Prestige 650 Series

ADSL Router

User's Guide

Version 3.40

July 2003

ZyXEL

Unleash Networking Power

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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.

Certifications

Refer to the product page at www.zyxel.com.

FC Tested To Comply
With FCC Standards
FOR HOME OR OFFICE USE

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.

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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.

Safety Warnings

1. To reduce the risk of fire, use only No. 26 AWG or larger telephone wire.

2. Do not use this product near water, for example, in a wet basement or near a swimming pool.

3. Avoid using this product during an electrical storm. There may be a remote risk of electric shock from lightening.

Customer Support

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

- Product model and serial number.
- 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 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 300, Taiwan.
NORTH AMERICA	support@zyxel.com sales@zyxel.com	+1-800-255-4101 +1-714-632-0858	www.us.zyxel.com ftp.zyxel.com	
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.
GERMANY	support@zyxel.de sales@zyxel.de	+49-2405-6909-0 +49-2405-6909-99	www.zyxel.de	ZyXEL Deutschland GmbH. Adenauerstr. 20/A2 D-52146 Wuerselen, Germany

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Preface

Congratulations on your purchase from the Prestige 650 ADSL Router series.

Your Prestige is easy to install and configure. Use the web configurator, System Management Terminal (SMT) or command interpreter interface to configure your Prestige. Not all features can be configured through all interfaces.

Don't forget to register your Prestige online at www.zyxel.com for free future product updates and information.

About This User's Guide

This manual is designed to guide you through the configuration of your Prestige for its various applications. The web configurator parts of this guide contain background information on features configurable by web configurator. The SMT parts of this guide contain background information on features not configurable by web configurator.

Related Documentation

- Supporting Disk

  Refer to the included CD for support documents.

- Compact Guide or Read Me First

  The Prestige 650H and Prestige 650HW come with a Compact Guide. The Prestige 650R and the Prestige 650R-E use a Read Me First. Both of them are designed to help you get up and running right away. They contain connection information and instructions on getting started. The Compact Guide contains additional information on the Wizard and key feature configuration.

- Web Configurator Online Help
  Embedded web help for descriptions of individual screens and supplementary information.

- ZyXEL Glossary and Web Site
  Please refer to www.zyxel.com for an online glossary of networking terms and additional support documentation.

Syntax Conventions

- "Enter" means for you to type one or more characters. "Select" or "Choose" means for you to use one predefined choices.

- The SMT menu titles and labels are in **Bold Times New Roman** font. Predefined field choices are in **Bold Arial** font. Command and arrow keys are enclosed in square brackets. [ENTER] means the Enter, or carriage return key; [ESC] means the Escape key and [SPACE BAR] means the Space Bar.

- Mouse action sequences are denoted using a comma. For example, "click the Apple icon, **Control Panels** and then **Modem**" means first click the Apple icon, then point your mouse pointer to **Control Panels** and then click **Modem**.
- 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 650 series may be referred to as the Prestige in this user's guide. This refers to both models (ADSL over POTS and ADSL over ISDN) unless specifically identified.
- The Prestige models with wireless features will be referred to as the Prestige 650H/HW.

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

User Guide Feedback

Help us help you. E-mail all User Guide-related comments, questions or suggestions for improvement to techwriters@zyxel.com.tw or send regular mail to The Technical Writing Team, ZyXEL Communications Corp., 6 Innovation Road II, Science-Based Industrial Park, Hsinchu, 300, Taiwan. Thank you.

Introduction to DSL

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

There are actually seven types of DSL service, ranging in speeds from 16 Kbits/sec to 52 Mbits/sec. The services are either symmetrical (traffic flows at the same speed in both directions), or asymmetrical (the downstream capacity is higher than the upstream capacity). Asymmetrical services (ADSL) are suitable for Internet users because more information is usually downloaded than uploaded. For example, a simple button click in a web browser can start an extended download that includes graphics and text.

As data rates increase, the carrying distance decreases. That means that users who are beyond a certain distance from the telephone company's central office may not be able to obtain the higher speeds.

A DSL connection is a point-to-point dedicated circuit, meaning that the link is always up and there is no dialing required.

What is ADSL?

It is an asymmetrical technology, meaning that the downstream data rate is much higher than the upstream data rate. As mentioned, this works well for a typical Internet session in which more information is downloaded, for example, from Web servers, than is uploaded. ADSL operates in a frequency range that is above the frequency range of voice services, so the two systems can operate over the same cable.

Part I:

Getting Started

This part is structured as a step-by-step guide to help you access your Prestige. It covers key features and applications, accessing the web configurator, password setup and configuring the wizard screens for initial setup.

Chapter 1
Getting To Know Your Prestige

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

1.1 Introducing the Prestige 650 Series

Your Prestige integrates high-speed 10/100Mbps auto-negotiating LAN interface(s) and a high-speed ADSL port into a single package. The Prestige is ideal for high-speed Internet browsing and making LAN-to-LAN connections to remote networks. By integrating DSL and NAT, the Prestige provides super-fast Internet access to multiple users at minimum cost.

The Prestige 650R and Prestige 650R-E is a router and includes two models, one for ADSL over POTS (Plain Old Telephone System) and one for ADSL over ISDN (Integrated Synchronous Digital System).

The Prestige 650H and Prestige 650HW have an integrated four-port switch with an embedded PCMCIA wireless card slot. The Prestige 650H/HW provides a wireless LAN connectivity allowing users to enjoy the convenience and mobility of working anywhere within the coverage area. The Prestige 650HW includes a wireless LAN card, but the Prestige 650H doesn't.

Only use firmware for your Prestige's specific model. Refer to the label on the bottom of your Prestige.

The web browser-based Graphical User Interface provides easy management and is totally independent of the operating system platform you use.

1.2 Features of the Prestige

The following sections describe the features of the Prestige series. Features vary by Prestige model. This table only lists the key features of the Prestige series. Please refer to the feature descriptions below for more details.

Some features are not available in every model. Refer to the *Model Specific Features* table to see what features are specific to your Prestige model.

Table 1-1 Model Specific Features

PRESTIGE MODEL FEATURES	P650R	P650R-E	P650H/HW
Wireless Slot			O
Wireless LAN Card			O
Four-Port Switch			O
Console Port	O		O
Auto-crossover 10/100 Mbps Ethernet LAN	O	O	O
Reset Button	O	O	O
Power Switch	O	O	O
IEEE 802.1x Network Security			O
Traffic Redirect	O		O
Bandwidth Management			O
IP Policy Routing	O	O	O
UPnP	O	O	O
Remote Management	O		O
Table Key: An "O" in a model's column shows that the model has the specified feature. A number specific to an individual model may alternately be displayed. The information in this table was correct at the time of writing, although it may be subject to change.			

➢ Four-Port Switch

A combination of switch and router makes your Prestige a cost-effective and viable network solution. You can connect up to four computers to the LAN ports on you Prestige without the cost of a hub.

➢ High Speed Internet Access

Your Prestige ADSL router can support downstream transmission rates of up to 8Mbps and upstream transmission rates of 832 Kbps. Prestige with ADSL over POTS also supports rate management.

➢ IEEE 802.11b 11Mbps Wireless LAN

The 11 Mbps wireless LAN provides mobility and a fast network environment for small and home offices. Computers with wireless LAN Ethernet adapters can connect to the local area network without any wiring efforts and enjoy reliable high-speed connectivity. This feature is not available on all models.

➢ PPPoE Support (RFC2516)

PPPoE (Point-to-Point Protocol over Ethernet) emulates a dial-up connection. It allows your ISP to use their existing network configuration with newer broadband technologies such as ADSL. The PPPoE driver on the Prestige is transparent to the computers on the LAN, which see only Ethernet and are not aware of PPPoE thus saving you from having to manage PPPoE clients on individual computers.

➢ IEEE 802.1x Network Security

The Prestige supports the IEEE 802.1x standard to enhance user authentication. Use the built-in user profile database to authenticate up to 32 users using MD5 encryption. Use an EAP-compatible RADIUS (RFC2138, 2139 - Remote Authentication Dial In User Service) server to authenticate a limitless number of users using EAP (Extensible Authentication Protocol). EAP is an authentication protocol that supports multiple types of authentication.

➢ Network Address Translation (NAT)

Network Address Translation (NAT) allows the translation of an Internet protocol address used within one network (for example a private IP address used in a local network) to a different IP address known within another network (for example a public IP address used on the Internet).

➢ Traffic Redirect

Traffic Redirect forwards WAN traffic to a backup gateway on the LAN when the Prestige cannot connect to the Internet, thus acting as an auxiliary backup when your regular WAN connection fails.

➢ Bandwidth Management

Bandwidth management allows you to allocate network resources according to defined policies. This policy-based bandwidth allocation helps your network to better handle real-time applications such as Voice-over-IP (VoIP).

➢ Universal Plug and Play (UPnP)

Using the standard TCP/IP protocol, the Prestige and other UPnP enabled devices can dynamically join a network, obtain an IP address and convey its capabilities to other devices on the network.

➢ 10/100M 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.

➢ 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.

➢ Multiple PVC (Permanent Virtual Circuits) Support

Your Prestige supports up to 8 PVC's.

➢ ADSL Standards

- Full-Rate (ANSI T1.413, Issue 2; G.dmt (G.992.1) with line rate support of up to 8 Mbps downstream and 832 Kbps upstream.
- G.lite (G.992.2) with line rate support of up to 1.5Mbps downstream and 512Kbps upstream.
- Supports Multi-Mode standard (ANSI T1.413, Issue 2; G.dmt (G.992.1); G.994.1 and G.996.1 (for ISDN only); G.991.1;G.lite (G992.2)).
- Supports OAM F4/F5 loop-back, AIS and RDI OAM cells.
- ATM Forum UNI 3.1/4.0 PVC.
- Supports up to 8 PVCs (UBR, CBR, VBR).
- Multiple Protocols over AAL5 (RFC 1483).
- PPP over AAL5 (RFC 2364).
- PPP over Ethernet (RFC 2516).

➢ DHCP Support

DHCP (Dynamic Host Configuration Protocol) allows individual clients (computers) to obtain TCP/IP configuration at start-up from a centralized DHCP server. The Prestige has built-in DHCP server capability enabled by default. It can assign IP addresses, an IP default gateway and DNS servers to DHCP clients. 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.

➢ IP Alias

IP Alias allows you to partition a physical network into 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.

IP Policy Routing (IPPR)

Traditionally, routing is based on the destination address only and the router takes the shortest path to forward a packet. IP Policy Routing (IPPR) provides a mechanism to override the default routing behavior and alter the packet forwarding based on the policy defined by the network administrator.

Protocol Support

- PPP (Point-to-Point Protocol) link layer protocol.
    - PPP over PAP (RFC 1334).
    - PPP over CHAP (RFC 1994).
- TCP/IP (Transmission Control Protocol/Internet Protocol) network layer protocol.
- Transparently bridging for unsupported network layer protocols.
- RIP I/RIP II
- IGMP Proxy
- ICMP support
- MIB II support (RFC 1213)
- PPPoE feature
    - PPPoE idle time out
    - PPPoE dial on demand

Networking Compatibility

Your Prestige is compatible with major ADSL DSLAM (Digital Subscriber Line Access Multiplexer) providers.

Multiplexing

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

Encapsulation

The Prestige series supports PPPoA (RFC 2364 - PPP over ATM Adaptation Layer 5), RFC 1483 encapsulation over ATM, MAC encapsulated routing (ENET Encapsulation) as well as PPP over Ethernet (RFC 2516).

Network Management

- Menu driven SMT (System Management Terminal) management
- Embedded Web Configurator

- CLI (Command Line Interpreter)
- Remote SMT session via Telnet
- SNMP manageable
- Local SMT session via console port
- DHCP Server/Client
- Built-in Diagnostic Tools
- Syslog
- TFTP/FTP server, firmware upgrade and configuration backup/support supported

Diagnostics Capabilities

- The Prestige can perform self-diagnostic tests. These tests check the integrity of the following circuitry:
  - FLASH memory
  - ADSL circuitry
  - RAM
  - LAN port

Filters

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

Ease of Installation

Your Prestige is designed for quick, intuitive and easy installation.

Housing

Your Prestige's all new compact and ventilated housing minimizes space requirements making it easy to position anywhere in your busy office.

1.3 Applications for the Prestige

Here are some example uses for which the Prestige is well suited.

1.3.1 Internet Access

The Prestige is the ideal high-speed Internet access solution. Your Prestige supports the TCP/IP protocol, which the Internet uses exclusively. It is compatible with all major ADSL DSLAM (Digital Subscriber Line Access Multiplexer) providers. A DSLAM is a rack of ADSL line cards with data multiplexed into a backbone network interface/connection (for example, T1, OC3, DS3, ATM or Frame Relay). Think of it as the equivalent of a modem rack for ADSL. In addition, for Prestige 650H/HW, you can insert an optional wireless PCMICA card into the Prestige and allow wireless stations access to your network resources. A typical Internet access application is shown below.

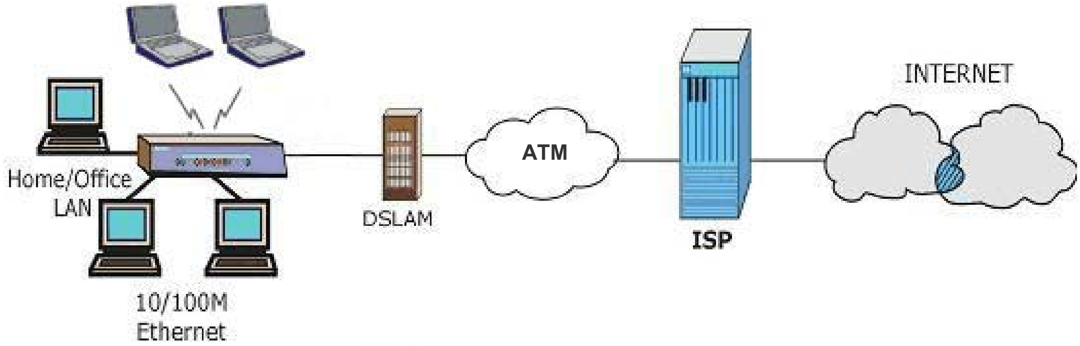


Figure 1-1 Prestige Internet Access Application

1.3.2 LAN to LAN Application

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

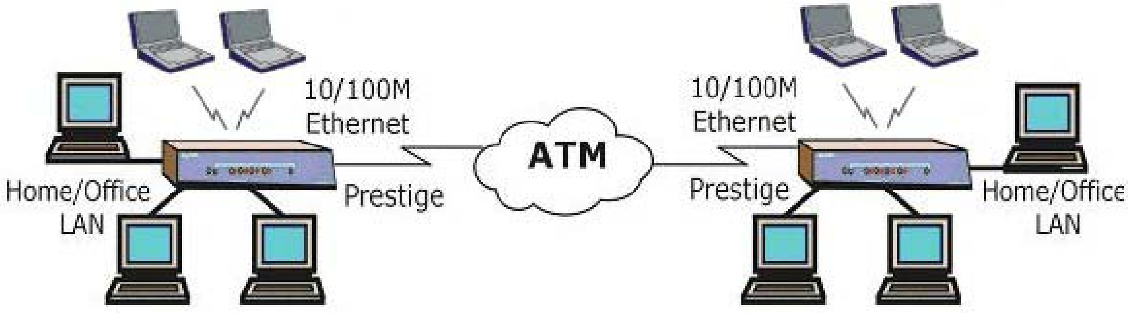


Figure 1-2 Prestige LAN-to-LAN Application

Chapter 2
Introducing the Web Configurator

This chapter describes how to access and navigate the web configurator.

2.1 Web Configurator Overview

The embedded web configurator allows you to manage the Prestige from anywhere through a browser such as Microsoft Internet Explorer or Netscape Navigator. Use Internet Explorer 6.0 and later or Netscape Navigator 7.0 and later versions with JavaScript enabled. It is recommended that you set your screen resolution to 1024 by 768 pixels

2.2 Accessing the Prestige Web Configurator

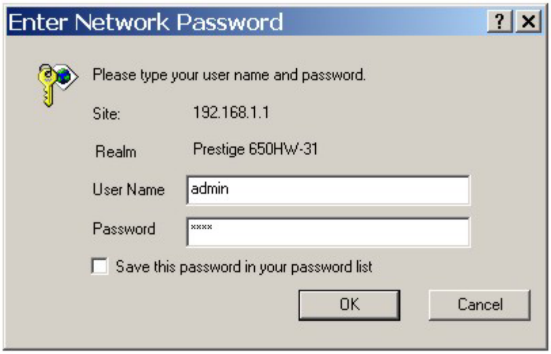
Step 1. Make sure your Prestige hardware is properly connected (refer to the *Compact Guide* or *Read Me First*).

Step 2. Prepare your computer/computer network to connect to the Prestige (refer to the *Compact Guide* or *Read Me First*).

Step 3. Launch your web browser.

Step 4. Type "192.168.1.1" as the URL.

Step 5. An **Enter Network Password** window displays. Enter the user name ("admin" is the default), password ("1234" is the default) and click **OK**.


Enter Network Password

Please type your user name and password.

Site: 192.168.1.1

Realm Prestige 650HW-31

User Name admin

Password ****

□ Save this password in your password list

Figure 2-1 Password Screen

Step 6. You should now see the **Site Map** screen.

The Prestige automatically times out after five minutes of inactivity. Simply log back into the Prestige if this happens to you.

2.3 Navigating the Prestige Web Configurator

The following summarizes how to navigate the web configurator from the **Site Map** screen. Screens vary slightly for different Prestige models.

- Select a language from the **Language** drop-down list box.
- Click **Wizard Setup** to begin a series of screens to configure your Prestige for the first time.
- Click a link under **Advanced Setup** to configure advanced Prestige features.
- Click a link under **Maintenance** to see Prestige performance statistics, upload firmware and back up, restore or upload a configuration file.
- Click **SITE MAP** to go to the **Site Map** screen.
- Click **Logout** in the navigation panel when you have finished a Prestige management session.

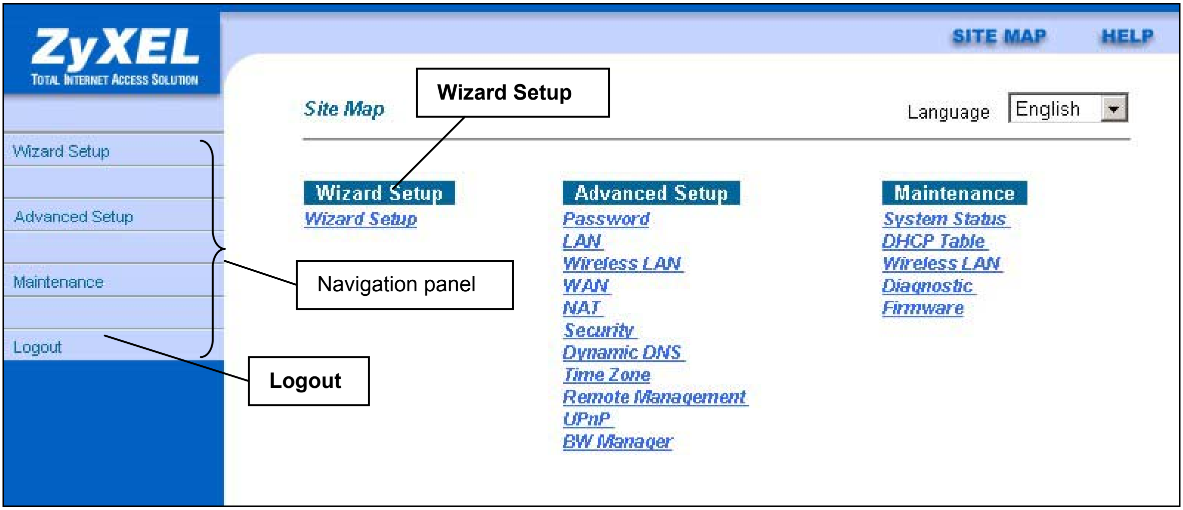


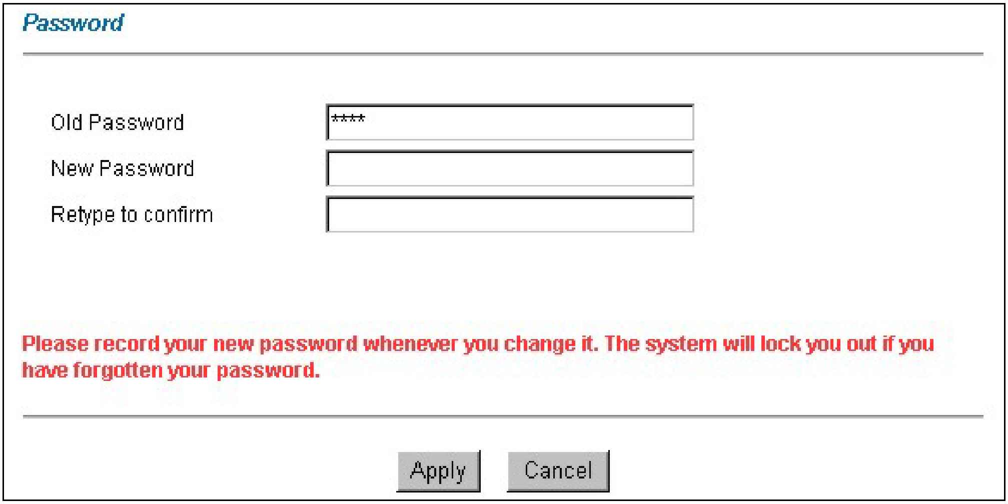
Figure 2-2 Web Configurator SITE MAP Screen

Click the HELP icon (located in the top right corner of most screens) to view embedded help.

2.4 Configuring Password

It is highly recommended that you change the password for accessing the Prestige.

To change your Prestige's password, click **Advanced Setup** and then **Password**. The screen appears as shown.



Password

Old Password: ****

New Password:

Retype to confirm:

Please record your new password whenever you change it. The system will lock you out if you have forgotten your password.

Figure 2-3 Password

The following table describes the labels in this screen.

Table 2-1 Password

LABEL	DESCRIPTION
Old Password	Type the default password or the existing password you use to access the system in this field.
New Password	Type the new password in this field.
Retype to Confirm	Type the new password again in this field.
Apply	Click **Apply** to save your changes back to the Prestige.
Cancel	Click **Cancel** to begin configuring this screen afresh.

2.5 Resetting the Prestige

If you forget your password or cannot access the Prestige, you will need to reload the factory-default configuration file or use the **RESET** button the back of the Prestige. Uploading this configuration file replaces the current configuration file with the factory-default configuration file. This means that you will lose all configurations that you had previously and the speed of the console port will be reset to the default of 9600bps with 8 data bit, no parity, one stop bit and flow control set to none. The password will be reset to "1234", also.

2.5.1 Using The Reset Button

Step 1. Make sure the **SYS** LED is on (not blinking).

Step 2. Press the **RESET** button for five seconds, and then release it. When the **SYS** LED begins to blink, the defaults have been restored and the Prestige restarts.

2.5.2 Uploading a Configuration File Via Console Port

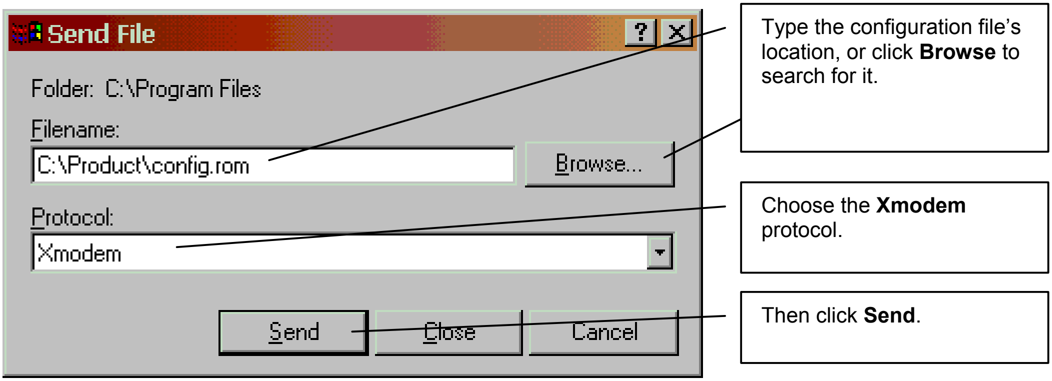
Download the default configuration file from the ZyXEL FTP site, unzip it and save it in a folder.

Step 1. Turn off the Prestige, begin a terminal emulation software session and 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.

Step 2. Enter "atlc" after "Enter Debug Mode" message.

Step 3. Wait for "Starting XMODEM upload" message before activating Xmodem upload on your terminal. This is an example Xmodem configuration upload using HyperTerminal.

Step 4. Click **Transfer**, then **Send File** to display the following screen.



Folder: C:\Program Files

Filename: C:\Product\config.rom

Protocol: Xmodem

Type the configuration file's location, or click **Browse** to search for it.

Choose the **Xmodem** protocol.

Then click **Send**.

Figure 2-4 Example Xmodem Upload

Step 5. After successful firmware upload, enter "atgo" to restart the router.

Chapter 3
Wizard Setup

This chapter provides information on the Wizard Setup screens in the web configurator.

3.1 Wizard Setup Introduction

Use the Wizard Setup screens to configure your system for Internet access settings and fill in the fields with the information in the *Internet Account Information* table of the *Compact Guide* or *Read Me First*. Your ISP may have already configured some of the fields in the wizard screens for you.

3.2 Encapsulation

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

3.2.1 ENET ENCAP

The MAC Encapsulated Routing Link Protocol (ENET ENCAP) is only implemented with the IP network protocol. IP packets are routed between the Ethernet interface and the WAN interface and then formatted so that they can be understood in a bridged environment. For instance, it encapsulates routed Ethernet frames into bridged ATM cells. ENET ENCAP requires that you specify a gateway IP address in the **Ethernet Encapsulation Gateway** field in the second wizard screen. You can get this information from your ISP.

3.2.2 PPP over Ethernet

PPPoE provides access control and billing functionality in a manner similar to dial-up services using PPP. The Prestige bridges a PPP session over Ethernet (PPP over Ethernet, RFC 2516) from your computer to an ATM PVC (Permanent Virtual Circuit) which connects to ADSL Access Concentrator where the PPP session terminates. One PVC can support any number of PPP sessions from your LAN. For more information on PPPoE, see the appendix.

3.2.3 PPPoA

PPPoA stands for Point to Point Protocol over ATM Adaptation Layer 5 (AAL5). It provides access control and billing functionality in a manner similar to dial-up services using PPP. The Prestige encapsulates the PPP session based on RFC1483 and sends it through an ATM PVC (Permanent Virtual Circuit) to the Internet Service Provider's (ISP) DSLAM (digital access multiplexer). Please refer to RFC 2364 for more information on PPPoA. Refer to RFC 1661 for more information on PPP.

3.2.4 RFC 1483

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

3.3 Multiplexing

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

3.3.1 VC-based Multiplexing

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

3.3.2 LLC-based Multiplexing

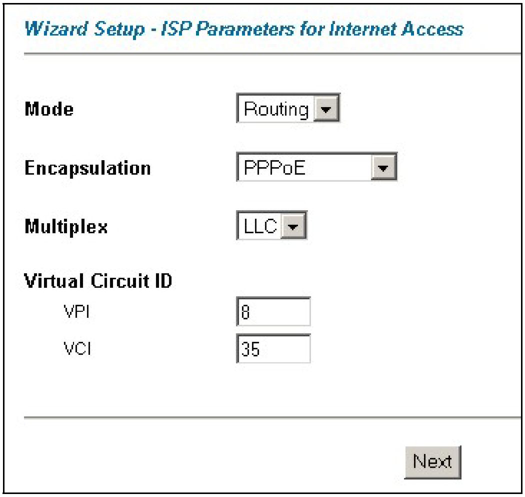
In this case one VC carries multiple protocols with protocol identifying information being contained in each packet header. Despite the extra bandwidth and processing overhead, this method may be advantageous if it is not practical to have a separate VC for each carried protocol, for example, if charging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

3.4 VPI and VCI

Be sure to use the correct Virtual Path Identifier (VPI) and Virtual Channel Identifier (VCI) numbers assigned to you. The valid range for the VPI is 0 to 255 and for the VCI is 32 to 65535 (0 to 31 is reserved for local management of ATM traffic). Please see the appendix for more information.

3.5 Wizard Setup Configuration: First Screen

In the **SITE MAP** screen click **Wizard Setup** to display the first wizard screen.



Wizard Setup - ISP Parameters for Internet Access

Mode: Routing

Encapsulation: PPPoE

Multiplex: LLC

Virtual Circuit ID

VPI: 8

VCI: 35

Figure 3-1 Wizard Screen 1

The following table describes the labels in this screen.

Table 3-1 Wizard Screen 1

LABEL	DESCRIPTION
Mode	From the **Mode** drop-down list box, select **Routing** (default) if your ISP allows multiple computers to share an Internet account. Otherwise select **Bridge**.
Encapsulation	Select the encapsulation type your ISP uses from the **Encapsulation** drop-down list box. Choices vary depending on what you select in the **Mode** field. If you select **Bridge** in the **Mode** field, select either **PPPoA** or **RFC 1483**. If you select **Routing** in the **Mode** field, select **PPPoA**, **RFC 1483**, **ENET ENCAP** or **PPPoE**.
Multiplex	Select the multiplexing method used by your ISP from the **Multiplex** drop-down list box either VC-based or LLC-based.
Virtual Circuit ID	VPI (Virtual Path Identifier) and VCI (Virtual Channel Identifier) define a virtual circuit. Refer to the appendix for more information.
VPI	Enter the VPI assigned to you. This field may already be configured.
VCI	Enter the VCI assigned to you. This field may already be configured.

Table 3-1 Wizard Screen 1

LABEL	DESCRIPTION
Next	Click this button to go to the next wizard screen. The next wizard screen you see depends on what protocol you chose above. Click on the protocol link to see the next wizard screen for that protocol.

3.6 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 computer on that network.

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

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.

3.7 IP Address Assignment

A static IP is a fixed IP that your ISP gives you. A dynamic IP is not fixed; the ISP assigns you a different one each time. The Single User Account feature can be enabled or disabled if you have either a dynamic or static IP. However the encapsulation method assigned influences your choices for IP address and ENET ENCAP Gateway.

3.7.1 IP Assignment with PPPoA or PPPoE Encapsulation

If you have a dynamic IP, then the IP Address and ENET ENCAP Gateway fields are not applicable (N/A). If you have a static IP, then you *only* need to fill in the IP Address field and *not* the ENET ENCAP Gateway field.

3.7.2 IP Assignment with RFC 1483 Encapsulation

In this case the IP Address Assignment *must* be static with the same requirements for the IP Address and ENET ENCAP Gateway fields as stated above.

3.7.3 IP Assignment with ENET ENCAP Encapsulation

In this case you can have either a static or dynamic IP. For a static IP you must fill in all the IP Address and ENET ENCAP Gateway fields as supplied by your ISP. However for a dynamic IP, the Prestige acts as a DHCP client on the WAN port and so the IP Address and ENET ENCAP Gateway fields are not applicable (N/A) as the DHCP server assigns them to the Prestige.

3.7.4 Private IP Addresses

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

```
10.0.0.0     —  10.255.255.255
172.16.0.0   —  172.31.255.255
192.168.0.0  —  192.168.255.255
```

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

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.*

3.8 Nailed-Up Connection (PPP)

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 when turned 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

3.9 NAT

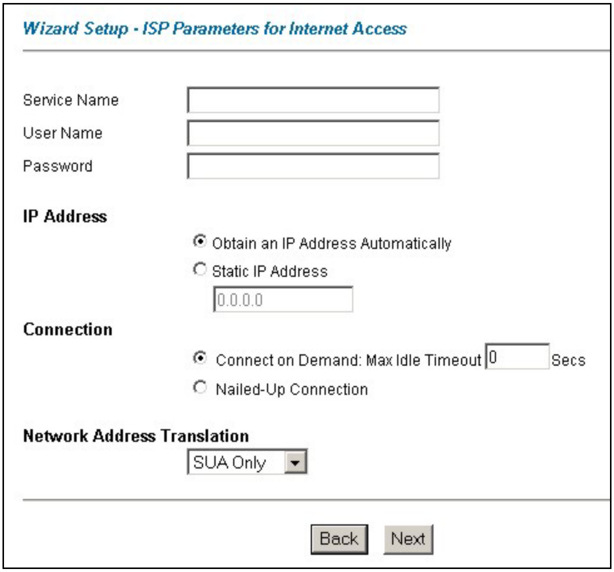
NAT (Network Address Translation - NAT, RFC 1631) is the translation of the IP address of a host in a packet, for example, the source address of an outgoing packet, used within one network to a different IP address known within another network.

3.10 Wizard Setup Configuration: Second Screen

The second wizard screen varies depending on what mode and encapsulation type you use. All screens shown are with routing mode. Configure the fields and click **Next** to continue.

3.10.1 PPPoE

Select **PPPoE** from the **Encapsulation** drop-down list box in the first wizard screen to display the screen as shown.



Wizard Setup - ISP Parameters for Internet Access

Service Name

User Name

Password

IP Address

● Obtain an IP Address Automatically

○ Static IP Address

0.0.0.0

Connection

● Connect on Demand: Max Idle Timeout 0 Secs

○ Nailed-Up Connection

Network Address Translation

SUA Only

Figure 3-2 Internet Connection with PPPoE

The following table describes the labels in this screen.

Table 3-2 Internet Connection with PPPoE

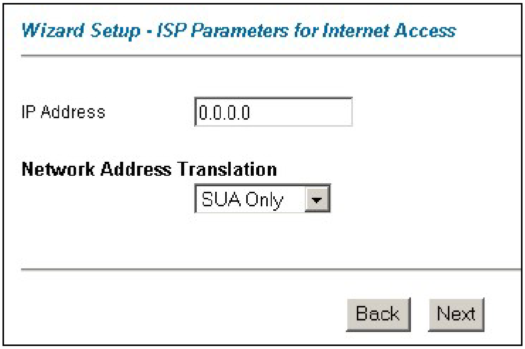
LABEL	DESCRIPTION
Service Name	Type the name of your PPPoE service here.
User Name	Configure **User Name** and **Password** fields for **PPPoA** and **PPPoE** encapsulation only. Enter the user name exactly as your ISP assigned. If assigned a name in the form user@domain where domain identifies a service name, then enter both components exactly as given.
Password	Enter the password associated with the user name above.
IP Address	A static IP address is a fixed IP that your ISP gives you. A dynamic IP address is not fixed; the ISP assigns you a different one each time you connect to the Internet. The Single User Account feature can be used with either a dynamic or static IP address. Select **Obtain an IP Address Automatically** if you have a dynamic IP address; otherwise select **Static IP Address** and type your ISP assigned IP address in the **IP Address** text box below.

Table 3-2 Internet Connection with PPPoE

LABEL	DESCRIPTION
Connection	Select **Connect on Demand** when you don't want the connection up all the time and specify an idle time-out (in seconds) in the **Max. Idle Timeout** field. The default setting selects **Connection on Demand** with 0 as the idle time-out, which means the Internet session will not timeout. Select **Nailed-Up Connection** when you want your connection up all the time. The Prestige will try to bring up the connection automatically if it is disconnected. The schedule rule(s) in SMT menu 26 has priority over your **Connection** settings.
Network Address Translation	Select **None**, **SUA Only** or **Full Feature** from the drop-sown list box. Refer to the NAT chapter for more details.
Back	Click **Back** to go back to the first wizard screen.
Next	Click **Next** to continue to the next wizard screen.

3.10.2 RFC 1483

Select **RFC 1483** from the **Encapsulation** drop-down list box in the first wizard screen to display the screen as shown.


Wizard Setup - ISP Parameters for Internet Access

IP Address 0.0.0.0

Network Address Translation SUA Only

Figure 3-3 Internet Connection with RFC 1483

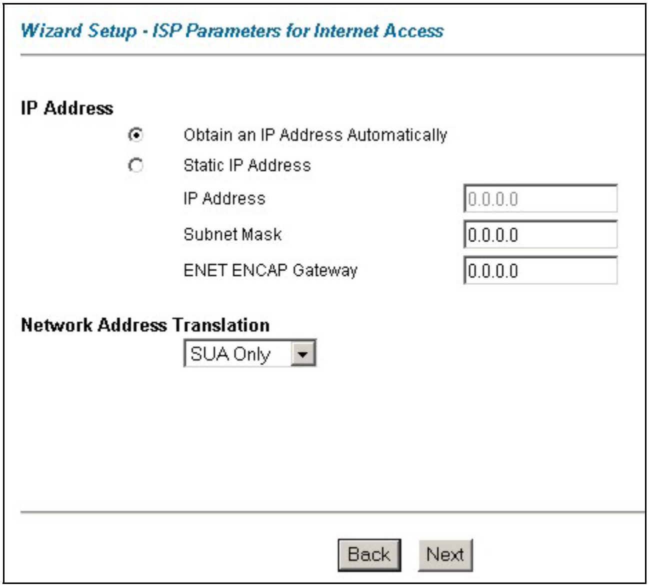
The following table describes the labels in this screen.

Table 3-3 Internet Connection with RFC 1483

LABEL	DESCRIPTION
IP Address	This field is available if you select **Routing** in the **Mode** field. Type your ISP assigned IP address in this field.
Network Address Translation	Select **None**, **SUA Only** or **Full Feature** from the drop-sown list box. Refer to the NAT chapter for more details.
Back	Click **Back** to go back to the first wizard screen.
Next	Click **Next** to continue to the next wizard screen.

3.10.3 ENET ENCAP

Select **ENET ENCAP** from the **Encapsulation** drop-down list box in the first wizard screen to display the screen as shown.



Wizard Setup - ISP Parameters for Internet Access

IP Address

● Obtain an IP Address Automatically

○ Static IP Address

IP Address: 0.0.0.0

Subnet Mask: 0.0.0.0

ENET ENCAP Gateway: 0.0.0.0

Network Address Translation: SUA Only

Figure 3-4 Internet Connection with ENET ENCAP

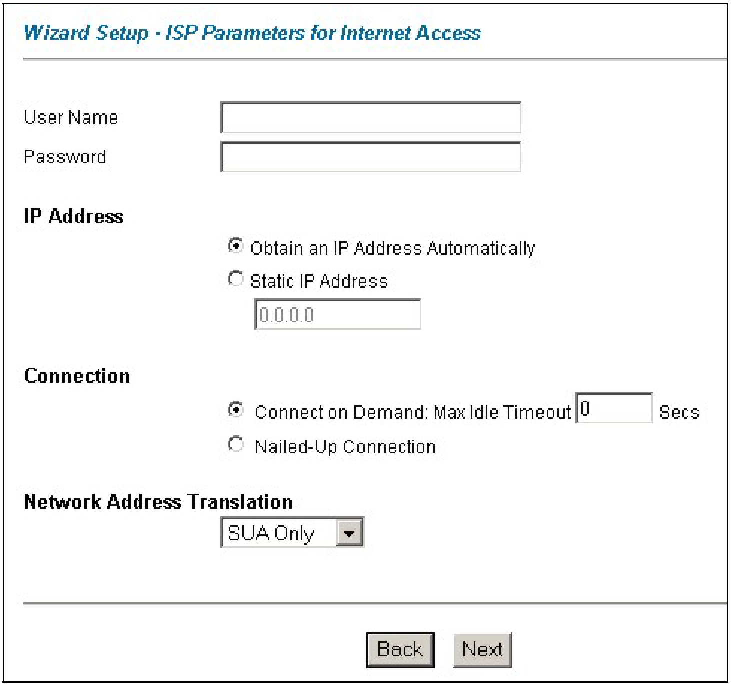
The following table describes the labels in this screen.

Table 3-4 Internet Connection with ENET ENCAP

LABEL	DESCRIPTION
IP Address	A static IP address is a fixed IP that your ISP gives you. A dynamic IP address is not fixed; the ISP assigns you a different one each time you connect to the Internet. The Single User Account feature can be used with either a dynamic or static IP address. Select **Obtain an IP Address Automatically** if you have a dynamic IP address; otherwise select **Static IP Address** and type your ISP assigned IP address in the **IP Address** text box below.
Subnet Mask	Enter a subnet mask in dotted decimal notation. Refer to the *IP Subnetting* appendix to calculate a subnet mask If you are implementing subnetting.
ENET ENCAP Gateway	You must specify a gateway IP address (supplied by your ISP) when you use **ENET ENCAP** in the **Encapsulation** field in the previous screen.
Network Address Translation	Select **None**, **SUA Only** or **Full Feature** from the drop-sown list box. Refer to the NAT chapter for more details.
Back	Click **Back** to go back to the first wizard screen.
Next	Click **Next** to continue to the next wizard screen.

3.10.4 PPPoA

Select **PPPoA** from the **Encapsulation** drop-down list box in the first wizard screen to display the screen as shown.



Wizard Setup - ISP Parameters for Internet Access

User Name

Password

IP Address

● Obtain an IP Address Automatically

○ Static IP Address

0.0.0.0

Connection

● Connect on Demand: Max Idle Timeout 0 Secs

○ Nailed-Up Connection

Network Address Translation

SUA Only

Figure 3-5 Internet Connection with PPPoA

The following table describes the labels in this screen.

Table 3-5 Internet Connection with PPPoA

LABEL	DESCRIPTION
User Name	Enter the user name exactly as your ISP assigned. If assigned a name in the form user@domain where domain identifies a service name, then enter both components exactly as given.
Password	Enter the password associated with the user name above.

Table 3-5 Internet Connection with PPPoA

LABEL	DESCRIPTION
IP Address	This option is available if you select **Routing** in the **Mode** field. A static IP address is a fixed IP that your ISP gives you. A dynamic IP address is not fixed; the ISP assigns you a different one each time you connect to the Internet. The Single User Account feature can be used with either a dynamic or static IP address. Click **Obtain an IP Address Automatically** if you have a dynamic IP address; otherwise click **Static IP Address** and type your ISP assigned IP address in the **IP Address** text box below.
Connection	Select **Connect on Demand** when you don't want the connection up all the time and specify an idle time-out (in seconds) in the **Max. Idle Timeout** field. The default setting selects **Connection on Demand** with 0 as the idle time-out, which means the Internet session will not timeout. Select **Nailed-Up Connection** when you want your connection up all the time. The Prestige will try to bring up the connection automatically if it is disconnected. The schedule rule(s) in SMT menu 26 has priority over your **Connection** settings.
Network Address Translation	This option is available if you select **Routing** in the **Mode** field. Select **None**, **SUA Only** or **Full Feature** from the drop-sown list box. Refer to the NAT chapter for more details.
Back	Click **Back** to go back to the first wizard screen.
Next	Click **Next** to continue to the next wizard screen.

3.11 DHCP Setup

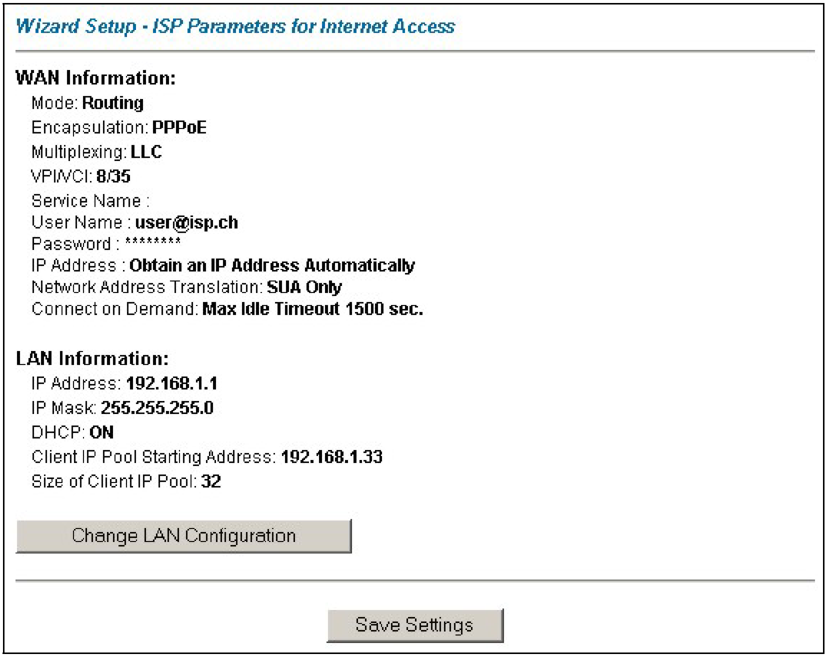
DHCP (Dynamic Host Configuration Protocol, RFC 2131 and RFC 2132) allows individual clients to obtain TCP/IP configuration at start-up from a server. You can configure the Prestige as a DHCP server or disable it. When configured as a server, the Prestige provides the TCP/IP configuration for the clients. If you turn DHCP service off, you must have another DHCP server on your LAN, or else the computer must be manually configured.

3.11.1 IP Pool Setup

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

3.12 Wizard Setup Configuration: Third Screen

Verify the settings in the screen shown next. To change the LAN information on the Prestige, click **Change LAN Configurations**. Otherwise click **Save Settings** to save the configuration and skip to section 3.13.



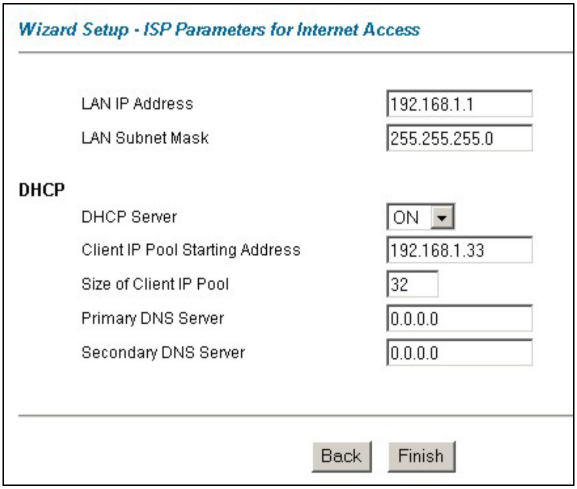
Wizard Setup - ISP Parameters for Internet Access

WAN Information:
Mode: Routing
Encapsulation: PPPoE
Multiplexing: LLC
VPI/VCI: 8/35
Service Name :
User Name : user@isp.ch
Password : ********
IP Address : Obtain an IP Address Automatically
Network Address Translation: SUA Only
Connect on Demand: Max Idle Timeout 1500 sec.

LAN Information:
IP Address: 192.168.1.1
IP Mask: 255.255.255.0
DHCP: ON
Client IP Pool Starting Address: 192.168.1.33
Size of Client IP Pool: 32

Figure 3-6 Wizard Screen 3

If you want to change your Prestige LAN settings, click **Change LAN Configuration** to display the screen as shown next.



Wizard Setup - ISP Parameters for Internet Access

LAN IP Address: 192.168.1.1

LAN Subnet Mask: 255.255.255.0

DHCP

DHCP Server: ON

Client IP Pool Starting Address: 192.168.1.33

Size of Client IP Pool: 32

Primary DNS Server: 0.0.0.0

Secondary DNS Server: 0.0.0.0

Figure 3-7 Wizard : LAN Configuration

The following table describes the labels in this screen.

Table 3-6 Wizard : LAN Configuration

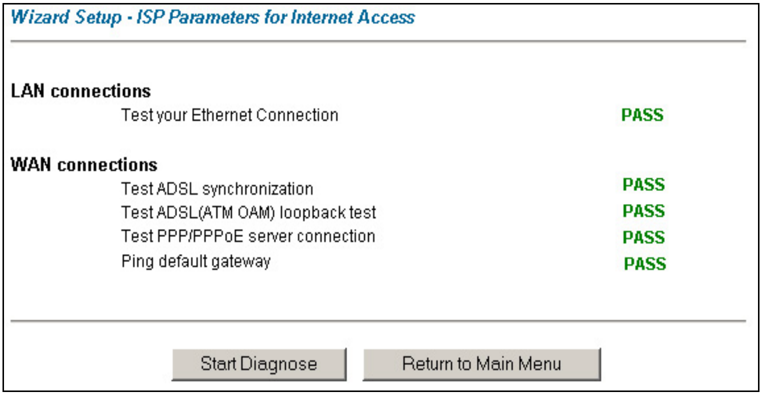
LABEL	DESCRIPTION
LAN IP Address	Enter the IP address of your Prestige in dotted decimal notation, for example, 192.168.1.1 (factory default). **If you changed the Prestige's LAN IP address, you must use the new IP address if you want to access the web configurator again.**
LAN Subnet Mask	Enter a subnet mask in dotted decimal notation.
DHCP	
DHCP Server	From the **DHCP Server** drop-down list box, select **On** to allow your Prestige to assign IP addresses, an IP default gateway and DNS servers to computer systems that support the DHCP client. Select **Off** to disable DHCP server. When DHCP server is used, set the following items:

Table 3-6 Wizard : LAN Configuration

LABEL	DESCRIPTION
Client IP Pool Starting Address	This field specifies the first of the contiguous addresses in the IP address pool.
Size of Client IP Pool	This field specifies the size or count of the IP address pool.
Primary DNS Server	Enter the IP addresses of the DNS servers. The DNS servers are passed to the DHCP clients along with the IP address and the subnet mask.
Secondary DNS Server	As above.
Back	Click **Back** to go back to the previous screen.
Finish	Click **Finish** to save the settings and proceed to the next wizard screen.

3.13 Wizard Setup Configuration: Connection Tests

The Prestige automatically tests the connection to the computer(s) connected to the LAN ports. To test the connection from the Prestige to the ISP, click **Start Diagnose**. Otherwise click **Return to Main Menu** to go back to the **Site Map** screen.



Wizard Setup - ISP Parameters for Internet Access

LAN connections

Test your Ethernet Connection PASS

WAN connections

Test ADSL synchronization PASS
Test ADSL(ATM OAM) loopback test PASS
Test PPP/PPPoE server connection PASS
Ping default gateway PASS

Figure 3-8 Wizard Screen 4

3.14 Test Your Internet Connection

Launch your web browser and navigate to www.zyxel.com. Internet access is just the beginning. Refer to the rest of this *User’s Guide* for more detailed information on the complete range of Prestige features. If you cannot access the Internet, open the web configurator again to confirm that the Internet settings you configured in the Wizard Setup are correct.

Part II:

LAN, Wireless LAN and WAN

This part covers the LAN (Local Area Network), wireless LAN and WAN setup.

Chapter 4
LAN Setup

This chapter describes how to configure LAN settings.

4.1 LAN Overview

A Local Area Network (LAN) is a shared communication system to which many computers are attached. A LAN is a computer network limited to the immediate area, usually the same building or floor of a building. The LAN screens can help you configure a LAN DHCP server and manage IP addresses.

4.1.1 LANs, WANs and the Prestige

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

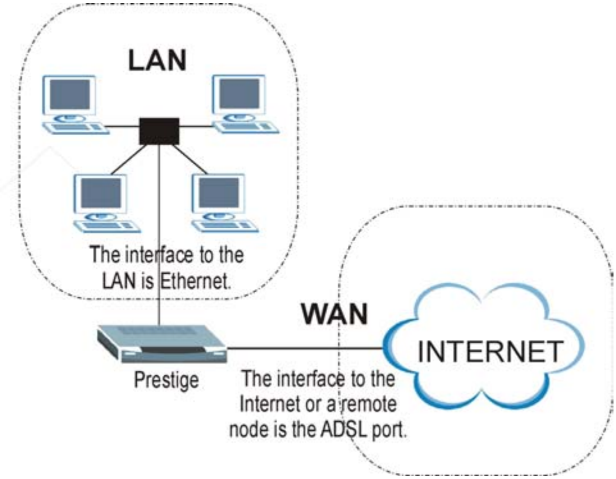

LAN
The interface to the LAN is Ethernet.
WAN
INTERNET
Prestige
The interface to the Internet or a remote node is the ADSL port.

Figure 4-1 LAN and WAN IP Addresses

4.2 DNS Server Address

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

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

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

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

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

4.3 DNS Server Address Assignment

Use DNS (Domain Name System) to map a domain name to its corresponding IP address and vice versa. 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.

4.4 LAN TCP/IP

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

4.4.1 Factory LAN Defaults

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

- IP address of 192.168.1.1 with subnet mask of 255.255.255.0 (24 bits)
- 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), read the embedded web configurator help regarding what fields need to be configured.

4.4.2 IP Address and Subnet Mask

Refer to the *IP Address and Subnet Mask* section in the **Wizard Setup** chapter for this information.

4.4.3 RIP Setup

RIP (Routing Information Protocol) 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:

1. **Both -** the Prestige will broadcast its routing table periodically and incorporate the RIP information that it receives.
2. **In Only -** the Prestige will not send any RIP packets but will accept all RIP packets received.
3. **Out Only -** the Prestige will send out RIP packets but will not accept any RIP packets received.
4. **None -** the Prestige 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.

4.4.4 Multicast

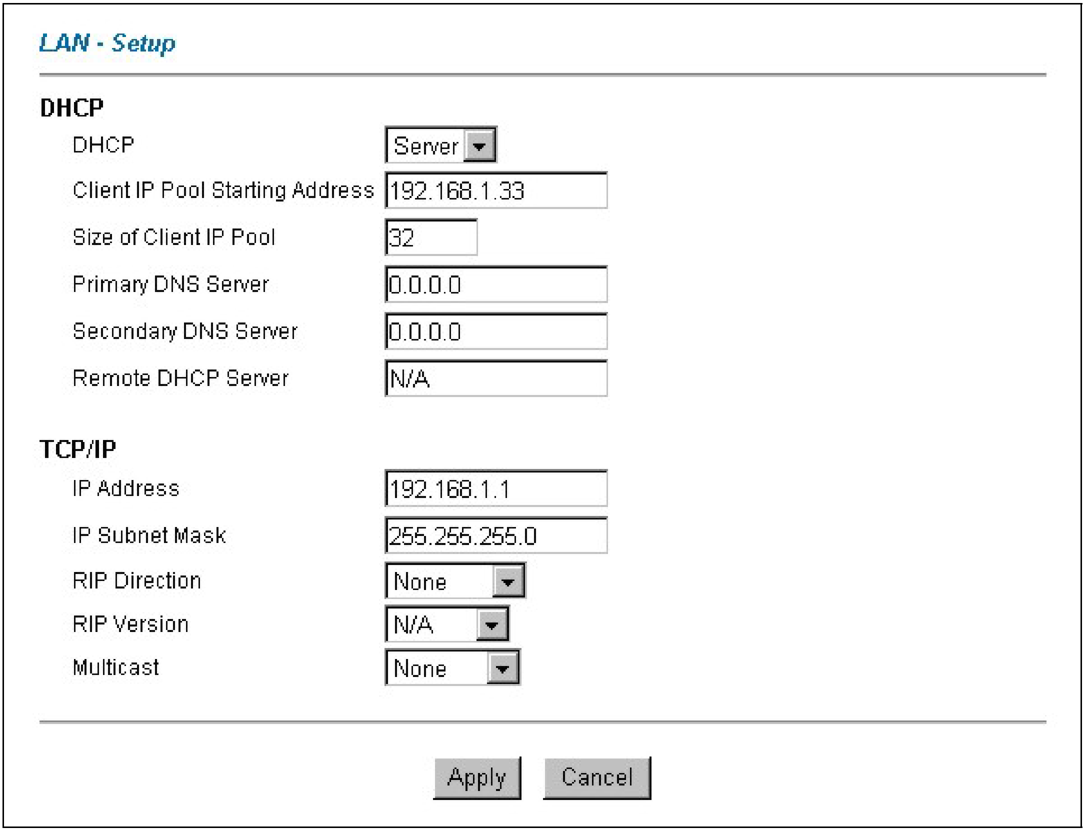
Traditionally, IP packets are transmitted in one of either two ways - Unicast (1 sender - 1 recipient) or Broadcast (1 sender - everybody on the network). Multicast delivers IP packets to a group of hosts on the network - not everybody and not just 1.

IGMP (Internet Group Multicast Protocol) is a network-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 in the web configurator (**LAN**; **WAN**). Select **None** to disable IP multicasting on these interfaces.

4.5 Configuring LAN

Click **LAN** to open the following screen.



LAN - Setup

DHCP

DHCP: Server

Client IP Pool Starting Address: 192.168.1.33

Size of Client IP Pool: 32

Primary DNS Server: 0.0.0.0

Secondary DNS Server: 0.0.0.0

Remote DHCP Server: N/A

TCP/IP

IP Address: 192.168.1.1

IP Subnet Mask: 255.255.255.0

RIP Direction: None

RIP Version: N/A

Multicast: None

Figure 4-2 LAN

The following table describes the labels in this screen.

Table 4-1 LAN

LABEL	DESCRIPTION
DHCP	

Table 4-1 LAN

LABEL	DESCRIPTION
DHCP	If set to **Server**, your Prestige can assign IP addresses, an IP default gateway and DNS servers to Windows 95, Windows NT and other systems that support the DHCP client. If set to **None**, the DHCP server will be disabled. If set to **Relay**, the Prestige acts as a surrogate DHCP server and relays DHCP requests and responses between the remote server and the clients. Enter the IP address of the actual, remote DHCP server in the Remote DHCP Server field in this case. When DHCP is used, the following items need to be set:
Client IP Pool Starting Address	This field specifies the first of the contiguous addresses in the IP address pool.
Size of Client IP Pool	This field specifies the size or count of the IP address pool.
Primary DNS Server	Enter the IP addresses of the DNS servers. The DNS servers are passed to the DHCP clients along with the IP address and the subnet mask.
Secondary DNS Server	As above.
Remote DHCP Server	If **Relay** is selected in the **DHCP** field above then enter the IP address of the actual remote DHCP server here.
TCP/IP	
IP Address	Enter the IP address of your Prestige in dotted decimal notation, for example, 192.168.1.1 (factory default).
IP Subnet Mask	Type the subnet mask assigned to you by your ISP (if given).
RIP Direction	Select the RIP direction from **None**, **Both**, **In Only** and **Out Only**.
RIP Version	Select the RIP version from **RIP-1**, **RIP-2B** and **RIP-2M**.
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**. Select **None** to disable it.
Apply	Click this button to save these settings back to the Prestige.
Cancel	Click this button to reset the fields in this screen.

