from_index] [to_index]	Parse or analyze specified (offline) packet contents.
sys	version			Displays the ZyNOS version, romRasSize (total rom and ras file size), system up time, bootbase version and ZyNOS CODE.
sys	wdog	switch	[on off]	Turn off/on system watchdog.

4.3.6 Sys Related CI Commands — Examples

Change Your Hostname

- Change the default P642ME-11> hostname (prompt) to a name of your choice. Change the hostname by following the example shown next.

```
P642ME-11> sys hostname mycompany
```

```
mycompany>
```

Syntax:

```
P642ME-11> sys hostname x
```

where x is the hostname you want.

Sys Reboot Command

- The `sys reboot` command instructs the system to perform a warm start. A “warm start” restarts the system without turning the power off and on.

Syntax:

```
P642ME-11> sys reboot
```

Sys Log Command

- The `sys log` command displays error log information and allows you to turn log online on or off.
- Display log error information by typing:

```
P642ME-11> sys log disp
```

- Turn on log error online by typing:

```
P642ME-11> sys log online on
```

- Turn off log error online by typing:

```
P642ME-11> sys log online off
```

Sys Time Command

- The `sys time` command displays the Prestige's current time and allows you to set a new time. Display the current time and set a new current time by following the example shown next.

```
P642ME-11> sys time
```

```
Current time is 09:46:38
```

```
P642ME-11> sys time 10 35 59
```

```
Set time to 10:35:59
```

Syntax:

```
P642ME-11> sys time a b c
```

where a = hour, b = minute and c = second.

Sys Date Command

- The `sys date` command displays the Prestige's current date and allows you to set a new date. Display the current date and set a new current date by following the example shown next.

```
P642ME-11> sys date
```

```
Current date is Sat 2000/01/01
```

```
P642ME-11> sys date 2001 10 28
```

```
Set date to 2001/10/28
```

Syntax:

```
P642ME-11> sys date a b c
```

where a = year, b = month and c = day.

Sys Trcpacket Channel Command

- The `sys trcpacket channel` command defines the port and direction of the packets that you want to analyze. Use `sys trcdisplay` commands to analyze packets specified by the `sys trcpacket channel` command. To obtain information from an incoming packet via Prestige Ethernet port 0 (`enet0`), see the example shown next.

```
sys trcpacket channel enet0 incoming
```

Syntax:

```
P642ME-11> sys trcpacket channel <name> [none/incoming/outgoing/bothway]
```

where `<name>` is `enet0` (Prestige Ethernet port) or `mpoa00` (Prestige WAN port). The subcommands `[none/incoming/outgoing/bothway]` are defined in the table shown next.

Table 4-6 Sys Trcpacket Channel CI Command — Optional Subcommand Meanings

OPTIONAL SUBCOMMANDS	MEANING
<code>none</code>	Do not acquire information about packets.
<code>incoming</code>	Obtain information about incoming packets only.
<code>outgoing</code>	Obtain information about outgoing packets only.
<code>bothway</code>	Obtain information about incoming and outgoing packets.

Sys Exit Command

- The `exit` command terminates the console or telnet management session.

Syntax:

```
P642ME-11> exit
```

4.3.7 WAN Related CI Commands

Table 4-7 WAN Related CI Commands

CI COMMAND			PARAMETER(S)	DESCRIPTION
wan	adsl	bert		Check ADSL line BERT (Bit Error Rate Test).
wan	adsl	chandata		Check ADSL channel status.
wan	adsl	close		Close ADSL line.
wan	adsl	coding		Display ADSL line coding.
wan	adsl	ctrleint		Display ADSL line response status.
wan	adsl	defbitmap		Check ADSL defect bit map table.
wan	adsl	dyinggasp		Send dying gasp (ADSL signal) to ATUC.
wan	adsl	linedata	[near far]	Show ADSL line/noise margin status.
wan	adsl	open		Open ADSL line.
wan	adsl	opencmd		Set mode of ADSL operation.
wan	adsl	opmode		Display ADSL mode standard.
wan	adsl	perfdata		Display ADSL line performance.
wan	adsl	reset		Reset ADSL Line connection.
wan	adsl	selftest	[long short]	ADSL module self-test.
wan	adsl	status		Check ADSL line status.
wan	adsl	rateadap	[on off]	Turn on/off rate adaption feature.
wan	adsl	dumpcondition		Dump ADSL line adaption information online.
wan	hwsar	clear		Clear SAR (Segmentation And Reassembly) statistics.
wan	hwsar	disp		Display SAR statistics.

4.3.8 WAN Related CI Commands — Examples

WAN ADSL Open Command/WAN ADSL Close Commands

- The `wan adsl open` and `wan adsl close` commands respectively opens or closes the WAN ADSL line as shown next.

```
P642ME-11> wan adsl open
```

ok

```
P642ME-11> wan adsl close
```

ok

Syntax:

```
P642ME-11> wan adsl [open|close]
```

where [open|close] opens or closes the WAN ADSL line.

