Prestige 310

Broadband Sharing Gateway

User's Guide

Version 3.25

August 2001

ZyXEL

TOTAL INTERNET ACCESS SOLUTION

Copyright

Disclaimer

ZyXEL does not assume any liability arising out of the application or use of any products, or software described herein. Neither does it convey any license under its patent rights nor the patent rights of others. ZyXEL further reserves the right to make changes in any products described herein without notice. This publication is subject to change without notice.

Trademarks

ZyNOS (ZyXEL Network Operating System) is a registered trademark of ZyXEL Communications, Inc. Other trademarks mentioned in this publication are used for identification purposes only and may be properties of their respective owners..

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:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and the receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. 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

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

Information for Canadian Users

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective operation and safety requirements. The Industry Canada label does not guarantee that the equipment will operate to a user's satisfaction.
Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

For their own protection, users should ensure that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution

Users should not attempt to make such connections themselves, but should contact the appropriate electrical inspection authority, or electrician, as appropriate.

Note

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the radio interference regulations of Industry Canada.

CE

Declaration of Conformity

The following products is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the laws of the Member States relating to Electromagnetic Compatibility Directive (89/336/EEC). The listed standard as below were applied:

The following Equipment:

Product : LAN / Gateway Router

Model Number : PRESTIGE 310 / 310-S, ZyWALL 10

RFI Emission: Generic emission standard according to EN 50081-1/1992
Limit class B according to EN 55022/1998
Limits class A for harmonic current emission according to EN 61000-3-2/1995
Limitation of voltage fluctuation and flicker in low-voltage supply system according to EN 61000-3-3/1995

Immunity : Generic immunity standard according to EN 50082-1:1997/ EN 55024: 1998
Electrostatic Discharge according to EN 61000-4-2:1995
Contact Discharge: 4 kV, Air Discharge : 8 kV
Radio-frequency electromagnetic field according to EN 61000-4-3:1996
80 – 1000MHz with 1kHz AM 80% Modulation: 3V/m
Electromagnetic field from digital telephones according to ENV 50204:1995
900 ±5MHz with 200Hz rep. Frequency ,Duty Cycle 50%
Electrical fast transient/burst according to EN 61000-4-4:1995
AC/DC power supply: 1kV, Data/Signal lines : 0.5kV
Surge immunity test according to EN 61000-4-5:1995
AC/DC Line to Line: 1kV, AC/DC Line to Earth : 2kV
Immunity to conducted disturbances, Induced by radio-frequency fields: EN 61000-4-6:1996
0.15 – 80MHz with 1kHz AM 80% Modulation: 3V/m
Power frequency magnetic field immunity test according to EN 61000-4-8:1993
3A/m at frequency 50Hz
Voltage dips, short interruptions and voltage variations immunity test according to EN 61000-4-11:1994
30% Reduction @ 10ms/ 500ms, 60% Reduction @100ms, >95%Reduction @10ms/ 5000ms

The following importer/manufacturer is responsible for this declaration:

Company Name ZyXEL Communications Services GmbH.

Company Address :Thaliastrasse 125a/2/2/4
A-1160 Wien • AUSTRIA

Telephone : Tel.: 01 / 494 86 77-0 Facsimile :
Fax: 01 / 494 86 78

Person is responsible for marking this declaration:

Manfred RECLA
Name (Full Name)

October 23, 2000
Date

ZyXEL Techn Support
Position/ Title

Manfred Recla
Legal Signature

ZyXEL Communications Services GmbH.
Thaliastrasse 125a/2/2/4
A-1160 Wien • AUSTRIA
Tel.: 01 / 494 86 77-0
Fax: 01 / 494 86 78

Declaration of Conformity

We, the Manufacturer/Importer,

ZyXEL Communications Corp.
No. 6, Innovation Rd. II,
Science-Based Industrial Park,
Hsinchu, Taiwan, 300 R.O.C

declare that the product

Prestige 310

is in conformity with
(reference to the specification under which conformity is declared)

Standard	*Standard Item*	Version
• EN 55022	Radio disturbance characteristics – Limits and method of measurement.	1998
• EN 61000-3-2	Disturbance in supply system caused by household appliances and similar electrical equipment “Harmonics”.	1995
• EN 61000-3-3	Disturbance in supply system caused by household appliances and similar electrical equipment “Voltage fluctuations”.	1995
• EN 61000-4-2	Electrostatic discharge immunity test – Basic EMC Publication	1995
• EN 61000-4-3	Radiated, radio-frequency, electromagnetic field immunity test	1996
• EN 61000-4-4	Electrical fast transient / burst immunity test - Basic EMC Publication	1995
• EN 61000-4-5	Surge immunity test	1995
• EN 61000-4-6	Immunity to conducted disturbances, induced by radio-frequency fields	1996
• EN 61000-4-8		1993
• EN61000-4-11	Voltage dips, short interruptions and voltage variations immunity tests	1994

ZyXEL Limited Warranty

ZyXEL warrants to the original end user (purchaser) that this product is free from any defects in materials or workmanship for a period of up to two years from the date of purchase. During the warranty period, and upon proof of purchase, should the product have indications of failure due to faulty workmanship and/or materials, ZyXEL will, at its discretion, repair or replace the defective products or components without charge for either parts or labor, and to whatever extent it shall deem necessary to restore the product or components to proper operating condition. Any replacement will consist of a new or re-manufactured functionally equivalent product of equal value, and will be solely at the discretion of ZyXEL. This warranty shall not apply if the product is modified, misused, tampered with, damaged by an act of God, or subjected to abnormal working conditions.

Note

Repair or replacement, as provided under this warranty, is the exclusive remedy of the purchaser. This warranty is in lieu of all other warranties, express or implied, including any implied warranty of merchantability or fitness for a particular use or purpose. ZyXEL shall in no event be held liable for indirect or consequential damages of any kind of character to the purchaser.

To obtain the services of this warranty, contact ZyXEL's Service Center for your Return Material Authorization number (RMA). Products must be returned Postage Prepaid. It is recommended that the unit be insured when shipped. Any returned products without proof of purchase or those with an out-dated warranty will be repaired or replaced (at the discretion of ZyXEL) and the customer will be billed for parts and labor. All repaired or replaced products will be shipped by ZyXEL to the corresponding return address, Postage Paid. This warranty gives you specific legal rights, and you may also have other rights that vary from country to country.

Online Registration

Don’t forget to register your ZyXEL product (fast, easy online registration at www.zyxel.com) for free future product updates and information.

Customer Support

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

- Product model and serial number.
- Information in **Menu 24.2.1 –System Information**.
- Warranty Information.
- Date that you received your device.
- Brief description of the problem and the steps you took to solve it.

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

Table of Contents

List of Figures

List of Tables

Preface

About Your Gateway

Congratulations on your purchase of the Prestige 310 Broadband Sharing Gateway.

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

The Prestige 310 is a dual Ethernet broadband gateway integrated with network management features that allows access to the Internet via Cable/xDSL modem. It is designed for:

- Home offices and small businesses with Cable and xDSL modem via Ethernet port as Internet access media.
- Multiple office/department connections via access devices.

Your Prestige 310 is easy to install and to configure. The embedded web configurator is a convenient platform-independent GUI (Graphical User Interface) that allows you to access the Prestige's management settings.

All functions of the Prestige 310 are also software configurable via the SMT (System Management Terminal) interface. The SMT is a menu-driven interface that you can access from a terminal emulator through the console port or over a telnet connection.

About This User's Manual

This manual is designed to guide you through the SMT configuration of your Prestige 310 for its various applications. There is also HTML help for the embedded web configurator.

Structure of this Manual

This manual is structured as follows:

Part I. Getting Started (Chapters 1-3) is structured as a step-by-step guide to help you connect, install and setup your Prestige to operate on your network and access the Internet.

Part II. Advanced Applications (Chapters 4-6) describe the advanced applications of your Prestige, such as NAT, Remote Node Setup and IP Static Route Setup.

Part III. Advanced Management (Chapter 7 - 13) Chapters 7 - 13 provide information on Filter Configuration, SNMP Configuration, System Information and Diagnosis, Firmware and Configuration File Maintenance, System Maintenance and Call Scheduling.

Part IV. Troubleshooting (Chapter 14), provides information about solving common problems as well as some Appendices.

Regardless of your particular application, it is important that you follow the steps outlined in *Chapters 1-2* to connect your Prestige to your LAN. You can then refer to the appropriate chapters of the manual, depending on your applications.

Related Documentation

- Support CD

More detailed information about the Prestige and examples of its use can be found in our Support CD. This CD contains HTML help on the embedded web configurator, our handy web-based Internet access wizard designed to get you up and running as soon as possible, the Prestige 310 manual in PDF format, Support Notes (that include a General FAQ, an Advanced FAQ, Applications Notes, Troubleshooting, Reference CI Commands) and bundled software.

- Read Me First

Our Read Me First is designed to help you get your Prestige up and running right away. It contains a detailed easy to follow connection diagram, Prestige default settings, handy checklists and information on setting up your PC.

- Packing List Card

Finally, you should have a Packing List Card that lists all items that should have come with your Prestige..

- ZyXEL Web Page and FTP Server Site

You can access release notes for firmware upgrades and other information at ZyXEL web pages and FTP server sites. Refer to the Customer Support page in this User's Guide for more information.

Syntax Conventions

- "Enter" means for you to type one or more characters and press the carriage return. "Select" or "Choose" means for you to select one from the predefined choices.
- The SMT menu titles and labels are in **Bold Times** font. The choices of a menu item are in **Bold Arial** font. A single keystroke is in Arial font and enclosed in square brackets, for instance, [ENTER] means the Enter, or carriage return, key; [ESC] means the escape key and [SPACE BAR] means the space bar. [UP] and [DOWN] are the up and down arrow keys.
- 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 310 may be referred to as the Prestige or the P310 in this manual. Occasionally, SMT screens may refer to the Prestige as a router.

Part I:

Getting Started

This section is a step-by-step guide to help you connect, install and setup your Prestige to operate on your network and access the Internet.

Chapter 1
Getting to Know Your Prestige

This chapter introduces the main features and applications of the Prestige as well as a checklist for fast Internet access.

1.1 The Prestige 310 Broadband Sharing Gateway

The Prestige 310 is a dual Ethernet broadband gateway integrated with robust network management features for Internet access via external Cable/xDSL modem. Equipped with 10Mbps Ethernet WAN port for WAN, an auto-negotiating 10/100Mbps Ethernet port for LAN and the Network Address Translation (NAT) feature, the Prestige is uniquely suited as a broadband Internet access sharing gateway for small offices and home offices.

The Prestige web configurator is a breeze to operate and totally independent of the operating system platform you use.

1.2 Features of the Prestige 310

The following are the main features of the Prestige 310.

10/100MB Auto-negotiation Ethernet/Fast Ethernet Interface

This auto-negotiation feature allows the Prestige to detect the speed of incoming transmissions and adjust appropriately without manual intervention. It allows data transfer of either 10 Mbps or 100 Mbps in either half-duplex or full-duplex mode depending on your Ethernet network.

SNMP

SNMP (Simple Network Management Protocol) is a protocol used for exchanging management information between network devices. SNMP is a member of the TCP/IP protocol suite. Your Prestige supports SNMP agent functionality, which allows a manager station to manage and monitor the Prestige through the network. The Prestige supports SNMP version one (SNMPv1).

NAT (Network Address Translation)

NAT (Network Address Translation - NAT, RFC 1631) allows the translation of an Internet Protocol address used within one network to a different IP address known within another network. The Prestige can now map multiple global IP addresses to local IP addresses of clients or servers.

Port Forwarding

Use this feature to forward incoming service requests to a server on your local network. You may enter a single port number or a range of port numbers to be forwarded, and the local IP address of the desired server.

DHCP Support

DHCP (Dynamic Host Configuration Protocol) allows the individual clients (workstations) 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 9X, Windows NT and other systems that support the DHCP client. The Prestige can now also act as a surrogate DHCP server (DHCP Relay) where it relays IP address assignment from the actual real DHCP server to the clients.

Dynamic DNS Support

With Dynamic DNS support, you can have a static hostname alias for a dynamic IP address, allowing the host to be more easily accessible from various locations on the Internet. You must register for this service with a Dynamic DNS client.

IP Multicast

Traditionally, IP packets are transmitted in two ways - unicast or broadcast. Multicast is a third way to deliver IP packets to a group of hosts. IGMP (Internet Group Management Protocol) is the protocol used to support multicast groups. The latest version is version 2 (see RFC 2236). The Prestige supports versions 1 and 2.

PPPoE Support

PPPoE facilitates the interaction of a host with a broadband modem to achieve access to high-speed data networks via a familiar "dial-up networking" user interface.

PPTP Support

Point-to-Point Tunneling Protocol (PPTP) is a network protocol that enables secure transfer of data from a remote client to a private server, creating a Virtual Private Network (VPN) using a TCP/IP-based network. PPTP supports on-demand, multi-protocol and virtual private networking over public networks, such as the Internet.

IP Alias

IP alias allows you to partition a physical network into logical networks over the same Ethernet interface.

Call Scheduling

Configure call time periods to restrict and allow access for users on remote nodes.

Call Control

The Prestige provides budget management for outgoing calls and chronicles incoming and outgoing calls.

Full Network Management

Your Prestige offers you a variety of options for network management. It supports password protected local and remote network management via the console port or a telnet connection using SMT (System Management Interface). It also supports FTP (File Transfer Protocol) server for remote management, TFTP (Trivial FTP), SNMP (Simple Network Management Protocol) and CI (Command Interpreter) mode.

RoadRunner Support

In addition to standard cable modem services, the Prestige supports Time Warner's RoadRunner Service.

Time and Date Setting

This new feature (menu 24.10) allows you to get the current time and date from an external server when you power up your Prestige. The real time is then displayed in the Prestige **Menu 24.1- System Status** and error logs. If you do not choose a time service protocol that your timeserver will send when the Prestige powers up you can enter the time manually but each time the system is booted, the time & date will be reset to 1/1/1970 0:0:0.

Logging and Tracing

- Built-in message logging and packet tracing.
- Unix syslog facility support.

Embedded FTP and TFTP Servers

The Prestige's embedded FTP and TFTP servers enable fast firmware upgrades as well as configuration file backups and restoration.

Packet Filtering

The Packet Filtering mechanism blocks unwanted traffic from entering/leaving your network.

Upgrade Prestige Firmware via LAN

The firmware of the Prestige 314 can be upgraded via the LAN.

1.3 Applications for the Prestige 310

1.3.1 Broadband Internet Access via Cable or DSL Modem

A cable modem or xDSL modem can connect to the Prestige 310 for broadband Internet access via Ethernet port on the modem. A typical Internet access application is shown next.

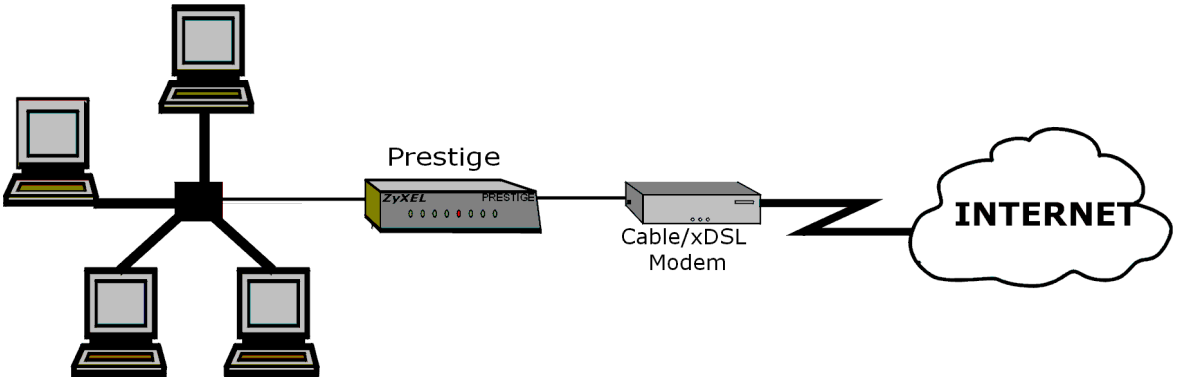


Figure 1-1 Internet Access Application

1.4 Internet Access Configuration Checklist

The following table shows the minimum SMT menu configurations you'll need to make (without changing the default Prestige values) in order to access the Internet. Please also refer to the Support CD which contains HTML help on the Web Embedded Configurator, our handy web-based Internet access wizard designed to get you up and running as soon as possible.

Table 1-1 Internet Access Configuration Checklist

SMT #	FIELD	ACTION
1	System Name	This field is for identification purposes but because some ISPs check this name you should enter your computer's "Computer Name". • In Windows 95/98 click **Start** -> **Settings** -> **Control Panel** -> **Network**. Click the **Identification** tab, note the entry for the **Computer name** field and enter it as the Prestige **System Name**. • In Windows 2000 click **Start**->**Settings**->**Control Panel** and then double-click **System**. Click the **Network Identification** tab and then the **Properties** button. Note the entry for the **Computer name** field and enter it as the Prestige **System Name**.
2	MAC Address: Assigned By	The default is **Factory Default**, which is the factory assigned default MAC Address. We recommend you choose **IP Address attached on LAN** and enter the IP address of the workstation on the LAN whose MAC you are cloning.
4	Encapsulation	Choose **PPPoE** if you have a dial-up connection to the Internet (or **PPTP** if you reside in France or Austria); otherwise choose **Ethernet**. Choose from **RR-Manager, RR-Telstra,** or **RR-Toshiba** if your ISP is Time Warner's RoadRunner; otherwise choose **Standard** .

SMT #	FIELD	ACTION
	PPTP	You need to know your login name, password and connection ID/Name. The latter may not be obligatory for some ISPs, but if it is you must follow the “c:id” and “n:name” format.
	PPPoE	You need to know your login name, password and service name. The latter may not be obligatory for some ISPs.
	IP Address Assignment	If your ISP did not assign you a fixed IP address, select **Dynamic**, otherwise select **Static** and enter the IP address & subnet mask in the IP address and IP Subnet Mask fields.
Once these key fields have been configured, you should be able to enjoy super-fast Internet access with your Prestige!		

Chapter 2
Hardware Installation & Initial Setup

This chapter shows you how to connect hardware and perform the initial setup.

2.1 Front Panel LEDs and Rear Panel Ports

2.1.1 Front Panel LEDs

The LEDs on the front panel indicate the operational status of the Prestige.

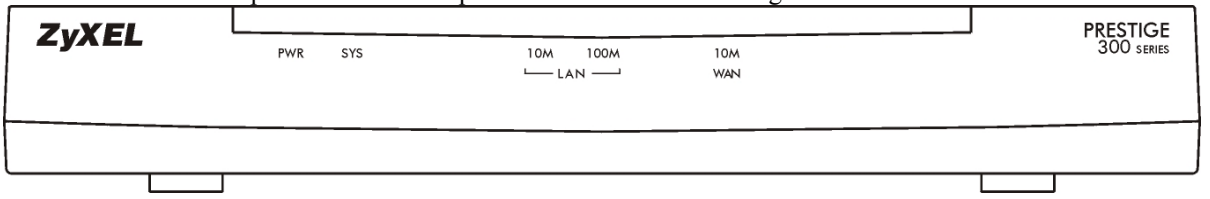


Figure 2-1 Front Panel

The following table describes the LED functions.

Table 2-1 LED Descriptions

LED	FUNCTION	COLOR	STATUS	MEANING
PWR	Power	Green	On	The Prestige is receiving power.
SYS	System		Off	The system is not ready or failed.
			On	The system is ready and running.
			Flashing	The system is rebooting.
10M LAN	LAN	Green	Off	The 10M LAN is not connected.
			On	The Prestige is connected to a 10M LAN.
			Flashing	The 10M LAN is sending/receiving packets.
100M LAN		Orange	Off	The 100M LAN is not connected.
			On	The Prestige is connected to a 100Mbps LAN.
			Flashing	The 100M LAN is sending/receiving packets.
WAN	WAN	Green	Off	The WAN Link is not ready, or has failed.
			On	The WAN Link is ok.
			Flashing	The 10M WAN link is sending/receiving packets.

2.2 Prestige 310 Rear Panel and Connections

The following figure shows the rear panel of your Prestige 310 and the related connections.

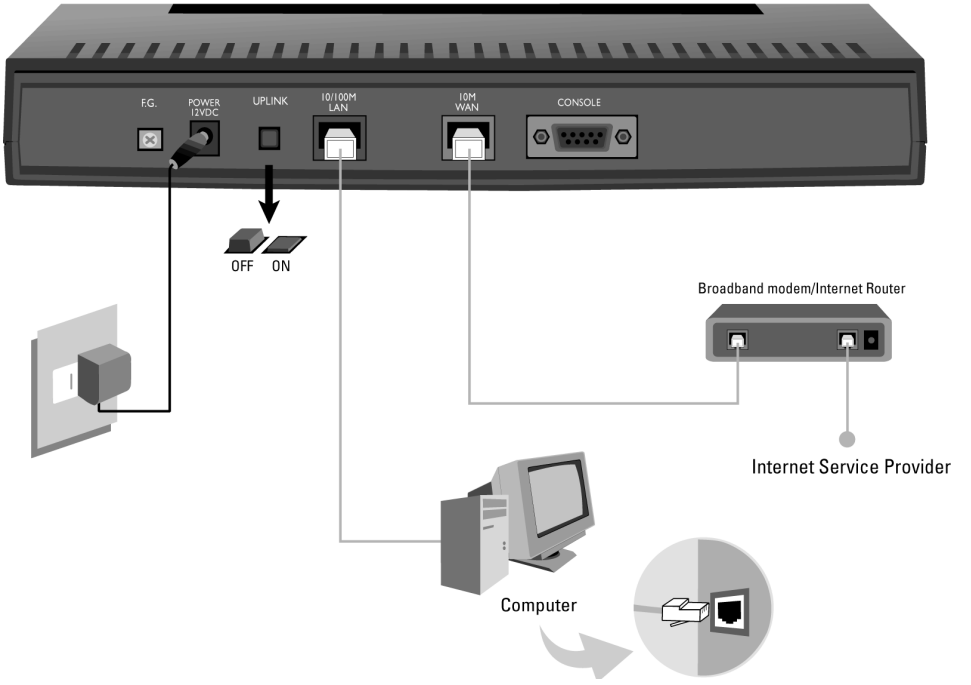


Figure 2-2 Prestige 310 Rear Panel Connections

This section outlines how to connect your Prestige 310 to the LAN and the WAN. If you want to connect a cable modem, you must connect the coaxial cable from your cable service to the threaded coaxial cable connector on the back of the cable modem. Connect an xDSL modem to the xDSL wall jack.

Step 1. Connecting the Console Port

For the initial configuration of your Prestige, you need to use terminal emulator software on your computer and connect it to the Prestige through the console port. Connect the 9-pin end of the console cable to the console port of the Prestige and the other end (choice of 9-pin or 25-pin, depending on your computer) 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. After the initial setup, you can modify the configuration remotely through telnet connections.

Step 2. Connecting the Prestige to the Broadband Modem

Step 2a. Connecting the Prestige to the cable modem:

Connect the WAN port (silver) on the Prestige to the Ethernet port on the cable modem using the cable that came with your cable modem. The Ethernet port on a cable modem is sometimes labeled "PC" or "Workstation".

OR

Step 2b. Connecting the Prestige to the xDSL Modem:

Connect the WAN port (silver) on the Prestige to the Ethernet port on the xDSL modem using the cable that came with your xDSL modem.

Step 3. Connecting the Prestige to the LAN

When the Prestige Ethernet cable is correctly connected to the PC or hub, the front panel LAN LED will go on.

For a single computer, connect the 10/100M LAN port on the Prestige to the Network Adapter on the computer using the white straight-through cable and push the **UPLINK** button ("on"). If the **UPLINK** button is not "on", you must use a crossover cable for this connection.

If you have more than one computer, you must use an external hub. Connect the 10/100M LAN port (gold) on the Prestige to a port on the hub using a straight-through Ethernet cable and make sure the Uplink button is "off".

Step 4. Connecting the Power Adapter to your Prestige

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

To prevent damage to the Prestige, make sure you have the correct power adapter. See the *Power Adapter Specification Appendix* for regional specifications.

Step 5. Grounding the Prestige (Optional)

Ground the Prestige by connecting a grounded wire to the **F.G.** (Frame Ground) of the Prestige.

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:

1. A computer with an installed Ethernet NIC (Network Interface Card).
2. A computer equipped with communications software called terminal emulation software configured to the following parameters:
   - VT100 terminal emulation.
   - 9600 baud.
   - No parity, 8 data bits, 1 stop bit, flow control set to none.
3. A cable/xDSL modem and an ISP account.

2.4 Turning on Your Prestige

At this point, you should have connected the console port, the LAN port, the WAN port and the power port to the appropriate devices or lines. Plug the power adapter into a wall outlet. The PWR LED should be on. The SYS LED will come on after the system tests are complete. The WAN LED and one of the LAN LEDs come on immediately after the SYS LED comes on, if connections have been made to the LAN and WAN ports.

2.4.1 Initial Screen

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

```
Copyright (c) 1994 - 2001 ZyXEL Communications Corp.
initialize ch =0, ethernet address: 00:a0:c5:27:84:52
initialize ch =1, ethernet address: 00:a0:c5:27:84:53
Press ENTER to continue...
```

Figure 2-3 Initial Screen

2.4.2 Entering the Password

The login screen appears after you press [ENTER], prompting you to enter the password, as shown next.
For your first login, enter the default password 1234. As you type the password, the screen displays an (X) for each character you type.
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.

```
Enter Password : XXXX
```

Figure 2-4 Password Screen

2.5 Navigating the SMT Interface

The SMT (System Management Terminal) is the interface that you use to configure your Prestige.
Several operations that you should be familiar with before you attempt to modify the configuration are listed next.

Table 2-2 Main Menu Commands

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

2.5.1 Main Menu

After you enter the password, the SMT displays the **Prestige 310 Main Menu**, as shown next.

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

                        Prestige 310 Main Menu

      Getting Started              Advanced Management
        1. General Setup             21. Filter Set Configuration
        2. WAN Setup                 22. SNMP Configuration
        3. LAN Setup                 23. System Password
        4. Internet Access Setup     24. System Maintenance

      Advanced Applications          26. Schedule Setup
        11. Remote Node Setup
        12. Static Routing Setup
        15. NAT Setup