Chapter 5
Wireless LAN Setup

This chapter discusses how to configure Wireless LAN on the Prestige. This chapter is only applicable to the Prestige 650H and Prestige 650HW.

5.1 Wireless LAN Overview

This section introduces the wireless LAN and some basic configurations. Wireless LANs can be as simple as two computers with wireless LAN cards communicating in a peer-to-peer network or as complex as a number of computers with wireless LAN cards communicating through access points which bridge network traffic to the wired LAN.

The WLAN screens are only available when a WLAN card is installed.

5.1.1 Additional Installation Requirements for Using 802.1x

- A computer with an IEEE 802.11b wireless LAN card and equipped with a web browser (with JavaScript enabled) and/or Telnet.
- A wireless station computer must be running IEEE 802.1x-compliant software. Currently, this is offered in Windows XP.
- An optional network RADIUS server for remote user authentication and accounting.

5.1.2 Channel

The range of radio frequencies used by IEEE 802.11b wireless devices is called a “channel”. Channels available depend on your geographical area. You may have a choice of channels (for your region) so you should use a different channel than an adjacent AP (access point) to reduce interference. Interference occurs when radio signals from different access points overlap causing interference and degrading performance.

Adjacent channels partially overlap however. To avoid interference due to overlap, your AP should be on a channel at least five channels away from a channel that an adjacent AP is using. For example, if your region has 11 channels and an adjacent AP is using channel 1, then you need to select a channel between 6 or 11.

5.1.3 ESS ID

An Extended Service Set (ESS) is a group of access points or wireless gateways connected to a wired LAN on the same subnet. An ESS ID uniquely identifies each set. All access points or wireless gateways and their associated wireless stations in the same set must have the same ESSID.

5.1.4 RTS/CTS

A hidden node occurs when two stations are within range of the same access point, but are not within range of each other. The following figure illustrates a hidden node. Both stations (STA) are within range of the access point (AP) or wireless gateway, but out-of-range of each other, so they cannot "hear" each other, that is they do not know if the channel is currently being used. Therefore, they are considered hidden from each other.

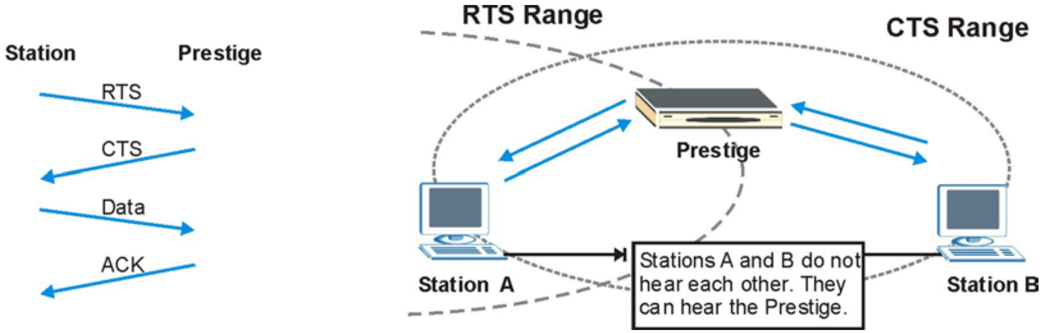


Figure 5-1 RTS/CTS

When station A sends data to the Prestige, it might not know that the station B is already using the channel. If these two stations send data at the same time, collisions may occur when both sets of data arrive at the AP at the same time, resulting in a loss of messages for both stations.

RTS/CTS is designed to prevent collisions due to hidden nodes. An **RTS/CTS** defines the biggest size data frame you can send before an RTS (Request To Send)/CTS (Clear to Send) handshake is invoked.

When a data frame exceeds the **RTS/CTS** value you set (between 0 to 2432 bytes), the station that wants to transmit this frame must first send an RTS (Request To Send) message to the AP for permission to send it. The AP then responds with a CTS (Clear to Send) message to all other stations within its range to notify them to defer their transmission. It also reserves and confirms with the requesting station the time frame for the requested transmission.

Stations can send frames smaller than the specified **RTS/CTS** directly to the AP without the RTS (Request To Send)/CTS (Clear to Send) handshake.

You should only configure **RTS/CTS** if the possibility of hidden nodes exists on your network and the "cost" of resending large frames is more than the extra network overhead involved in the RTS (Request To Send)/CTS (Clear to Send) handshake.

If the **RTS/CTS** value is greater than the **Fragmentation Threshold** value (see next), then the RTS (Request To Send)/CTS (Clear to Send) handshake will never occur as data frames will be fragmented before they reach **RTS/CTS** size.

Enabling the RTS Threshold causes redundant network overhead that could negatively affect the throughput performance instead of providing a remedy.

5.1.5 Fragmentation Threshold

A **Fragmentation Threshold** is the maximum data fragment size (between 256 and 2432 bytes) that can be sent in the wireless network before the Prestige will fragment the packet into smaller data frames.

A large **Fragmentation Threshold** is recommended for networks not prone to interference while you should set a smaller threshold for busy networks or networks that are prone to interference.

If the **Fragmentation Threshold** value is smaller than the **RTS/CTS** value (see previously) you set then the RTS (Request To Send)/CTS (Clear to Send) handshake will never occur as data frames will be fragmented before they reach **RTS/CTS** size.

5.2 Levels of Security

Wireless security is vital to your network to protect wireless communication between wireless stations, access points and the wired network.

The figure below shows the possible wireless security levels on your Prestige. The highest security level relies on EAP (Extensible Authentication Protocol) for authentication and utilizes dynamic WEP key exchange. It requires interaction with a RADIUS (Remote Authentication Dial-In User Service) server either on the WAN or your LAN to provide authentication service for wireless stations.

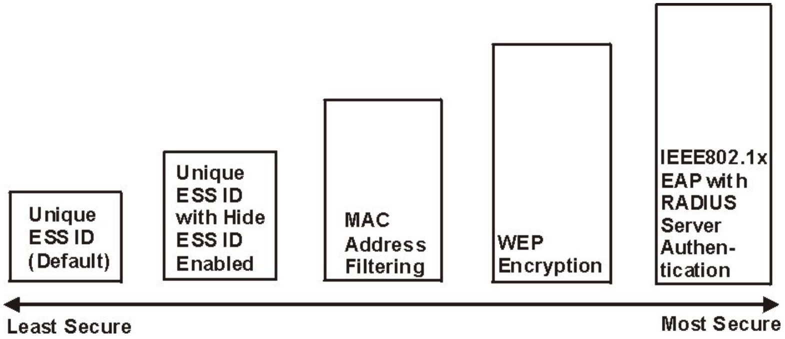

Unique ESS ID (Default)
Unique ESS ID with Hide ESS ID Enabled
MAC Address Filtering
WEP Encryption
IEEE802.1x EAP with RADIUS Server Authen-tication
Least Secure
Most Secure

Figure 5-2 Prestige Wireless Security Levels

If you do not enable any wireless security on your Prestige, your network is accessible to any wireless networking device that is within range.

Use the Prestige web configurator to configurator to set up your wireless LAN security settings. Refer to the chapter on using the Prestige web configurator to see how to access the web configurator.

5.3 Data Encryption with WEP

WEP encryption scrambles the data transmitted between the wireless stations and the access points to keep network communications private. It encrypts unicast and multicast communications in a network. Both the wireless stations and the access points must use the same WEP key for data encryption and decryption.

Your Prestige allows you to configure up to four 64-bit or 128-bit WEP keys but only one key can be enabled at any one time.

5.4 Inserting a PCMCIA Wireless LAN Card

Use a ZyAIR series wireless LAN PCMCIA card to add wireless LAN capabilities.

Step 1. Turn off the Prestige.

Never insert or remove a wireless LAN card when the Prestige is turned on.

Step 2. Locate the slot labeled **Wireless LAN** on the Prestige.

Step 3. With its pin connector facing the slot and the LED side facing upwards, slide the ZyAIR wireless LAN card into the slot.

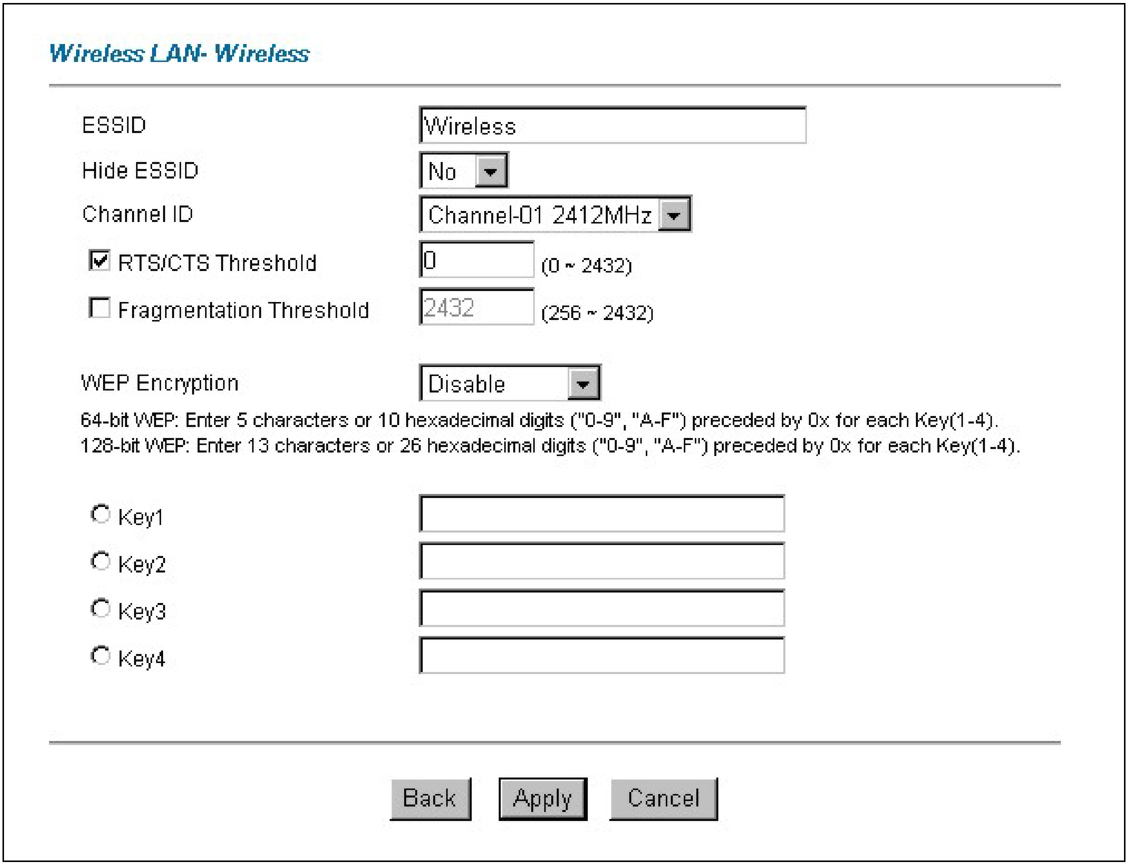
Never force, bend or twist the wireless LAN card into the slot.

Step 4. Turn on the Prestige. The **WLAN** LED should turn on.

5.5 Configuring Wireless LAN

If you are configuring the Prestige from a computer connected to the wireless LAN and you change the Prestige's ESSID or WEP settings, you will lose your wireless connection when you press Apply to confirm. You must then change the wireless settings of your computer to match the Prestige's new settings.

Click **Wireless LAN**, **Wireless** to open the **Wireless** screen.



Wireless LAN- Wireless

ESSID: Wireless

Hide ESSID: No

Channel ID: Channel-01 2412MHz

☑ RTS/CTS Threshold: 0 (0 ~ 2432)

☐ Fragmentation Threshold: 2432 (256 ~ 2432)

WEP Encryption: Disable

64-bit WEP: Enter 5 characters or 10 hexadecimal digits ("0-9", "A-F") preceded by 0x for each Key(1-4).
128-bit WEP: Enter 13 characters or 26 hexadecimal digits ("0-9", "A-F") preceded by 0x for each Key(1-4).

○ Key1

○ Key2

○ Key3

○ Key4

Figure 5-3 Wireless

The following table describes the labels in this screen.

Table 5-1 Wireless

LABEL	DESCRIPTION
ESSID	The ESSID (Extended Service Set Identification) is a unique name to identify the Prestige in the wireless LAN. Wireless stations associating to the Prestige must have the same ESSID. Enter a descriptive name (up to 32 characters).

Table 5-1 Wireless

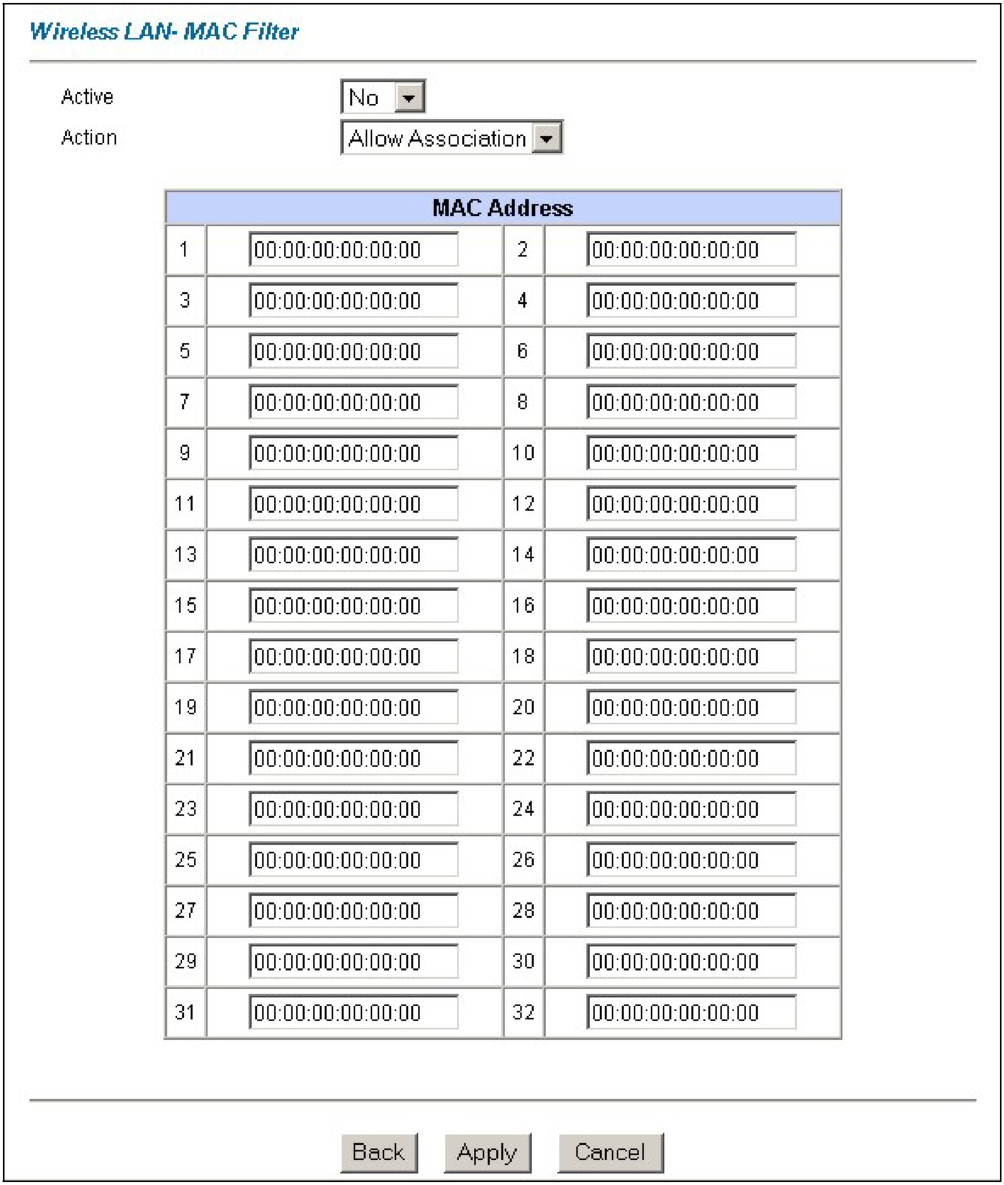
LABEL	DESCRIPTION
Hide ESSID	Select **Yes** to hide the ESSID in so a station cannot obtain the ESSID through passive scanning. Select **No** to make the ESSID visible so a station can obtain the ESSID through passive scanning.
Channel ID	The range of radio frequencies used by IEEE 802.11b wireless devices is called a channel. Select a channel from the drop-down list box.
RTS/CTS Threshold	The RTS (Request To Send) threshold (number of bytes) for enabling RTS/CTS handshake. Data with its frame size larger than this value will perform the RTS/CTS handshake. Setting this attribute to be larger than the maximum MSDU (MAC service data unit) size turns off the RTS/CTS handshake. Setting this attribute to zero turns on the RTS/CTS handshake. Enter a value between 0 and 2432.
Fragmentation Threshold	The threshold (number of bytes) for the fragmentation boundary for directed messages. It is the maximum data fragment size that can be sent. Enter a value between 256 and 2432.
WEP Encryption	WEP (Wired Equivalent Privacy) encrypts data frames before transmitting over the wireless network. Select **Disable** to allow all wireless computers to communicate with the access points without any data encryption. Select **64-bit WEP** or **128-bit WEP** to use data encryption.
Key 1 to Key 4	The WEP keys are used to encrypt data. Both the Prestige and the wireless stations must use the same WEP key for data transmission. If you chose **64-bit WEP**, then enter any 5 ASCII characters or 10 hexadecimal characters ("0-9", "A-F"). If you chose **128-bit WEP**, then enter 13 ASCII characters or 26 hexadecimal characters ("0-9", "A-F"). You must configure all four keys, but only one key can be activated at any one time. The default key is key 1.
Back	Click **Back** to go to the main wireless LAN setup screen.
Apply	Click **Apply** to save your changes back to the Prestige.
Cancel	Click **Cancel** to begin configuring this screen afresh.

5.6 Configuring MAC Filter

The MAC filter screen allows you to configure the Prestige to give exclusive access to up to 32 devices (Allow Association) or exclude up to 32 devices from accessing the Prestige (Deny Association). Every Ethernet device has a unique MAC (Media Access Control) address. The MAC address is assigned at the factory and consists of six pairs of hexadecimal characters, for example, 00:A0:C5:00:00:02. You need to know the MAC address of the devices to configure this screen.

To change your Prestige's MAC filter settings, click **Wireless LAN**, **MAC Filter** to open the **MAC Filter** screen. The screen appears as shown.

.



Wireless LAN- MAC Filter

Active: No

Action: Allow Association

MAC Address			
1	00:00:00:00:00:00	2	00:00:00:00:00:00
3	00:00:00:00:00:00	4	00:00:00:00:00:00
5	00:00:00:00:00:00	6	00:00:00:00:00:00
7	00:00:00:00:00:00	8	00:00:00:00:00:00
9	00:00:00:00:00:00	10	00:00:00:00:00:00
11	00:00:00:00:00:00	12	00:00:00:00:00:00
13	00:00:00:00:00:00	14	00:00:00:00:00:00
15	00:00:00:00:00:00	16	00:00:00:00:00:00
17	00:00:00:00:00:00	18	00:00:00:00:00:00
19	00:00:00:00:00:00	20	00:00:00:00:00:00
21	00:00:00:00:00:00	22	00:00:00:00:00:00
23	00:00:00:00:00:00	24	00:00:00:00:00:00
25	00:00:00:00:00:00	26	00:00:00:00:00:00
27	00:00:00:00:00:00	28	00:00:00:00:00:00
29	00:00:00:00:00:00	30	00:00:00:00:00:00
31	00:00:00:00:00:00	32	00:00:00:00:00:00

Figure 5-4 MAC Address Filter

The following table describes the labels in this menu.

Table 5-2 MAC Address Filter

LABEL	DESCRIPTION
Active	Select **Yes** from the drop down list box to enable MAC address filtering.
Action	Define the filter action for the list of MAC addresses in the MAC address filter table. Select **Deny Association** to block access to the router, MAC addresses not listed will be allowed to access the router. Select **Allow Association** to permit access to the router, MAC addresses not listed will be denied access to the router.
MAC Address	Enter the MAC addresses (in XX:XX:XX:XX:XX:XX format) of the wireless station that are allowed or denied access to the Prestige in these address fields.
Back	Click **Back** to go to the main wireless LAN setup screen.
Apply	Click **Apply** to save your changes back to the Prestige.
Cancel	Click **Cancel** to begin configuring this screen afresh.

5.7 802.1x Overview

The IEEE 802.1x standard outlines enhanced security methods for both the authentication of wireless stations and encryption key management. Authentication can be done using the local user database internal to the Prestige (authenticate up to 32 users) or an external RADIUS server for an unlimited number of users.

5.8 Introduction to RADIUS

RADIUS is based on a client-sever model that supports authentication and accounting, where access point is the client and the server is the RADIUS server. The RADIUS server handles the following tasks among others:

- **Authentication**

  Determines the identity of the users.

- **Accounting**

  Keeps track of the client's network activity.

RADIUS user is a simple package exchange in which your Prestige acts as a message relay between the wireless station and the network RADIUS server.

Types of RADIUS Messages

The following types of RADIUS messages are exchanged between the access point and the RADIUS server for user authentication:

- **Access-Request**

  Sent by an access point requesting authentication.

- **Access-Reject**

  Sent by a RADIUS server rejecting access.

- **Access-Accept**

  Sent by a RADIUS server allowing access.

- **Access-Challenge**

  Sent by a RADIUS server requesting more information in order to allow access. The access point sends a proper response from the user and then sends another Access-Request message.

The following types of RADIUS messages are exchanged between the access point and the RADIUS server for user accounting:

- **Accounting-Request**

  Sent by the access point requesting accounting.

- **Accounting-Response**

  Sent by the RADIUS server to indicate that it has started or stopped accounting.

In order to ensure network security, the access point and the RADIUS server use a shared secret key, which is a password, they both know. The key is not sent over the network. In addition to the shared key, password information exchanged is also encrypted to protect the wired network from unauthorized access.

5.8.1 EAP Authentication Overview

EAP (Extensible Authentication Protocol) is an authentication protocol that runs on top of the IEEE802.1x transport mechanism in order to support multiple types of user authentication. By using EAP to interact with an EAP-compatible RADIUS server, the access point helps a wireless station and a RADIUS server perform authentication.

The type of authentication you use depends on the RADIUS server or the AP. The Prestige supports EAP-TLS, EAP-TTLS and DEAP with RADIUS. Refer to the *Types of EAP Authentication* appendix for descriptions on the four common types.

Your Prestige supports EAP-MD5 (Message-Digest Algorithm 5) with the local user database and RADIUS.

The following figure shows an overview of authentication when you specify a RADIUS server on your access point.

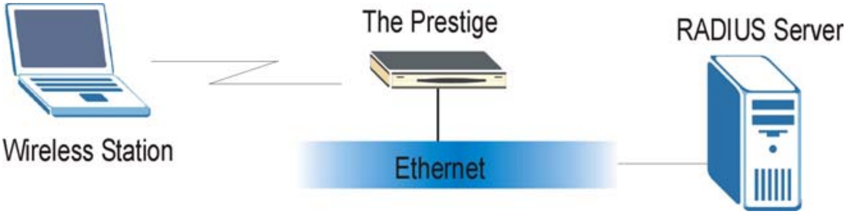


Figure 5-5 EAP Authentication

The details below provide a general description of how IEEE 802.1x EAP authentication works. For an example list of EAP-MD5 authentication steps, see the IEEE 802.1x appendix.

Step 1. The wireless station sends a "start" message to the Prestige.

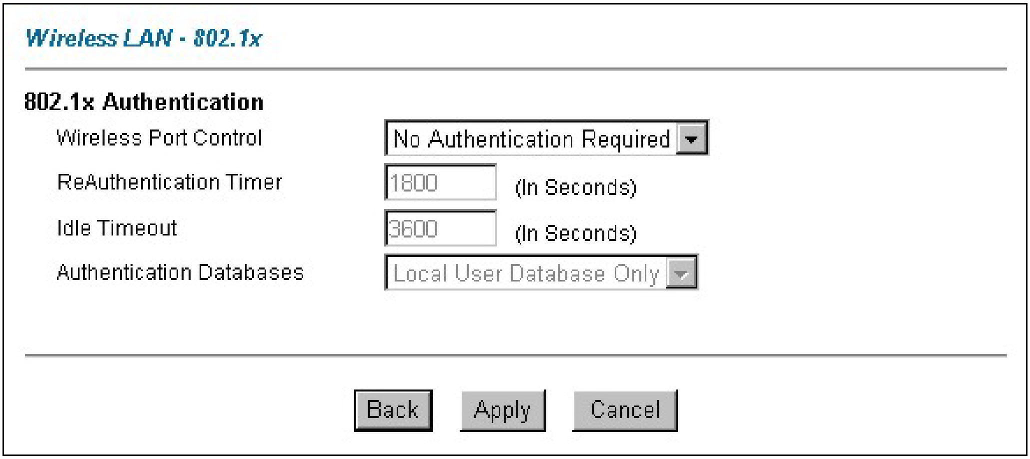
Step 2. The Prestige sends a "request identity" message to the wireless station for identity information.

Step 3. The wireless station replies with identity information, including username and password.

Step 4. The RADIUS server checks the user information against its user profile database and determines whether or not to authenticate the wireless station.

5.9 Configuring 802.1x

To change your Prestige's authentication settings, click **Wireless LAN**, **802.1x**. The screen appears as shown.



Wireless LAN - 802.1x

802.1x Authentication

Wireless Port Control	No Authentication Required
ReAuthentication Timer	1800 (In Seconds)
Idle Timeout	3600 (In Seconds)
Authentication Databases	Local User Database Only

Figure 5-6 802.1x

The following table describes the labels in this screen.

Table 5-3 802.1x

LABEL	DESCRIPTION
Wireless Port Control	To control wireless stations access to the wired network, select a control method from the drop-down list box. Choose from **No Authentication Required**, **Authentication Required** and **No Access Allowed**. **No Authentication Required** allows all wireless stations access to the wired network without entering user names and passwords. This is the default setting. **Authentication Required** means that all wireless stations have to enter user names and passwords before access to the wired network is allowed. **No Access Allowed** blocks all wireless stations access to the wired network.
ReAuthentication Timer	Specify how often wireless stations have to re-enter user names and passwords in order to stay connected. This field is activated only when you select **Authentication Required** in the **Wireless Port Control** field. Enter a time interval between 10 and 9999 seconds. The default time interval is **1800** seconds (30 minutes). **If wireless station authentication is done using a RADIUS server, the reauthentication timer on the RADIUS server has priority.**
Idle Timeout	The Prestige automatically disconnects a wireless station from the wired network after a period of inactivity. The wireless station needs to enter the user name and password again before access to the wired network is allowed. This field is activated only when you select **Authentication Required** in the **Wireless Port Control** field. The default time interval is **3600** seconds (1 hour).

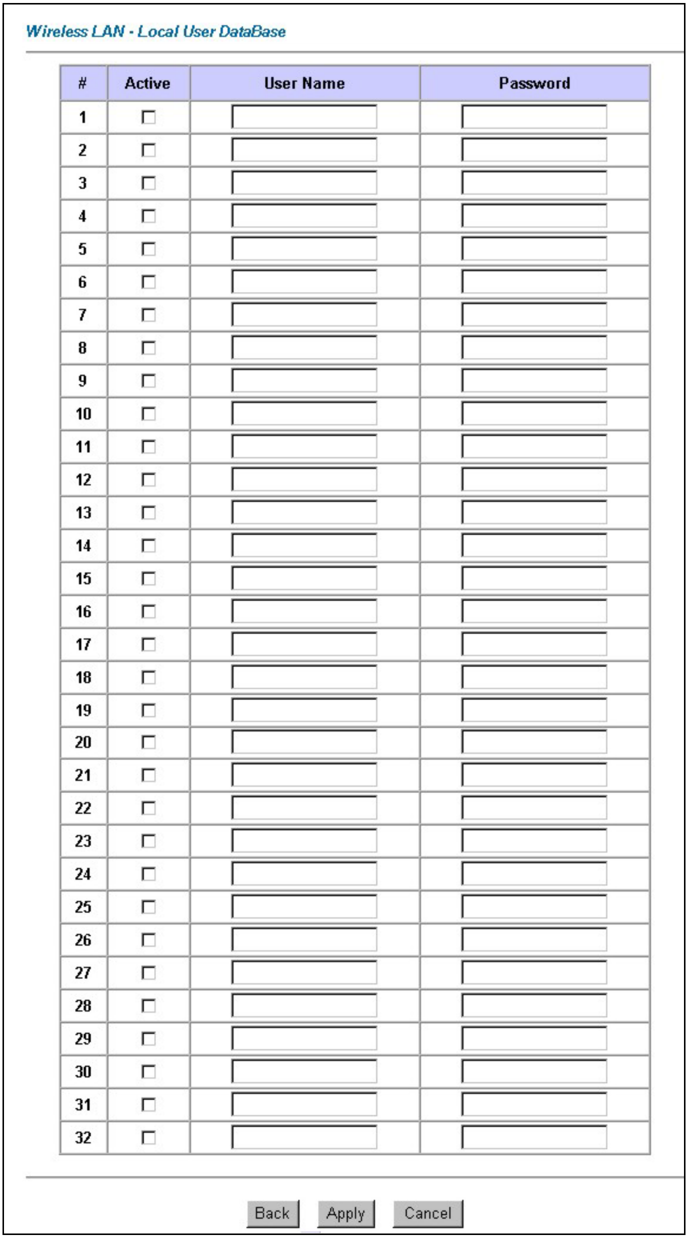
Table 5-3 802.1x

LABEL	DESCRIPTION
Authentication Databases	This field is activated only when you select **Authentication Required** in the **Wireless Port Control** field. The authentication database contains wireless station login information. The local user database is the built-in database on the Prestige. The RADIUS is an external server. Use this drop-down list box to select which database the Prestige should use (first) to authenticate a wireless station. Before you specify the priority, make sure you have set up the corresponding database(s) correctly. Select **Local User Database Only** to have the Prestige just check the built-in user database on the Prestige for a wireless station's user name and password. Select **RADIUS Only** to have the Prestige just check the user database on the specified RADIUS server for a wireless station's user name and password. Select **Local first, then RADIUS** to have the Prestige first check the user database on the Prestige for a wireless station's user name and password. If the user name is not found, the Prestige checks the user database on the specified RADIUS server. Select **RADIUS first, then Local** to have the Prestige first check the user database on the specified RADIUS server for a wireless station's user name and password. When the user name is not found or password does not match in the RADIUS server, the Prestige will not check the local user database and the authentication fails. If the Prestige cannot reach the RADIUS server, then the Prestige checks the local user database on the Prestige.
Back	Click **Back** to go to the main wireless LAN setup screen.
Apply	Click **Apply** to save these settings back to the Prestige.
Cancel	Click **Cancel** to begin configuring this screen again.

5.10 Configuring Local User Authentication

By storing user profiles locally, your Prestige is able to authenticate wireless users without interacting with a network RADIUS server. However, there is a limit on the number of users you may authenticate in this way.

To change your Prestige's local user database, click **Wireless LAN**, **Local User Database**. The screen appears as shown.



Wireless LAN - Local User DataBase

#	Active	User Name	Password
1	□		
2	□		
3	□		
4	□		
5	□		
6	□		
7	□		
8	□		
9	□		
10	□		
11	□		
12	□		
13	□		
14	□		
15	□		
16	□		
17	□		
18	□		
19	□		
20	□		
21	□		
22	□		
23	□		
24	□		
25	□		
26	□		
27	□		
28	□		
29	□		
30	□		
31	□		
32	□		

Figure 5-7 Local User Database

The following table describes the labels in this screen.

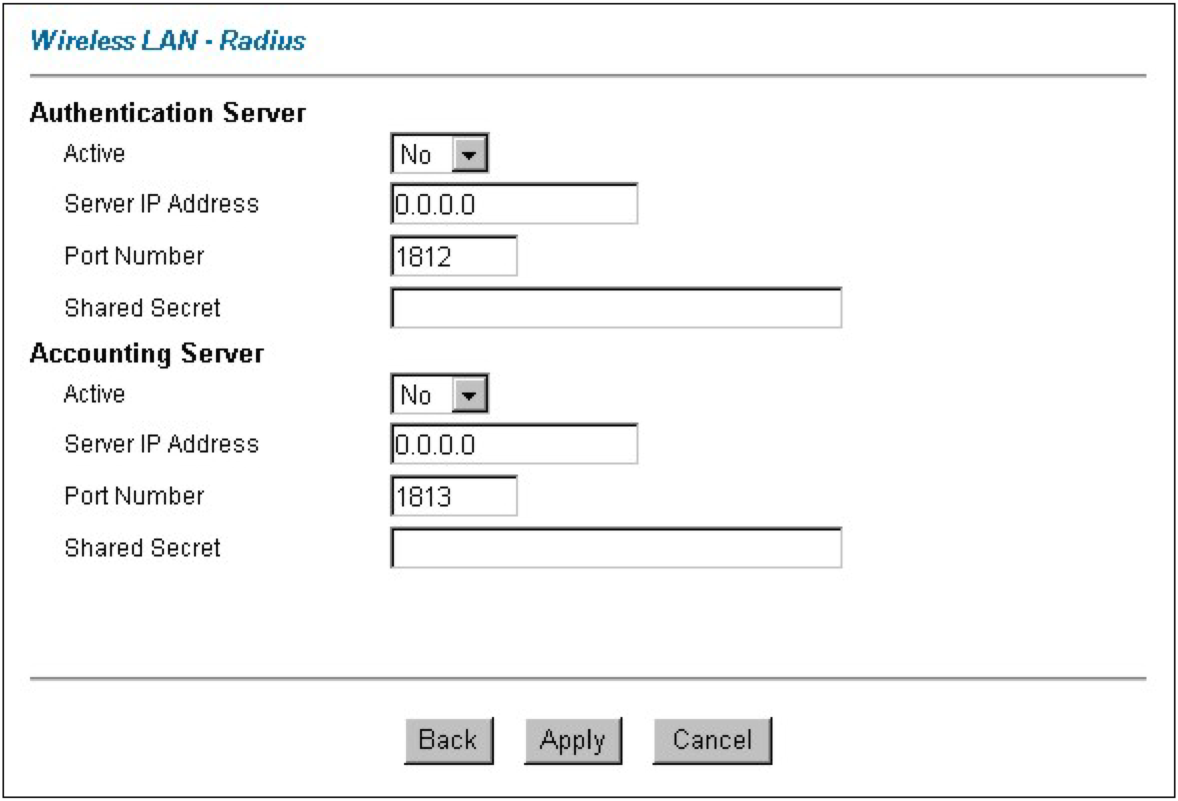
Table 5-4 Local User Database

LABEL	DESCRIPTION
#	This is the index number of a local user account.
Active	Select this check box to enable the user profile.
User Name	Enter the user name of the user profile.
Password	Enter a password up to 31 characters long for this user profile.
Back	Click **Back** to go to the main wireless LAN setup screen.
Apply	Click **Apply** to save these settings back to the Prestige.
Cancel	Click **Cancel** to begin configuring this screen again.

5.11 Configuring RADIUS

Once you enable the EAP authentication, you need to specify the external sever for remote user authentication and accounting.

To set up your Prestige’s RADIUS server settings, click **WIRELESS LAN**, **RADIUS**. The screen appears as shown.



Wireless LAN - Radius

Authentication Server

Active: No

Server IP Address: 0.0.0.0

Port Number: 1812

Shared Secret:

Accounting Server

Active: No

Server IP Address: 0.0.0.0

Port Number: 1813

Shared Secret:

Figure 5-8 RADIUS

The following table describes the labels in this screen.

Table 5-5 RADIUS

LABEL	DESCRIPTION
Authentication Server	
Active	Select **Yes** from the drop-down list box to enable user authentication through an external authentication server.
Server IP Address	Enter the IP address of the external authentication server in dotted decimal notation.

Table 5-5 RADIUS

LABEL	DESCRIPTION
Port Number	The default port of the RADIUS server for authentication is **1812**. You need not change this value unless your network administrator instructs you to do so with additional information.
Shared Secret	Enter a password (up to 31 alphanumeric characters) as the key to be shared between the external authentication server and the access points. The key is not sent over the network. This key must be the same on the external authentication server and Prestige.
Accounting Server	
Active	Select **Yes** from the drop-down list box to enable user authentication through an external accounting server.
Server IP Address	Enter the IP address of the external accounting server in dotted decimal notation.
Port Number	The default port of the RADIUS server for accounting is **1813**. You need not change this value unless your network administrator instructs you to do so with additional information.
Shared Secret	Enter a password (up to 31 alphanumeric characters) as the key to be shared between the external accounting server and the access points. The key is not sent over the network. This key must be the same on the external accounting server and the Prestige.
Back	Click **Back** to go to the main wireless LAN setup screen.
Apply	Click **Apply** to save these settings back to the Prestige.
Cancel	Click **Cancel** to begin configuring this screen again.

Chapter 6
WAN Setup

This chapter describes how to configure WAN settings.

6.1 WAN Overview

A WAN (Wide Area Network) is an outside connection to another network or the Internet.

See the *Wizard Setup* chapter for more information on the fields in the WAN screens.

6.2 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 (DSL, cable, wireless, etc.) connection. The **PPPoE** option is for a dial-up connection using PPPoE.

For the service provider, PPPoE offers an access and authentication method that works with existing access control systems (for example Radius). 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 you 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 individuals.

Operationally, PPPoE saves significant effort for both you and the ISP or 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.

6.3 PPTP Encapsulation

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 TCP/IP-based networks.

PPTP supports on-demand, multi-protocol and virtual private networking over public networks, such as the Internet.

6.4 Traffic Shaping

Traffic Shaping is an agreement between the carrier and the subscriber to regulate the average rate and "burstiness" or fluctuation of data transmission over an ATM network. This agreement helps eliminate congestion, which is important for transmission of real time data such as audio and video connections.

Peak Cell Rate (PCR) is the maximum rate at which the sender can send cells. This parameter may be lower (but not higher) than the maximum line speed. 1 ATM cell is 53 bytes (424 bits), so a maximum speed of 832 Kbps gives a maximum PCR of 1962 cells/sec. This rate is not guaranteed because it is dependent on the line speed.

Sustained Cell Rate (SCR) is the mean cell rate of a bursty, on-off traffic source that can be sent at the peak rate, and a parameter for burst-type traffic. SCR may not be greater than the PCR; the system default is 0 cells/sec.

Maximum Burst Size (MBS) is the maximum number of cells that can be sent at the PCR. After MBS is reached, cell rates fall below SCR until cell rate averages to the SCR again. At this time, more cells (up to the MBS) can be sent at the PCR again.

If the PCR, SCR or MBS is set to the default of "0", the system will assign a maximum value that correlates to your upstream line rate.

The following figure illustrates the relationship between PCR, SCR and MBS.

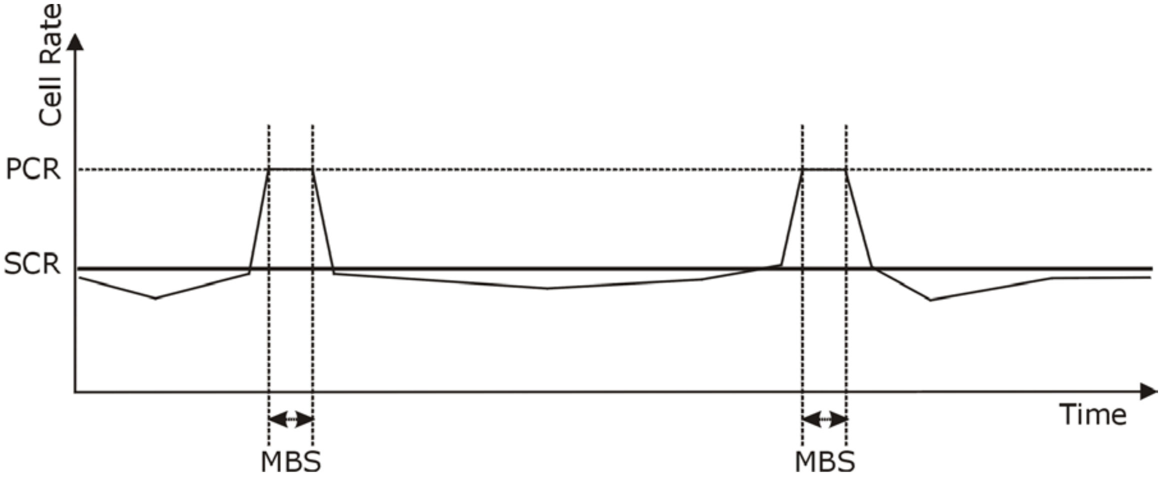
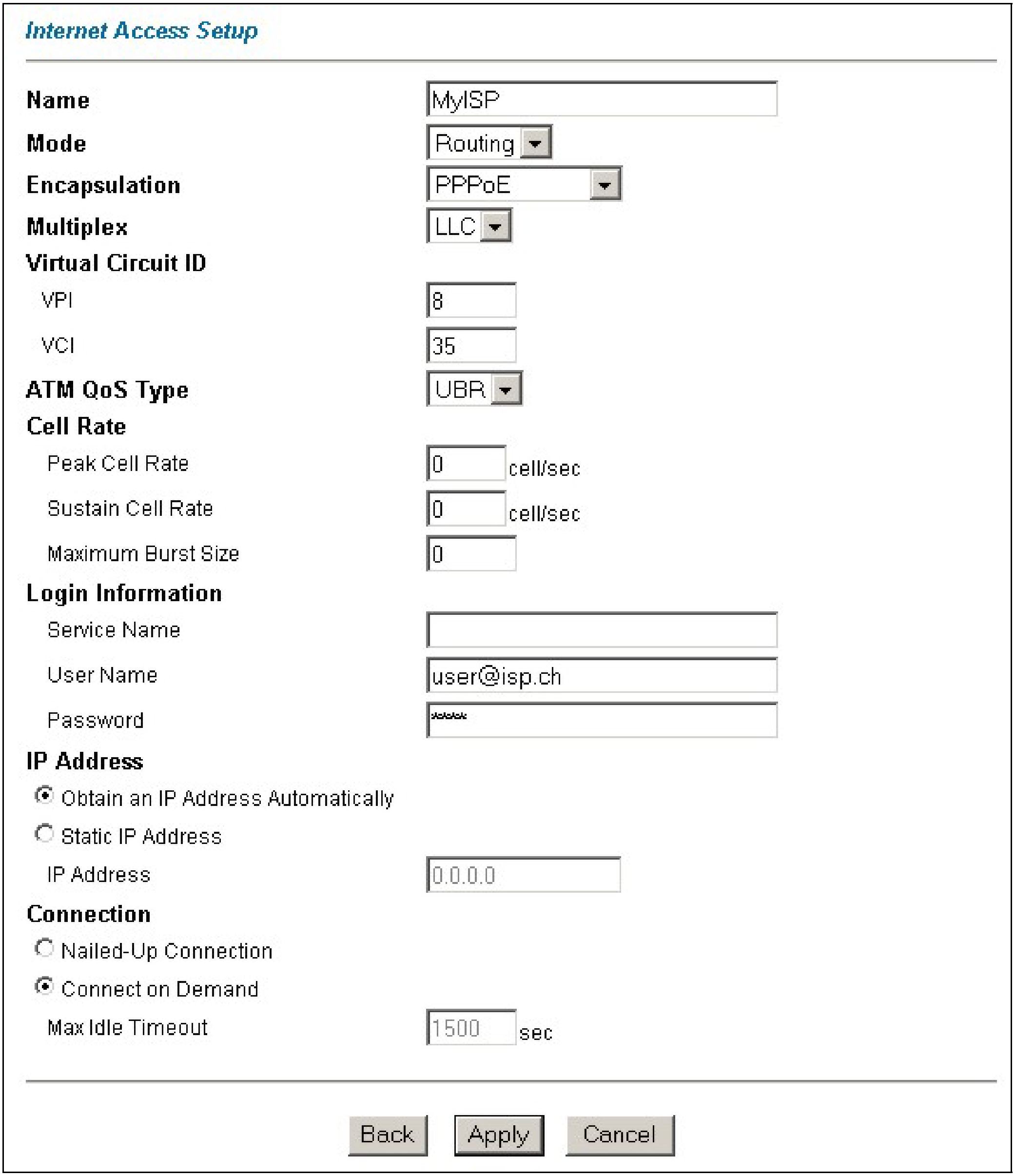


Figure 6-1 Example of Traffic Shaping

6.5 Configuring WAN Setup

To change your Prestige's WAN remote node settings, click **WAN**. The screen differs by the encapsulation.



Internet Access Setup

Name	MyISP
Mode	Routing
Encapsulation	PPPoE
Multiplex	LLC
Virtual Circuit ID	
VPI	8
VCI	35
ATM QoS Type	UBR
Cell Rate	
Peak Cell Rate	0 cell/sec
Sustain Cell Rate	0 cell/sec
Maximum Burst Size	0
Login Information	
Service Name	
User Name	user@isp.ch
Password	*****
IP Address	
● Obtain an IP Address Automatically	
○ Static IP Address	
IP Address	0.0.0.0
Connection	
○ Nailed-Up Connection	
● Connect on Demand	
Max Idle Timeout	1500 sec

Figure 6-2 Internet Access Setup

The following table describes the labels in this screen.

Table 6-1 Internet Access Setup

LABEL	DESCRIPTION
Name	Enter the name of your Internet Service Provider, e.g., MyISP. This information is for identification purposes only.
Mode	Select **Routing** (default) from the drop-down list box if your ISP allows multiple computers to share an Internet account. Otherwise select **Bridge**.
Encapsulation	Select the method of encapsulation used by your ISP from the drop-down list box. Choices vary depending on the mode you select in the **Mode** field. If you select **Bridge** in the **Mode** field, select either **PPPoA** or **RFC 1483**. If you select **Routing** in the **Mode** field, select **PPPoA**, **RFC 1483**, **ENET ENCAP** or **PPPoE**.
Multiplex	Select the method of multiplexing used by your ISP from the drop-down list. Choices are **VC** or **LLC**.
Virtual Circuit ID	VPI (Virtual Path Identifier) and VCI (Virtual Channel Identifier) define a virtual circuit. Refer to the appendix for more information.
VPI	The valid range for the VPI is 0 to 255. Enter the VPI assigned to you.
VCI	The valid range for the VCI is 32 to 65535 (0 to 31 is reserved for local management of ATM traffic). Enter the VCI assigned to you.
ATM QoS Type	Select **CBR** (Continuous Bit Rate) to specify fixed (always-on) bandwidth for voice or data traffic. Select **UBR** (Unspecified Bit Rate) for applications that are non-time sensitive, such as e-mail. Select **VBR** (Variable Bit Rate) for bursty traffic and bandwidth sharing with other applications. **VBR** is not available on all models.
Cell Rate	Cell rate configuration often helps eliminate traffic congestion that slows transmission of real time data such as audio and video connections.
Peak Cell Rate	Divide the DSL line rate (bps) by 424 (the size of an ATM cell) to find the Peak Cell Rate (PCR). This is the maximum rate at which the sender can send cells. Type the PCR here.
Sustain Cell Rate	The Sustain Cell Rate (SCR) sets the average cell rate (long-term) that can be transmitted. Type the SCR, which must be less than the PCR.

Table 6-1 Internet Access Setup

LABEL	DESCRIPTION
Maximum Burst Size	Maximum Burst Size (MBS) refers to the maximum number of cells that can be sent at the peak rate. Type the MBS, which is less than 65535.
Login Information	(PPPoA and PPPoE encapsulation only)
Service Name	(PPPoE only) Type the name of your PPPoE service here.
User Name	Enter the user name exactly as your ISP assigned. If assigned a name in the form user@domain where domain identifies a service name, then enter both components exactly as given.
Password	Enter the password associated with the user name above.
IP Address	A static IP address is a fixed IP that your ISP gives you. A dynamic IP address is not fixed; the ISP assigns you a different one each time you connect to the Internet. The Single User Account feature can be used with either a dynamic or static IP address. Select **Obtain an IP Address Automatically** if you have a dynamic IP address; otherwise select **Static IP Address** and type your ISP assigned IP address in the **IP Address** field below.
Connection (PPPoA and PPPoE encapsulation only)	The schedule rule(s) in SMT menu 26 have priority over your **Connection** settings.
Nailed-Up Connection	Select **Nailed-Up Connection** when you want your connection up all the time. The Prestige will try to bring up the connection automatically if it is disconnected.
Connect on Demand	Select **Connect on Demand** when you don't want the connection up all the time and specify an idle time-out in the **Max Idle Timeout** field.
Max Idle Timeout	Specify an idle time-out in the **Max Idle Timeout** field when you select **Connect on Demand**. The default setting is 0, which means the Internet session will not timeout.
Subnet Mask (ENET ENCAP encapsulation only)	Enter a subnet mask in dotted decimal notation. Refer to the *Subnetting* appendix in the to calculate a subnet mask If you are implementing subnetting.

Table 6-1 Internet Access Setup

LABEL	DESCRIPTION
ENET ENCAP Gateway (ENET ENCAP encapsulation only)	You must specify a gateway IP address (supplied by your ISP) when you select **ENET ENCAP** in the **Encapsulation** field.
Back	Click **Back** to return to the previous screen.
Apply	Click **Apply** to save the changes.
Cancel	Click **Cancel** to begin configuring this screen afresh.

Part III:

NAT, Dynamic DNS and Time Zone

This part covers NAT (Network Address Translation), dynamic DNS (Domain Name Sever) and Time Zone setup.

Chapter 7
Network Address Translation (NAT)

This chapter discusses how to configure NAT on the Prestige.

7.1 NAT Overview

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

7.1.1 NAT Definitions

Inside/outside denotes where a host is located relative to the Prestige, for example, the computers 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, for example, 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 traveling 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 7-1 NAT Definitions

ITEM	DESCRIPTION
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.**

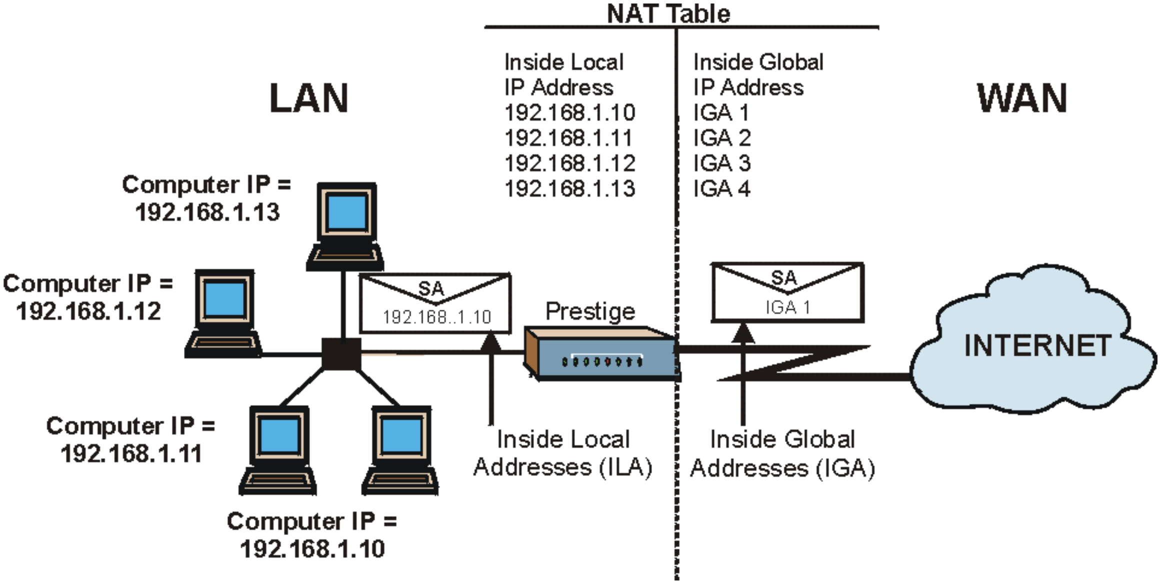
7.1.2 What NAT Does

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 to 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, for example, a web server and a telnet server, on your local network and make them accessible to the outside world. With no servers defined, your Prestige filters out all incoming inquiries, thus preventing intruders from probing your network. For more information on IP address translation, refer to *RFC 1631*, *The IP Network Address Translator (NAT)*.

7.1.3 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.



Inside Local IP Address	Inside Global IP Address
192.168.1.10	IGA 1
192.168.1.11	IGA 2
192.168.1.12	IGA 3
192.168.1.13	IGA 4

NAT Table
LAN
WAN
Computer IP = 192.168.1.13
Computer IP = 192.168.1.12
Computer IP = 192.168.1.11
Computer IP = 192.168.1.10
SA
192.168..1.10
Prestige
SA
IGA 1
INTERNET
Inside Local Addresses (ILA)
Inside Global Addresses (IGA)

Figure 7-1 How NAT Works

7.1.4 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.

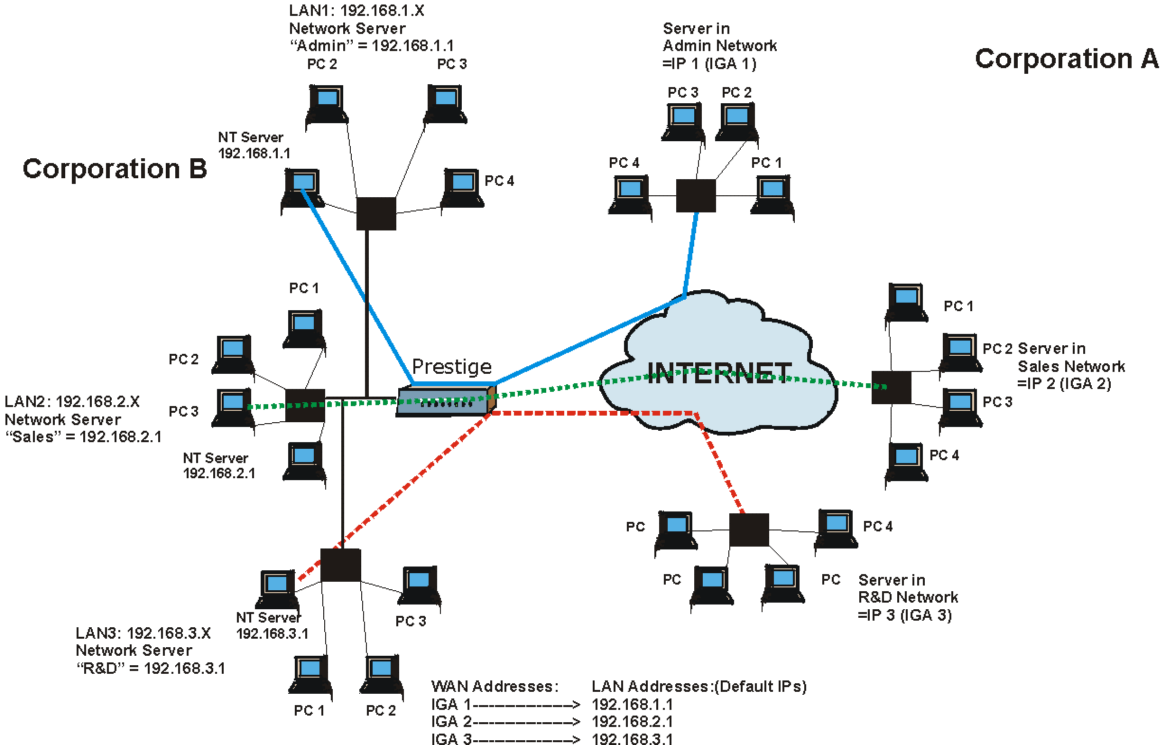


Figure 7-2 NAT Application With IP Alias

7.1.5 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 (for instance, 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 each local IP address to a unique global IP address.

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 7-2 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

7.2 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**. 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 7-2*.

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.**

7.3 SUA Server

A SUA 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 SUA makes your whole inside network appear as a single computer to the outside world.

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. You can allocate a server IP address that corresponds to a port or a range of ports.

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.

Default Server IP Address

In addition to the servers for specified services, NAT supports a default server IP address. A default server receives packets from ports that are not specified in this screen.

If you do not assign a Default Server IP Address, then all packets received for ports not specified in this screen will be discarded.

7.3.1 Port Forwarding: Services and Port Numbers

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

Use the **SUA Server** page 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.

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.

Table 7-3 Services and Port Numbers

SERVICES	PORT NUMBER
ECHO	7
FTP (File Transfer Protocol)	21
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

7.3.2 Configuring Servers Behind SUA (Example)

Let's say you want to assign ports 22-25 to one server, port 80 to another and assign a default server IP address of 192.168.1.35 as shown in the next figure.