WAN ADSL Opmode Command

- The `wan adsl opmode` command displays the ADSL standard (operational mode) your Prestige is using as shown next.

```
P642ME-11>wan adsl opmode
operational mode: ITU G.992.1(G.DMT)
ras> wan ad status
current modem status: up
```

Syntax:

```
P642ME-11> wan adsl opmode
```

WAN ADSL Status Command

- The `WAN ADSL status` command displays the status of your WAN ADSL line as shown next.

```
P642ME-11> wan adsl status
current modem status: wait for initialization
```

Syntax:

```
P642ME-11> wan adsl status
```

4.3.9 Device Related CI Commands

Table 4-8 Device Related CI Commands

CI COMMAND		PARAMETER(S)	DESCRIPTION
device	dial	[node#]	Initiates remote node # used by PPPoE.

4.3.10 Device Related CI Commands — Example

Device Dial Command

- The `device dial` command initiates a PPPoE session. In the example shown next, remote node 1 is initiated by typing:

```
P642ME-11> device dial 1

Start dialing for node <pppoe>...
### Hit any key to continue.###
$$$ DIALING dev=6 ch=0.....
$$$ OUTGOING-CALL phone(ffa)
$$$ CALL CONNECT speed<512000> type<6> chan<0>
$$$ LCP opened
$$$ CHAP login to remote OK
$$$ IPCP negotiation started
$$$ BCP stopped
$$$ BACP stopped
$$$ IPCP opened
```

Syntax:

```
P642ME-11>device dial [node#]
```

where [node#] is the remote node number.

4.3.11 IP Related CI Commands

Table 4-9 IP Related CI Commands

CI COMMAND		PARAMETER(S)	DESCRIPTION	
ip	Address		Display host IP address.	
ip	arp	status	Display IP ARP (Address Resolution Protocol) status.	
ip	dhcp	enif0 status	Show DHCP configuration.	
ip	dns	stats disp	[disp clear]	Display or clear DNS server information and statistics.
ip	icmp	status	Display ICMP status.	
ip	ifconfig		Display WAN/LAN interface information.	
ip	ping		<hostid>	Ping an IP address or host.

CI COMMAND			PARAMETER(S)	DESCRIPTION
ip	route	status		Display routing table.
ip	route	add		Add a gateway to a routing table.
ip	route	addiface		Add an interface to a routing table.
ip	route	addprivate		Add a private routing entry.
ip	route	drop		Drop a routing entry.
ip	status			Display IP layer's status.

4.3.12 IP Related CI Commands — Examples

IP DHCP Enif0 Status Command

The `ip dhcp enif0 status` command displays DHCP configuration, as shown in the following example.

```

ras> ip dhcp enif0 status
DHCP on iface enif0 is server
Start assigned IP address: 192.168.1.2/24
Number of IP addresses reserved: 4
Hostname prefix: dhcppe
DNS server: 0.0.0.0 0.0.0.0
Default gateway: 192.168.1.1
Lease time: 259200 seconds
Renewal time: 129600 seconds
Rebind time: 226800 seconds
Probing count: 4
slot state timer type hardware address
0 UNCERTAIN 0 0 00
1 UNCERTAIN 0 0 00
2 UNCERTAIN 0 0 00
3 UNCERTAIN 0 0 00
Status:
Packet InCount: 0, OutCount: 0, DiscardCount: 0

Syntax:
Ip dhcp enif0 status

```

IP Ping Command

The `ip ping` command sends a signal to a host (IP address) on a network to see if that host is reachable from your host, as shown in the next example.

```
P642ME-11> ip ping 192.168.1.2
Resolving 192.168.1.2... 192.168.1.2
      sent      rcvd  rate   rtt    avg    mdev    max    min
        1         1  100    1     1      0       1     1
        2         2  100   369   47     92     369    1
        3         3  100    1    41     81     369    1
```

Syntax:

```
ip ping <hostid>
```

where <hostid> is the destination host (IP address) you want to ping.

IP Route Status Command

The `ip route status` command displays a routing table. A routing table consists of routing information specific to your system, as shown in the next example.

```
P642ME-11> ip route status
```

Dest	FF	Len	Interface	Gateway	Metric	stat	Timer	Use
192.168.1.0	00	29	enif0	192.168.1.1	1	041b	0	3
default	00	0	wanIdle	MyISP	2	002b	0	0

Syntax:

```
P642ME-11> ip route status
```


Chapter 5

Firmware and Configuration File Maintenance

This chapter tells you how to back up and restore your configuration file as well as upload new firmware and a new configuration file.