                                     99. Exit

                        Enter Menu Selection Number:
```

Figure 2-5 Prestige 310 Main Menu

2.5.2 System Management Terminal Interface Summary

Table 2-3 Main Menu Summary

NO.	MENU TITLE	FUNCTION
1	General Setup	Use this menu to set up routing/bridging and general information.
2	WAN Setup	Use this menu to clone a MAC address from a computer on your LAN.
3	LAN Setup	Use this menu to configure LAN DHCP and TCP/IP settings as well as apply LAN filters.
4	Internet Access Setup	Configure your Internet Access setup (Internet address, gateway, login, etc.) with this menu.
11	Remote Node Setup	Use this menu to configure detailed remote node settings (your ISP is also a remote node) as well as apply WAN filters.
12	Static Routing Setup	Configure static routes for bridging and IP in this menu.
15	NAT Setup	Use this menu to configure Network Address Translation.
21	Filter Set Configuration	Use this menu to provide security via filters.
22	SNMP Configuration	Use this menu to configure SNMP-related parameters.
23	System Password	Change your password in this menu (recommended).
24	System Maintenance	From displaying system status to uploading firmware, this menu provides comprehensive system maintenance.

NO.	MENU TITLE	FUNCTION
26	Schedule Setup	Use this menu to schedule outgoing calls.
99	Exit	Use this menu to exit (necessary for remote configuration).

2.5.3 SMT Menus at a Glance

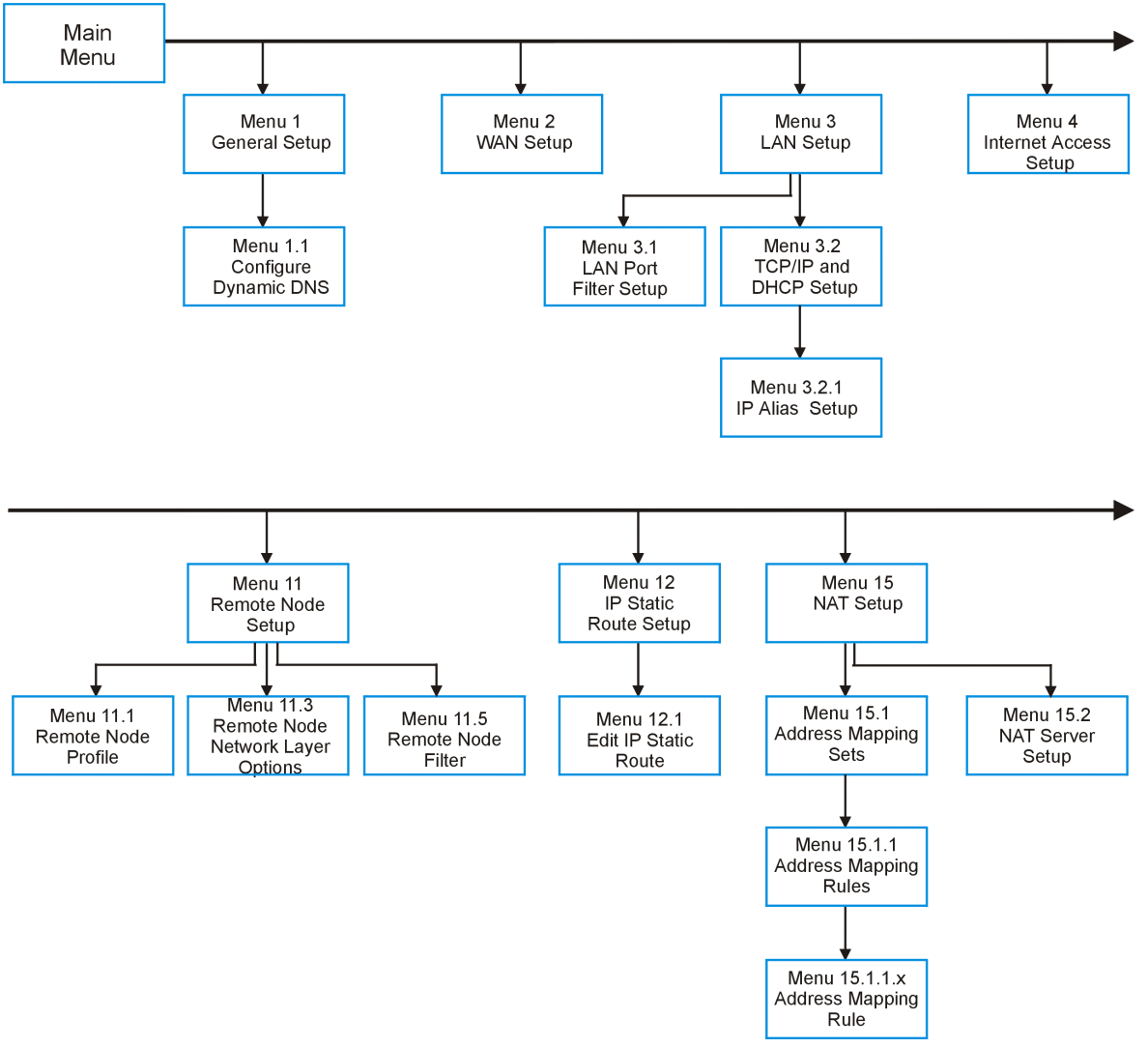


Figure 2-6 Getting Started and Advanced Application SMT Menus

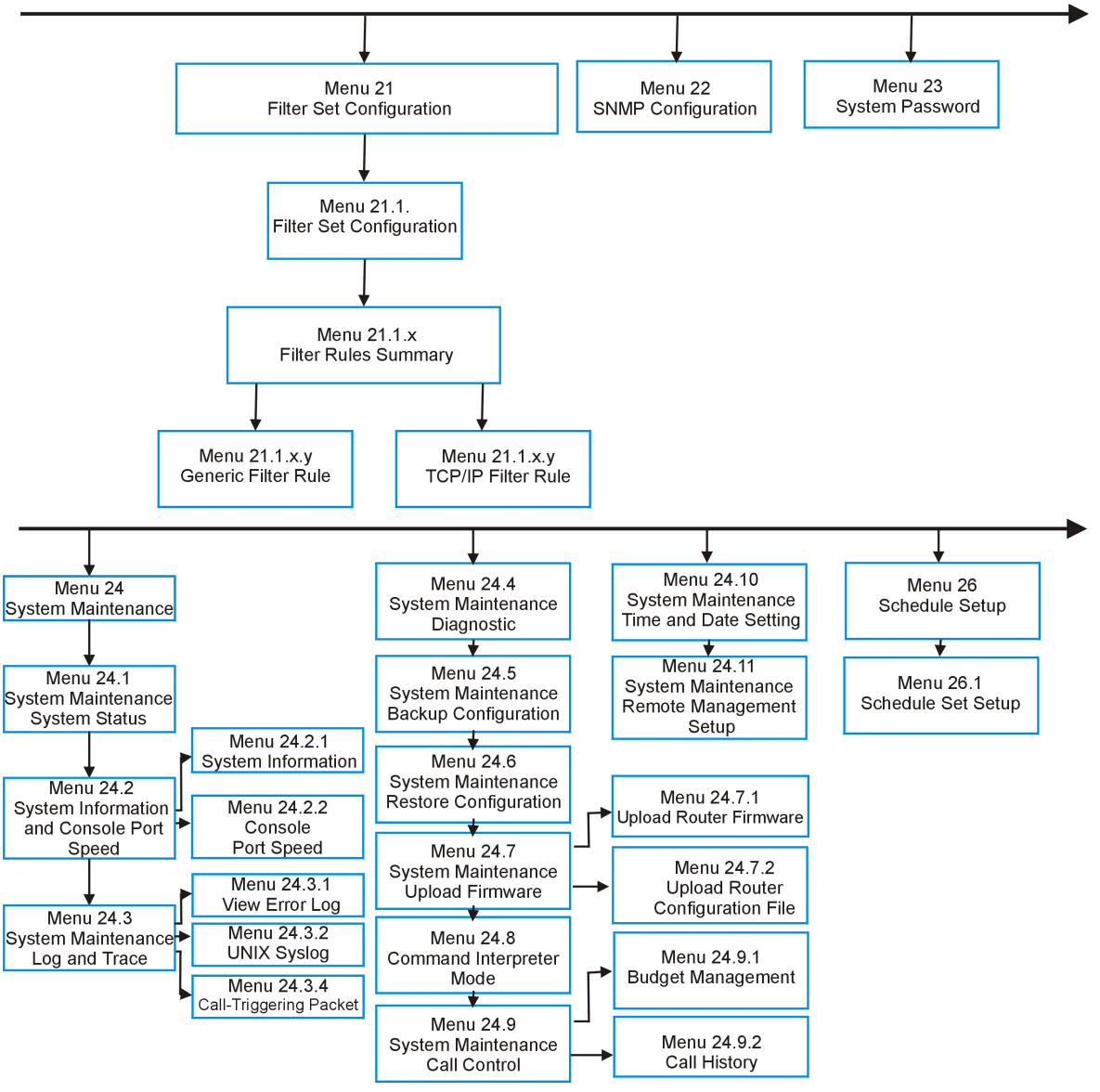


Figure 2-7 Advanced Management SMT Menus

2.6 Changing the System Password

The first thing your should do is change the default system password by following the steps shown next.

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

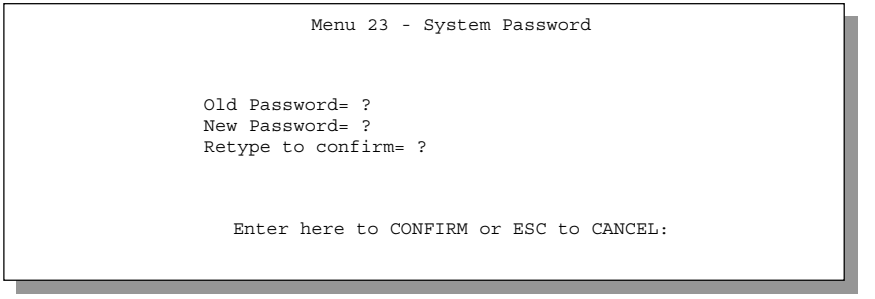


Figure 2-8 Menu 23 — System Security

Step 2. Enter your existing password and press [ENTER].

Step 3. Enter your new system password and press [ENTER].

Step 4. Re-type your new system password for confirmation and press [ENTER].

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

2.6.1 Resetting the Prestige

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

Turn off the Prestige and begin a terminal emulation software session with the default console port settings. Turn on the Prestige again. When you see the message "Press Any key to enter Debug Mode within 3 seconds", press any key to enter debug mode. You should already have downloaded the correct file from your nearest ZyXEL FTP site. See *section 10.4* for more information on how to transfer the configuration file to your Prestige.

2.7 General Setup

Menu 1 - General Setup contains administrative and system-related information (shown next). **System Name** is for identification purposes. However, because some ISPs check this name you should enter your computer's "Computer Name".

- In Windows 95/98 click **Start** -> **Settings** -> **Control Panel** -> **Network**. Click the **Identification** tab, note the entry for the **Computer name** field and enter it as the Prestige **System Name**.
- In Windows 2000 click **Start**->**Settings**->**Control Panel** and then double-click **System**. Click the **Network Identification** tab and then the **Properties** button. Note the entry for the **Computer name** field and enter it as the Prestige **System Name**.

The **Domain Name** entry is what is propagated to the DHCP clients on the LAN. If you leave this blank, the domain name obtained by DHCP from the ISP is used. While you must enter the host name (**System Name**) on each individual computer, the domain name can be assigned from the Prestige via DHCP.

2.7.1 Dynamic DNS

Dynamic DNS allows you to update your current dynamic IP address with one or many dynamic DNS services so that anyone can contact you (in *NetMeeting*, *CU-SeeMe*, etc.). You can also access your FTP server or Web site on your own computer using a DNS-like address (e.g. *myhost.dhs.org*, where *myhost* is a name of your choice) which will never change instead of using an IP address that changes each time you reconnect. Your friends or relatives will always be able to call you even if they don't know your IP address. First of all, you need to have registered a dynamic DNS account with www.dyndns.org. This is for people with a dynamic IP from their ISP or DHCP server that would still like to have a DNS name.
To use this service, you must register with the Dynamic DNS client. The Dynamic DNS Client service provider will give you a password or key. The Prestige, at the time of writing, supports www.dyndns.org clients. You can apply to this client for Dynamic DNS service.

DYNDNS Wildcard

Enabling the wildcard feature for your host causes ***.**yourhost.dyndns.org to be aliased to the same IP address as yourhost.dyndns.org. This feature is useful if you want to be able to use, for example, *www.*yourhost.dyndns.org and still reach your hostname.

2.7.2 Procedure For Configuring Menu 1

Step 1. Enter 1 in the main menu to open **Menu 1 – General Setup** (shown next).
Step 2. Fill in the required fields. Refer to the table shown next for more information about these fields.

```
                        Menu 1 - General Setup

            System Name= xxx
            Domain Name=zyxel.com.tw
            Edit Dynamic DNS= No




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

Figure 2-9 Menu 1 — General Setup

Table 2-4 General Setup Menu Field

FIELD	DESCRIPTION	EXAMPLE
System Name	Choose a descriptive name for identification purposes. It is recommended you enter your computer's "Computer name" in this field. This name can be up to 30 alphanumeric characters long. Spaces are not allowed, but dashes "-" and underscores "_" are accepted.	P310
Domain Name	Enter the domain name (if you know it) here. If you leave this field blank, the ISP may assign a domain name via DHCP. You can go to menu 24.8 and type "sys domainname" to see the current domain name used by your gateway. If you want to clear this field just press the [SPACE BAR]. The domain name entered by you is given priority over the ISP assigned domain name.	zyxel.com.tw
Edit Dynamic DNS	Press the [SPACE BAR] to select **Yes** or **No** (default). Select **Yes** to configure **Menu 1.1 – Configure Dynamic DNS** (discussed next).	**No**
When you have completed this menu, press [ENTER] at the prompt "Press ENTER to Confirm…" to save your configuration, or press [ESC] at any time to cancel.		

2.7.3 Configuring Dynamic DNS

To configure Dynamic DNS, go to **Menu 1 – General Setup** and press select **Yes** in the **Edit Dynamic DNS** field. Press [ENTER] to display **Menu 1.1– Configure Dynamic DNS** as shown next.

```
                    Menu 1.1 - Configure Dynamic DNS

Service Provider = WWW.DynDNS.ORG
Active= Yes
Host= me.ddns.org
EMAIL= mail@mailserver
User= username
Password= ******
Enable Wildcard= No
             Press ENTER to confirm or ESC to cancel:
```

Figure 2-10 Configure Dynamic DNS

Follow the instructions in the next table to configure Dynamic DNS parameters.

Table 2-5 Configure Dynamic DNS Menu Fields

FIELD	DESCRIPTION	EXAMPLE
Service Provider	This is the name of your Dynamic DNS client. This field is read-only.	WWW.DynDNS.org
Active	Press [SPACE BAR] to select either **Yes** or **No**.	**Yes**
Host	Enter the domain name assigned to your Prestige by your Dynamic DNS provider.	me.dyndns.org
EMAIL	Enter your e-mail address.	mail@mailserver
User	Enter your user name.	
Password	Enter the password assigned to you.	
Enable Wildcard	Your Prestige supports DYNDNS Wildcard. Press [SPACE BAR] to select **Yes** or **No**.	**Yes**
When you have completed this menu, press [ENTER] at the prompt “Press ENTER to Confirm…” to save your configuration, or press [ESC] at any time to cancel.		

The IP address will be updated when you reconfigure menu 1 or perform DHCP client renewal.

If you have a private WAN IP address, then you can not use Dynamic DNS.

2.8 WAN Setup

This section describes how to configure the WAN using **Menu 2 – WAN Setup**. From the main menu, enter 2 to display menu 2.

ZyXEL recommends you configure this menu even if your ISP does not require MAC address athentication.

```
                    Menu 2 - WAN Setup
               MAC Address:
                Assigned By=IP address attached on LAN
                IP Address= 192.168.1.33



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

Figure 2-11 Menu 2 — WAN Setup

The MAC address field allows users to configure the WAN port's MAC Address by either using the factory default or cloning the MAC address from a workstation on your LAN. Once it is successfully configured, the

address will be copied to the rom file (ZyNOS configuration file). It will not change unless you change the setting in menu 2 or upload a different rom file.
The following table contains instructions on how to configure your WAN setup.

Table 2-6 WAN Setup Menu Fields

FIELD	DESCRIPTION	EXAMPLE
MAC Address Assigned By	Press the [SPACE BAR] to choose one of two methods to assign a MAC Address. Choose **Factory Default** to select the factory assigned default MAC Address. Choose **IP Address attached on LAN** to use the MAC Address of that workstation whose IP you give in the following field.	**IP Address attached on LAN**
IP Address	This field is applicable only if you choose the **IP Address attached on LAN** method in the **Assigned By** field above. Enter the IP address of the workstation on the LAN whose MAC you are cloning.	192.168.1.33
When you have completed this menu, press [ENTER] at the prompt "Press ENTER to Confirm…" to save your configuration, or press [ESC] at any time to cancel.		

Your Prestige WAN Port is always set at half-duplex mode as most cable modems only support half-duplex mode. If your cable modem supports full-duplex mode, then you will be able to manually set it at half-duplex mode. If the Prestige is set at half-duplex mode and the cable modem is set at full-duplex mode, then the WAN port will not function properly.

Your Prestige supports full duplex mode on the LAN side.

2.9 LAN Setup

This section describes how to configure the LAN using **Menu 3 — LAN Setup**. From the main menu, enter 3 to display menu 3 (shown next).

```
                    Menu 3 - LAN Setup


                1. LAN Port Filter Setup
                2. TCP/IP and DHCP Setup




                Enter Menu Selection Number:
```

Figure 2-12 Menu 3 — LAN Setup

2.9.1 LAN Port Filter Setup

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

```
                Menu 3.1 - LAN Port Filter Setup

            Input Filter Sets:
               protocol filters= 2
               device filters=
            Output Filter Sets:
               protocol filters=
               device filters=


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

Figure 2-13 Menu 3.1 — LAN Port Filter Setup

Menu 3.2 is discussed in the next part of the manual. Please read on.

Chapter 3
Internet Access

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

3.1 TCP/IP and DHCP for LAN

The Prestige has built-in DHCP server capability that assigns IP addresses and DNS servers to systems that support DHCP client capability.

3.1.1 Factory LAN Defaults

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

1. IP address of 192.168.1.1 with subnet mask of 255.255.255.0 (24 bits)
2. DHCP server enabled with 32 client IP addresses starting from 192.168.1.33.

These parameters should work for the majority of installations. If your ISP gives you explicit DNS server address(es), skip to the *DNS Server Address section* to see how to enter the DNS server address(es).

3.1.2 DHCP Configuration

DHCP (Dynamic Host Configuration Protocol, RFC 2131 and RFC 2132) allows individual clients to obtain TCP/IP configuration at start-up from a server. You can configure the Prestige as a DHCP server or disable it. When configured as a server, the Prestige provides the TCP/IP configuration for the clients. If set to **None**, DHCP service will be disabled and you must have another DHCP server on your LAN, or else the workstation must be manually configured.
The Prestige can also act as a surrogate DHCP server (DHCP Relay) where it relays IP address assignment from the actual real DHCP server to the 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. This configuration leaves 31 IP addresses (excluding the Prestige itself) in the lower range for other server computers, e.g., server for mail, FTP, telnet, web, etc., that you may have.

DNS Server Address

Use DNS (Domain Name System) to map 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.
There are two ways that an ISP disseminates the DNS server addresses.

1. The ISP tells you the DNS server addresses, usually in the form of an information sheet, when you sign up. If your ISP gives you DNS server addresses, enter them in the **DNS Server** fields in DHCP Setup**.**
2. Leave the **DNS Server** fields in DHCP Setup blank (for example 0.0.0.0). The Prestige acts as a DNS proxy when this field is blank.

Table 3-1 Example of Network Properties for LAN Servers with Fixed IP Addresses

Choose an IP address	192.168.1.2 - 192.168.1.32**;** 192.168.1.65 - 192.168.1.254.
Subnet mask	255.255.255.0
Gateway (or default route)	192.168.1.1 (Prestige LAN IP)

3.1.3 IP Address and Subnet Mask

Similar to the way houses on a street share a common street name, so too do computers on a LAN share one common network number.

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

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

Once you have decided on the network number, pick an IP address that is easy to remember, e.g., 192.168.1.1, for your Prestige, but make sure that no other device on your network is using that IP.

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

3.1.4 Private IP Addresses

Every computer on the Internet must have a unique IP 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:

Table 3-2 Private IP Address Ranges

10.0.0.0	—	10.255.255.255
172.16.0.0	—	172.31.255.255
192.168.0.0	—	192.168.255.255

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

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

3.1.5 RIP Setup

RIP (Routing Information Protocol, RFC1058 and RFC 1389) allows a router to exchange routing information with other routers. The **RIP Direction** field controls the sending and receiving of RIP packets. When set to **Both** or **Out Only**, the Prestige will broadcast its routing table periodically. When set to **Both** or **In Only**, it will incorporate the RIP information that it receives; when set to **None**, it will not send any RIP packets and will ignore any RIP packets received.

The **Version** field controls the format and the broadcasting method of the RIP packets that the Prestige sends (it recognizes both formats when receiving). **RIP-1** is universally supported; but **RIP-2** carries more information. **RIP-1** is probably adequate for most networks, unless you have an unusual network topology.

Both **RIP-2B** and **RIP-2M** sends the routing data in RIP-2 format; the difference being that **RIP-2B** uses subnet broadcasting while **RIP-2M** uses multicasting. Multicasting can reduce the load on non-router machines since they generally do not listen to the RIP multicast address and so will not receive the RIP packets. However, if one router uses multicasting, then all routers on your network must use multicasting, also.

By default, **RIP Direction** is set to **Both** and the **Version** set to **RIP-1**.

3.1.6 IP Multicast

Traditionally, IP packets are transmitted in one of either two ways - Unicast (1 sender — 1 recipient) or Broadcast (1 sender — everybody on the network). Multicast delivers IP packets to *a group* of hosts on the network - not everybody and not just 1.

IGMP (Internet Group Multicast Protocol) is a session-layer protocol used to establish membership in a Multicast group - it is not used to carry user data. IGMP version 2 (RFC 2236) is an improvement over version 1 (RFC 1112) but IGMP version 1 is still in wide use. If you would like to read more detailed

information about interoperability between IGMP version 2 and version 1, please see *sections 4 and 5 of RFC 2236*. The class D IP address is used to identify host groups and can be in the range 224.0.0.0 to 239.255.255.255. The address 224.0.0.0 is not assigned to any group and is used by IP multicast computers. The address 224.0.0.1 is used for query messages and is assigned to the permanent group of all IP hosts (including gateways). All hosts must join the 224.0.0.1 group in order to participate in IGMP. The address 224.0.0.2 is assigned to the multicast routers group.
The Prestige supports both IGMP version 1 (**IGMP-v1**) and IGMP version 2 (**IGMP-v2**). At start up, the Prestige queries all directly connected networks to gather group membership. After that, the Prestige periodically updates this information. IP Multicasting can be enabled/disabled on the Prestige LAN and/or WAN interfaces using menus 3.2 (LAN) and 11.3 (WAN). Select **None** to disable IP Multicasting on these interfaces.

3.1.7 IP Alias

IP Alias allows you to partition a physical network into different logical networks over the same Ethernet interface. The Prestige supports three logical LAN interfaces via its single physical Ethernet interface with the Prestige itself as the gateway for each LAN network.

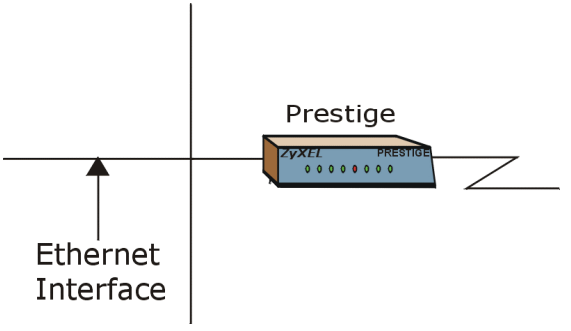


Figure 3-1 Physical Network

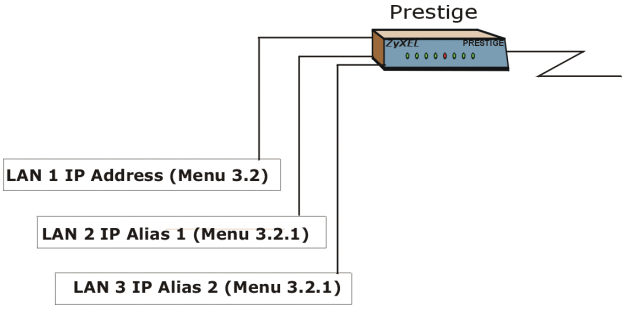


Figure 3-2 Partitioned Logical Networks

Use menu 3.2.1 to configure IP Alias on your Prestige.

3.2 TCP/IP and DHCP Ethernet Setup

From the main menu, enter 3 to open **Menu 3 - LAN Setup** (10/100 Mbps Ethernet) to configure TCP/IP (RFC 1155) and DHCP Ethernet setup.

```
                        Menu 3 - LAN Setup


          1.  LAN Port Filter Setup
          2.  TCP/IP and DHCP Setup









 Enter Menu Selection Number:
```

Figure 3-3 Menu 3 — LAN Setup (10/100 Mbps Ethernet)

To edit the TCP/IP and DHCP configuration, enter 2 to display **Menu 3.2 - TCP/IP and DHCP Ethernet Setup** as shown next.

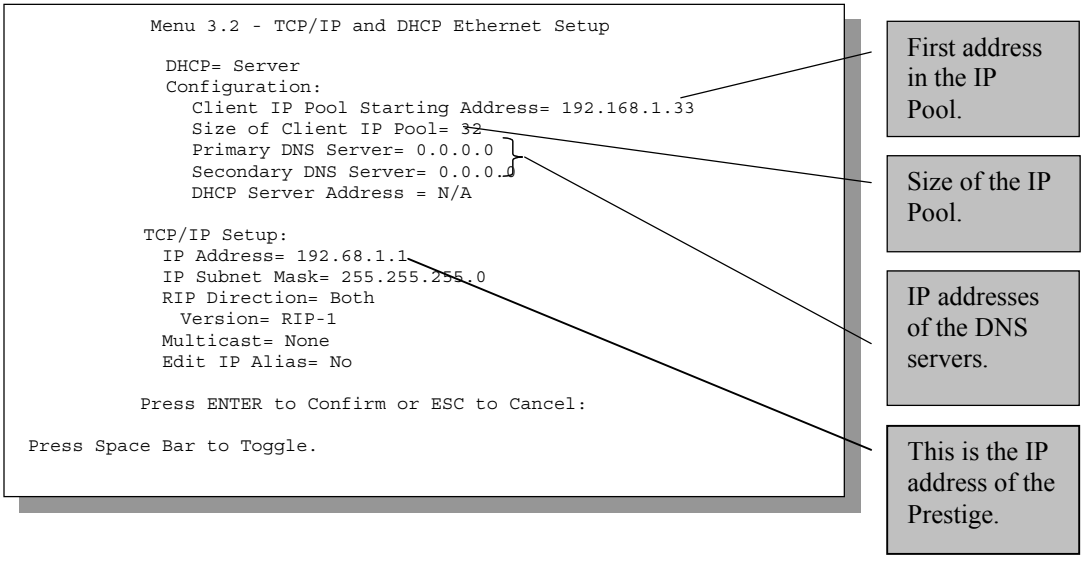


Figure 3-4 Menu 3.2 — TCP/IP and DHCP Ethernet Setup

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

Table 3-3 LAN DHCP Setup Menu Fields

FIELD	DESCRIPTION	EXAMPLE
DHCP	This field enables/disables the DHCP server. If it is set to **Server**, your Prestige will act as a DHCP server. If set to **None**, DHCP service will be disabled and you must have another DHCP sever on your LAN, or else the workstation must be manually configured. When DHCP is set to **Server**, the following four items need to be set. The Prestige can now also act as a surrogate DHCP server (**Relay**) where it relays IP address assignment from the actual real DHCP server to the clients.	**Server** (default)
Configuration:		
Client IP Pool Starting Address	This field specifies the first of the contiguous addresses in the IP address pool.	192.168.1.33
Size of Client IP Pool	This field specifies the size, or count, of the IP address pool.	32
Primary DNS Server Secondary DNS Server	Enter the IP addresses of the DNS servers. The DNS servers are passed to the DHCP clients along with the IP address and the subnet mask. Leave these entries at 0.0.0.0 if they are provided by a WAN DHCP server.	
DHCP Server Address	The Prestige acts as a surrogate DHCP server when you select **Relay** from the **DHCP** field. This field is **N/A** when the **DHCP** field is **Server** or **None**.	**N/A**

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

Table 3-4 LAN TCP/IP Setup Menu Fields

FIELD	DESCRIPTION	EXAMPLE
TCP/IP Setup:		
IP Address	Enter the IP address of your Prestige in dotted decimal notation	192.168.1.1 (default)
IP Subnet Mask	Your Prestige will automatically calculate the subnet mask based on the IP address that you assign. Unless you are implementing subnetting, use the subnet mask computed by the Prestige	255.255.255.0
RIP Direction	Press the [SPACE BAR] to select the RIP direction. Options are **Both**, **In Only**, **Out Only** or **None**.	**Both** (default)

FIELD	DESCRIPTION	EXAMPLE
Version	Press the [SPACE BAR] to select the RIP version. Options are **RIP-1**, **RIP-2B** or **RIP-2M**.	**RIP-1** (default)
Multicast	IGMP (Internet Group Multicast Protocol) is a session-layer protocol used to establish membership in a Multicast group. The Prestige supports both IGMP version 1 (**IGMP-v1**) and **IGMP-v2**. Press the [SPACE BAR] to enable IP Multicasting or select **None** (default) to disable it.	**None**
Edit IP Alias	The Prestige supports three logical LAN interfaces via its single physical Ethernet interface with the Prestige itself as the gateway for each LAN network. Press the [SPACE BAR] to select **Yes**, then press [ENTER] to display menu 3.2.1	**Yes**
When you have completed this menu, press [ENTER] at the prompt [Press ENTER to Confirm…] to save your configuration, or press [ESC] at any time to cancel.		

3.2.1 IP Alias Setup

Use menu 3.2 to configure the first network and move the cursor to the **Edit IP Alias** field and press [SPACE BAR] to choose **Yes** and press [ENTER] to configure the second and third network. Pressing [ENTER] opens **Menu 3.2.1 - IP Alias Setup**, as shown next.

```
                        Menu 3.2.1 - IP Alias Setup

                    IP Alias 1= No
                      IP Address= N/A
                      IP Subnet Mask= N/A
                      RIP Direction= N/A
                        Version= N/A
                      Incoming protocol filters= N/A
                      Outgoing protocol filters= N/A
                    IP Alias 2= No
                      IP Address= N/A
                      IP Subnet Mask= N/A
                      RIP Direction= N/A
                        Version= N/A
                      Incoming protocol filters= N/A
                      Outgoing protocol filters= N/A

                     Enter here to CONFIRM or ESC to CANCEL:

Press Space Bar to Toggle.
```

Figure 3-5 Menu 3.2.1 — IP Alias Setup

Follow the instructions in the following table to configure IP Alias parameters.

Table 3-5 IP Alias Setup Menu Fields

FIELD	DESCRIPTION	EXAMPLE
IP Alias	Choose **Yes** to configure the LAN network for the Prestige.	**Yes**
IP Address	Enter the IP address of your Prestige in dotted decimal notation	192.168.2.1
IP Subnet Mask	Your Prestige will automatically calculate the subnet mask based on the IP address that you assign. Unless you are implementing subnetting, use the subnet mask computed by the Prestige.	255.255.255.0
RIP Direction	Press the [SPACE BAR] to select the RIP direction. Options are **None**, **Both**, **In Only** or **Out Only**.	**None**
Version	Press the [SPACE BAR] to select the RIP version. Options are **RIP-1**, **RIP-2B** or **RIP-2M**.	**RIP-1**
Incoming Protocol Filters	Enter the filter set(s) you wish to apply to the incoming traffic between this node and the Prestige.	
Outgoing Protocol Filters	Enter the filter set(s) you wish to apply to the outgoing traffic between this node and the Prestige.	
When you have completed this menu, press [ENTER] at the prompt [Press ENTER to Confirm…] to save your configuration, or press [ESC] at any time to cancel.		

3.3 Internet Access Setup

You will see three different menu 4 screens depending on whether you chose **Ethernet, PPTP** or **PPPoE** encapsulation.

In the **Encapsulation** field in menu 4, choose:

- **Ethernet** when the WAN port is used as a regular Ethernet.
- **PPTP or PPPoE** if you have a dial-up connection to the Internet.

3.3.1 Ethernet Encapsulation

Step 1. You must choose the **Ethernet** option when the WAN port is used as a regular Ethernet. If you choose **Ethernet** in menu 4 you will see the next screen.

```
        Menu 4 - Internet Access Setup

ISP's Name= ChangeMe
Encapsulation= Ethernet
  Service Type= Standard
  My Login= N/A
  My Password= N/A
  Login Server IP= N/A

IP Address Assignment= Dynamic
  IP Address= N/A
  IP Subnet Mask= N/A
  Gateway IP Address= N/A
Network Address Translation = SUA Only


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

Figure 3-6 Internet Access Setup (Ethernet)

The following table describes this screen.

Table 3-6 Internet Access Setup Menu Fields

FIELD	DESCRIPTION
ISP's Name	Enter the name of your Internet Service Provider, e.g., myISP. This information is for identification purposes only.
Encapsulation	Press the [SPACE BAR] and the press [ENTER] to choose **Ethernet**. The encapsulation method influences your choices for IP Address.
Service Type	This is applicable only when you choose Ethernet as your encapsulation method. Press the [SPACE BAR] to select **Standard**, **RR-Toshiba** (RoadRunner Toshiba authentication method), **RR-Manager** (RoadRunner Manager authentication method) or **RR-Telstra** (RoadRunner Telstra authentication method). Choose a RoadRunner flavor if your ISP is Time Warner's RoadRunner; otherwise choose **Standard**.
Note: xDSL users must choose the **Standard** option only. The **Server IP**, **My Login IP** and **My Password** fields are not applicable in this case.	
My Login	Enter the login name given to you by your ISP.
My Password	Enter the password associated with the login name above.
Login Server IP	The Prestige will find the RoadRunner Server IP if this field is left blank. If it does not, then you must enter the authentication server IP address.
IP Address Assignment	If your ISP did not assign you a fixed IP address, select **Dynamic**, otherwise select **Static** and enter the IP address & subnet mask in the following fields.

FIELD	DESCRIPTION
IP Address	Enter the (fixed) IP address assigned to you by your ISP (Static IP Address Assignment is selected in the previous field).
IP Subnet Mask	Enter the subnet mask associated with your static IP.
Gateway IP Address	Enter the gateway IP address associated with your static IP.
Network Address Translation	Refer to the following chapter for a more detailed discussion on the Single User Account and NAT. Options are **SUA only, Full Feature** or **None**.
Once you have finished configuring a rule in this menu, press [ENTER] at the message "Press ENTER to Confirm…" to save your configuration, or press [ESC] to cancel.	

3.3.2 PPTP Encapsulation

Point-to-Point Tunneling Protocol (PPTP) is a network protocol that enables transfer of data from a remote client to a private server, creating a Virtual Private Network (VPN) using TCP/IP-based networks.
PPTP supports on-demand, multi-protocol, and virtual private networking over public networks, such as the Internet.

The P310 supports one PPTP server connection at any given time.

3.3.3 Configure PPTP Client

To configure a PPTP client, you must configure **My Login** and **Password** fields for PPP connection and PPTP parameters for PPTP connection.

After configuring the **User Name** and **Password** for PPP connection, press [SPACE BAR] in the **Encapsulation** field in **Menu 4 -Internet Access Setup** to choose **PPTP** as your encapsulation option. If you choose **PPTP** in menu 4 you will see the next screen.

```
                Menu 4 - Internet Access Setup

           ISP's Name= ChangeMe
           Encapsulation= PPTP
             Service Type= N/A
             My Login= username
             My Password= ******
             Idle Timeout= 300

            IP Address Assignment= Dynamic
             IP Address= N/A
             IP Subnet Mask= N/A
             Gateway IP Address=N/A
           Network Address Translation = SUA Only

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

Figure 3-7 Internet Access Setup (PPTP)

The following table contains instructions about the new fields when you choose **PPTP** in the **Encapsulation** field in menu 4.

Table 3-7 New Fields in Menu 4 (PPTP) screen

FIELD	DESCRIPTION	EXAMPLE
Encapsulation	Press the [SPACE BAR] and then press [ENTER] to choose PPTP. The encapsulation method influences your choices for IP Address.	**PPTP**
Idle Timeout	This value specifies the time in seconds that elapses before the Prestige automatically disconnects from the PPTP server.	300 (default)
Once you have finished configuring a rule in this menu, press [ENTER] at the message “Press ENTER to Confirm…” to save your configuration, or press [ESC] to cancel.		

3.3.4 PPPoE Encapsulation

The Prestige supports PPPoE (Point-to-Point Protocol over Ethernet). You can use PPPoE encapsulation only when you’re using the Prestige with an xDSL modem as the WAN device.

PPPoE is an IETF Draft standard specifying how a host personal computer interacts with a broadband modem (i.e. xDSL, cable, wireless, etc.) to achieve access to high-speed data networks. It preserves the existing Microsoft Dial-Up Networking experience and requires no new learning or procedures.

For the service provider, PPPoE offers an access and authentication method that works with existing access control systems (e.g., Radius). For the user, PPPoE provides a login and authentication method that the existing Microsoft Dial-Up Networking software can activate, and therefore requires no new learning or procedures for Windows users.

One of the benefits of PPPoE is the ability to let end users access one of multiple network services, a function known as dynamic service selection. This enables the service provider to easily create and offer new IP services for specific users.

Operationally, PPPoE saves significant effort for both the end user and ISP/carrier, as it requires no specific configuration of the broadband modem at the customer site.

By implementing PPPoE directly on the Prestige (rather than individual computers), the computers on the LAN do not need PPPoE software installed, since the Prestige does that part of the task. Furthermore, with NAT, all of the LAN's computers will have access.

If you enable PPPoE in menu 4, you will see the next screen. For more information on PPPoE, please refer to the *PPPoE Appendix*.