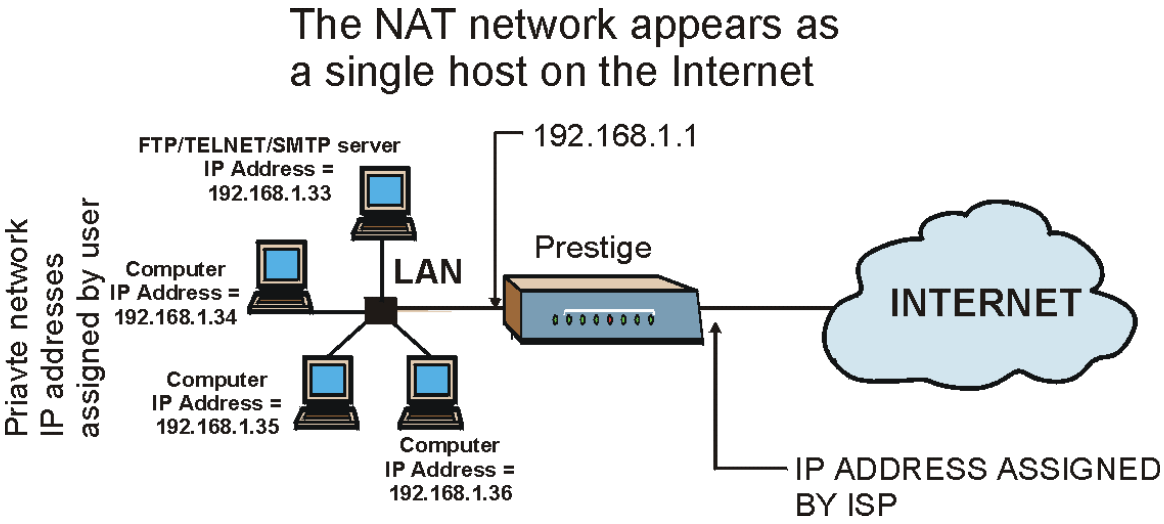
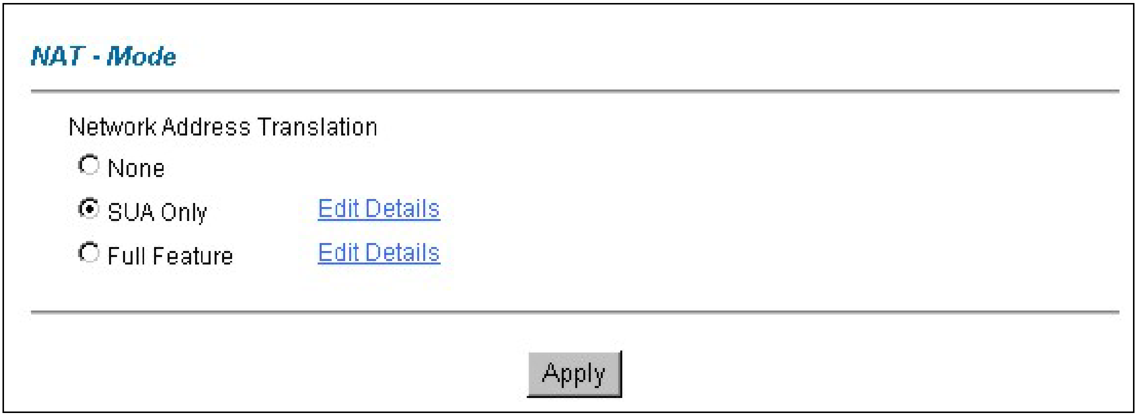


Figure 7-3 Multiple Servers Behind NAT Example

7.4 Selecting the NAT Mode

Click **NAT** to open the following screen.



NAT - Mode

Network Address Translation

○ None

● SUA Only Edit Details

○ Full Feature Edit Details

Figure 7-4 NAT Mode

The following table describes the labels in this screen.

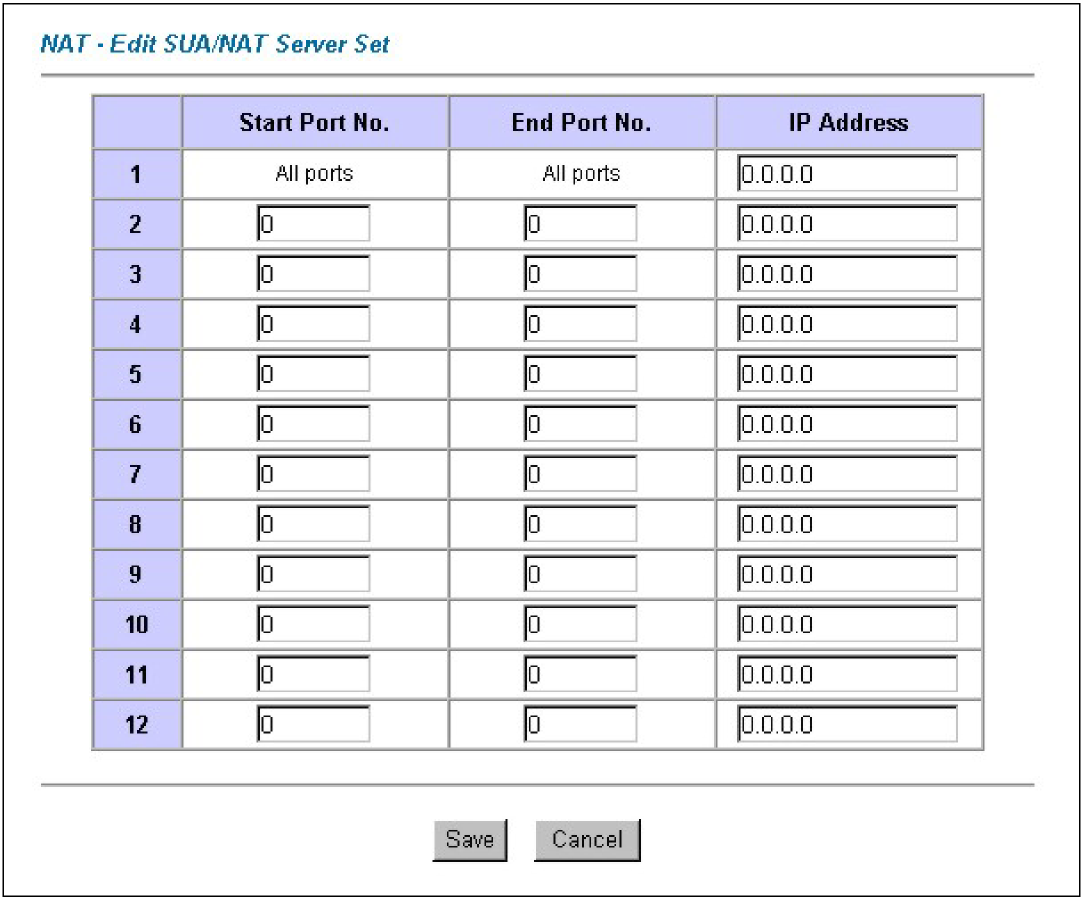
Table 7-4 NAT Mode

LABEL	DESCRIPTION
None	Select this radio button to disable NAT.
SUA Only	Select this radio button if you have just one public WAN IP address for your Prestige. The Prestige uses Address Mapping Set 1 in the **NAT - Edit SUA/NAT Server Set** screen.
Edit Details	Click this link to go to the **NAT - Edit SUA/NAT Server Set** screen.
Full Feature	Select this radio button if you have multiple public WAN IP addresses for your Prestige.
Edit Details	Click this link to go to the **NAT - Address Mapping Rules** screen.
Apply	Click **Apply** to save your configuration.

7.5 Configuring SUA Server

If you do not assign an IP Address in Server Set 1 (default server), then all packets received for ports not specified in this screen will be discarded.

Click **NAT**, Select **SUA Only** and click **Edit Details** to open the following screen.



NAT - Edit SUA/NAT Server Set

	Start Port No.	End Port No.	IP Address
1	All ports	All ports	0.0.0.0
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	0	0	0.0.0.0

Figure 7-5 Edit SUA/NAT Server Set

The following table describes the labels in this screen.

Table 7-5 Edit SUA/NAT Server Set

LABEL	DESCRIPTION
Start Port No.	Enter a port number in this field. To forward only one port, enter the port number again in the **End Port No.** field. To forward a series of ports, enter the start port number here and the end port number in the **End Port No.** field.

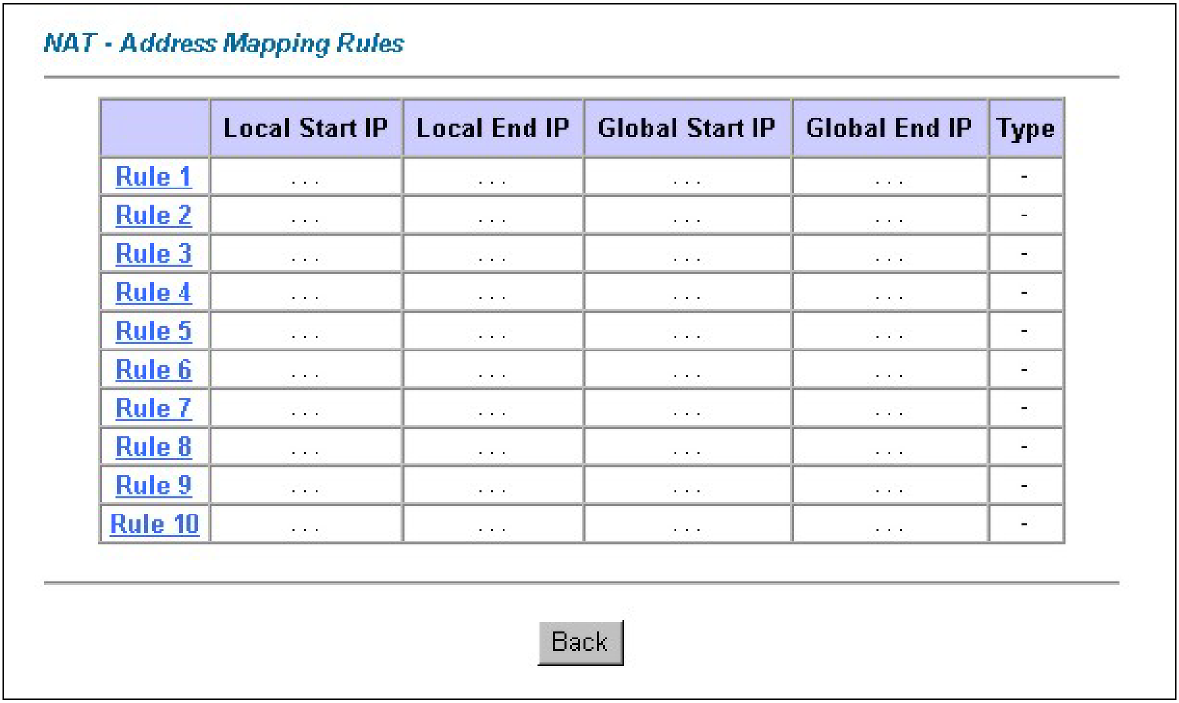
Table 7-5 Edit SUA/NAT Server Set

LABEL	DESCRIPTION
End Port No.	Enter a port number in this field. To forward only one port, enter the port number again in the **Start Port No.** field above and then enter it again in this field. To forward a series of ports, enter the last port number in a series that begins with the port number in the **Start Port No.** field above.
IP Address	Enter your server IP address in this field.
Save	Click **Save** to save your changes back to the Prestige.
Cancel	Click **Cancel** to return to the previous configuration.

7.6 Configuring Address Mapping

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 old rules 5, 6 and 7 become new rules 4, 5 and 6.

To change your Prestige's address mapping settings, click **NAT**, Select **Full Feature** and click **Edit Details** to open the following screen.



NAT - Address Mapping Rules

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

Figure 7-6 Address Mapping Rules

The following table describes the labels in this screen.

Table 7-6 Address Mapping Rules

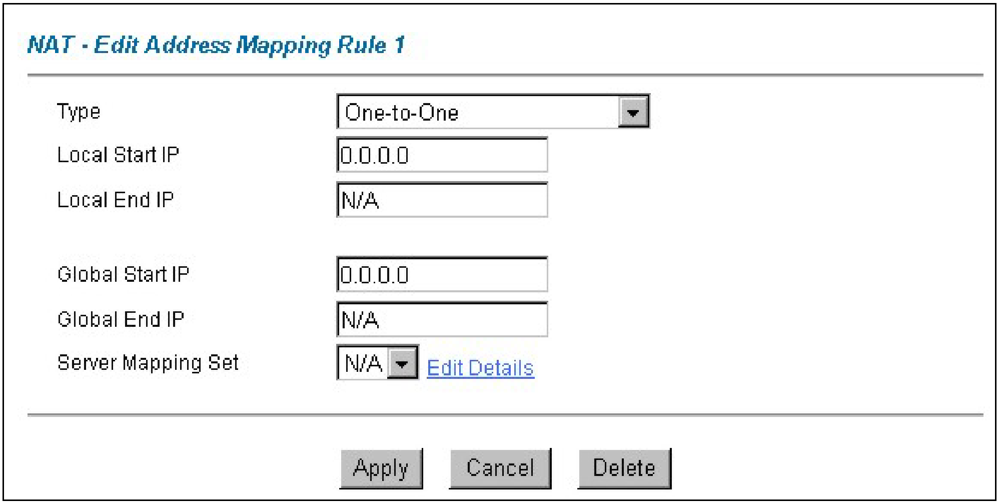
LABEL	DESCRIPTION
Local Start IP	This is the starting Inside Local IP Address (ILA). Local IP addresses are **N/A** for **Server** port mapping.
Local End IP	This is the end Inside Local IP Address (ILA). If your rule is for all local IP addresses, then enter 0.0.0.0 as the **Local Start IP** address and 255.255.255.255 as the **Local End IP** address. This field is **N/A** for **One-to-one** and **Server** mapping types.
Global Start IP	This is the starting Inside Global IP Address (IGA). Enter 0.0.0.0 here if you have a dynamic IP address from your ISP. You can only do this for **Many-to-One** and **Server** mapping types.
Global End IP	This is the ending Inside Global IP Address (IGA). This field is **N/A** for **One-to-one**, **Many-to-One** and **Server** mapping types.

Table 7-6 Address Mapping Rules

LABEL	DESCRIPTION
Type	**1-1**: One-to-one mode maps one local IP address to one global IP address. Note that port numbers do not change for the One-to-one NAT mapping type. **M-1**: Many-to-One mode 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 only. **M-M Ov** (Overload): Many-to-Many Overload mode maps multiple local IP addresses to shared global IP addresses. **MM No** (No Overload): Many-to-Many No Overload mode maps each local IP address to unique global IP addresses. **Server**: This type allows you to specify inside servers of different services behind the NAT to be accessible to the outside world.
Back	Click **Back** to return to the **NAT Mode** screen.

7.7 Editing an Address Mapping Rule

To edit an address mapping rule, click the rule's link in the **NAT Address Mapping Rules** screen to display the screen shown next.



NAT - Edit Address Mapping Rule 1

Type	One-to-One
Local Start IP	0.0.0.0
Local End IP	N/A
Global Start IP	0.0.0.0
Global End IP	N/A
Server Mapping Set	N/A

Figure 7-7 Address Mapping Rule Edit

The following table describes the labels in this screen.

Table 7-7 Address Mapping Rule Edit

LABEL	DESCRIPTION
Type	Choose the port mapping type from one of the following. 1. **One-to-One**: One-to-One mode maps one local IP address to one global IP address. Note that port numbers do not change for One-to-one NAT mapping type. 2. **Many-to-One**: Many-to-One mode 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 only. 3. **Many-to-Many Overload**: Many-to-Many Overload mode maps multiple local IP addresses to shared global IP addresses. 4. **Many-to-Many No Overload**: Many-to-Many No Overload mode maps each local IP address 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.
Local Start IP	This is the starting local IP address (ILA). Local IP addresses are **N/A** for **Server** port mapping.
Local End IP	This is the end local IP address (ILA). If your rule is for all local IP addresses, then enter 0.0.0.0 as the **Local Start IP** address and 255.255.255.255 as the **Local End IP** address. This field is **N/A** for **One-to-One** and **Server** mapping types.
Global Start IP	This is the starting global IP address (IGA). Enter 0.0.0.0 here if you have a dynamic IP address from your ISP.
Global End IP	This is the ending global IP address (IGA). This field is **N/A** for **One-to-One**, **Many-to-One** and **Server** mapping types.
Server Mapping Set	Only available when **Type** is set to **Server**. Select a number from 1 to 10 from the drop-down menu to choose a server set from the **NAT - Address Mapping Rules** screen.
Edit Details	Click this link to go to the **NAT - Edit SUA/NAT Server Set** screen to edit a server set that you have selected in the **Server Mapping Set** field.
Apply	Click **Apply** to save your changes back to the Prestige.
Cancel	Click **Cancel** to return to the previously saved settings.
Delete	Click **Delete** to exit this screen without saving

Chapter 8
Dynamic DNS Setup

This chapter discusses how to configure your Prestige to use Dynamic DNS.

8.1 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 (for instance myhost.dhs.org, where myhost is a name of your choice) that 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. The Dynamic DNS service provider will give you a password or key.

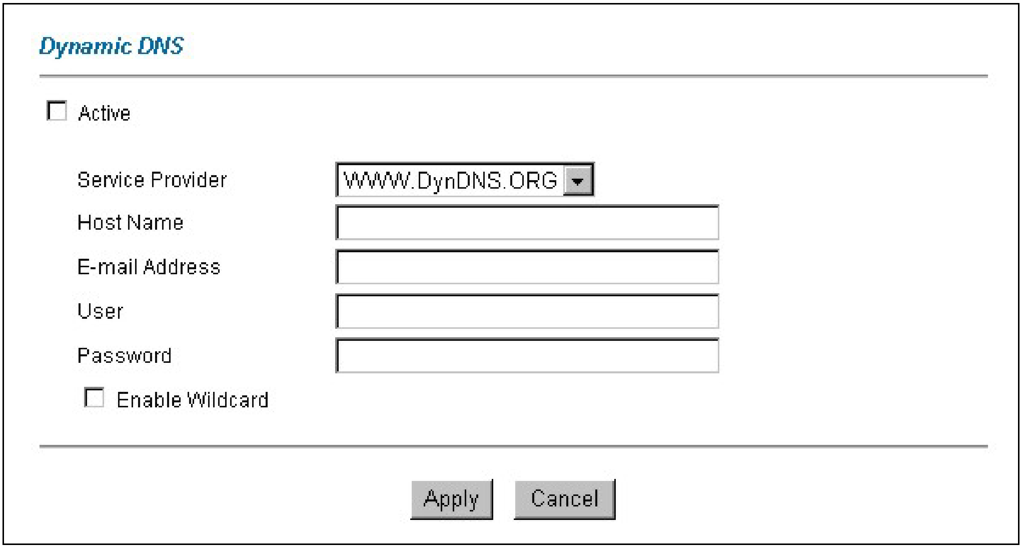
8.1.1 DYNDNS Wildcard

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.

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

8.2 Configuring Dynamic DNS

To change your Prestige's DDNS, click **Dynamic DNS**. The screen appears as shown.



Dynamic DNS

□ Active

Service Provider WWW.DynDNS.ORG

Host Name

E-mail Address

User

Password

□ Enable Wildcard

Figure 8-1 DDNS

The following table describes the labels in this screen.

Table 8-1 DDNS

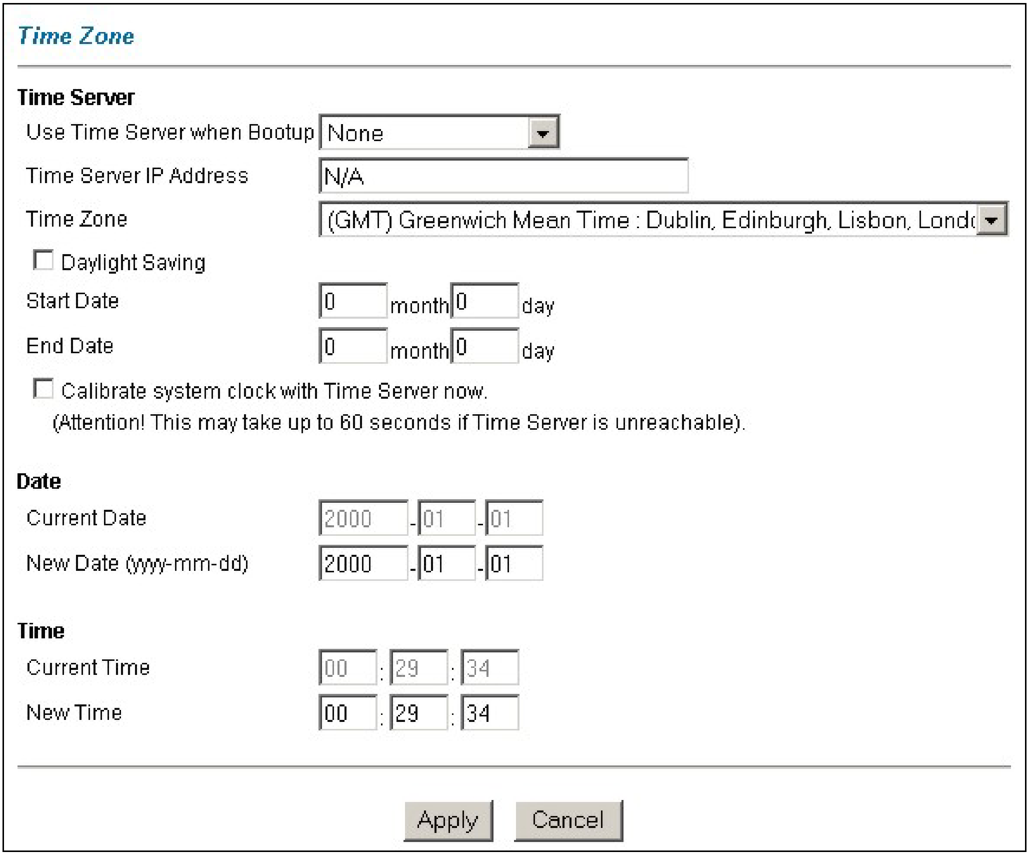
LABEL	DESCRIPTION
Active	Select this check box to use dynamic DNS.
Service Provider	Select the name of your Dynamic DNS service provider.
Host Name	Type the domain name assigned to your Prestige by your Dynamic DNS provider.
E-mail Address	Type your e-mail address.
User	Type your user name.
Password	Type the password assigned to you.
Enable Wildcard	Select this check box to enable DYNDNS Wildcard.
Apply	Click **Apply** to save your changes back to the Prestige.
Cancel	Click **Cancel** to return to the previously saved settings.

Chapter 9
Time and Date Setup

Use this screen to configure the Prestige's time and date settings. This chapter is not available on all models.

9.1 Configuring Time Zone

To change your Prestige's time and date, click **Time Zone**. The screen appears as shown. Use this screen to configure the Prestige's time based on your local time zone.



Time Zone

Time Server

Use Time Server when Bootup	None
Time Server IP Address	N/A
Time Zone	(GMT) Greenwich Mean Time : Dublin, Edinburgh, Lisbon, Londc

□ Daylight Saving

Start Date	0 month 0 day
End Date	0 month 0 day

□ Calibrate system clock with Time Server now.
(Attention! This may take up to 60 seconds if Time Server is unreachable).

Date

Current Date	2000 - 01 - 01
New Date (yyyy-mm-dd)	2000 - 01 - 01

Time

Current Time	00 : 29 : 34
New Time	00 : 29 : 34

Figure 9-1 Time/Date

The following table describes the labels in this screen.

Table 9-1 Time/Date

LABEL	DESCRIPTION
Time Server	
Use Time Server when Bootup	Select 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 difference between them is 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. The default, **NTP (RFC 1305),** is similar to Time (RFC 868). Select **None** to enter the time and date manually.
Time Server IP Address	Enter the IP address of your time server. Check with your ISP/network administrator if you are unsure of this information.
Time Zone	Choose the time zone of your location. This will set the time difference between your time zone and Greenwich Mean Time (GMT).
Daylight Savings	Select this option if you use daylight savings time. Daylight saving is a period from late spring to early fall when many countries set their clocks ahead of normal local time by one hour to give more daytime light in the evening.
Start Date	Enter the month and day that your daylight-savings time starts on if you selected **Daylight Savings**.
End Date	Enter the month and day that your daylight-savings time ends on if you selected **Daylight Savings**.
Calibrate system clock with Time Server now	Click this button to have your Prestige use the time server (that you configured above) to set its internal system clock. Please wait for up to 60 seconds while the Prestige locates the time server. If the Prestige cannot find the time server, please check the time server protocol and its IP address. If the IP address was entered correctly, try pinging it for example to test the connection.
Date	
Current Date	This field displays the date of your Prestige. Each time you reload this page, the Prestige synchronizes the time with the time server.

Table 9-1 Time/Date

LABEL	DESCRIPTION
New Date (yyyy-mm-dd)	This field displays the last updated date from the time server. When you select **None** in the **Use Time Server when Bootup** field, enter the new date in this field and then click **Apply**.
Time	
Current Time	This field displays the time of your Prestige. Each time you reload this page, the Prestige synchronizes the time with the time server.
New Time	This field displays the last updated time from the time server. When you select **None** in the **Use Time Server when Bootup** field, enter the new time in this field and then click **Apply**.
Apply	Click **Apply** to save your changes back to the Prestige.
Cancel	Click **Cancel** to return to the previously saved settings.

Part IV:

Remote Management and UPnP

This part contains information on how to configure the Prestige for remote management and setting up Universal Plug and Play (UPnP).

Chapter 10
Remote Management Configuration

This chapter provides information on configuring remote management. Remote management is not available on all models

10.1 Remote Management Overview

Remote management allows you to determine which services/protocols can access which Prestige interface (if any) from which computers.

You may manage your Prestige from a remote location via:

- Internet (WAN only)
- LAN only
- ALL (LAN and WAN)
- Neither (Disable)

To disable remote management of a service, select **Disable** in the corresponding **Server Access** field.

10.1.1 Remote Management Limitations

Remote management over LAN or WAN will not work when:

1. A filter in SMT menu 3.1 (LAN) or in menu 11.5 (WAN) is applied to block a Telnet, FTP or Web service.
2. You have disabled that service in one of the remote management screens.
3. The IP address in the **Secured Client IP** field does not match the client IP address. If it does not match, the Prestige will disconnect the session immediately.
4. There is an SMT console session running.
5. There is already another remote management session of the same type (web, FTP or Telnet) running. You may only have one remote management session of the same type running at one time.
6. There is a web remote management session running with a Telnet session. A Telnet session will be disconnected if you begin a web session; it will not begin if there already is a web session.

10.1.2 Remote Management and NAT

When NAT is enabled:

- Use the Prestige's WAN IP address when configuring from the WAN.
- Use the Prestige's LAN IP address when configuring from the LAN.

10.1.3 System Timeout

There is a system timeout of five minutes (three hundred seconds) for either the console port or telnet/web/FTP connections. Your Prestige automatically logs you out if you do nothing in this timeout period, except when it is continuously updating the status in menu 24.1 or when `sys stdio` has been changed on the command line.

10.2 Telnet

You can configure your Prestige for remote Telnet access as shown next.

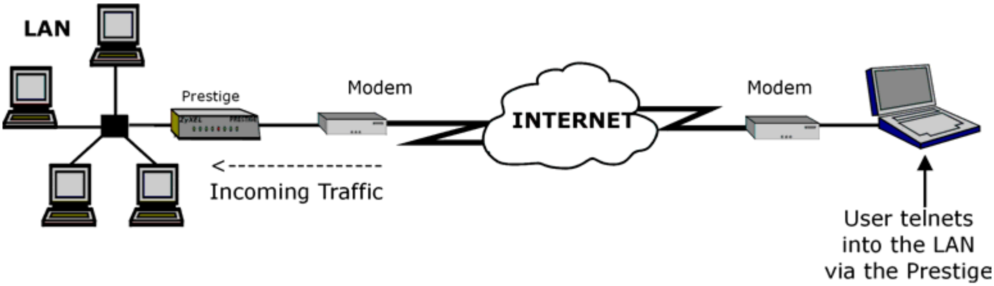


Figure 10-1 Telnet Configuration on a TCP/IP Network

10.3 FTP

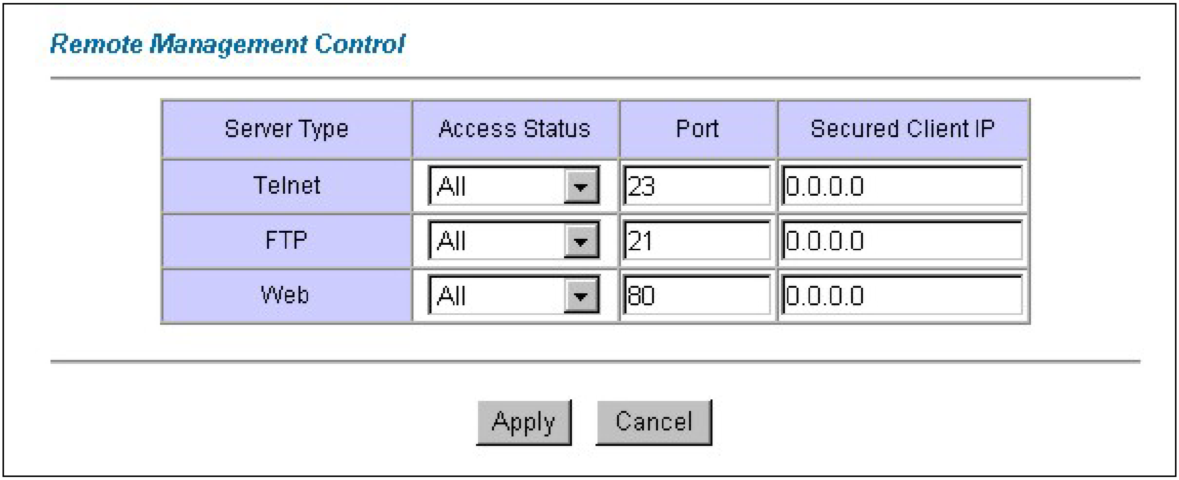
You can upload and download Prestige firmware and configuration files using FTP. To use this feature, your computer must have an FTP client.

10.4 Web

You can use the Prestige's embedded web configurator for configuration and file management. See the online help for details.

10.5 Configuring Remote Management

Click **Remote Management** to open the following screen.



Server Type	Access Status	Port	Secured Client IP
Telnet	All	23	0.0.0.0
FTP	All	21	0.0.0.0
Web	All	80	0.0.0.0

Figure 10-2 Remote Management

The following table describes the labels in this screen.

Table 10-1 Remote Management

LABEL	DESCRIPTION
Server Type	Each of these labels denotes a service that you may use to remotely manage the Prestige.
Access Status	Select the access interface. Choices are **All**, **LAN Only**, **WAN Only** and **Disable**.
Port	This field shows the port number for the remote management service. You may change the port number for a service in this field, but you must use the same port number to use that service for remote management.
Secured Client IP	The default 0.0.0.0 allows any client to use this service to remotely manage the Prestige. Type an IP address to restrict access to a client with a matching IP address.
Apply	Click **Apply** to save your settings back to the Prestige.
Cancel	Click **Cancel** to begin configuring this screen afresh.

Chapter 11 Universal Plug-and-Play (UPnP)

This chapter introduces the UPnP feature in the web configurator.

11.1 Universal Plug and Play Overview

Universal Plug and Play (UPnP) is a distributed, open networking standard that uses TCP/IP for simple peer-to-peer network connectivity between devices. A UPnP device can dynamically join a network, obtain an IP address, convey its capabilities and learn about other devices on the network. In turn, a device can leave a network smoothly and automatically when it is no longer in use.

11.1.1 How do I know if I'm using UPnP?

UPnP hardware is identified as an icon in the Network Connections folder (Windows XP). Each UPnP compatible device installed on your network will appear as a separate icon. Selecting the icon of a UPnP device will allow you to access the information and properties of that device.

11.1.2 NAT Traversal

UPnP NAT traversal automates the process of allowing an application to operate through NAT. UPnP network devices can automatically configure network addressing, announce their presence in the network to other UPnP devices and enable exchange of simple product and service descriptions. NAT traversal allows the following:

- Dynamic port mapping
- Learning public IP addresses
- Assigning lease times to mappings

Windows Messenger is an example of an application that supports NAT traversal and UPnP.

See the *Network Address Translation (NAT)* chapter for further information about NAT.

11.1.3 Cautions with UPnP

The automated nature of NAT traversal applications in establishing their own services may present network security issues. Network information and configuration may also be obtained and modified by users in some network environments.

All UPnP-enabled devices may communicate freely with each other without additional configuration. Disable UPnP if this is not your intention.

11.2 UPnP and ZyXEL

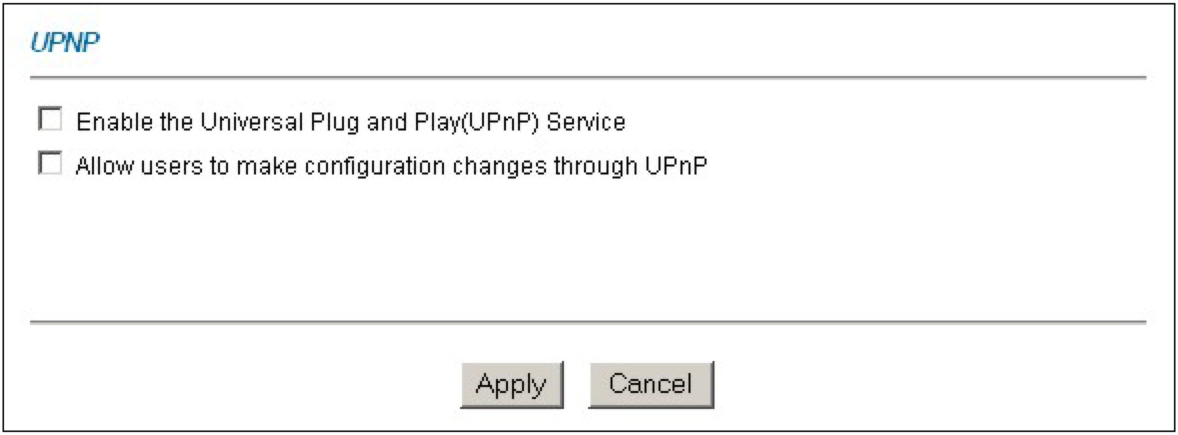
ZyXEL has achieved UPnP certification from the Universal Plug and Play Forum Creates UPnP™ Implementers Corp. (UIC). ZyXEL's UPnP implementation supports IGD 1.0 (Internet Gateway Device). At the time of writing ZyXEL's UPnP implementation supports Windows Messenger 4.6 and 4.7 while Windows Messenger 5.0 and Xbox are still being tested.

UPnP broadcasts are only allowed on the LAN.

See later sections for examples of installing UPnP in Windows XP and Windows Me as well as an example of using UPnP in Windows.

11.2.1 Configuring UPnP

From the **Site Map** in the main menu, click **UPnP** under **Advanced Setup** to display the screen shown next.


UPNP

□ Enable the Universal Plug and Play(UPnP) Service

□ Allow users to make configuration changes through UPnP

Figure 11-1 Configuring UPnP

The following table describes the labels in this screen.

Table 11-1 Configuring UPnP

LABEL	DESCRIPTION
Enable the Universal Plug and Play (UPnP) Service	Select this checkbox to activate UPnP. Be aware that anyone could use a UPnP application to open the web configurator's login screen without entering the Prestige's IP address (although you must still enter the password to access the web configurator).
Allow users to make configuration changes through UPnP	Select this check box to allow UPnP-enabled applications to automatically configure the Prestige so that they can communicate through the Prestige, for example by using NAT traversal, UPnP applications automatically reserve a NAT forwarding port in order to communicate with another UPnP enabled device; this eliminates the need to manually configure port forwarding for the UPnP enabled application.
Apply	Click **Apply** to save the setting to the Prestige.
Cancel	Click **Cancel** to return to the previously saved settings.

11.3 Installing UPnP in Windows Example

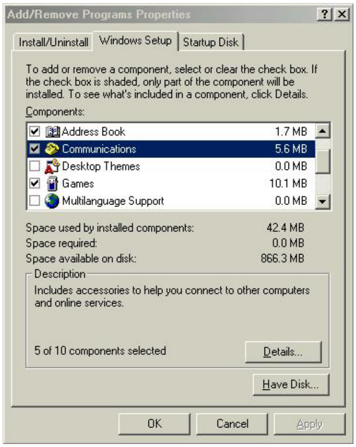
This section shows how to install UPnP in Windows Me and Windows XP.

11.3.1 Installing UPnP in Windows Me

Follow the steps below to install the UPnP in Windows Me.

Step 1. Click **Start** and **Control Panel**. Double-click **Add/Remove Programs**.

Step 2. Click on the **Windows Setup** tab and select **Communication** in the **Components** selection box. Click **Details**.



To add or remove a component, select or clear the check box. If the check box is shaded, only part of the component will be installed. To see what's included in a component, click Details.

Components:

☑	Address Book	1.7 MB
☑	Communications	5.6 MB
□	Desktop Themes	0.0 MB
☑	Games	10.1 MB
□	Multilanguage Support	0.0 MB

Space used by installed components: 42.4 MB
Space required: 0.0 MB
Space available on disk: 866.3 MB

Description

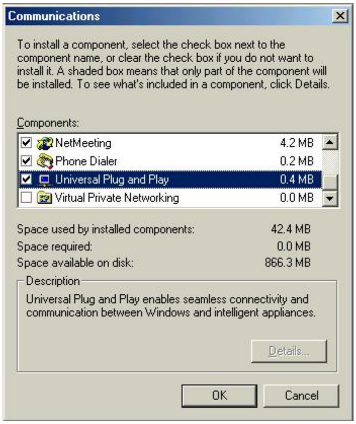
Includes accessories to help you connect to other computers and online services.

5 of 10 components selected

Step 3. In the **Communications** window, select the **Universal Plug and Play** check box in the **Components** selection box.

Step 4. Click **OK** to go back to the **Add/Remove Programs Properties** window and click **Next**.

Step 5. Restart the computer when prompted.



Communications

To install a component, select the check box next to the component name, or clear the check box if you do not want to install it. A shaded box means that only part of the component will be installed. To see what's included in a component, click Details.

Components:

☑ NetMeeting 4.2 MB
☑ Phone Dialer 0.2 MB
☑ Universal Plug and Play 0.4 MB
☐ Virtual Private Networking 0.0 MB

Space used by installed components: 42.4 MB
Space required: 0.0 MB
Space available on disk: 866.3 MB

Description

Universal Plug and Play enables seamless connectivity and communication between Windows and intelligent appliances.

11.3.2 Installing UPnP in Windows XP

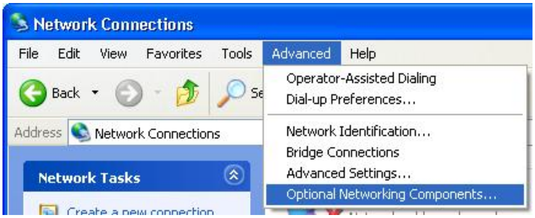
Follow the steps below to install the UPnP in Windows XP.

Step 1. Click **Start** and **Control Panel**.

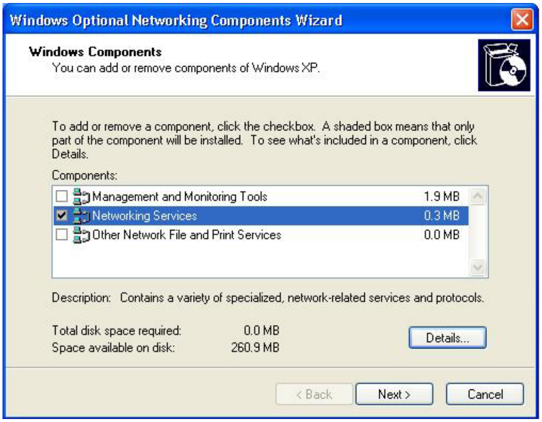
Step 2. Double-click **Network Connections**.

Step 3. In the **Network Connections** window, click **Advanced** in the main menu and select **Optional Networking Components** ….

The **Windows Optional Networking Components Wizard** window displays.



Step 4. Select **Networking Service** in the **Components** selection box and click **Details**.



Windows Optional Networking Components Wizard

Windows Components
You can add or remove components of Windows XP.

To add or remove a component, click the checkbox. A shaded box means that only part of the component will be installed. To see what's included in a component, click Details.

Components:

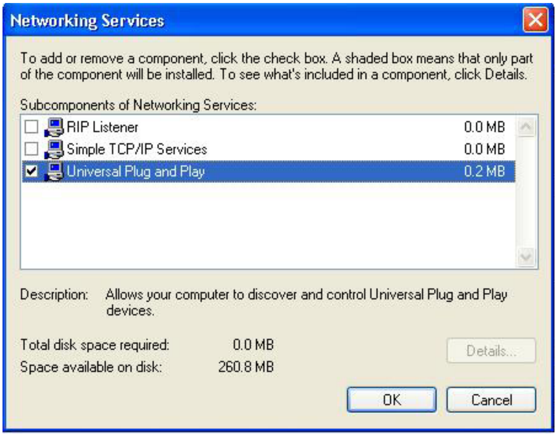
☐ Management and Monitoring Tools 1.9 MB
☑ Networking Services 0.3 MB
☐ Other Network File and Print Services 0.0 MB

Description: Contains a variety of specialized, network-related services and protocols.

Total disk space required: 0.0 MB
Space available on disk: 260.9 MB

Step 5. In the **Networking Services** window, select the **Universal Plug and Play** check box.

Step 6. Click **OK** to go back to the **Windows Optional Networking Component Wizard** window and click **Next**.



Networking Services

To add or remove a component, click the check box. A shaded box means that only part of the component will be installed. To see what's included in a component, click Details.

Subcomponents of Networking Services:

☐	RIP Listener	0.0 MB
☐	Simple TCP/IP Services	0.0 MB
☑	Universal Plug and Play	0.2 MB

Description: Allows your computer to discover and control Universal Plug and Play devices.

Total disk space required: 0.0 MB

Space available on disk: 260.8 MB

11.4 Using UPnP in Windows XP Example

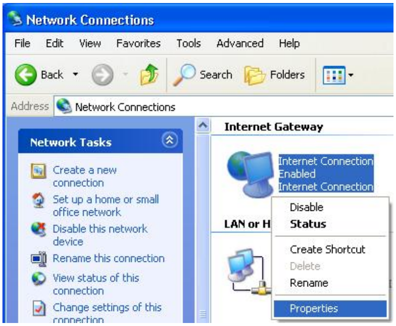
This section shows you how to use the UPnP feature in Windows XP. You must already have UPnP installed in Windows XP and UPnP activated on the Prestige.

Make sure the computer is connected to a LAN port of the Prestige. Turn on your computer and the Prestige.

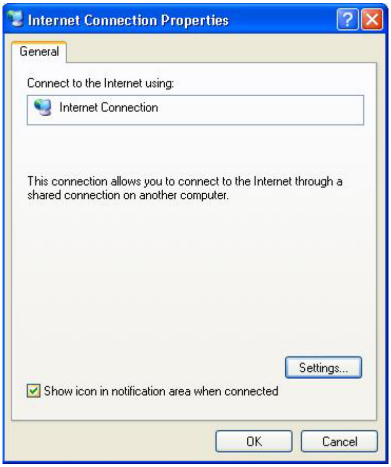
11.4.1 Auto-discover Your UPnP-enabled Network Device

Step 1. Click **start** and **Control Panel**. Double-click **Network Connections**. An icon displays under Internet Gateway.

Step 2. Right-click the icon and select **Properties**.



Step 3. In the **Internet Connection Properties** window, click **Settings** to see the port mappings there were automatically created.



Internet Connection Properties

General

Connect to the Internet using:

Internet Connection

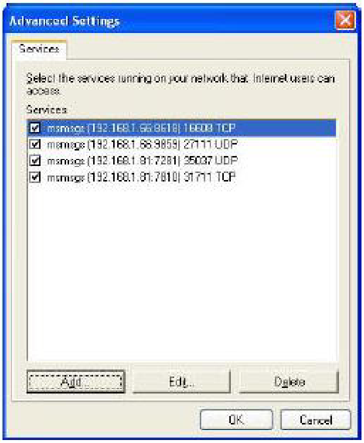
This connection allows you to connect to the Internet through a shared connection on another computer.

Settings...

☑ Show icon in notification area when connected

OK | Cancel

Step 4. You may edit or delete the port mappings or click **Add** to manually add port mappings.



Advanced Settings

Services

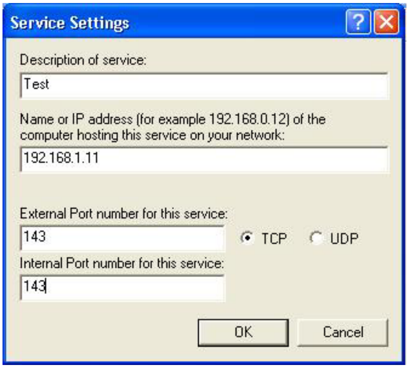
Select the services running on your network that Internet users can access.

Services

☑ msmsgs (192.168.1.66:8618) 16608 TCP
☑ msmsgs (192.168.1.66:9859) 27111 UDP
☑ msmsgs (192.168.1.81:7281) 35037 UDP
☑ msmsgs (192.168.1.81:7810) 31711 TCP

Add... | Edit... | Delete

OK | Cancel



Service Settings

Description of service:
Test

Name or IP address (for example 192.168.0.12) of the computer hosting this service on your network:
192.168.1.11

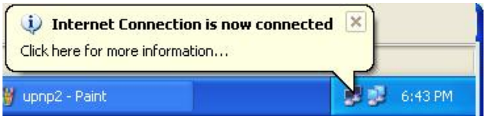
External Port number for this service:
143 ● TCP ○ UDP

Internal Port number for this service:
143

OK | Cancel

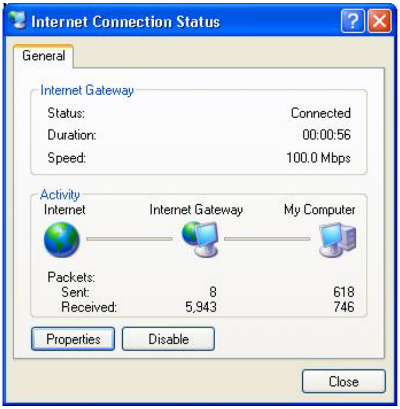
When the UPnP-enabled device is disconnected from your computer, all port mappings will be deleted automatically.

Step 5. Select **Show icon in notification area when connected** option and click **OK**. An icon displays in the system tray



Internet Connection is now connected
Click here for more information...

Step 6. Double-click on the icon to display your current Internet connection status.



Status: Connected
Duration: 00:00:56
Speed: 100.0 Mbps

Packets:	Internet Gateway	My Computer
Sent:	8	618
Received:	5,943	746

11.4.2 Web Configurator Easy Access

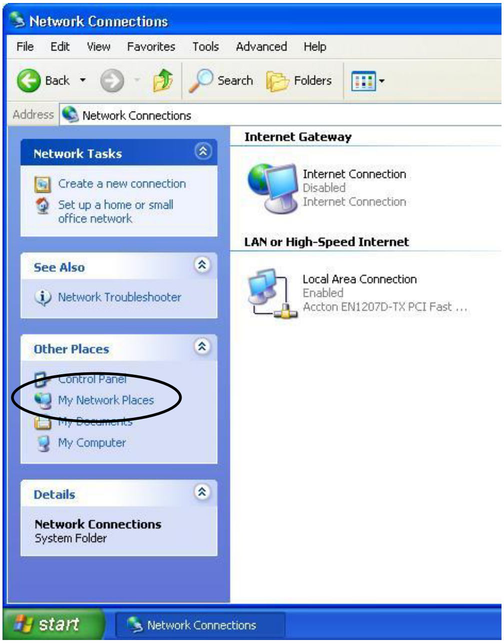
With UPnP, you can access the web-based configurator on the Prestige without finding out the IP address of the Prestige first. This comes helpful if you do not know the IP address of the Prestige.

Follow the steps below to access the web configurator.

Step 1. Click **Start** and then **Control Panel**.

Step 2. Double-click **Network Connections**.

Step 3. Select **My Network Places** under **Other Places**.

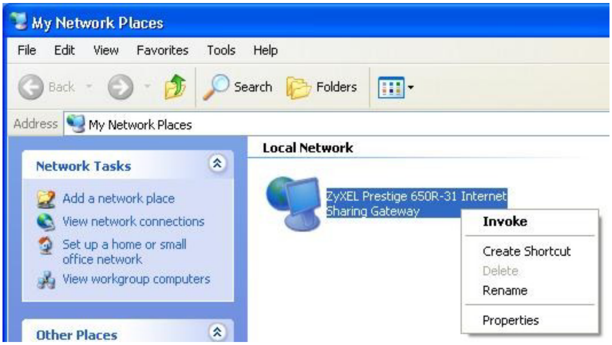


Internet Connection
Disabled
Internet Connection

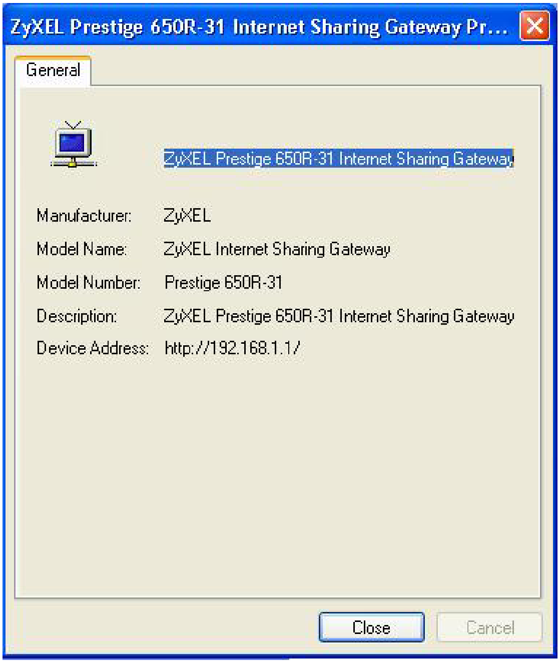
Local Area Connection
Enabled
Accton EN1207D-TX PCI Fast ...

Step 4. An icon with the description for each UPnP-enabled device displays under **Local Network**.

Step 5. Right-click on the icon for your Prestige and select **Invoke**. The web configurator login screen displays.



Step 6. Right-click on the icon for your Prestige and select **Properties**. A properties window displays with basic information about the Prestige.



ZyXEL Prestige 650R-31 Internet Sharing Gateway

Manufacturer:	ZyXEL
Model Name:	ZyXEL Internet Sharing Gateway
Model Number:	Prestige 650R-31
Description:	ZyXEL Prestige 650R-31 Internet Sharing Gateway
Device Address:	http://192.168.1.1/

Part V:

Bandwidth Management

This part provides information on the functions and configuration of Bandwidth Management.

Chapter 12
Bandwidth Management

This chapter describes the functions and configuration of bandwidth management. Bandwidth management is not available on all models.

12.1 Bandwidth Management Overview

Bandwidth management allows you to allocate an interface's outgoing capacity to specific types of traffic. It can also help you make sure that the Prestige forwards certain types of traffic (especially real-time applications) with minimum delay. With the use of real-time applications such as Voice-over-IP (VoIP) increasing, the requirement for bandwidth allocation is also increasing.

Bandwidth management addresses questions such as:

- Who gets how much access to specific applications?
- What priority level should you give to each type of traffic?
- Which traffic must have guaranteed delivery?
- How much bandwidth should be allotted to guarantee delivery?

Bandwidth management also allows you to configure the allowed output for an interface to match what the network can handle. This helps reduce delays and dropped packets at the next routing device. For example, you can set the WAN interface speed to 1000kbps if the broadband device connected to the WAN port has an upstream speed of 1000kbps. All configuration screens display measurements in kbps (kilobits per second), but this *User's Guide* also uses Mbps (megabits per second) for brevity's sake.

12.2 Bandwidth Classes and Filters

Use bandwidth classes and child-classes to allocate specific amounts of bandwidth capacity (bandwidth budgets). Configure a bandwidth filter to define a bandwidth class (or child-class) based on a specific application and/or subnet. Use the **Class Configuration** tab (see *section 12.9.1*) to set up a bandwidth class's name, bandwidth allotment, and bandwidth filter. You can configure up to one bandwidth filter per bandwidth class. You can also configure bandwidth classes without bandwidth filters. However, it is recommended that you configure child-classes with filters for any classes that you configure without filters. The Prestige leaves the bandwidth budget allocated and unused for a class that does not have a filter itself or child-classes with filters. View your configured bandwidth classes and child-classes in the **Class Setup** tab (see *section 12.9* for details).

The total of the configured bandwidth budgets for child-classes cannot exceed the configured bandwidth budget speed of the parent class.

12.3 Proportional Bandwidth Allocation

Bandwidth management allows you to define how much bandwidth each class gets; however, the actual bandwidth allotted to each class decreases or increases in proportion to actual available bandwidth.

12.4 Bandwidth Management Usage Examples

These examples show bandwidth management allotments on a WAN interface that is configured for 10Mbps.

12.4.1 Application-based Bandwidth Management Example

The bandwidth classes in the following example are based solely on application. Each bandwidth class (VoIP, Web, FTP, E-mail and Video) is allotted 2 Mbps.

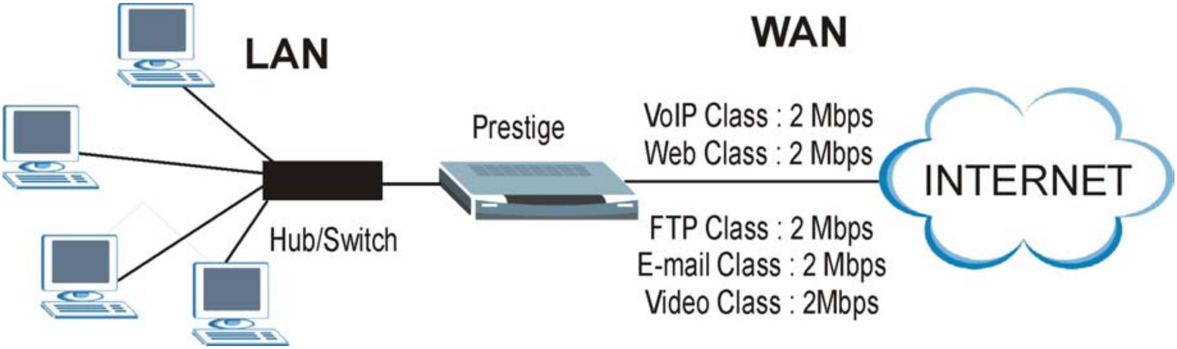


Figure 12-1 Application-based Bandwidth Management Example

12.4.2 Subnet-based Bandwidth Management Example

The following example uses bandwidth classes based solely on LAN subnets. Each bandwidth class (Subnet A and Subnet B) is allotted 5 Mbps.

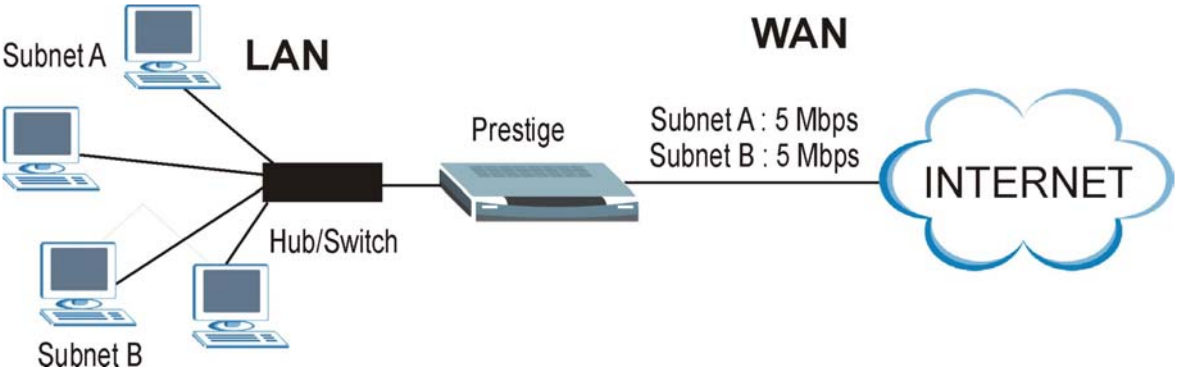


Figure 12-2 Subnet-based Bandwidth Management Example

12.4.3 Application and Subnet-based Bandwidth Management Example

The following example uses bandwidth classes based on LAN subnets and applications (specific applications in each subnet are allotted bandwidth).

Table 12-1 Application and Subnet-based Bandwidth Management Example

TRAFFIC TYPE	FROM SUBNET A	FROM SUBNET B
VoIP	1 Mbps	1 Mbps
Web	1 Mbps	1 Mbps
FTP	1 Mbps	1 Mbps
E-mail	1 Mbps	1 Mbps
Video	1 Mbps	1 Mbps

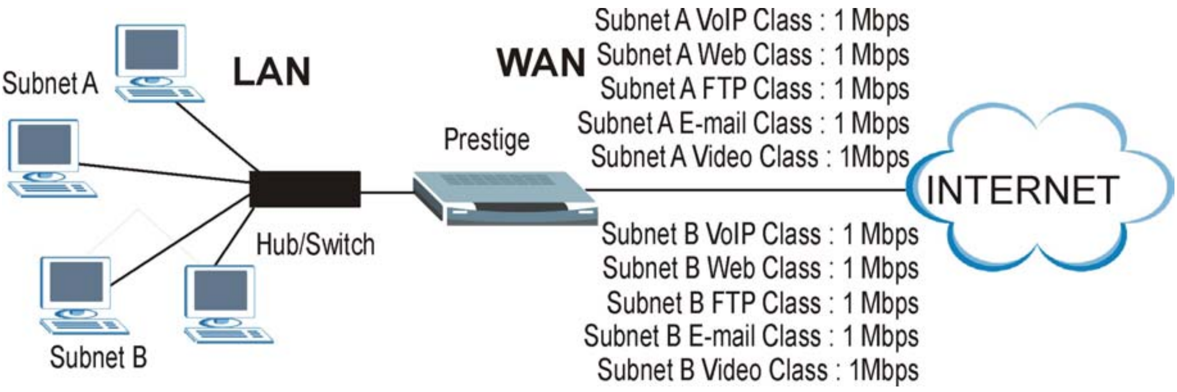

Subnet A
LAN
Hub/Switch
Subnet B
Prestige
WAN
Subnet A VoIP Class : 1 Mbps
Subnet A Web Class : 1 Mbps
Subnet A FTP Class : 1 Mbps
Subnet A E-mail Class : 1 Mbps
Subnet A Video Class : 1Mbps
INTERNET
Subnet B VoIP Class : 1 Mbps
Subnet B Web Class : 1 Mbps
Subnet B FTP Class : 1 Mbps
Subnet B E-mail Class : 1 Mbps
Subnet B Video Class : 1Mbps

Figure 12-3 Application and Subnet-based Bandwidth Management Example

12.5 Scheduler

The scheduler divides up an interface's bandwidth among the bandwidth classes. The Prestige has two types of scheduler: fairness-based and priority-based.