5.1 Filename Conventions

The configuration file (often called the romfile or rom-0) contains the factory default settings in the menus such as password, DHCP Setup, TCP/IP Setup, etc. It arrives from ZyXEL with a name of prestige.rom or similar. Once you have customized the Prestige's settings, they can be saved back to your computer under a filename of your choosing. Choose something meaningful, e.g., "prestige.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 system model name with a *.bin extension, e.g., prestige.bin. With serial (XMODEM) transfer, the filenames on the computer are your choice. With many ftp and tftp clients, they are similar to those seen next.

```
ftp> put prestige.bin ras
```

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

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

This is a sample ftp session saving the current configuration to the computer file prestige.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 computer, local network or ftp site and so the name (but not the extension) will vary. After uploading new firmware see the **ZyNOS F/W Version** field displayed after you type CI Command `sys version` to confirm that you have uploaded the correct firmware version.

Table 5-1 Filename Conventions

FILE TYPE	INTERNAL NAME	EXTERNAL NAME	DESCRIPTION	AT COMMAND
Configuration File	Rom-0	*.rom	This is the system 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 console port speed and default password), the error log and the trace log.	ATLC
Firmware	Ras	*.bin	This is the generic name for the ZyNOS firmware on the Prestige.	ATUR

5.1.1 Firmware Development

It is important to upgrade your firmware regularly, especially if there are problems. If you discover an unexpected behavior or bug, see if your problem is mentioned in the release notes. Load it according to instructions (e.g., see if the default configuration file is needed also). If the problem still exists, e-mail or call technical support.

5.2 Backup Configuration

Backup the current Prestige configuration to your computer via AT commands. Backup is highly recommended once your Prestige is functioning properly. FTP and TFTP are the preferred methods for backing up your current computer configuration to your computer since FTP and TFTP are faster. Any serial communications program should work fine; however, you must use XMODEM protocol to perform the download/upload and you don't have to rename the files.

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

5.2.1 Backup Configuration Using HyperTerminal

This section contains examples of backup configuration, restore configuration and upload firmware using the HyperTerminal program. Other serial communications programs should be similar.

Turn on your Prestige and press any key to enter `Debug Mode` as shown next.

```

Bootbase Version: V2.02 | 3/30/2001 14:14:29
RAM: Size = 8192 Kbytes
FLASH: Intel 8M

ZyNOS Version: V2.50(AV.0)b5 | 4/26/2001 12:43:59

Press any key to enter debug mode within 3 seconds.
.....
Enter Debug Mode

```

Figure 5-1 Enter Debug Mode

Run the HyperTerminal program. Click **Transfer**, then **Receive File** to display the following screen.

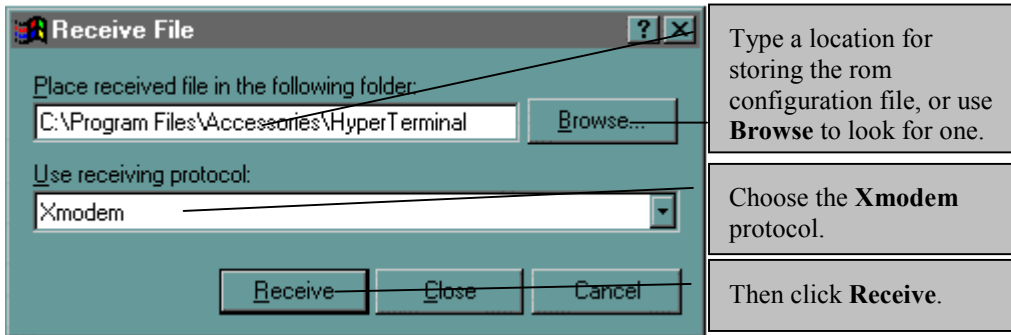


Figure 5-2 Example: Backup Configuration

5.2.2 Backup Configuration Using FTP

To transfer the configuration file to your computer, follow the procedure below.

- Step 1.** Launch the FTP client on your computer.
- Step 2.** Type `open` and the IP address of your system.
- Step 3.** Type `root` and system password as requested.
- Step 4.** Locate the 'rom-0' file.
- Step 5.** Type `get rom-0` to back up the current system configuration to your computer.

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

5.3 Restore Configuration

Restore the configuration via the console port.

FTP and TFTP are the preferred methods for restoring your current computer configuration to your Prestige since FTP and TFTP are faster. Please note that the system reboots automatically after the file transfer is complete.

5.3.1 Restore Configuration Using HyperTerminal

Turn on your Prestige and press any key to enter `Debug Mode` as shown next.

```

Bootbase Version: V2.02 | 3/30/2001 14:14:29
RAM: Size = 8192 Kbytes
FLASH: Intel 8M

ZyNOS Version: V2.50 (AV.0)b5 | 4/26/2001 12:43:59

Press any key to enter debug mode within 3 seconds.
.....
Enter Debug Mode
    
```

Figure 5-3 Enter Debug Mode

Run the HyperTerminal program. Click **Transfer**, then **Send File** to display the following screen.