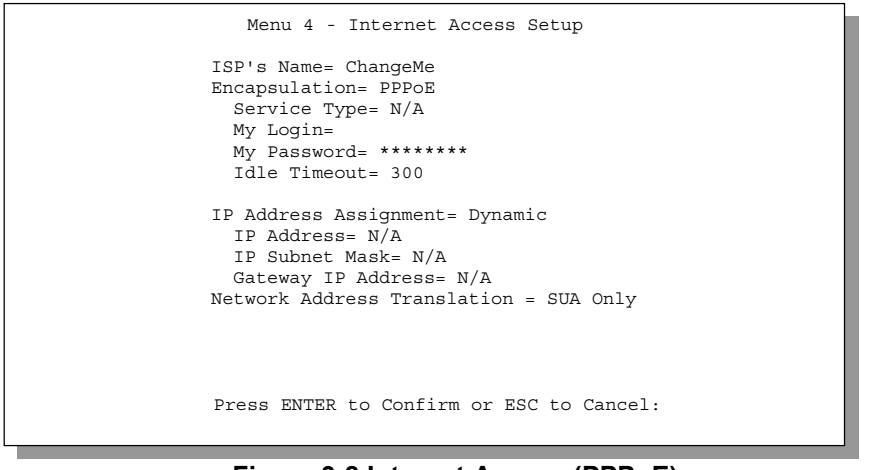


Figure 3-8 Internet Access (PPPoE)

Table 3-8 New Fields in Menu 4 (PPPoE) screen

FIELD	DESCRIPTION	EXAMPLE
Encapsulation	Press the [SPACE BAR] and then press [ENTER] to choose **PPPoE**. The encapsulation method influences your choices for IP Address.	**PPPoE**
Idle Timeout	This value specifies the time in seconds that elapses before the Prestige automatically disconnects from the PPPoE server.	300 (default)

3.4 Internet Test Setup

After configuring the menu 4 fields when you press [ENTER] to confirm you will see the message, " Do you wish to perform the Internet Setup Test[y/n]:" if you have chosen PPTP or PPPoE as your encapsulation method. Say 'Y' to test your setup. An example of Internet Setup Test is shown next.

```
Start dialing for node <ChangeMe>...
### Hit any key to continue.###
$$$ DIALING dev=a ch=0..........
$$$ OUTGOING-CALL phone()
$$$ PPTP: Start tunnel setup, send SCCRQ
$$$ PPTP: OCRQ sent
$$$ CALL CONNECT speed<10000000> type<10> chan<0>
$$$ LCP opened
$$$ CHAP login to remote OK
$$$ IPCP negotiation started
$$$ CCP stopped
$$$ BACP stopped
$$$ IPCP neg' Primary DNS 202.xxx.xxx.x
$$$ IPCP opened
```

Figure 3-9 Internet Setup Test Example

3.5 Basic Setup Complete

Well done! You have successfully connected, installed and set up your Prestige to operate on your network and access the Internet.

Part II:

Advanced Applications

This section describes the advanced applications of your Prestige, such as NAT, Remote Node Setup and IP Static Route Setup.

Chapter 4
Network Address Translation (NAT)

This chapter discusses how to configure NAT on the Prestige.

4.1 Introduction

NAT (Network Address Translation - NAT, RFC 1631) is the translation of the IP address of a host in a packet, e.g., the source address of an outgoing packet, used within one network to a different IP address known within another network.

4.1.1 NAT Definitions

Inside/outside denotes where a host is located relative to the Prestige, e.g., the workstations of your subscribers are the inside hosts, while the web servers on the Internet are the outside hosts.
Global/local denotes the IP address of a host in a packet as the packet traverses a router, e.g., the local address refers to the IP address of a host when the packet is in the local network, while the global address refers to the IP address of the host when the same packet is travelling in the WAN side.
Note that inside/outside refers to the location of a host, while global/local refers to the IP address of a host used in a packet. Thus, an inside local address (ILA) is the IP address of an inside host in a packet when the packet is still in the local network, while an inside global address (IGA) is the IP address of the same inside host when the packet is on the WAN side. The following table summarizes this information.

Table 4-1 NAT Definitions

TERM	DEFINITION
Inside	This refers to the host on the LAN.
Outside	This refers to the host on the WAN.
Local	This refers to the packet address (source or destination) as the packet travels on the LAN.
Global	This refers to the packet address (source or destination) as the packet travels on the WAN.

NAT never changes the IP address (either local or global) of an outside **host.**

4.1.2 What NAT Does

In the simplest form, NAT changes the source IP address in a packet received from a subscriber (the inside local address) to another (the inside global address) before forwarding the packet to the WAN side. When the response comes back, NAT translates the destination address (the inside global address) back the inside

local address before forwarding it to the original inside host. Note that the IP address (either local or global) of an outside host is never changed.
The global IP addresses for the inside hosts can be either static 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. If you do not define any servers (for Many-to-One and Many-to-Many Overload mapping – see *Table 4-2*), NAT offers the additional benefit of firewall protection. If no server is defined in these cases, all incoming inquiries will be filtered out by your Prestige, thus preventing intruders from probing your network. For more information on IP address translation, refer to *RFC 1631*, *The IP Network Address Translator (NAT)*.

4.1.3 How NAT Works

Each packet has two addresses – a source address and a destination address. For outgoing packets, the ILA (Inside Local Address) is the source address on the LAN, and the IGA (Inside Global Address) is the source address on the WAN. For incoming packets, the ILA is the destination address on the LAN, and the IGA is the destination address on the WAN. NAT maps private (local) IP addresses to globally unique ones required for communication with hosts on other networks. It replaces the original IP source address (and TCP or UDP source port numbers for Many-to-One and Many-to-Many Overload NAT mapping) in each packet and then forwards it to the Internet. The Prestige keeps track of the original addresses and port numbers so incoming reply packets can have their original values restored. The following figure illustrates this.

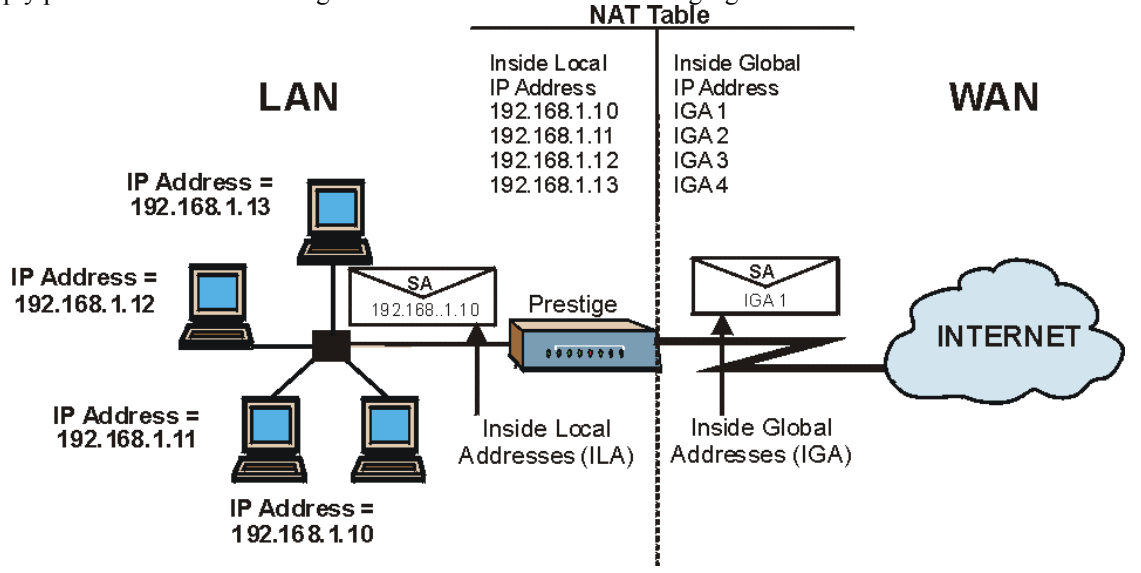


Figure 4-1 How NAT Works

4.1.4 NAT Application

The following figure illustrates a possible NAT application, where three inside LANs (logical LANs using IP Alias) behind the Prestige can communicate with three distinct WAN networks. More examples follow at the end of this chapter.

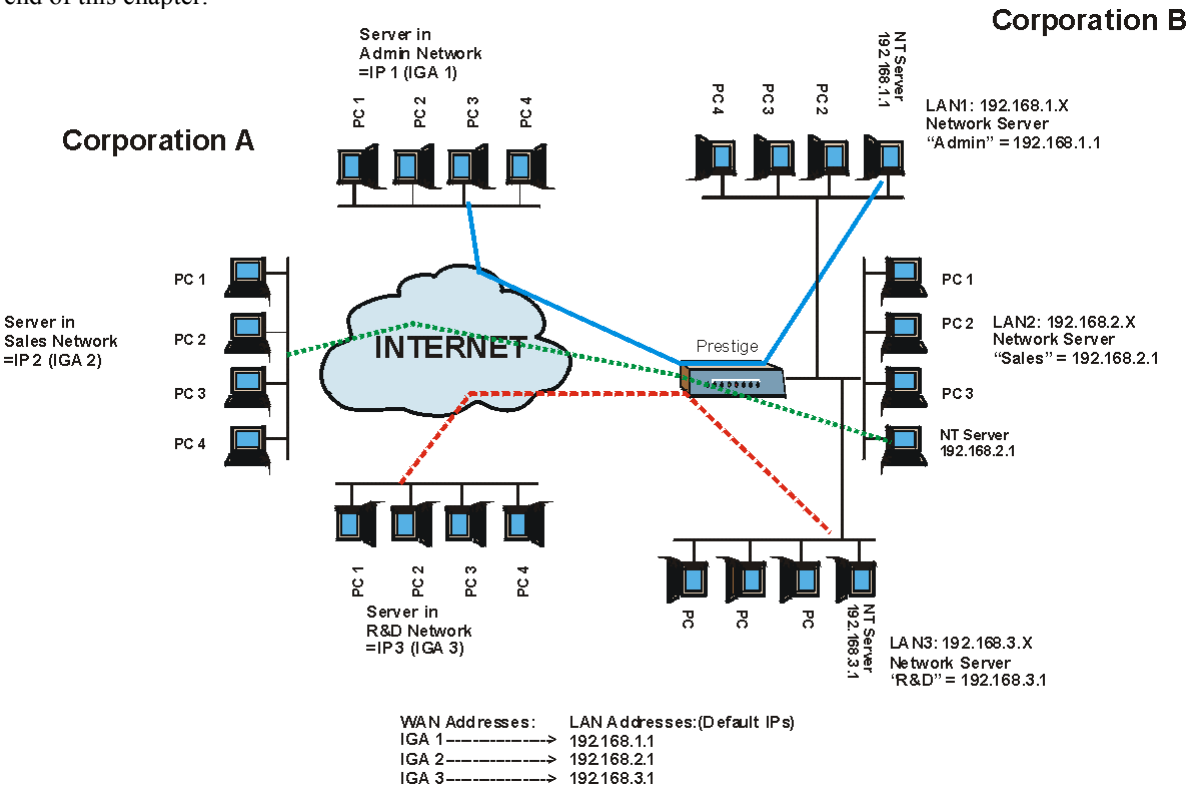


Figure 4-2 NAT Application With IP Alias

4.1.5 NAT Mapping Types

NAT supports five types of IP/port mapping. They are:

1. **One to One**: In One-to-One mode, the Prestige maps one local IP address to one global IP address.
2. **Many to One**: In Many-to-One mode, the Prestige maps multiple local IP addresses to one global IP address. This is equivalent to SUA (i.e., PAT, port address translation), ZyXEL's Single User Account feature that previous ZyXEL routers supported (the SUA Only option in today's routers).

3. **Many to Many Overload**: In Many-to-Many Overload mode, the Prestige maps the multiple local IP addresses to shared global IP addresses.
4. **Many to Many No Overload**: In Many-to-Many No Overload mode, the Prestige maps the each local IP addresses to unique global IP addresses.
5. **Server**: This type allows you to specify inside servers of different services behind the NAT to be accessible to the outside world.

Port numbers do not **change for** One-to-One **and** Many-to-Many-No Overload **NAT mapping types.**

The following table summarizes these types.

Table 4-2 NAT Mapping Types

TYPE	IP MAPPING	SMT ABBREVIATION
One-to-One	ILA1←→ IGA1	1:1
Many-to-One (SUA/PAT)	ILA1←→ IGA1 ILA2←→ IGA1 …	M:1
Many-to-Many Overload	ILA1←→ IGA1 ILA2←→ IGA2 ILA3←→ IGA1 ILA4←→ IGA2 …	M:M Ov
Many-to-Many No Overload	ILA1←→ IGA1 ILA2←→ IGA2 ILA3←→ IGA3 …	M:M No Ov
Server	Server 1 IP←→ IGA1 Server 2 IP←→ IGA1 Server 3 IP←→ IGA1	Server

4.2 Using NAT

4.2.1 SUA (Single User Account) Versus NAT

SUA (Single User Account) is a ZyNOS implementation of a subset of NAT that supports two types of mapping, **Many-to-One** and **Server**. See section *4.3.1* for a detailed description of the NAT set for SUA. The Prestige also supports **Full Feature** NAT to map multiple global IP addresses to multiple private LAN IP addresses of clients or servers using mapping types as outlined in *Table 4-2*.

1. **Choose** SUA Only **if you have just one public WAN IP address for your Prestige.**
2. **Choose** Full Feature **if you have multiple public WAN IP addresses for your Prestige.**

4.2.2 Applying NAT

You apply NAT via menus 4 or 11.3 as displayed next. The next figure shows you how to apply NAT for Internet access in menu 4. Enter 4 from the main menu to go to **Menu 4 - Internet Access Setup**.

```
                Menu 4 - Internet Access Setup

                  ISP's Name= myISP
                  Encapsulation= Ethernet
                    Service Type= Standard
                    My Login= N/A
                    My Password= N/A
                    Login Server IP= N/A

                  IP Address Assignment= Dynamic
                    IP Address= N/A
                    IP Subnet Mask= N/A
                    Gateway IP Address= N/A
                  Network Address Translation= SUA Only



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

Figure 4-3 Menu 4 — Applying NAT for Internet Access

The following figure shows how you apply NAT to the remote node in menu 11.1.

Step 1. Enter 11 from the main menu.

Step 2. Move the cursor to the **Edit IP** field, press the [SPACE BAR] to select **Yes** and then press [ENTER] to bring up **Menu 11.3 - Remote Node Network Layer Options.**

```
Menu 11.3 - Remote Node Network Layer Options

  IP Address Assignment= Dynamic
  IP Address= N/A
  IP Subnet Mask= N/A
  Gateway IP Addr= N/A

  Network Address Translation= Full Feature
  Metric= N/A
  Private= N/A
  RIP Direction= None
    Version= N/A
  Multicast= None
```

Figure 4-4 Menu 11.3 — Applying NAT to the Remote Node

The following table describes the options for Network Address Translation.

Table 4-3 Applying NAT in Menus 4 & 11.3

FIELD	OPTIONS	DESCRIPTION
Network Address Translation	**Full Feature**	When you select this option the SMT will use Address Mapping Set 1 (menu 15.1 - see section *4.3.1* for further discussion). You can configure any of the mapping types described in *Table 4-2*. Choose **Full Feature** if you have multiple public WAN IP addresses for your Prestige.
	None	NAT is disabled when you select this option.
	SUA Only	When you select this option the SMT will use Address Mapping Set 255 (menu 15.1 - see section *4.3.1*). Choose **SUA Only** if you have just one public WAN IP address for your Prestige.

4.3 NAT Setup

Use the Address Mapping Sets menus and submenus to create the mapping table used to assign global addresses to computers on the LAN. You can see two NAT Address Mapping sets in menu 15.1. You can only configure **Set 1**. **Set 255** is used for SUA. When you select **Full Feature** in menu 4 or 11.3, the SMT will use **Set 1**, which supports all mapping types as outlined in *Table 4-2*. When you select **SUA Only**, the SMT will use the pre-configured **Set 255** (read only).

The Server Set is a list of LAN side servers mapped to external ports. To use this set (one set for the Prestige 10), a server rule must be set up inside the NAT Address Mapping set. Please see *section 4.4* for further information on these menus. To configure NAT, enter 15 from the main menu to bring up the following screen.

```
                    Menu 15 — NAT Setup

          1.    Address Mapping Sets
          2.    Server Set


                Enter Menu Selection Number:
```

Figure 4-5 Menu 15 — NAT Setup

4.3.1 Address Mapping Sets

Enter 1 to bring up **Menu 15.1 — Address Mapping Sets**.

```
                  Menu 15.1 — Address Mapping Sets

                       1.
                   255. SUA (read only)









                        Enter Menu Selection Number:
```

Figure 4-6 Menu 15.1 — Address Mapping Sets

SUA Address Mapping Set

Enter 255 to display the next screen (see also *section 4.2.1)*. The fields in this menu cannot be changed.

```
                    Menu 15.1.255 - Address Mapping Rules

 Set Name= SUA

Idx  Local Start IP   Local End IP     Global Start IP  Global End IP    Type
---  ---------------  ---------------  ---------------  ---------------  ------
 1.  0.0.0.0          255.255.255.255  0.0.0.0                           M-1
 2.                                    0.0.0.0                           Server
 3.
 4.
 5.
 6.
 7.
 8.
 9.
10.


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

Figure 4-7 Menu 15.1.255 — SUA Address Mapping Rules

The following table explains the fields in this screen.

The fields in Menu 15.1.255 are read-only.

Table 4-4 SUA Address Mapping Rules

FIELD	DESCRIPTION	EXAMPLE
Set Name	This is the name of the set you selected in menu 15.1 or enter the name of a new set you want to create.	**SUA**
Idx	This is the index or rule number.	1
Local Start IP Local End IP	**Local Start IP** is the starting local IP address (ILA) (see *Figure 4-1)*. **Local End IP** is the ending local IP address (ILA). If the rule is for all local IPs, then the Start IP is 0.0.0.0 and the End IP is 255.255.255.255.	0.0.0.0 255.255.255.255
Global Start IP	This is the starting global IP address (IGA). If you have a dynamic IP, enter 0.0.0.0 as the **Global Start IP**.	0.0.0.0
Global End IP	This is the ending global IP address (IGA).	**N/A**
Type	These are the mapping types discussed above (see *Table 4-2*). **Server** allows us to specify multiple servers of different types behind NAT to this machine. See later for some examples.	**Server**

FIELD	DESCRIPTION	EXAMPLE
Once you have finished configuring a rule in this menu, press [ENTER] at the message “Press ENTER to Confirm…” to save your configuration, or press [ESC] to cancel.		

User-Defined Address Mapping Sets

Now let’s look at Option 1 in menu 15.1. Enter 1 to bring up this menu. We’ll just look at the differences from the previous menu. Note the extra **Action** and **Select Rule** fields mean you can configure rules in this screen. Note also that the [?] in the **Set Name** field means that this is a required field and you must enter a name for the set.

If the Set Name **field is left blank, the entire set will be deleted.**

```
                    Menu 15.1.1 - Address Mapping Rules

 Set Name= NAT_SET

Idx  Local Start IP   Local End IP     Global Start IP  Global End IP    Type
---  ---------------  ---------------  ---------------  ---------------  ------
 1.
 2
 3.
 4.
 5.
 6.
 7.
 8.
 9.
10.

                  Action= Edit          Select Rule=

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

Figure 4-8 Menu 15.1.1 — First Set

The Type, Local and Global Start/End IPs are configured in menu 15.1.1.1 (described later) and the values are displayed here.

Ordering Your Rules

Ordering your rules is important because the Prestige applies the rules in the order that you specify. When a rule matches the current packet, the Prestige takes the corresponding action and the remaining rules are ignored. If there are any empty rules before your new configured rule, your configured rule will be pushed up by that number of empty rules. For example, if you have already configured rules 1 to 6 in your current set and now you configure rule number 9. In the set summary screen, the new rule will be rule 7, not 9. Now if you delete rule 4, rules 5 to 7 will be pushed up by 1 rule, so as old rule 5 becomes rule 4, old rule 6 becomes rule 5 and old rule 7 becomes rule 6.

Table 4-5 Fields in Menu 15.1.1

FIELD	DESCRIPTION	EXAMPLE
Set Name	Enter a name for this set of rules. This is a required field. If this field is left blank, the entire set will be deleted.	NAT_SET
Action	The default is **Edit**. **Edit** means you want to edit a selected rule (see following field). **Insert Before** means to insert a rule before the rule selected. The rules after the selected rule will then be moved down by one rule. **Delete** means to delete the selected rule and then all the rules after the selected one will be advanced one rule. **None** disables the **Select Rule** item.	**Edit**
Select Rule	When you choose **Edit**, **Insert Before** or **Delete** in the previous field the cursor jumps to this field to allow you to select the rule to apply the action in question.	1

You must press [ENTER] at the bottom of the screen to save the whole set. You must do this again if you make any changes to the set – including deleting a rule. No **changes to the set take place until this action is taken.**

Selecting **Edit** in the **Action** field and then selecting a rule brings up the following menu, **Menu 15.1.1.1 - Address Mapping Rule** in which you can edit an individual rule and configure the **Type**, **Local** and **Global Start/End IPs**.

An End IP address must be numerically greater than its corresponding IP Start address.

```
                Menu 15.1.1.1 Address Mapping Rule

        Type= One-to-One

        Local IP:
          Start=
          End  = N/A

        Global IP:
          Start=
          End  = N/A



            Press ENTER to Confirm or ESC to Cancel:

    Press Space Bar to Toggle.
```

Figure 4-9 Menu 15.1.1.1 — Editing/Configuring an Individual Rule in a Set

Table 4-6 Menu 15.1.1.1 — Editing/Configuring an Individual Rule in a Set

FIELD	DESCRIPTION	EXAMPLE
Type	Press the [SPACE BAR] to toggle through a total of five types. These are the mapping types discussed in *Table 4-2*. **Server** allows you to specify multiple servers of different types behind NAT to this computer. See *section 4.5.3 below* for an example.	**One-to-One**
Local IP	Only local IP fields are **N/A** for server; Global IP fields MUST be set for **Server**.	
Start	This is the starting local IP address (ILA).	0.0.0.0
End	This is the ending local IP address (ILA). If the rule is for all local IPs, then put the Start IP as 0.0.0.0 and the End IP as 255.255.255.255. This field is **N/A** for One-to-One and Server types.	N/A
Global IP		
Start	This is the starting global IP address (IGA). If you have a dynamic IP, enter 0.0.0.0 as the **Global IP Start**. Note that **Global IP Start** can be set to 0.0.0.0 only if the types are **Many-to-One** or **Server**.	0.0.0.0
End	This is the ending global IP address (IGA). This field is **N/A** for **One-to-One**, **Many-to-One** and **Server types**.	N/A
Once you have finished configuring a rule in this menu, press [ENTER] at the message "Press ENTER to Confirm…" to save your configuration, or press [ESC] to cancel.		

4.4 NAT Server Sets – Port Forwarding

A NAT server set is a list of inside (behind NAT on the LAN) servers, for example, web or FTP, that you can make visible to the outside world even though NAT makes your whole inside network appear as a single machine to the outside world.

Use **Menu 15 - NAT Setup** to forward incoming service requests to the server(s) on your local network. You may enter a single port number or a range of port numbers to be forwarded, and the local IP address of the desired server. The port number identifies a service; for example, web service is on port 80 and FTP on port 21. In some cases, such as for unknown services or where one server can support more than one service (for example both FTP and web service), it might be better to specify a range of port numbers. Entry 12 (port 1026) is non-editable (see *Figure 4-10*).

In addition to the servers for specified services, NAT 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 is not defined, the service request is simply discarded.

Many residential broadband ISP accounts do not allow you to run any server processes (such as a Web or FTP server) from your location. Your ISP may periodically check for servers and may suspend your account if it discovers any active services at your location. If you are unsure, refer to your ISP.

The most often used port numbers are shown in the following table. Please refer to *RFC 1700* for further information about port numbers. Please also refer to the included disk for more examples and details on NAT.

Table 4-7 Services & Port Numbers

SERVICES	PORT NUMBER
ECHO	7
FTP (File Transfer Protocol)	21
Telnet	23
SMTP (Simple Mail Transfer Protocol)	25
DNS (Domain Name System)	53
Finger	79
HTTP (Hyper Text Transfer protocol or WWW, Web)	80
POP3 (Post Office Protocol)	110
NNTP (Network News Transport Protocol)	119
SNMP (Simple Network Management Protocol)	161
SNMP trap	162
PPTP (Point-to-Point Tunneling Protocol)	1723

4.4.1 Configuring a Server behind NAT

Follow these steps to configure a server behind NAT:

Step 6. Enter 15 in the main menu to go to **Menu 15 - NAT Setup.**

Step 7. Enter 2 to go to **Menu 15.2 - NAT Server Setup**.

Step 8. Enter a port number in an unused **Start Port No** field. To forward only one port, enter it again in the **End Port No** field. To specify a range of ports, enter the last port to be forwarded in the **End Port No** field.

Step 9. Enter the inside IP address of the server in the **IP Address** field. In the following figure, you have a computer acting as an FTP, Telnet and SMTP server (ports 21, 23 and 25) at 192.168.1.33.

Step 10. Press [ENTER] at the "Press ENTER to confirm …" prompt to save your configuration after you define all the servers or press [ESC] at any time to cancel.

```
                    Menu 15.2 - NAT Server Setup

 Rule    Start Port No.    End Port No.    IP Address
-----------------------------------------------------
   1.     Default           Default         0.0.0.0
   2.       21                25            192.168.1.33
   3.       0                 0             0.0.0.0
   4.       0                 0             0.0.0.0
   5.       0                 0             0.0.0.0
   6.       0                 0             0.0.0.0
   7.       0                 0             0.0.0.0
   8.       0                 0             0.0.0.0
   9.       0                 0             0.0.0.0
  10.       0                 0             0.0.0.0
  11.       0                 0             0.0.0.0
  12.       1026              1026          RR Reserved

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

Figure 4-10 Menu 15.2 — NAT Server Setup

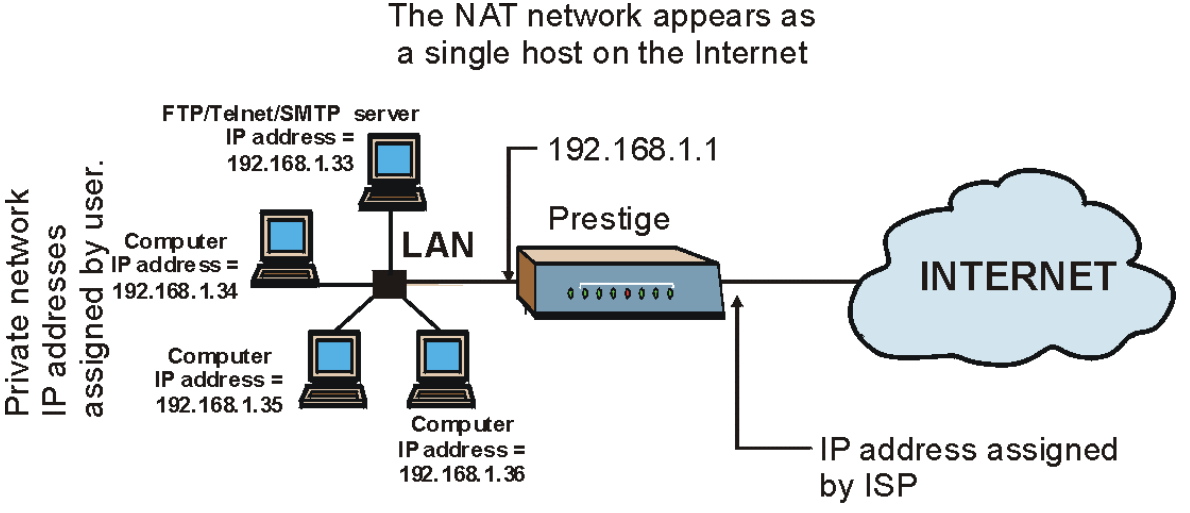


Figure 4-11 Multiple Servers Behind NAT Example

4.5 General NAT Examples

4.5.1 Internet Access Only

In the following Internet access example, you only need one rule where all your ILAs (Inside Local addresses) map to one dynamic IGA (Inside Global Address) assigned by your ISP.

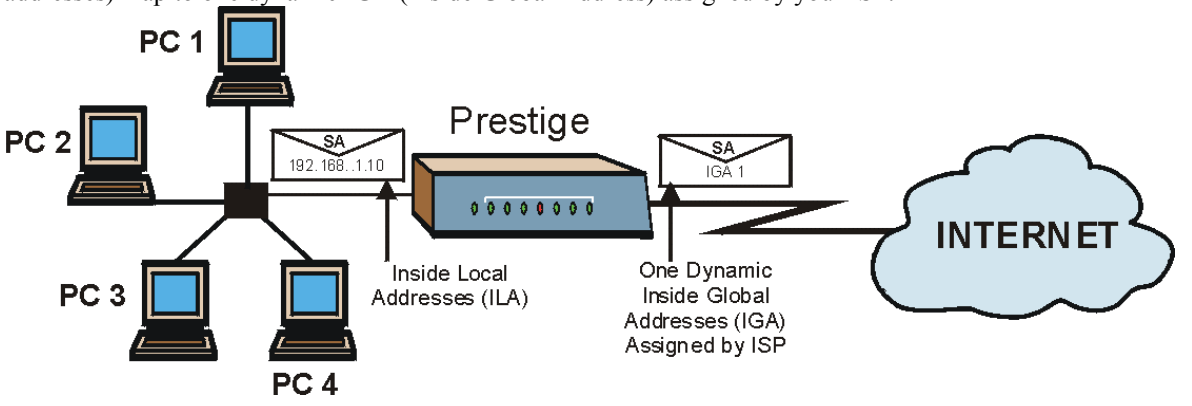


Figure 4-12 NAT Example 1

```
                Menu 4 - Internet Access Setup

ISP's Name= ChangeMe
Encapsulation= Ethernet
Service Type= Standard
  My Login= N/A
  My Password= N/A
  Login Server IP= N/A

IP Address Assignment= Dynamic
  IP Address= N/A
  IP Subnet Mask= N/A
  Gateway IP Address= N/A
Network Address Translation= SUA Only



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

Figure 4-13 Menu 4 — Internet Access & NAT Example

From menu 4 shown above, simply choose the **SUA Only** option from the **Network Address Translation** field. This is the Many-to-One mapping discussed in *section 4.1.5*. The **SUA Only** read-only option from the **Network Address Translation** field in menus 4 and 11.3 is specifically pre-configured to handle this case.

4.5.2 Example 2: Internet Access with an Inside Server

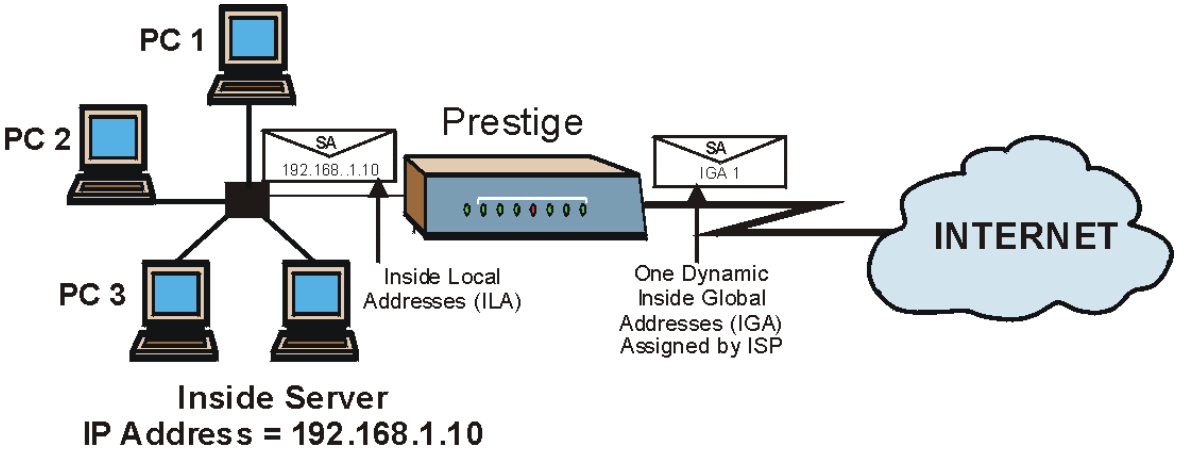


Figure 4-14 NAT Example 2

In this case, you do exactly as above (use the convenient pre-configured **SUA Only** set) and also go to menu 15.2 to specify the Inside Server behind the NAT as shown in the next figure.