12.5.1 Priority-based Scheduler

With the priority-based scheduler, the Prestige forwards traffic from bandwidth classes according to the priorities that you assign to the bandwidth classes. The larger a bandwidth class's priority number is, the higher the priority. Assign real-time applications (like those using audio or video) a higher priority number to provide smoother operation.

12.5.2 Fairness-based Scheduler

The Prestige divides bandwidth equally among bandwidth classes when using the fairness-based scheduler; thus preventing one bandwidth class from using all of the interface's bandwidth.

12.6 Maximize Bandwidth Usage

The maximize bandwidth usage option (see *Figure 12-7*) allows the Prestige to divide up any available bandwidth on the interface (including unallocated bandwidth and any allocated bandwidth that a class is not using) among the bandwidth classes that require more bandwidth.

When you enable maximize bandwidth usage, the Prestige first makes sure that each bandwidth class gets up to its bandwidth allotment. Next, the Prestige divides up an interface's available bandwidth (bandwidth that is unbudgeted or unused by the classes) depending on how many bandwidth classes require more bandwidth and on their priority levels. When only one class requires more bandwidth, the Prestige gives extra bandwidth to that class.

When multiple classes require more bandwidth, the Prestige gives the highest priority classes the available bandwidth first (as much as they require, if there is enough available bandwidth), and then to lower priority classes if there is still bandwidth available. The Prestige distributes the available bandwidth equally among classes with the same priority level.

12.6.1 Reserving Bandwidth for Non-Bandwidth Class Traffic

Do the following three steps to configure the Prestige to allow bandwidth for traffic that is not defined in a bandwidth filter.

Step 1. Leave some of the interface's bandwidth unbudgeted.

Step 2. Do not enable the interface's **Maximize Bandwidth Usage** option.

Step 3. Do not enable bandwidth borrowing on the child-classes that have the root class as their parent (see *section 12.7*).

12.6.2 Maximize Bandwidth Usage Example

Here is an example of a Prestige that has maximized bandwidth usage enabled on an interface. The first figure shows each bandwidth class's bandwidth budget and priority. The classes are set up based on subnets. The interface is set to 10 Mbps. Each subnet is allocated 2 Mbps. The unbudgeted 2 Mbps allows traffic not defined in one of the bandwidth filters to go out when you do not select the maximize bandwidth option.

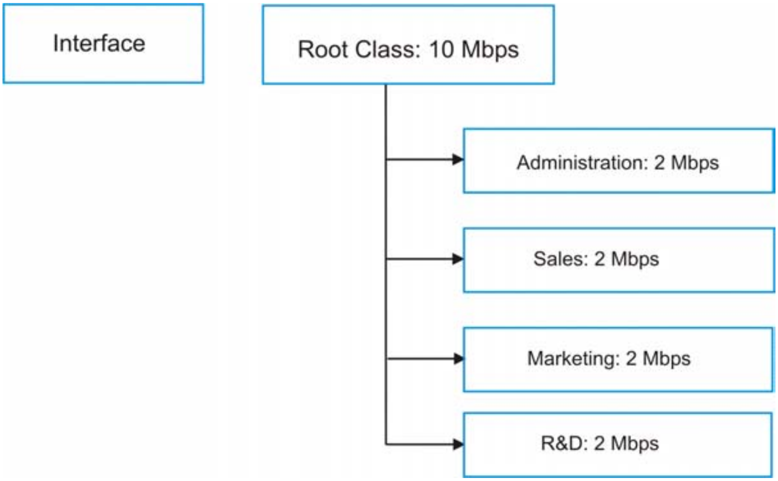


Figure 12-4 Bandwidth Allotment Example

The following figure shows the bandwidth usage with the maximize bandwidth usage option enabled. The Prestige divides up the unbudgeted 2 Mbps among the classes that require more bandwidth. If the administration department only uses 1 Mbps of the budgeted 2 Mbps, the Prestige also divides the remaining 1 Mbps among the classes that require more bandwidth. Therefore, the Prestige divides a total of 3 Mbps total of unbudgeted and unused bandwidth among the classes that require more bandwidth.

In this case, suppose that all of the classes except for the administration class need more bandwidth.

- Each class gets up to its budgeted bandwidth. The administration class only uses 1 Mbps of its budgeted 2 Mbps.
- Sales and Marketing are first to get extra bandwidth because they have the highest priority (6). If they each require 1.5 Mbps or more of extra bandwidth, the Prestige divides the total 3 Mbps total of unbudgeted and unused bandwidth equally between the sales and marketing departments (1.5 Mbps extra to each for a total of 3.5 Mbps for each) because they both have the highest priority level.
- R&D requires more bandwidth but only gets its budgeted 2 Mbps because all of the unbudgeted and unused bandwidth goes to the higher priority sales and marketing classes.
- The Prestige does not send any traffic that is not defined in the bandwidth filters because all of the unbudgeted bandwidth goes to the classes that need it.

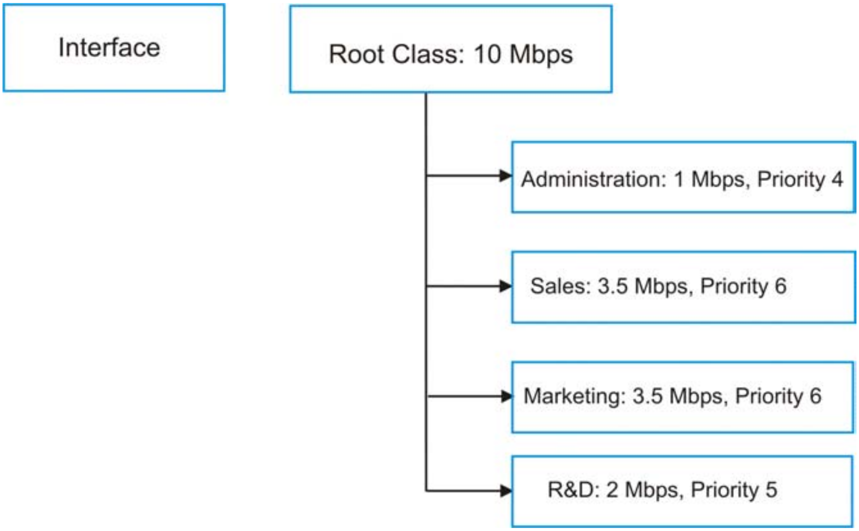

Interface
Root Class: 10 Mbps
Administration: 1 Mbps, Priority 4
Sales: 3.5 Mbps, Priority 6
Marketing: 3.5 Mbps, Priority 6
R&D: 2 Mbps, Priority 5

Figure 12-5 Maximize Bandwidth Usage Example

12.7 Bandwidth Borrowing

Bandwidth borrowing allows a child-class to borrow unused bandwidth from its parent class, whereas maximize bandwidth usage allows bandwidth classes to borrow any unused or unbudgeted bandwidth on the whole interface.

Enable bandwidth borrowing on a child-class to allow the child-class to use its parent class's unused bandwidth. A parent class's unused bandwidth is given to the highest priority child-class first. The child-class can also borrow bandwidth from a higher parent class (grandparent class) if the child-class's parent class is also configured to borrow bandwidth from its parent class. This can go on for as many levels as are configured to borrow bandwidth from their parent class (see *section 12.7.1*).

The total of the bandwidth allotments for child-classes cannot exceed the bandwidth allotment of their parent class. The Prestige uses the scheduler to divide a parent class's unused bandwidth among the child-classes.

12.7.1 Bandwidth Borrowing Example

Here is an example of bandwidth management with classes configured for bandwidth borrowing. The classes are set up based on departments and individuals within certain departments.

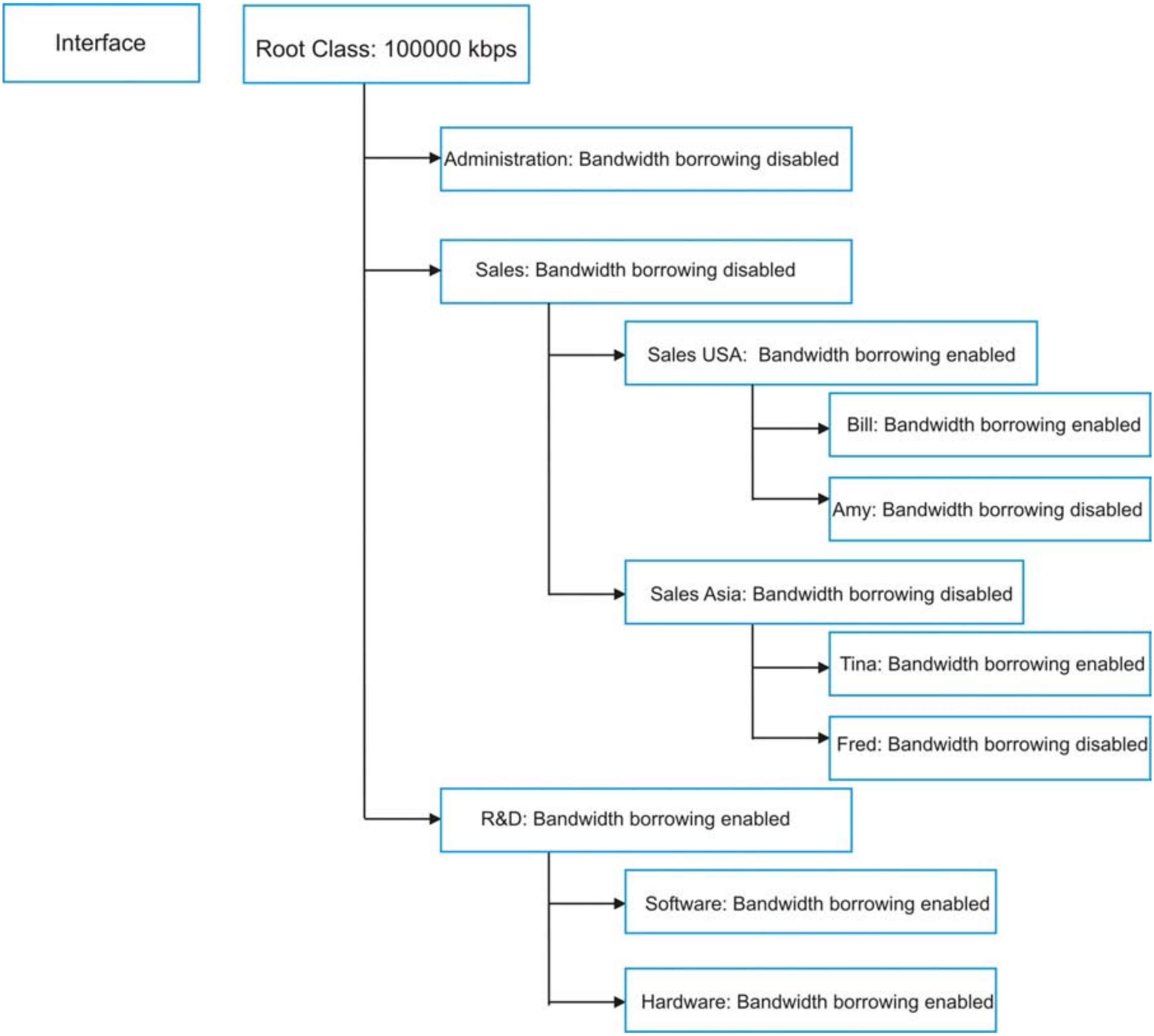

Interface
Root Class: 100000 kbps
Administration: Bandwidth borrowing disabled
Sales: Bandwidth borrowing disabled
Sales USA: Bandwidth borrowing enabled
Bill: Bandwidth borrowing enabled
Amy: Bandwidth borrowing disabled
Sales Asia: Bandwidth borrowing disabled
Tina: Bandwidth borrowing enabled
Fred: Bandwidth borrowing disabled
R&D: Bandwidth borrowing enabled
Software: Bandwidth borrowing enabled
Hardware: Bandwidth borrowing enabled

Figure 12-6 Bandwidth Borrowing Example

- The Bill class can borrow unused bandwidth from the Sales USA class because the Bill class has bandwidth borrowing enabled.
- The Bill class can also borrow unused bandwidth from the Sales class because the Sales USA class also has bandwidth borrowing enabled.

- The Bill class cannot borrow unused bandwidth from the Root class because the Sales class has bandwidth borrowing disabled.
- The Amy class cannot borrow unused bandwidth from the Sales USA class because the Amy class has bandwidth borrowing disabled.
- The R&D Software and Hardware classes can both borrow unused bandwidth from the R&D class because the R&D Software and Hardware classes both have bandwidth borrowing enabled.
- The R&D Software and Hardware classes can also borrow unused bandwidth from the Root class because the R&D class also has bandwidth borrowing enabled.

12.7.2 Maximize Bandwidth Usage With Bandwidth Borrowing

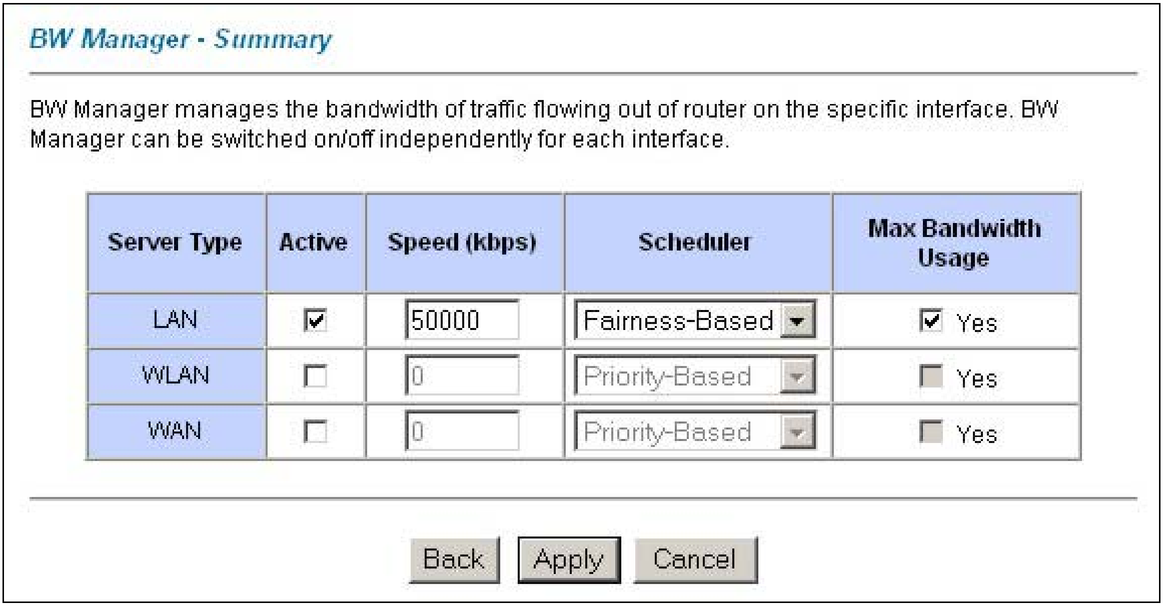
If you configure both maximize bandwidth usage (on the interface) and bandwidth borrowing (on individual child-classes), the Prestige functions as follows.

1. The Prestige sends traffic according to each bandwidth class's bandwidth budget.
2. The Prestige assigns a parent class's unused bandwidth to its child-classes that have more traffic than their budgets and have bandwidth borrowing enabled. The Prestige gives priority to bandwidth child-classes of higher priority and treats bandwidth classes of the same priority equally.
3. The Prestige assigns any remaining unused or unbudgeted bandwidth on the interface to any bandwidth class that requires it. The Prestige gives priority to bandwidth classes of higher priority and treats bandwidth classes of the same level equally.
4. The Prestige assigns any remaining unbudgeted bandwidth to traffic that does not match any of the bandwidth classes.

12.8 Configuring Summary

Click **BW Manager**, **Summary** to open the **Summary** screen.

Enable bandwidth management on an interface and set the maximum allowed bandwidth for that interface.



BW Manager - Summary

BW Manager manages the bandwidth of traffic flowing out of router on the specific interface. BW Manager can be switched on/off independently for each interface.

Server Type	Active	Speed (kbps)	Scheduler	Max Bandwidth Usage
LAN	☑	50000	Fairness-Based	☑ Yes
WLAN	□	0	Priority-Based	□ Yes
WAN	□	0	Priority-Based	□ Yes

Figure 12-7 Bandwidth Manager: Summary

The following table describes the labels in this screen.

Table 12-2 Bandwidth Manager: Summary

LABEL	DESCRIPTION
LAN WLAN WAN	These read-only labels represent the physical interfaces.
Active	Select an interface's check box to enable bandwidth management on that interface. Not all interfaces are available on every Prestige.
Speed (kbps)	Enter the amount of bandwidth for this interface that you want to allocate using bandwidth management. This appears as the bandwidth budget of the interface's root class (see *section 12.9*). The recommendation is to set this speed to match what the device connected to the port can handle. For example, set the WAN interface speed to 1000 kbps if the broadband device connected to the WAN port has an upstream speed of 1000 kbps.

Table 12-2 Bandwidth Manager: Summary

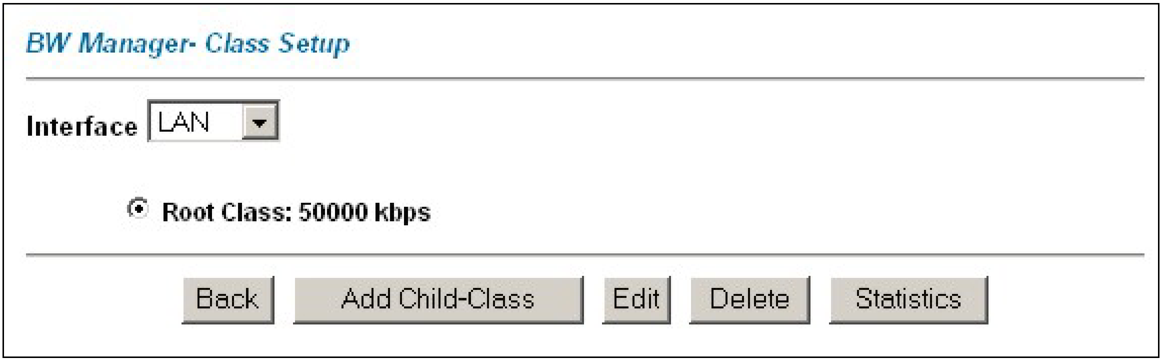
LABEL	DESCRIPTION
Scheduler	Select either **Priority-Based** or **Fairness-Based** from the drop-down menu to control the traffic flow. Select **Priority-Based** to give preference to bandwidth classes with higher priorities. Select **Fairness-Based** to treat all bandwidth classes equally. See *section 12.5*.
Maximize Bandwidth Usage	Select this check box to have the Prestige divide up all of the interface's unallocated and/or unused bandwidth among the bandwidth classes that require bandwidth. Do not select this if you want to reserve bandwidth for traffic that does not match a bandwidth class (see *section 12.6.1*) or you want to limit the speed of this interface (see the **Speed** field description).
Back	Click **Back** to go to the main **BW Manager** screen.
Apply	Click **Apply** to save your settings back to the Prestige.
Cancel	Click **Cancel** to begin configuring this screen afresh.

12.9 Configuring Class Setup

The class setup screen displays the configured bandwidth classes by individual interface. Select an interface and click the buttons to perform the actions described next. Click "+" to expand the class tree or click "-" to collapse the class tree. Each interface has a permanent root class. The bandwidth budget of the root class is equal to the speed you configured on the interface (see *section 12.8* to configure the speed of the interface). Configure child-class layers for the root class.

To add or delete child classes on an interface, click **BW Manager**, then **Class Setup**. The screen appears as shown (with example classes).

The example reserves 15 Mbps of unbudgeted bandwidth for traffic that is not defined in the bandwidth filters (see *section 12.6.1*). The Administration, Sales USA and Sales Asia bandwidth classes each have bigger bandwidth budgets than the total of the budgets of their child-classes. The child-classes can borrow the extra bandwidth as long as they have bandwidth borrowing enabled (see *section 12.7*).



BW Manager- Class Setup

Interface LAN

● Root Class: 50000 kbps

Figure 12-8 Bandwidth Manager: Class Setup

The following table describes the labels in this screen.

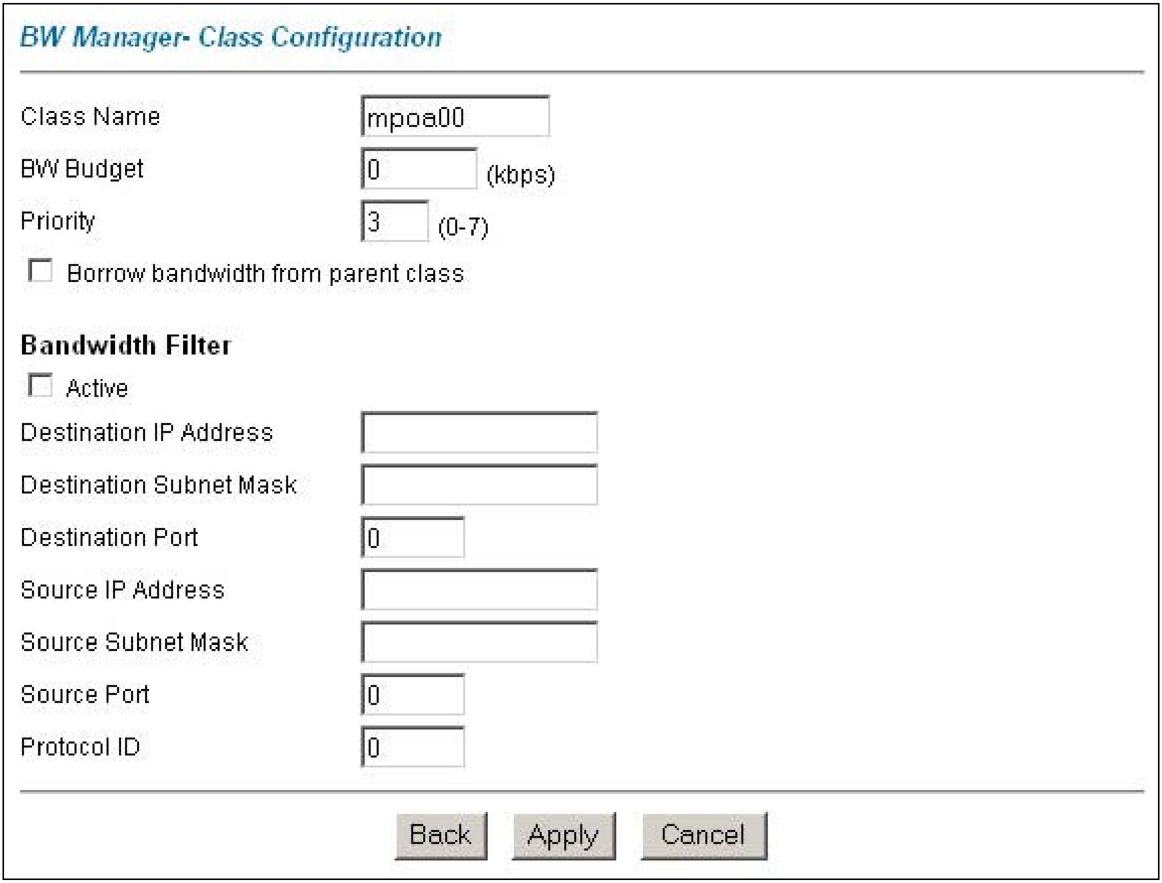
Table 12-3 Bandwidth Manager: Class Setup

LABEL	DESCRIPTION
Interface	Select an interface from the drop-down list box for which you wish to set up classes.
Back	Click **Back** to go to the main **BW Manager** screen.
Add Child-Class	Click **Add Child-class** to add a sub-class.
Edit	Click **Edit** to configure the selected class. You cannot edit the root class.
Delete	Click **Delete** to delete the class and all its child-classes. You cannot delete the root class.
Statistics	Click **Statistics** to display the status of the selected class.

12.9.1 Bandwidth Manager Class Configuration

Configure a bandwidth management class in the **Class Configuration** screen. You must use the **Bandwidth Manager - Summary** screen to enable bandwidth management on an interface before you can configure classes for that interface.

To add a child class, click **BW Manager**, then **Class Setup**. Click the **Add Child-Class** button to open the following screen.



BW Manager- Class Configuration

Class Name: mpoa00

BW Budget: 0 (kbps)

Priority: 3 (0-7)

□ Borrow bandwidth from parent class

Bandwidth Filter

□ Active

Destination IP Address:

Destination Subnet Mask:

Destination Port: 0

Source IP Address:

Source Subnet Mask:

Source Port: 0

Protocol ID: 0

Figure 12-9 Bandwidth Manager: Class Configuration

The following table describes the labels in this screen.

Table 12-4 Bandwidth Manager: Class Configuration

LABEL	DESCRIPTION
Class Name	Use the auto-generated name or enter a descriptive name of up to 20 alphanumeric characters, including spaces.
BW Budget (kbps)	Specify the maximum bandwidth allowed for the class in kbps. The recommendation is a setting between 20 kbps and 20000 kbps for an individual class.

Table 12-4 Bandwidth Manager: Class Configuration

LABEL	DESCRIPTION
Priority	Enter a number between 0 and 7 to set the priority of this class. The higher the number, the higher the priority. The default setting is 3.
Borrow bandwidth from parent class	Select this option to allow a child-class to borrow bandwidth from its parent class if the parent class is not using up its bandwidth budget. Bandwidth borrowing is governed by the priority of the child-classes. That is, a child-class with the highest priority (7) is the first to borrow bandwidth from its parent class. Do not select this for the classes directly below the root class if you want to leave bandwidth available for other traffic types (see *12.6.1*) or you want to set the interface's speed to match what the next device in network can handle (see the **Speed** field description in *Table 12-2*).
Bandwidth Filter	
Active	Select the check box to have the Prestige use this bandwidth filter when it performs bandwidth management. You must enter a value in at least one of the following fields (other than the **Destination Subnet Mask** fields which are only available when you enter the destination or source IP address).
Destination IP Address	Enter the destination IP address in dotted decimal notation.
Destination Subnet Mask	Enter the destination subnet mask. This field is N/A if you do not specify a **Destination IP Address**. Refer to the appendix for more information on IP subnetting.
Destination Port	Enter the port number of the destination.
Source IP Address	Enter the source IP address.
Source Subnet Mask	Enter the source subnet mask. This field is N/A if you do not specify a **Source IP Address**. Refer to the appendix for more information on IP subnetting.
Source Port	Enter the port number of the source. See the following table for some common services and port numbers.
Protocol ID	Enter the protocol ID (service type) number, for example: 1 for ICMP, 6 for TCP or 17 for UDP.
Back	Click **Back** to go to the main **BW Manager** screen.
Apply	Click **Apply** to save your changes back to the Prestige.

Table 12-4 Bandwidth Manager: Class Configuration

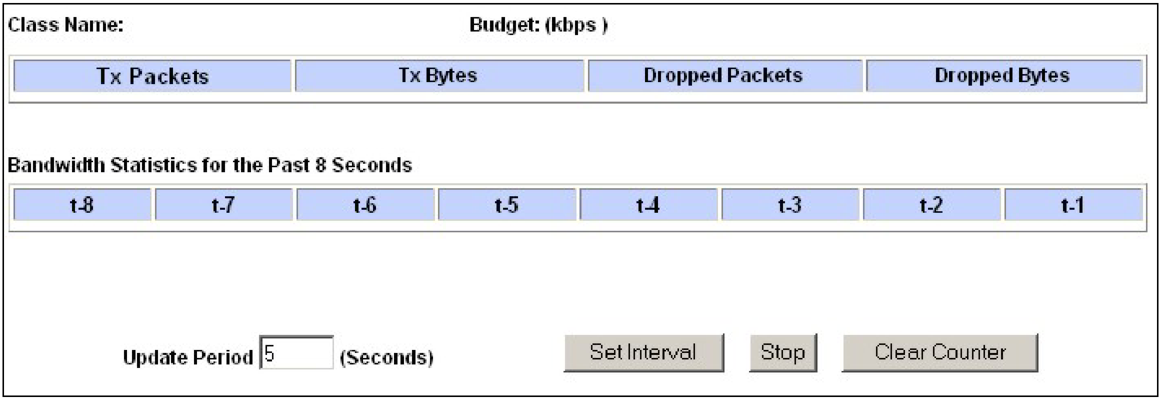
LABEL	DESCRIPTION
Cancel	Click **Cancel** to begin configuring this screen afresh.

Table 12-5Services and Port Numbers

SERVICES	PORT NUMBER
ECHO	7
FTP (File Transfer Protocol)	21
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

12.9.2 Bandwidth Management Statistics

Use the **Bandwidth Management Statistics** screen to view network performance information. Click the **Statistics** button in the **Class Setup** screen to open the **Statistics** screen.



Update Period 5 (Seconds)

Figure 12-10 Bandwidth Management Statistics

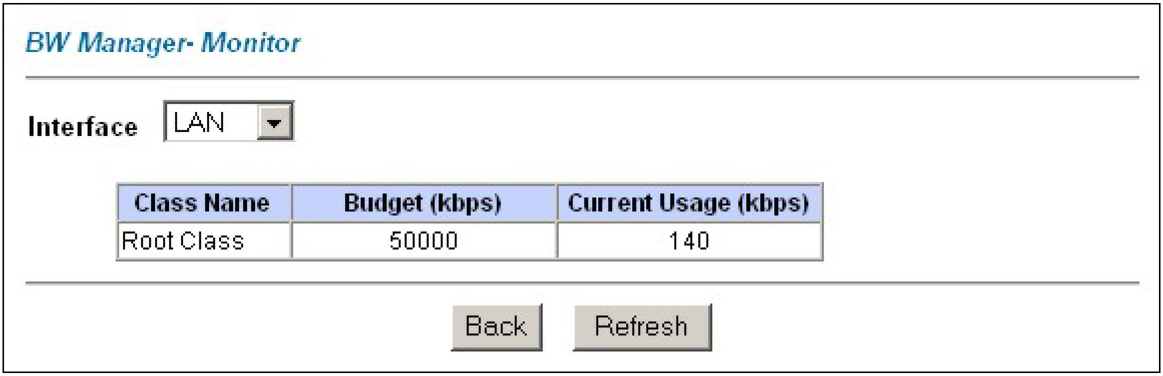
The following table describes the labels in this screen.

Table 12-6 Bandwidth Management Statistics

LABEL	DESCRIPTION
Class Name	This field displays the name of the class the statistics page is showing.
Budget (kbps)	This field displays the amount of bandwidth allocated to the class.
Tx Packets	This field displays the total number of packets transmitted.
TX Bytes	This field displays the total number of bytes transmitted.
Dropped Packets	This field displays the total number of packets dropped.
Dropped Bytes	This field displays the total number of bytes dropped.
Bandwidth Statistics for the Past 8 Seconds (t-8 to t-1)	
This field displays the bandwidth statistics (in bps) for the past one to eight seconds. For example, t-1 means one second ago.	
Update Period (seconds)	Enter the time interval in seconds to define how often the information should be refreshed.
Set Interval	Click **Set Interval** to apply the new update period you entered in the **Update Period** field above.
Stop Update	Click **Stop Update** to stop the browser from refreshing bandwidth management statistics.
Clear Counter	Click **Clear Counter** to clear all of the bandwidth management statistics.

12.10 Configuring Monitor

To view the Prestige's bandwidth usage and allotments, click **BW Manager**, then **Monitor**. The screen appears as shown.



BW Manager- Monitor

Interface: LAN

Class Name	Budget (kbps)	Current Usage (kbps)
Root Class	50000	140

Figure 12-11 Bandwidth Manager Monitor

The following table describes the labels in this screen.

Table 12-7 Bandwidth Manager Monitor

LABEL	DESCRIPTION
Interface	Select an interface from the drop-down list box to view the bandwidth usage of its bandwidth classes.
Class Name	This field displays the name of the class.
Budget (kbps)	This field displays the amount of bandwidth allocated to the class.
Current Usage (kbps)	This field displays the amount of bandwidth that each class is using.
Back	Click **Back** to go to the main **BW Manager** screen.
Refresh	Click **Refresh** to update the page.

Part VI:

Maintenance

This part covers the maintenance screens.

Chapter 13 Maintenance

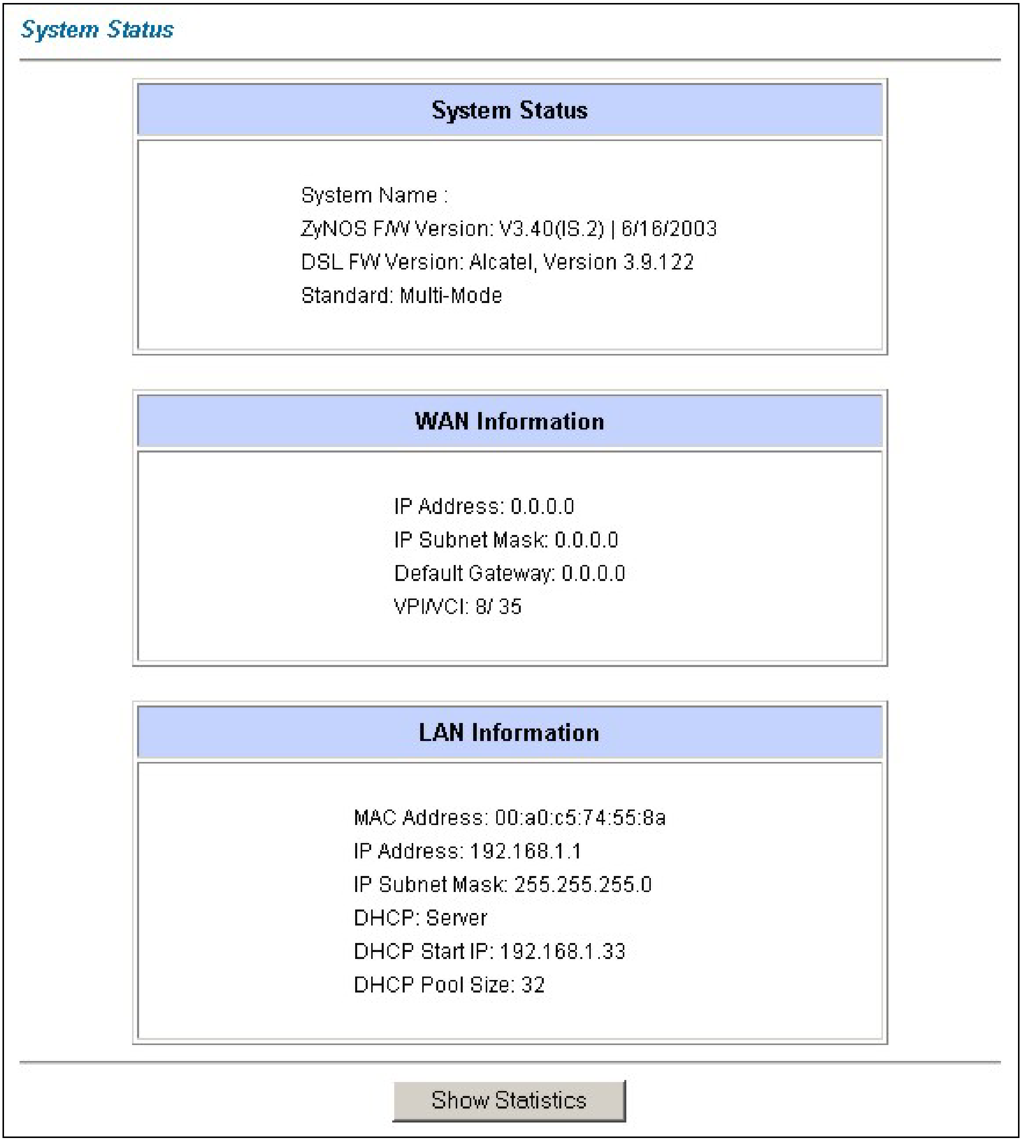
This chapter displays system information such as ZyNOS firmware, port IP addresses and port traffic statistics.

13.1 Maintenance Overview

Use the maintenance screens to view system information, upload new firmware, manage configuration and restart your Prestige.

13.2 System Status Screen

Click **System Status** to open the following screen, where you can use to monitor your Prestige. Note that these fields are READ-ONLY and are meant to be used for diagnostic purposes.



System Status

System Status

System Name :

ZyNOS F/W Version: V3.40(IS.2) | 6/16/2003

DSL FW Version: Alcatel, Version 3.9.122

Standard: Multi-Mode

WAN Information

IP Address: 0.0.0.0

IP Subnet Mask: 0.0.0.0

Default Gateway: 0.0.0.0

VPI/VCI: 8/ 35

LAN Information

MAC Address: 00:a0:c5:74:55:8a

IP Address: 192.168.1.1

IP Subnet Mask: 255.255.255.0

DHCP: Server

DHCP Start IP: 192.168.1.33

DHCP Pool Size: 32

Figure 13-1 System Status

The following table describes the labels in this screen.

Table 13-1 System Status

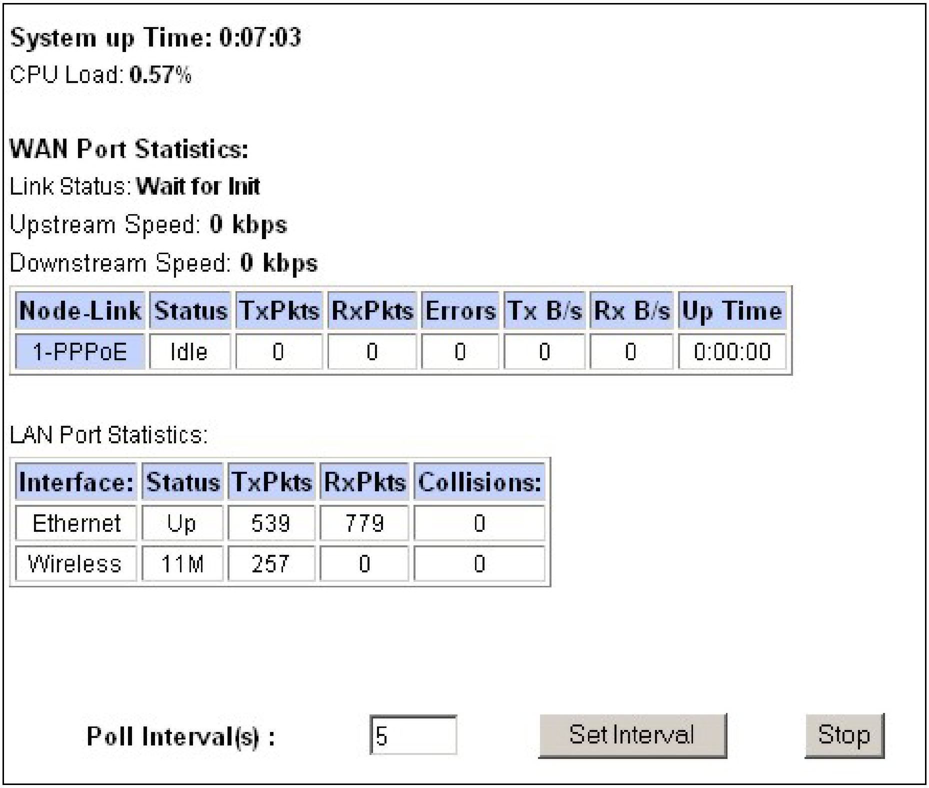
LABEL	DESCRIPTION
System Status	
System Name	This is the name of your Prestige. It is for identification purposes.
ZyNOS F/W Version	This is the ZyNOS firmware version and the date created. ZyNOS is ZyXEL's proprietary Network Operating System design.
DSL FW Version	This is the DSL firmware version associated with your Prestige.
Standard	This is the standard that your Prestige is using.
WAN Information	
IP Address	This is the WAN port IP address.
IP Subnet Mask	This is the WAN port IP subnet mask.
Default Gateway	This is the IP address of the default gateway, if applicable.
VPI/VCI	This is the Virtual Path Identifier and Virtual Channel Identifier that you entered in the first Wizard screen.
LAN Information	
MAC Address	This is the MAC (Media Access Control) or Ethernet address unique to your Prestige.
IP Address	This is the LAN port IP address.
IP Subnet Mask	This is the LAN port IP subnet mask.
DHCP	This is the WAN port DHCP role - **Server**, **Relay** (not all Prestige models) or **None**.
DHCP Start IP	This is the first of the contiguous addresses in the IP address pool.
DHCP Pool Size	This is the number of IP addresses in the IP address pool.

Table 13-1 System Status

LABEL	DESCRIPTION
Show Statistics	Click **Show Statistics** to see router performance statistics such as number of packets sent and number of packets received for each port.

13.2.1 System Statistics

Click **Show Statistics** in the **System Status** screen to open the following screen. Read-only information here includes port status and packet specific statistics. Also provided are "system up time" and "poll interval(s)". The **Poll Interval(s)** field is configurable.



System up Time: 0:07:03

CPU Load: **0.57%**

WAN Port Statistics:

Link Status: **Wait for Init**

Upstream Speed: **0 kbps**

Downstream Speed: **0 kbps**

Node-Link	Status	TxPkts	RxPkts	Errors	Tx B/s	Rx B/s	Up Time
1-PPPoE	Idle	0	0	0	0	0	0:00:00

LAN Port Statistics:

Interface:	Status	TxPkts	RxPkts	Collisions:
Ethernet	Up	539	779	0
Wireless	11M	257	0	0

Poll Interval(s) : 5

Figure 13-2 System Status: Show Statistics

The following table describes the labels in this screen.

Table 13-2 System Status: Show Statistics

LABEL	DESCRIPTION
System up Time	This is the elapsed time the system has been up.
CPU Load	This field specifies the percentage of CPU utilization.
WAN Port Statistics	This is the WAN port.
Link Status	This is the status of your WAN link.
Transfer Rate	This is the transfer rate in kbps.
Upstream Speed	This is the upstream speed of your Prestige.
Downstream Speed	This is the downstream speed of your Prestige.
Node-Link	This field displays the remote node index number and link type. Link types are PPPoA, ENET, RFC 1483 and PPPoE .
LAN Port Statistics	This is the LAN port.
Interface	This field displays the type of port.
Status	For the WAN port, this displays 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. For a LAN port, this shows the port speed and duplex setting.
TxPkts	This field displays the number of packets transmitted on this port.
RxPkts	This field displays the number of packets received on this port.
Errors	This field displays the number of error packets on this port.
Tx B/s	This field displays the number of bytes transmitted in the last second.
Rx B/s	This field displays the number of bytes received in the last second.
Up Time	This field displays the elapsed time this port has been up.

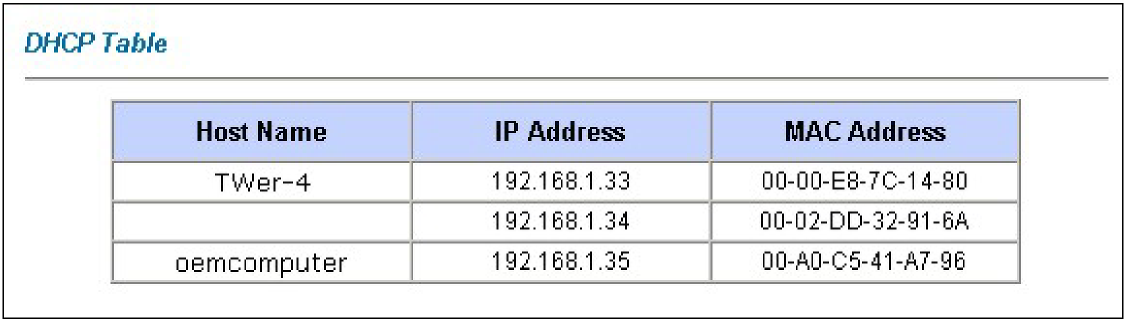
Table 13-2 System Status: Show Statistics

LABEL	DESCRIPTION
Collisions	This is the number of collisions on this port.
Poll Interval(s)	Type the time interval for the browser to refresh system statistics.
Set Interval	Click this button to apply the new poll interval you entered in the **Poll Interval** field above.
Stop	Click this button to halt the refreshing of the system statistics.

13.3 DHCP Table Screen

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 computer must be manually configured.

Click **MAINTENANCE**, and then the **DHCP Table** tab. Read-only information here relates to your DHCP status. The DHCP table shows current DHCP client information (including **IP Address**, **Host Name** and **MAC Address**) of all network clients using the DHCP server.



DHCP Table

Host Name	IP Address	MAC Address
TWer-4	192.168.1.33	00-00-E8-7C-14-80
	192.168.1.34	00-02-DD-32-91-6A
oemcomputer	192.168.1.35	00-A0-C5-41-A7-96

Figure 13-3 DHCP Table

The following table describes the labels in this screen.

Table 13-3 DHCP Table

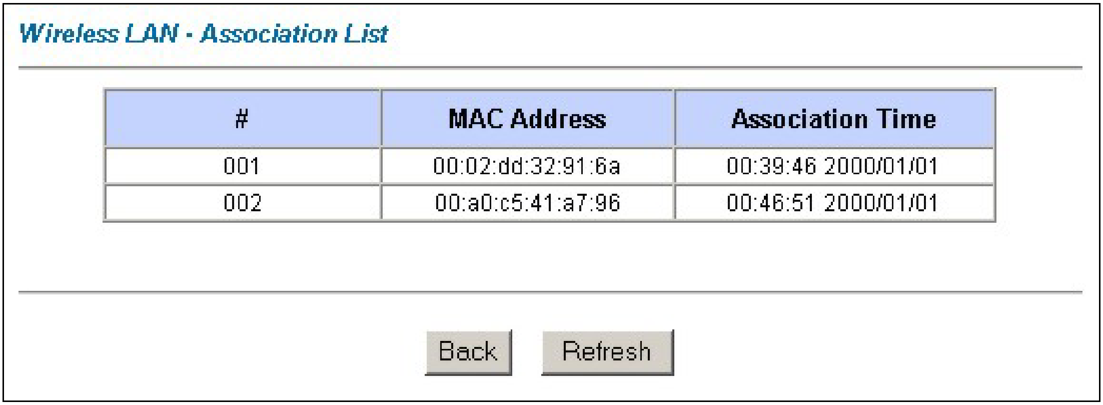
LABEL	DESCRIPTION
Host Name	This is the name of the host computer.
IP Address	This field displays the IP address relative to the **Host Name** field.
MAC Address	This field displays the MAC (Media Access Control) address of the computer with the displayed host name. Every Ethernet device has a unique MAC address. The MAC address is assigned at the factory and consists of six pairs of hexadecimal characters, for example, 00:A0:C5:00:00:02.

13.4 Wireless Screens

These read-only screens display information about the Prestige's wireless LAN.

13.4.1 Association List

This screen displays the MAC address(es) of the wireless clients that are currently logged in to the network. Click **Wireless LAN** and then **Association List** to open the screen shown next.



Wireless LAN - Association List

#	MAC Address	Association Time
001	00:02:dd:32:91:6a	00:39:46 2000/01/01
002	00:a0:c5:41:a7:96	00:46:51 2000/01/01

Figure 13-4 Association List

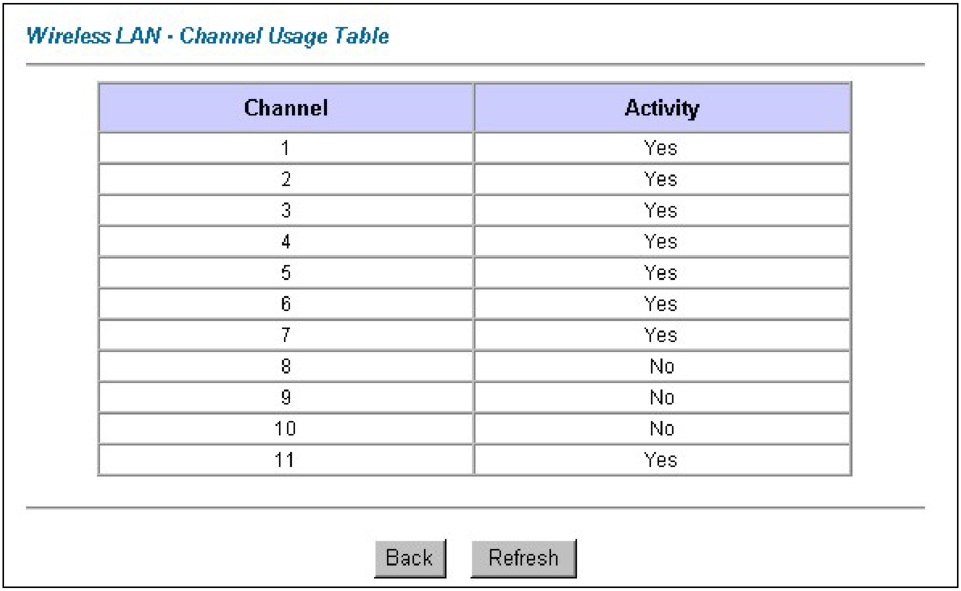
The following table describes the labels in this screen.

Table 13-4 Association List

LABEL	DESCRIPTION
#	This is the index number of an associated wireless client.
MAC Address	This field displays the MAC (Media Access Control) address of an associated wireless station. Every Ethernet device has a unique MAC address. The MAC address is assigned at the factory and consists of six pairs of hexadecimal characters, for example, 00:A0:C5:00:00:02.
Association Time	This field displays how long a wireless station has been associated to the Prestige.
Back	Click **Back** to go to the main **Wireless LAN** screen.
Refresh	Click **Refresh** to renew the information in the table.

13.4.2 Channel Usage Table

This screen displays the state of the channels within the Prestige's transmission range. Click **Wireless LAN** and then **Channel Usage Table** to open the screen shown next.



Wireless LAN - Channel Usage Table

Channel	Activity
1	Yes
2	Yes
3	Yes
4	Yes
5	Yes
6	Yes
7	Yes
8	No
9	No
10	No
11	Yes

Figure 13-5 Channel Usage Table

The following table describes the labels in this screen.

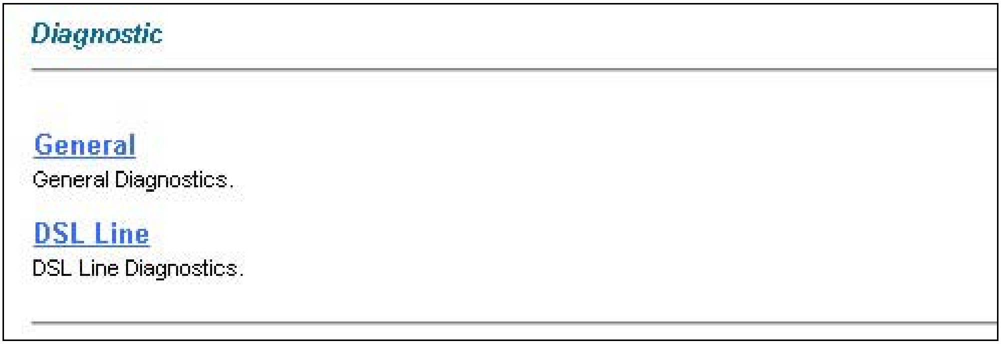
Table 13-5 Channel Usage Table

LABEL	DESCRIPTION
Channel	This is the index number of the channel.
IP Address	This field displays **Yes** if another AP or Ad-hoc network is using the channel within the Prestige's transmission range.
Back	Click **Back** to go to the main **Wireless LAN** screen.
Refresh	Click **Refresh** to renew the information in the table.

13.5 Diagnostic Screens

These read-only screens display information to help you identify problems with the Prestige.

Click **Diagnostic** to display the following screen.



Diagnostic

General

General Diagnostics.

DSL Line

DSL Line Diagnostics.

Figure 13-6 Diagnostic

13.5.1 Diagnostic General Screen

Click **Diagnostic** and then **General** to open the screen shown next.

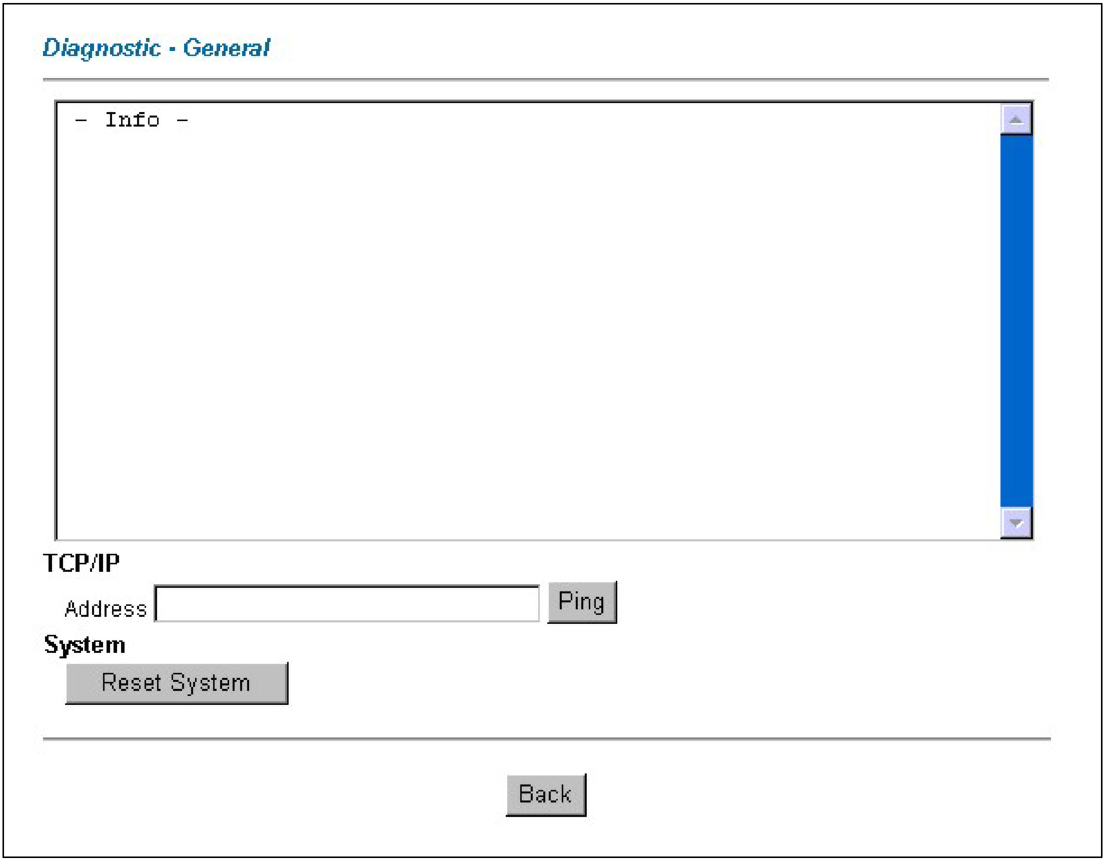


Figure 13-7 Diagnostic General

The following table describes the labels in this screen.

Table 13-6 Diagnostic General

LABEL	DESCRIPTION
TCP/IP Address	Type the IP address of a computer that you want to ping in order to test a connection.
Ping	Click this button to ping the IP address that you entered.

Table 13-6 Diagnostic General

LABEL	DESCRIPTION
Reset System	Click this button to reboot the Prestige. A warning dialog box is then displayed asking you if you're sure you want to reboot the system. Click **OK** to proceed.
Back	Click this button to go back to the main **Diagnostic** screen.

13.5.2 Diagnostic DSL Line Screen

Click **Diagnostic** and then **DSL Line** to open the screen shown next.