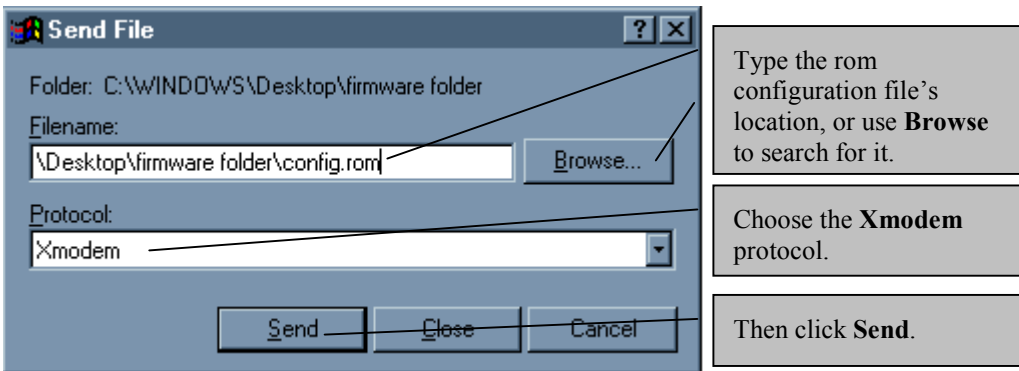


Figure 5-4 Example: Restore Configuration

5.3.2 Restore Configuration Using FTP

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

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

5.4 Upload Firmware

The following procedures allow you to upgrade the firmware and the configuration file via the console port. There are two components in the system: the system firmware and the configuration file.

5.4.1 Uploading the System Firmware

Turn on your Prestige and press any key to enter `Debug Mode` as shown next.

```

Bootbase Version: V2.02 | 3/30/2001 14:14:29
RAM: Size = 8192 Kbytes
FLASH: Intel 8M

ZyNOS Version: V2.50 (AV.0)b5 | 4/26/2001 12:43:59

Press any key to enter debug mode within 3 seconds.
.....
Enter Debug Mode
Enter Debug Mode
atur
Starting XMODEM upload (CRC mode)...
CC

```

Figure 5-5 Enter Debug Mode

- Step 1.** Enter `atur` after the `Enter Debug Mode` message.
- Step 2.** Wait for the `Starting XMODEM upload` message before activating Xmodem upload on your terminal.

After successful firmware upload, enter `atgo` to restart the Prestige.

5.4.2 Xmodem Upload Using HyperTerminal

Click **Transfer**, then **Send File** to display the following screen.

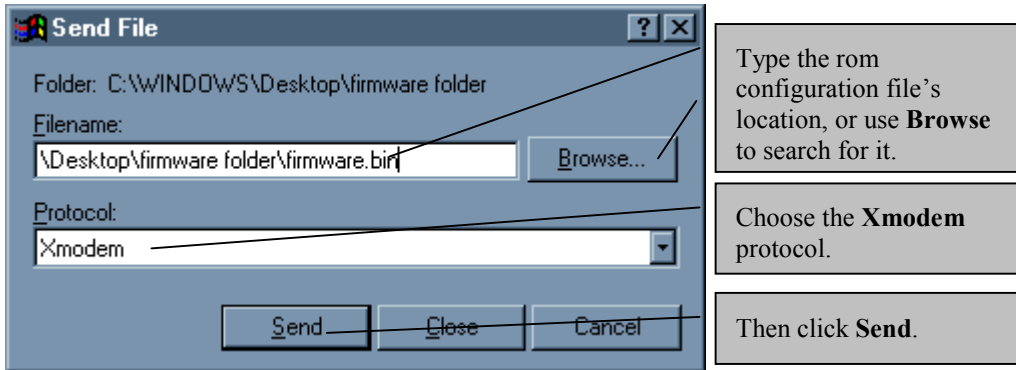


Figure 5-6 Example: Xmodem Upload

5.4.3 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.

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.

Turn on your Prestige and press any key to enter `Debug Mode` as shown next.

```
Bootbase Version: V2.02 | 3/30/2001 14:14:29
RAM: Size = 8192 Kbytes
FLASH: Intel 8M

ZyNOS Version: V2.50(AV.0)b5 | 4/26/2001 12:43:59

Press any key to enter debug mode within 3 seconds.
.....
Enter Debug Mode
Enter Debug Mode
atur
Starting XMODEM upload (CRC mode)....
CC
```

Figure 5-7 Enter Debug Mode

- Step 1.** Enter `y` at the prompt to go into debug mode.
- Step 2.** Enter `atlc` after the `Enter Debug Mode` message.
- Step 3.** Wait for the `Starting XMODEM upload` message before activating Xmodem upload on your terminal (Xmodem upload will be similar to the previous example for uploading firmware).
- Step 4.** After successful firmware upload, enter `atgo` to restart the Prestige.