```
                    Menu 15.2 - NAT Server Setup

Rule    Start Port No.    End Port No.    IP Address
-------------------------------------------------------
  1       Default           Default         192.168.1.10
  2.      0                 0               0.0.0.0
  3.      0                 0               0.0.0.0
  4.      0                 0               0.0.0.0
  5.      0                 0               0.0.0.0
  6.      0                 0               0.0.0.0
  7.      0                 0               0.0.0.0
  8.      0                 0               0.0.0.0
  9.      0                 0               0.0.0.0
 10.      0                 0               0.0.0.0
 11.      0                 0               0.0.0.0
 12.      1026              1026            RR Reserved

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

Figure 4-15 Menu 15.2 — Specifying an Inside Server

4.5.3 Example 3: Multiple Public IP Addresses With Inside Servers

In this example, there are 3 IGAs from our ISP. There are many departments but two have their own FTP server. All departments share the same router. The example will reserve one IGA for each department with

an FTP server and all departments use the other IGA. Map the FTP servers to the first two IGAs and the other LAN traffic to the remaining IGA. Map the third IGA to an inside web server and mail server. Four rules need to be configured, two bi-directional and two uni-directional as follows.

Rule 1. Map the first IGA to the first inside FTP server for FTP traffic in both directions (**1 : 1** mapping, giving both local and global IP addresses).

Rule 2. Map the second IGA to our second inside FTP server for FTP traffic in both directions (**1 : 1** mapping, giving both local and global IP addresses).

Rule 3. Map the other outgoing LAN traffic to IGA3 (**Many : 1** mapping).

Rule 4. You also map your third IGA to the web server and mail server on the LAN. Type **Server** allows you to specify multiple servers, of different types, to other computers behind NAT on the LAN.

The example situation looks somewhat like this:

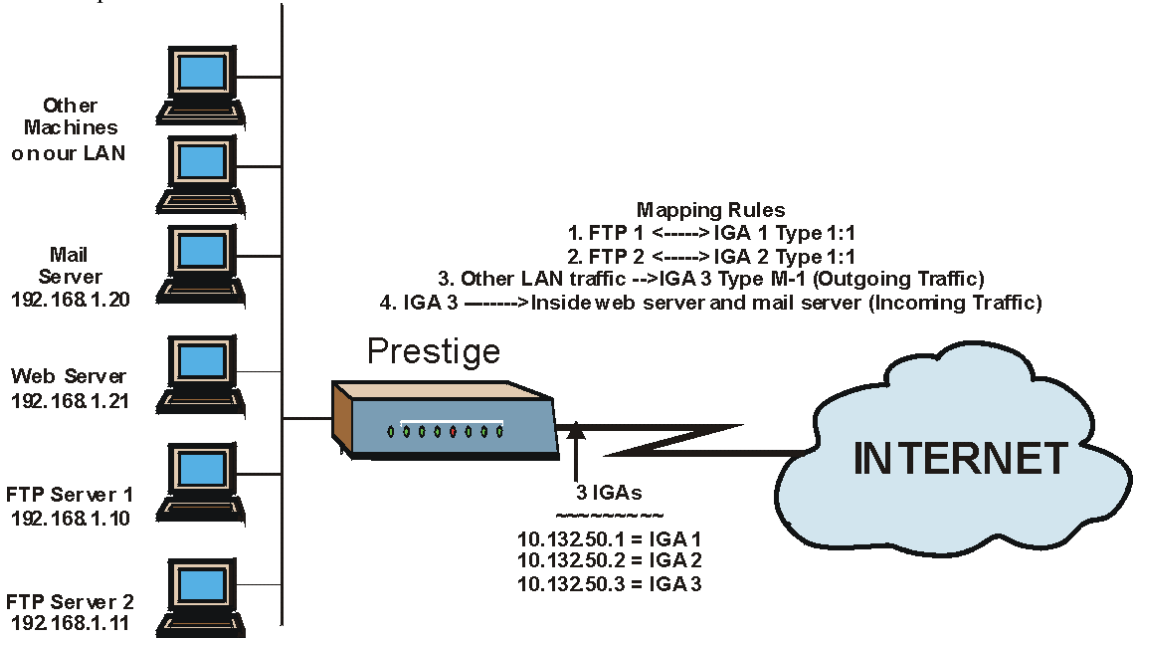


Figure 4-16 NAT Example 3

Step 1. In this case you need to configure Address Mapping Set 1 from **Menu 15.1 - Address Mapping Sets.** Therefore you must choose the **Full Feature** option from the **Network Address Translation** field (in menu 4 or menu 11.3) in *Figure 4-17*.

Step 2. Then enter 15 from the main menu.

Step 3. Enter 1 to configure the Address Mapping Sets.

Step 4. Enter 1 to begin configuring this new set. Enter a Set Name, choose the **Edit Action** and then enter 1 for the **Select Rule** field. Press [ENTER] to confirm.

Step 5. Select **Type** as **One-to-One** (direct mapping for packets going both ways), and enter the local **Start IP** as 192.168.1.10 (the IP address of FTP Server 1), the global **Start IP** as 10.132.50.1 (our first IGA). (See *Figure 4-18).*

Step 6. Repeat the previous step for rules 2 to 4 as outlined above.

Step 7. When finished, menu 15.1.1 should look like as shown in *Figure 4-19.*

```
            Menu 11.3 - Remote Node Network Layer Options

          IP Address Assignment= Dynamic
          IP Address= N/A
          IP Subnet Mask= N/A
          Gateway IP Addr= N/A

          Network Address Translation= Full Feature
          Metric= N/A
          Private= N/A
          RIP Direction= None
          Version= N/A




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

Figure 4-17 Example 3: Menu 11.3

The following figure shows how to configure the first rule.

```
                  Menu 15.1.1.1 Address Mapping Rule

          Type= One-to-One

          Local IP:
            Start= 192.168.1.10

            End  = N/A

          Global IP:
            Start= 10.132.50.1
            End  = N/A



                              Press ENTER to Confirm or ESC to Cancel:

       Press Space Bar to Toggle.
```

Figure 4-18 Example 3: Menu 15.1.1.1

```
                    Menu 15.1.1 - Address Mapping Rules

 Set Name= Example3

Idx  Local Start IP   Local End IP     Global Start IP  Global End IP    Type
---  ---------------  ---------------  ---------------  ---------------  ------
 1. 192.168.1.10                      10.132.50.1                       1-1
 2  192.168.1.11                      10.132.50.2                       1-1
 3. 0.0.0.0           255.255.255.255  10.132.50.3                       M-1
 4.                                    10.132.50.3                       Server
 5.
 6.
 7.
 8.
 9.
10.

                  Action= Edit          Select Rule=

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

Figure 4-19 Example 3: Final Menu 15.1.1

Now configure the IGA3 to map to our web server and mail server on the LAN.

Step 8. Enter 15 from the main menu.

Step 9. Now enter 2 from this menu and configure it as shown in *Figure 4-20*.

```
                    Menu 15.2 - NAT Server Setup

  Rule   Start Port No.   End Port No.   IP Address
 ------  --------------   ------------   ---------
    1.      Default          Default       0.0.0.0
    2.        80               80          192.168.1.21
    3.        25               25          192.168.1.20
    4.        0                0           0.0.0.0
    5.        0                0           0.0.0.0
    6.        0                0           0.0.0.0
    7.        0                0           0.0.0.0
    8.        0                0           0.0.0.0
    9.        0                0           0.0.0.0
   10.        0                0           0.0.0.0
   11.        0                0           0.0.0.0
   12.        1026             1026        RR Reserved

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

Figure 4-20 Example 3: Menu 15.2

4.5.4 Example 4: NAT Unfriendly Application Programs

Some applications do not support NAT Mapping using TCP or UDP port address translation. In this case it is better to use **Many-to-Many No Overload** mapping as port numbers do *not* change for **Many-to-Many No Overload** (and **One-to-One**) NAT mapping types. The following figure illustrates this.

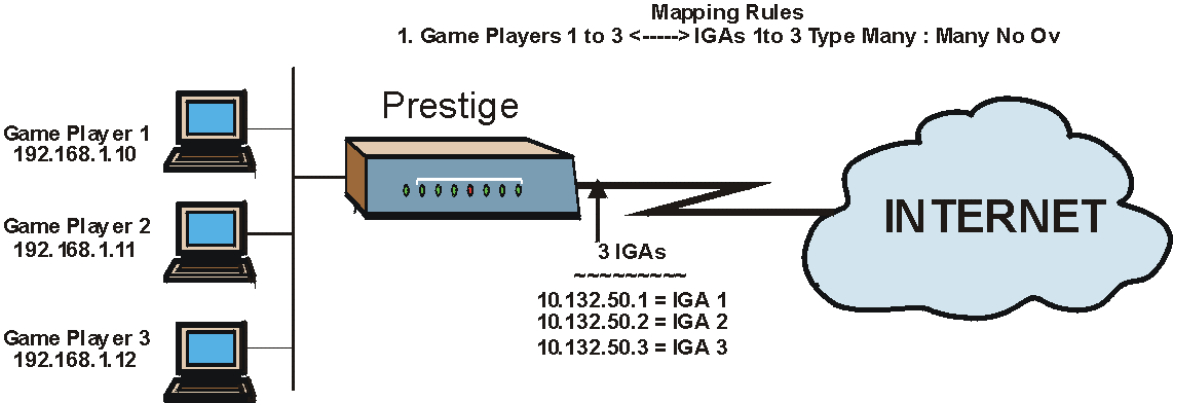


Figure 4-21 NAT Example 4

Other applications, for example, gaming programs are NAT unfriendly because they embed addressing information in the data stream. These applications still won't work through NAT even when using One-to-One **and** Many-to-Many No Overload **mapping types.**

Follow the steps outlined in example 3 above to configure these two menus as follows.

```
                    Menu 15.1.1.1 Address Mapping Rule

Type= Many-to-Many No Overload

Local IP:
  Start= 192.168.1.10
  End  = 192.168.1.12

Global IP:
  Start= 10.132.50.1
  End  = 10.132.50.3



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

Figure 4-22 Example 4: Menu 15.1.1.1 — Address Mapping Rule

After you've configured your rule, you should be able to check the settings in menu 15.1.1 as shown next.

```
                        Menu 15.1.1 - Address Mapping Rules

 Set Name= Example4

Idx  Local Start IP   Local End IP     Global Start IP  Global End IP    Type
---  ---------------  ---------------  ---------------  ---------------  ------
 1.  192.168.1.10     192.168.1.12     10.132.50.1      10.132.50.3      M-M No Ov
 2.
 3.
 4.
 5.
 6.
 7.
 8.
 9.
10.

                   Action= Edit          Select Rule=

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

Figure 4-23 Example 4: Menu 15.1.1 — Address Mapping Rules

Chapter 5
Remote Node Setup

This chapter shows you how to configure a remote node.

A remote node is required for placing calls to a remote gateway. A remote node represents both the remote gateway and the network behind it across a WAN connection. Note that when you use menu 4 to set up Internet access, you are actually configuring a remote node. We will show you how to configure **Menu 11.1 Remote Node Profile, Menu 11.3 - Remote Node Network Layer Options** and **Menu 11.5 - Remote Node Filter**.

5.1 Remote Node Profile

From the main menu, select option 11 to display **Menu 11.1 - Remote Node Profile**. There are three variations of this menu depending on whether you choose **Ethernet Encapsulation, PPTP** or **PPPoE Encapsulation.**

5.1.1 Ethernet Encapsulation

Choose the **Ethernet** option when the WAN port is used as a regular Ethernet. The first menu 11.1 screen you see is for **Ethernet Encapsulation** shown next.

```
                    Menu 11.1 - Remote Node Profile

Rem Node Name= ChangeMe              Route= IP
Active= Yes

Encapsulation= Ethernet              Edit IP= No
Service Type= Standard               Session Options:
Service Name= N/A                      Edit Filter Sets= No
Outgoing:
  My Login= N/A
  My Password= N/A
  Server IP= CHAP/PAP


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

Figure 5-1 Menu 11.1 Remote Node Profile for Ethernet Encapsulation

Table 5-1 Fields in Menu 11.1 (Ethernet Encapsulation)

FIELD	DESCRIPTION	EXAMPLE
Rem Node Name	Enter a descriptive name for the remote node. This field can be up to eight characters.	LAoffice
Active	Press [SPACE BAR] to select **Yes** (activate remote node) or **No** (deactivate remote node).	**Yes**
Encapsulation	**Ethernet** is the default encapsulation. Press the [SPACE BAR] if you wish to change to **PPPoE** or **PPTP** encapsulation.	**Ethernet**
Service Type	Press [SPACE BAR] to select from **Standard**, **RR-Toshiba** (RoadRunner Toshiba authentication method), **RR-Manager** (RoadRunner Manager authentication method) or, **RR-Telstra** (RoadRunner Telstra authentication method). Choose one of the RoadRunner methods if your ISP is Time Warner's RoadRunner; otherwise choose **Standard**.	**Standard**
Note: xDSL users must choose the **Standard** option only. The **Server IP**, **My Login IP** and **My Password** fields are not applicable in this case.		
Service Name	This is valid only when you have chosen **PPPoE** encapsulation. If you are using **PPPoE** encapsulation, then type the name of your PPPoE service here.	poellc
Outgoing		
My Login	This field is applicable for **PPPoE** encapsulation only. Enter the login name assigned by your ISP when the Prestige calls this remote node. Some ISPs append this field to the **Service Name** field above (e.g., jim@poellc) to access the PPPoE server.	**jim**
My Password	Enter the password assigned by your ISP when the Prestige calls this remote node. Valid for **PPPoE** encapsulation only.	*****
Server IP	This field is valid for RoadRunner service type only. The Prestige will find the RoadRunner Server IP automatically if this field is left blank. If it does not, then you must enter the authentication server IP address here.	
Route	This field refers to the protocol that will be routed by your Prestige – IP is the only option for the Prestige 10.	**IP**
Edit IP	This field leads to a “hidden” menu. Press [SPACE BAR] to select **Yes** and press [ENTER] to go to M**enu 11.3 - Remote Node Network Layer Options**.	**Yes**

FIELD	DESCRIPTION	EXAMPLE
Session Options Edit Filter sets	This field leads to another “hidden” menu. Use the [SPACE BAR] to select **Yes** and press [ENTER] to open menu 11.5 to edit the filter sets. See the *Remote Node Filter* section for more details.	**Yes**
Once you have configured the Remote Node Profile Menu, press [ENTER] to return to menu 11. Press [ENTER] at the message “Press ENTER to Confirm...” to save your configuration, or press [ESC] at any time to cancel.		

5.1.2 PPTP Encapsulation

If you change the **Encapsulation** to **PPTP** in **Menu 11.1**, then you will see the next screen. Please see the appendix for information.

```
                        Menu 11.1 - Remote Node Profile

      Rem Node Name= ChangeMe             Route= IP
      Active= Yes

      Encapsulation= PPTP                 Edit IP= No
      Service Type= Standard              Telco Option:
      Service Name=N/A                    Allocated Budget(min)= 0
      Outgoing:                           Period(hr)= 0
        My Login= 1234                    Schedules=
        My Password= ********             Nailed-up Connections=
        Authen= CHAP/PAP

       PPTP :                             Session Options:
       IP Addr=                           Edit Filter Sets= No
       Server IP Addr=                     Idle Timeout(sec)= 300
       Connection ID/Name=



                    Press ENTER to Confirm or ESC to Cancel:

  Press Space Bar to Toggle.
```

Figure 5-2 Remote Node Profile for PPTP Encapsulation

The next table shows how to configure the new fields in the **Remote Node Profile** menu.

Table 5-2 Fields in Menu 11.1 (PPTP Encapsulation)

FIELD	DESCRIPTION	EXAMPLE
Encapsulation	Press the [SPACE BAR] to choose **PPTP**. You must also go to menu 11.3 to check the IP Address setting once you have selected the encapsulation method.	**PPTP**
My IP Addr	Enter the IP address of the WAN Ethernet port.	10.0.0.140
Server IP Addr	Enter the IP address of the ANT modem.	10.0.0.138
Connection ID/Name	Enter the connection ID or connection name in the ANT. It must follow the "c:id" and "n:name" format. This field is optional and depends on the requirements of your xDSL Modem.	N:My ISP
Schedules	You can apply up to four schedule sets here. For more details please refer to the *Call Schedule Scheduling* chapter.	
Nailed-Up Connections	Use the [SPACE BAR] to select **Yes** if you want to make the connection to this remote node a nailed-up connection.	**No**

Nailed-Up Connection

A nailed-up connection is a dial-up line where the connection is always up regardless of traffic demand. The Prestige does two things when you specify a nailed-up connection. The first is that idle timeout is disabled. The second is that the Prestige will try to bring up the connection at power-on and whenever the connection is down. A nailed-up connection can be very expensive for obvious reasons.

Do not specify a nailed-up connection unless your telephone company offers flat-rate service or you need a constant connection and the cost is of no concern.

5.1.3 PPPoE Encapsulation

The Prestige supports PPPoE (Point-to-Point Protocol over Ethernet). PPPoE is an IETF Draft standard (RFC 2516) specifying how a personal computer (PC) interacts with a broadband modem (i.e. xDSL, cable, wireless, etc.) connection.

For the service provider, PPPoE offers an access and authentication method that works with existing access control systems (e.g., Radius). For the user, PPPoE provides a login and authentication method that the existing Microsoft Dial-Up Networking software can activate, and therefore requires no new learning or procedures for Windows users.

One of the benefits of PPPoE is the ability to let end users access one of multiple network services, a function known as dynamic service selection. This enables the service provider to easily create and offer new IP services for specific users.

Operationally, PPPoE saves significant effort for both the end user and ISP/carrier, as it requires no specific configuration of the broadband modem at the customer site.

By implementing PPPoE directly on the Prestige (rather than individual computers), the computers on the LAN do not need PPPoE software installed, since the Prestige does that part of the task. Furthermore, with NAT, all of the LANs' computers will have access.

Enable PPPoE in menu 11.1 by pressing the [SPACE BAR] to select **PPPoE** in the **Encapsulation** field.

```
                        Menu 11.1 - Remote Node Profile

      Rem Node Name= ChangeMe              Route= IP
      Active= Yes

      Encapsulation= PPPoE                 Edit IP= No
      Service Type= Standard               Telco Option:
      Service Name=                          Allocated Budget(min)= 0
      Outgoing=                              Period(hr)= 0
        My Login=                            Schedules=
        My Password= ********                Nailed-up Connections=
        Authen= CHAP/PAP
                                           Session Options:
                                             Edit Filter Sets= No
                                             Idle Timeout(sec)= 100



                     Press ENTER to Confirm or ESC to Cancel:

Press Space Bar to Toggle.
```

Figure 5-3 Menu 11.1 Remote Node Profile for PPPoE Encapsulation

The next table describes the fields NOT already described in *Table 5-1*.

Table 5-3 Fields in Menu 11.1 (PPPoE Encapsulation Specific Only)

FIELD	DESCRIPTION	EXAMPLE
Authen	This field sets the authentication protocol used for outgoing calls. Options for this field are: **CHAP/PAP** - Your Prestige will accept either **CHAP** or **PAP** when requested by this remote node. **CHAP** - accept CHAP only. **PAP** - accept PAP only.	**CHAP/PAP**

FIELD	DESCRIPTION	EXAMPLE
Telco Option		
Allocated Budget (min)	The field sets a ceiling for outgoing call time for this remote node. The default for this field is 0 meaning no budget control.	10
Period(hr)	This field is the time period that the budget should be reset. For example, if we are allowed to call this remote node for a maximum of 10 minutes every hour, then the **Allocated Budget(min)** is (10 minutes) and the **Period(hr)** is 1 (hour).	1
Schedules	You can apply up to four schedule sets here. For more details please refer to the *Call Scheduling* chapter.	
Nailed-Up Connection	This field specifies if you want to make the connection to this remote node a nailed-up connection. More details are given earlier in this section.	
Session Options Idle Timeout	This value specifies the idle time (i.e., the length of time there is no traffic from the Prestige to the remote node) in seconds that can elapse before the Prestige automatically disconnects the PPPoE connection. *This option only applies when the Prestige initiates the call.*	300 seconds (default)

5.2 Editing TCP/IP Options (with Ethernet Encapsulation)

Move the cursor to the **Edit IP** field in **Menu 11.1**, then press the [SPACE BAR] to set the value to **Yes**. Press [ENTER] to open **Menu 11.3 - Network Layer Options**.

```
              Menu 11.3 - Remote Node Network Layer Options

                     IP Address Assignment= Dynamic
                     IP Address= N/A
                     IP Subnet Mask= N/A
                     Gateway IP Addr= N/A

                     Network Address Translation= SUA only
                     Metric= N/A
                     Private= N/A
                     RIP Direction= None
                       Version= N/A
                     Multicast= None

                      Enter here to CONFIRM or ESC to CANCEL:
Press Space Bar to Toggle.
```

Figure 5-4 Remote Node Network Layer Options

The next table gives you instructions about configuring remote node network layer options.

Table 5-4 Remote Node Network Layer Options Menu Fields

FIELD	DESCRIPTION	EXAMPLE
IP Address Assignment	If your ISP did not assign you an explicit IP address, select **Dynamic**; otherwise select **Static** and enter the IP address & subnet mask in the following fields.	**Dynamic**
IP Address	If you have a Static IP Assignment, enter the IP address assigned to you by your ISP.	
IP Subnet Mask	If you have a Static IP Assignment, enter the subnet mask assigned to you.	
Gateway IP Addr	If you have a Static IP Assignment, enter the gateway IP address assigned to you.	
Network Address Translation	Use the [SPACE BAR] to select either **Full Feature**, **None** or **SUA Only**. See the *NAT* chapter for a full discussion of this feature.	**SUA Only**
Metric	This field is valid only for PPTP/PPPoE encapsulation. The metric represents the “cost” of transmission for routing purposes. IP routing uses hop count as the measurement of cost, with a minimum of 1 for directly connected networks. Enter a number that approximates the cost for this link. The number need not be precise, but it must be between 1 and 15. In practice, 2 or 3 is usually a good number.	3
Private	This field is valid only for PPTP/PPPoE encapsulation. This parameter determines if the Prestige will include the route to this	**Yes**

FIELD	DESCRIPTION	EXAMPLE
	remote node in its RIP broadcasts. If set to **Yes**, this route is kept private and not included in RIP broadcast. If **No**, the route to this remote node will be propagated to other hosts through RIP broadcasts.	
RIP	Press the [SPACE BAR] to select the RIP direction from **Both**, **None**, **In Only** or **Out Only**. Please see the *RIP Setup section* for more information on RIP. The default for RIP on the WAN side is **None**. It is recommended that you do not change this setting.	**None**
Version	Press the [SPACE BAR] to select the RIP version from **RIP-1**/**RIP-2B**/**RIP-2M** or **None**.	**None**
Multicast	IGMP (Internet Group Multicast Protocol) is a session-layer protocol used to establish membership in a Multicast group. The Prestige supports both IGMP version 1 (**IGMP-v1**) and version 2 (**IGMP-v2)**. Press [SPACE BAR] to enable IP Multicasting or select **None** to disable it. See the previous *Part* for more information on this feature.	**IGMP-v2**
Once you have completed filling in the Network Layer Options Menu, press [ENTER] to return to menu 11. Press [ENTER] at the message “Press ENTER to Confirm...” to save your configuration, or press [ESC] at any time to cancel.		

5.2.1 Editing TCP/IP Options (with PPTP Encapsulation)

Make sure that **Encapsulation** is set to **PPTP** in menu 11.1. Then move the cursor to the **Edit IP** field in menu 11.1, press the [SPACE BAR] to toggle **No** to **Yes**. Press [ENTER] to open **Menu 11.3 - Network Layer Options**.

```
            Menu 11.3 - Remote Node Network Layer Options

                  IP Address Assignment= Dynamic
                  Rem IP Address= N/A
                  Rem Subnet Mask= N/A
                  My WAN Addr= N/A

                  Network Address Translation= Yes
                  Metric= 1
                  Private= No
                  RIP Direction= None
                    Version= N/A
                  Multicast= None

                   Enter here to CONFIRM or ESC to CANCEL:
Press Space Bar to Toggle.
```

Figure 5-5 Remote Node Network Layer Options

The next table gives you instructions about configuring remote node network layer options.

Table 5-5 Remote Node Network Layer Options Menu Fields

FIELD	DESCRIPTION	EXAMPLE
IP Address Assignment	If your ISP did not assign you an explicit IP address, select **Dynamic**; otherwise select **Static** and enter the IP address & subnet mask in the following fields.	**Dynamic**
Rem IP Address	If you have a **Static IP Assignment**, enter the IP address assigned to the remote node.	192.168.1.1
Rem IP Subnet Mask	If you have a **Static IP Assignment**, enter the subnet mask assigned to the remote node.	255.255.255.0
My WAN Addr	Some implementations, especially the UNIX derivatives, require the WAN link to have a separate IP network number from the LAN and each end must have a unique address within the WAN network number. If this is the case, enter the IP address assigned to the WAN port of your Prestige. Note that this is the address assigned to your local Prestige, not the remote router.	
Network Address Translation	Use the [SPACE BAR] to select either **Full Feature, None** or **SUA Only.** See the *NAT chapter* for a full discussion on this feature.	**SUA Only**
Metric	The metric represents the "cost" of transmission for routing purposes. IP routing uses hop count as the measurement of cost, with a minimum of 1 for directly connected networks. Enter a number that approximates the cost for this link. The number need not be precise, but it must be between 1 and 15. In practice, 2 or 3 is usually a good number.	1 to 15
Private	This parameter determines if the Prestige will include the route to this remote node in its RIP broadcasts. If set to **Yes**, this route is kept private and not included in RIP broadcast. If **No**, the route to this remote node will be propagated to other hosts through RIP broadcasts.	**Yes**
RIP	Press the [SPACE BAR] to select the **RIP direction.** Options are: **Both**, **None**, **In Only**, **Out Only** or **None**. Please see the *RIP Setup section* for more information on RIP. The default for RIP on the WAN side is **None**. It is recommended that you do not change this setting.	**None** (default)
Version	Press the [SPACE BAR] to select the RIP version. Options are **RIP-1**, **RIP-2B** or **RIP-2M**.	**RIP-1**

FIELD	DESCRIPTION	EXAMPLE
Multicast	IGMP (Internet Group Multicast Protocol) is a session-layer protocol used to establish membership in a Multicast group. The Prestige supports both IGMP version 1 (**IGMP-v1**) and version 2 (**IGMP-v2**). Press the [SPACE BAR] to enable IP Multicasting or select **None** to disable it. See the previous *Part* for more information on this feature.	**None**
Once you have completed filling in the Network Layer Options Menu, press [ENTER] to return to menu 11. Press [ENTER] at the message "Press ENTER to Confirm..." to save your configuration, or press [ESC] at any time to cancel.		

5.2.2 Editing TCP/IP Options (with PPPoE Encapsulation)

Make sure **Encapsulation** is set to **PPPoE** in menu 11.1. Move the cursor to the **Edit IP** field in menu 11.1. The menu and filed are the same as described for PPTP encapsulation.

5.3 Remote Node Filter

Move the cursor to the field **Edit Filter Sets** in menu 11.1, then press the [SPACE BAR] to set the value to **Yes**. Press [ENTER] to open **Menu 11.5 - Remote Node Filter**.

Use menu 11.5 to specify the filter set(s) to apply to the incoming and outgoing traffic between this remote node and the Prestige to prevent certain packets from triggering calls. You can specify up to 4 filter sets separated by commas, e.g., 1, 5, 9, 12, in each filter field. Note that spaces are accepted in this field. For more information on defining the filters, please refer to the *Filters* chapter. For PPPoE or PPTP encapsulation, you can also specify remote node call filter sets.

```
                Menu 11.5 - Remote Node Filter

          Input Filter Sets:
            protocol filters= 5
              device filters=
          Output Filter Sets:
            protocol filters= 1
              device filters=

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

Figure 5-6 Remote Node Filter (Ethernet Encapsulation)

```
                    Menu 11.5 - Remote Node Filter

                         Input Filter Sets:
                         protocol filters= 5
                         device filters=
                         Output Filter Sets:
                         protocol filters= 1
                         device filters=
                         Call Filter Sets:
                         protocol filters= 1
                         device filters=

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

Figure 5-7 Remote Node Filter (PPTP/PPPoE Encapsulation)

Chapter 6
IP Static Route Setup

This chapter shows you how to configure static routes with your Prestige.

Static routes tell the Prestige routing information that it cannot learn automatically through other means. This can arise in cases where RIP is disabled on the LAN.
Each remote node specifies only the network to which the gateway is directly connected, and the Prestige has no knowledge of the networks beyond. For instance, the Prestige knows about network N2 in the following diagram through remote node Router 1. However, the Prestige is unable to route a packet to network N3 because it doesn't know that there is a route through the same remote node Router 1 (via gateway Router 2). The static routes are for you to tell the Prestige about the networks beyond the remote nodes.