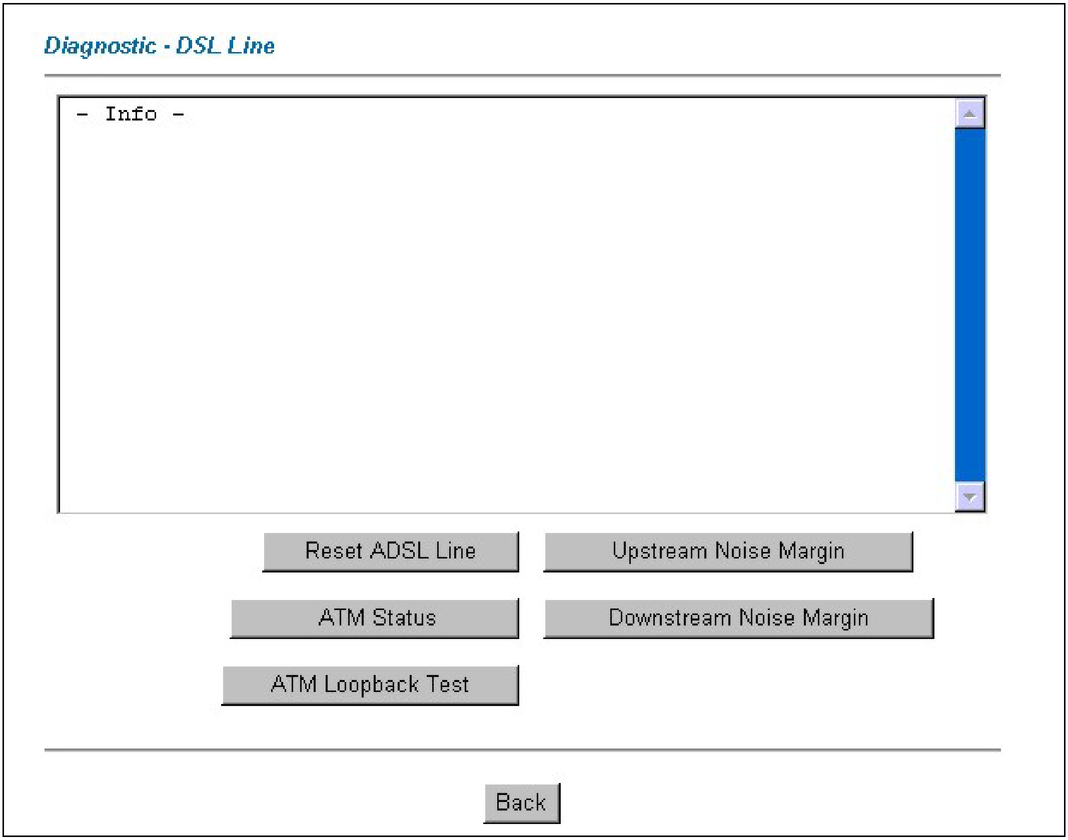


Figure 13-8 Diagnostic DSL Line

The following table describes the labels in this screen.

Table 13-7 Diagnostic DSL Line

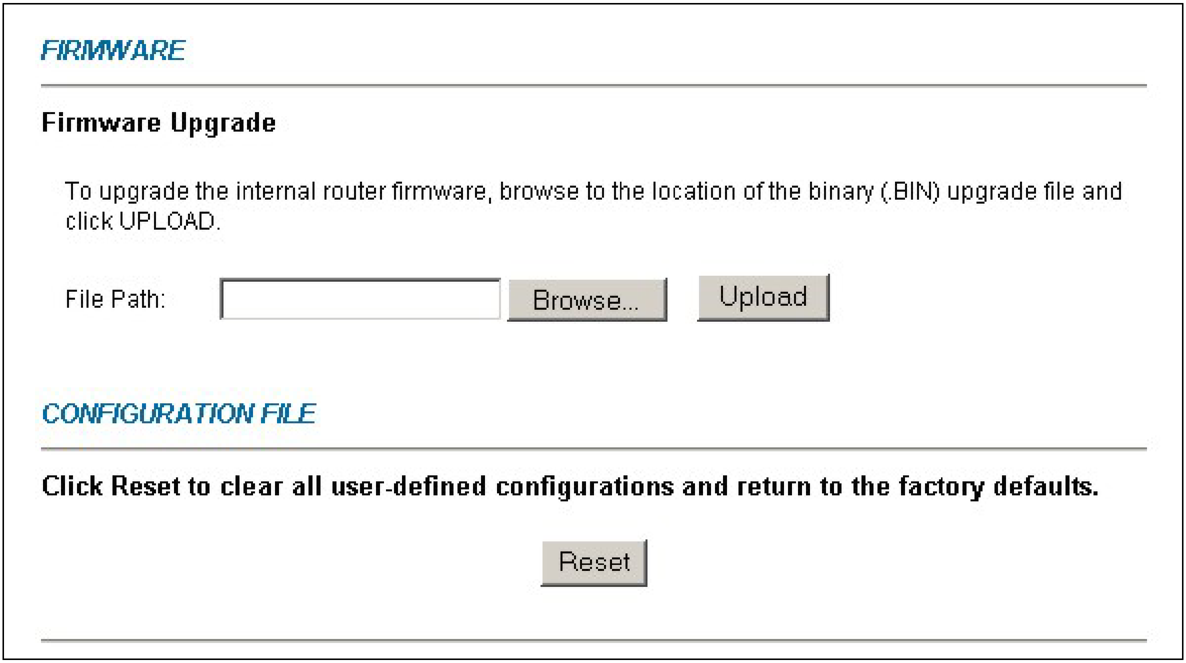
LABEL	DESCRIPTION
Reset ADSL Line	Click this button to reinitialize the ADSL line. The large text box above then displays the progress and results of this operation, for example: "Start to reset ADSL Loading ADSL modem F/W... Reset ADSL Line Successfully!"
ATM Status	Click this button to view ATM status.
ATM Loopback Test	Click this button to start the ATM loopback test. Make sure you have configured at least one PVC with proper VPIs/VCIs before you begin this test. The Prestige sends an OAM F5 packet to the DSLAM/ATM switch and then returns it (loops it back) to the Prestige. The ATM loopback test is useful for troubleshooting problems with the DSLAM and ATM network.
Upstream Noise Margin	Click this button to display the upstream noise margin.
Downstream Noise Margin	Click this button to display the downstream noise margin.
Back	Click this button to go back to the main **Diagnostic** screen.

13.6 Firmware Screen

Find firmware at www.zyxel.com in a file that (usually) uses the system model name with a "*.bin" extension, e.g., "Prestige.bin". The upload process uses FTP (File Transfer Protocol) and may take up to two minutes. After a successful upload, the system will reboot. See the *Firmware and Configuration File Maintenance* chapter in the parts that document the SMT for upgrading firmware using FTP/TFTP commands.

Only use firmware for your Prestige's specific model. Refer to the label on the bottom of your Prestige.

Click **Firmware** to open the following screen. Follow the instructions in this screen to upload firmware to your Prestige.



FIRMWARE

Firmware Upgrade

To upgrade the internal router firmware, browse to the location of the binary (.BIN) upgrade file and click UPLOAD.

File Path:

CONFIGURATION FILE

Click Reset to clear all user-defined configurations and return to the factory defaults.

Figure 13-9 Firmware Upgrade

The following table describes the labels in this screen.

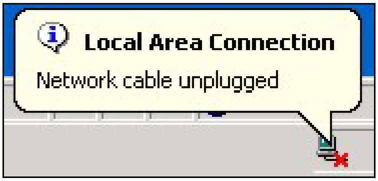
Table 13-8 Firmware Upgrade

LABEL	DESCRIPTION
File Path	Type in the location of the file you want to upload in this field or click **Browse ...** to find it.
Browse...	Click **Browse...** to find the .bin file you want to upload. Remember that you must decompress compressed (.zip) files before you can upload them.
Upload	Click **Upload** to begin the upload process. This process may take up to two minutes.
Reset	Click this button to clear all user-entered configuration information and return the Prestige to its factory defaults. Refer to the *Resetting the Prestige* section.

Do not turn off the Prestige while firmware upload is in progress!

After you see the **Firmware Upload in Process** screen, wait two minutes before logging into the Prestige again.

The Prestige automatically restarts in this time causing a temporary network disconnect. In some operating systems, you may see the following icon on your desktop.



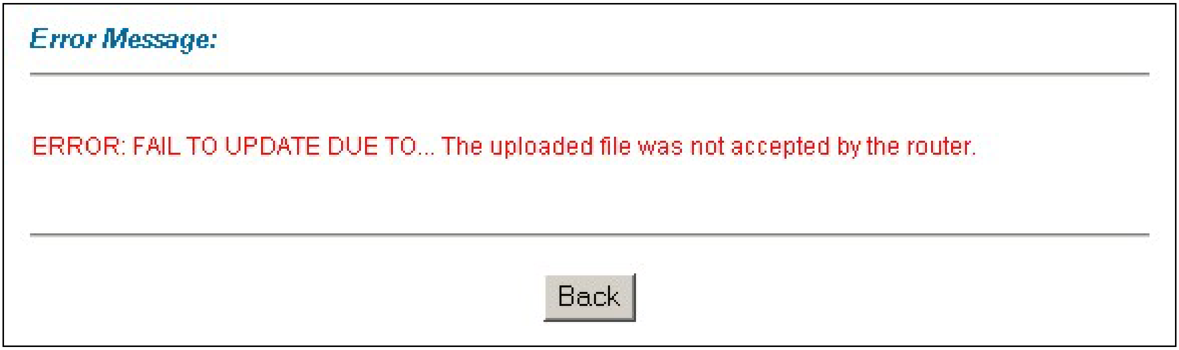
Local Area Connection

Network cable unplugged

Figure 13-10 Network Temporarily Disconnected

After two minutes, log in again and check your new firmware version in the **System Status** screen.

If the upload was not successful, the following screen will appear. Click **Back** to go back to the **Firmware** screen.



Error Message:

ERROR: FAIL TO UPDATE DUE TO... The uploaded file was not accepted by the router.

Figure 13-11 Error Message

Part VII:

SMT General Configuration

This part covers System Management Terminal configuration for general setup, LAN setup, wireless LAN setup, Internet access, remote nodes, remote node TCP/IP, static routing and NAT.

See the web configurator parts of this guide for background information on features configurable by web configurator and SMT.

Chapter 14
Introducing the SMT

This chapter explains how to access and navigate the System Management Terminal and gives an overview of its menus.

14.1 SMT Introduction

The Prestige's SMT (System Management Terminal) is a menu-driven interface that you can access from a terminal emulator through the console port or over a telnet connection.

14.1.1 Procedure for SMT Configuration via Console Port

Follow the steps below to access your Prestige via the console port.

Configure a terminal emulation communications program as follows: VT100 terminal emulation, no parity, 8 data bits, 1 stop bit, data flow set to none, 9600 bps port speed.

Press [ENTER] to display the SMT password screen. The default password is "1234".

14.1.2 Procedure for SMT Configuration via Telnet

The following procedure details how to telnet into your Prestige.

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

Step 2. Enter "1234" in the **Password** field.

Step 3. After entering the password you will see the main menu.

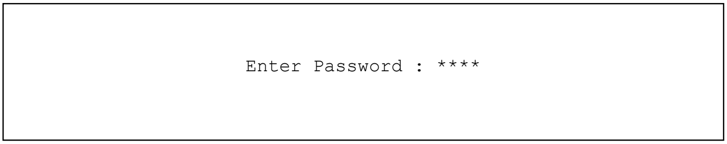
Please note that if there is no activity for longer than five minutes (default timeout period) after you log in, your Prestige will automatically log you out. You will then have to telnet into the Prestige again.

14.1.3 Entering 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 asterisk "*" for each character you type.

Please note that if there is no activity for longer than five minutes after you log in, your Prestige will automatically log you out.



```
Enter Password : ****
```

Figure 14-1 Login Screen

14.1.4 Prestige SMT Menu Overview

We use the Prestige 650HW-31 SMT menus in this guide as an example. The SMT menus vary slightly for different Prestige models.

The following figure gives you an overview of the various SMT menu screens of your Prestige.

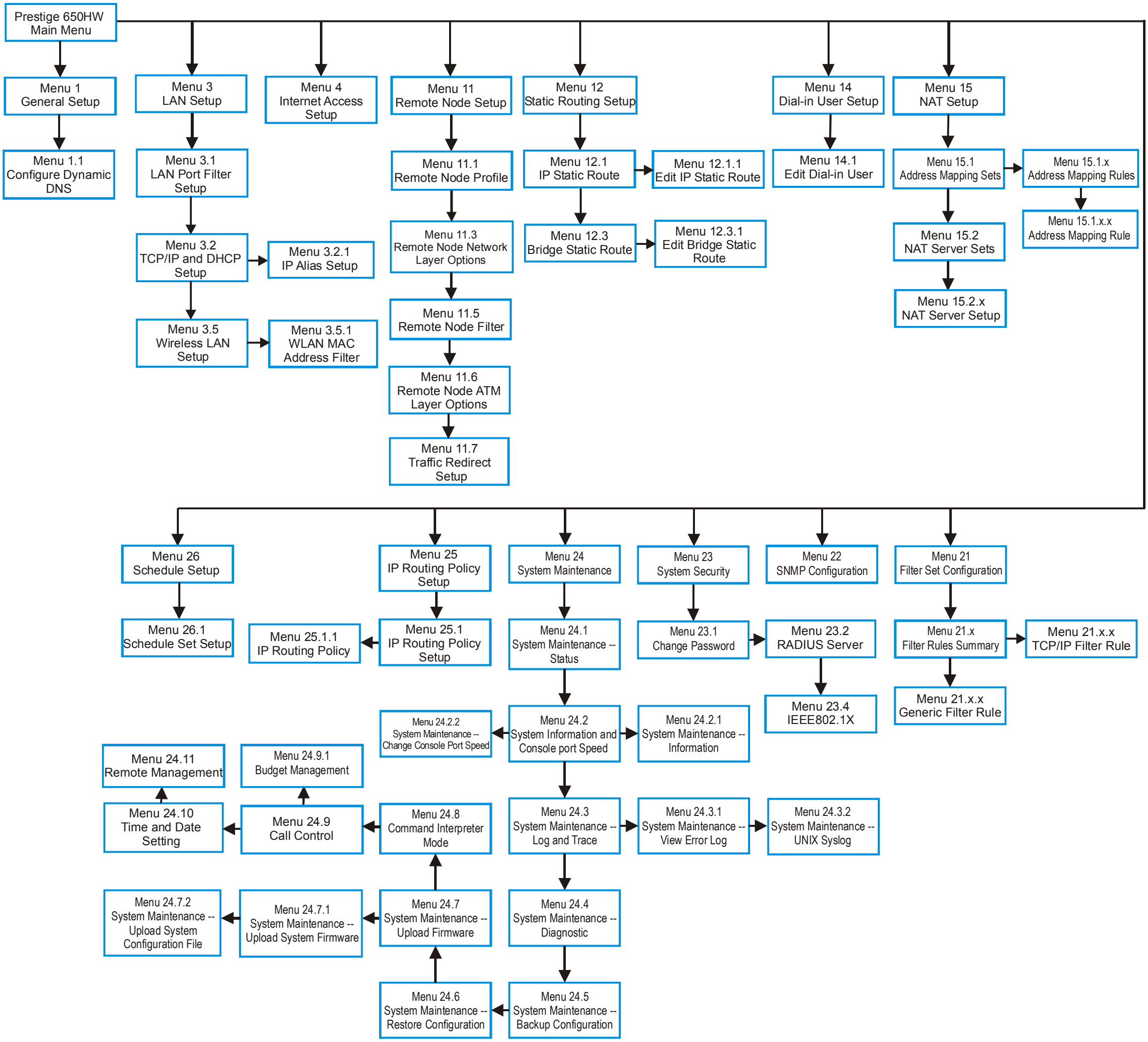

Prestige 650HW Main Menu
Menu 1 General Setup
Menu 1.1 Configure Dynamic DNS
Menu 3 LAN Setup
Menu 3.1 LAN Port Filter Setup
Menu 3.2 TCP/IP and DHCP Setup
Menu 3.2.1 IP Alias Setup
Menu 3.5 Wireless LAN Setup
Menu 3.5.1 WLAN MAC Address Filter
Menu 4 Internet Access Setup
Menu 11 Remote Node Setup
Menu 11.1 Remote Node Profile
Menu 11.3 Remote Node Network Layer Options
Menu 11.5 Remote Node Filter
Menu 11.6 Remote Node ATM Layer Options
Menu 11.7 Traffic Redirect Setup
Menu 12 Static Routing Setup
Menu 12.1 IP Static Route
Menu 12.1.1 Edit IP Static Route
Menu 12.3 Bridge Static Route
Menu 12.3.1 Edit Bridge Static Route
Menu 14 Dial-in User Setup
Menu 14.1 Edit Dial-in User
Menu 15 NAT Setup
Menu 15.1 Address Mapping Sets
Menu 15.1.x Address Mapping Rules
Menu 15.1.x.x Address Mapping Rule
Menu 15.2 NAT Server Sets
Menu 15.2.x NAT Server Setup
Menu 26 Schedule Setup
Menu 26.1 Schedule Set Setup
Menu 25 IP Routing Policy Setup
Menu 25.1 IP Routing Policy Setup
Menu 25.1.1 IP Routing Policy
Menu 24 System Maintenance
Menu 24.1 System Maintenance -- Status
Menu 24.2 System Information and Console port Speed
Menu 24.2.1 System Maintenance -- Information
Menu 24.2.2 System Maintenance -- Change Console Port Speed
Menu 24.3 System Maintenance -- Log and Trace
Menu 24.3.1 System Maintenance -- View Error Log
Menu 24.3.2 System Maintenance -- UNIX Syslog
Menu 24.4 System Maintenance -- Diagnostic
Menu 24.5 System Maintenance -- Backup Configuration
Menu 24.6 System Maintenance -- Restore Configuration
Menu 24.7 System Maintenance -- Upload Firmware
Menu 24.7.1 System Maintenance -- Upload System Firmware
Menu 24.7.2 System Maintenance -- Upload System Configuration File
Menu 24.8 Command Interpreter Mode
Menu 24.9 Call Control
Menu 24.9.1 Budget Management
Menu 24.10 Time and Date Setting
Menu 24.11 Remote Management
Menu 23 System Security
Menu 23.1 Change Password
Menu 23.2 RADIUS Server
Menu 23.4 IEEE802.1X
Menu 22 SNMP Configuration
Menu 21 Filter Set Configuration
Menu 21.x Filter Rules Summary
Menu 21.x.x TCP/IP Filter Rule
Menu 21.x.x Generic Filter Rule

Figure 14-2 Prestige 650HW-31 SMT Menu Overview

14.2 Navigating the SMT Interface

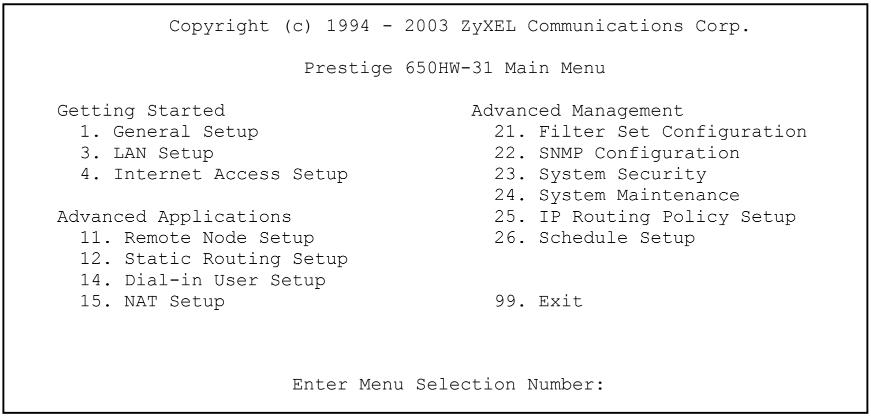
The SMT (System Management Terminal) is the interface that you use to configure your Prestige.

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

Table 14-1 Main Menu Commands

OPERATION	KEYSTROKE	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 [ESC] to move back to the previous menu.
Move to a "hidden" menu	Press [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 [SPACE BAR] once to change **No** to **Yes**, then press [ENTER] to go to the "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.
Entering information	Type in or press [SPACE BAR], then press [ENTER].	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 [SPACE BAR].
Required fields	<? > or **ChangeMe**	All fields with the symbol <?> must be filled in order to be able to save the new configuration. All fields with **ChangeMe** must not be left blank in order to be able to save the new configuration.
N/A fields	<N/A>	Some of the fields in the SMT will show a <N/A>. This symbol refers to an option that is Not Applicable.
Save your configuration	[ENTER]	Save your configuration by pressing [ENTER] at the message "Press ENTER to confirm or ESC to cancel". Saving the data on the screen will take you, in most cases to the previous menu.
Exit the SMT	Type 99, then press [ENTER].	Type 99 at the main menu prompt and press [ENTER] to exit the SMT interface.

After you enter the password, the SMT displays the main menu, as shown next.



```
                Copyright (c) 1994 - 2003 ZyXEL Communications Corp.

                            Prestige 650HW-31 Main Menu

     Getting Started                     Advanced Management
       1. General Setup                    21. Filter Set Configuration
       3. LAN Setup                        22. SNMP Configuration
       4. Internet Access Setup            23. System Security
                                           24. System Maintenance
     Advanced Applications                 25. IP Routing Policy Setup
       11. Remote Node Setup               26. Schedule Setup
       12. Static Routing Setup
       14. Dial-in User Setup
       15. NAT Setup                       99. Exit



                           Enter Menu Selection Number:
```

Figure 14-3 SMT Main Menu for P650HW

14.2.1 System Management Terminal Interface Summary

Table 14-2 Main Menu Summary for P650HW

#	MENU TITLE	DESCRIPTION
1	General Setup	Use this menu to set up your general information.
3	LAN Setup	Use this menu to set up your wireless LAN (Prestige 650H/HW only) and LAN connection.
4	Internet Access Setup	A quick and easy way to set up an Internet connection.
11	Remote Node Setup	Use this menu to set up the Remote Node for LAN-to-LAN connection, including Internet connection.
12	Static Routing Setup	Use this menu to set up static routes.
14	Dial-in User Setup	Use this menu to set up local user profiles on the Prestige 650H/HW.
15	NAT Setup	Use this menu to specify inside servers when NAT is enabled.
21	Filter Set Configuration	Use this menu to set up filters to provide security, etc.
22	SNMP Configuration	Use this menu to set up SNMP related parameters.
23	System Security	Use this menu to set up wireless security (Prestige 650H/HW only) and change your password.
24	System Maintenance	This menu provides system status, diagnostics, software upload, etc.

Table 14-2 Main Menu Summary for P650HW

#	MENU TITLE	DESCRIPTION
25	IP Routing Policy Setup	Use this menu to configure your IP routing policy.
26	Schedule Setup	Use this menu to schedule outgoing calls.
99	Exit	Use this to exit from SMT and return to a blank screen.

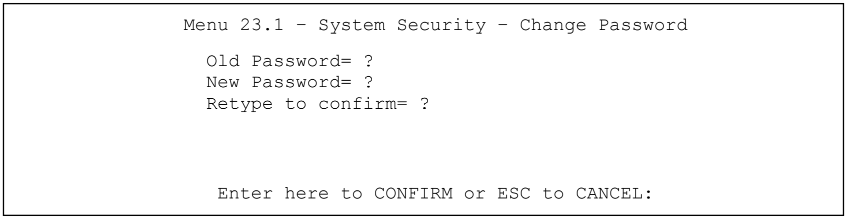
14.3 Changing the System Password

Change the Prestige default password by following the steps shown next.

Step 1. Enter 23 in the main menu to display **Menu 23 - System Security**.

Step 2. Enter 1 to display **Menu 23.1 - System Security - Change Password** as shown next.

Step 3. Type your existing system password in the **Old Password** field, for example "1234", and press [ENTER].



```
                Menu 23.1 - System Security - Change Password

                  Old Password= ?
                  New Password= ?
                  Retype to confirm= ?



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

Figure 14-4 Menu 23 System Password

Step 4. Type your new system password in the **New Password** field (up to 30 characters), and press [ENTER].

Step 5. Re-type your new system password in the **Retype to confirm** field for confirmation and press [ENTER].

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

Chapter 15
General Setup

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

15.1 General Setup

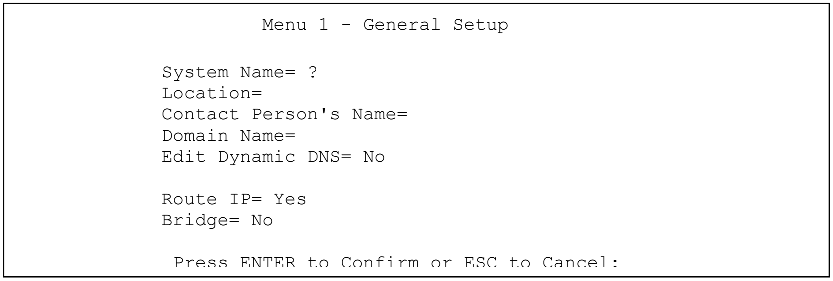
Menu 1 — General Setup contains administrative and system-related information (shown next). The **System Name** field is for identification purposes. However, because some ISPs check this name you should enter your computer's "Computer Name".

- 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**.
- In Windows XP, click **start**, **My Computer**, **View system information** and then click the **Computer Name** tab. Note the entry in the **Full 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.

15.2 Configuring Menu 1

Enter 1 in the Main Menu to open **Menu 1** — **General Setup** (shown next).



```
                      Menu 1 - General Setup

             System Name= ?
             Location=
             Contact Person's Name=
             Domain Name=
             Edit Dynamic DNS= No

             Route IP= Yes
             Bridge= No

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

Figure 15-1 Menu 1 General Setup

Fill in the required fields. Refer to the table shown next for more information about these fields.

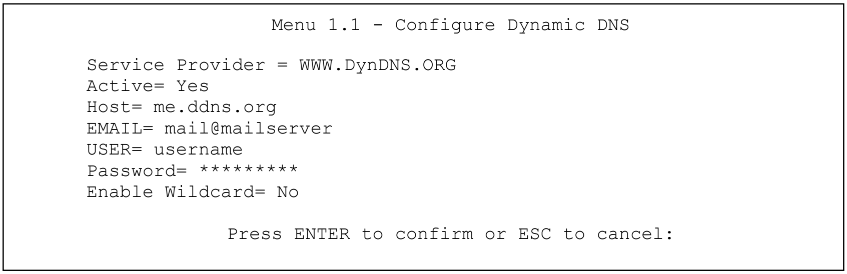
Table 15-1 Menu 1 General Setup

FIELD	DESCRIPTION	EXAMPLE
System Name	Enter a descriptive name for identification purposes. This name can be up to 30 alphanumeric characters long. Spaces are not allowed, but dashes “-” and underscores "_" are accepted.	
Location (optional)	Enter the geographic location (up to 31 characters) of your Prestige.	MyHouse
Contact Person's Name (optional)	Enter the name (up to 30 characters) of the person in charge of this Prestige.	JohnDoe
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**
Route IP	Set this field to **Yes** to enable or **No** to disable IP routing. You must enable IP routing for Internet access.	**Yes**
Bridge	Turn on/off bridging for protocols not supported (for example, SNA) or not turned on in the previous **Route IP** field. Select **Yes** to turn bridging on; select **No** to turn bridging off.	**No**

15.2.1 Configuring Dynamic DNS

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

To configure Dynamic DNS, go to **Menu 1 — General Setup** and 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 15-2 Menu 1.1 Configure Dynamic DNS

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

Table 15-2 Menu 1.1 Configure Dynamic DNS

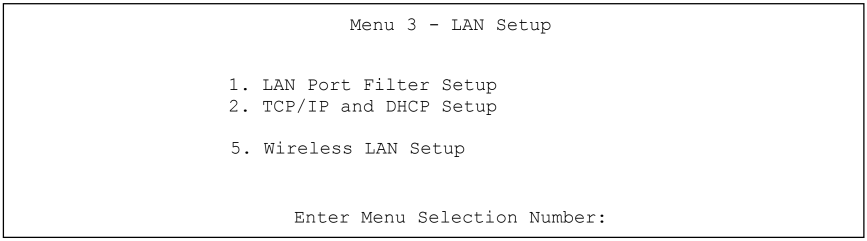
FIELD	DESCRIPTION	EXAMPLE
Service Provider	This is the name of your Dynamic DNS service provider.	WWW.DynDNS.ORG (default)
Active	Press [SPACE BAR] to select **Yes** and then press [ENTER] to make dynamic DNS active.	**Yes**
Host	Enter the domain name assigned to your Prestige by your Dynamic DNS provider.	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] and then [ENTER] to select **Yes** or **No** This field is **N/A** when you choose DDNS client as your service provider.	**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.		

Chapter 16
LAN Setup

This chapter covers how to configure your wired Local Area Network (LAN) settings.

16.1 LAN Setup

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

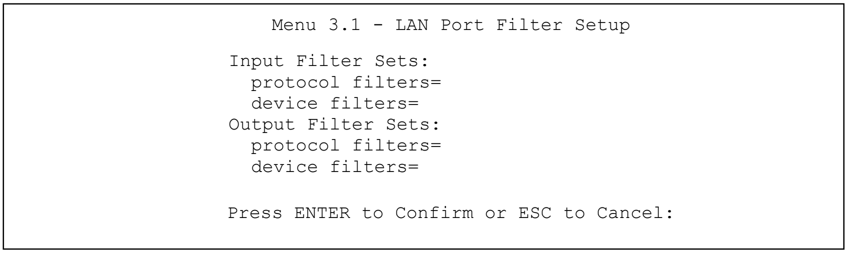


```
                      Menu 3 - LAN Setup


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

             5. Wireless LAN Setup


                 Enter Menu Selection Number:
```

Figure 16-1 Menu 3 LAN Setup

16.1.1 General Ethernet Setup

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



```
              Menu 3.1 - LAN Port Filter Setup

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

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

Figure 16-2 Menu 3.1 LAN Port Filter Setup

If you need to define filters, please read the *Filter Set Configuration* chapter first, then return to this menu to define the filter sets.

16.2 Protocol Dependent Ethernet Setup

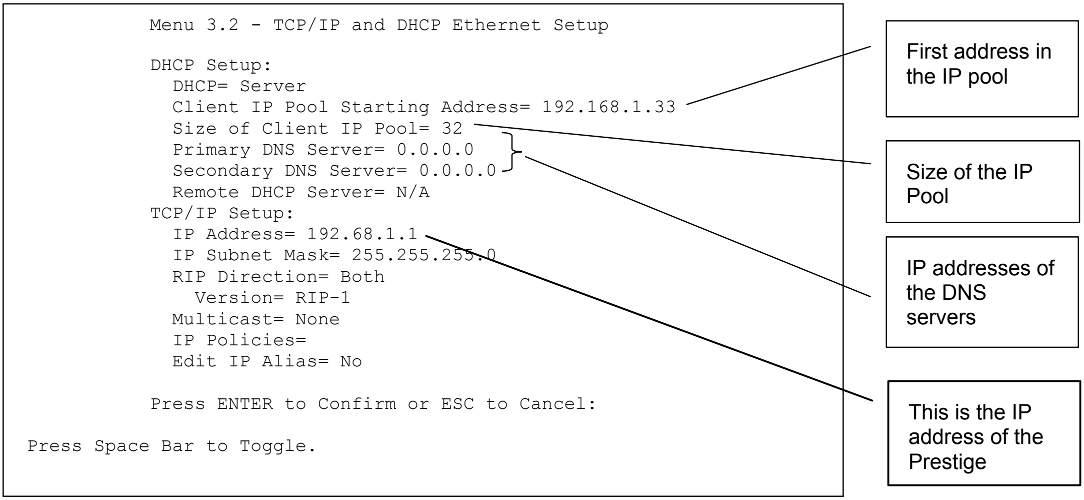
Depending on the protocols for your applications, you need to configure the respective Ethernet Setup, as outlined below.

- For TCP/IP Ethernet setup refer to the *Internet Access Application* chapter.
- For bridging Ethernet setup refer to the *Bridging Setup* chapter.

16.3 TCP/IP Ethernet Setup and DHCP

Use menu 3.2 to configure your Prestige for TCP/IP.

To edit menu 3.2, enter 3 from the main menu to display **Menu 3 — Ethernet Setup**. When menu 3 appears, press 2 and press [ENTER] to display **Menu 3.2 — TCP/IP and DHCP Ethernet Setup**, as shown next:



```
             Menu 3.2 - TCP/IP and DHCP Ethernet Setup

             DHCP Setup:
               DHCP= Server
               Client IP Pool Starting Address= 192.168.1.33
               Size of Client IP Pool= 32
               Primary DNS Server= 0.0.0.0
               Secondary DNS Server= 0.0.0.0
               Remote DHCP Server= N/A
             TCP/IP Setup:
               IP Address= 192.68.1.1
               IP Subnet Mask= 255.255.255.0
               RIP Direction= Both
                 Version= RIP-1
               Multicast= None
               IP Policies=
               Edit IP Alias= No

             Press ENTER to Confirm or ESC to Cancel:

  Press Space Bar to Toggle.
```

First address in the IP pool

Size of the IP Pool

IP addresses of the DNS servers

This is the IP address of the Prestige

Figure 16-3 Menu 3.2 TCP/IP and DHCP Ethernet Setup

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

Table 16-1 DHCP Ethernet Setup Menu Fields

FIELD	DESCRIPTION	EXAMPLE
DHCP Setup		
DHCP	If set to **Server**, your Prestige can assign IP addresses, an IP default gateway and DNS servers to Windows 95, Windows NT and other systems that support the DHCP client. If set to **None**, the DHCP server will be disabled. If set to **Relay**, the Prestige acts as a surrogate DHCP server and relays DHCP requests and responses between the remote server and the clients. Enter the IP address of the actual, remote DHCP server in the Remote DHCP Server in this case. When DHCP is used, the following items need to be set:	**Server** (default)
Client IP Pool Starting Address	This field specifies the first of the contiguous addresses in the IP address pool.	192.168.1.33
Size of Client IP Pool	This field specifies the size or count of the IP address pool.	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.	
Remote DHCP Server	If **Relay** is selected in the **DHCP** field above then enter the IP address of the actual remote DHCP server here.	

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

Table 16-2 TCP/IP Ethernet Setup Menu Fields

FIELD	DESCRIPTION	EXAMPLE
TCP/IP Setup		
IP Address	Enter the (LAN) IP address of your Prestige in dotted decimal notation	192.168.1.1
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 [SPACE BAR] to select the RIP direction. Choices are **Both**, **In Only**, **Out Only** or **None**.	**Both** (default)
Version	Press [SPACE BAR] to select the RIP version. Choices are **RIP-1**, **RIP-2B** or **RIP-2M**.	**RIP-1** (default)

Table 16-2 TCP/IP Ethernet Setup Menu Fields

FIELD	DESCRIPTION	EXAMPLE
Multicast	IGMP (Internet Group Multicast Protocol) is a network-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.	**None** (default)
IP Policies	Create policies using SMT menu 25 (see the *IP Policy Routing chapter*) and apply them on the Prestige LAN interface here. You can apply up to four IP Policy sets (from twelve) by entering their numbers separated by commas.	2,4,7,9
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 [SPACE BAR] to change **No** to **Yes** and press [ENTER] to for menu 3.2.1	**No** (default)

Chapter 17
Wireless LAN Setup

This chapter covers how to configure wireless LAN settings in SMT menu 3.5. This chapter is only applicable to the Prestige 650 and Prestige 650HW.

17.1 Wireless LAN Overview

Refer to the chapter on the wireless LAN screens for wireless LAN background information.

17.2 Inserting a PCMCIA Wireless LAN Card

Use a ZyAIR series wireless LAN PCMCIA card to add optional wireless LAN capabilities.

Step 1. Turn off the Prestige.

Never insert or remove a wireless LAN card when the Prestige is turned on.

Step 2. Locate the slot labeled **Wireless LAN** on the Prestige.

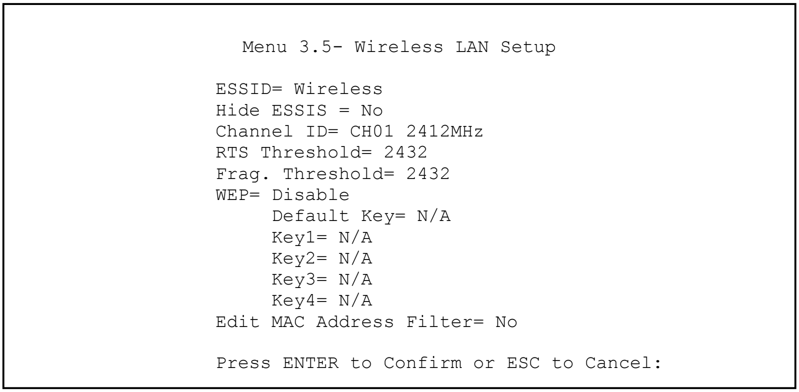
Step 3. With its pin connector facing the slot and the LED side facing upwards, slide the ZyAIR wireless LAN card into the slot.

Never force, bend or twist the wireless LAN card into the slot.

Step 4. Turn on the Prestige. The **WLAN** LED should turn on.

17.3 Wireless LAN Setup

Use menu 3.5 to set up your Prestige as the wireless access point. To edit menu 3.5, enter 3 from the main menu to display **Menu 3 – LAN Setup**. When menu 3 appears, press 5 and then press [ENTER] to display **Menu 3.5 – Wireless LAN Setup** as shown next.



```
                    Menu 3.5- Wireless LAN Setup

                  ESSID= Wireless
                  Hide ESSIS = No
                  Channel ID= CH01 2412MHz
                  RTS Threshold= 2432
                  Frag. Threshold= 2432
                  WEP= Disable
                       Default Key= N/A
                       Key1= N/A
                       Key2= N/A
                       Key3= N/A
                       Key4= N/A
                  Edit MAC Address Filter= No

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

Figure 17-1 Menu 3.5 - Wireless LAN Setup

The following table describes the fields in this menu.

Table 17-1 Wireless LAN Setup Field Description

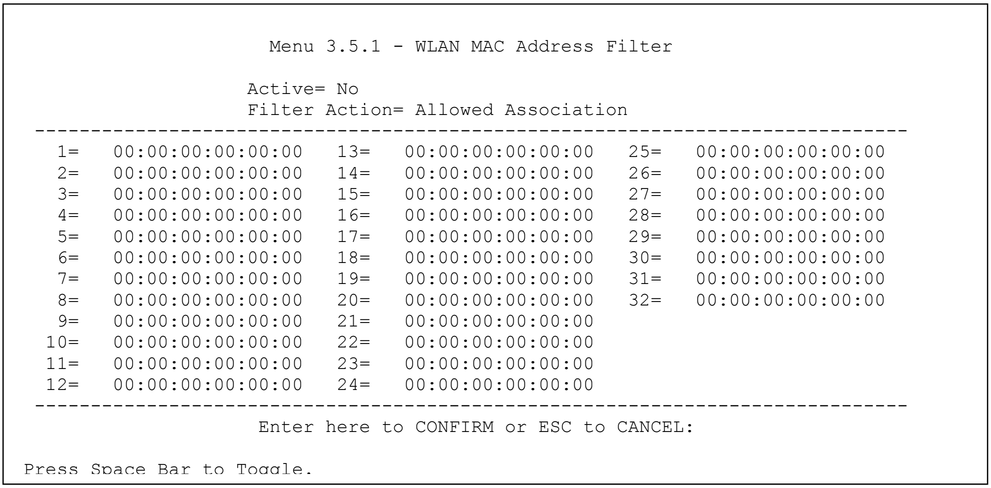
FIELD	DESCRIPTION	EXAMPLE
ESSID	The ESSID (Extended Service Set IDentifier) identifies the service set the wireless station is to connect to. Wireless stations associating to the Access Point must have the same ESSID. Enter a descriptive name (up to 32 characters) for the wireless Service Set.	**Wireless**
Hide ESSID	Press [SPACE BAR] and select **Yes** to hide the ESSID in the outgoing beacon frame so a station cannot obtain the ESSID through passive scanning.	**No**
Channel ID	Press [SPACE BAR] to select a channel. This allows you to set the operating frequency/channel depending on your particular region.	**CH01 2412MHz**
RTS Threshold	RTS(Request To Send) threshold (number of bytes) enables RTS/CTS handshake. Data with its frame size larger than this value will perform the RTS/CTS handshake. Setting this attribute to be larger than the maximum MSDU (MAC Service Data Unit) size turns off the RTS/CTS handshake. Setting this attribute to zero turns on the RTS/CTS handshake. Enter a value between 0 and 2432.	**2432**
Frag. Threshold	The threshold (number of bytes) for the fragmentation boundary for directed messages. It is the maximum data fragment size that can be sent. Enter a value between 256 and 2432.	**2432**

Table 17-1 Wireless LAN Setup Field Description

FIELD	DESCRIPTION	EXAMPLE
WEP	WEP (Wired Equivalent Privacy) provides data encryption to prevent wireless stations from accessing data transmitted over the wireless network. Select **Disable** allows wireless stations to communicate with the access points without any data encryption. Select **64-bit WEP** or **128-bit WEP** to for the type of data encryption. WEP causes performance degradation.	**Disable**
Default Key	Enter the number of the key as an active key.	
Key 1 to Key 4	If you chose **64-bit WEP** in the **WEP Encryption** field, then enter 5 characters or 10 hexadecimal digits ("0-9", "A-F") preceded by 0x for each key (1-4). If you chose **128-bit WEP** in the **WEP Encryption** field, then enter 13 characters or 26 hexadecimal digits ("0-9", "A-F") preceded by 0x for each key (1-4). There are four data encryption keys to secure your data from eavesdropping by unauthorized wireless users. The values for the keys must be set up exactly the same on the access points as they are on the wireless station computers.	
Edit MAC Address Filter	To edit MAC address filtering table, press [SPACE BAR] to select **Yes** and press [ENTER] to open menu 3.5.1.	**No**
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.		

17.3.1 Wireless LAN MAC Address Filter

The next layer of security is MAC address filter. To allow a wireless station to associate with the Prestige, enter the MAC address of the wireless LAN card on that wireless station in the MAC address table.



```
                     Menu 3.5.1 - WLAN MAC Address Filter

                   Active= No
                   Filter Action= Allowed Association
 ------------------------------------------------------------------------------
   1=   00:00:00:00:00:00   13=   00:00:00:00:00:00   25=   00:00:00:00:00:00
   2=   00:00:00:00:00:00   14=   00:00:00:00:00:00   26=   00:00:00:00:00:00
   3=   00:00:00:00:00:00   15=   00:00:00:00:00:00   27=   00:00:00:00:00:00
   4=   00:00:00:00:00:00   16=   00:00:00:00:00:00   28=   00:00:00:00:00:00
   5=   00:00:00:00:00:00   17=   00:00:00:00:00:00   29=   00:00:00:00:00:00
   6=   00:00:00:00:00:00   18=   00:00:00:00:00:00   30=   00:00:00:00:00:00
   7=   00:00:00:00:00:00   19=   00:00:00:00:00:00   31=   00:00:00:00:00:00
   8=   00:00:00:00:00:00   20=   00:00:00:00:00:00   32=   00:00:00:00:00:00
   9=   00:00:00:00:00:00   21=   00:00:00:00:00:00
  10=   00:00:00:00:00:00   22=   00:00:00:00:00:00
  11=   00:00:00:00:00:00   23=   00:00:00:00:00:00
  12=   00:00:00:00:00:00   24=   00:00:00:00:00:00
 ------------------------------------------------------------------------------
                    Enter here to CONFIRM or ESC to CANCEL:

Press Space Bar to Toggle.
```

Figure 17-2 Menu 3.5.1 WLAN MAC Address Filtering

The following table describes the fields in this menu.

Table 17-2 Menu 3.5.1 WLAN MAC Address Filtering

FIELD	DESCRIPTION
Active	To enable MAC address filtering, press [SPACE BAR] to select **Yes** and press [ENTER].
Filter Action	Define the filter action for the list of MAC addresses in the MAC address filter table. To deny access to the Prestige, press [SPACE BAR] to select **Deny Association** and press [ENTER]. MAC addresses not listed will be allowed to access the router. The default action, **Allowed Association**, permits association with the Prestige. MAC addresses not listed will be denied access to the router.
MAC Address Filter	
Address 1….	Enter the MAC addresses (in XX:XX:XX:XX:XX:XX format) of the wireless station that are allowed or denied access to the Prestige in these address fields.
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.	

Chapter 18
Internet Access

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

18.1 Internet Access Overview

Refer to the chapters on the web configurator's wizard, LAN and WAN screens for more background information on fields in the SMT screens covered in this chapter.

18.2 IP Policies

Traditionally, routing is based on the destination address *only* and the router takes the shortest path to forward a packet. IP Policy Routing (IPPR) provides a mechanism to override the default routing behavior and alter the packet forwarding based on the policy defined by the network administrator. Policy-based routing is applied to incoming packets on a per interface basis, prior to the normal routing. Create policies using SMT menu 25 (see *IP Policy Routing*) and apply them on the Prestige LAN and/or WAN interfaces using menus 3.2 (LAN) and 11.3 (WAN).

18.3 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.

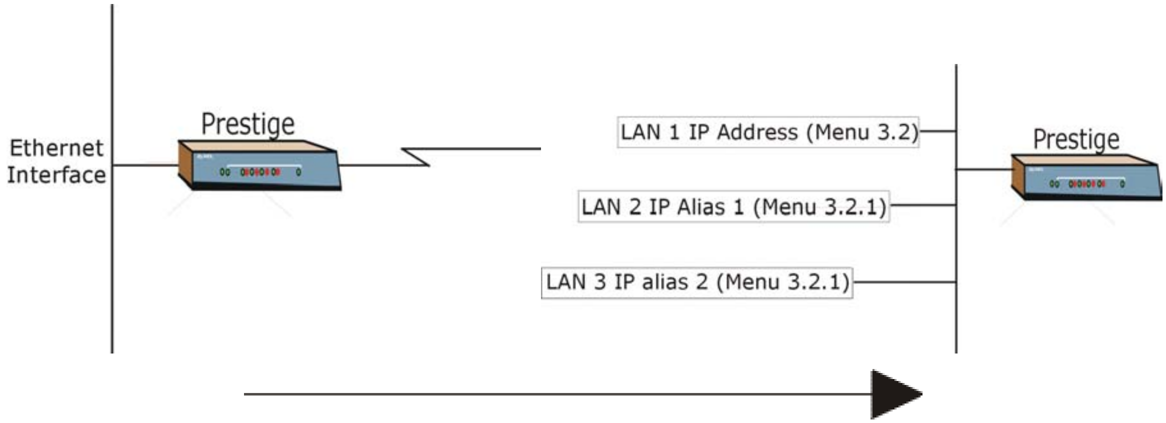

Ethernet Interface
Prestige
LAN 1 IP Address (Menu 3.2)
LAN 2 IP Alias 1 (Menu 3.2.1)
LAN 3 IP alias 2 (Menu 3.2.1)
Prestige

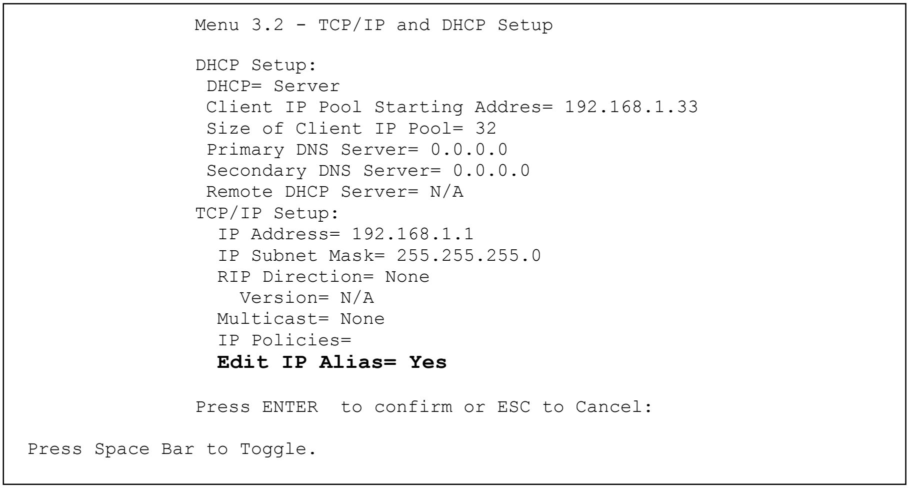
Figure 18-1 Physical Network

Figure 18-2 Partitioned Logical Networks

Use menu 3.2.1 to configure IP Alias on your Prestige.

18.4 IP Alias Setup

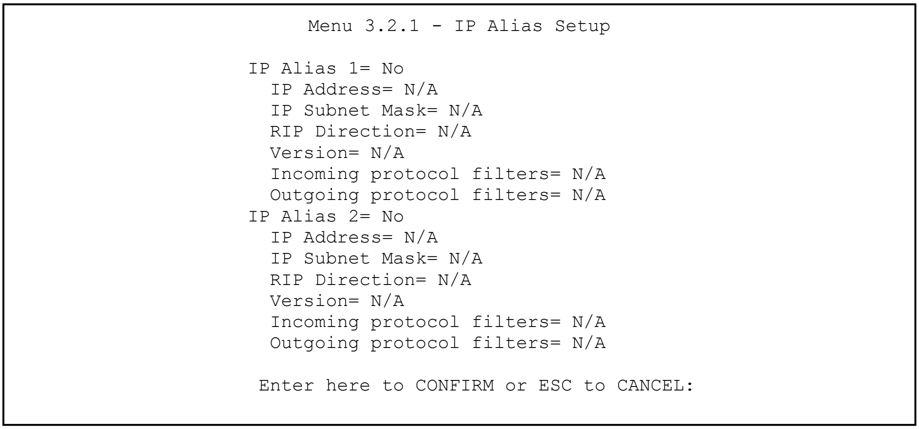
Use menu 3.2 to configure the first network. Move the cursor to **Edit IP Alias** field and press [SPACEBAR] to choose **Yes** and press [ENTER] to configure the second and third network.



```
               Menu 3.2 - TCP/IP and DHCP Setup

               DHCP Setup:
                DHCP= Server
                Client IP Pool Starting Addres= 192.168.1.33
                Size of Client IP Pool= 32
                Primary DNS Server= 0.0.0.0
                Secondary DNS Server= 0.0.0.0
                Remote DHCP Server= N/A
               TCP/IP Setup:
                 IP Address= 192.168.1.1
                 IP Subnet Mask= 255.255.255.0
                 RIP Direction= None
                   Version= N/A
                 Multicast= None
                 IP Policies=
                 Edit IP Alias= Yes

               Press ENTER  to confirm or ESC to Cancel:

Press Space Bar to Toggle.
```

Figure 18-3 Menu 3.2 TCP/IP and DHCP Setup

Pressing [ENTER] displays **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:
```

Figure 18-4 Menu 3.2.1 IP Alias Setup

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

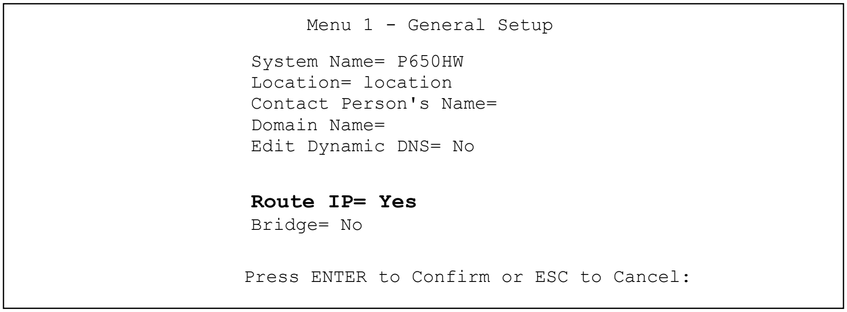
Table 18-1 Menu 3.2.1 IP Alias Setup

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	192.168.1.1
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 [SPACE BAR] to select the RIP direction. Choices are **None**, **Both**, **In Only** or **Out Only**.	**None**
Version	Press [SPACE BAR] to select the RIP version. Choices 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.		

18.5 Route IP Setup

The first step is to enable the IP routing in **Menu 1 — General Setup**.

To edit menu 1, type in 1 in the main menu and press [ENTER]. Set the **Route IP** field to **Yes** by pressing [SPACE BAR].



```
                    Menu 1 - General Setup

               System Name= P650HW
               Location= location
               Contact Person's Name=
               Domain Name=
               Edit Dynamic DNS= No


               Route IP= Yes
               Bridge= No


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

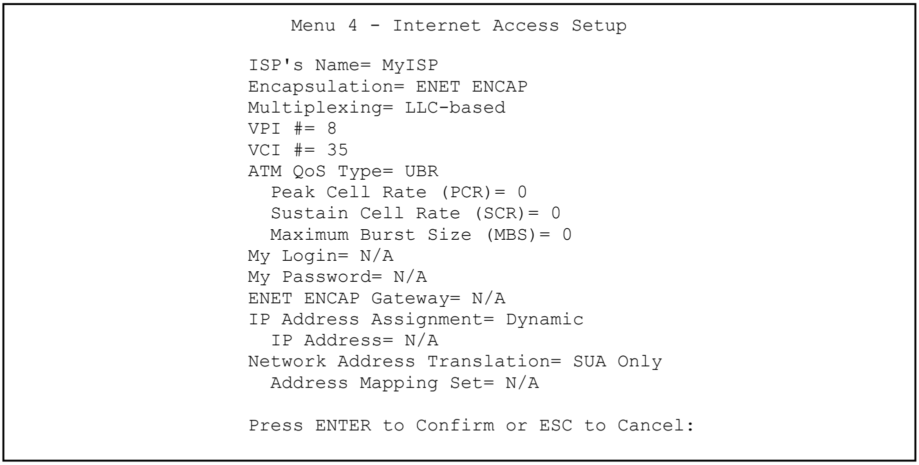
Figure 18-5 Menu 1 General Setup

18.6 Internet Access Configuration

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

Use the *Internet Account Information* table in the *Compact Guide/Read Me First/Quick Start Guide* to record your Internet account information. Note that if you are using PPPoA or PPPoE encapsulation, then the only ISP information you need is a login name and password. You only need to know the Ethernet Encapsulation Gateway IP address if you are using ENET ENCAP encapsulation.

From the main menu, type 4 to display **Menu 4 - Internet Access Setup**, as shown next.



```
                    Menu 4 - Internet Access Setup

                ISP's Name= MyISP
                Encapsulation= ENET ENCAP
                Multiplexing= LLC-based
                VPI #= 8
                VCI #= 35
                ATM QoS Type= UBR
                  Peak Cell Rate (PCR)= 0
                  Sustain Cell Rate (SCR)= 0
                  Maximum Burst Size (MBS)= 0
                My Login= N/A
                My Password= N/A
                ENET ENCAP Gateway= N/A
                IP Address Assignment= Dynamic
                  IP Address= N/A
                Network Address Translation= SUA Only
                  Address Mapping Set= N/A

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

Figure 18-6 Menu 4 Internet Access Setup

The following table contains instructions on how to configure your Prestige for Internet access.

Table 18-2 Menu 4 Internet Access Setup

FIELD	DESCRIPTION	EXAMPLE
ISP's Name	Enter the name of your Internet Service Provider. This information is for identification purposes only.	MyISP
Encapsulation	Press [SPACE BAR] to select the method of encapsulation used by your ISP. Choices are **PPPoE**, **PPPoA**, **RFC 1483** or **ENET ENCAP**.	ENET ENCAP

Table 18-2 Menu 4 Internet Access Setup

FIELD	DESCRIPTION	EXAMPLE
Multiplexing	Press [SPACE BAR] to select the method of multiplexing used by your ISP. Choices are **VC-based** or **LLC-based**.	LLC-based
VPI #	Enter the Virtual Path Identifier (VPI) assigned to you.	8
VCI #	Enter the Virtual Channel Identifier (VCI) assigned to you.	35
ATM QoS Type	Press [SPACE BAR] and select **CBR** (Continuous Bit Rate) to specify fixed (always-on) bandwidth. Select **UBR** (Unspecified Bit Rate) for applications that are non-time sensitive, such as e-mail. Select **VBR** (Variable Bit Rate) for bursty traffic and bandwidth sharing with other applications.	UBR
Peak Cell Rate (PCR)	This is the maximum rate at which the sender can send cells. Type the PCR.	0
Sustain Cell Rate (SCR)= 0	Sustained Cell Rate is the mean cell rate of a bursty, on-off traffic source that can be sent at the peak rate, and a parameter for burst-type traffic. Type the SCR; it must be less than the PCR.	0
Maximum Burst Size (MBS)= 0	Refers to the maximum number of cells that can be sent at the peak rate. Type the MBS. The MBS must be less than 65535.	0
My Login	Configure the **My Login** and **My Password** fields for PPPoA and PPPoE encapsulation only. Enter the login name that your ISP gives you. If you are using PPPoE encapsulation, then this field must be of the form user@domain where domain identifies your PPPoE service name.	N/A
My Password	Enter the password associated with the login name above.	N/A
ENET ENCAP Gateway	Enter the gateway IP address supplied by your ISP when you are using **ENET ENCAP** encapsulation.	N/A
Idle Timeout	This value specifies the number of idle seconds that elapse before the Prestige automatically disconnects the PPPoE session.	0
IP Address Assignment	Press [SPACE BAR] to select **Static** or **Dynamic** address assignment.	Dynamic
IP Address	Enter the IP address supplied by your ISP if applicable.	N/A

Table 18-2 Menu 4 Internet Access Setup

FIELD	DESCRIPTION	EXAMPLE
Network Address Translation	Press [SPACE BAR] to select **None**, **SUA Only** or **Full Feature**. Please see the *NAT Chapter* for more details on the SUA (Single User Account) feature.	SUA Only
Address Mapping Set	Type the numbers of mapping sets (1-8) to use with NAT. See the *NAT* chapter for details.	N/A
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.		

If all your settings are correct your Prestige should connect automatically to the Internet. If the connection fails, note the error message that you receive on the screen and take the appropriate troubleshooting steps.

Chapter 19
Remote Node Configuration

This chapter covers remote node configuration.

19.1 Remote Node Setup Overview

This section describes the protocol-independent parameters for 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. When you use menu 4 to set up Internet access, you are configuring one of the remote nodes.

You first choose a remote node in **Menu 11- Remote Node Setup**. You can then edit that node's profile in menu 11.1, as well as configure specific settings in three submenus: edit IP and bridge options in menu 11.3; edit ATM options in menu 11.6; and edit filter sets in menu 11.5.

19.2 Remote Node Setup

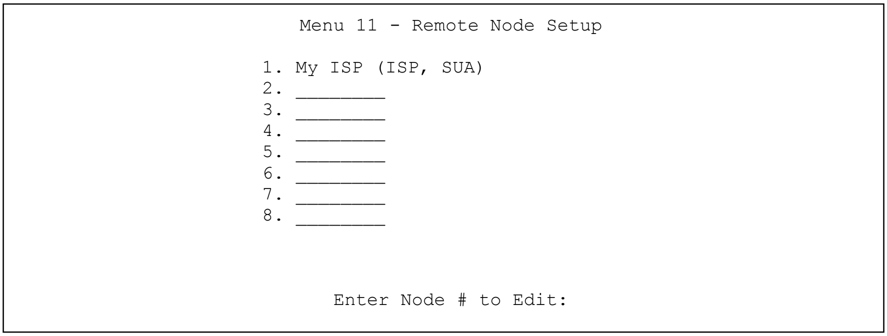
This section describes the protocol-independent parameters for a remote node.

19.2.1 Remote Node Profile

To configure a remote node, follow these steps:

Step 1. From the main menu, enter 11 to display **Menu 11 - Remote Node Setup.**

Step 2. When menu 11 appears, as shown in the following figure, type the number of the remote node that you want to configure.