5.5 TFTP File Transfer

In addition to the direct console port connection(s), the Prestige supports the up/downloading of the firmware and the configuration file using TFTP (Trivial File Transfer Protocol) over LAN. Although TFTP should work over WAN as well, it is not recommended.

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

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

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

If 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 system in CI mode before and during the TFTP transfer. For details on TFTP commands (see following example), please consult the documentation of your TFTP client program. For UNIX, use `get` to transfer from the Prestige to the computer, `put` the other way around, and `binary` to set binary transfer mode.

5.5.1 Example: TFTP Command

The following is an example tftp command:

```
TFTP [-i] host put prestige.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 computer (`prestige.bin` – name of the firmware on the computer) 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 5-2 Third Party TFTP Clients — General Commands

COMMAND	DESCRIPTION
Host	Enter the IP address of the Prestige. 192.168.1.1 is the Prestige default IP address when shipped.
Send/Fetch	Click 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.

FTP over WAN will not work if security level 2 or 3 is enabled.

5.6 FTP File Transfer

In addition to uploading the firmware and configuration via the console port and TFTP client, you can also upload the Prestige firmware and configuration files using FTP. To use this feature, your computer must have an FTP client.

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

5.6.1 Uploading Firmware using FTP

When you telnet into the Prestige, follow the procedure shown next for uploading firmware using FTP.

- Step 1.** Launch the FTP client on your computer.
- Step 2.** Type `open` and the IP address of your system.
- Step 3.** Then type `root` and system password as requested.
- Step 4.** Type `put firmwarefilename ras` where `firmwarefilename` is the name of your firmware upgrade file on your computer and "ras" is the remote file name on the system.
- Step 5.** The system reboots automatically after a successful firmware upload.

5.6.2 Uploading the Configuration File using FTP

When you telnet into the Prestige, follow the procedure shown next for uploading the configuration file using FTP.

- Step 1.** Launch the FTP client on your computer.
- Step 2.** Type `open` and the IP address of your system.
- Step 3.** Type `root` and your system password as requested.
- Step 4.** Type `put configurationfilename rom-0` where `configurationfilename` is the name of your system configuration file on your computer, which will be transferred to the "rom-0" file on the system.
- Step 5.** The system reboots automatically after the upload system configuration file process is complete.

Step 6. Press [ENTER] to exit.

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

5.6.3 Using the FTP command from the DOS Prompt

Step 1. Launch the FTP client on your computer.

Step 2. Type `open` and the IP address of your Prestige.

Step 3. Press [ENTER] when prompted for a username.

Step 4. Type `root` and your system password as requested. The default is 1234.

Step 5. Type `bin` to set transfer mode to binary.

Step 6. Type `put` to transfer files from the computer to the Prestige, e.g., `put prestige.bin ras` transfers the firmware on your computer (`prestige.bin`) to the Prestige and renames it “`ras`”. Similarly, `put prestige.rom rom-0` transfers the configuration file on your computer (`prestige.rom`) to the Prestige and renames it “`rom-0`”; `get rom-0 prestige.rom` transfers the configuration file on the Prestige to your computer and renames it `prestige.rom`. Refer to the beginning of this chapter for more information on filename conventions.

Step 7. Type `quit` to exit the ftp prompt.

```

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

Figure 5-8 Example: FTP Session

The system reboots after a successful upload.

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

Table 5-3 Third Party FTP Clients — General Fields

COMMAND	DESCRIPTION
Host Address	Enter the address of the host server.
Login Type	Anonymous.

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

FTP over WAN will not work if security level 2 or 3 is enabled.

Chapter 6

Troubleshooting

This chapter covers potential problems and possible remedies.

After each problem description, corrective instructions are provided to help you diagnose and solve the correlating problem.

6.1 Problems Starting Up the Prestige

Table 6-1 Troubleshooting the Start-Up of your Prestige

PROBLEM	CORRECTIVE ACTION		
None of the LEDs light when I turn on the Prestige.	<ol style="list-style-type: none"> 1. Check the connection between the AC adapter and the Prestige. 2. If the error persists, you may have a hardware problem. In this case you should contact technical support. 		
I 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:		
	<table border="1"> <tr> <td>VT100 terminal emulation.</td> </tr> <tr> <td>9600 bps.</td> </tr> <tr> <td>No parity, 8 Data bits, 1 Stop bit, flow control set to none.</td> </tr> </table>	VT100 terminal emulation.	9600 bps.
VT100 terminal emulation.			
9600 bps.			
No parity, 8 Data bits, 1 Stop bit, flow control set to none.			