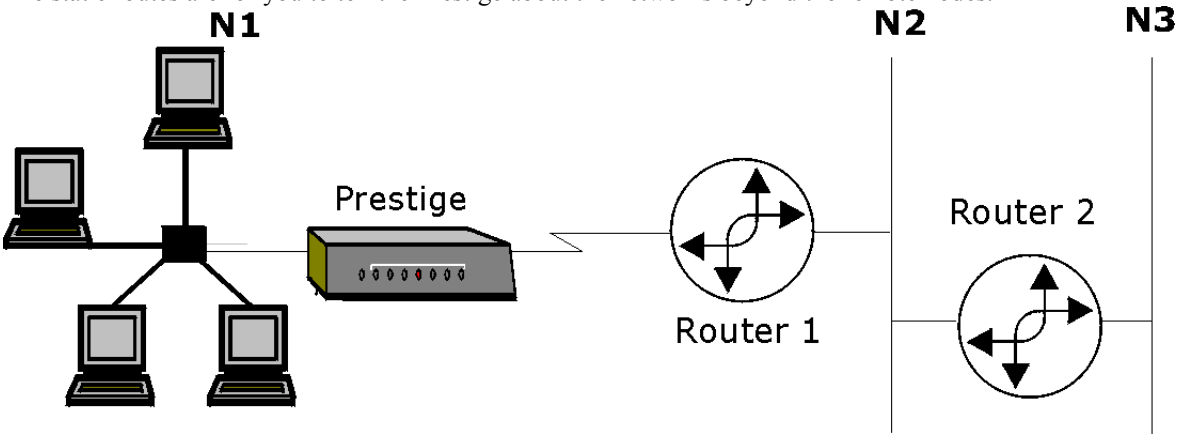


Figure 6-1 Example of Static Routing Topology

6.1 IP Static Route Setup

You configure IP static routes in menu 12. 1, by selecting one of the IP static routes as shown below. Enter 12 from the main menu.

```
                    Menu 12 - IP Static Route Setup


          1. ________
          2. ________
          3. ________
          4. ________
          5. ________
          6. ________
          7. ________
          8. ________



                                Enter selection number:
```

Figure 6-2 Menu 12 — IP Static Route Setup

Now, enter the index number of one of the static routes you want to configure.

```
                    Menu 12.1 - Edit IP Static Route


               Route #: 1
               Route Name= ?
               Active= No
               Destination IP Address= ?
               IP Subnet Mask= ?
               Gateway IP Address= ?
               Metric= 2
               Private= No

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

Figure 6-3 Menu 12. 1 — Edit IP Static Route

`The following table describes the IP Static Route Menu fields.

Table 6-1 IP Static Route Menu Fields

FIELD	DESCRIPTION
Route #	This is the index number of the static route that you chose in menu 12.
Route Name	Enter a descriptive name for this route. This is for identification purposes only.
Active	This field allows you to activate/deactivate this static route.
Destination IP Address	This parameter specifies the IP network address of the final destination. Routing is always based on network number. If you need to specify a route to a single host, use a subnet mask of 255.255.255.255 in the subnet mask field to force the network number to be identical to the host ID.
IP Subnet Mask	Enter the IP subnet mask for this destination.
Gateway IP Address	Enter the IP address of the gateway. The gateway is an immediate neighbor of your Prestige that will forward the packet to the destination. On the LAN, the gateway must be a router on the same segment as your Prestige; over the WAN, the gateway must be the IP address of one of the Remote Nodes.
Metric	Metric represents the “cost” of transmission for routing purposes. IP routing uses hop count as the measurement of cost, with a minimum of 1 for directly connected networks. Enter a number that approximates the cost for this link. The number need not be precise, but it must be between 1 and 15. In practice, 2 or 3 is usually a good number.
Private	This parameter determines if the Prestige will include the route to this remote node in its RIP broadcasts. If set to **Yes**, this route is kept private and not included in RIP broadcast. If **No**, the route to this remote node will be propagated to other hosts through RIP broadcasts.
Once you have completed filling in this menu, press [ENTER] at the message “Press ENTER to Confirm…” to save your configuration, or press [ESC] to cancel.	

Part III:

Advanced Management

This section provides information on Filter Configuration, SNMP Configuration, System Information and Diagnosis, Firmware and Configuration File Maintenance, System Maintenance and Call Scheduling.

Chapter 7
Filter Configuration

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

7.1 About Filtering

Your Prestige uses filters to decide whether to allow passage of a data packet and/or to make a call. There are two types of filter applications: data filtering and call filtering. Filters are subdivided into device and protocol filters, which are discussed later.

Data filtering screens the data to determine if the packet should be allowed to pass. Data filters are divided into incoming and outgoing filters, depending on the direction of the packet relative to a port. Data filtering can be applied on either the WAN side or the Ethernet side. Call filtering is used to determine if a packet should be allowed to trigger a call. Remote node call filtering is only applicable when using **PPTP or PPPoE** encapsulation (*see* Figure 5-7*)*. Outgoing packets must undergo data filtering before they encounter call filtering as shown in the following figure.

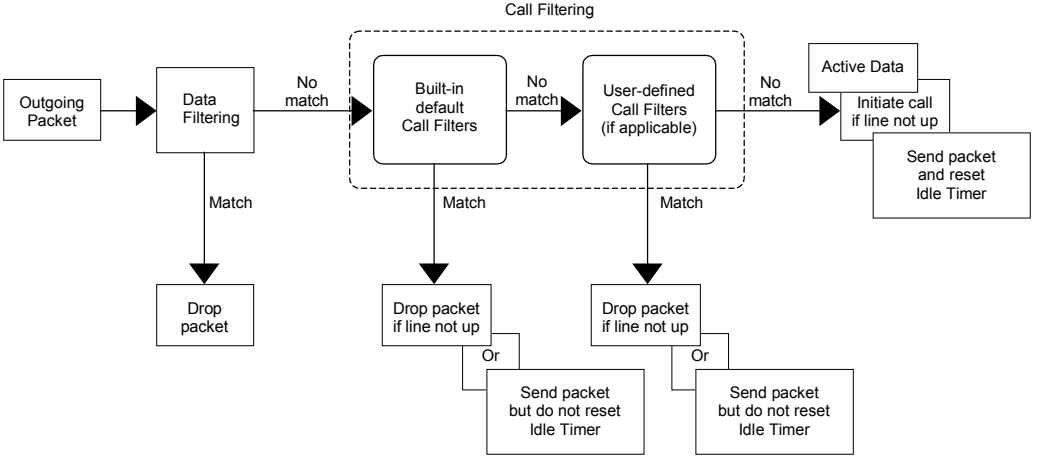


Figure 7-1 Outgoing Packet Filtering Process

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

7.1.1 The Filter Structure of the Prestige

A filter set consists of one or more filter rules. Usually, you would group related rules, e.g., all the rules for NetBIOS, into a single set and give it a descriptive name. The Prestige allows you to configure up to twelve filter sets with six rules in each set, for a total of 72 filter rules in the system. You cannot mix device filter rules and protocol filter rules within the same set. You can apply up to four filter sets to a particular port to block multiple types of packets. With each filter set having up to six rules, you can have a maximum of 24 rules active for a single port.

Three sets of factory default filter rules have been configured in menu 21 to prevent NetBIOS traffic from triggering calls and to prevent incoming telnetting and FTP connections from the WAN side. A summary of their filter rules is shown in the figures that follow.

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

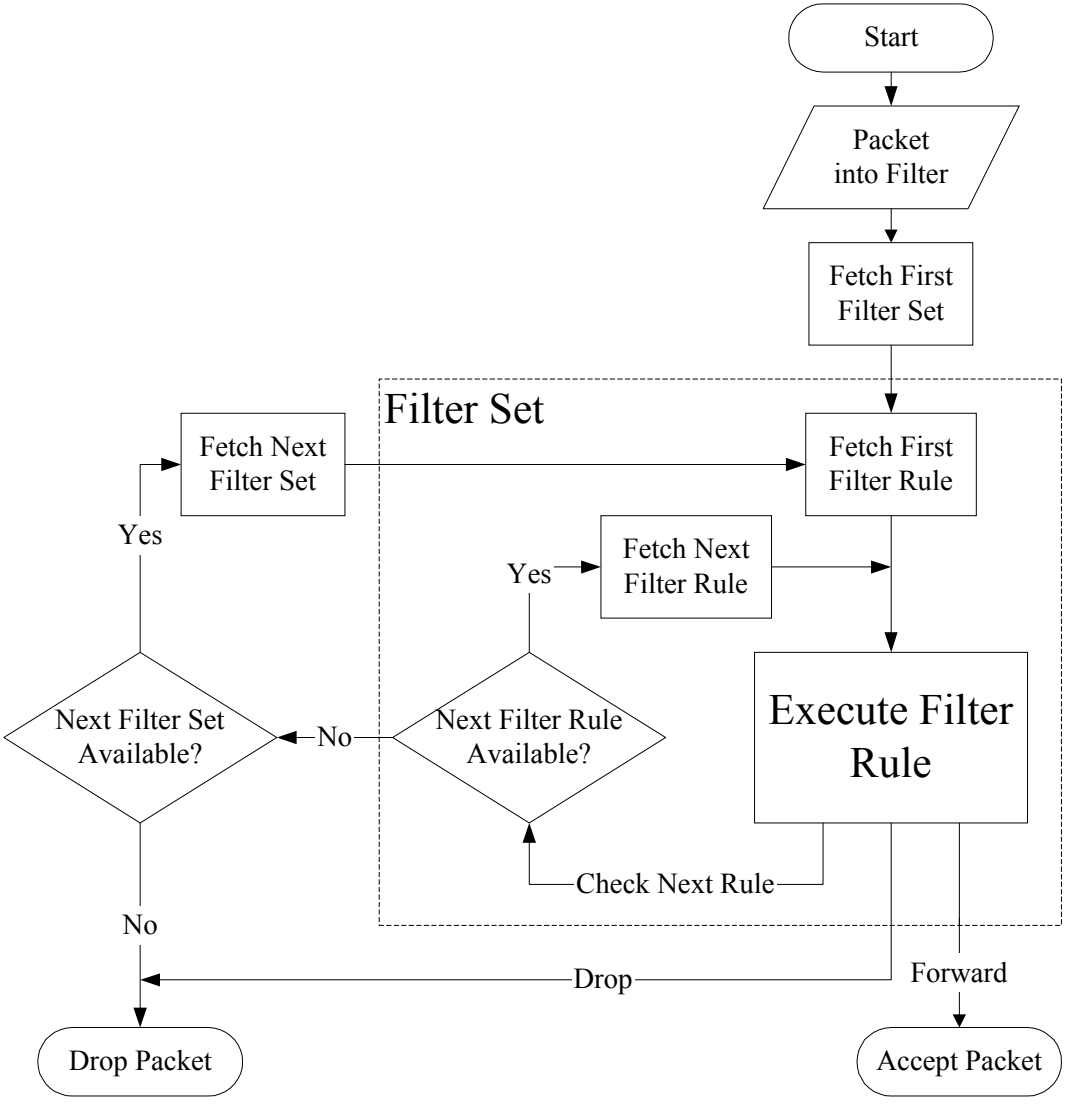


Figure 7-2 Filter Rule Process

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

7.2 Configuring a Filter Set

To configure a filter set, follow the procedure below. Select option 21 from the main menu to display menu 21.

Step 1. Enter 1 to display the following menu.

```
                Menu 21.1 - Filter Set Configuration

Filter                                Filter
Set #         Comments                Set #         Comments
------     ------------------         ------     ------------------
1            NetBIOS_WAN              7            _______________
2            NetBIOS_LAN              8            _______________
3            TEL_FTP_WEB_WAN          9            _______________
4            _______________          10           _______________
5            SNMP_WAN                 11           _______________
6            _______________          12           _______________

                Enter Filter Set Number to Configure= 0

                Edit Comments=

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

Figure 7-3 Menu 21 — Filter Set Configuration

Step 2. Select the filter set you wish to configure (no. 1-12) and press [ENTER].

Step 3. Enter a descriptive name or comment in the **Edit Comments** field and press [ENTER].

Step 4. Press [ENTER] at the message: [Press ENTER to confirm] to open **Menu 21.1.1 — Filter Rules Summary**.

```
                Menu 21.1 - Filter Rules Summary

# A Type                        Filter Rules                        M m n
 - - ---- ------------------------------------------- --------- - - -
 1 Y IP   Pr=6,  SA=0.0.0.0, DA=0.0.0.0, DP=137                    N D N
 2 Y IP   Pr=6,  SA=0.0.0.0, DA=0.0.0.0, DP=138                    N D N
 3 Y IP   Pr=6,  SA=0.0.0.0, DA=0.0.0.0, DP=139                    N D N
 4 Y IP   Pr=17, SA=0.0.0.0, DA=0.0.0.0, DP=137                    N D N
 5 Y IP   Pr=17, SA=0.0.0.0, DA=0.0.0.0, DP=138                    N D N
 6 Y IP   Pr=17, SA=0.0.0.0, DA=0.0.0.0, DP=139                    N D F


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

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

Figure 7-4 NetBIOS_WAN Filter Rules Summary

```
                    Menu 21.3 - Filter Rules Summary

 # A Type                  Filter Rules                          M m n
 - - ---- ------------------------------------------------------------
 1 Y IP   Pr=6, SA=0.0.0.0, DA=0.0.0.0, DP=23                   N D N
 2 Y IP   Pr=6, SA=0.0.0.0, DA=0.0.0.0, DP=21                   N D N
 3 Y IP   Pr=6, SA=0.0.0.0, DA=0.0.0.0, DP=80                   N D F
 4 N
 5 N
 6 N


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

Figure 7-5 TEL_FTP_WEB_WAN Filter Rules Summary

```
                  Menu 21.3 - Filter Rules Summary

# A Type                      Filter Rules                          M m n
- - ---- ------------------------------------------------------------ - - -
1 Y IP   Pr=17, SA=0.0.0.0, DA=0.0.0.0, DP=161                      N D F
2 N
3 N
4 N
5 N
6 N


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

Figure 7-6 SNMP_WAN Filter Rules Summary

```
                    Menu 21.2 - Filter Rules Summary

  # A Type                      Filter Rules                      M m n
  - - ---- ------------------------------------------- --------- - - -
  1 Y IP   Pr=17, SA=0.0.0.0, SP=137, DA=0.0.0.0, DP=53          N D F
  2 Y
  3 Y
  4 Y
  5 Y
  6 Y


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

Figure 7-7 NetBIOS _LAN Filter Rules Summary

7.2.1 Filter Rules Summary Menu

This screen shows the summary of the existing rules in the filter set. The following tables contain a brief description of the abbreviations used in the previous menus.

Table 7-1 Abbreviations Used in the Filter Rules Summary Menu

FIELD	DESCRIPTION
#	The filter rule number: 1 to 6.
A	Active: “Y” means the rule is active. “N” means the rule is inactive.
Type	The type of filter rule: “GEN” for Generic, “IP” for TCP/IP.
Filter Rules	These parameters are displayed here.
M	More. “Y” means there are more rules to check which form a rule chain with the present rule. An action cannot be taken until the rule chain is complete. “N” means there are no more rules to check. You can specify an action to be taken i.e., forward the packet, drop the packet or check the next rule. For the latter, the next rule is independent of the rule just checked.
m	Action Matched. “F” means to forward the packet immediately and skip checking the remaining rules. “D” means to drop the packet. “N“ means to check the next rule.
n	Action Not Matched. “F” means to forward the packet immediately and skip checking the remaining rules. “D” means to drop the packet. “N” means to check the next rule.

The protocol dependent filter rules abbreviation are listed as follows:

Table 7-2 Rule Abbreviations Used

ABBREVIATION	DESCRIPTION
IP	
Pr	Protocol
SA	Source Address
SP	Source Port number
DA	Destination Address
DP	Destination Port number
GEN	
Off	Offset
Len	Length

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

7.2.2 Configuring a Filter Rule

To configure a filter rule, type its number in **Menu 21.1 - Filter Rules Summary** and press [ENTER] to open menu 21.1.1 for the rule.
To speed up filtering, all rules in a filter set must be of the same class, i.e., protocol filters or generic filters. The class of a filter set is determined by the first rule that you create. When applying the filter sets to a port, separate menu fields are provided for protocol and device filter sets. If you include a protocol filter set in a device filter field or vice versa, the Prestige will warn you and will not allow you to save.

7.2.3 TCP/IP Filter Rule

This section shows you how to configure a TCP/IP filter rule. TCP/IP rules allow you to base the rule on the fields in the IP and the upper layer protocol, e.g., UDP and TCP headers.
To configure TCP/IP rules, select press [ENTER] to open **Menu 21.1.1 - TCP/IP Filter Rule**, as shown next.

```
                    Menu 21.1.1 - TCP/IP Filter Rule

                Filter #: 1,1
                Filter Type= TCP/IP Filter Rule
                Active= Yes
                IP Protocol= 6      IP Source Route= No
                Destination: IP Addr= 0.0.0.0
                             IP Mask= 0.0.0.0
                             Port #= 137
                             Port # Comp= Equal
                     Source: IP Addr= 0.0.0.0
                             IP Mask= 0.0.0.0
                             Port #=
                             Port # Comp= None
                TCP Estab= No
                More= No              Log= None
                Action Matched= Drop
                Action Not Matched= Check Next Rule

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

Figure 7-8 Menu 21.1.1 — TCP/IP Filter Rule

The following table describes how to configure your TCP/IP filter rule.

Table 7-3 TCP/IP Filter Rule Menu Fields

FIELD	DESCRIPTION	EXAMPLE
Active	**Yes** activates and **No** deactivates the filter rule.	**Yes**
IP Protocol	Protocol refers to the upper layer protocol, e.g., TCP is 6, UDP is 17 and ICMP is 1. This value must be between 0	0-255

FIELD	DESCRIPTION	EXAMPLE
	and 255	
IP Source Route	If **Yes**, the rule applies to packet with IP source route option; else the packet must not have source route option. The majority of IP packets do not have source route.	**No**
Destination IP Address	Enter the destination IP Address of the packet you wish to filter. This field reads **don't-care** if it is 0.0.0.0.	IP address
IP Mask	Enter the IP mask that will be used to mask the bits of the IP address given in the **Destination IP Address** field.	IP mask
Port #	Enter the destination port of the packets that you wish to filter. The range of this field is 0 to 65535. This field reads **don't-care** if it is 0.	0-65535
Port # Comp	Select the comparison to apply to the destination port in the packet against the value given in **Destination Port #** field. Options are: **None**, **Less**, **Greater**, **Equal** or **Not Equal**.	**Equal**
Source IP Address	Enter the source IP Address of the packet you wish to filter. This field reads **don't-care** if it is 0.0.0.0.	IP Address
IP Mask	Enter the IP mask that will be used to mask the bits of the IP address given in the **Source IP Address** field.	IP Mask
Port #	Enter the source port of the packets that you wish to filter. The range of this field is 0 to 65535. This field **reads don't-care** if it is 0.	0-65535
Port # Comp	Select the comparison to apply to the source port in the packet against the value given in **Source Port #** field. Options are: **None**, **Less**, Greater, **Equal** or **Not Equal**.	**None**
TCP Estab	This field is applicable only when **IP Protocol** field is 6, TCP. If **Yes**, the rule matches only established TCP connections; else the rule matches all TCP packets.	**No**
More	If **Yes**, a matching packet is passed to the next filter rule before an action is taken; else the packet is disposed of according to the action fields. If the **More** field is **Yes**, then **Action Matched** and **Action Not Matched** will be **No**.	**No**

FIELD	DESCRIPTION	EXAMPLE
Log	Select the logging option from the following: **None** – No packets will be logged. **Action Matched** - Only packets that match the rule parameters will be logged. **Action Not Matched** - Only packets that do not match the rule parameters will be logged. **Both** – All packets will be logged.	**None**
Action Matched	Select the action for a matching packet. Options are **Check Next Rule**, **Forward** or **Drop**.	**Drop**
Action Not Matched	Select the action for a packet not matching the rule. Options are **Check Next Rule**, **Forward** or **Drop**.	**Check Next Rule**
Once you have completed filling in **Menu 21.1.1.1 - TCP/IP Filter Rule**, press [ENTER] at the message "Press Enter to Confirm to save your configuration, or press [ESC] to cancel". This data will now be displayed on **Menu 21.1.1 - Filter Rules Summary**.		

The following figure illustrates the logic flow of an IP filter.

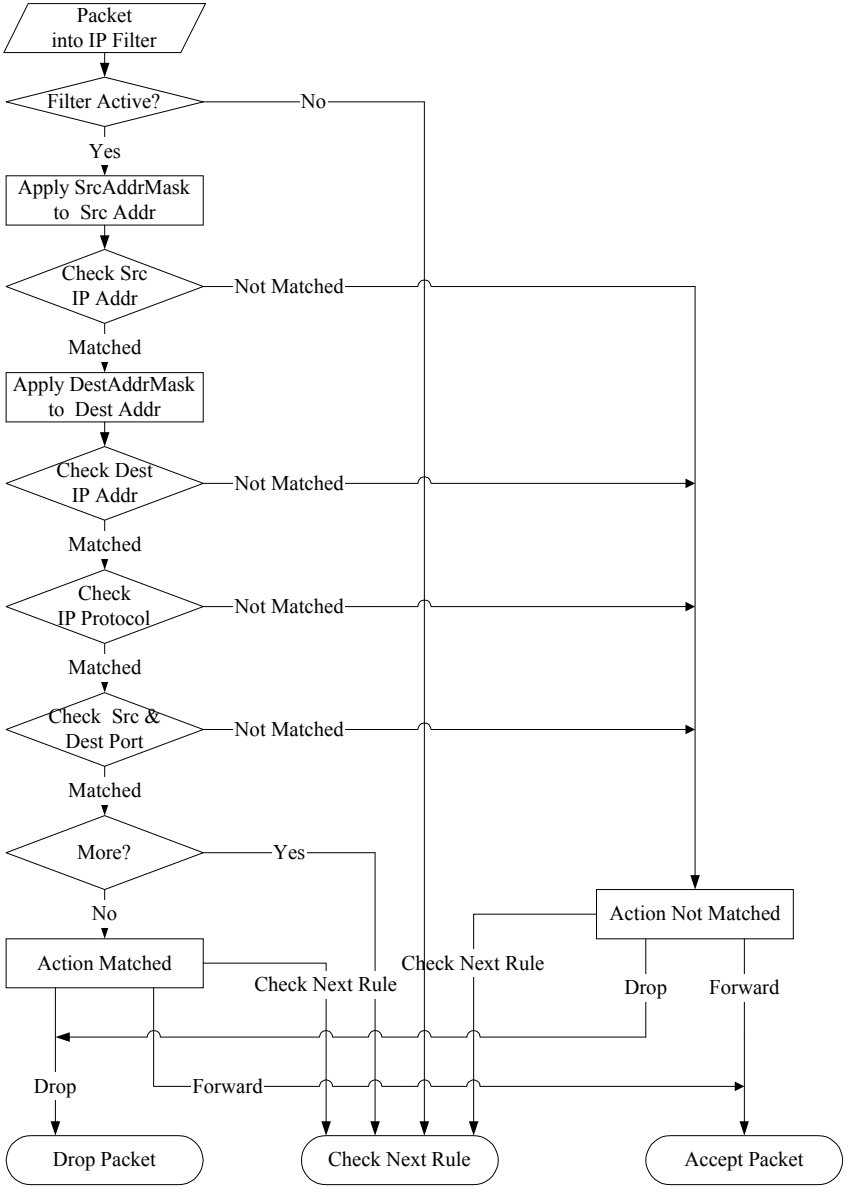


Figure 7-9 Executing an IP Filter

7.2.4 Generic Filter Rule

This section shows you how to configure a generic filter rule. The purpose of generic rules is to allow you to filter non-IP packets. For IP, it is generally easier to use the IP rules directly.

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

To configure a generic rule, select **Generic Filter Rule** in the **Filter Type** field in the menu 21.4.1 and press [ENTER] to open **Menu 21.4.1 - Generic Filter Rule**, as shown below.

```
                Menu 21.4.1 - Generic Filter Rule

                Filter #: 4,1
                Filter Type= Generic Filter Rule
                Active= No
                Offset= 0
                Length= 0
                Mask= N/A
                Value= N/A
                More= No            Log= None
                Action Matched= Check Next Rule
                Action Not Matched= Check Next Rule



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

Figure 7-10 Menu 21.4.1 — Generic Filter Rule

The following table describes the fields in the Generic Filter Rule Menu.

Table 7-4 Generic Filter Rule Menu Fields

Field	Description	Option
Filter #	This is the filter set, filter rule co-ordinates, i.e., 2,3 refers to the second filter set and the third rule of that set.	
Filter Type	Use the [SPACE BAR] to select a rule. Parameters displayed below each type will be different. Options are: **Generic Filter Rule** or **TCP/IP Filter Rule**.	**Generic Filter Rule**
Active	Select **Yes** to turn on the filter rule.	**No**

Field	Description	Option
Offset	Enter the starting byte of the data portion in the packet that you wish to compare. The range for this field is from 0 to 255.	0 (default)
Length	Enter the byte count of the data portion in the packet that you wish to compare. The range for this field is 0 to 8.	0 (default)
Mask	Enter the mask (in Hexadecimal) to apply to the data portion before comparison.	
Value	Enter the value (in Hexadecimal) to compare with the data portion.	
More	If **Yes**, a matching packet is passed to the next filter rule before an action is taken; else the packet is disposed of according to the action fields. If the **More** field is **Yes**, then **Action Matched and Action Not Matched** will be **No**.	**No**
Log	Select the logging option from the following: **None** – No packets will be logged. **Action Matched** - Only packets that match the rule parameters will be logged. **Action Not Matched** - Only packets that do not match the rule parameters will be logged. **Both** – All packets will be logged.	**None**
Action Matched	Select the action for a matching packet. Options are: **Check Next Rule**, **Forward** or **Drop**.	**Check Next Rule**
Action Not Matched	Select the action for a packet not matching the rule. Options are: **Check Next Rule**, **Forward** or **Drop**.	**Check Next Rule**
Once you have completed filling in **Menu 21.4.1.1 — Generic Filter Rule**, press [ENTER] at the message "[Press Enter to Confirm] to save your configuration, or press [ESC] to cancel". This data will now be displayed on **Menu 21.1.1 — Filter Rules Summary**.		

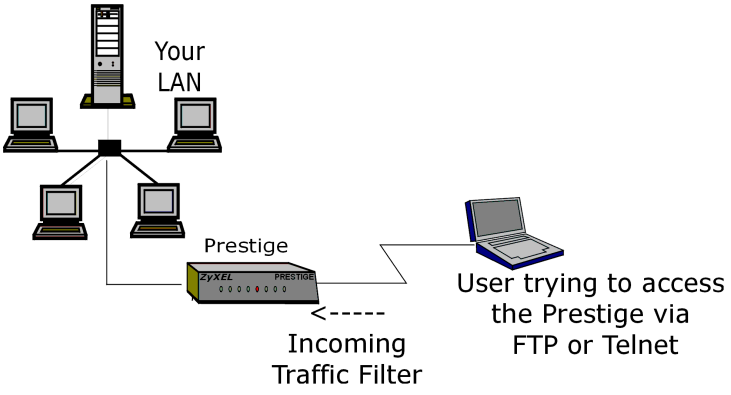


Figure 7-11 Filter Example

7.3 Example Filter

Let's look at an example to block outside users from telnetting into the Prestige. See the included support CD for more example filters.

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

Step 2. Enter the index of the filter set you wish to configure (e.g., 7) and press [ENTER].

Step 3. Enter a descriptive name or comment in the **Edit Comments** field (e.g., TELNET_WAN) and press [ENTER].

Step 4. Press [ENTER] at the message "[Press ENTER to confirm] to open **Menu 21.7 - Filter Rules Summary.**

Step 5. Enter 1 to configure the first filter rule. Make the entries in this menu as shown in the following figure.

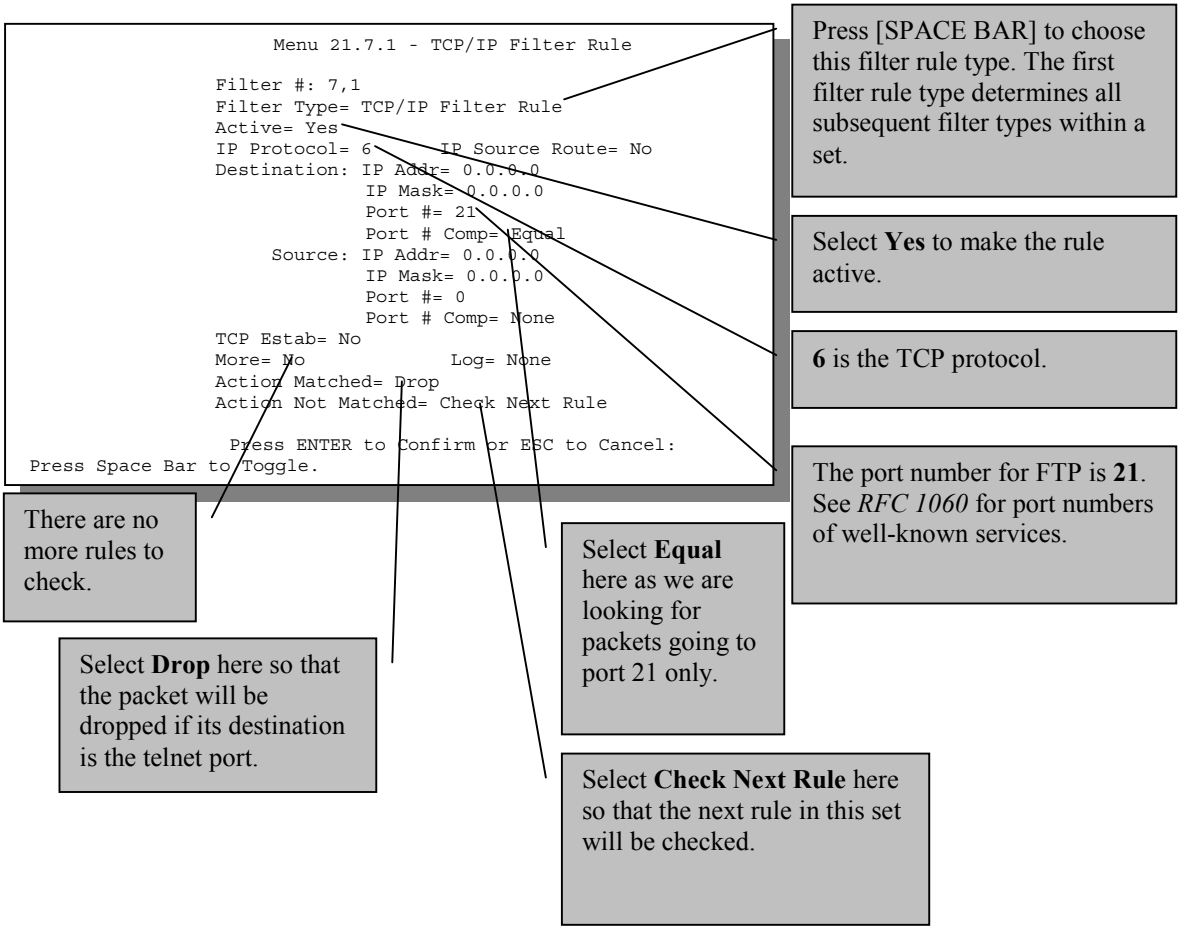


Figure 7-12 Example Filter — Menu 21.3.1

Step 6. Press [ENTER] to confirm and display the next screen. Note that there is only one filter rule in this set.

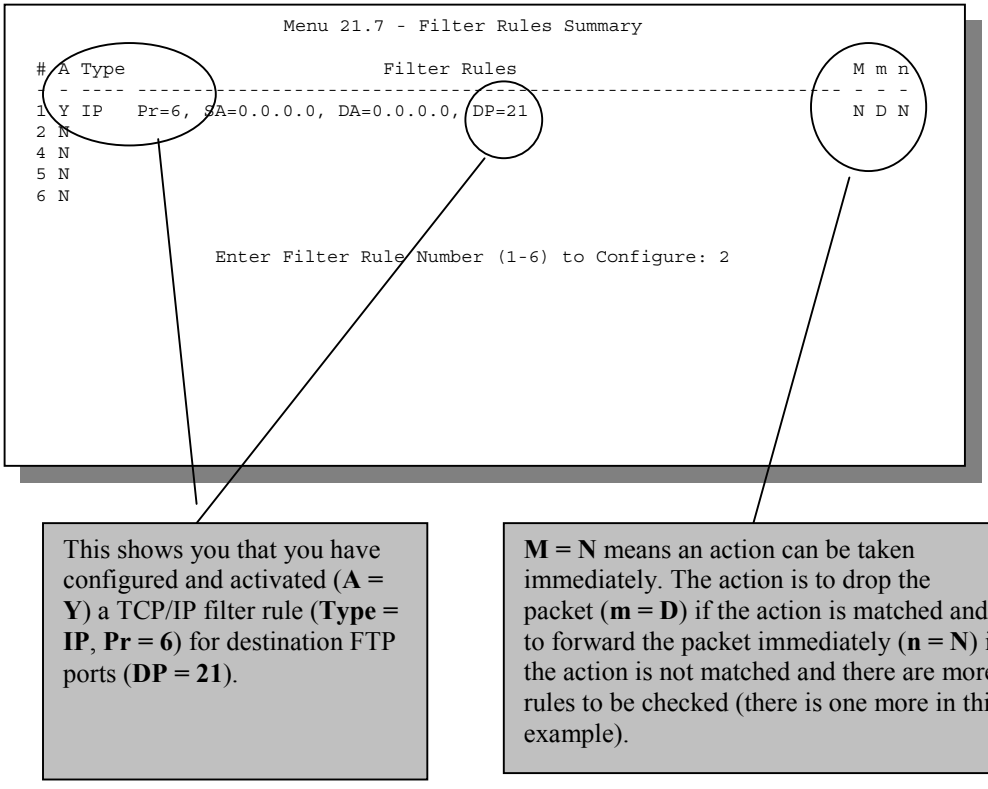


Figure 7-13 Example Filter Rules Summary — Menu 21.3

Step 7. Enter 2 in the above menu to configure the second rule**.** Configure this filter rule with port number as 23 (Telnet) as shown in the next screen (after you press [ENTER] to confirm.

```
                    Menu 21.7 - Filter Rules Summary

 # A Type                  Filter Rules                          M m n
 - - ---- ------------------------------------------------------------
 1 Y IP   Pr=6, SA=0.0.0.0, DA=0.0.0.0, DP=21                   N D N
 2 Y IP   Pr=6, SA=0.0.0.0, DA=0.0.0.0, DP=23                   N D F
 3 N
 4 N
 5 N
 6 N


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

Figure 7-14 Example Filter Rules Summary

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

Step 1. Enter 11 from the main menu to display menu 11.

Step 2. Go to the **Edit Filter Sets** field, press the [SPACE BAR] to select **No** and press [ENTER].

Step 3. This brings you to menu 11.5. Apply the TELNET_FTP_WAN filter set (filter set 7) as shown in *Figure 7-17*.

7.4 Filter Types and NAT

There are two classes of filter rules, **Generic Filter** (Device) rules and Protocol Filter (**TCP/IP**) rules.

Generic Filter rules act on the raw data from/to LAN and WAN.
Protocol Filter rules act on the IP packets.

Generic and TCP/IP filter rules are discussed in more detail in the next section. When NAT (Network Address Translation) is enabled, the inside IP address and port number are replaced on a connection-by-connection basis, which makes it impossible to know the exact address and port on the wire. Therefore, the Prestige applies the protocol filters to the "native" IP address and port number before NAT for outgoing packets and after NAT for incoming packets. On the other hand, the generic, or device filters are applied to the raw packets that appear on the wire. They are applied at the point when the Prestige is receiving and sending the packets; i.e. the interface. The interface can be an Ethernet port or any other hardware port. The following figure illustrates this.

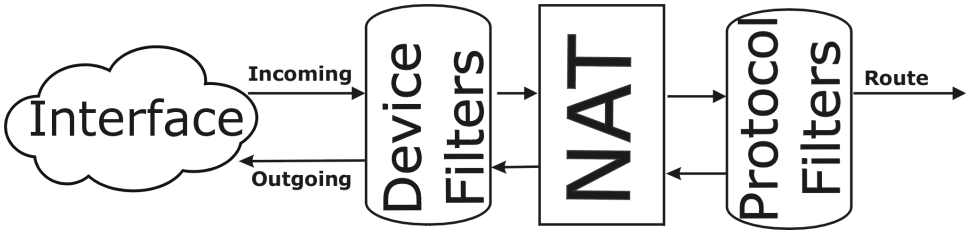


Figure 7-15 Protocol and Device Filter Sets

7.5 Applying a Filter and Factory Defaults

This section shows you where to apply the filter(s) after you design it (them). Sets of factory default filter rules have been configured in menu 21 to prevent NetBIOS traffic from triggering calls and block incoming telnet, FTP and HTTP connections.

7.5.1 LAN traffic

You seldom need to filter LAN traffic; however, the filter sets may be useful to block certain packets, reduce traffic and prevent security breaches. Go to menu 3.1 (shown below) and enter the number(s) of the filter set(s) that you want to apply as appropriate. You can choose up to four filter sets (from twelve) by entering their numbers separated by commas, e.g., 3, 4, 6, 11. Input filter sets filter incoming traffic to the Prestige and Output filter sets filter outgoing traffic from the Prestige. A factory default set, NetBIOS_LAN, is inserted in **protocol filters** field under **Input Filter Sets** in menu 3.1 to block NetBIOS traffic to the Prestige from the LAN.