```
                    Menu 11 - Remote Node Setup

                 1. My ISP (ISP, SUA)
                 2. ________
                 3. ________
                 4. ________
                 5. ________
                 6. ________
                 7. ________
                 8. ________



                       Enter Node # to Edit:
```

Figure 19-1 Menu 11 Remote Node Setup

19.2.2 Encapsulation and Multiplexing Scenarios

For Internet access you should use the encapsulation and multiplexing methods used by your ISP. Consult your ISP for information on encapsulation and multiplexing methods for LAN-to-LAN applications, for example between a branch office and corporate headquarters. There must be prior agreement on encapsulation and multiplexing methods because they cannot be automatically determined. What method(s) you use also depends on how many VCs you have and how many different network protocols you need. The extra overhead that ENET ENCAP encapsulation entails makes it a poor choice in a LAN-to-LAN application. Here are some examples of more suitable combinations in such an application.

Scenario 1. One VC, Multiple Protocols

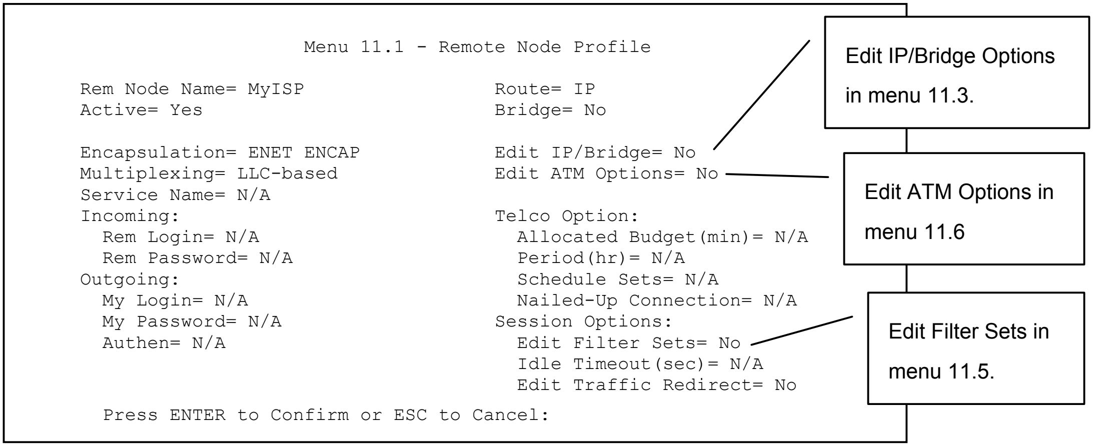
PPPoA (RFC-2364) encapsulation with **VC-based** multiplexing is the best combination because no extra protocol identifying headers are needed. The **PPP** protocol already contains this information.

Scenario 2. One VC, One Protocol (IP)

Selecting **RFC-1483** encapsulation with **VC-based** multiplexing requires the least amount of overhead (0 octets). However, if there is a potential need for multiple protocol support in the future, it may be safer to select **PPPoA** encapsulation instead of **RFC-1483**, so you do not need to reconfigure either computer later.

Scenario 3. Multiple VCs

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



```
                    Menu 11.1 - Remote Node Profile

      Rem Node Name= MyISP                 Route= IP
      Active= Yes                          Bridge= No

      Encapsulation= ENET ENCAP            Edit IP/Bridge= No
      Multiplexing= LLC-based              Edit ATM Options= No
      Service Name= N/A
      Incoming:                            Telco Option:
        Rem Login= N/A                       Allocated Budget(min)= N/A
        Rem Password= N/A                    Period(hr)= N/A
      Outgoing:                              Schedule Sets= N/A
        My Login= N/A                        Nailed-Up Connection= N/A
        My Password= N/A                   Session Options:
        Authen= N/A                          Edit Filter Sets= No
                                             Idle Timeout(sec)= N/A
                                             Edit Traffic Redirect= No

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

Edit IP/Bridge Options in menu 11.3.

Edit ATM Options in menu 11.6

Edit Filter Sets in menu 11.5.

Figure 19-2 Menu 11.1 Remote Node Profile

In **Menu 11.1 – Remote Node Profile**, fill in the fields as described in the following table.

Table 19-1 Menu 11.1 Remote Node Profile

FIELD	DESCRIPTION	EXAMPLE
Rem Node Name	Type a unique, descriptive name of up to eight characters for this node.	MyISP
Active	Press [SPACE BAR] and then [ENTER] to select **Yes** to activate or **No** to deactivate this node. Inactive nodes are displayed with a minus sign “–“ in SMT menu 11.	**Yes**
Encapsulation	**PPPoA** refers to RFC-2364 (PPP Encapsulation over ATM Adaptation Layer 5). If RFC-1483 (Multiprotocol Encapsulation over ATM Adaptation Layer 5) of **ENET ENCAP** are selected, then the **Rem Login**, **Rem Password**, **My Login**, **My Password** and **Authen** fields are not applicable (**N/A**).	**ENET ENCAP**
Multiplexing	Press [SPACE BAR] and then [ENTER] to select the method of multiplexing that your ISP uses, either **VC-based** or **LLC-based**.	**LLC-based**
Service Name	When using **PPPoE** encapsulation, type the name of your PPPoE service here.	N/A
Incoming:		

Table 19-1 Menu 11.1 Remote Node Profile

FIELD	DESCRIPTION	EXAMPLE
Rem Login	Type the login name that this remote node will use to call your Prestige. The login name and the **Rem Password** will be used to authenticate this node.	
Rem Password	Type the password used when this remote node calls your Prestige.	
Outgoing:		
My Login	Type the login name assigned by your ISP when the Prestige calls this remote node.	
My Password	Type the password assigned by your ISP when the Prestige calls this remote node.	
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** (Challenge Handshake Authentication Protocol) only. **PAP** – accept PAP (Password Authentication Protocol) only.	
Route	This field determines the protocol used in routing. Options are **IP** and **None.**	**IP**
Bridge	When bridging is enabled, your Prestige will forward any packet that it does not route to this remote node; otherwise, the packets are discarded. Select **Yes** to enable and **No** to disable.	**No**
Edit IP/Bridge	Press [SPACE BAR] to select **Yes** and press [ENTER] to display **Menu 11.3 – Remote Node Network Layer Options**.	**No**
Edit ATM Options	Press [SPACE BAR] to select **Yes** and press [ENTER] to display **Menu 11.6 – Remote Node ATM Layer Options**.	**No**
Telco Option		
Allocated Budget (min)	This sets a ceiling for outgoing call time for this remote node. The default for this field is 0 meaning no budget control.	
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** is (10 minutes) and the **Period (hr)** is 1 (hour).	

Table 19-1 Menu 11.1 Remote Node Profile

FIELD	DESCRIPTION	EXAMPLE
Schedule Sets	This field is only applicable for **PPPoE** and **PPPoA** encapsulation. You can apply up to four schedule sets here. For more details please refer to the *Call Scheduling* chapter.	
Nailed up Connection	This field is only applicable for **PPPoE** and **PPPoA** encapsulation. This field specifies if you want to make the connection to this remote node a nailed-up connection.	
Session Options		
Edit Filter Sets	Use [SPACE BAR] to choose **Yes** and press [ENTER] to open menu 11.5 to edit the filter sets. See the *Remote Node Filter* section for more details.	**No** (default)
Idle Timeout (sec)	Type the number of seconds (0-9999) that can elapse when the Prestige is idle (there is no traffic going to the remote node), before the Prestige automatically disconnects the remote node. 0 means that the session will not timeout.	
Edit Traffic Redirect	Use [SPACE BAR] to choose **Yes** and press [ENTER] to open menu 11.7 to edit the traffic redirect. See the *Traffic Redirect* section for more details. This field is not available on all models.	**No** (default)
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.		

19.2.3 Outgoing Authentication Protocol

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

19.3 Metric

The metric represents the "cost of transmission". A router determines the best route for transmission by choosing a path with the lowest "cost". RIP routing uses hop count as the measurement of cost, with a minimum of "1" for directly connected networks. The number must be between "1" and "15"; a number greater than "15" means the link is down. The smaller the number, the lower the "cost".

The metric sets the priority for the Prestige's routes to the Internet. If any two of the default routes have the same metric, the Prestige uses the following pre-defined priorities:

1. Normal route: designated by the ISP
2. Traffic-redirect route

IP Policy Routing overrides the default routing behavior and takes priority over all of the routes mentioned above (see the *IP Policy Routing* chapter).

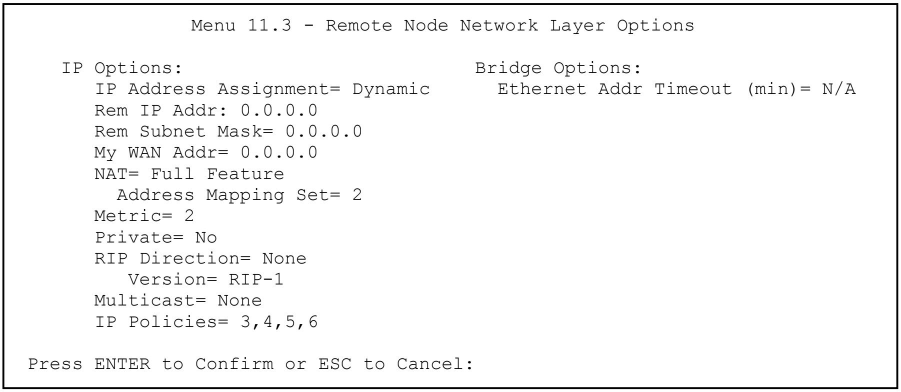
For example, if the normal route has a metric of "1" and the traffic-redirect route has a metric of "2", then the normal route acts as the primary default route. If the normal route fails to connect to the Internet, the Prestige tries the traffic-redirect route next.

19.4 Remote Node Network Layer Options

For the TCP/IP parameters, perform the following steps to edit **Menu 11.3 – Remote Node Network Layer Options** as shown next.

Step 1. In menu 11.1, make sure **IP** is among the protocols in the **Route** field.

Step 2. Move the cursor to the **Edit IP/Bridge** field, press [SPACE BAR] to select **Yes,** then press [ENTER] to display **Menu 11.3** – **Remote Node Network Layer Options.**



```
               Menu 11.3 - Remote Node Network Layer Options

   IP Options:                            Bridge Options:
      IP Address Assignment= Dynamic        Ethernet Addr Timeout (min)= N/A
      Rem IP Addr: 0.0.0.0
      Rem Subnet Mask= 0.0.0.0
      My WAN Addr= 0.0.0.0
      NAT= Full Feature
        Address Mapping Set= 2
      Metric= 2
      Private= No
      RIP Direction= None
         Version= RIP-1
      Multicast= None
      IP Policies= 3,4,5,6

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

Figure 19-3 Menu 11.3 Remote Node Network Layer Options

The next table explains fields in **Menu 11.3 – Remote Node Network Layer Options**.

Table 19-2 Menu 11.3 Remote Node Network Layer Options

FIELD	DESCRIPTION	EXAMPLE
IP Address Assignment	Press [SPACE BAR] and then [ENTER] to select **Dynamic** if the remote node is using a dynamically assigned IP address or **Static** if it is using a static (fixed) IP address. You will only be able to configure this in the ISP node (also the one you configure in menu 4). All other nodes are set to **Static**.	**Dynamic**
Rem IP Addr	This is the IP address you entered in the previous menu.	
Rem Subnet Mask	Type the subnet mask assigned to the remote node.	
My WAN Addr	Some implementations, especially UNIX derivatives, require separate IP network numbers for the WAN and LAN links and each end to have a unique address within the WAN network number. In that case, type the IP address assigned to the WAN port of your Prestige. NOTE: Refers to local Prestige address, not the remote router address.	
NAT	Press [SPACE BAR] and then [ENTER] to select **Full Feature** if you have multiple public WAN IP addresses for your Prestige. Select **SUA Only** if you have just one public WAN IP address for your Prestige. The SMT uses Address Mapping Set 255 (menu 15.1 - see section *22.3.1*). Select **None** to disable NAT.	**SUA Only**

Table 19-2 Menu 11.3 Remote Node Network Layer Options

FIELD	DESCRIPTION	EXAMPLE
Address Mapping Set	When **Full Feature** is selected in the **NAT** field, configure address mapping sets in menu 15.1. Select one of the NAT server sets (2-10) in menu 15.2 (see the *NAT* chapter for details) and type that number here. When **SUA Only** is selected in the **NAT** field, the SMT uses NAT server set 1 in menu 15.2 (see the *NAT* chapter for details).	2
Metric	The metric represents the "cost" of transmission for routing purposes. IP routing uses hop count as the cost measurement, with a minimum of 1 for directly connected networks. Type 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.	2
Private	This 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.	**No**
RIP Direction	Press [SPACE BAR] and then [ENTER] to select the RIP Direction. Options are **Both**, **In Only**, **Out Only** or **None**.	**None**
Version	Press [SPACE BAR] and then [ENTER] to select the RIP version. Options are **RIP-1**, **RIP-2B** or **RIP-2M**.	**RIP-1**
Multicast	**IGMP-v1** sets IGMP to version 1, **IGMP-v2** sets IGMP to version 2 and **None** disables IGMP.	**None**
IP Policies	You can apply up to four IP Policy sets (from 12) by typing in their numbers separated by commas. Configure the filter sets in menu 25 first (see the *IP Policy Routing* chapter) and then apply them here.	3, 4, 5, 6
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.		

19.4.1 My WAN Addr Sample IP Addresses

The following figure uses sample IP addresses to help you understand the field of **My Wan Addr** in menu 11.3. Refer to the previous *LAN and WAN IP Addresses* figure in the web configurator chapter on LAN setup for a brief review of what a WAN IP is. **My WAN Addr** indicates the local Prestige WAN IP (172.16.0.1 in the following figure) while **Rem IP Addr** indicates the peer WAN IP (172.16.0.2 in the following figure).

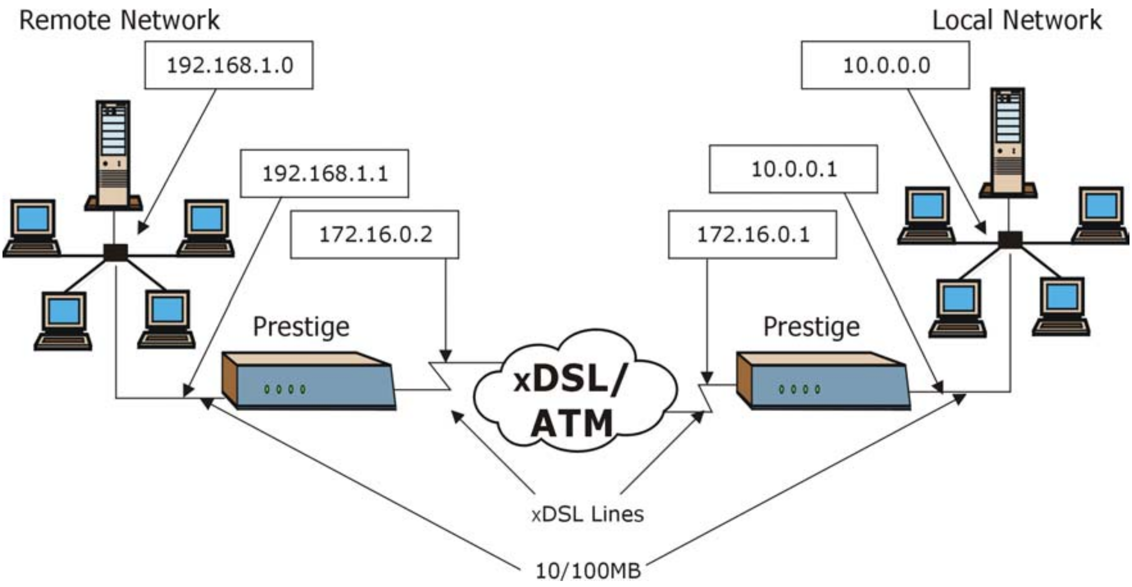


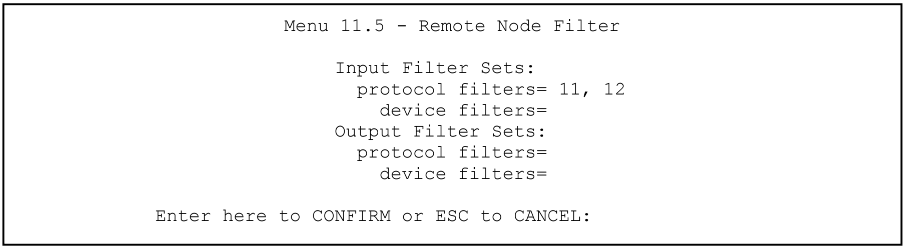
Figure 19-4 Sample IP Addresses for a TCP/IP LAN-to-LAN Connection

19.5 Remote Node Filter

Move the cursor to the **Edit Filter Sets** field in menu 11.1, then press [SPACE BAR] to select **Yes**. Press [ENTER] to display **Menu 11.5 – Remote Node Filter**.

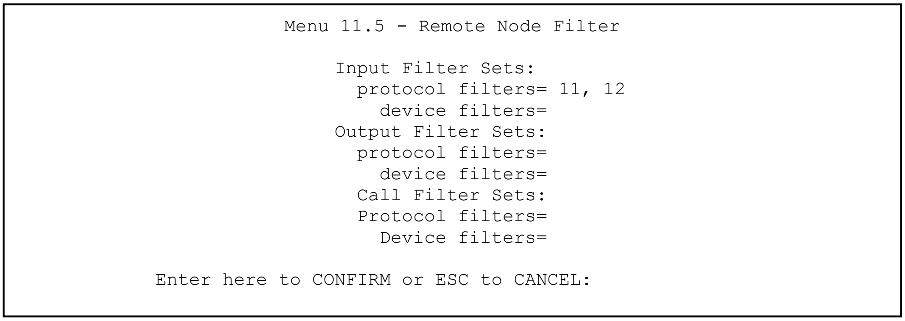
Use **Menu 11.5 – Remote Node Filter** to specify the filter set(s) to apply to the incoming and outgoing traffic between this remote node and the Prestige and also to prevent certain packets from triggering calls. You can specify up to 4 filter sets separated by comma, for example, 1, 5, 9, 12, in each filter field.

Note that spaces are accepted in this field. The Prestige has a prepackaged filter set, NetBIOS_WAN, that blocks NetBIOS packets (call protocol filter = 1). Include this in the call filter sets if you want to prevent NetBIOS packets from triggering calls to a remote node.



```
                     Menu 11.5 - Remote Node Filter

                         Input Filter Sets:
                           protocol filters= 11, 12
                             device filters=
                         Output Filter Sets:
                           protocol filters=
                             device filters=

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

Figure 19-5 Menu 11.5 Remote Node Filter (RFC 1483 or ENET Encapsulation)

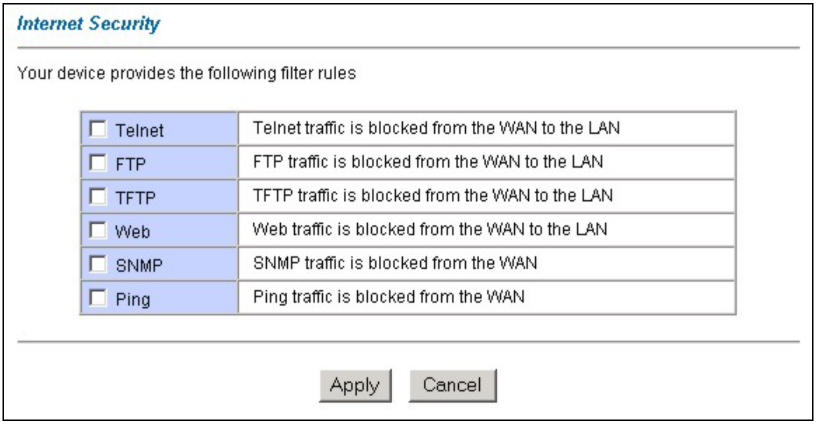


```
                     Menu 11.5 - Remote Node Filter

                         Input Filter Sets:
                           protocol filters= 11, 12
                             device filters=
                         Output Filter Sets:
                           protocol filters=
                             device filters=
                           Call Filter Sets:
                           Protocol filters=
                             Device filters=

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

Figure 19-6 Menu 11.5 Remote Node Filter (PPPoA or PPPoE Encapsulation)

19.5.1 Web Configurator Internet Security Filter Rules

In the web configurator, open the **Security** screen as shown next. Select the predefined filter rules and click **Apply**.



Internet Security

Your device provides the following filter rules

□ Telnet	Telnet traffic is blocked from the WAN to the LAN
□ FTP	FTP traffic is blocked from the WAN to the LAN
□ TFTP	TFTP traffic is blocked from the WAN to the LAN
□ Web	Web traffic is blocked from the WAN to the LAN
□ SNMP	SNMP traffic is blocked from the WAN
□ Ping	Ping traffic is blocked from the WAN

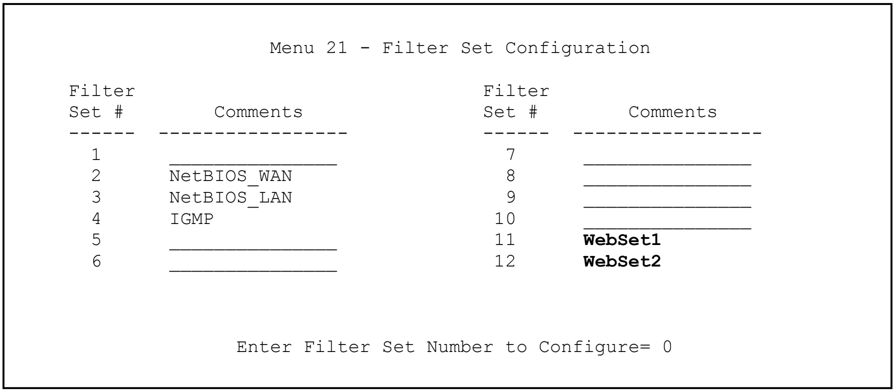
Figure 19-7 Internet Security

Once you apply the filter rules in the web configurator, filter sets 11 and 12 are automatically applied in the **protocol filters** field under **Input Filter Sets** in SMT menu 11.5.

SMT input protocol filter set numbers that were previously applied are erased after you apply the Internet Security **filter rules in the web configurator. To reapply them or apply new filter sets, you need to enter the filter set numbers again along with filter sets 11 and 12. For example, to apply filter sets 1 and 2, you enter "1, 2, 11, 12".**

19.5.2 Web Configurator Filter Sets

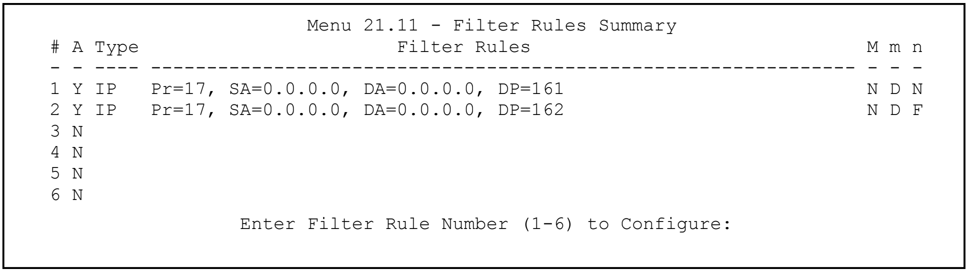
When you apply filter rules using the web configurator, filter sets 11 and 12 are automatically generated in SMT menu 21.



```
                    Menu 21 - Filter Set Configuration

    Filter                                  Filter
    Set #        Comments                   Set #        Comments
    ------  -----------------               ------  -----------------
      1      _______________                  7      _______________
      2      NetBIOS_WAN                      8      _______________
      3      NetBIOS_LAN                      9      _______________
      4      IGMP                            10      _______________
      5      _______________                 11      WebSet1
      6      _______________                 12      WebSet2


                 Enter Filter Set Number to Configure= 0
```

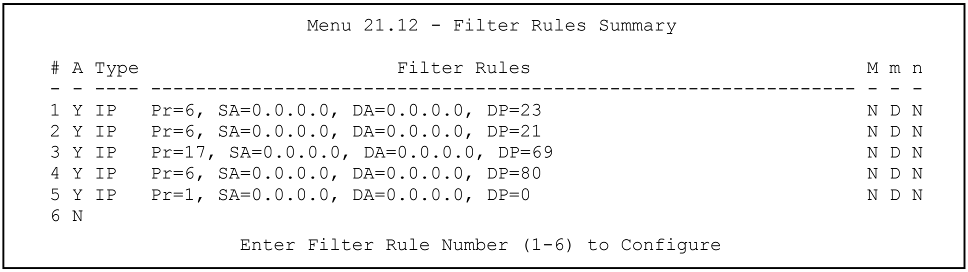
Figure 19-8 Menu 21- Filer Set Configuration (P650H/HW)

The following figures display the filter rules in filter sets 11 and 12.



```
                           Menu 21.11 - 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 N
 2 Y IP   Pr=17, SA=0.0.0.0, DA=0.0.0.0, DP=162                            N D F
 3 N
 4 N
 5 N
 6 N
                     Enter Filter Rule Number (1-6) to Configure:
```

Figure 19-9 Menu 21.11- WebSet 11



```
                           Menu 21.12 - 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=17, SA=0.0.0.0, DA=0.0.0.0, DP=69                             N D N
 4 Y IP   Pr=6, SA=0.0.0.0, DA=0.0.0.0, DP=80                              N D N
 5 Y IP   Pr=1, SA=0.0.0.0, DA=0.0.0.0, DP=0                               N D N
 6 N
                     Enter Filter Rule Number (1-6) to Configure
```

Figure 19-10 Menu 21.12- WebSet 12

Do not edit filter sets 11 and 12. They are used exclusively by the web configurator. Any rules you configured in sets 11 and 12 will be erased and replaced when you apply the web configurator-generated filter rules.

19.6 Editing ATM Layer Options

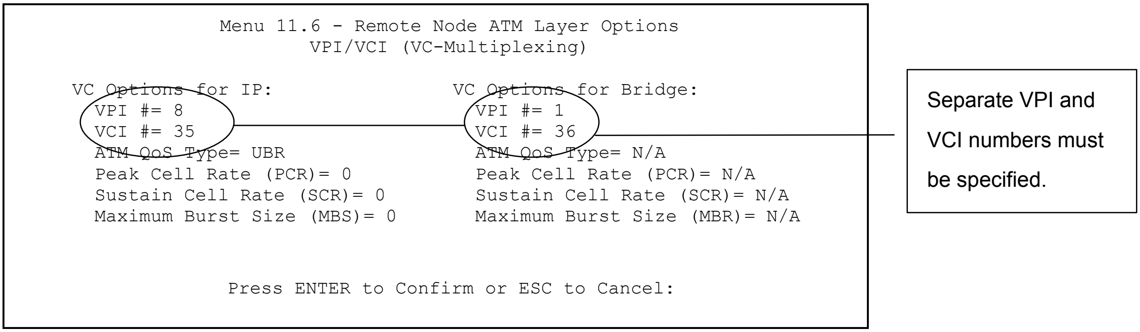
Follow the steps shown next to edit **Menu 11.6 – Remote Node ATM Layer Options**.

In menu 11.1, move the cursor to the **Edit ATM Options** field and then press [SPACE BAR] to select **Yes**. Press [ENTER] to display **Menu 11.6 – Remote Node ATM Layer Options**.

There are two versions of menu 11.6 for the Prestige, depending on whether you chose **VC-based**/**LLC-based** multiplexing and **PPP** encapsulation in menu 11.1.

19.6.1 VC-based Multiplexing (non-PPP Encapsulation)

For **VC-based** multiplexing, by prior agreement, a protocol is assigned a specific virtual circuit, for example, VC1 will carry IP. Separate VPI and VCI numbers must be specified for each protocol.



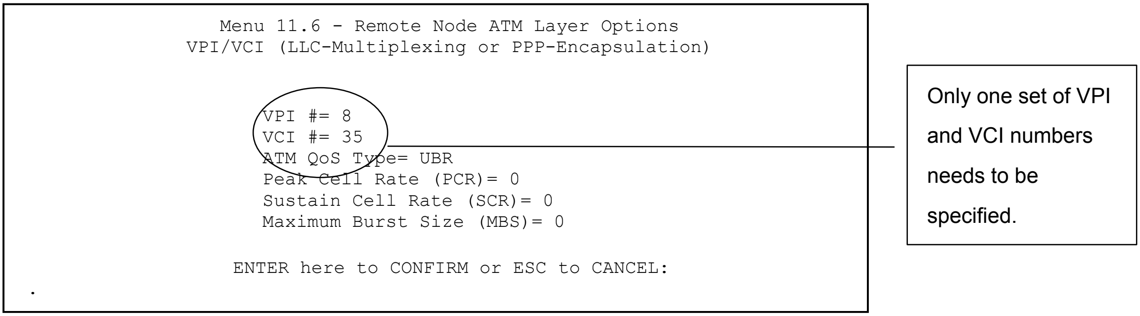
```
                    Menu 11.6 - Remote Node ATM Layer Options
                            VPI/VCI (VC-Multiplexing)

      VC Options for IP:                  VC Options for Bridge:
        VPI #= 8                            VPI #= 1
        VCI #= 35                           VCI #= 36
        ATM QoS Type= UBR                   ATM QoS Type= N/A
        Peak Cell Rate (PCR)= 0             Peak Cell Rate (PCR)= N/A
        Sustain Cell Rate (SCR)= 0          Sustain Cell Rate (SCR)= N/A
        Maximum Burst Size (MBS)= 0         Maximum Burst Size (MBR)= N/A


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

Separate VPI and VCI numbers must be specified.

Figure 19-11 Menu 11.6 for VC-based Multiplexing

19.6.2 LLC-based Multiplexing or PPP Encapsulation

For **LLC-based** multiplexing or **PPP** encapsulation, one VC carries multiple protocols with protocol identifying information being contained in each packet header.



```
                    Menu 11.6 - Remote Node ATM Layer Options
                 VPI/VCI (LLC-Multiplexing or PPP-Encapsulation)


                      VPI #= 8
                      VCI #= 35
                      ATM QoS Type= UBR
                      Peak Cell Rate (PCR)= 0
                      Sustain Cell Rate (SCR)= 0
                      Maximum Burst Size (MBS)= 0

                    ENTER here to CONFIRM or ESC to CANCEL:
 .
```

Only one set of VPI and VCI numbers needs to be specified.

Figure 19-12 Menu 11.6 for LLC-based Multiplexing or PPP Encapsulation

In this case, only one set of VPI and VCI numbers need be specified for all protocols. The valid range for the VPI is 0 to 255 and for the VCI is 32 to 65535 (1 to 31 is reserved for local management of ATM traffic).

19.7 Traffic Redirect

Traffic redirect forwards LAN traffic to a backup gateway when the Prestige cannot connect to the Internet. An example is shown in the figure below.

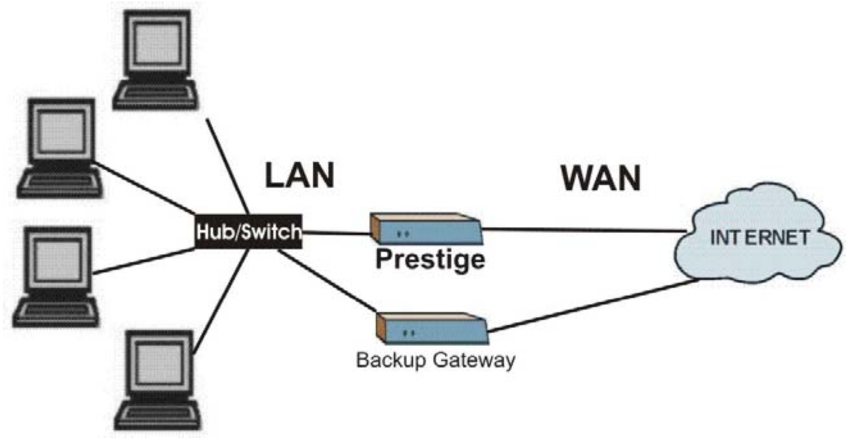
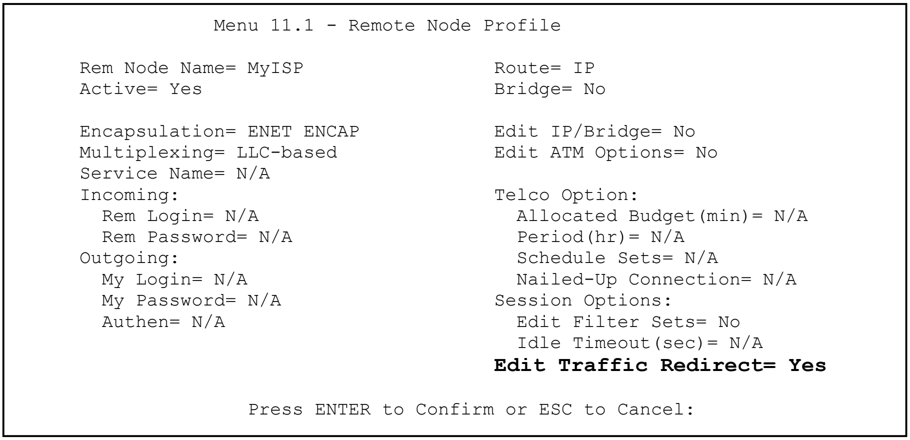


Figure 19-13 Traffic Redirect Setup Example

To configure the parameters for traffic redirect, enter 11 from the main menu to display **Menu 11.1– Remote Node Profile** as shown next.



```
                   Menu 11.1 - Remote Node Profile

       Rem Node Name= MyISP                  Route= IP
       Active= Yes                           Bridge= No

       Encapsulation= ENET ENCAP             Edit IP/Bridge= No
       Multiplexing= LLC-based               Edit ATM Options= No
       Service Name= N/A
       Incoming:                             Telco Option:
         Rem Login= N/A                        Allocated Budget(min)= N/A
         Rem Password= N/A                     Period(hr)= N/A
       Outgoing:                               Schedule Sets= N/A
         My Login= N/A                         Nailed-Up Connection= N/A
         My Password= N/A                    Session Options:
         Authen= N/A                           Edit Filter Sets= No
                                               Idle Timeout(sec)= N/A
                                             Edit Traffic Redirect= Yes

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

Figure 19-14 Menu 11.1 – Remote Node Profile

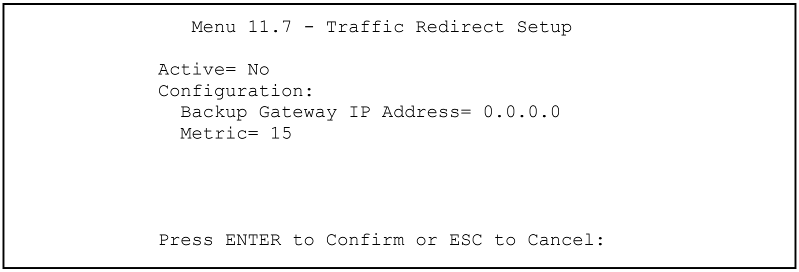
To configure traffic redirect properties, press [SPACE BAR] to select **Yes** in the **Edit Traffic Redirect** field and then press [ENTER].

Table 19-3 Menu 11.1 – Remote Node Profile (Traffic Redirect Field)

FIELD	DESCRIPTION	EXAMPLE
Edit Traffic Redirect	Press [SPACE BAR] to select **Yes** and press [ENTER] to configure **Menu 11.7 – Traffic Redirect Setup**.	**Yes**
Press [ENTER] at the message "Press ENTER to Confirm..." to save your configuration, or press [ESC] at any time to cancel.		

19.7.1 Traffic Redirect Setup

Configure parameters that determine when the Prestige will forward WAN traffic to the backup gateway using **Menu 11.7 — Traffic Redirect Setup**.



```
                Menu 11.7 - Traffic Redirect Setup

             Active= No
             Configuration:
               Backup Gateway IP Address= 0.0.0.0
               Metric= 15




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

Figure 19-15 Menu 11.7 Traffic Redirect Setup

The following table describes the fields in this menu.

Table 19-4 Menu 11.7 Traffic Redirect Setup

FIELD	DESCRIPTION
Active	Press [SPACE BAR] and select **Yes** (to enable) or **No** (to disable) traffic redirect setup. The default is **No**. When the **Active** field is **Yes**, you must configure every field in this screen unless you are using PPPoE encapsulation (except **Check WAN IP Address** and **Timeout**). If you don't configure these fields and are using PPPoE encapsulation, then the Prestige checks the PPPoE channel to determine if the WAN connection is down.
Configuration:	
Backup Gateway IP Address	Enter the IP address of your backup gateway in dotted decimal notation. The Prestige automatically forwards traffic to this IP address if the Prestige's Internet connection terminates.
Metric	This field sets this route's priority among the routes the Prestige uses. The metric represents the "cost of transmission". A router determines the best route for transmission by choosing a path with the lowest "cost". RIP routing uses hop count as the measurement of cost, with a minimum of "1" for directly connected networks. The number must be between "1" and "15"; a number greater than "15" means the link is down. The smaller the number, the lower the "cost".
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.	

Chapter 20
Static Route Setup

This chapter shows how to setup IP static routes.

20.1 IP Static Route Overview

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 or a remote network is beyond the one that is directly connected to a remote node.

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 figure through remote node Router 1. However, the Prestige is unable to route a packet to network N3 because it does not know that there is a route through remote node Router 1 (via Router 2). The static routes allow you to tell the Prestige about the networks beyond the remote nodes.

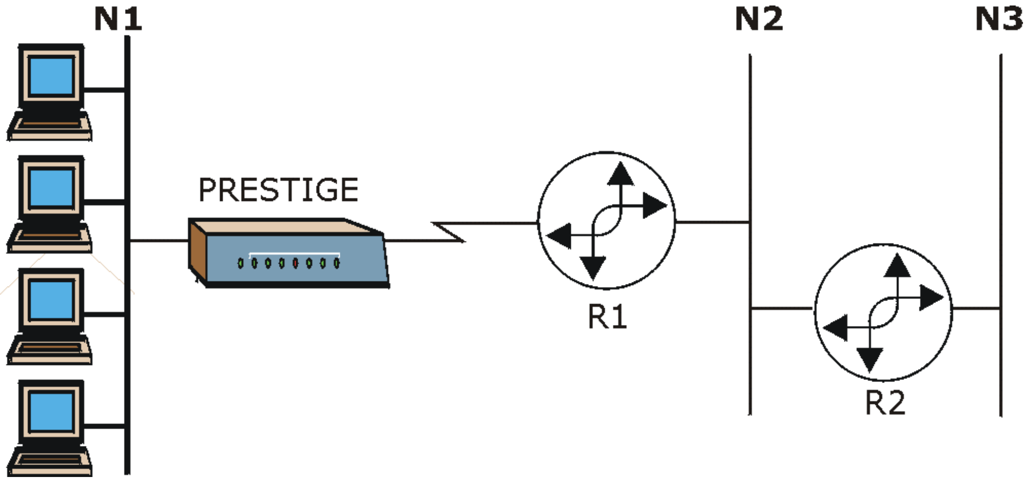
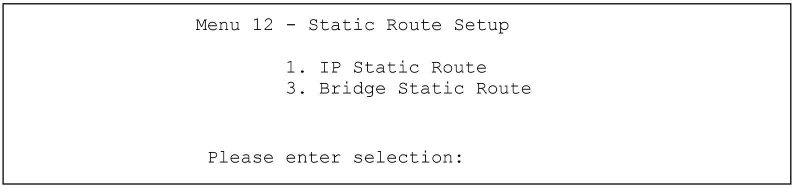


Figure 20-1 Sample Static Routing Topology

20.2 Configuring an IP static route

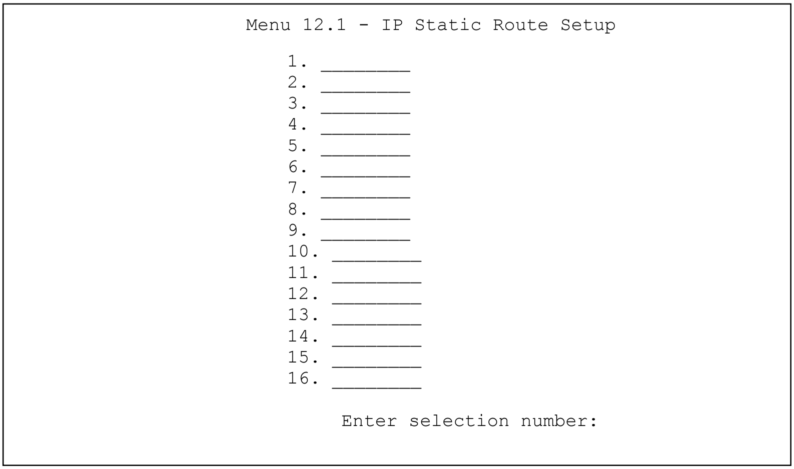
Step 1. To configure an IP static route, use **Menu 12** – **Static Route Setup** (shown next).



```
                 Menu 12 - Static Route Setup

                         1. IP Static Route
                         3. Bridge Static Route


                  Please enter selection:
```

Figure 20-2 Menu 12 Static Route Setup

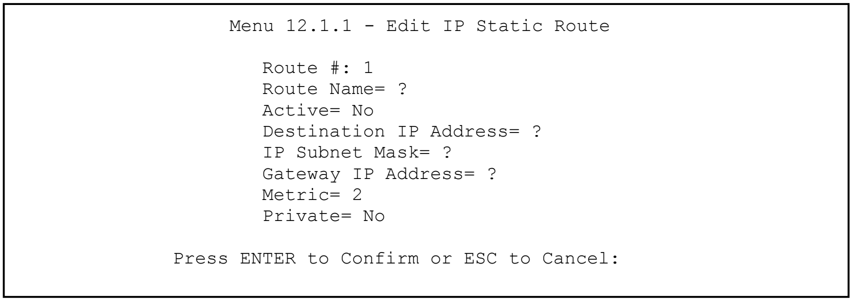
Step 2. From menu 12, select 1 to open **Menu 12.1** — **IP Static Route Setup** (shown next).



```
                      Menu 12.1 - IP Static Route Setup

                          1. ________
                          2. ________
                          3. ________
                          4. ________
                          5. ________
                          6. ________
                          7. ________
                          8. ________
                          9. ________
                          10. ________
                          11. ________
                          12. ________
                          13. ________
                          14. ________
                          15. ________
                          16. ________

                               Enter selection number:
```

Figure 20-3 Menu 12.1 IP Static Route Setup (P650H/HW)

Step 3. Now, type the route number of a static route you want to configure.



```
                    Menu 12.1.1 - 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 20-4 Menu12.1.1 Edit IP Static Route

The following table describes the fields for **Menu 12.1.1 – Edit IP Static Route Setup**.

Table 20-1 Menu12.1.1 Edit IP Static Route

FIELD	DESCRIPTION
Route #	This is the index number of the static route that you chose in menu 12.1.
Route Name	Type a descriptive name for this route. This is for identification purpose 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	Type the subnet mask for this destination. Follow the discussion on *IP Subnet Mask* in this manual.
Gateway IP Address	Type 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 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. Type 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.

Table 20-1 Menu12.1.1 Edit IP Static Route

FIELD	DESCRIPTION
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 is not included in RIP broadcasts. If **No**, the route to this remote node will be propagated to other hosts through RIP broadcasts.
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.	

Chapter 21
Bridging Setup

This chapter shows you how to configure the bridging parameters of your Prestige.

21.1 Bridging Overview

Bridging bases the forwarding decision on the MAC (Media Access Control), or hardware address, while routing does it on the network layer (IP) address. Bridging allows the Prestige to transport packets of network layer protocols that it does not route, for example, SNA, from one network to another. The caveat is that, compared to routing, bridging generates more traffic for the same network layer protocol, and it also demands more CPU cycles and memory.

For efficiency reasons, do *not* turn on bridging unless you need to support protocols other than IP on your network. For IP, enable the routing if you need it; do not bridge what the Prestige can route.

21.2 Bridge Ethernet Setup

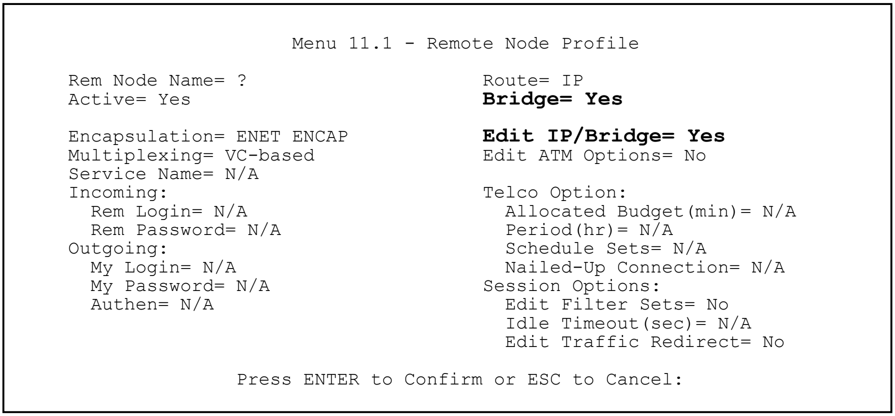
Basically, all non-local packets are bridged to the WAN. Your Prestige does not support IPX.

21.2.1 Remote Node Bridging Setup

Follow the procedure in another section to configure the protocol-independent parameters in **Menu 11.1 – Remote Node Profile**. For bridging-related parameters, you need to configure **Menu 11.3 – Remote Node Network Layer Options**.

To setup **Menu 11.3 – Remote Node Network Layer Options** shown in the next figure, follow these steps:

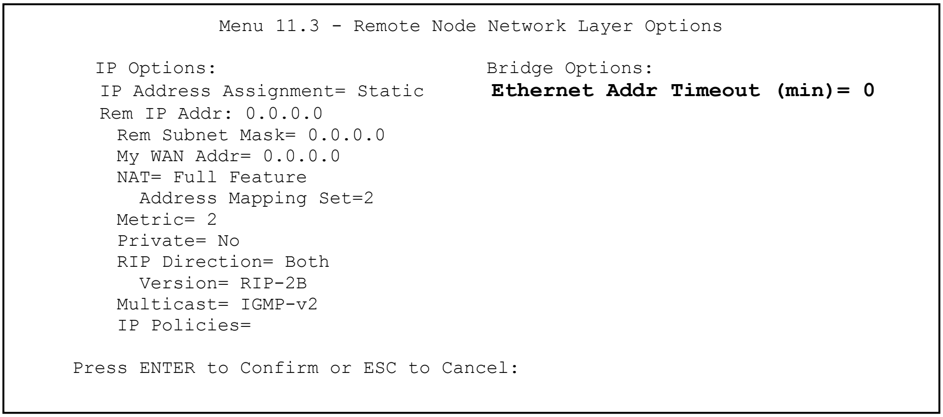
Step 1. In menu 11.1, make sure the **Bridge** field is set to **Yes**.



```
                    Menu 11.1 - Remote Node Profile

   Rem Node Name= ?                     Route= IP
   Active= Yes                          Bridge= Yes

   Encapsulation= ENET ENCAP            Edit IP/Bridge= Yes
   Multiplexing= VC-based               Edit ATM Options= No
   Service Name= N/A
   Incoming:                            Telco Option:
     Rem Login= N/A                       Allocated Budget(min)= N/A
     Rem Password= N/A                    Period(hr)= N/A
   Outgoing:                              Schedule Sets= N/A
     My Login= N/A                        Nailed-Up Connection= N/A
     My Password= N/A                   Session Options:
     Authen= N/A                          Edit Filter Sets= No
                                          Idle Timeout(sec)= N/A
                                          Edit Traffic Redirect= No

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

Figure 21-1 Menu 11.1 Remote Node Profile

Step 2. Move the cursor to the **Edit IP/Bridge** field, then press [SPACE BAR] to set the value to **Yes** and press [ENTER] to edit **Menu 11.3 – Remote Node Network Layer Options**.



```
                 Menu 11.3 - Remote Node Network Layer Options

        IP Options:                         Bridge Options:
         IP Address Assignment= Static       Ethernet Addr Timeout (min)= 0
         Rem IP Addr: 0.0.0.0
           Rem Subnet Mask= 0.0.0.0
           My WAN Addr= 0.0.0.0
           NAT= Full Feature
             Address Mapping Set=2
           Metric= 2
           Private= No
           RIP Direction= Both
             Version= RIP-2B
           Multicast= IGMP-v2
           IP Policies=

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

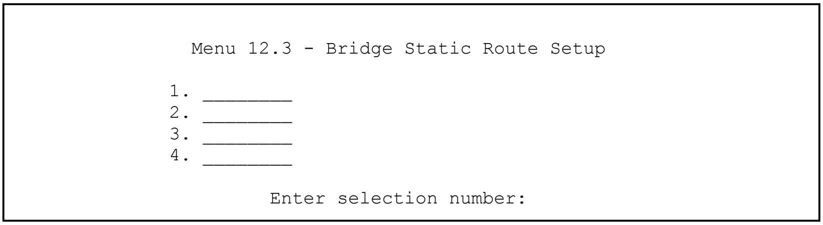
Figure 21-2 Menu 11.3 Remote Node Network Layer Options

Table 21-1 Menu 11.3 Remote Node Network Layer Options : Bridge Fields

FIELD	DESCRIPTION
Bridge (menu 11.1)	Make sure this field is set to **Yes**.
Edit IP/Bridge (menu 11.1)	Press [SPACE BAR] to select **Yes** and press [ENTER] to display menu 11.3.
Ethernet Addr Timeout (min.) (menu 11.3)	Type the time (in minutes) for the Prestige to retain the Ethernet Address information in its internal tables while the line is down. If this information is retained, your Prestige will not have to recompile the tables when the line comes back up.
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.	

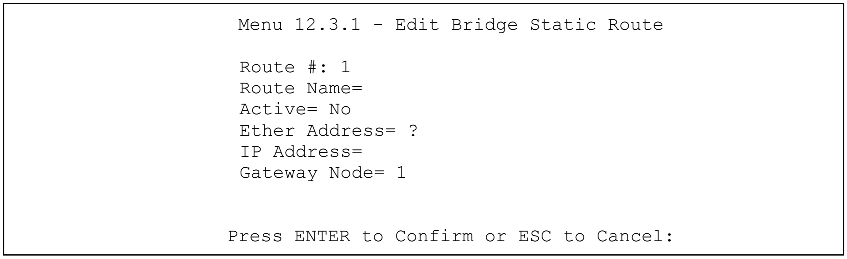
21.2.2 Bridge Static Route Setup

Similar to network layer static routes, a bridging static route tells the Prestige the route to a node before a connection is established. You configure bridge static routes in menu 12.3.1 (go to menu 12, choose option 3, then choose a static route to edit) as shown next.



```
                Menu 12.3 - Bridge Static Route Setup

              1. ________
              2. ________
              3. ________
              4. ________

                       Enter selection number:
```

Figure 21-3 Menu 12.3 Bridge Static Route Setup



```
                    Menu 12.3.1 - Edit Bridge Static Route

                    Route #: 1
                    Route Name=
                    Active= No
                    Ether Address= ?
                    IP Address=
                    Gateway Node= 1


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

Figure 21-4 Menu 12.3.1 Edit Bridge Static Route

The following table describes the **Edit Bridge Static Route** menu.

Table 21-2 Menu 12.3.1 Edit Bridge Static Route

FIELD	DESCRIPTION
Route #	This is the route index number you typed in **Menu 12.3 – Bridge Static Route Setup**.
Route Name	Type a name for the bridge static route for identification purposes.
Active	Indicates whether the static route is active (**Yes**) or not (**No**).
Ether Address	Type the MAC address of the destination computer that you want to bridge the packets to.
IP Address	If available, type the IP address of the destination computer that you want to bridge the packets to.
Gateway Node	Press [SPACE BAR] and then [ENTER] to select the number of the remote node (one to eight) that is the gateway of this static route.
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.	

Chapter 22
Network Address Translation (NAT)

This chapter discusses how to configure NAT on the Prestige.

22.1 NAT Overview

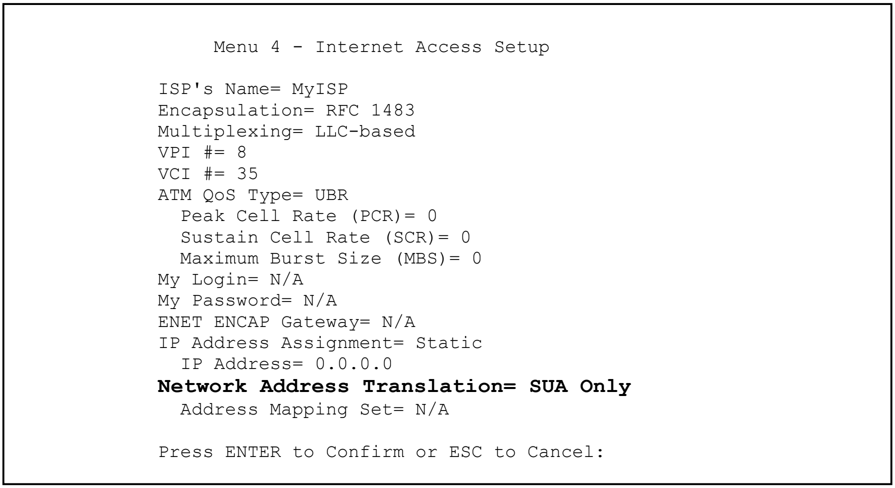
22.1.1 SUA (Single User Account) Versus NAT

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 22.3.1* 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 the web configurator part of this guide.

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.**

22.2 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= RFC 1483
               Multiplexing= LLC-based
               VPI #= 8
               VCI #= 35
               ATM QoS Type= UBR
                 Peak Cell Rate (PCR)= 0
                 Sustain Cell Rate (SCR)= 0
                 Maximum Burst Size (MBS)= 0
               My Login= N/A
               My Password= N/A
               ENET ENCAP Gateway= N/A
               IP Address Assignment= Static
                 IP Address= 0.0.0.0
               Network Address Translation= SUA Only
                 Address Mapping Set= N/A

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

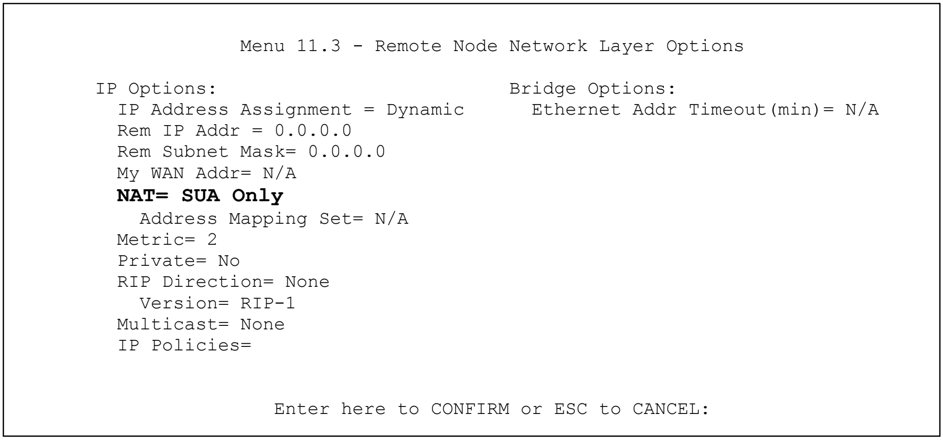
Figure 22-1 Menu 4 Applying NAT for Internet Access

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. When menu 11 appears, as shown in the following figure, type the number of the remote node that you want to configure.

Step 3. Move the cursor to the **Edit IP/Bridge** field, press [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 Options:                          Bridge Options:
          IP Address Assignment = Dynamic      Ethernet Addr Timeout(min)= N/A
          Rem IP Addr = 0.0.0.0
          Rem Subnet Mask= 0.0.0.0
          My WAN Addr= N/A
          NAT= SUA Only
            Address Mapping Set= N/A
          Metric= 2
          Private= No
          RIP Direction= None
            Version= RIP-1
          Multicast= None
          IP Policies=


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

Figure 22-2 Menu 11.3 Applying NAT to the Remote Node

The following table describes the options for Network Address Translation.