6.2 Problems With the WAN Interface

Table 6-2 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 then you may need to verify these variables with the telephone company and/or ISP.

6.3 Problems with the LAN Interface

Table 6-3 Troubleshooting the LAN Interface

PROBLEM	CORRECTIVE ACTION
I cannot ping any computer on the LAN.	Check the LAN LEDs on the front panel. The LEDs 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 computers.

6.4 Problems Connecting to a Remote Node or ISP

Table 6-4 Troubleshooting a Connection to a Remote Node or ISP

PROBLEM	CORRECTIVE ACTION
Cannot connect to a remote node or ISP.	Verify the line status.
	Verify your login name and password for the remote node.

Appendix A

VPI & VCI

This appendix describes VPI and VCI.

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

- **Virtual Channel** Logical connections between end stations
- **Virtual Path** A bundle of virtual channels

Think of a virtual path 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.

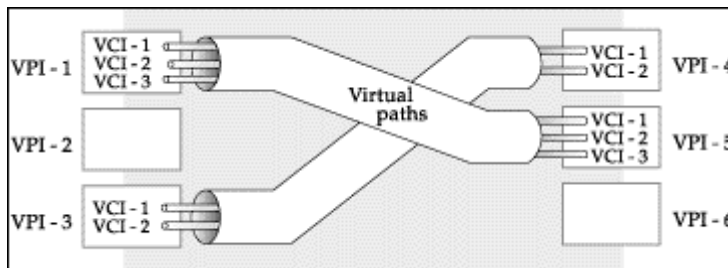


Diagram 1 VPI's & VCI's.

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 the hub and the workstation.
ADSL	Asymmetrical Digital Subscriber Line is an asymmetrical technology which means that the downstream data rate of the line 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 that is, in other words, either a one or a zero. A Bit is the smallest unit of computerized data.
Byte	A set of bits that represent a single character. There are eight 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, for example, is a specific kind of Client.
Command Line Interface	A command line interface is a computer environment in which you enter predefined commands on the command line to modify, configure and display information about a device or devices. A command line is the line on the display screen where a command is expected. Generally, the command line is the line that contains the most recently displayed command prompt. An interface is a set of commands (for example, a ZyXEL Command Line Interface) or menus (for example, a ZyXEL web configurator) used to communicate with a program. A command-driven interface is an interface in which you enter commands.
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.
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 past addresses are “recycled” and made available for future reassignment 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. Thereafter, the IP address is used in all subsequent communications.
Domain Name	The unique name that identifies an Internet site. Domain Names always have two or more parts that are 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 (Random Access Memory) 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 Multiplexor (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.
EMI	ElectroMagnetic Interference. 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) has the authority to allocate the electromagnetic spectrum and thus the bandwidth of various communication systems.

Flash memory	The nonvolatile storage device 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. Use a search engine to find the current IANA web site.
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 two or more networks together, you have an internet.
Internet	(Upper case "I"). The vast collection of inter-connected networks that use TCP/IP protocols evolved from the ARPANET (Advanced Research Projects Agency Network) of the late 1960's and early 1970's.
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. (Currently IP version 4 or IPv4). The underlying protocol for routing packets on the Internet and other TCP/IP-based networks.
IPCP (PPP)	IP Control Protocol allows changes to IP parameters such as the IP address.
ISP	Internet Service Providers provide connections into the Internet for home users and businesses. There are local, regional, national, and global ISPs. You can think of local ISPs as the gatekeepers into the Internet.
LAN	Local Area Network is a shared 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.
LLC-Multiplexing	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, eg., if charging heavily depends on the number of simultaneous VCs.

MAC	On a local area network (LAN) or other network, the MAC (Media Access Control) address is a 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.
Multiplexor	Multiplexors or MUXs, as they are often called, are devices that combine signals from various sources such as PBX (Private Branch Exchange), asynchronous terminals or a bridge connected to a Wan. A multiplexor transmits these signals as a single data stream over a digital line. Multiplexors, among other tasks, conserve bandwidth.
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 two or more computers together, allowing them to share resources, you have a computer network. Connect two 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 is a security protocol that requires users to enter a password before accessing a secure system. The user's name and password are sent over the wire to a server where they are compared with a database of user account names and passwords. This technique is vulnerable to wiretapping (eavesdropping) because the password can be captured and used by someone to log onto the system.
Port	An Internet port refers to a number that is part of a URL, appearing after a colon (:), directly following 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.
PPPoE	PPPoE (Point-to-Point Protocol over Ethernet) relies on two widely accepted standards: PPP and Ethernet. PPPoE is a specification for connecting the users on an Ethernet to the Internet through a common broadband medium, such as a single DSL line, wireless