```
                Menu 3.1 - LAN Port Filter Setup

Input Filter Sets:
  protocol filters= 2
    device filters=
Output Filter Sets:
  Protocol filters=
    device filters=

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

Apply factory default filter here.

Figure 7-16 Filtering LAN Traffic

7.5.2 Remote Node Filters

Go to menu 11.5 (shown next – note that call filter sets are only present for PPPoE encapsulation) and enter the number(s) of the filter set(s) as appropriate. You can cascade up to four filter sets by entering their numbers separated by commas. The factory default filter set, NetBIOS_WAN, can be applied in menu 11.5 to block local NetBIOS traffic from triggering calls to the ISP (when you are using PPPoE or PPTP encapsulation only). Enter 1 in **protocol filters** under **Output Filter Sets** when using Ethernet encapsulation, and in the **protocol filters** field under **Call Filter Sets** when using PPPoE or PPTP encapsulation. Apply them as shown in the following figure.

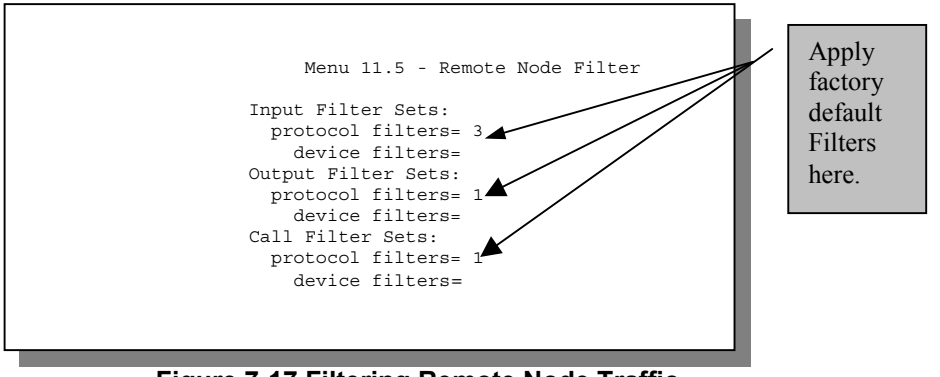


Figure 7-17 Filtering Remote Node Traffic

Chapter 8
SNMP Configuration

This chapter explains SNMP configuration menu 22.

SNMP is only available if TCP/IP is configured.

8.1 About SNMP

Simple Network Management Protocol is a protocol used for exchanging management information between network devices. SNMP is a member of TCP/IP protocol suite. Your Prestige supports SNMP agent functionality, which allows a manager station to manage and monitor the Prestige through the network. The Prestige supports SNMP version one (SNMPv1). The next figure illustrates an SNMP management operation. SNMP is only available if TCP/IP is configured.

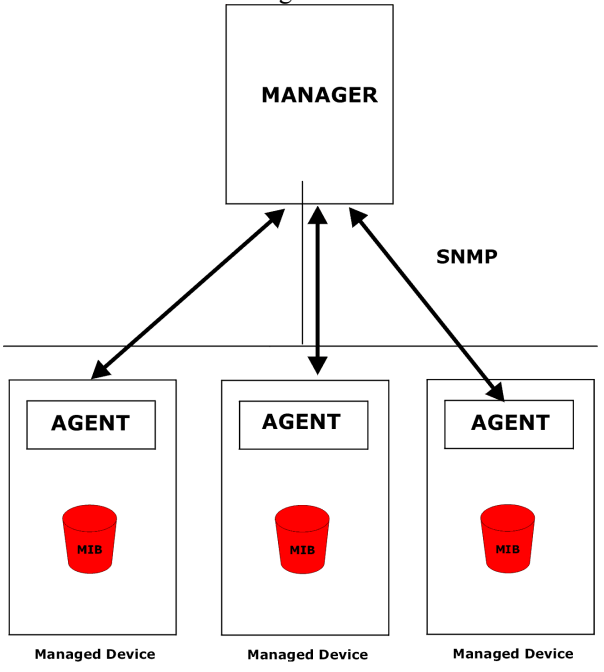


Figure 8-1 SNMP Management Model

An SNMP managed network consists of two main components: agents and a manager.

An agent is a management software module that resides in a managed device (the Prestige). An agent translates the local management information from the managed device into a form compatible with SNMP. The manager is the console through which network administrators perform network management functions. It executes applications that control and monitor managed devices.
The managed devices contain object variables/managed objects that define each piece of information to be collected about a device. Examples of variables include such as number of packets received, node port status etc. A Management Information Base (MIB) is a collection of managed objects. SNMP allows a manager and agents to communicate for the purpose of accessing these objects.
SNMP itself is a simple request/response protocol based on the manager/agent model. The manager issues a request and the agent returns responses using the following protocol operations:

- Get - Allows the manager to retrieve an object variable from the agent.
- GetNext - Allows the manager to retrieve the next object variable from a table or list within an agent. In SNMPv1, when a manager wants to retrieve all elements of a table from an agent, it initiates a Get operation, followed by a series of GetNext operations.
- Set - Allows the manager to set values for object variables within an agent.
- Trap - Used by the agent to inform the manager of some events.

8.2 Supported MIBs

The MI1951 supports MIB II that is defined in RFC-1213 and RFC-1215. The focus of the MIBs is to let administrators collect statistic data and monitor status and performance.

8.3 SNMP Configuration

To configure SNMP, enter 22 from the main menu to display **Menu 22 - SNMP Configuration** as shown next. The "community" for **Get**, **Set** and **Trap** fields is SNMP terminology for password.

```
                Menu 22 - SNMP Configuration

SNMP:
Get Community= public
Set Community= public
Trusted Host= 0.0.0.0
Trap:
Community= public
Destination= 0.0.0.0


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

Figure 8-2 Menu 22 — SNMP Configuration

The following table describes the SNMP configuration parameters.

Table 8-1 SNMP Configuration Menu Fields

FIELD	DESCRIPTION	EXAMPLE
Get Community	Type the **Get Community**, which is the password for the incoming Get- and GetNext requests from the management station.	**Public**
Set Community	Type the **Set** community, which is the password for incoming Set requests from the management station.	**Public**
Trusted Host	If you enter a trusted host, your Prestige will only respond to SNMP messages from this address. A blank (default) field means your Prestige will respond to all SNMP messages it receives, regardless of source.	**Blank**
Trap: Community	Type the trap community, which is the password sent with each trap to the SNMP manager.	**Public**
Trap: Destination	Type the IP address of the station to send your SNMP traps to.	**Blank**
When you have completed this menu, press [ENTER] at the prompt “Press [ENTER] to confirm or [ESC] to cancel” to save your configuration or press [ESC] to cancel and go back to the previous screen.		

8.4 SNMP Traps

The Prestige will send traps to the SNMP manager when any one of the following events occurs:

Table 8-2 SNMP Traps

TRAP #	TRAP NAME	DESCRIPTION
0	coldStart (defined in *RFC-1215*)	A trap is sent after booting (power on).
1	warmStart (defined in *RFC-1215*)	A trap is sent after booting (software reboot).
4	authenticationFailure (defined in *RFC-1215*)	A trap is sent to the manager when receiving any SNMP get or set requirements with wrong community (password).
6	whyReboot (defined in ZYXEL-MIB)	A trap is sent with the reason of restart before rebooting when the system is going to restart (warmstart).
6a	For intentional reboot :	A trap is sent with the message "System reboot by user!" if reboot is done intentionally, (e.g. download new files, CI command "sys reboot", etc.).
6b	For fatal error :	A trap is sent with the message of the fatal code if the system reboots because of fatal errors.

Chapter 9
System Information & Diagnosis

This chapter covers SMT menus 24.1 to 24 .4.

This chapter covers the diagnostic tools that help you to maintain your Prestige. These tools include updates on system status, port status, log and trace capabilities and upgrades for the system software.
Select menu 24 in the main menu to open **Menu 24 - System Maintenance**, as shown below.

```
                Menu 24 - System Maintenance

                    1.  System Status
                    2.  System Information and Console Port Speed
                    3.  Log and Trace
                    4.  Diagnostic
                    5.  Backup Configuration
                    6.  Restore Configuration
                    7.  Upload Firmware
                    8.  Command Interpreter Mode
                    9.  Call Control
                    10. Time and Date Setting
                    11. Remote Management Setup



                     Enter Menu Selection Number:
```

Figure 9-1 Menu 24 — System Maintenance

9.1 System Status

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

9.1.1 To get to the System Status:

- Enter 24 to display **Menu 24 - System Maintenance**.
- In this menu, enter number 1 to open **System Maintenance - Status**.
- There are three commands in **Menu 24.1 - System Maintenance - Status**. Entering 1 drops the WAN (PPTP/PPPoE) connection, 9 resets the counters and [ESC] takes you back to the previous screen.

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

```
                Menu 24.1 -- System Maintenance - Status
                                                                  1:39:06
                                                          Thus. Jan. 1. 1970
Port   Status          TxPkts     RxPkts       Cols    Tx B/s     Rx B/s     Up Time
WAN    Down                 1          0          0         0          0     0:00:00
LAN    Down                 0          0          0         0          0     0:00:00

Port:      Ethernet Address     IP Address                    IP Mask     DHCP
     WAN   00:a0:c5:21:8c:a3     0.0.0.0                       0.0.0.0    Client
     LAN   00:a0:c5:21:8c:a2    192.168.1.1              255.255.255.0    Server


   System up Time:    1:08:22

   Name: P310.www.zyxel.com
   Routing: IP
   ZyNOS F/W Version: V.251 : 2/17/2000

                                Press Command:

             COMMANDS: 1-Drop WAN 9-Reset Counters   ESC-Exit
```

Figure 9-2 Menu 24.1 — System Maintenance — Status

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

Table 9-1 System Maintenance — Status Menu Fields

FIELD	DESCRIPTION
Port	The WAN or LAN port.
Status	Shows the port speed and duplex setting if you're using **Ethernet Encapsulation** and **Down** (line is down), **idle** (line (ppp) idle), **dial** (starting to trigger a call) and **drop** (dropping a call) if you're using **PPPoE Encapsulation**.
TxPkts	The number of transmitted packets on this port.
RxPkts	The number of received packets on this port.
Cols	The number of collisions on this port.
Tx B/s	Shows the transmission speed in Bytes per second on this port.
Rx B/s	Shows the reception speed in Bytes per second on this port.
Up Time	Total amount of time the line has been up.
LAN	
Ethernet Address	The LAN port Ethernet address.

FIELD	DESCRIPTION
IP Address	The LAN port IP address.
IP Mask	The LAN port IP mask.
DHCP	The LAN port DHCP role.
WAN	
Ethernet Address	The WAN port Ethernet address.
IP Address	The WAN port IP address.
IP Mask	The WAN port IP mask.
DHCP	The WAN port DHCP role.
System up Time	The total time the Prestige has been on.
Name	This is the Prestige's system name + domain name assigned in menu 1. e.g., System Name= xxx; Domain Name= baboo.mickey.com. Name= xxx.baboo.mickey.com
ZyNOS F/W Version	The ZyNOS Firmware version and the date created.
You may enter 1 to drop the PPPoE/PPTP connection, 9 to reset the counters or [ESC] to return to menu 24.	

9.2 System Information and Console Port Speed

This section describes your system and allows you to choose different console port speeds. To get to the System Information and Console Port Speed:

Step 1. Enter 24 to go to **Menu 24 – System Maintenance**.

Step 2. Enter 2 to open **Menu 24.2 - System Information and Console Port Speed**.

Step 3. From this menu you have two choices as shown in the next figure:

```
Menu 24.2 - System Information and Console Port Speed

      1. System Information
      2. Console Port Speed



            Please enter selection:
```

Figure 9-3 Menu 24.2 — System Information and Console Port Speed

9.2.1 System Information

System Information gives you information about your system as shown below. More specifically, it gives you information on your routing protocol, country code, Ethernet address, IP address, etc.

```
                Menu 24.2.1 - System Maintenance - Information
                    Name: P310.www.zyxel.com
                    Routing: IP
                    ZyNOS F/W Version: V2.51 | 2/17/2000



                    LAN
                      Ethernet Address: 00:a0:c5:21:8c:a2
                      IP Address: 192.168.1.10
                      IP Mask: 255.255.255.0
                      DHCP: Server



                        Press ESC or RETURN to Exit
```

Figure 9-4 Menu 24.2.1 System Maintenance — Information

Table 9-2 Fields in System Maintenance

FIELD	DESCRIPTION
Name	This is the Prestige's system name + domain name assigned in menu 1. E.G., System Name= Prestige; Domain Name= zyxel.com Name= P310.zyxel.com
Routing	Refers to the routing protocol used.
ZyNOS F/W Version	Refers to the version of ZyXEL's Network Operating System software.
Ethernet Address	Refers to the Ethernet MAC (Media Access Control) address of your Prestige.
IP Address	This is the IP address of the Prestige in dotted decimal notation.
IP Mask	This shows the subnet mask of the Prestige.
DHCP	This field shows the DHCP setting of the Prestige.

9.2.2 Console Port Speed

You can change the speed of the console port through **Menu 24.2.2 — Console Port Speed**. Your Prestige supports 9600 (default), 19200, 38400, 57600, and 115200 bps for the console port. Use the [SPACE BAR] to select the desired speed in menu 24.2.2, as shown next.

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

Console Port Speed: 115200




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

Figure 9-5 Menu 24.2.2 — System Maintenance — Change Console Port Speed

9.3 Log and Trace

There are three logging facilities in the Prestige. The first is the error logs and trace records that are stored locally. The second is the UNIX syslog facility for message logging.

9.3.1 Viewing Error Log

The first place you should look for clues when something goes wrong is the error/trace log. Follow the procedure below to view the local error/trace log:

Step 1. Select option 24 from the main menu to open **Menu 24 - System Maintenance**.

Step 2. From menu 24, select option 3 display **Menu 24.3 - System Maintenance - Log and Trace**.

Step 3. Select the first option from **Menu 24.3 - System Maintenance - Log and Trace** to display the error log in the system.

After the Prestige finishes displaying, you will have the option to clear the error log.

```
Menu 24.3 - System Maintenance - Log and Trace

 1. View Error Log
 2. UNIX Syslog

 4. Call-Triggering Packet

          Please enter selection
```

Figure 9-6 Examples of Error and Information Messages

Examples of typical error and information messages are presented in the figure below.

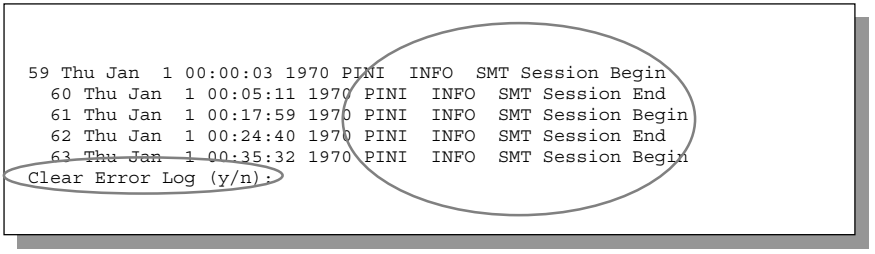


Figure 9-7 Examples of Error and Information Messages

9.3.2 UNIX Syslog

The Prestige uses the UNIX syslog facility to log the CDR (Call Detail Record) and system messages to a syslog server. Syslog and accounting can be configured in **Menu 24.3.2 - System Maintenance - Syslog and Accounting**, as shown next.

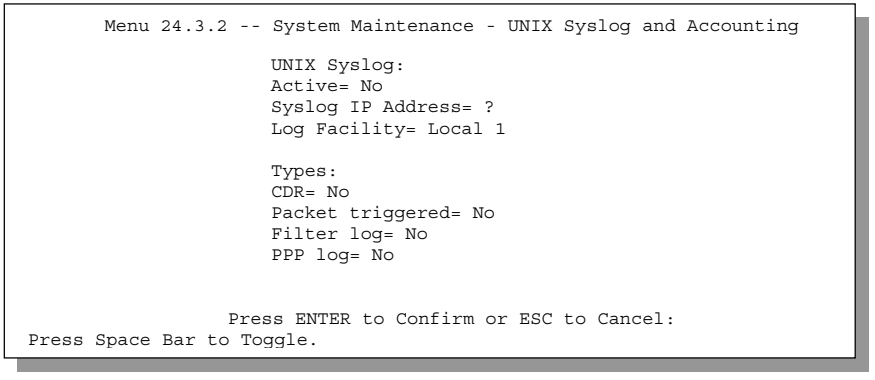


Figure 9-8 Menu 24.3.2 — System Maintenance — UNIX Syslog

You need to configure the UNIX syslog parameters described in the following table to activate syslog then choose what you want to log.

Table 9-3 System Maintenance Menu Syslog Parameters

PARAMETER	DESCRIPTION
UNIX Syslog:	
Active	Press the [SPACE BAR] to turn on or off syslog.
Syslog IP Address	Enter the IP Address of the server that will log the CDR (Call Detail Record) and system messages i.e., the syslog server.
Log Facility	Press the [SPACE BAR] to toggle between the 7 different Local options. The log facility allows you to log the message to different files in the server. Please refer to your UNIX manual for more detail.
Types:	
CDR	Call Detail Record (CDR) logs all data phone line activity if set to **Yes**.
Packet triggered	The first 48 bytes or octets and protocol type of the triggering packet is sent to the UNIX syslog server when this field is set to **Yes**.
Filter log	No filters are logged when this field is set to **No**. Filters with the individual filter Log Filter field set to **Yes** (menu 21.x.x).) are logged when this field is set to **Yes**.
PPP log	PPP events are logged when this field is set to **Yes**.
When finished viewing, press [ESC] or [ENTER] to exit.	

Your Prestige sends five types of syslog messages. Some examples (not P310 specific) of these syslog messages with their message formats are shown next:

1. CDR

CDR Message Format
SdcmdSyslogSend(SYSLOG_CDR, SYSLOG_INFO, String); String = board xx line xx channel xx, call xx, str board = the hardware board ID line = the WAN ID in a board Channel = channel ID within the WAN call = the call reference number which starts from 1 and increments by 1 for each new call str = C01 Outgoing Call dev xx ch xx (dev:device No. ch:channel No.) L02 Tunnel Connected(L2TP) C02 OutCall Connected xxxx (means connected speed) xxxxx (means Remote Call Number) L02 Call Terminated C02 Call Terminated Jul 19 11:19:27 192.168.102.2 ZyXEL: board 0 line 0 channel 0, call 1, C01 Outgoing Call dev=2 ch=0 40002 Jul 19 11:19:32 192.168.102.2 ZyXEL: board 0 line 0 channel 0, call 1, C02 OutCall Connected 64000 40002 Jul 19 11:20:06 192.168.102.2 ZyXEL: board 0 line 0 channel 0, call 1, C02 Call Terminated

2. Packet triggered

Packet triggered Message Format
sdcmdSyslogSend(SYSLOG_PKTTRI, SYSLOG_NOTICE, String); String = Packet trigger: Protocol=xx Data=xxxxxxxxxx…..x Protocol: (1:IP 2:IPX 3:IPXHC 4:BPDU 5:ATALK 6:IPNG) Data: We will send forty-eight Hex characters to the server Jul 19 11:28:39 192.168.102.2 ZyXEL: Packet Trigger: Protocol=1, Data=4500003c100100001f010004c0a86614ca849a7b08004a5c020001006162636465666768696a6b6c6d6e6f70 71727374 Jul 19 11:28:56 192.168.102.2 ZyXEL: Packet Trigger: Protocol=1, Data=4500002c1b0140001f06b50ec0a86614ca849a7b0427001700195b3e00000000600220008cd40000020405b 4 Jul 19 11:29:06 192.168.102.2 ZyXEL: Packet Trigger: Protocol=1, Data=45000028240140001f06ac12c0a86614ca849a7b0427001700195b451d1430135004000077600000

3. Filter log

Filter log Message Format
SdcmdSyslogSend(SYSLOG_FILLOG, SYSLOG_NOTICE, String); String = IP[Src=xx.xx.xx.xx Dst=xx.xx.xx.xx prot spo=xxxx dpo=xxxx] S04>R01mD IP[…] is the packet header and S04>R01mD means filter set 4 (S) and rule 1 (R), match (m) drop (D). Src: Source Address Dst: Destination Address prot: Protocol (“TCP”,”UDP”,”ICMP”) spo: Source port dpo: Destination port Mar 03 10:39:43 202.132.155.97 ZyXEL: GEN[ffffffffffnordff0080] }S05>R01mF Mar 03 10:41:29 202.132.155.97 ZyXEL: GEN[00a0c5f502fnord010080] }S05>R01mF Mar 03 10:41:34 202.132.155.97 ZyXEL: IP[Src=192.168.2.33 Dst=202.132.155.93 ICMP]}S04>R01mF Mar 03 11:59:20 202.132.155.97 ZyXEL: GEN[00a0c5f502fnord010080] }S05>R01mF Mar 03 12:00:31 202.132.155.97 ZyXEL: GEN[ffffffffffnordff0080] }S05>R01mF Mar 03 12:00:52 202.132.155.97 ZyXEL: GEN[ffffffffffff0080] }S05>R01mF Mar 03 12:00:57 202.132.155.97 ZyXEL: GEN[00a0c5f502010080] }S05>R01mF Mar 03 12:01:01 202.132.155.97 ZyXEL: IP[Src=192.168.2.33 Dst=202.132.155.93 TCP spo=01170 dpo=00021]}S04>R01mF Mar 03 12:01:06 202.132.155.97 ZyXEL: IP[Src=192.168.2.33 Dst=202.132.155.93 TCP spo=01170 dpo=00021]}S04>R01mF

4. PPP log

PPP Log Message Format
sdcmdSyslogSend(SYSLOG_PPPLOG, SYSLOG_NOTICE, String); String = ppp:Proto Starting / ppp:Proto Opening / ppp:Proto Closing / ppp:Proto Shutdown Proto = LCP / ATCP / BACP / BCP / CBCP / CCP / CHAP/ PAP / IPCP / IPXCP Jul 19 11:42:44 192.168.102.2 ZyXEL: ppp:LCP Closing Jul 19 11:42:49 192.168.102.2 ZyXEL: ppp:IPCP Closing Jul 19 11:42:54 192.168.102.2 ZyXEL: ppp:CCP Closing

9.3.3 Call-Triggering Packet

Call-Triggering Packet displays information about the packet that triggered a dial-out call in an easy readable format. Equivalent information is available in menu 24.1 in hex format. An example is shown next.

Note: This feature is available for PPTP/PPPoE Encapsulation only

```
IP Frame: ENET0-RECV Size:  44/  44   Time: 17:02:44.262
 Frame Type:

   IP Header:
     IP Version               = 4
     Header Length            = 20
     Type of Service          = 0x00 (0)
     Total Length             = 0x002C (44)
     Identification            = 0x0002 (2)
     Flags                    = 0x00
     Fragment Offset          = 0x00
     Time to Live             = 0xFE (254)
     Protocol                 = 0x06 (TCP)
     Header Checksum          = 0xFB20 (64288)
     Source IP                = 0xC0A80101 (192.168.1.1)
     Destination IP           = 0x00000000 (0.0.0.0)

   TCP Header:
     Source Port              = 0x0401 (1025)
     Destination Port         = 0x000D (13)
     Sequence Number          = 0x05B8D000 (95997952)
     Ack Number               = 0x00000000 (0)
     Header Length            = 24
     Flags                    = 0x02 (....S.)
     Window Size              = 0x2000 (8192)
     Checksum                 = 0xE06A (57450)
     Urgent Ptr               = 0x0000 (0)
     Options                  =
         0000: 02 04 02 00

   RAW DATA:
     0000: 45 00 00 2C 00 02 00 00-FE 06 FB 20 C0 A8 01 01  E.........  ....
     0010: 00 00 00 00 04 01 00 0D-05 B8 D0 00 00 00 00 00  ................
     0020: 60 02 20 00 E0 6A 00 00-02 04 02 00
Press any key to continue...
```

Figure 9-9 Call-Triggering Packet Example

9.4 Diagnostic

The diagnostic facility allows you to test the different aspects of your Prestige to determine if it is working properly. menu 24.4 allows you to choose among various types of diagnostic tests to evaluate your system, as shown next.

```
Menu 24.4 - System Maintenance - Diagnostic


  TCP/IP
  1.  Ping Host
  2.  WAN DHCP Release
  3.  WAN DHCP Renewal
  4.  Internet Setup Test


  System
  11. Reboot System




  Enter Menu Selection Number:


  Host IP Address= N/A
```

Figure 9-10 Menu 24.4 — System Maintenance — Diagnostic

Follow the procedure below to get to **Menu 24.4 - System Maintenance – Diagnostic.**

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

Step 2. From this menu, select option 4 (Diagnostic). This will open **Menu 24.4 - System Maintenance - Diagnostic**.

9.4.1 WAN DHCP

DHCP functionality can be enabled on the LAN or WAN as shown in *Figure 9-11*. The Prestige can act either as a WAN DHCP client (**IP Address Assignment** field in menu 4 or menu 11.3 is **Dynamic** and the **Encapsulation** field in menu 4 or menu 11 is **Ethernet**) or “none”, i.e., you have a static IP. The WAN Release and Renewal fields in menu 24.4 conveniently allow you to release and/or renew the assigned WAN IP address, subnet mask and default gateway in a fashion similar to winipcfg.

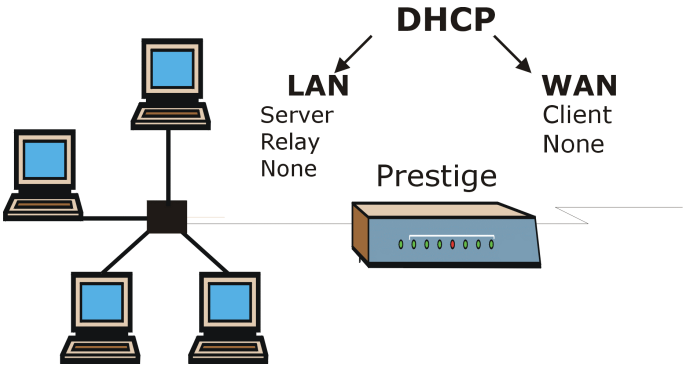


Figure 9-11 WAN & LAN DHCP

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

Table 9-4 System Maintenance Menu Diagnostic

NUMBER	FIELD	DESCRIPTION
1	Ping Host	Enter 1 to ping any machine (with an IP address) on your LAN or WAN. Enter its IP address in the **Host IP Addres** field mentioned in the last row of this table.
2	WAN DHCP Release	Enter 2 to release your WAN DHCP settings.
3	WAN DHCP Renewal	Enter 3 to renew your WAN DHCP settings. The renewal timeout is 32 seconds.
4	Internet Setup Test	Enter 4 to test the Internet Setup. You can also test the Internet Setup in menu 4 - Internet Access. Please refer to the chapter- *Internet Access* for more details.
11	Reboot System	Enter 11 to reboot the Prestige.
	Host IP Address	If you entered 1 above, then enter the IP address of the machine you want to ping in this field.

Chapter 10
Firmware and Configuration 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.

10.1 Filename Conventions

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

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

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

```
ftp> get rom-0 config.cfg
```
This is a sample ftp session saving the current configuration to the computer file config.cfg.

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

The following table is a summary. Please note that the internal filename refers to the filename on the Prestige and the external filename refers to the filename not on the Prestige, that is, on your computer, local network or ftp site and so the name (but not the extension) will vary. After uploading new firmware see the **ZyNOS F/W Version** field in **Menu 24.2.1 - System Maintenance - Information** to confirm that you have uploaded the correct firmware version. The AT command is the command you enter after you press “y” when prompted in the SMT menu to go into debug mode.

Table 10-1 Filename Conventions

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

10.2 Backup Configuration

The Prestige displays different messages explaining different ways to backup, restore and upload files in menus 24.5, 24.6, 24. 7.1 and 24.7.2 when you use the serial/console port and when you telnet in.

Option 5 from **Menu 24 - System Maintenance** allows you to backup the current Prestige configuration to your computer. Backup is highly recommended once your Prestige is functioning properly. FTP and TFTP are the preferred methods for backing up your current configuration to your computer since FTP and TFTP are faster. You can also perform backup and restore using menu 24 through the console port. 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 (see *section 10.1*).

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.

10.2.1 Backup Configuration

Follow the instructions as shown in the next screen.

```
              Menu 24.5 - System Maintenance - Backup Configuration

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

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

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


                                Press ENTER to Exit:
```

Figure 10-1 Telnet in Menu 24.5

10.2.2 Using the FTP Command from the DOS Prompt

Step 1. Launch the FTP client on your computer.

Step 2. Enter “open”, followed by a space and the IP address of your Prestige.

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

Step 4. Enter your password as requested (the default is “1234”).

Step 5. Enter “bin” to set transfer mode to binary.

Step 6. Use “get” to transfer files from the Prestige to the computer, for example, “get rom-0 config.rom” transfers the configuration file on the Prestige to your computer and renames it “config.rom”. See earlier in this chapter for more information on filename conventions.

Step 7. Enter “quit” to exit the ftp prompt.

Example of FTP Commands from the DOS Prompt

```
331 Enter PASS command
Password:
230 Logged in
ftp> bin
200 Type I OK
ftp> get rom-0 zyxel.rom
200 Port command okay
150 Opening data connection for STOR ras
226 File received OK
ftp: 16384 bytes sent in 1.10Seconds 297.89Kbytes/sec.
ftp> quit
```

Figure 10-2 FTP Session Example

Third Party FTP Clients

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

Table 10-2 General Commands for Third Party FTP Clients

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

TFTP and FTP over WAN Will Not Work When

- Telnet service is disabled in menu 24.11.
- A filter in menu 3.1 (LAN) or in menu 11.5 (WAN) is applied to block Telnet service.
- The IP address in the **Secured Client IP** field (menu 24.11) does not match the client IP address. If it does not match, the Prestige will disconnect the Telnet session immediately.

- There is a SMT console session running.

10.2.3 Backup Configuration Using TFTP

The Prestige supports the up/downloading of the firmware and the configuration file using TFTP (Trivial File Transfer Protocol) over LAN. Although TFTP should work over WAN as well, it is not recommended.
To use TFTP, your computer must have both telnet and TFTP clients. To backup the configuration file, follow the procedure shown next.

Step 1. Use telnet from your computer to connect to the Prestige and log in. Because TFTP does not have any security checks, the Prestige records the IP address of the telnet client and accepts TFTP requests only from this address.

Step 2. Put the SMT in command interpreter (CI) mode by entering 8 in **Menu 24 – System Maintenance**.

Step 3. Enter command "sys stdio 0" to disable the SMT timeout, so the TFTP transfer will not be interrupted. Enter command "sys stdio 5" to restore the five-minute SMT timeout (default) when the file transfer is complete.

Step 4. Launch the TFTP client on your computer and connect to the Prestige. Set the transfer mode to binary before starting data transfer.

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

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

10.2.4 TFTP Command Example

The following is an example tftp command:

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

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

Third Party TFTP Clients

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

Table 10-3 General Commands for Third Party TFTP Clients

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

Refer to the *TFTP and FTP over WAN Will Not Work When* section to read about configurations that disallow TFTP and FTP to work over WAN.

10.2.5 Backup Via Console Port

Backup configuration via console port by following the HyperTerminal procedure shown next. Procedures using other serial communications programs should be similar.

Step 1. Display menu 24.5 and enter "y" at the following screen.

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

Figure 10-3 System Maintenance — Backup Configuration

Step 2. The following screen indicates that the Xmodem download has started.