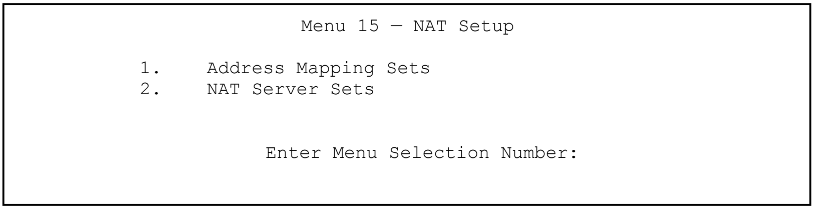
Table 22-1 Applying NAT in Menus 4 & 11.3

FIELD	DESCRIPTION	EXAMPLE
NAT	Press [SPACE BAR] and then [ENTER] to select **Full Feature** if you have multiple public WAN IP addresses for your Prestige. The SMT uses the address mapping set that you configure and enter in the **Address Mapping Set** field (menu 15.1 - see section *22.3.1*).	**Full Feature**
	Select **None** to disable NAT.	**None**
	When you select **SUA Only**, the SMT uses Address Mapping Set 255 (menu 15.1 - see section *22.3.1*). Choose **SUA Only** if you have just one public WAN IP address for your Prestige.	**SUA Only**

22.3 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**. When you select **SUA Only**, the SMT will use the pre-configured **Set 255** (read only).

The server set is a list of LAN servers mapped to external ports. To use this set, a server rule must be set up inside the NAT address mapping set. Please see the section on port forwarding in the chapter on NAT web configurator screens for further information on these menus. To configure NAT, enter 15 from the main menu to bring up the following screen.

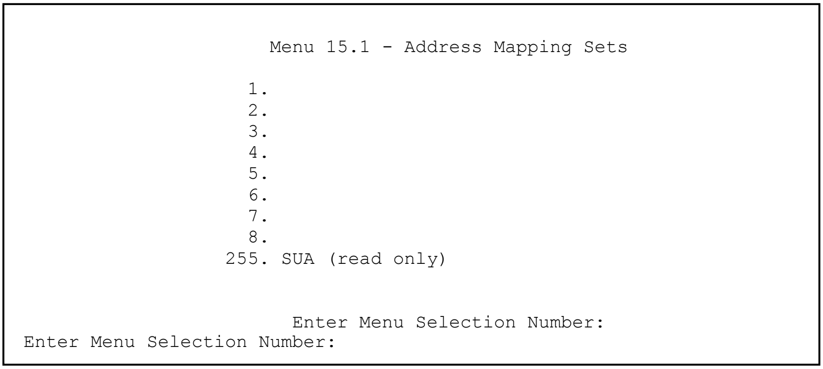


```
                        Menu 15 — NAT Setup

          1.    Address Mapping Sets
          2.    NAT Server Sets


                   Enter Menu Selection Number:
```

Figure 22-3 Menu 15 NAT Setup

22.3.1 Address Mapping Sets

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

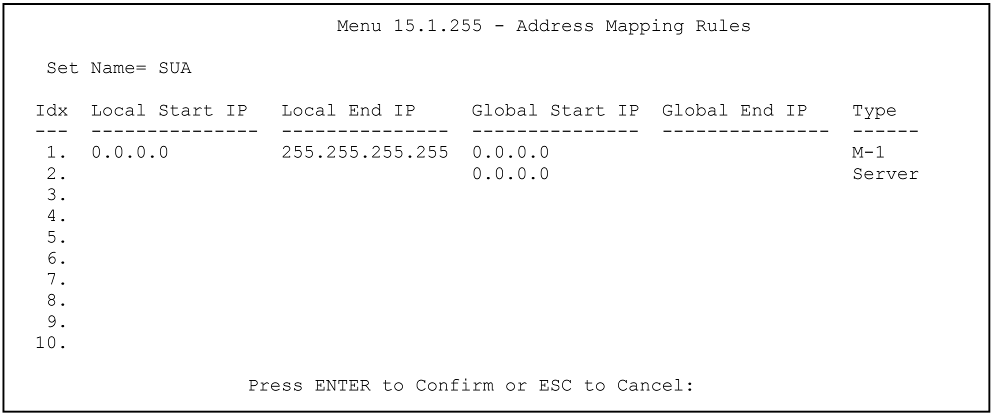


```
                      Menu 15.1 - Address Mapping Sets

                    1.
                    2.
                    3.
                    4.
                    5.
                    6.
                    7.
                    8.
                  255. SUA (read only)


                        Enter Menu Selection Number:
Enter Menu Selection Number:
```

Figure 22-4 Menu 15.1 Address Mapping Sets

SUA Address Mapping Set

Enter 255 to display the next screen (see also *section 22.1.1)*. 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 22-5 Menu 15.1.255 SUA Address Mapping Rules

The following table explains the fields in this menu.

Menu 15.1.255 is read-only.

Table 22-2 SUA Address Mapping Rules

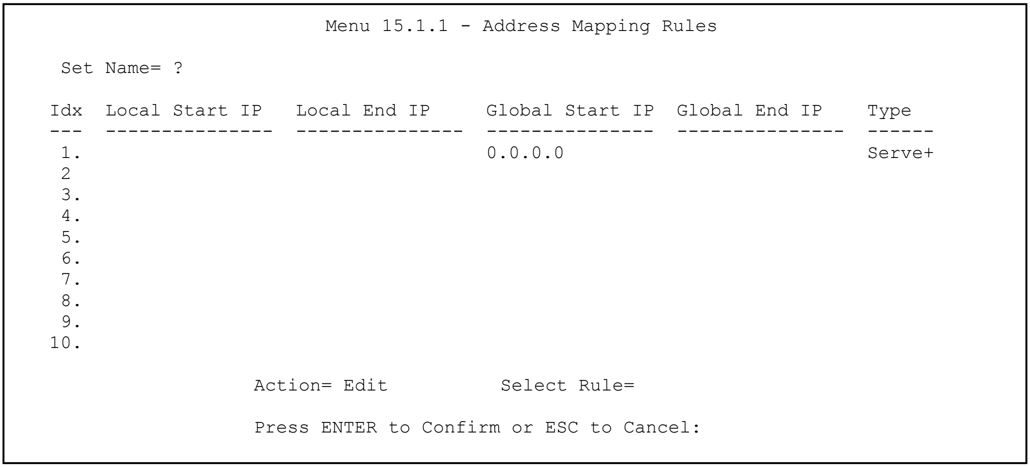
FIELD	DESCRIPTION	EXAMPLE
Set Name	This is the name of the set you selected in menu 15.1 or enter the name of a new set you want to create.	SUA
Idx	This is the index or rule number.	1
Local Start IP	**Local Start IP** is the starting local IP address (ILA).	0.0.0.0
Local End IP	**Local End IP** is the 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.	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).	
Type	These are the mapping types. **Server** allows us to specify multiple servers of different types behind NAT to this machine. See later for some examples.	Server

Table 22-2 SUA Address Mapping Rules

FIELD	DESCRIPTION	EXAMPLE
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.		

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.



```
                         Menu 15.1.1 - Address Mapping Rules

   Set Name= ?

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

                  Action= Edit          Select Rule=

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

Figure 22-6 Menu 15.1.1 First Set

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

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.

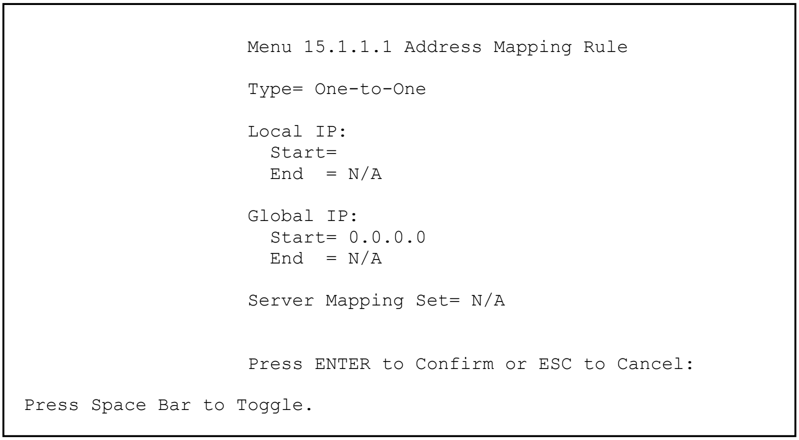
Table 22-3 Menu 15.1.1 First Set

FIELD	DESRIPTION	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.	ACL Default 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= 0.0.0.0
                        End  = N/A

                      Server Mapping Set= N/A


                      Press ENTER to Confirm or ESC to Cancel:

Press Space Bar to Toggle.
```

Figure 22-7 Menu 15.1.1.1 Editing/Configuring an Individual Rule in a Set

The following table explains the fields in this menu.

Table 22-4 Menu 15.1.1.1 Editing/Configuring an Individual Rule in a Set

FIELD	DESCRIPTION	EXAMPLE
Type	Press [SPACE BAR] and then [ENTER] to select from a total of five types. These are the mapping types discussed in the chapter on NAT web configurator screens. **Server** allows you to specify multiple servers of different types behind NAT to this computer. See *section 22.5.3* 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 inside 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 inside global IP address (IGA). This field is **N/A** for **One-to-One**, **Many-to-One** and **Server types**.	N/A

Table 22-4 Menu 15.1.1.1 Editing/Configuring an Individual Rule in a Set

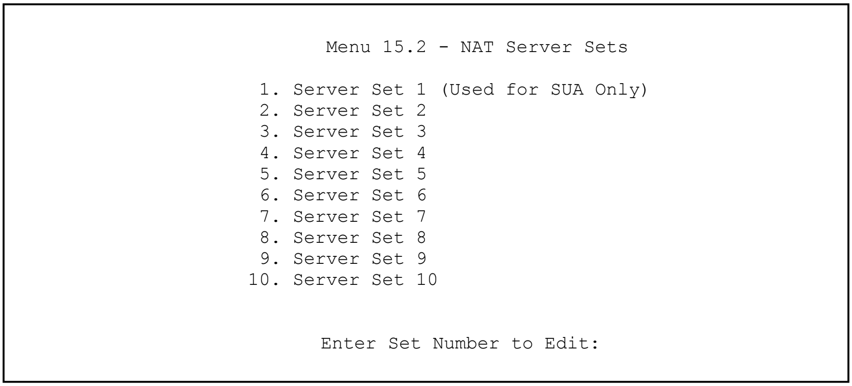
FIELD	DESCRIPTION	EXAMPLE
Server Mapping Set	Only available when **Type** is set to **Server**. Type a number from 1 to 10 to choose a server set from menu 15.2.	
When you have completed this menu, press [ENTER] at the prompt “Press ENTER to confirm or ESC to cancel” to save your configuration or press [ESC] to cancel and go back to the previous screen.		

22.4 Configuring a Server behind NAT

Follow these steps to configure a server behind NAT:

Step 1. Enter 15 in the main menu to go to **Menu 15 - NAT Setup.**

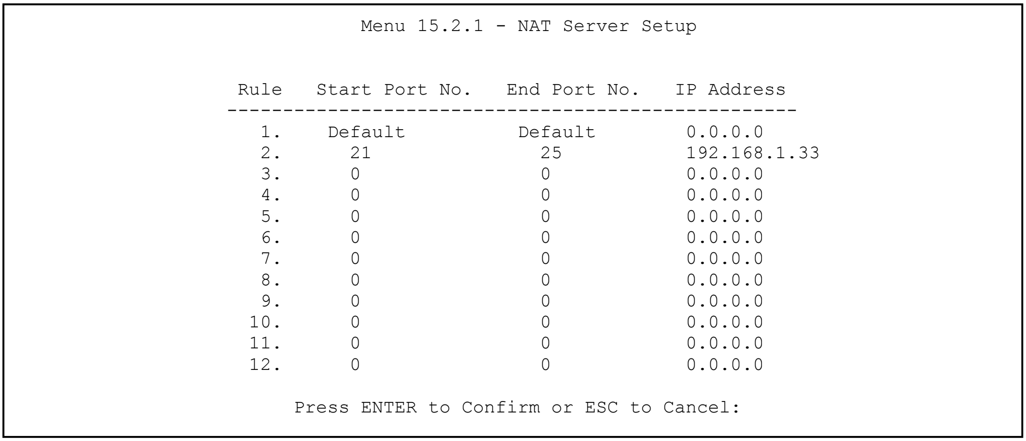
Step 2. Enter 2 to display **Menu 15.2 - NAT Server Sets** as shown next.



```
                    Menu 15.2 - NAT Server Sets

               1. Server Set 1 (Used for SUA Only)
               2. Server Set 2
               3. Server Set 3
               4. Server Set 4
               5. Server Set 5
               6. Server Set 6
               7. Server Set 7
               8. Server Set 8
               9. Server Set 9
              10. Server Set 10


                    Enter Set Number to Edit:
```

Figure 22-8 Menu 15.2 NAT Server Setup

Step 3. Enter 1 to go to **Menu 15.2.1 NAT Server Setup** as follows.



```
                        Menu 15.2.1 - 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.      0                0            0.0.0.0

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

Figure 22-9 Menu 15.2.1 NAT Server Setup

Step 4. 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 5. 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 6. 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.

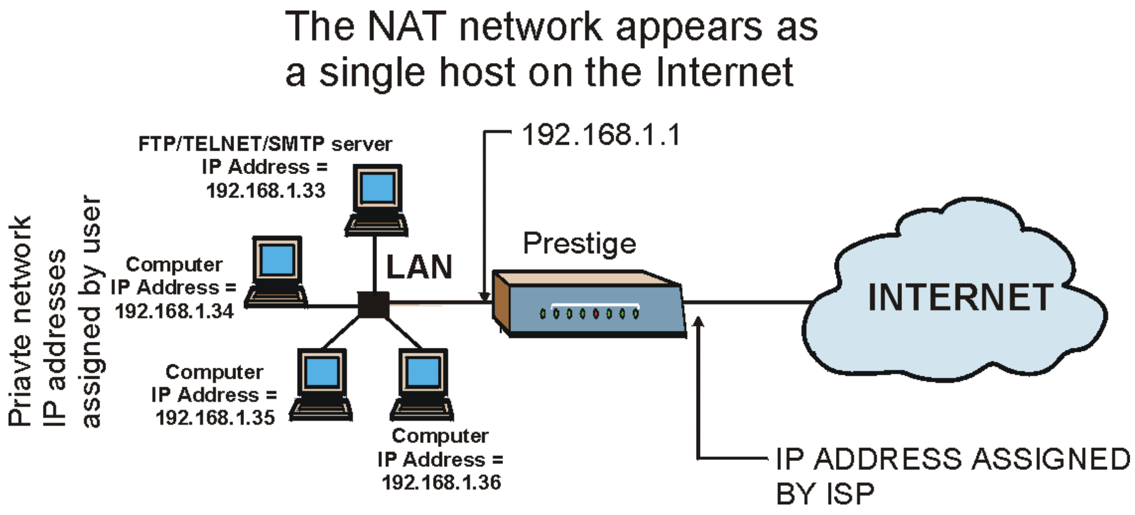


Figure 22-10 Multiple Servers Behind NAT Example

22.5 General NAT Examples

The following are some examples of NAT configuration.

22.5.1 Example 1: Internet Access Only

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

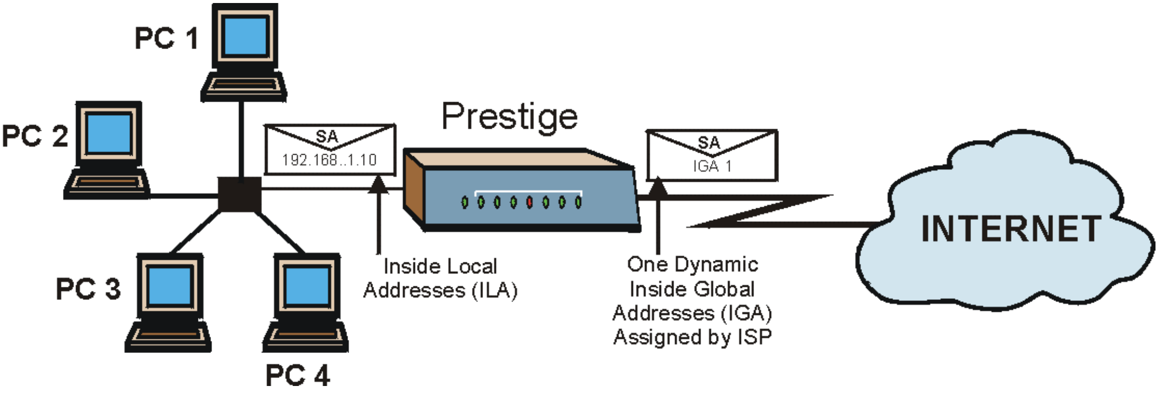
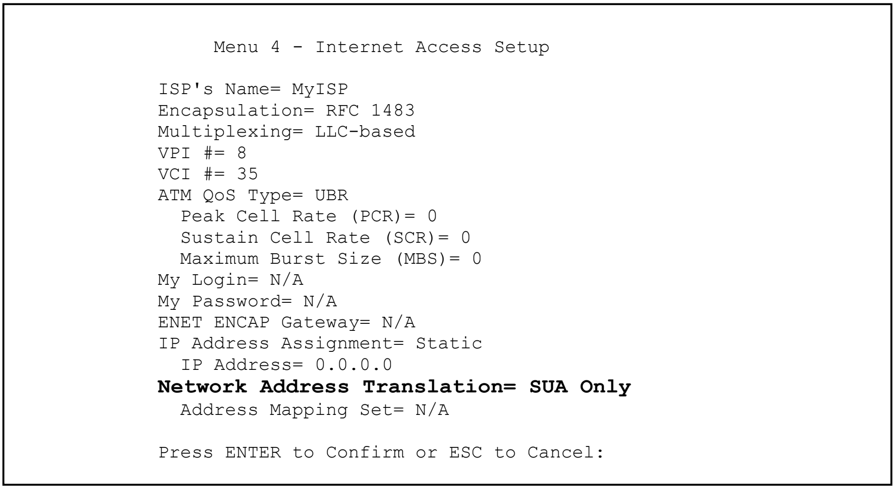


Figure 22-11 NAT Example 1



```
     Menu 4 - Internet Access Setup

ISP's Name= MyISP
Encapsulation= RFC 1483
Multiplexing= LLC-based
VPI #= 8
VCI #= 35
ATM QoS Type= UBR
  Peak Cell Rate (PCR)= 0
  Sustain Cell Rate (SCR)= 0
  Maximum Burst Size (MBS)= 0
My Login= N/A
My Password= N/A
ENET ENCAP Gateway= N/A
IP Address Assignment= Static
  IP Address= 0.0.0.0
Network Address Translation= SUA Only
  Address Mapping Set= N/A

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

Figure 22-12 Menu 4 Internet Access & NAT Example

From menu 4, choose the **SUA Only** option from the **Network Address Translation** field. This is the Many-to-One mapping discussed in *section 22.5.* 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.

22.5.2 Example 2: Internet Access with an Inside Server

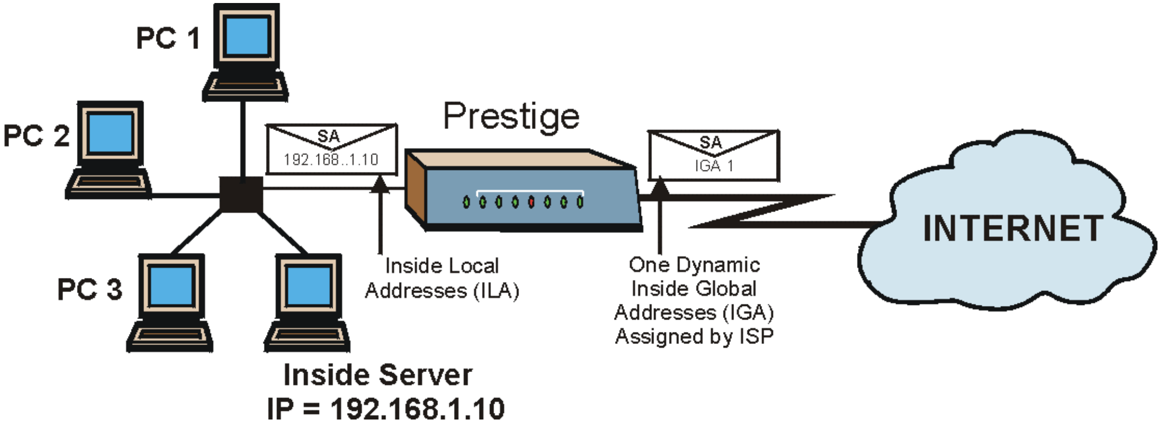


Figure 22-13 NAT Example 2

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 15.2.1 - NAT Server Setup (Used for SUA Only)


               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.       0                0            0.0.0.0

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

Figure 22-14 Menu 15.2.1 Specifying an Inside Server

22.5.3 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:

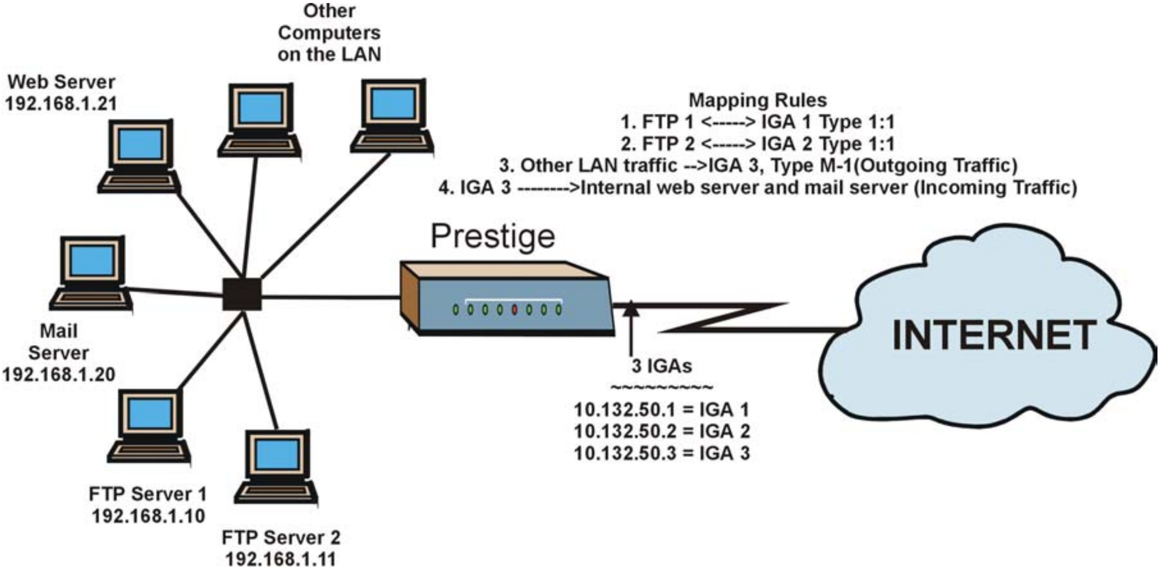

Other Computers on the LAN
Web Server 192.168.1.21
Mapping Rules
1. FTP 1 <-----> IGA 1 Type 1:1
2. FTP 2 <-----> IGA 2 Type 1:1
3. Other LAN traffic -->IGA 3, Type M-1(Outgoing Traffic)
4. IGA 3 -------->Internal web server and mail server (Incoming Traffic)
Prestige
Mail Server 192.168.1.20
INTERNET
3 IGAs
~~~~~~~~~
10.132.50.1 = IGA 1
10.132.50.2 = IGA 2
10.132.50.3 = IGA 3
FTP Server 1 192.168.1.10
FTP Server 2 192.168.1.11

Figure 22-15 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 22-16*.

Step 2. Then enter 15 from the main menu.

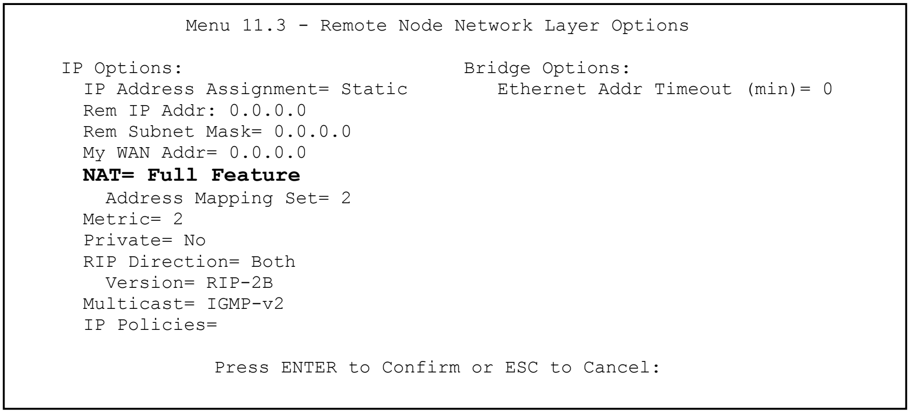
Step 3. Enter 1 to configure the Address Mapping Sets.

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 22-17).*

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

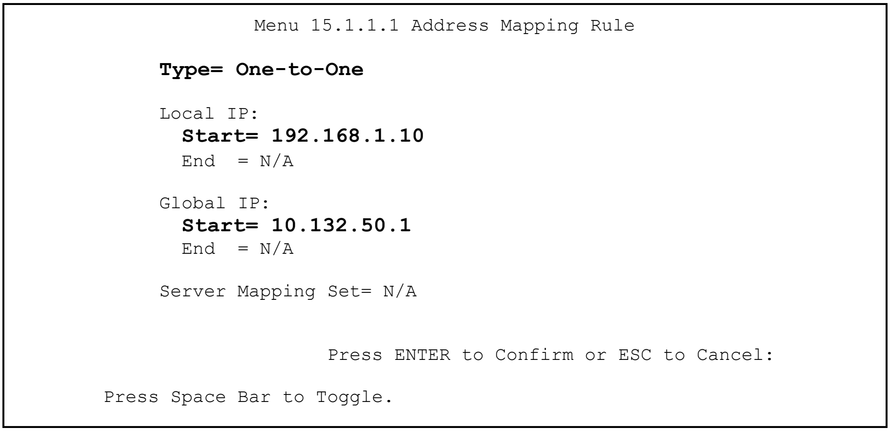
Step 7. When finished, menu 15.1.1 should look like as shown in .



```
                Menu 11.3 - Remote Node Network Layer Options

     IP Options:                           Bridge Options:
       IP Address Assignment= Static          Ethernet Addr Timeout (min)= 0
       Rem IP Addr: 0.0.0.0
       Rem Subnet Mask= 0.0.0.0
       My WAN Addr= 0.0.0.0
       NAT= Full Feature
         Address Mapping Set= 2
       Metric= 2
       Private= No
       RIP Direction= Both
         Version= RIP-2B
       Multicast= IGMP-v2
       IP Policies=

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

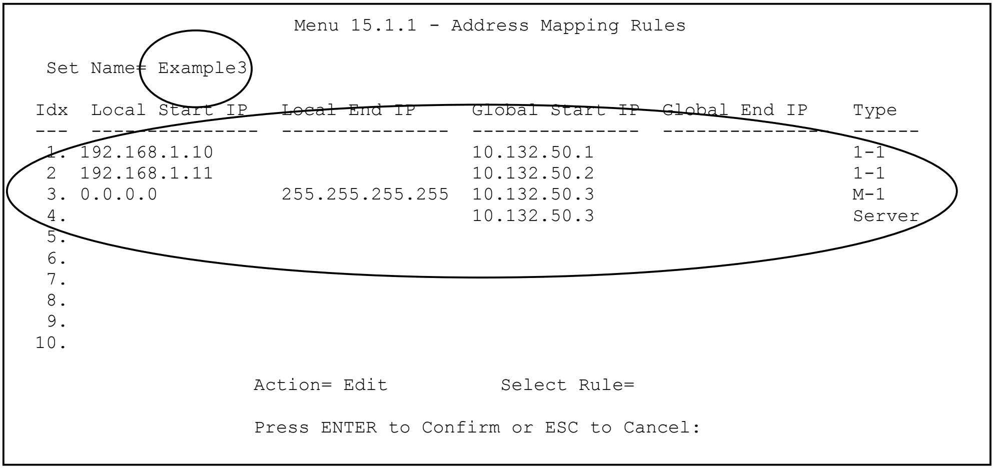
Figure 22-16 Example 3: Menu 11.3

The following figures show 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

             Server Mapping Set= N/A


                          Press ENTER to Confirm or ESC to Cancel:

        Press Space Bar to Toggle.
```

Figure 22-17 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:
```

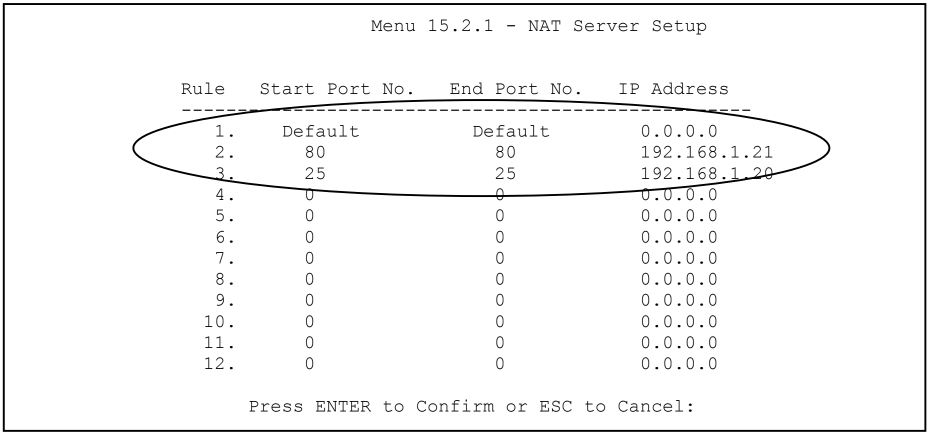
Figure 22-18 Example 3: Final Menu 15.1.1

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. Enter 2 in **Menu 15 - NAT Setup**.

Step 10. Enter 1 in **Menu 15.2 - NAT Server Sets** to see the following menu. Configure it as shown.



```
                    Menu 15.2.1 - 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.       0                0           0.0.0.0

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

Example 3: Menu 15.2.1

22.5.4 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.

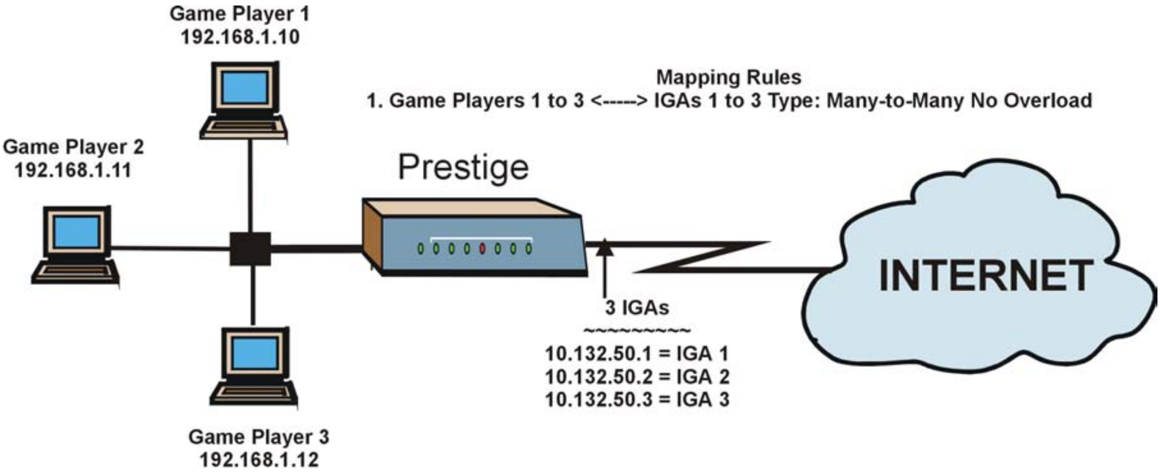
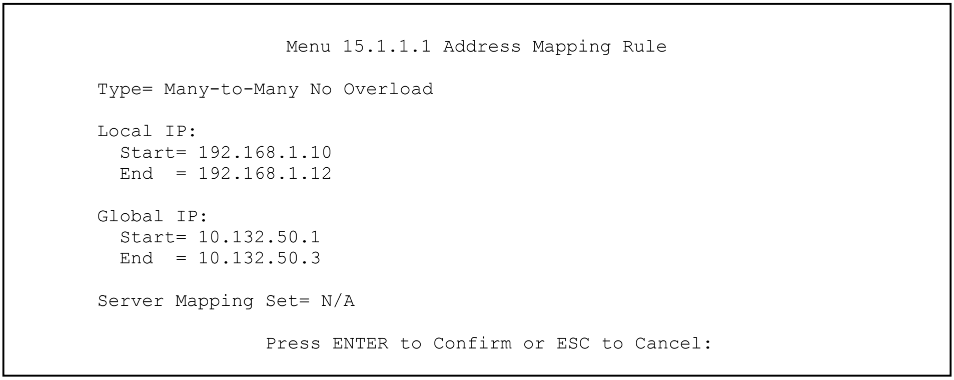


Figure 22-19 NAT Example 4

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

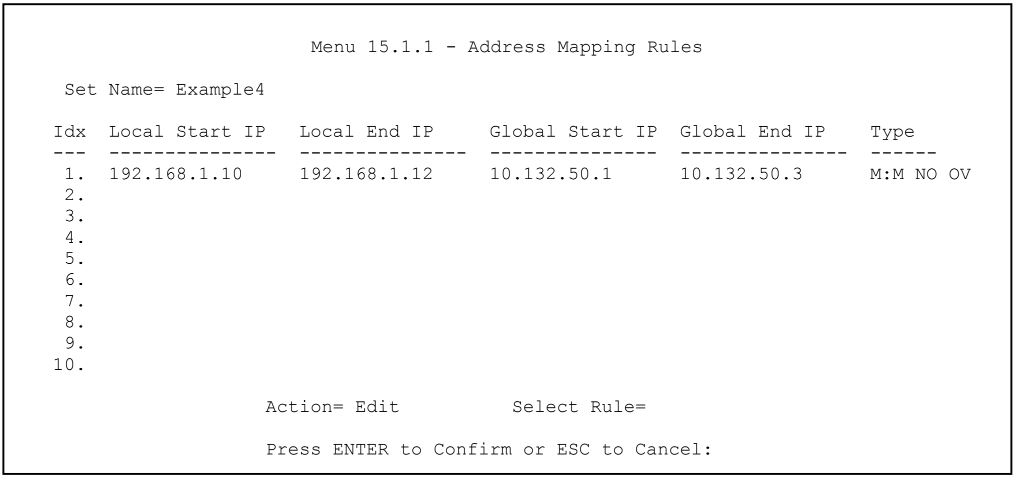
Follow the steps outlined in example 3 to configure these two menus as follows.



```
                         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

        Server Mapping Set= N/A

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

Figure 22-20 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 22-21 Example 4: Menu 15.1.1 Address Mapping Rules

Part VIII:

SMT Advanced Management

This part discusses filtering setup, SNMP, system security, system information and diagnosis, firmware and configuration file maintenance, system maintenance, remote management, IP policy routing and call scheduling.

See the web configurator parts of this guide for background information on features configurable by web configurator and SMT.

Chapter 23
Filter Configuration

This chapter shows you how to create and apply filters.

23.1 About Filtering

Your Prestige uses filters to decide whether or not 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 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.

Outgoing packets must undergo data filtering before they encounter call filtering. Call filters are divided into two groups, the built-in call filters and user-defined call filters. Your Prestige has built-in call filters that prevent administrative, for example, RIP packets from triggering calls. These filters are always enabled and not accessible to you. Your Prestige applies the built-in filters first and then the user-defined call filters, if applicable, as shown next.

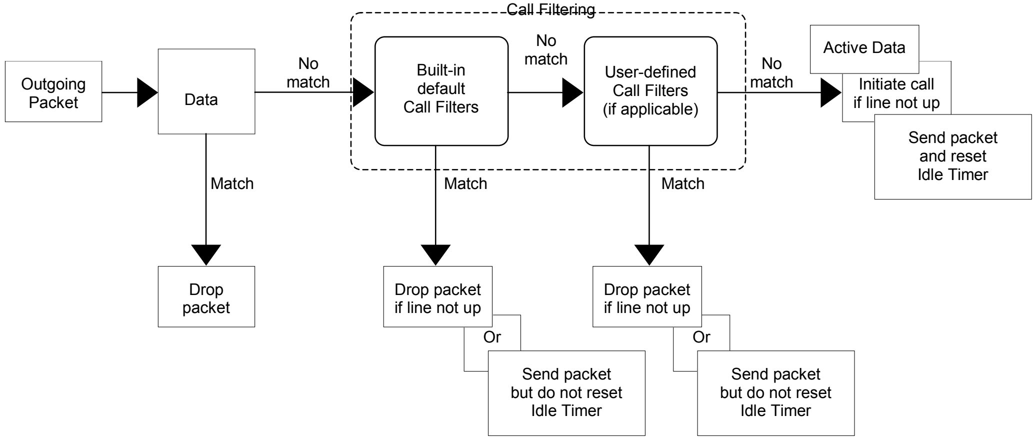

Call Filtering
Outgoing Packet
Data
No match
Built-in default Call Filters
No match
User-defined Call Filters (if applicable)
No match
Active Data
Initiate call if line not up
Send packet and reset Idle Timer
Match
Match
Match
Drop packet
Drop packet if line not up
Or
Send packet but do not reset Idle Timer
Drop packet if line not up
Or
Send packet but do not reset Idle Timer

Figure 23-1 Outgoing Packet Filtering Process

Two sets of factory filter rules have been configured in menu 21 to prevent NetBIOS traffic from triggering calls. A summary of their filter rules is shown in the figures that follow.

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

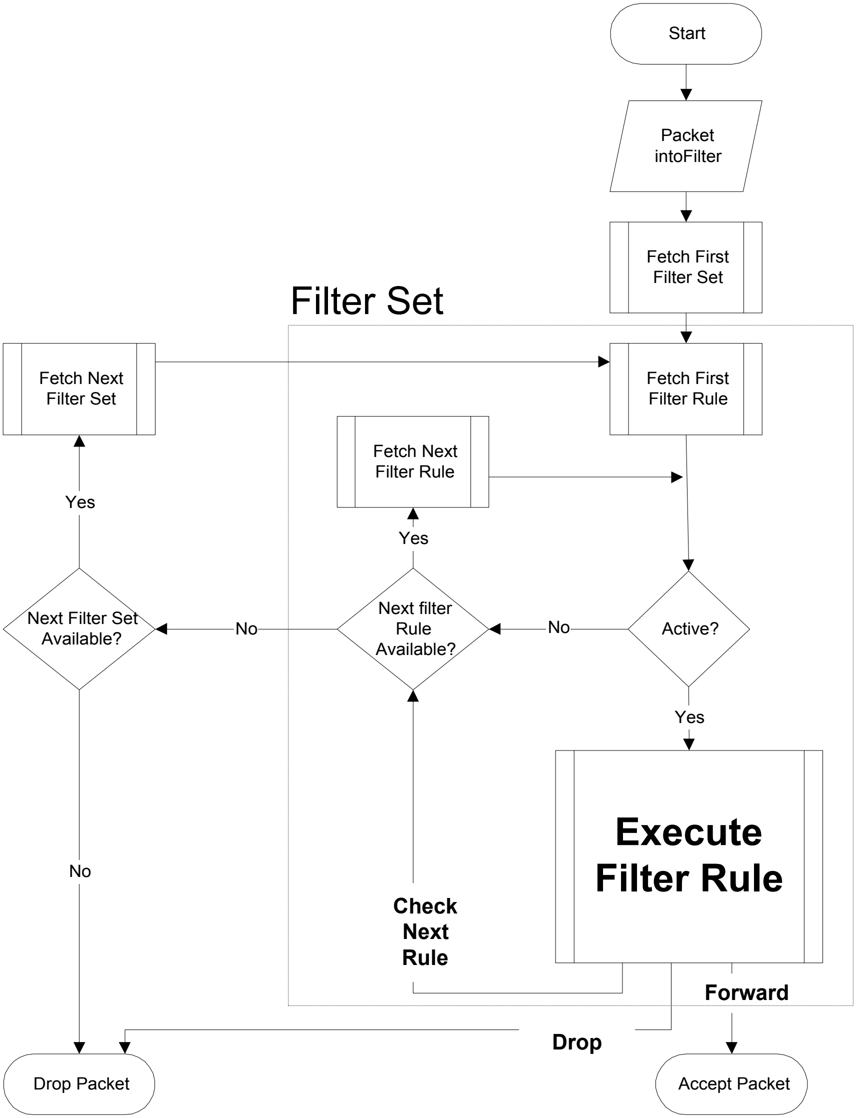


Figure 23-2 Filter Rule Process

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

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

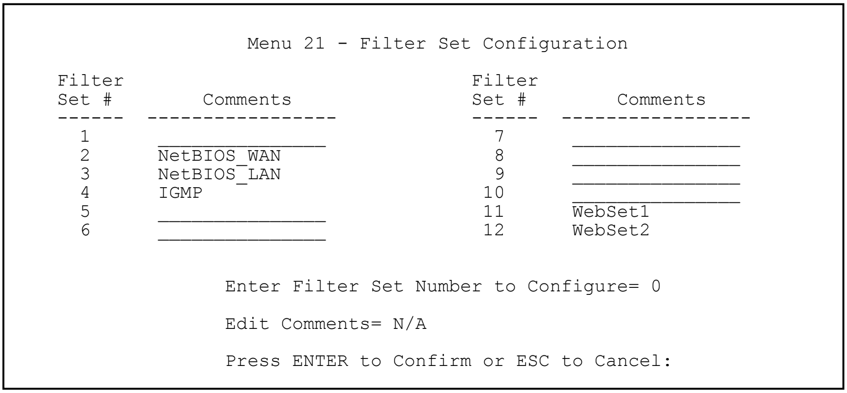
The Filter Structure of the Prestige

A filter set consists of one or more filter rules. Usually, you would group related rules, for example, all the rules for NetBIOS, into a single set and give it a descriptive name. You can configure up to twelve filter sets with six rules in each set, for a total of 72 filter rules in the system.

23.2 Configuring a Filter Set for the Prestige 650H and the Prestige 650HW

To configure a filter set, follow the steps shown next.

Step 1. Enter 21 in the main menu to display **Menu 21 – Filter Set Configuration**.



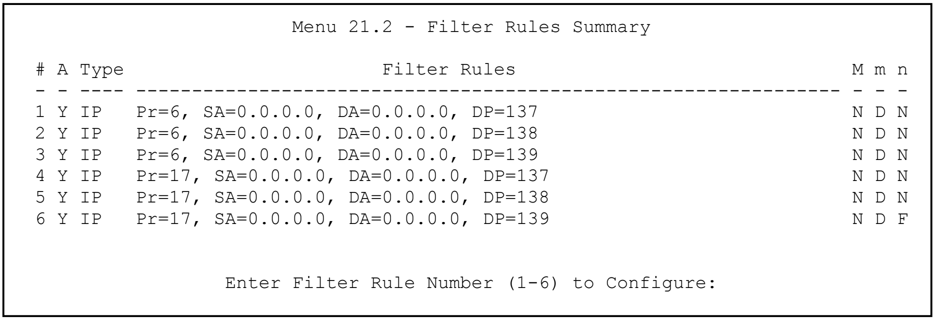
```
                     Menu 21 - Filter Set Configuration

     Filter                                 Filter
     Set #        Comments                  Set #        Comments
     ------  -----------------              ------  -----------------
       1      _______________                 7      _______________
       2      NetBIOS_WAN                     8      _______________
       3      NetBIOS_LAN                     9      _______________
       4      IGMP                           10      _______________
       5      _______________                11      WebSet1
       6      _______________                12      WebSet2

                   Enter Filter Set Number to Configure= 0

                   Edit Comments= N/A

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

Figure 23-3 Menu 21 Filter Set Configuration (P650H/HW)

Step 2. Type the filter set to configure (no. 1 to 12) and press [ENTER].

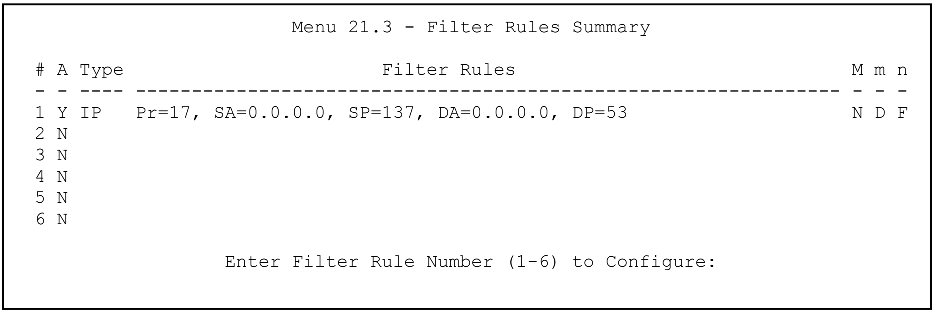
Step 3. Type a descriptive name or comment in the **Edit Comments** field and press [ENTER].

Step 4. Press [ENTER] at the message "Press ENTER to confirm…" to display **Menu 21.2 – Filter Rules Summary** (that is, if you selected filter set 2 in menu 21).



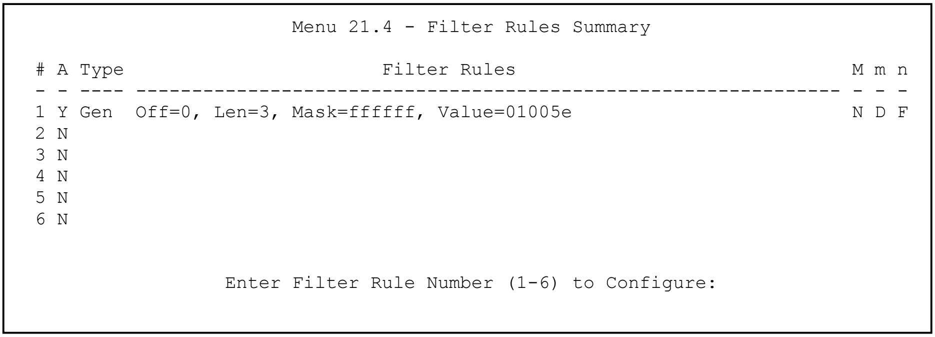
```
                       Menu 21.2 - Filter Rules Summary

# 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:
```

Figure 23-4 NetBIOS_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, SP=137, DA=0.0.0.0, DP=53                    N D F
2 N
3 N
4 N
5 N
6 N

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

Figure 23-5 NetBIOS_LAN Filter Rules Summary



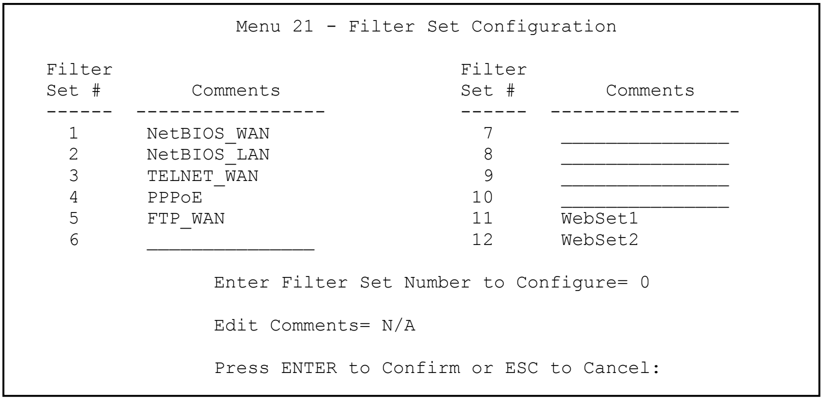
```
                       Menu 21.4 - Filter Rules Summary

# A Type                       Filter Rules                              M m n
- - ---- --------------------------------------------------------------- - - -
1 Y Gen  Off=0, Len=3, Mask=ffffff, Value=01005e                         N D F
2 N
3 N
4 N
5 N
6 N


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

Figure 23-6 IGMP Filter Rules Summary

23.3 Configuring a Filter Set for the Prestige 650R and the Prestige 650R-E

To configure a filter set, follow the steps shown next.

Step 1. Enter 21 in the main menu to display **Menu 21 – Filter Set Configuration**.



```
                  Menu 21 - Filter Set Configuration

   Filter                                Filter
   Set #       Comments                  Set #       Comments
   ------  -----------------             ------  -----------------
     1      NetBIOS_WAN                    7      _______________
     2      NetBIOS_LAN                    8      _______________
     3      TELNET_WAN                     9      _______________
     4      PPPoE                         10      _______________
     5      FTP_WAN                       11      WebSet1
     6      _______________               12      WebSet2

                  Enter Filter Set Number to Configure= 0

                  Edit Comments= N/A

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

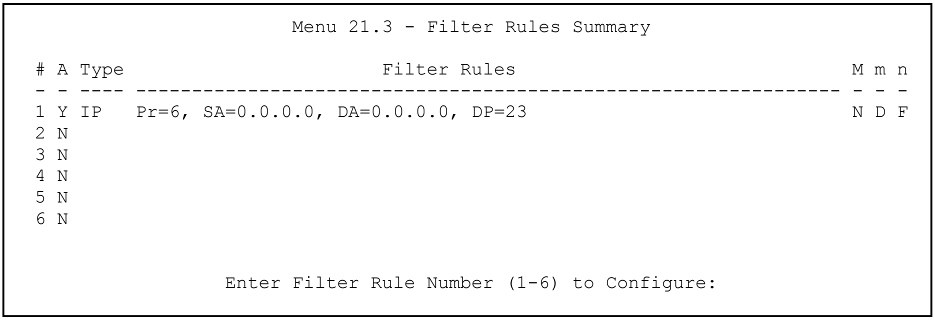
Figure 23-7 Menu 21 Filter Set Configuration (P650R and P650R-E)

Step 2. Type the filter set to configure (no. 1 to 12) and press [ENTER].

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

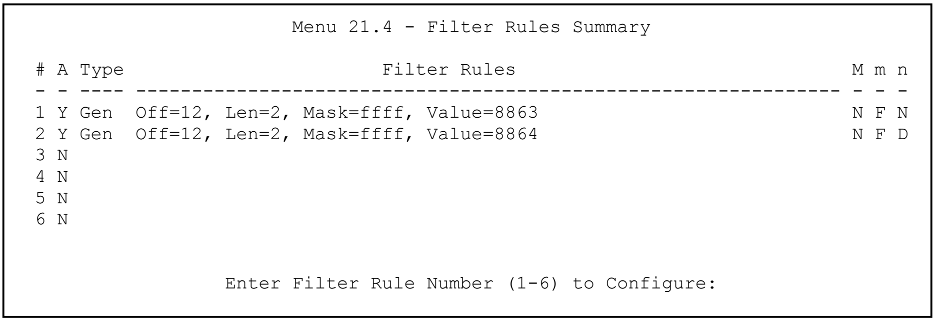
Step 4. Press [ENTER] at the message "Press ENTER to confirm…" to display **Menu 21.4 – Filter Rules Summary** (that is, if you selected filter set 4 in menu 21).

See *Figure 23-4* for the summary of the NetBIOS WAN rules and *Figure 23-5* for the summary of the NetBIOS LAN rules.



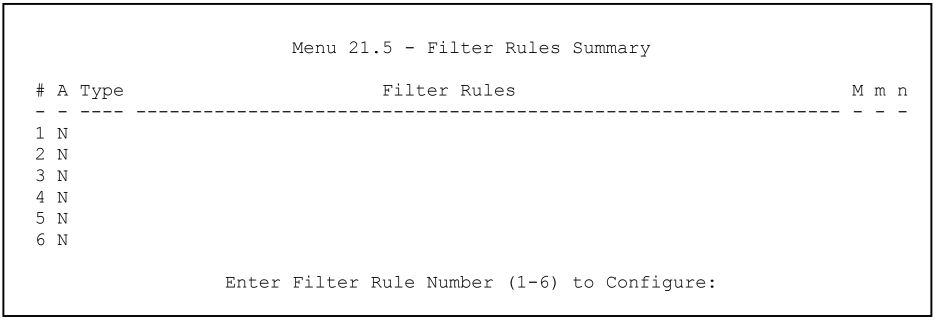
```
                       Menu 21.3 - Filter Rules Summary

# 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 F
2 N
3 N
4 N
5 N
6 N


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

Figure 23-8 TELNET_WAN Filter Rules Summary



```
                       Menu 21.4 - Filter Rules Summary

# A Type                       Filter Rules                                M m n
- - ---- --------------------------------------------------------------- - - -
1 Y Gen  Off=12, Len=2, Mask=ffff, Value=8863                              N F N
2 Y Gen  Off=12, Len=2, Mask=ffff, Value=8864                              N F D
3 N
4 N
5 N
6 N


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

Figure 23-9 PPPoE Filter Rules Summary



```

                       Menu 21.5 - Filter Rules Summary

# A Type                       Filter Rules                                M m n
- - ---- --------------------------------------------------------------- - - -
1 N
2 N
3 N
4 N
5 N
6 N

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

Figure 23-10 FTP_WAN Filter Rules Summary

23.3.1 Filter Rules Summary Menus

The following tables briefly describe the abbreviations used in menu 21.x.

Table 23-1 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 for instance, 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 23-2 Rule Abbreviations Used

FILTER TYPE	DESCRIPTION
IP	
Pr	Protocol
SA	Source Address
SP	Source Port Number
DA	Destination Address
DP	Destination Port Number
GEN	

Table 23-2 Rule Abbreviations Used

FILTER TYPE	DESCRIPTION
Off	Offset
Len	Length

23.4 Configuring a Filter Rule

To configure a filter rule, type its number in **Menu 21.x – Filter Rules Summary** and press [ENTER] to open menu 21.x.1 for the rule.

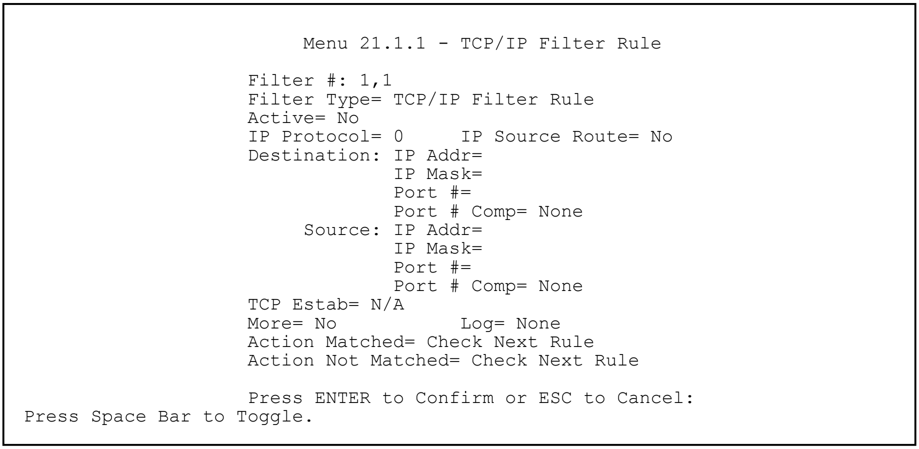
There are two types of filter rules: **TCP/IP** and **Generic**. Depending on the type of rule, the parameters for each type will be different. Use [SPACE BAR] to select the type of rule that you want to create in the **Filter Type** field and press [ENTER] to open the respective menu.

To speed up filtering, all rules in a filter set must be of the same class, for instance, 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 filters field or vice versa, the Prestige will warn you and will not allow you to save.

23.4.1 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, for example, UDP and TCP headers.

To configure TCP/IP rules, select TCP/IP Filter Rule from the **Filter Type** field and press [ENTER] to open **Menu 21.x.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= No
                    IP Protocol= 0     IP Source Route= No
                    Destination: IP Addr=
                                 IP Mask=
                                 Port #=
                                 Port # Comp= None
                         Source: IP Addr=
                                 IP Mask=
                                 Port #=
                                 Port # Comp= None
                    TCP Estab= 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 23-11 Menu 21.x.1 TCP/IP Filter Rule

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

Table 23-3 Menu 21.x.1 TCP/IP Filter Rule

FIELD	DESCRIPTION	EXAMPLE
Filter #	This is the filter set, filter rule coordinates, for instance, 2, 3 refers to the second filter set and the third filter rule of that set.	1,1
Filter Type	Use [SPACE BAR] and then [ENTER] to choose a rule. Parameters displayed for each type will be different. Choices are **TCP/IP Filter Rule** or **Generic Filter Rule**.	**TCP/IP Filter Rule**
Active	Select **Yes** to activate or **No** to deactivate the filter rule.	**No** (default)
IP Protocol	This is the upper layer protocol, for example, TCP is 6, UDP is 17 and ICMP is 1. The value must be between 0 and 255. A value of O matches ANY protocol.	0 to 255
IP Source Route	IP Source Route is an optional header that dictates the route an IP packet takes from its source to its destination. If **Yes**, the rule applies to any packet with an IP source route. The majority of IP packets do not have source route.	**No** (default)
Destination: IP Addr	Type the destination IP address of the packet you want to filter. This field is ignored if it is 0.0.0.0.	IP address

Table 23-3 Menu 21.x.1 TCP/IP Filter Rule

FIELD	DESCRIPTION	EXAMPLE
IP Mask	Type the IP mask to apply to the Destination: IP Addr field.	IP mask
Port #	Type the destination port of the packets you want to filter. The field range is 0 to 65535. A 0 field is ignored.	0 to 65535
Port # Comp	Select the comparison to apply to the destination port in the packet against the value given in **Destination: Port #.** Choices are **None**, **Less**, **Greater**, **Equal** or **Not Equal**.	**None**
Source: IP Addr	Type the source IP Address of the packet you want to filter. A 0.0.0.0 field is ignored.	IP address
IP Mask	Type the IP mask to apply to the **Source: IP Addr** field.	IP mask
Port #	Type the source port of the packets you want to filter. The range of this field is 0 to 65535. A 0 field is ignored.	0 to 65535
Port # Comp	Select the comparison to apply to the source port in the packet against the value given in **Source: Port #** field. Choices are **None**, **Less**, **Greater**, **Equal** or **Not Equal**.	**None**
TCP Estab	This applies only when the IP Protocol field is 6, TCP. If **Yes**, the rule matches packets that want to establish TCP connection(s) (SYN=1 and ACK=0); else it is ignored.	**No** (default)
More	If **Yes**, a matching packet is passed to the next filter rule before an action is taken or else the packet is disposed of according to the action fields. If **More** is **Yes**, then **Action Matched** and **Action Not Matched** will be N/A.	**No** (default)
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. Choices are **Check Next Rule**, **Forward** or **Drop**.	**Check Next Rule** (default)

Table 23-3 Menu 21.x.1 TCP/IP Filter Rule

FIELD	DESCRIPTION	EXAMPLE
Action Not Matched	Select the action for a packet not matching the rule. Choices are **Check Next Rule**, **Forward** or **Drop**.	**Check Next Rule** (default)
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.		