	device or cable modem. All the users over the Ethernet share a common connection, so the Ethernet principles supporting multiple users in a LAN combine with the principles of PPP, which apply to serial connections. From authentication, accounting and secure access to configuration management, PPPoE supports a broad range of existing applications and services.
PSTN	Public Switched Telephone Network was put into place many years ago as a voice telephone call-switching system. The system transmits voice calls as analog signals across copper twisted cables from homes and businesses to neighborhood COs (central offices); this is often called the local loop. The PSTN is a circuit-switched system, meaning that an end-to-end private circuit is established between caller and callee.
PVC	Permanent Virtual Circuit. A PVC is a logical point-to-point circuit between customer sites. PVCs are low-delay circuits because routing decisions do not need to be made along the way. Permanent means that the circuit is preprogrammed by the carrier as a path through the network. It does not need to be set up or torn down for each session.
RFC	An RFC (Request for Comments) is an Internet formal document or standard that is the result of committee drafting and subsequent review by interested parties. Some RFCs are informational in nature. Of those that are intended to become Internet standards, the final version of the RFC becomes the standard and no further comments or changes are permitted. Change can occur, however, through subsequent RFCs.
RIP	Routing Information Protocol is an interior or intra-domain routing protocol that uses 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.
Server	A computer, or a software package, that provides a specific kind of service to client software running on other computers.
SNMP	Simple 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	Shielded Twisted-Pair cable consists of copper-core wires surrounded by an insulator. Two wires are twisted together to form a pair; the pair form a balanced circuit. The twisting prevents interference problems. STP 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 feature allows multiple user Internet access for the cost of a single ISP account - see also NAT.
TCP	Transmission Control Protocol handles flow control, packet recovery and IPs that 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	User Datagram Protocol. DP 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. A URL is basically a pointer to the location of an object.
VC-based Multiplexing	By prior mutual agreement, each protocol is assigned to a specific virtual circuit, eg., VCI 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.
VCI	A Virtual Channel Identifier identifies virtual channels between users or between users and networks.
VPI	A Virtual Path Identifier identifies virtual paths between users or between users and networks.
WAN	Wide Area Networks link geographically dispersed offices in other cities or around the globe. Just about any long-distance communication medium can serve as a WAN link including switched and permanent telephone circuits, terrestrial radio systems and satellite systems.
WWW	World Wide Web. Frequently used (incorrectly) when referring to "The Internet". WWW has two major definitions. One, the whole constellation of resources that can be accessed using Gopher, FTP, HTTP, telnet, USENET, WAIS and other tools. Two, the universe of hypertext servers (HTTP servers).

Index

I

10/100Mbps Fast Ethernet LAN Interface 1-1

A

About This User’s Guide xi

ADSL xiii

ADSL Line Connections 2-2

ADSL Modem xi

ADSL Standards Supported 1-1

Advanced Setup — Date & Time Screen 3-10

Advanced Setup — Date & Time Screen Screen Description 3-11

Advanced Setup — Ethernet Screen 3-11

Advanced Setup — Ethernet Screen Description 3-13

Advanced Setup — Internet Security 3-16

Advanced Setup — Internet Security Screen Description 3-17

Advanced Setup — SUA (Single User Account) Applications 3-13

Advanced Setup — SUA (Single User Account) Applications Screen Description 3-15

Advanced Setup — System Administration Screen 3-9

Advanced Setup — System Administration Wizard Screen Description 3-9

Applications for the Prestige 642 PPPoE Modem 1-3

Asymmetrical xiii

B

Backup Configuration 5-2

Backup Configuration Using HyperTerminal .. 5-2

Backup Configuration Using Telnet 5-3

C

CE Certification iv

certification iv

Change Your Hostname 4-8

CHAP (Challenge Handshake Authentication Protocol) 1-2

CLI See Command Line Interface

Command Line Interface 4-1

 Default Settings 2-5

 Device Related Commands 4-12

 Getting Started 4-1

 IP Related Commands 4-13

 Set Related Commands 4-4

 Show Related Commands 4-6

 Sys Related Commands 4-7

 Using Abbreviated CI Commands 4-3

 WAN Related Commands 4-11

Connecting a POTS Splitter 2-3

Connections

 Additional Requirements 2-3

 ADSL Line 2-2

 Console Port 2-3

 LAN Port 2-2

 Power Adapter 2-2

 Rear Panel 2-2

Console Port 2-3

Console Port Connections 2-3

Copyright ii

Customer Support v

D

Data Rate xiii

Date Command (sys) 4-9

Declaration of Conformity iv

Diagnostics Capabilities 1-2

Digital Subscriber Line Access Multiplexer ... 1-3

Downstream Rate xi

DSL (Digital Subscriber Line).....xiii
DSLAM See Digital Subscriber Line Access
Multiplexer