```
You can enter ctrl-x to terminate operation any time.
Starting XMODEM download...
```

Figure 10-4 System Maintenance — Starting Xmodem Download Screen

Step 3. Run the HyperTerminal program by clicking **Transfer**, then **Receive File** as shown in the following screen.

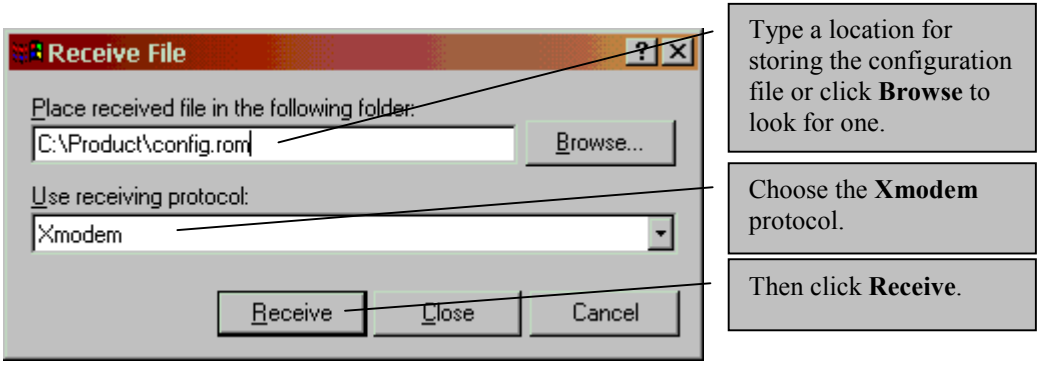


Figure 10-5 Backup Configuration Example

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

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

Figure 10-6 Successful Backup Confirmation Screen

10.3 Restore Configuration

This section shows you how to restore a previously saved configuration. Note that this function erases the current configuration before restoring a previous back up configuration; please do not attempt to restore unless you have a backup configuration file stored on disk.

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 you must restart the system after the file transfer is complete.

WARNING!
DO NOT INTERUPT THE FILE TRANSFER PROCESS AS THIS MAY PERMANENTLY DAMAGE YOUR PRESTIGE. WHEN THE RESTORE CONFIGURATION PROCESS IS COMPLETE, THE PRESTIGE WILL AUTOMATICALLY RESTART.

10.3.1 Restore Using FTP or TFTP

For details about backup using (T)FTP please refer to earlier sections on FTP and TFTP file upload in this chapter.

```
              Menu 24.6 -- System Maintenance - Restore Configuration

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

1. Launch the FTP client on your workstation.
2. Type "open" and the IP address of your router. Then type "root" and
   SMT password as requested.
3. Type "put backupfilename rom-0" where backupfilename is the name of
   your backup configuration file on your workstation and rom-spt is the
   remote file name on the router. This restores the configuration to
   your router.
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 backup using TFTP (note that you must remain
in this menu to back up using TFTP), please see your router manual.


                                Press ENTER to Exit:
```

Figure 10-7 Telnet into Menu 24.6

Step 1. Launch the FTP client on your computer.

Step 2. Enter “open”, followed by a space and the IP address of your Prestige.

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

Step 4. Enter your password as requested (the default is “1234”).

Step 5. Enter “bin” to set transfer mode to binary.

Step 6. Find the “rom” file (on your computer) that you want to restore to your Prestige.

Step 7. Use “put” to transfer files from the Prestige to the computer, for example, “put config.rom rom-0” transfers the configuration file on the Prestige to your computer and renames it “config.rom”. See earlier in this chapter for more information on filename conventions.

Step 8. Enter “quit” to exit the ftp prompt. The Prestige will automatically restart after a successful restore process.

Restore Using FTP or TFTP Session Example

```
ftp> put config.rom rom-0
200 Port command okay
150 Opening data connection for STOR rom-0
226 File received OK
221 Goodbye for writing flash
ftp: 16384 bytes sent in 0.06Seconds 273.07Kbytes/sec.
ftp>quit
```

Figure 10-8 Restore Using FTP or TFTP Session Example

Refer to the *TFTP and FTP over WAN Will Not Work When* section to read about configurations that disallow TFTP and FTP to work over WAN.

10.3.2 Restore Via Console Port

Restore configuration via console port by following the HyperTerminal procedure shown next. Procedures using other serial communications programs should be similar.

Step 1. Display menu 24.6 and enter "y" at the following screen.

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

Figure 10-9 System Maintenance — Restore Configuration

Step 2. The following screen indicates that the Xmodem download has started.

```
Starting XMODEM download (CRC mode) ...
CCCCCCCCC
```

Figure 10-10 System Maintenance — Starting Xmodem Download Screen

Step 3. Run the HyperTerminal program by clicking **Transfer**, then **Receive File** as shown in the following screen.

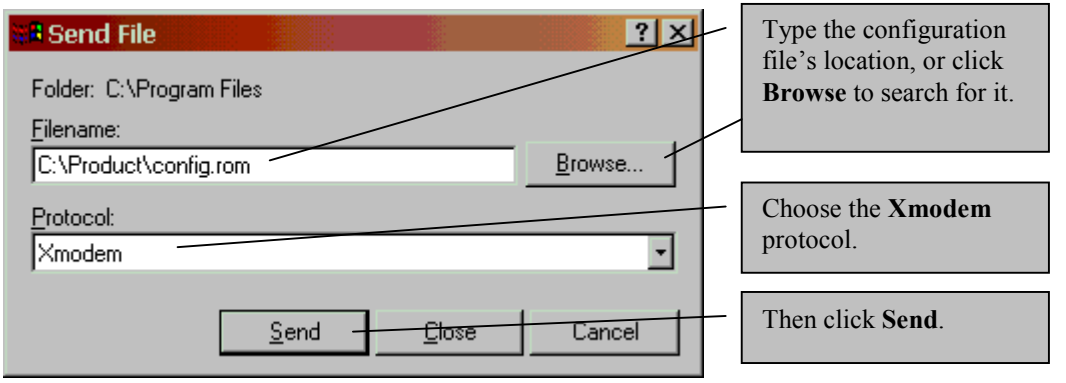


Figure 10-11 Restore Configuration Example

Step 4. After a successful restoration you will see the following screen. Press any key to restart the Prestige and return to the SMT menu.

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

Figure 10-12 Successful Restoration Confirmation Screen

10.4 Uploading Firmware and Configuration Files

This section shows you how to upload firmware and configuration files. You can upload configuration files by following the procedure in the previous *Restore Configuration* section or by following the instructions in **Menu 24.7.2 - System Maintenance - Upload Router Configuration File** (for console port).

WARNING!
DO NOT INTERUPT THE FILE TRANSFER PROCESS AS THIS MAY PERMANENTLY DAMAGE YOUR PRESTIGE.

10.4.1 Firmware File Upload

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

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

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

     To upload the system firmware, follow the procedure below:

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


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


                                Press ENTER to Exit:
```

Figure 10-13 Telnet Into Menu 24.7.1 — Upload System Firmware

10.4.2 Configuration File Upload

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

```
          Menu 24.7.2 - System Maintenance - Upload System Configuration File

   To upload the system configuration file, follow the procedure below:

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

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

                                  Press ENTER to Exit:
```

Figure 10-14 Telnet Into Menu 24.7.2 — System Maintenance

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

FTP File Upload Command from the DOS Prompt Example

Step 1. Launch the FTP client on your computer.

Step 2. Enter "open", followed by a space and the IP address of your Prestige.

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

Step 4. Enter your password as requested (the default is "1234").

Step 5. Enter "bin" to set transfer mode to binary.

Step 6. Use "put" to transfer files from the computer to the Prestige, for example, put firmware.bin ras transfers the firmware on your computer (firmware.bin) to the Prestige and renames it "ras". Similarly put config.rom rom-0 transfers the configuration file on your computer (config.rom) to the Prestige and renames it "rom-0". Likewise get rom-0 config.rom transfers the configuration file on the Prestige to your computer and renames it "config.rom." See earlier in this chapter for more information on filename conventions.

Step 7. Enter "quit" to exit the ftp prompt.

FTP Session Example of Firmware File Upload

```
331 Enter PASS command
Password:
230 Logged in
ftp> bin
200 Type I OK
ftp> put firmware.bin ras
200 Port command okay
150 Opening data connection for STOR ras
226 File received OK
ftp: 1103936 bytes sent in 1.10Seconds 297.89Kbytes/sec.
ftp> quit
```

Figure 10-15 FTP Session Example of Firmware File Upload

More commands (found in third party FTP clients), are listed earlier in this chapter.

Refer to the *TFTP and FTP over WAN Will Not Work When* section to read about configurations that disallow TFTP and FTP to work over WAN.

10.4.3 TFTP File Upload

The Prestige also supports the uploading of firmware files using TFTP (Trivial File Transfer Protocol) over LAN. Although TFTP should work over WAN as well, it is not recommended.
To use TFTP, your computer must have both telnet and TFTP clients. To transfer the firmware and the configuration file, follow the procedure shown next.

Step 1. Use telnet from your computer to connect to the Prestige and log in. Because TFTP does not have any security checks, the Prestige records the IP address of the telnet client and accepts TFTP requests only from this address.

Step 2. Put the SMT in command interpreter (CI) mode by entering 8 in **Menu 24 – System Maintenance**.

Step 3. Enter the command "sys stdio 0" to disable the console timeout, so the TFTP transfer will not be interrupted. Enter "command sys stdio 5" to restore the five-minute console 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".

Note that the telnet connection must be active and the Prestige 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.

TFTP Upload Command Example

The following is an example tftp command:

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

where "i" specifies binary image transfer mode (use this mode when transferring binary files), "host" is the Prestige's IP address, "put" transfers the file source on the computer (firmware.bin – name of the firmware on the computer) to the file destination on the remote host (ras - name of the firmware on the Prestige). Commands that you may see in third party TFTP clients are listed earlier in this chapter.

10.4.4 Uploading Via Console Port

FTP or TFTP are the preferred methods for uploading firmware to your Prestige. However in the event of your network being down, uploading files is only possible with a direct connection to your Prestige via the console port. Uploading files via the console port under normal conditions is not recommended since FTP or TFTP is faster. Any serial communications program should work fine; however, you must use the Xmodem protocol to perform the download/upload.

Uploading a Firmware File Via Console Port

Step 1. Select 1 from **Menu 24.7 – System Maintenance – Upload Firmware** to display **Menu 24.7.1 - System Maintenance - Upload Router Firmware**, then follow the instructions as shown in the following screen.

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


          To upload router firmware:

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

          Warning: Proceeding with the upload will erase the current router
          firmware.
                           Do You Wish To Proceed:(Y/N)
```

Figure 10-16 Menu 24.7.1 as seen using the Console Port

Step 2. After the "Starting Xmodem upload" message appears, activate the Xmodem protocol on your computer. Follow the procedure as shown previously for the HyperTerminal program. The procedure for other serial communications programs should be similar.

Example Xmodem Firmware Upload Using HyperTerminal

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

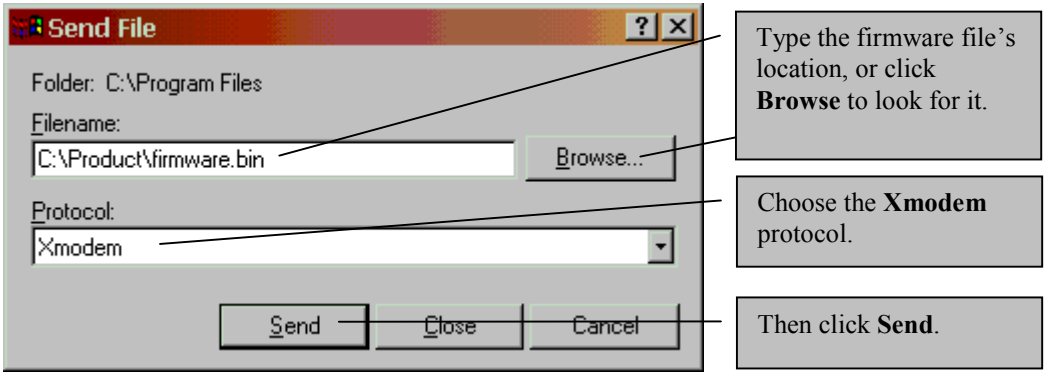


Figure 10-17 Example Xmodem Upload

After the firmware upload process has completed, the Prestige will automatically restart.

Uploading a Configuration File Via Console Port

Step 1. Select 2 from **Menu 24.7 – System Maintenance – Upload Firmware** to display **Menu 24.7.2 - System Maintenance - Upload Router Configuration File**. Follow the instructions as shown in the next screen.

```
Menu 24.7.2 - System Maintenance - Upload Router Configuration File


To upload router configuration file:

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

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

Figure 10-18 Menu 24.7.2 as seen using the Console Port

Step 2. After the "Starting Xmodem upload" message appears, activate the Xmodem protocol on your computer. Follow the procedure as shown previously for the HyperTerminal program. The procedure for other serial communications programs should be similar.

Step 3. Enter “atgo” to restart the Prestige.

Example Xmodem Configuration Upload Using HyperTerminal

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

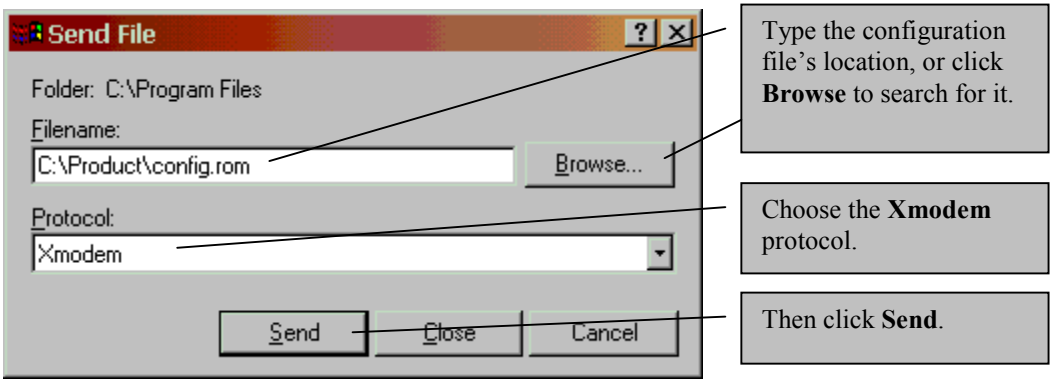


Figure 10-19 Example Xmodem Upload

After the configuration upload process has completed, restart the Prestige by entering "atgo".

Chapter 11
System Maintenance & Information

This chapter leads you through SMT menus 24.8 to 24.11.

11.1 Command Interpreter Mode

The Command Interpreter (CI) is a part of the main router firmware. The CI provides much of the same functionality as the SMT, while adding some low-level setup and diagnostic functions. The CI can be entered from the SMT by selecting menu 24.8. Access can be either by Telnet or by a serial connection to the console port, although some commands are only available with a serial connection. See the support CD or the zyxel.com web site for more detailed information on CI commands. Enter 8 from **Menu 24 - System Maintenance**. A list of valid commands can be found by typing `help` or `?` at the command prompt. Type "exit" to return to the SMT main menu when finished.

```
                    Menu 24 - System Maintenance

                        1.  System Status
                        2.  System Information and Console Port Speed
                        3.  Log and Trace
                        4.  Diagnostic
                        5.  Backup Configuration
                        6.  Restore Configuration
                        7.  Firmware Update
                        8.  Command Interpreter Mode
                        9.  Call Control
                        10. Time and Date Setting
                        11. Remote Management Setup



                         Enter Menu Selection Number:
```

Figure 11-1 Command Mode in Menu 24

```
Copyright (c) 1994 - 2001 ZyXEL Communications Corp.
ras> ?
Valid commands are:
sys             exit            device          ether
poe             config          ip              ppp
hdap
ras>
```

Figure 11-2 Valid Commands

11.2 Call Control Support

The Prestige provides two call control functions: budget management and call history. Please note that this menu is only applicable when **Encapsulation** is set to **PPPoE** or **PPTP** in menu 4 or menu 11.1.
The budget management function allows you to set a limit on the total outgoing call time of the Prestige within certain times. When the total outgoing call time exceeds the limit, the current call will be dropped and any future outgoing calls will be blocked.
Call history chronicles preceding incoming and outgoing calls.

To access the call control menu, select option 9 in menu 24 to go to **Menu 24.9 - System Maintenance - Call Control**, as shown in the next table.

```
Menu 24.9 - System Maintenance - Call Control


    1.  Budget Management
    2.  Call History


          Enter Menu Selection Number:
```

Figure 11-3 Call Control

11.2.1 Budget Management

Menu 24.9.1 shows the budget management statistics for outgoing calls. Enter 1 from **Menu 24.9 - System Maintenance - Call Control** to bring up the following menu.

```
                Menu 24.9.1 - Budget Management

  Remote Node          Connection Time/Total Budget    Elapsed Time/Total Period
1. ChangeMe                     No Budget                       No Budget









                Reset Node (0 to update screen):
```

Figure 11-4 Budget Management

The total budget is the time limit on the accumulated time for outgoing calls to a remote node. When this limit is reached, the call will be dropped and further outgoing calls to that remote node will be blocked. After each period, the total budget is reset. The default for the total budget is 0 minutes and the period is 0 hours, meaning no budget control. You can reset the accumulated connection time in this menu by entering the index of a remote node. Enter 0 to update the screen. The budget and the reset period can be configured in menu 11.1 for the remote node.

Table 11-1 Budget Management

FIELD	DESCRIPTION	EXAMPLE
Remote Node	Enter the index number of the remote node you want to reset (just one in this case)	1
Connection Time/Total Budget	This is the total connection time that has gone by (within the allocated budget that you set in menu 11.1.	5/10 means that 5 minutes out of a total allocation of 10 minutes have lapsed.
Elapsed Time/Total Period	The period is the time cycle in hours that the allocation budget is reset (see menu 11.1.) The elapsed time is the time used up within this period.	0.5/1 means that 30 minutes out of the 1 hour time period has lapsed.
Enter “0” to update the screen or press [ESC] to return to the previous screen.		

11.2.2 Call History

This is the second option in **Menu 24.9 - System Maintenance - Call Control**. It displays information about past incoming and outgoing calls. Enter 2 from **Menu 24.9 - System Maintenance - Call Control** to bring up the following menu.

```
                        Menu 24.9.2 - Call History

Phone Number     Dir      Rate        #call        Max         Min         Total
   1.
   2.
   3.
   4.
   5.
   6.
   7.
   8.
   9.
  10.
                        Enter Entry to Delete(0 to exit):
```

Figure 11-5 Call History

Table 11-2 Call History Fields

FIELD	DESCRIPTION
Phone Number	The PPPoE service names are shown here.
Dir	This shows whether the call was incoming or outgoing.
Rate	This is the transfer rate of the call.
#call	This is the number of calls made to or received from that telephone number.
Max	This is the length of time of the longest telephone call.
Min	This is the length of time of the shortest telephone call.
Total	This is the total length of time of all the telephone calls to/from that telephone number.
You may enter an entry number to delete it or ‘”0” to exit.	

11.3 Time and Date Setting

There is no Real Time Chip (RTC) in the Prestige, so there is a software mechanism to set the time manually or get the current time and date from an external server when you turn on your Prestige. Menu 24.10 allows you to update the time and date settings of your Prestige. The real time is then displayed in the Prestige error logs and firewall logs. If you do not choose a time service protocol that your timeserver will send when you turn on the Prestige, then you can enter the time manually but each time the system is booted, the time and date will be reset to 2000/01/01 00:00:00.

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

```
                Menu 24 - System Maintenance

                1.  System Status
                2.  System Information and Console Port Speed
                3.  Log and Trace
                4.  Diagnostic
                5.  Backup Configuration
                6.  Restore Configuration
                7.  Upload Firmware
                8.  Command Interpreter Mode
                9.  Call Control
                10. Time and Date Setting
                11. Remote Management Setup

                Enter Menu Selection Number:
```

Figure 11-6 Menu 24 — System Maintenance

Then enter 10 to go to **Menu 24.10 - System Maintenance - Time and Date Setting** to update the time and date settings of your Prestige as shown in the following screen.

```
          Menu 24.10 - System Maintenance - Time and Date Setting


        Use Time Server when Bootup= None
        Time Server IP Address= N/A

        Current Time:                       00 : 00 : 00
        New Time (hh:mm:ss):                11 : 23 : 16

        Current Date:                       2000 - 01 - 01
        New Date (yyyy-mm-dd):              2001 - 03 - 01

        Time Zone= GMT

        Daylight Saving= No
        Start Date (mm-dd):                       01 - 01
        End Date (mm_dd):                         01 - 01

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

Figure 11-7 Menu 24.10 System Maintenance — Time and Date Setting

Table 11-3 Time and Date Setting Fields

FIELD	DESCRIPTION
Use Time Server when Bootup	Enter the time service protocol that your time server sends when you turn on the Prestige. Not all time servers support all protocols, so you may have to check with your ISP/network administrator or use trial and error to find a protocol that works. The main differences between them are the format. **Daytime (RFC 867)** format is day/month/year/time zone of the server. **Time (RFC-868)** format displays a 4-byte integer giving the total number of seconds since 1970/1/1 at 0:0:0. **NTP (RFC-1305)** is similar to **Time (RFC-868)**. **None** is the default value. Enter the time manually. Each time you turn on the Prestige, the time and date will be reset to 2000-1-1 0:0:0.
Time Server IP Address	Enter the IP address or domain name (DNS) of your time server. Check with your ISP/network administrator if you are unsure of this information.
Current Time	This field displays an updated time only when you reenter this menu.
New Time	Enter the new time in hour, minute and second format.
Current Date	This field displays an updated date only when you reenter this menu.
New Date	Enter the new date in year, month and day format.
Time Zone	Press [SPACE BAR] to set the time difference between your time zone and Greenwich Mean Time (GMT).
Daylight Saving	If you use daylight savings time, then choose **Yes**.
Start Date	If using daylight savings time, enter the month and day that it starts on.
End Date	If using daylight savings time, enter the month and day that it ends on
Once you have filled in this menu, press [ENTER] at the message “Press ENTER to Confirm or ESC to Cancel“ to save your configuration, or press [ESC] to cancel.	

How often does the Prestige update the time?

The Prestige updates the time in three instances:

i. On leaving menu 24.10 after making changes.
ii. When the Prestige boots up and there is a time server configured in menu 24.10.
iii. 24-hour intervals after booting.

11.4 Remote Management Setup

Remote management setup is for managing Telnet, Web and FTP services. You can customize the service port, access interface, and the secured client IP address to enhance security and flexibility.
You may manage your Prestige from a remote location, via the Internet (**WAN only**), via the **LAN only**, **Both** (LAN & WAN) or neither (**Disable**).

If you enable remote management of a service, but have applied a filter to block the service, then you will not be able to remotely manage the service.

To disable remote management of a service, select **Disable** in the corresponding **Server Access** field.
Enter 11 from menu 24 to bring up **Menu 24.11 – Remote Management Control**.

If you just wish to block certain users from using these services, then use filtering – please see *menu 21.1*.

```
                Menu 24.11 - Remote Management Control

TELNET Server:
  Server Port = 23              Server Access = WAN only
  Secured Client IP = 0.0.0.0

FTP Server:
  Server Port = 21              Server Access = LAN only
  Secured Client IP = 0.0.0.0

Web Server:
  Server Port = 80              Server Access = LAN only
  Secured Client IP = 0.0.0.0
```

Figure 11-8 Menu 24.11 – Remote Management Control

Table 11-4 Menu 24.11 – Remote Management Control

FIELD	DESCRIPTION	EXAMPLE
Servers	These read-only labels denote the kind of server (Telnet, FTP, Web) that you may remotely manage via LAN, WAN, both or neither.	
Server Port	Many residential broadband ISP accounts do not allow you to run any server processes (such as a Web or FTP server) from your location. If you wish to run such a server from your location, you will have to change the default service port number. Type in the new service port number here corresponding to the new port number you configured on the server.	23

FIELD	DESCRIPTION	EXAMPLE
Server Access	Select the access interface (if any) by pressing the [SPACE BAR], then [ENTER} to choose from: **LAN only**, **WAN only**, **ALL** or **Disable**.	**LAN only**
Secured Client IP	The default value for **Secured Client IP** is 0.0.0.0, which means you don't care which host is trying to use a service (Telnet, FTP, Web). If you enter an IP address in this field, the Prestige will check if the client IP address matches the value here when a (Telnet, FTP, Web) session is up. If it does not match, the Prestige will disconnect the session immediately. If the **Server Access** field is **Disable**, then this field is **N/A**.	0.0.0.0
Once you have filled in this menu, press [ENTER] at the message "Press ENTER to Confirm or ESC to Cancel" to save your configuration, or press [ESC] to cancel.		

11.5 Boot Commands

The BootModule AT commands execute from within the router's bootup software, when debug mode is selected before the main router firmware (ZyNOS) is started. When you start up your Prestige, you are given a choice to go into debug mode by pressing a key at the prompt shown in the following screen. In debug mode you have access to a series of boot module commands, for example ATUR (for uploading firmware) and ATLC (for uploading the configuration file). These are already discussed in the *Transferring Files* chapter.

```
Bootbase Version: V2.02 | 10/11/2000 13:58:03
RAM: Size = 8192 Kbytes
DRAM Post: Testing:  8192K OK
FLASH: Intel 16M

ZyNOS Version: V324\wa0b05 | 3/5/2001 18:00:34

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

Figure 11-9 Option to Enter Debug Mode

Enter ATHE to view all available Prestige boot module commands as shown in the next screen. ATBAx allows you to change the console port speed. The x denotes the number preceding the colon to give the console port speed following the colon in the list of numbers that follows; e.g., ATBA3 will give a console port speed of 9.6 Kbps. ATSE displays the seed that is used to generate a password to turn on the debug flag in the firmware. The ATSH command shows product related information such as boot module version,

vendor name, product model, RAS code revision, etc. ATGO allows you to continue booting the system. Most other commands aid in advanced troubleshooting and should only be used by qualified engineers.

```
                    ======= Debug Command Listing =======
AT              just answer OK
ATHE            print help
ATBAx           change baudrate. 1:38.4k, 2:19.2k, 3:9.6k 4:57.6k 5:115.2k
ATENx,(y)       set BootExtension Debug Flag (y=password)
ATSE            show the seed of password generator
ATTI(h,m,s)     change system time to hour:min:sec or show current time
ATDA(y,m,d)     change system date to year/month/day or show current date
ATDS            dump RAS stack
ATDT            dump Boot Module Common Area
ATDUx,y         dump memory contents from address x for length y
ATWBx,y         write address x with  8-bit value y
ATWWx,y         write address x with 16-bit value y
ATWLx,y         write address x with 32-bit value y
ATRBx           display the  8-bit value of address x
ATRWx           display the 16-bit value of address x
ATRLx           display the 32-bit value of address x
ATGO(x)         run program at addr x or boot router
ATGR            boot router
ATGT            run Hardware Test Program
AT%Tx           Enable Hardware Test Program at boot up
ATBTx           block0 write enable (1=enable, other=disable)
ATRTw,x,y(,z)  RAM test level w, from address x to y (z iterations)
ATWEa(,b,c,d)  write MAC addr, Country code, EngDbgFlag, FeatureBit to flash ROM
ATCUx           write Country code to flash ROM
ATCB            copy from FLASH ROM to working buffer
ATCL            clear working buffer
ATSB            save working buffer to FLASH ROM
ATBU            dump manufacturer related data in working buffer
ATSH            dump manufacturer related data in ROM
ATWMx           set MAC address in working buffer
ATCOx           set country code in working buffer
ATFLx           set EngDebugFlag in working buffer
ATSTx           set ROMRAS address in working buffer
ATSYx           set system type in working buffer
ATVDx           set vendor name in working buffer
ATPNx           set product name in working buffer
ATFEx,y,...     set feature bits in working buffer
ATMP            check & dump memMapTab
ATDOx,y         download from address x for length y to PC via XMODEM
ATTD            download router configuration to PC via XMODEM
ATUPx,y         upload to RAM address x for length y from PC via XMODEM
ATUR            upload router firmware to flash ROM
ATLC            upload router configuration file to flash ROM
ATUXx(,y)       xmodem upload from flash block x to y
ATERx,y         erase flash rom from block x to y
ATWFx,y,z       copy data from addr x to flash addr y, length z
ATXSx           xmodem select: x=0: CRC mode(default); x=1: checksum mode
ATLOa,b,c,d     Int/Trap Log Cmd
```

Figure 11-10 Boot Module Commands

Chapter 12
Telnet Configuration and Capabilities

This chapter covers the Telnet configuration and capabilities of the prestige.

12.1 About Telnet Configuration

Before the Prestige is properly setup for TCP/IP, the only option for configuring it is through the console port. Once your Prestige is configured, you can use telnet to configure it remotely as shown below.

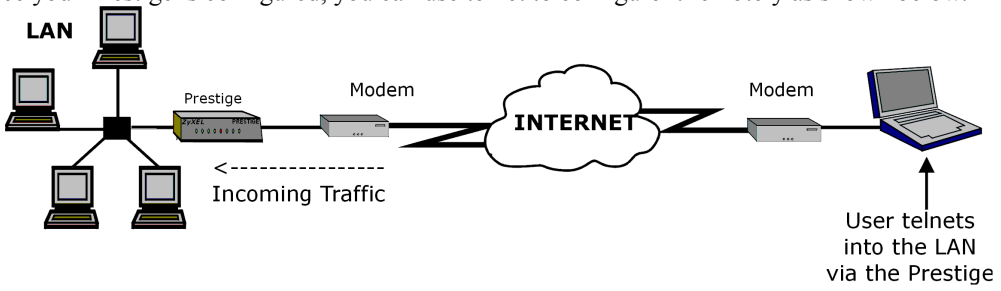


Figure 12-1 Telnet Configuration on a TCP/IP Network

When IP routing is disabled, the Prestige can still function as a host.

12.2 Telnet Under NAT

When NAT is enabled and an inside server is specified, telnet connections from the outside will be forwarded to the inside server. So to configure the Prestige via telnet from the outside, you must first telnet to the inside server, and then telnet from the server to the Prestige using its inside LAN IP address. If no insider server is specified, telnet to the NAT's IP address will connect to the Prestige directly.

12.3 Telnet Capabilities

12.3.1 Single Administrator

To prevent confusion and discrepancy on the configuration, your Prestige only allows one administrator to log in at any time. Your Prestige also gives priority to the console port over telnet. If you have already connected to your Prestige via telnet, you will be logged out if another user logs in to the Prestige via the console port.

12.3.2 System Timeout

There is a system timeout of five minutes (300 seconds) for either the console port or telnet. Your Prestige will automatically log you out if you do nothing in this timeout period, except when it is continuously updating the status in menu 24.1.

Chapter 13
Call Scheduling

This chapter shows you how to setup call time periods for remote nodes.

13.1 Introduction

The call scheduling feature allows the Prestige to manage a remote node and dictate when a remote node should be called and for how long. This feature is similar to the scheduler in a video cassette recorder (you can record programs at times that you specify). You can apply up to four schedule sets in **Menu 11.1 - Remote Node Profile**.

13.2 Schedule Setup

From the main menu, enter 26 to access **Menu 26 - Schedule Setup** as shown next.

```
                        Menu 26 - Schedule Setup

Schedule                                Schedule
Set #         Name                      Set #         Name
------     ------------------           ------     ------------------
  1        _________________              7        _________________
  2        _________________              8        _________________
  3        _________________              9        _________________
  4        _________________             10        _________________
  5        _________________             11        _________________
  6        _________________             12        _________________

               Enter Schedule Set Number to Configure=

               Edit Name=

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

Figure 13-1 Schedule Setup

Lower numbered sets take precedence over higher numbered sets thereby avoiding scheduling conflicts. For example, if sets 1, 2 ,3 and 4 in are applied in the remote node then set 1 will take precedence over set 2, 3 and 4 as the Prestige, by default, applies the lowest numbered set first. Set 2 will take precedence over set 3 and 4, and so on.

You can design up to 12 schedule sets but you can only apply up to four schedule sets for a remote node.

To delete a schedule set, enter the set number and press the [SPACE BAR] in the Edit Name **field.**

13.3 Schedule Set Setup

To setup a schedule set, select the schedule set you want to setup from menu 26 (1-12), press [ENTER] and then type in a name for the set. Press [ENTER] to display **Menu 26.1 - Schedule Set Setup** as shown next.

```
                Menu 26.1 - Schedule Set Setup

          Active= Yes
          Start Date(yyyy/mm/dd) = 2000 - 07 - 01
          How Often= Once
          Once:
            Date(yyyy/mm/dd)= 2001 - 01 - 01
          Weekdays:
            Sunday= N/A
            Monday= N/A
            Tuesday= N/A
            Wednesday= N/A
            Thursday= N/A
            Friday= N/A
            Saturday= N/A
          Start Time (hh:mm)= 12 : 00
          Duration (hh:mm)= 10 : 00
          Action= Forced On

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

Figure 13-2 Schedule Set Setup

If a connection has been already established, your Prestige will not drop it. Once the connection is dropped manually or it times out, then that remote node can't be triggered again until the time period configured in the **Duration** field expires.

Table 13-1 Schedule Set Setup Fields

FIELD	DESCRIPTION	EXAMPLE
Active	Choose **Yes** to activate and **No** to deactivate the schedule set.	**Yes** (default)
Start Date	Enter the start date that you wish the set to take effect in year - month-day format. Valid dates are from the present to February 5, 2036.	2000 – 07 – 01
How Often	Should this schedule set recur weekly or be used just once? Choose **Once** or **Weekly**. Both these options are mutually exclusive. If **Once** is selected, then all weekday settings are **N/A**. When **Once** is selected, the schedule rule deletes automatically after the scheduled time elapses.	**Once** (default)
Once: Date	If you select **Once** in the **How Often** field above, enter the date the set should activate in year-month-day format. If you select **Weekly** in the **How Often** field above, this field is	2001 – 01 – 01

FIELD	DESCRIPTION	EXAMPLE
	N/A.	
Weekday: Day	If you select **Weekly** in the **How Often** field above, then choose the day(s) the set should activate (and recur). Individual **Day** parameters are active when their fields read **Yes** and inactive when their fields read **No** or **N/A**.	**N/A** (default)
Start Time	Enter the start time that you wish the schedule set to take effect in hour : minute format.	12 : 00
Duration	Enter the maximum duration allowed in hour : minute format for this scheduled connection.	10 : 00
Action	Choose an action. Choices are: **Forced On** means that the connection is maintained whether or not there is a demand call on the line and will persist for the time period specified in the **Duration** field. **Forced Down** means that the connection is blocked whether or not there is a demand call on the line. **Enable Dial-On-Demand** means that this schedule permits a demand call on the line. **Disable Dial-On-Demand** means that this schedule prevents a demand call on the line.	**Forced On**

13.4 Applying Schedule Sets to Remote Nodes

Once your schedule sets are configured, you must apply them to the desired remote node(s). Enter 11 from the main menu and, using the [SPACE BAR], select **PPPoE** or **PPTP** in the **Encapsulation** field. Enter your target remote node index number(s) in the **Schedules** field, as shown next.

```
                    Menu 11.1 - Remote Node Profile

  Rem Node Name= ChangeMe              Route= IP
  Active= Yes

  Encapsulation= PPPoE                 Edit IP= No
  Service Type= Standard               Telco Option:
  Service Name=                          Allocated Budget(min)= 0
  Outgoing:                              Period (hr)= 0
    Rem Login=                           Schedules= 1,3,4
    Rem Password= ********               Nailed-Up Connection= 0
  Outgoing:
    My Login=                          Session Options:
    My Password= ********                Edit Filter Sets= No
    Authen= CHAP/PAP                     Idle Timeout(sec)= 100


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

Figure 13-3 Applying Schedule Sets to a Remote Node Example (PPPoE Encapsulation)

You can apply up to four schedule sets, separated by commas, for one remote node. Enter the schedule set numbers for specific remote nodes in the **Schedules** field. In the examples, shown previously and next, schedule sets 1, 3 and 4 are applied.

```
                    Menu 11.1 - Remote Node Profile

  Rem Node Name= ChangeMe              Route= IP
  Active= Yes

  Encapsulation= PPTP                  Edit IP= No
  Service Type= Standard               Telco Option:
  Service Name=                          Allocated Budget(min)= 0
  Outgoing:                              Period (hr)= 0
    Rem Login=                           Schedules= 1,3,4
    Rem Password= ********               Nailed-Up Connection= 0
    Athen= CHAP/PAP
                                       Session Options:
  PPTP:                                  Edit Filter Sets= No
    My IP Addr=                          Idle Timeout(sec)= 100
    Server IP Addr=
    Connection ID/Name=
    Authen= CHAP/PAP

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

Figure 13-4 Applying Schedule Sets to a Remote Node Example (PPTP Encapsulation)

Part IV:

Troubleshooting and Additional Information

This section provides information about solving common problems, some Appendices, as well as a Glossary and Index.

Chapter 14
Troubleshooting

This chapter covers the potential problems and possible remedies. After each problem description, some instructions are provided to help you to diagnose and to solve the problem. See the included CD for further information.

14.1 Problems Starting Up the Prestige

Table 14-1 Troubleshooting the Start-Up of your Prestige

PROBLEM	CORRECTIVE ACTION	
None of the LEDs are on when I turn on the Prestige	Check the connection between the adapter and the Prestige. If the error persists, you may have a hardware problem. In this case, you should contact your vendor.	
Cannot access the Prestige via the console port.	1. Check to see if the Prestige is connected to your computer's console port.	
	2. Check to see if the communications program is configured correctly. The communications software should be configured as follows:	VT100 terminal emulation
		9600 bps
		No parity, 8 data bits, 1 stop bit, data flow set to none.

14.2 Problems with the LAN Interface

Table 14-2 Troubleshooting the LAN Interface

PROBLEM	CORRECTIVE ACTION
Cannot access the Prestige.	Verify that the Prestige **UPLINK** button is in the correct position and that you are using the correct Ethernet cable.
Cannot ping any computer on the LAN.	Check the 10M/100M LEDs on the front panel. One of these LEDs should be on. If they are both off, check the cables between your Prestige and hub or the station.
	Verify that the IP addresses and subnet masks of the Prestige and the computers on the LAN are on the same subnet.

14.3 Problems with the WAN Interface

Table 14-3 Troubleshooting the WAN interface

PROBLEM	CORRECTIVE ACTION
Cannot get a WAN IP address from the ISP.	The WAN IP address is provided when the ISP recognizes the user as an authorized user after verifying the MAC address or Host Name or User ID. Find out the verification method used by your ISP.
	If the ISP checks the LAN MAC address, tell the ISP the WAN MAC address of the Prestige. The WAN MAC can be obtained from menu 24.1. In case the ISP does not allow you to use a new MAC, you can clone the MAC from the LAN as the WAN MAC and send it to the ISP using **Menu 2 - WAN Setup**.
	If the ISP checks the Host Name, enter host name in the system field in **Menu 1 - General Setup** when you connect the Prestige to a cable/xDSL modem.
	If the ISP checks the User ID, make sure that you have entered the correct Service Type, User Name and Password in **Menu 4 - Internet Access Setup**.
Cannot connect to a remote node or ISP.	Check menu 24.1 to verify the line status. Contact your service provider if your line remains down.

14.4 Problems with Internet Access

Table 14-4 Internet Access

PROBLEM	CORRECTIVE ACTION
Cannot access the Internet.	Connect your cable/xDSL modem with the Prestige using appropriate type of cable. Check with the manufacturer of your Cable/xDSL modem about the cable requirement because some devices require a crossover cable and others a straight-through cable.
	Verify your settings in menu 3.2 and menu 4.

Appendix A PPPoE

PPPoE in Action

An ADSL modem bridges a PPP session over Ethernet (PPP over Ethernet, RFC 2516) from your PC to an ATM PVC (Permanent Virtual Circuit) which connects to a xDSL Access Concentrator where the PPP session terminates (see the next figure). One PVC can support any number of PPP sessions from your LAN. PPPoE provides access control and billing functionality in a manner similar to dial-up services using PPP.

Benefits of PPPoE

PPPoE offers the following benefits:

1. It provides you with a familiar dial-up networking (DUN) user interface.
2. It lessens the burden on the carriers of provisioning virtual circuits all the way to the ISP on multiple switches for thousands of users. For GSTN (PSTN & ISDN), the switching fabric is already in place.
3. It allows the ISP to use the existing dial-up model to authenticate and (optionally) to provide differentiated services.

Traditional Dial-up Scenario

The following diagram depicts a typical hardware configuration where the PCs use traditional dial-up networking.

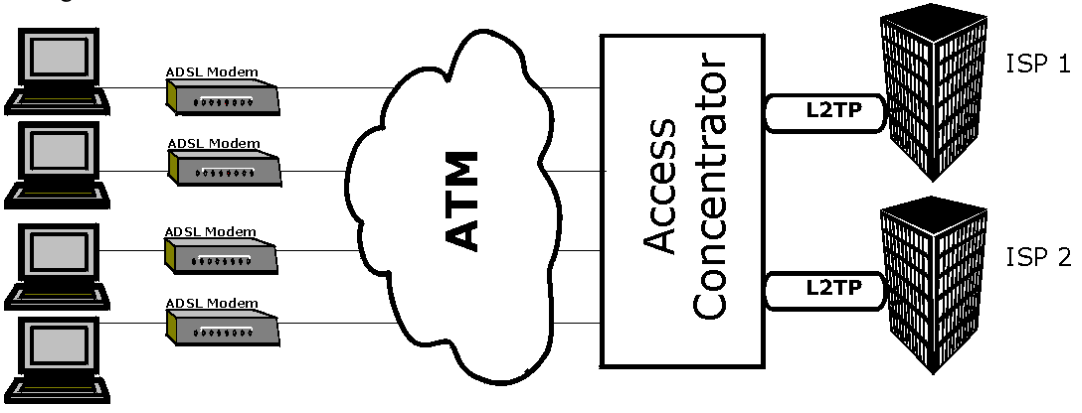


Diagram 1 Single-PC per Modem Hardware Configuration

How PPPoE Works

The PPPoE driver makes the Ethernet appear as a serial link to the PC and the PC runs PPP over it, while the modem bridges the Ethernet frames to the Access Concentrator (AC). Between the AC and an ISP, the AC is

acting as a L2TP (Layer 2 Tunneling Protocol) LAC (L2TP Access Concentrator) and tunnels the PPP frames to the ISP. The L2TP tunnel is capable of carrying multiple PPP sessions.
With PPPoE, the VC (Virtual Circuit) is equivalent to the dial-up connection and is between the modem and the AC, as opposed to all the way to the ISP. However, the PPP negotiation is between the PC and the ISP.

The Prestige as a PPPoE Client

When using the Prestige as a PPPoE client, the PCs on the LAN see only Ethernet and are not aware of PPPoE. This alleviates the administrator from having to manage the PPPoE clients on the individual PCs.

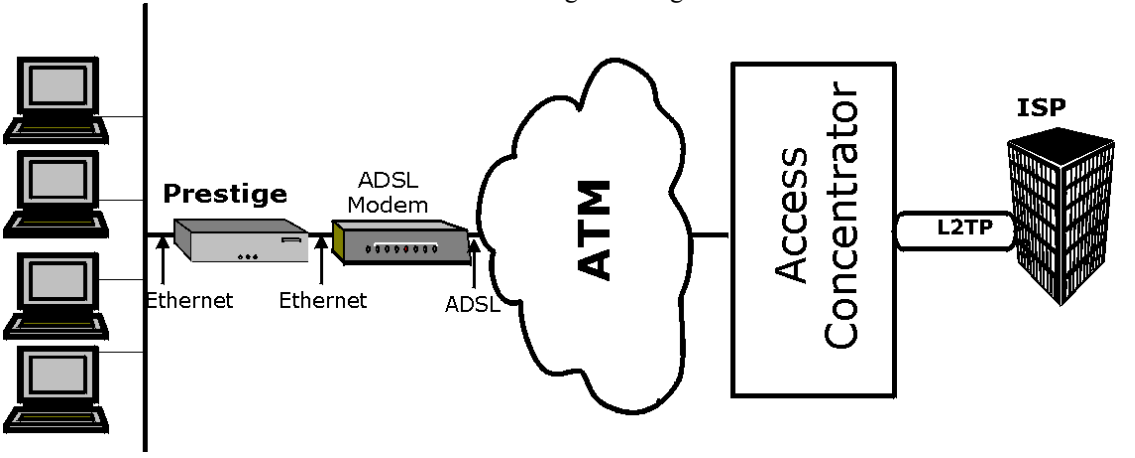


Diagram 2 Prestige as a PPPoE Client

Appendix B
PPTP

What is PPTP?

PPTP (Point-to-Point Tunneling Protocol) is a Microsoft proprietary protocol (RFC 2637 for PPTP is informational only) to tunnel PPP frames.

How can we transport PPP frames from a PC to a broadband modem over Ethernet?

A solution is to build PPTP into the ANT (ADSL Network Termination) where PPTP is used only over the short haul between the PC and the modem over Ethernet. For the rest of the connection, the PPP frames are transported with PPP over AAL5 (RFC 2364). The PPP connection, however, is still between the PC and the ISP. The various connections in this setup are depicted in the following diagram. The drawback of this solution is that it requires one separate ATM VC per destination.

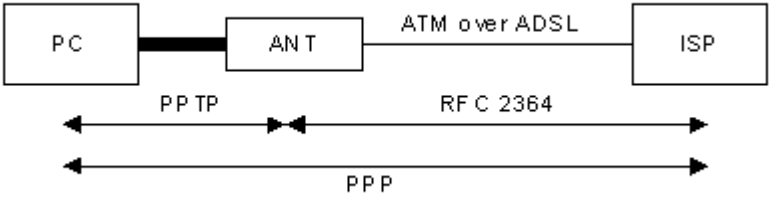


Diagram 3 Transport PPP frames over Ethernet

PPTP and the Prestige

When the Prestige is deployed in such a setup, it appears as a PC to the ANT (ADSL Network Termination). In Windows VPN or PPTP Pass-Through feature, the PPTP tunneling is created from Windows 95, 98 and NT clients to an NT server in a remote location. The pass-through feature allows users on the network to access a different remote server using the Prestige's Internet connection. In NAT mode, the Prestige is able to pass the PPTP packets to the internal PPTP server (i.e. NT server) behind the NAT. Users need to forward PPTP packets to port 1723 by configuring the server in **Menu 15.2 - Server Set Setup**. In the case above as the PPTP connection is initialized by the remote PPTP Client, the user must configure the PPTP clients. The Prestige initializes the PPTP connection hence, there is no need to configure the remote PPTP clients.

PPTP Protocol Overview

PPTP is very similar to L2TP, since L2TP is based on both PPTP and L2F (Cisco's Layer 2 Forwarding). Conceptually, there are three parties in PPTP, namely the PNS (PPTP Network Server), the PAC (PPTP Access Concentrator) and the PPTP user. The PNS is the box that hosts both the PPP and the PPTP stacks and forms one end of the PPTP tunnel. The PAC is the box that dials/answers the phone calls and relays the

PPP frames to the PNS. The PPTP user is not necessarily a PPP client (can be a PPP server too). Both the PNS and the PAC must have IP connectivity; however, the PAC must in addition have dial-up capability. The phone call is between the user and the PAC and the PAC tunnels the PPP frames to the PNS. The PPTP user is unaware of the tunnel between the PAC and the PNS.

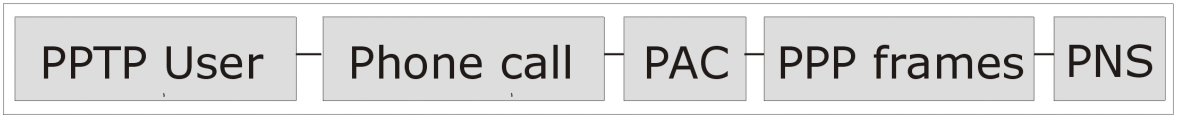


Diagram 4 PPTP Protocol Overview

Microsoft includes PPTP as a part of the Windows OS. In Microsoft's implementation, the PC, and hence the Prestige, is the PNS that requests the PAC (the ANT) to place an outgoing call over AAL5 to an RFC 2364 server.

Control & PPP connections

Each PPTP session has distinct control connection and PPP data connection.

Call Connection

The control connection runs over TCP. Similar to L2TP, a tunnel control connection is first established before call control messages can be exchanged. Please note that a tunnel control connection supports multiple call sessions.

The following diagram depicts the message exchange of a successful call setup between a PC and an ANT.

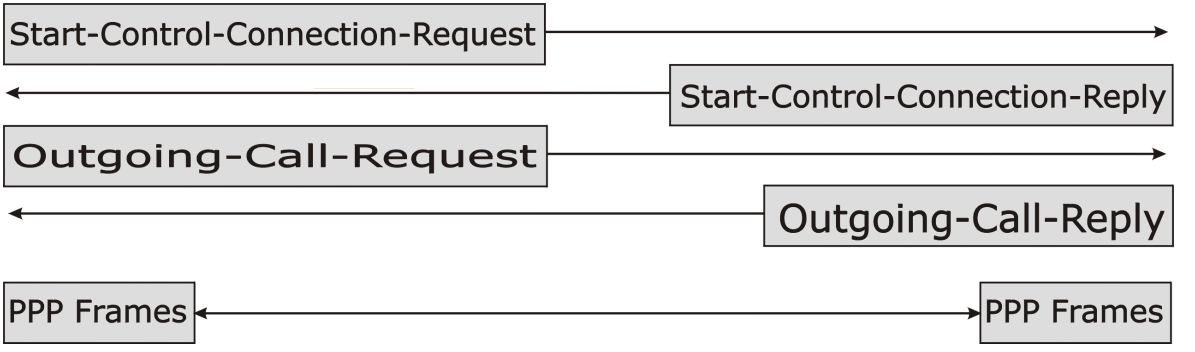


Diagram 5 Example Message Exchange between PC and an ANT

PPP Data Connection

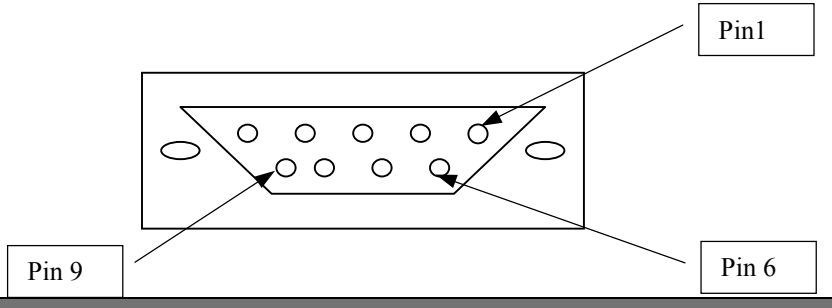
The PPP frames are tunneled between the PNS and PAC over GRE (General Routing Encapsulation, RFC 1701, 1702). The individual calls within a tunnel are distinguished using the Call ID field in the GRE header.

Appendix C
Power Adapter Specifications

NORTH AMERICAN PLUG STANDARDS		
AC Power Adapter Model	MW48-1201200	AD48-1201200DUY
Input Power	AC120Volts/60Hz/22W	AC120Volts/60Hz/0.25A
Output Power	DC12Volts/1.2A	DC12Volts/1.2A
Power Consumption	9 W	9 W
Safety Standards	UL, CUL (UL1310, CSA C22.2 No. 233-M91)	
EUROPEAN PLUG STANDARDS		
AC Power Adapter Model	AD-1201200DV	JAD-121200E
Input Power	AC230Volts/50Hz/0.2A	AC230Volts/50Hz
Output Power	DC12Volts/1.2A	DC12Volts/1.2A
Power Consumption	9 W	9 W
Safety Standards	TUV, CE (EN 60950)	
	UNITED KINGDOM PLUG STANDARDS	**JAPANESE PLUG STANDARDS**
AC Power Adapter Model	AD-1201200DK	JOD-48-1124
Input Power	AC230Volts/50Hz/0.2A	AC100Volts/ 50/60Hz/ 27VA
Output Power	DC12Volts/1.2A	DC12Volts/1.2A
Power Consumption	9 W	9 W
Safety Standards	TUV, CE (EN 60950, BS7002)	T-Mark (Japan Dentori)
AUSTRALIAN AND NEW ZEALAND PLUG STANDARDS		
AC Power Adapter Model	AD-1201200DS or AD-121200DS	
Input Power	AC240Volts/50Hz/0.2A	
Output Power	DC12Volts/1.2A	
Power Consumption	9 W	
Safety Standards	NATA (AS 3260)	

Appendix D
Hardware Specifications

SPECIFICATIONS	
Power Specification	I/P AC 120V / 60Hz ; O/P DC 12V 1200 mA
MTBF	100000 hrs
Operation Temperature	0º C ~ 40 degrees Celecius
Ethernet Specification for WAN	10Mbit Half / Full Manual Setting
Ethernet Specification for LAN	10/100 Mbit Half / Full Auto-negotiation
Console Port RS–232	Pin 1 = NON ; Pin 2 = DTE-RXD; Pin 3 = DTE-TXD; Pin 4 = DTE-DTR; Pin 5 = GND; Pin 6 = DTE-DSR; Pin 7 = DTE-RTS; Pin 8 = DTE-CTS; PIN 9 = NON. See figure below.



WAN/LAN CABLE PIN LAYOUT

STRAIGHT-THROUGH

(Switch)		(Adapter)
1 IRD +	———	1 OTD +
2 IRD -	———	2 OTD -
3 OTD +	———	3 IRD +
6 OTD -	———	6 IRD -

CROSSOVER

(Switch)		(Switch)
1 IRD +	⟍	1 IRD +
2 IRD -	⟍	2 IRD -
3 OTD +	⟋	3 OTD +
6 OTD -	⟋	6 OTD -

Glossary

100Base-T	Uses two pairs of twisted-pair wire with a maximum distance of 100 meters between the hub and the workstation.
10Base-T	The 10-Mbps baseband Ethernet specification that uses two pairs of twisted-pair cabling (Category 3 or 5), one pair for transmitting data and the other for receiving data.
ADSL	Asymmetrical Digital Subscriber Line is an asymmetrical technology 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.
Analog	An electrical circuit that is represented by means of continuous, variable physical quantities (such as voltages and frequencies), as opposed to discrete representations (like the 0/1, off/on representation of digital circuits).
ARP	Address Resolution Protocol is a protocol for mapping an Internet Protocol address (IP address) to a physical computer 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	A Binary Digit (either a one or a zero); a single digit number in base-2. A bit is the smallest unit of computerized data.
Boot Module Commands	Boot Module Commands, available in the debug mode via SMT (some devices may not have SMTs), help you initialize the configuration of the basic functions and features of your device(s) such as uploading firmware, changing the console port speed and viewing product-related information.
Bridging	Bridging provides LAN to LAN frame forwarding services between two or more LANs. Frames from one LAN are forwarded across a bridge to a connected LAN, although filtering can be employed to selectively forward frames. Bridging works similar to the way repeaters work except that bridges forward frames based on their MAC (Medium Access Control) addresses which are hardware-level addresses of NICs (Network Interface Cards).
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.
CO	Central Office. A CO is a facility that serves local telephone subscribers. In the CO, subscribers' lines are joined to switching equipment that allows them to connect to each other for both local and long distance calls.
COE	Central Office Equipment. COE is where home and office phone lines terminate and connect to a much larger switching system.
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.
CPE	Customer Premise Equipment. CPE is privately-owned telecommunication equipment at an organization's site that is attached to the telecommunication network. CPE includes routers, modems, PBXs, telephones, key systems, facsimile products, voice processing equipment and video communication equipment.
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.
Device Filters	Device Filters decide whether or not to allow passage of a data packet and/or to make a call. Device filters act on raw data from/to LAN and WAN and serve as a limited firewall to your device.
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.
Digital	The use of a binary code to represent information, such as 0/1, or on/off.
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 enhance 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.
Embedded Web Configurator	This is an HTML-based configurator that usually includes an Internet Access Wizard and menus for configuring key settings and features.
Ethernet	A very common method of networking computers in a LAN. There are a number of adaptations to the IEEE 802.3 Ethernet standard, including adaptations with data rates of 10 Mbits/sec and 100 Mbits/sec over coaxial cable, twisted-pair cable and fiber-optic cable. The latest version of Ethernet, Gigabit Ethernet, has a data rate of 1 Gbit/sec.
FAQ	Frequently Asked Questions. FAQs are documents that list and answer the most common questions on a particular subject.
FCC	The FCC (Federal Communications Commission) is in charge of allocating the electromagnetic spectrum and thus the bandwidth of various communication systems.
Flash memory	A nonvolatile storage device that can be electrically erased and reprogrammed so that data can be stored, booted and rewritten as necessary.
FTP	File Transfer Protocol is an Internet file transfer service that operates on the Internet and over TCP/IP networks. FTP is basically a client/server protocol in which a system running the FTP server accepts commands from a system running an FTP client. The service allows users to send commands to the server for uploading and downloading

	files. FTP is popular on the Internet because it allows for speedy transfer of large files between two systems.
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.
HTTP	Hyper Text Transfer Protocol. The most common protocol used on the Internet. HTTP is the primary protocol used for web sites and web browsers. It is also prone to certain kinds of attacks.
IANA	Internet Assigned Number Authority acts as the clearing house 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	(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.
internet	(Lower case "i"). Any time you connect two or more networks together, you have an internet.
Intranet	A private network inside a company or organization that uses the same kinds of software that you would find on the public Internet, but that is only for internal use.
IP	Internet Protocol. (Currently IP version 4 or IPv4). The underlying protocol for routing packets on the Internet and other TCP/IP-based networks.
IP Alias	Internet Protocol Alias allows you to partition a physical network into different logical networks over the same Ethernet interface.
IP Pool	Internet Protocol Pool refers to the collective group of IP addresses located in any particular place (for example, LAN, WAN, Ethernet, etc.).
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.
Jack Type	Different types of jacks (RJ-11, RJ45 or RJ-48) can be used for an ISDN line. The RJ-

	11 is the most common in the world and is most often used for analog phones, modems and fax machines. RJ-48 and RJ-45 are essentially the same, as they both have the same 8-pin configuration. An RJ-11 jack can fit into an RJ-45/RJ-48 connector, however, an RJ-45/RJ-48 cannot fit into an RJ-11 connector.
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.
LEC	Local Exchange Carrier. The local phone companies – either a Regional Bell Operating Company (RBOC) or an independent phone company (e.g., GTE) – that provide local transmission services.
LED	Light Emitting Diode. LEDs are visual indicators that relay information about the status of specific MI1951 functions to the user by lighting up, turning off or blinking. LEDs are usually found on the front panel of the physical device. Examples include Status, Power and System LEDS.
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 my 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.
Name Resolution	The allocation of an IP address to a host name. See also DNS.
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 - see also SUA.
NetBIOS	Network Basic Input/Output System. NetBIOS is an extension of the DOS BIOS that enables a computer to connect to and communicate with a LAN.

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.
PAC	The PPTP Access Concentrator (PAC) is the box that calls/answers the phone call and relays the PPP frames to the PNS (PPTP Network Server). A PAC must have IP and dial-up capability.
Packet Filter	A filter that scans packets and decides whether to let them through or not.
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.
PBX	A Private Branch Exchange is a subscriber-owned telecommunications exchange that usually includes access to the public switched network. It may also be a private telephone switchboard that provides on-premises dial service and may provide connections to local and trunked communications networks.
Plain Text	Plain Text is clear text, readable by anyone – it is the opposite of cipher text.
Point of Demarcation	The physical point where the phone company ends its responsibility with the wiring of the phone line.
POP	Post Office Protocol. This is a common protocol used for sending, receiving, and delivering mail messages.
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.
Port (H/W)	An interface on a computer for connecting peripherals or devices to the computer. A printer port, for example, is an interface that is designed to have a printer connected to it. Ports can be defined by specific hardware (such as a keyboard port) or through software.
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.
PPTP	Point-to-Point Tunneling Protocol.
Protocol	A "language" for communicating on a network. Protocols are sets of standards or rules used to define, format and transmit data across a network. There are many different protocols used on networks. For example, most web pages are transmitted using the HTTP protocol.
Protocol Filters	Use Protocol Filters to decide whether or not to allow passage of a data packet and/or to make a call. Protocol filters act on IP/IPX packets and can serve as a limited firewall.
Proxy Server	A server that performs network operations in lieu of other systems on the network. Proxy Servers are most often used as part of a firewall to mask the identity of users inside a corporate network yet still provide access to the Internet. When a user connects to a proxy server, via a web browser or other networked application, he submits commands to the proxy server. The server then submits those same commands to the Internet, yet without revealing any information about the system that originally requested the information. Proxy servers are an ideal way to also have all users on a corporate network channel through one point for all external communications. Proxy servers can be configured to block certain kinds of connections and stop some hacks.
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.
ras	This is the name of the firmware on the ZyXEL device. Renaming may be necessary when uploading new firmware to the device.
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.
Rom-0	This is the name of the configuration file on your ZyXEL device. Renaming may be necessary when uploading a new configuration file to your ZyXEL device.
Router	A device that connects two networks together. Routers monitor, direct and filter information that passes between these networks. Because of their location, routers are a good place to install traffic or mail filters. Routers are also prone to attacks because they contain a great deal of information about a network.
Server	A computer, or a software package, that provides a specific kind of service to client software running on other computers.
SMT	System Management Terminal. The SMT is a menu-based interface that you use to configure your device.
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.
Splitter	In telephony, a splitter, sometimes called a “plain old telephone service splitter" is a device that divides a telephone signal into two or more signals, each carrying a selected frequency range, and can also reassemble signals from multiple signal sources into a single signal
Spoofing	To forge something, such as an IP address. IP spoofing is a common way for hackers to hide their location and identity
SSL (Secured Socket Layer)	Technology that allows you to send information that only the server can read. SSL allows servers and browsers to encrypt data as they communicate with each other. This

	makes it very difficult for third parties to understand the communications.
Static Routing	Static routes tell routing information that a networking device cannot learn automatically through other means. The need for static routing can arise in cases where RIP is disabled on the LAN or a remote network is beyond the one that is directly connected to a remote node.
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) device and a data communications equipment (DCE) device. A straight through Ethernet cable is the most commonly used Ethernet cable.
SUA	Single User Account. Your system's SUA feature allows multiple user Internet access for the cost of a single ISP account. See also NAT.
Subnet Mask	The subnet mask specifies the network number portion of an IP address. Your device will compute the subnet mask automatically based on the IP Address that you entered. You do not need to change the sutomatically computer subnet mask unless you are instructed to do so.
Syslog	An abbreviated form of System Log. Using the UNIX syslog facility, a device records (logs) phone calls or creates a CDR (Call Detail Record). Syslog is an administrative tool that assists in accounting and is configurable via the SMT.
TCP	Transmission Control Protocol is a connection-oriented transport service that ensures the reliability of message delivery. It verifies that messages and data were received.
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, 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).
Twisted Pair	Two insulated wires, usually copper, twisted together and often bound into a common

	sheath to form multi-pair cables. In ISDN, the cables are the basic path between a subscriber's terminal or telephone and the PBX or the central office.
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 the Internet Protocol (IP) and the ability to address a particular application process running on a host via a port number without setting up a connection session.
UNIX	A widely-used operating system in large networks. Usually used on workstations and servers.
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 is a number that denotes a particular logical connection between end stations (users or networks). See also, VPI.
VPI	A Virtual Path Identifier is a number that denotes a bundle of virtual channels. See also VCI.
WAN	Wide Area Networks link geographically dispersed offices in other cities or around the globe. Just about any long-distance communication medium can serve as a WAN link including switched and permanent telephone circuits, terrestrial radio systems and satellite systems.
WWW	World Wide Web. Frequently used (incorrectly) when referring to "The Internet". WWW has two major 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).
xDSL	Digital Subscriber Line(s) where x, when specified, denotes a particular flavor of DSL, eg., ADSL, G.SHDSL, SDSL, VDSL, RDSL, etc.
ZyNOS	ZyXEL Network Operating System is the firmware used in many ZyXEL products.

Index