E

Ease of Installation..... 1-1
Enter Debug Mode..... 5-3
Exit Command..... 4-10

F

FCC.....iv
FCC Rules.....iv
Features of the Prestige 642 PPPoE Modem ... 1-1
Federal Communications Commission (FCC)
Interference Statement.....iv
Filename Conventions 5-1, 5-2
Final Wizard Screen..... 3-8
Firmware and Configuration File Maintenance 5-1
Firmware Development 5-2
Frame Relay..... 1-3
Front Panel LED Description..... 2-1
Front Panel LEDs of the P642 2-1
Front Panel of the P642 2-1
FTP File Transfer..... 5-9
Full Network Management 1-2
Full Rate 2-3
Full-duplex.....xi

G

Getting to Know Your PPPoE Modem 1-1
Glossary B

H

Half-duplex.....xi
Hardware and Software Requirements 2-3
Hardware Installation & Initial Setup 2-1
HyperTerminal..... 5-3

I

IANA 3-4, 3-5
IndexI
Initial Configuration, Prestige2-3
Initial Wizard Screen.....3-4
Initialization.....4-1
Internet Access xi, 1-1, 1-3, 3-4
Internet Assigned Numbers Authority.. See IANA

L

LAN Port Connections2-2
LED Colors.....2-1
LED Functions2-1
LED Status2-1
LEDs.....2-1
List of Figures ix
List of Tables..... x
Log Command (sys)4-9
Login screen3-2
Logout3-22

M

Maintenance — Diagnostic Screen3-21
Maintenance — Diagnostic Screen Description...
.....3-21
Maintenance — System Statistics3-19
Maintenance — System Status Screen
Description3-18
Microfilter2-4
Microfilter, how to connect2-5
Modem.....xi
Modem Wizard Screen.....3-7
Modem Wizard Screen Description.....3-7
Multiple Servers behind SUA.....3-14
Multiplexing1-2

N

Networking Compatibility.....1-2
NIC (Network Interface Card).....2-2

O

Online Registration iii

P

PAP (Password Authentication Protocol) 1-2

Password 4-1

Point-To-Point dedicated circuit xiii

POTS Splitter, how to connect..... 2-3, 2-4

Power Adapter Connections..... 2-2

PPPoE Wizard Screen 3-5

PPPoE Wizard Screen Description 3-6

Preface xi

Prestige 642 PPPoE Modem 1-1

Prestige 642, Prestige, P624..... xii

Prestige Web Configurator..... 3-2

Problems Connecting to a Remote Node 6-2

Problems Starting Up the Prestige 6-1

Problems with the LAN Interface 6-2

Problems with the WAN Interface 6-1

Protocols Supported 1-2

R

Rate Selection xi

Rear Panel 2-2

Rear Panel Connections 2-2

Reboot Command (sys)..... 4-8

Related Documentation..... xi

Restore Configuration 5-4

Restore Configuration Using HyperTerminal .. 5-4

ROM File 5-6

RS-232 2-3

S

Security 1-2

Set Baudrate 4-5

Single User Account 3-13

Splitters 2-3

Standards Supported 1-1

STP 2-2

SUA 3-15

Symmetrical xiii

Syntax Conventions xii

System Maintenance 5-7

System Statistics Screen Description 3-20

T

Table of Contents vi

Telephone Microfilters 2-4

Telephone Splitter See POTS Splitter

Terminal Emulator Software 2-3

TFTP Command, Example 5-8

TFTP File Transfer 5-7

Third Party FTP Clients — General Fields... 5-10

Third Party TFTP Clients — General Commands
..... 5-8

Time Command (sys)..... 4-9

Time Out, Web Configurator 3-2

Transmission Rates 1-1

Troubleshooting 6-1

 ADSL 6-1

 LAN 6-2

 Remote Node 6-2

Turning On the Prestige 2-5

U

Upload Firmware 5-5

Uploading Firmware using FTP 5-9

Uploading System Configuration File 5-6

Uploading the Configuration File using FTP... 5-9

Uploading the System Firmware 5-5

Upstream Rate xi

Using the FTP command from the DOS Prompt ...
..... 5-10

V

VPI and VCI Numbers, a note 3-5

W

Web Configurator

- About the Login Screen 3-2
- About the Welcome Screen 3-2
- Advanced Setup 3-8
- Introduction..... 3-1
- Login and Welcome Screens 3-2
- Logout Screen 3-22
- Maintenance..... 3-17
- Wizard Setup 3-3

Web Configurator 1-1, 3-1

Welcome Screen 3-3

What is ADSL?xiii

- What is DSL?xiii
- Wizard Setup 3-2
- Wizard Setup—Final Wizard Screen..... 3-8
- Wizard Setup—Modem..... 3-6

X

- XMODEM protocol 5-2
- Xmodem Upload Using HyperTerminal 5-6

Z

- ZyNOS..... 5-1, 5-2
- ZyNOS F/W Version..... 5-1
- ZyXEL Limited Warranty iii