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

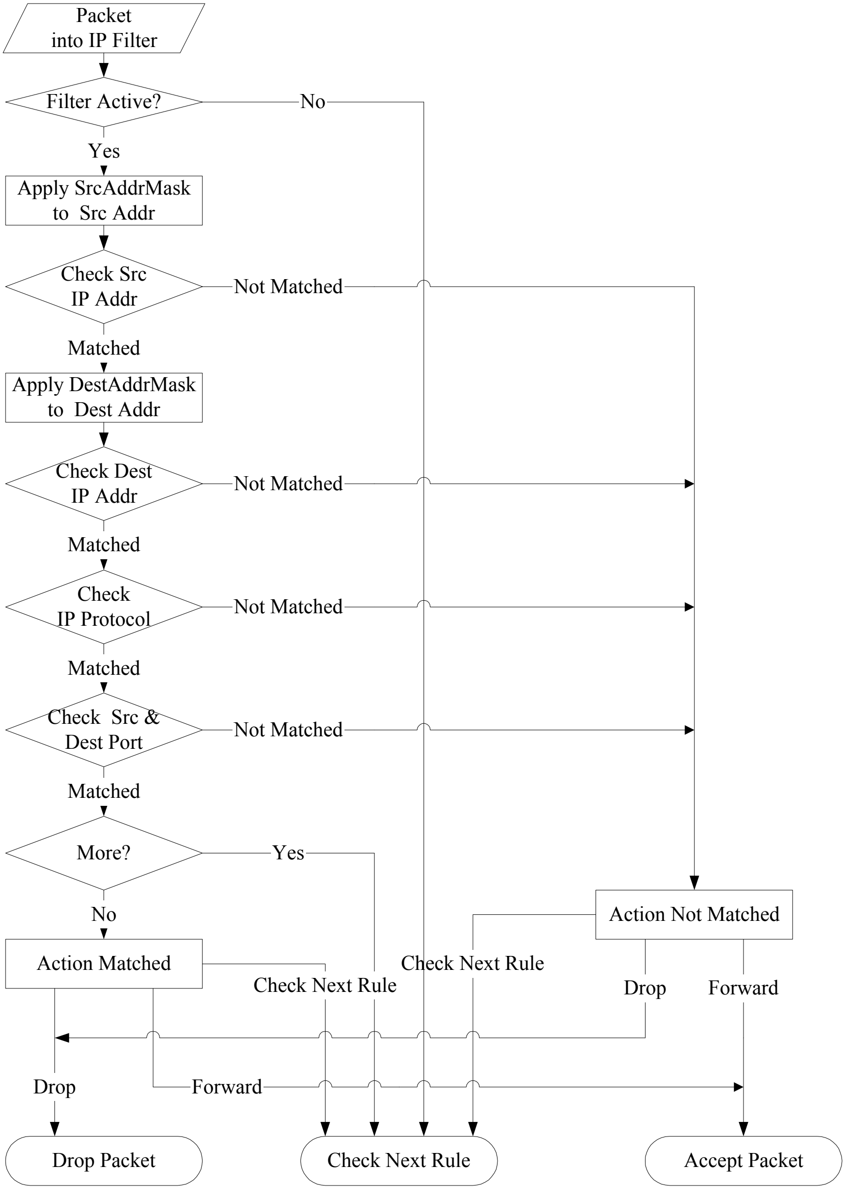


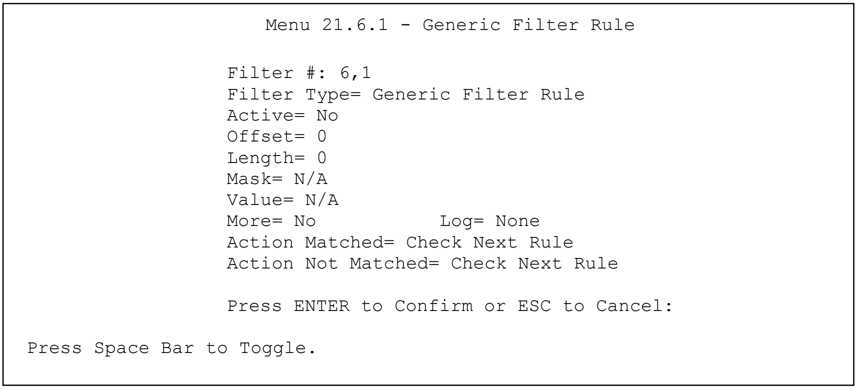
Figure 23-12 Executing an IP Filter

23.4.2 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 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** fields 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, for example, FFFFFFFF.

To configure a generic rule select an empty filter set in menu 21, for example 6. Select **Generic Filter Rule** in the **Filter Type** field and press [ENTER] to open **Menu 21.6.1 – Generic Filter Rule**, as shown in the following figure.



```
                     Menu 21.6.1 - Generic Filter Rule

                  Filter #: 6,1
                  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 23-13 Menu 21.6.1 Generic Filter Rule

The next table describes the fields in the Generic Filter Rule menu.

Table 23-4 Menu 21.6.1 Generic Filter Rule

FIELD	DESCRIPTION	EXAMPLE
Filter #	This is the filter set, filter rule coordinates, for instance, 2, 3 refers to the second filter set and the third rule of that set.	6,1
Filter Type	Press [SPACE BAR] and then [ENTER] to select a type of rule. Parameters displayed below each type will be different. Choices are **Generic Filter Rule** or **TCP/IP Filter Rule**.	**Generic Filter Rule**
Active	Select **Yes** to turn on or **No** to turn off the filter rule.	**No** (default)
Offset	Type the starting byte of the data portion in the packet that you want to compare. The range for this field is from 0 to 255.	0 (default)
Length	Type the byte count of the data portion in the packet that you want to compare. The range for this field is 0 to 8.	0 (default)
Mask	Type the mask (in Hexadecimal) to apply to the data portion before comparison.	
Value	Type 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 or else the packet is disposed of according to the action fields. If **More** is **Yes**, then **Action Matched** and **Action Not Matched** will be **N/A**.	**No** (default)
Log	Select the logging option from the following: **None** – No packets will be logged. **Action Matched** – Only matching packets and rules 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. Choices are **Check Next Rule**, **Forward** or **Drop**.	**Check Next Rule** (default)
Action Not Matched	Select the action for a packet not matching the rule. Choices are **Check Next Rule**, **Forward** or **Drop**.	**Check Next Rule** (default)
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.		

23.5 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 IP packets.

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 where the Prestige is receiving and sending the packets; for instance, the interface. The interface can be an Ethernet, or any other hardware port. The following figure illustrates this.

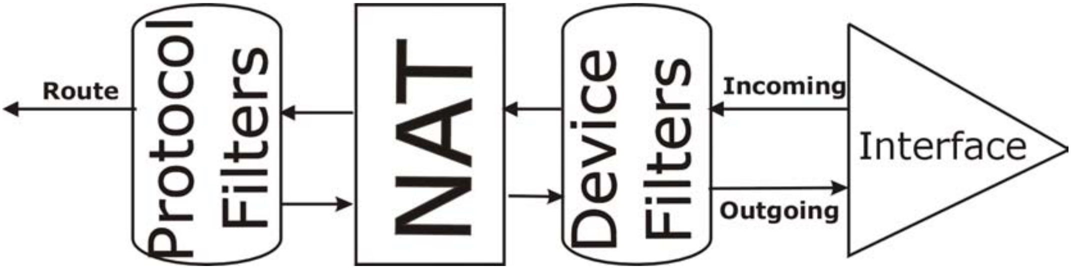


Figure 23-14 Protocol and Device Filter Sets

23.6 Example Filter

Let's look at an example to block outside users from telnetting into the Prestige.

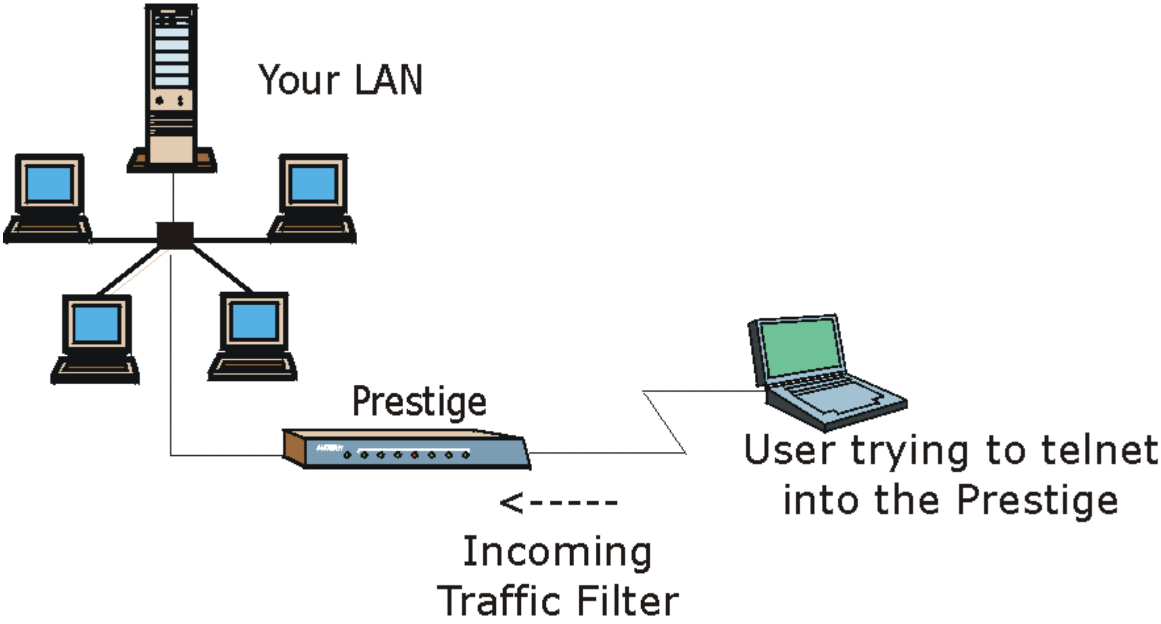


Figure 23-15 Sample Telnet Filter

Step 1. Enter 21 in the main menu to display **Menu 21** — **Filter Set Configuration**.

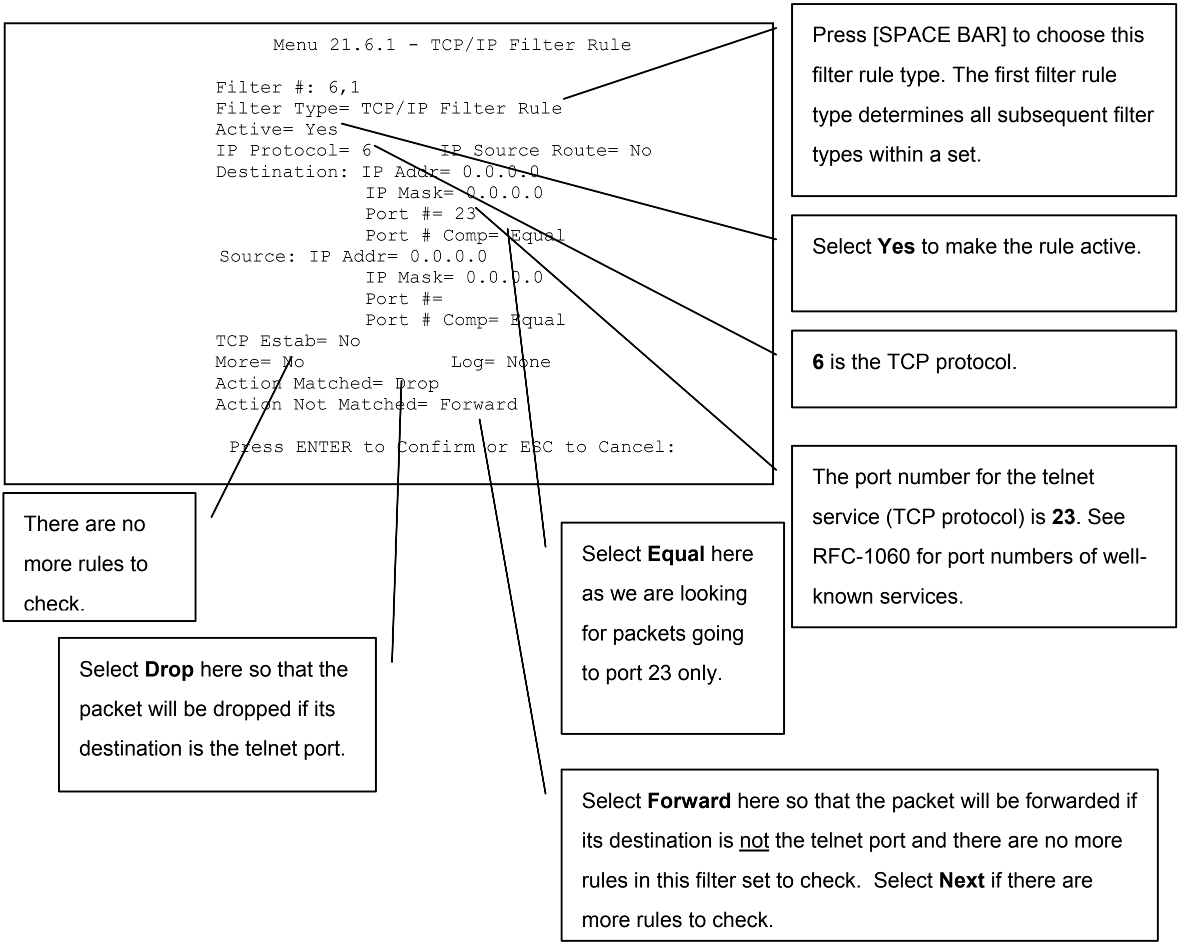
Step 2. Enter the index number of the filter set you want to configure (in this case 6).

Step 3. Type a descriptive name or comment in the **Edit Comments** field (for example, TELNET_WAN) and press [ENTER].

Step 4. Press [ENTER] at the message "Press [ENTER] to confirm or [ESC] to cancel" to open **Menu 21.6 — Filter Rules Summary**.

Step 5. Type 1 to configure the first filter rule. Make the entries in this menu as shown next.

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



```
                       Menu 21.6.1 - TCP/IP Filter Rule

              Filter #: 6,1
              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 #= 23
                        Port # Comp= Equal
               Source: IP Addr= 0.0.0.0
                        IP Mask= 0.0.0.0
                        Port #=
                        Port # Comp= Equal
              TCP Estab= No
              More= No              Log= None
              Action Matched= Drop
              Action Not Matched= Forward

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

Press [SPACE BAR] to choose this filter rule type. The first filter rule type determines all subsequent filter types within a set.

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

6 is the TCP protocol.

The port number for the telnet service (TCP protocol) is **23**. See RFC-1060 for port numbers of well-known services.

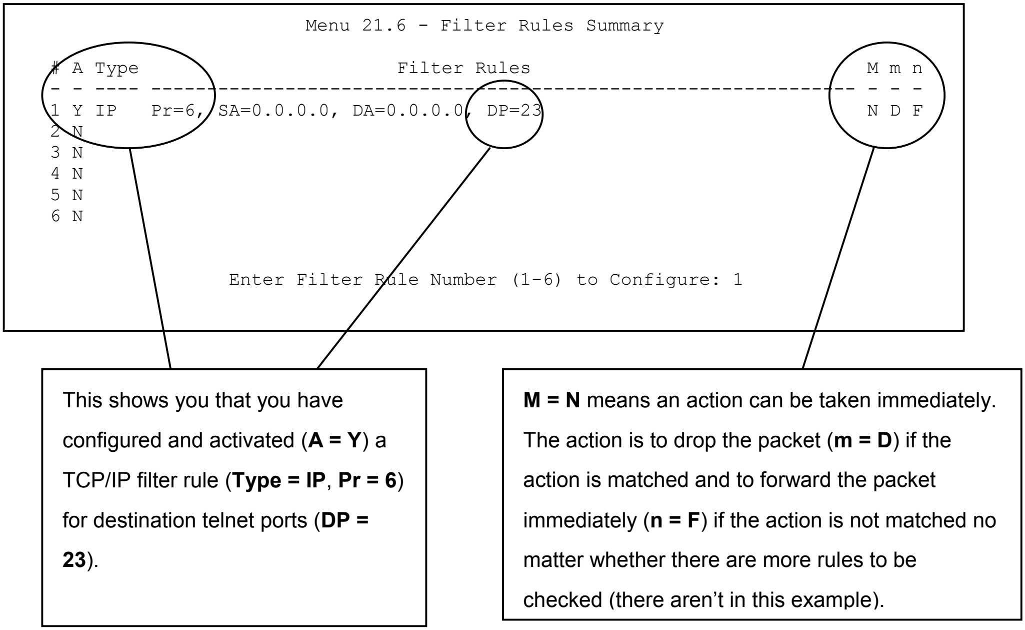
There are no more rules to check.

Select **Drop** here so that the packet will be dropped if its destination is the telnet port.

Select **Equal** here as we are looking for packets going to port 23 only.

Select **Forward** here so that the packet will be forwarded if its destination is not the telnet port and there are no more rules in this filter set to check. Select **Next** if there are more rules to check.

Figure 23-16 Menu 21.6.1 Sample Filter



```
                     Menu 21.6 - Filter Rules Summary

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


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

This shows you that you have configured and activated (**A = Y**) a TCP/IP filter rule (**Type = IP**, **Pr = 6**) for destination telnet ports (**DP = 23**).

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

Figure 23-17 Menu 21.6 Sample Filter Rules Summary

After you have created the filter set, you must apply it.

Step 1. Enter 11 in the main menu to display menu 11 and type the remote node number to edit.

Step 2. Go to the **Edit Filter Sets** field, press [SPACE BAR] to choose **Yes** and press [ENTER].

Step 3. This brings you to menu 11.5. Apply the example filter set (for example, filter set 3) in this menu as shown in the next section.

23.7 Applying Filters and Factory Defaults

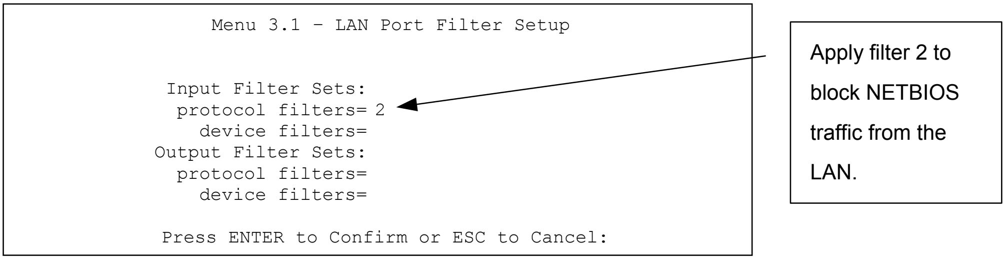
This section shows you where to apply the filter(s) after you design it (them). Sets of factory default filter rules have been configured in menu 21 (but have not been applied) to filter traffic.

Table 23-5 Filter Sets Table

FILTER SETS	DESCRIPTION
Input Filter Sets:	Apply filters for incoming traffic. You may apply protocol or device filter rules. See earlier in this chapter for information on filters.
Output Filter Sets:	Apply filters for traffic leaving the Prestige. You may apply filter rules for protocol or device filters. See earlier in this section for information on types of filters.
Call Filter Sets:	Apply filters to decide if a packet should be allowed to trigger a call.

23.7.1 Ethernet Traffic

You seldom need to filter Ethernet traffic; however, the filter sets may be useful to block certain packets, reduce traffic and prevent security breaches. Go to menu 3.1 (shown next) and type 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 typing their numbers separated by commas, for example, 2, 4, 6, 11. The factory default filter set, NetBIOS_LAN, is inserted in the **protocol filters** field under **Input Filter Sets** in menu 3.1 in order to prevent local NetBIOS messages from triggering calls to the DNS server.



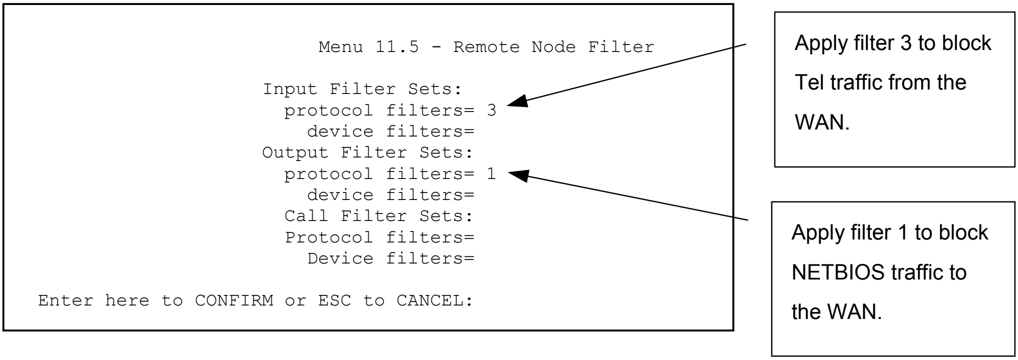
```
                 Menu 3.1 - LAN Port Filter Setup


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

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

Apply filter 2 to block NETBIOS traffic from the LAN.

Figure 23-18 Filtering Ethernet Traffic

23.7.2 Remote Node Filters

Go to menu 11.5 (shown next) and type the number(s) of the filter set(s) as appropriate. You can cascade up to four filter sets by typing their numbers separated by commas. The factory default filter set, NetBIOS_WAN, is inserted in the **protocol filters** field under **Call Filter Sets** in menu 11.5 to block local NetBIOS traffic from triggering calls to the ISP.



```
                              Menu 11.5 - Remote Node Filter

                         Input Filter Sets:
                           protocol filters= 3
                             device filters=
                         Output Filter Sets:
                           protocol filters= 1
                             device filters=
                           Call Filter Sets:
                           Protocol filters=
                             Device filters=

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

Apply filter 3 to block Tel traffic from the WAN.

Apply filter 1 to block NETBIOS traffic to the WAN.

Figure 23-19 Filtering Remote Node Traffic

Note that call filter sets are visible when you select PPPoA or PPPoE encapsulation.

Chapter 24
SNMP Configuration

This chapter explains SNMP Configuration menu 22.

24.1 SNMP Overview

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) and version two c (SNMPv2c). The next figure illustrates an SNMP management operation. SNMP is only available if TCP/IP is configured.

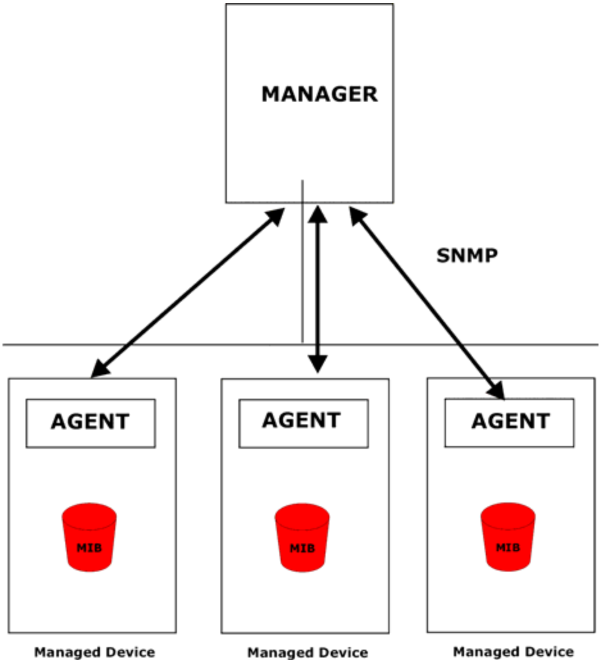


Figure 24-1 SNMP Management Model

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 the 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:

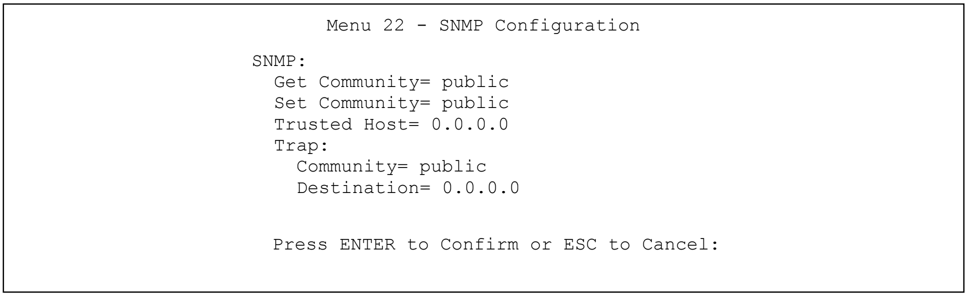
- Get - Allows the manager to retrieve an object variable from the agent.
- GetNext - Allows the manager to retrieve the next object variable from a table or list within an agent. In SNMPv1, when a manager wants to retrieve all elements of a table from an agent, it initiates a Get operation, followed 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.

24.2 Supported MIBs

The Prestige supports RFC-1215 and MIB II as defined in RFC-1213 as well as ZyXEL private MIBs. The focus of the MIBs is to let administrators collect statistic data and monitor status and performance.

24.3 SNMP Configuration

To configure SNMP, select option 22 from the main menu to open **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 24-2 Menu 22 SNMP Configuration

The following table describes the SNMP configuration parameters.

Table 24-1 Menu 22 SNMP Configuration

FIELD	DESCRIPTION	EXAMPLE
SNMP:		
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.	0.0.0.0
Trap:		
Community Destination	Type the trap community, which is the password sent with each trap to the SNMP manager. Type the IP address of the station to send your SNMP traps to.	public 0.0.0.0
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.		

24.4 SNMP Traps

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

Table 24-2 SNMP Traps

TRAP #	TRAP NAME	DESCRIPTION
1	coldStart (*defined in RFC-1215*)	A trap is sent after booting (power on).
2	warmStart (*defined in RFC-1215*)	A trap is sent after booting (software reboot).
3	linkDown (*defined in RFC-1215*)	A trap is sent when the port is down.
4	linkUp (*defined in RFC-1215*)	A trap is sent when the port is up.
5	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 (warm start).
6a	For intentional reboot :	A trap is sent with the message "System reboot by user!" if reboot is done intentionally, (for example, download new files, CI command "sys reboot", etc.).

The following table maps the physical port and encapsulation to the interface type.

Table 24-3 Ports and Interface Types

PHYSICAL PORT/ENCAP	INTERFACE TYPE
LAN port(s)	enet0
Wireless port	enet1
PPPoE encap	pppoe
1483 encap	mpoa
Ethernet encap	enet-encap
PPPoA	ppp

Chapter 25
System Security

This chapter describes how to configure the system security on the Prestige. This chapter is only applicable to the Prestige 650H and the Prestige 650HW.

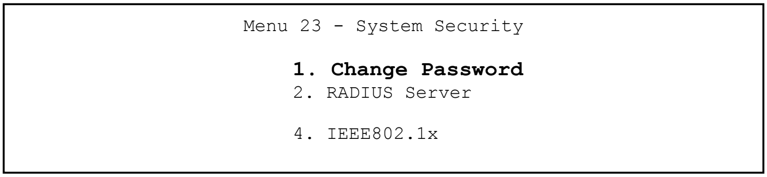
25.1 System Security Overview

You can configure the system password, an external RADIUS server and IEEE802.1x in menu 23.

25.1.1 System Password

Enter 1 in the main menu to display **Menu 23- System Security**.

You should change the default password. If you forget your password you have to restore the default configuration file. Refer to the section on changing the system password in the *Introducing the SMT* chapter and the section on resetting the Prestige in the *Introducing the Web Configurator* chapter.

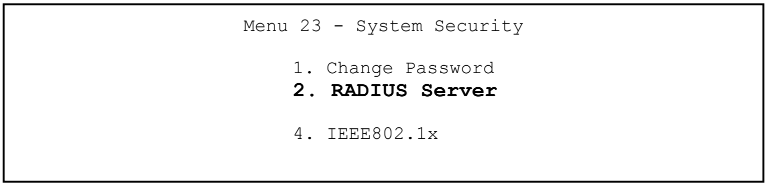


```
                        Menu 23 - System Security

                            1. Change Password
                            2. RADIUS Server

                            4. IEEE802.1x
```

Figure 25-1 Menu 23 System Security

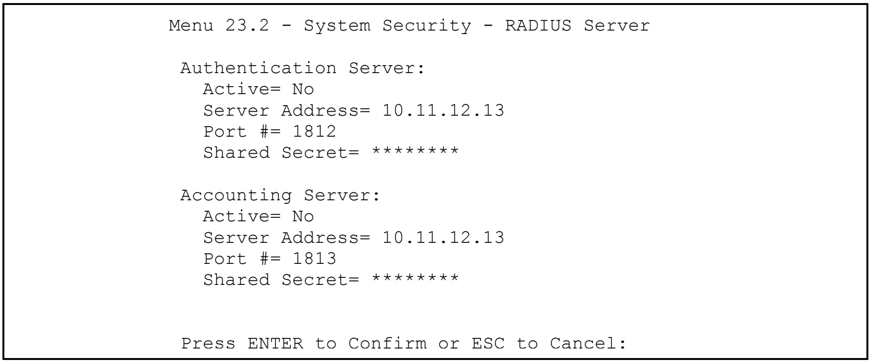
25.1.2 Configuring External RADIUS Server

From **Menu 23- System Security**, enter 2 to display **Menu 23.2 - System Security-RADIUS Server**.



```
                        Menu 23 - System Security

                            1. Change Password
                            2. RADIUS Server

                            4. IEEE802.1x
```

Figure 25-2 Menu 23 System Security



```
              Menu 23.2 - System Security - RADIUS Server

               Authentication Server:
                 Active= No
                 Server Address= 10.11.12.13
                 Port #= 1812
                 Shared Secret= ********

               Accounting Server:
                 Active= No
                 Server Address= 10.11.12.13
                 Port #= 1813
                 Shared Secret= ********


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

Figure 25-3 Menu 23.2 System Security : RADIUS Server

The following table describes the fields in this menu.

Table 25-1 Menu 23.2 System Security : RADIUS Server

FIELD	DESCRIPTION	EXAMPLE
Authentication Server		
Active	Press [SPACE BAR] to select **Yes** and press [ENTER] to enable user authentication through an external authentication server.	**No**
Server Address	Enter the IP address of the external authentication server in dotted decimal notation.	10.11.12.13
Port #	The default port of the RADIUS server for authentication is **1812**. You need not change this value unless your network administrator instructs you to do so with additional information.	**1812**
Shared Secret	Specify a password (up to 31 alphanumeric characters) as the key to be shared between the external authentication server and the access points. The key is not sent over the network. This key must be the same on the external authentication server and Prestige.	
Accounting Server		
Active	Press [SPACE BAR] to select **Yes** and press [ENTER] to enable user authentication through an external accounting server.	**No**
Server Address	Enter the IP address of the external accounting server in dotted decimal notation.	10.11.12.13

Table 25-1 Menu 23.2 System Security : RADIUS Server

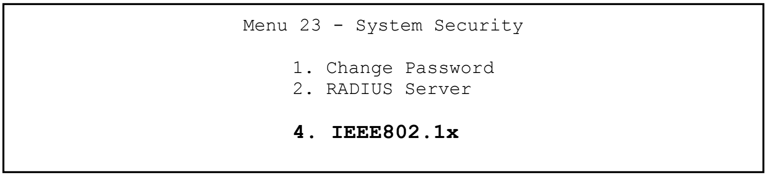
FIELD	DESCRIPTION	EXAMPLE
Port #	The default port of the RADIUS server for accounting is **1813**. You need not change this value unless your network administrator instructs you to do so with additional information.	**1813**
Shared Secret	Specify a password (up to 31 alphanumeric characters) as the key to be shared between the external accounting server and the access points. The key is not sent over the network. This key must be the same on the external accounting server and Prestige.	
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.		

25.1.3 IEEE802.1x

The IEEE802.1x standards outline enhanced security methods for both the authentication of wireless stations and encryption key management.

Follow the steps below to enable EAP authentication on your Prestige.

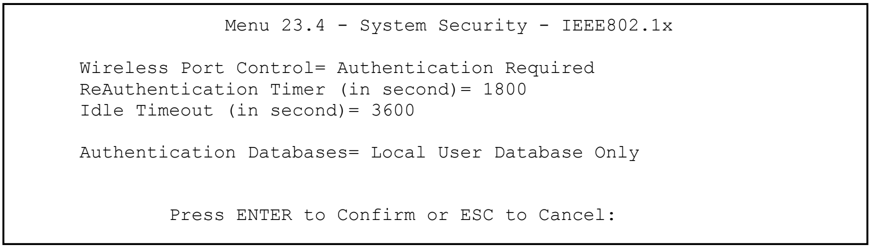
Step 1. From the main menu, enter 23 to display **Menu23 – System Security**.



```
                    Menu 23 - System Security

                         1. Change Password
                         2. RADIUS Server

                         4. IEEE802.1x
```

Figure 25-4 Menu 23 System Security

Step 2. Enter 4 to display **Menu 23.4 – System Security – IEEE802.1x**.



```
                 Menu 23.4 - System Security - IEEE802.1x

      Wireless Port Control= Authentication Required
      ReAuthentication Timer (in second)= 1800
      Idle Timeout (in second)= 3600

      Authentication Databases= Local User Database Only


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

Figure 25-5 Menu 23.4 System Security : IEEE802.1x

The following table describes the fields in this menu.

Table 25-2 Menu 23.4 System Security : IEEE802.1x

FIELD	DESCRIPTION
Wireless Port Control	Press [SPACE BAR] and select a security mode for the wireless LAN access. Select **No Authentication Required** to allow any clients access to your wired network without entering usernames and passwords. This is the default setting. Selecting **Authentication Required** means clients have to enter usernames and passwords before access to the wired network is allowed. Select **No Access Allowed** to block all clients access to the wired network.
ReAuthentication Timer (in seconds)	Specify how often a client has to re-enter username and password to stay connected to the wired network. This field is activated only when you select **Authentication Required** in the **Wireless Port Control** field. Enter a time interval between 10 and 9999 (in seconds). The default time interval is **1800** seconds (or 30 minutes).
Idle Timeout	The Prestige automatically disconnects a client from the wired network after a period of inactivity. The client needs to enter the username and password again before access to the wired network is allowed. This field is activated only when you select **Authentication Required** in the **Wireless Port Control** field. The default time interval is **3600** seconds (or 1 hour).

Table 25-2 Menu 23.4 System Security : IEEE802.1x

FIELD	DESCRIPTION
Authentication Databases	This field is activated only when you select **Authentication Required** in the **Wireless Port Control** field. The authentication database contains wireless station login information. The local user database is the built-in database on the Prestige. The RADIUS is an external server. Use this field to decide which database the Prestige should use (first) to authenticate a wireless station. Before you specify the priority, make sure you have set up the corresponding database correctly first. Select **Local User Database Only** to have the Prestige just check the built-in user database on the Prestige for a wireless station's username and password. Select **RADIUS Only** to have the Prestige just check the user database on the specified RADIUS server for a wireless station's username and password. Select **Local first, then RADIUS** to have the Prestige first check the user database on the Prestige for a wireless station's user name and password. If the user name is not found, the Prestige checks the user database on the specified RADIUS server. Select **RADIUS first, then Local** to have the Prestige first check the user database on the specified RADIUS server for a wireless station's user name and password. When the user name is not found or password does not match in the RADIUS server, the Prestige will not check the local user database and the authentication fails. If the Prestige cannot reach the RADIUS server, then the Prestige checks the local user database on the Prestige.
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.	

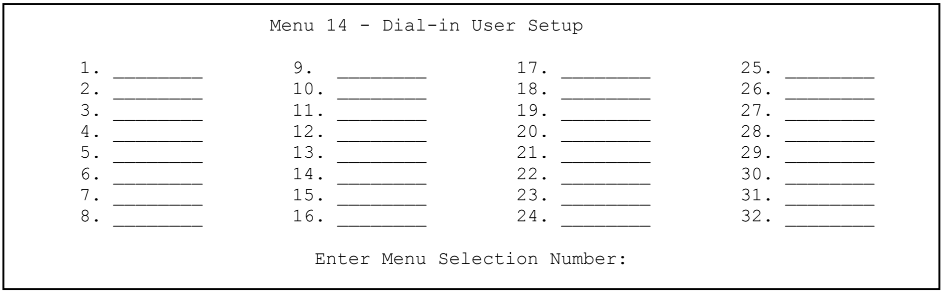
Once you enable user authentication, you need to specify an external RADIUS server or create local user accounts on the Prestige for authentication.

25.2 Creating User Accounts on the Prestige

By storing user profiles locally, your Prestige is able to authenticate wireless users without interacting with a network RADIUS server.

Follow the steps below to set up user profiles on your Prestige.

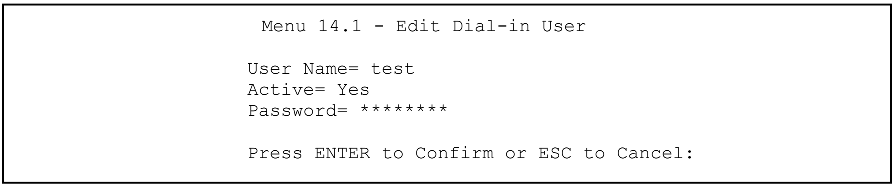
Step 1. From the main menu, enter 14 to display **Menu 14 - Dial-in User Setup**.



```
                    Menu 14 - Dial-in User Setup

     1. ________         9.  ________         17. ________         25. ________
     2. ________         10. ________         18. ________         26. ________
     3. ________         11. ________         19. ________         27. ________
     4. ________         12. ________         20. ________         28. ________
     5. ________         13. ________         21. ________         29. ________
     6. ________         14. ________         22. ________         30. ________
     7. ________         15. ________         23. ________         31. ________
     8. ________         16. ________         24. ________         32. ________

                        Enter Menu Selection Number:
```

Figure 25-6 Menu 14 Dial-in User Setup

Step 3. Type a number and press [ENTER] to edit the user profile.



```
                     Menu 14.1 - Edit Dial-in User

                    User Name= test
                    Active= Yes
                    Password= ********

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

Figure 25-7 Menu 14.1 Edit Dial-in User

The following table describes the fields in this menu.

Table 25-3 Menu 14.1 Edit Dial-in User

FIELD	DESCRIPTION
User Name	Enter a username up to 31 alphanumeric characters long for this user profile. This field is case sensitive.
Active	Press [SPACE BAR] to select **Yes** and press [ENTER] to enable the user profile.
Password	Enter a password up to 31 characters long for this user profile.
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.	

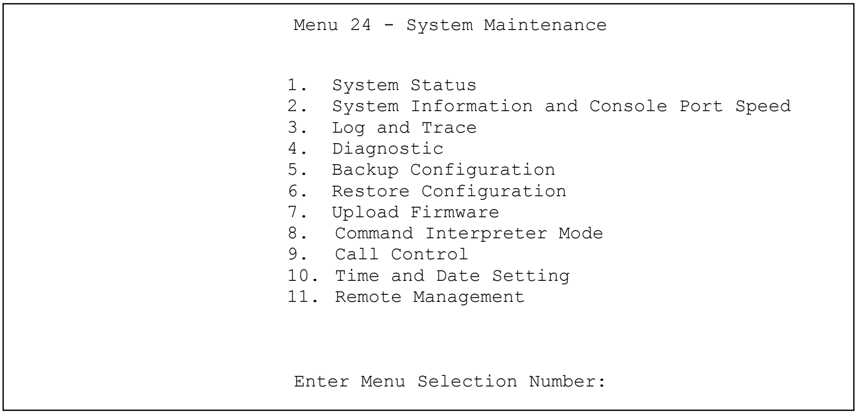
Chapter 26
System Information and Diagnosis

This chapter covers the information and diagnostic tools in SMT menus 24.1 to 24.4.

26.1 System Maintenance Overview

These tools include updates on system status, port status, log and trace capabilities and upgrades for the system software. This chapter describes how to use these tools in detail.

Type 24 in the main menu to open **Menu 24 – System Maintenance**, as shown in the following figure.



```
                    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



                    Enter Menu Selection Number:
```

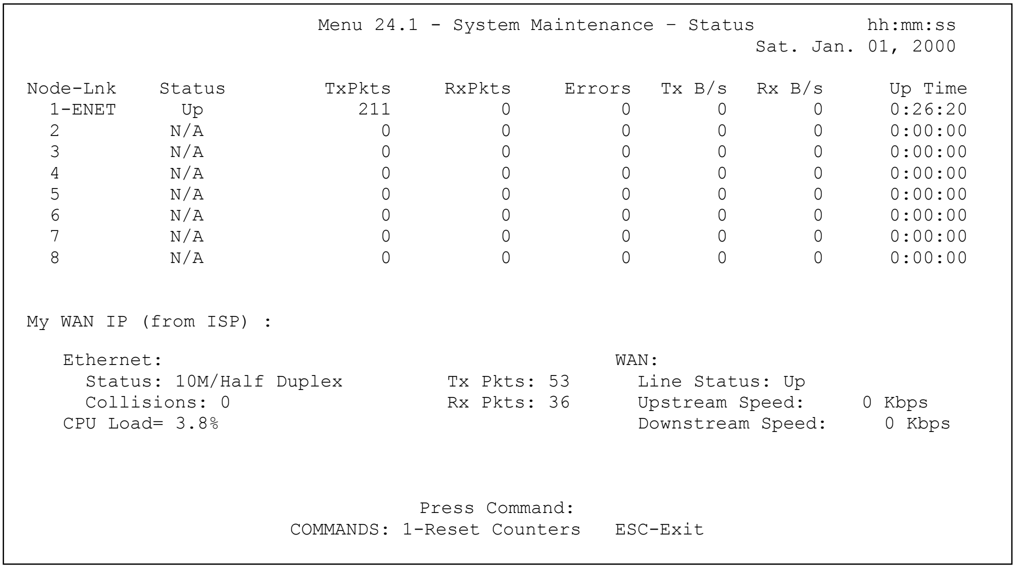
Figure 26-1 Menu 24 System Maintenance

26.2 System Status

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

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

The following table describes the fields present in **Menu 24.1** — **System Maintenance** — **Status** which are read-only and meant for diagnostic purposes.



```
                          Menu 24.1 - System Maintenance - Status          hh:mm:ss
                                                                   Sat. Jan. 01, 2000

Node-Lnk    Status         TxPkts     RxPkts     Errors   Tx B/s   Rx B/s      Up Time
  1-ENET      Up             211          0          0        0        0      0:26:20
  2          N/A               0          0          0        0        0      0:00:00
  3          N/A               0          0          0        0        0      0:00:00
  4          N/A               0          0          0        0        0      0:00:00
  5          N/A               0          0          0        0        0      0:00:00
  6          N/A               0          0          0        0        0      0:00:00
  7          N/A               0          0          0        0        0      0:00:00
  8          N/A               0          0          0        0        0      0:00:00


My WAN IP (from ISP) :

   Ethernet:                                         WAN:
     Status: 10M/Half Duplex          Tx Pkts: 53      Line Status: Up
     Collisions: 0                    Rx Pkts: 36      Upstream Speed:     0 Kbps
   CPU Load= 3.8%                                      Downstream Speed:     0 Kbps



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

Figure 26-2 Menu 24.1 System Maintenance : Status

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

Table 26-1 Menu 24.1 System Maintenance : Status

FIELD	DESCRIPTION
Node-Lnk	This is the node index number and link type. Link types are: PPP, ENET, 1483.
Status	This shows the status of the remote node.
TxPkts	The number of transmitted packets to this remote node.
RxPkts	The number of received packets from this remote node.
Errors	The number of error packets on this connection.
Tx B/s	This shows the transmission rate in bytes per second.
Rx B/s	This shows the receiving rate in bytes per second.
Up Time	This is the time this channel has been connected to the current remote node.
My WAN IP	This is the IP address of the ISP remote node.

Table 26-1 Menu 24.1 System Maintenance : Status

FIELD	DESCRIPTION
My WAN IP (from ISP)	This is the IP address of the ISP remote node.
Ethernet	This shows statistics for the LAN.
Status	This shows the current status of the LAN.
Tx Pkts	This is the number of transmitted packets to the LAN.
Rx Pkts	This is the number of received packets from the LAN.
Collision	This is the number of collisions.
WAN	This shows statistics for the WAN.
Line Status	This shows the current status of the xDSL line which can be Up or Down.
Upstream Speed	This shows the upstream transfer rate in kbps.
Downstream Speed	This shows the downstream transfer rate in kbps.
CPU Load	This specifies the percentage of CPU utilization.

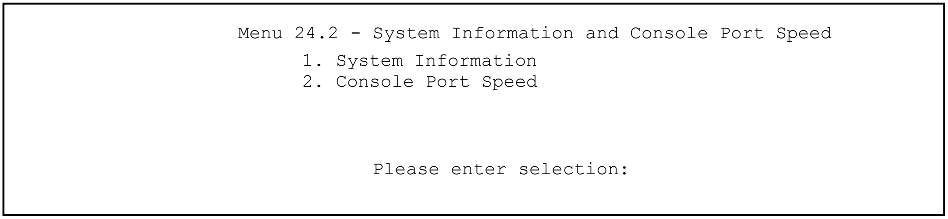
26.3 System Information

To get to the System Information :

Step 1. Enter 24 in the main menu to display **Menu 24** — **System Maintenance**.

Step 2. Enter 2 to display **Menu 24.2** — **System Information**.

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

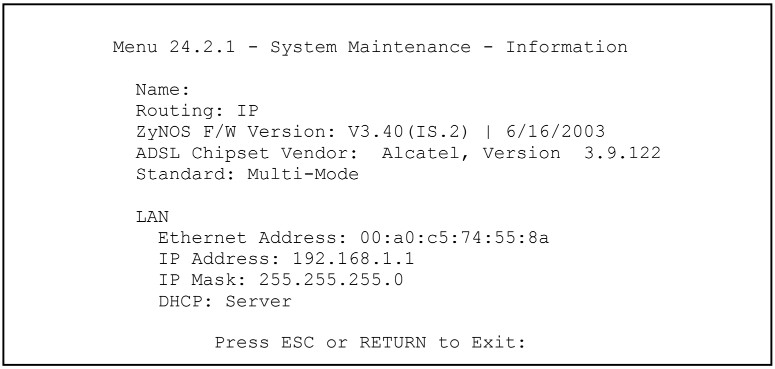


```
                    Menu 24.2 - System Information and Console Port Speed
                          1. System Information
                          2. Console Port Speed



                                Please enter selection:
```

Figure 26-3 Menu 24.2 System Information and Console Port Speed

26.3.1 System Information

Enter 1 in menu 24.2 to display the screen shown next.



```
         Menu 24.2.1 - System Maintenance - Information

           Name:
           Routing: IP
           ZyNOS F/W Version: V3.40(IS.2) | 6/16/2003
           ADSL Chipset Vendor:  Alcatel, Version  3.9.122
           Standard: Multi-Mode

           LAN
             Ethernet Address: 00:a0:c5:74:55:8a
             IP Address: 192.168.1.1
             IP Mask: 255.255.255.0
             DHCP: Server

                  Press ESC or RETURN to Exit:
```

Figure 26-4 Menu 24.2.1 System Maintenance : Information

The following table describes the fields in this menu.

Table 26-2 Menu 24.2.1 System Maintenance : Information

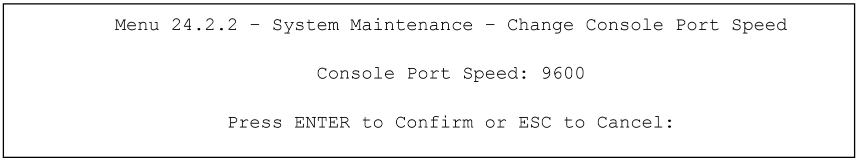
FIELD	DESCRIPTION
Name	Displays the system name of your Prestige. This information can be changed in **Menu 1 – General Setup**.
Routing	Refers to the routing protocol used.
ZyNOS F/W Version	Refers to the ZyNOS (ZyXEL Network Operating System) system firmware version. ZyNOS is a registered trademark of ZyXEL Communications Corporation.
ADSL Chipset Vendor	**Displays the vendor of the ADSL chipset and DSL version.**
Standard	This refers to the operational protocol the Prestige and the DSLAM (Digital Subscriber Line Access Multiplexer) are using.
LAN	
Ethernet Address	Refers to the Ethernet MAC (Media Access Control) of your Prestige.
IP Address	This is the IP address of the Prestige in dotted decimal notation.
IP Mask	This shows the subnet mask of the Prestige.

Table 26-2 Menu 24.2.1 System Maintenance : Information

FIELD	DESCRIPTION
DHCP	This field shows the DHCP setting (None, Relay or Server) of the Prestige.

26.3.2 Console Port Speed

You can set up different port speeds for the console port through **Menu 24.2.2 – System Maintenance – Console Port Speed**. Your Prestige supports 9600 (default), 19200, 38400, 57600 and 115200 bps. Press [SPACE BAR] and then [ENTER] to select the desired speed in menu 24.2.2, as shown in the following figure.



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

                        Console Port Speed: 9600

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

Figure 26-5 Menu 24.2.2 System Maintenance : Change Console Port Speed

Once you change the Prestige consol port speed, you must also set the speed parameter for the communication software you are using to connect to the Prestige.

26.4 Log and Trace

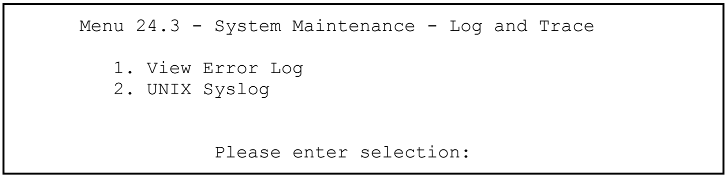
There are two logging facilities in the Prestige. The first is the error logs and trace records that are stored locally. The second is the UNIX syslog facility for message logging.

26.4.1 Viewing Error Log

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

Step 1. Type 24 in the main menu to display **Menu 24** – **System Maintenance**.

Step 2. From menu 24, type 3 to display **Menu 24.3** – **System Maintenance** – **Log and Trace**.

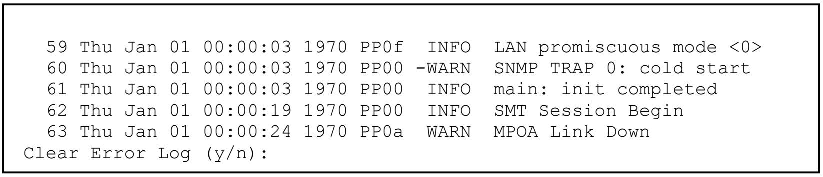


```
      Menu 24.3 - System Maintenance - Log and Trace

         1. View Error Log
         2. UNIX Syslog


                  Please enter selection:
```

Figure 26-6 Menu 24.3 System Maintenance : Log and Trace

Step 3. Enter 1 from **Menu 24.3** — **System Maintenance** — **Log and Trace** to display the error log in the system.

After the Prestige finishes displaying the error log, you will have the option to clear it. Samples of typical error and information messages are presented in the next figure.

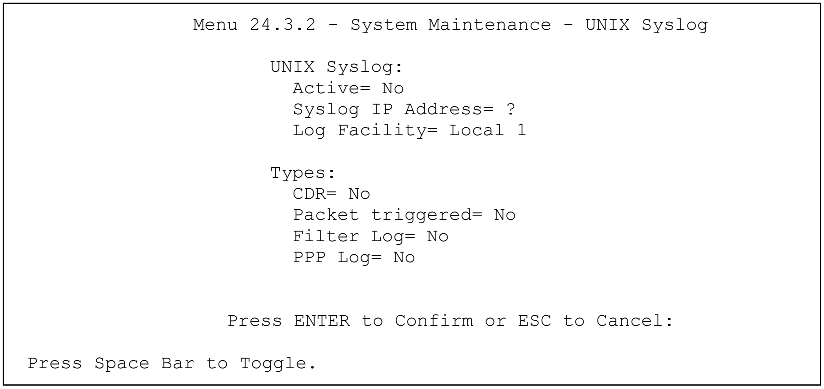


```
  59 Thu Jan 01 00:00:03 1970 PP0f  INFO  LAN promiscuous mode <0>
  60 Thu Jan 01 00:00:03 1970 PP00 -WARN  SNMP TRAP 0: cold start
  61 Thu Jan 01 00:00:03 1970 PP00  INFO  main: init completed
  62 Thu Jan 01 00:00:19 1970 PP00  INFO  SMT Session Begin
  63 Thu Jan 01 00:00:24 1970 PP0a  WARN  MPOA Link Down
Clear Error Log (y/n):
```

Figure 26-7 Sample Error and Information Messages

26.4.2 Syslog and Accounting

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** — **UNIX Syslog**, as shown next.



```
                 Menu 24.3.2 - System Maintenance - UNIX Syslog

                        UNIX Syslog:
                          Active= No
                          Syslog IP Address= ?
                          Log Facility= Local 1

                        Types:
                          CDR= No
                          Packet triggered= No
                          Filter Log= No
                          PPP Log= No


                    Press ENTER to Confirm or ESC to Cancel:

Press Space Bar to Toggle.
```

Figure 26-8 Menu 24.3.2 System Maintenance : Syslog and Accounting

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

Table 26-3 Menu 24.3.2 System Maintenance : Syslog and Accounting

PARAMETER	DESCRIPTION
UNIX Syslog:	
Active	Use [SPACE BAR] and then [ENTER] to turn syslog on or off.
Syslog IP Address	Type the IP address of your syslog server.
Log Facility	Use [SPACE BAR] and then [ENTER] to select one of seven different local options. The log facility lets you log the message in different server files. Refer to your UNIX manual.
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** are logged when this field is set to **Yes**.
PPP Log	PPP events are logged when this field is set to **Yes**.

The following are examples of the four types of syslog messages sent by the Prestige:

```
                                  1 - CDR
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.)
        C01 Incoming Call xxxxBps xxxxx (L2TP, xxxxx = Remote Call ID)
        C01 Incoming Call xxxx (= connected speed) xxxxx (= Remote Call ID)
        L02 Tunnel Connected (L2TP)
        C02 OutCall Connected xxxx (= connected speed) xxxxx (= Remote Call ID)
        C02 CLID call refused
        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
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=4500003c100100001f010004c0a86614ca849a7b08004a5c020001006162636465666768696a6b6c6d6e6f70717273
74
Jul 19 11:28:56 192.168.102.2 ZYXEL: Packet Trigger: Protocol=1,
Data=4500002c1b0140001f06b50ec0a86614ca849a7b0427001700195b3e00000000600220008cd40000020405b4
Jul 19 11:29:06 192.168.102.2 ZYXEL: Packet Trigger: Protocol=1,
Data=45000028240140001f06ac12c0a86614ca849a7b0427001700195b451d1430135004000077600000
                                  3 - Filter Log
         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
Jul 19 14:43:55 192.168.102.2 ZYXEL: IP [Src=202.132.154.123 Dst=255.255.255.255 UDP spo=0208
dpo=0208]} S03>R01mF
Jul 19 14:44:00 192.168.102.2 ZYXEL: IP [Src=192.168.102.20 Dst=202.132.154.1 UDP spo=05d4
dpo=0035]} S03>R01mF
Jul 19 14:44:04 192.168.102.2 ZYXEL: IP [Src=192.168.102.20 Dst=202.132.154.1 UDP spo=05d4
dpo=0035]} S03>R01mF
                                   4 - PPP Log
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
```

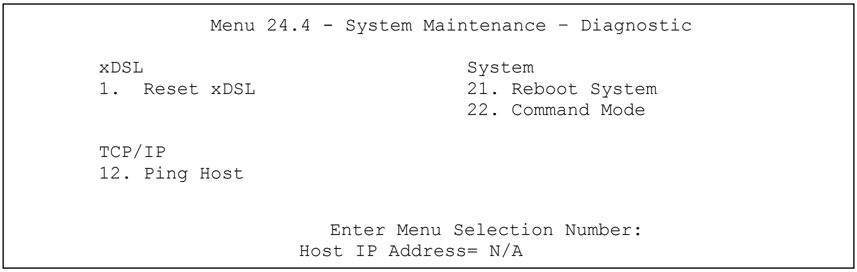
26.5 Diagnostic

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 in the following figure.

Follow the procedure next to get to Diagnostic:

Step 1. From the main menu, type 24 to open **Menu 24 – System Maintenance**.

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



```
                  Menu 24.4 - System Maintenance – Diagnostic

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

       TCP/IP
       12. Ping Host


                           Enter Menu Selection Number:
                        Host IP Address= N/A
```

Figure 26-9 Menu 24.4 System Maintenance : Diagnostic

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

Table 26-4 Menu 24.4 System Maintenance Menu : Diagnostic

FIELD	DESCRIPTION
Reset xDSL	Re-initialize the xDSL link to the telephone company.
Ping Host	Ping the host to see if the links and TCP/IP protocol on both systems are working.
Reboot System	Reboot the Prestige.
Command Mode	Type the mode to test and diagnose your Prestige using specified commands.
Host IP Address	If you typed 12 to Ping Host, now type the address of the computer you want to ping.

Chapter 27
Firmware and Configuration File Maintenance

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

27.1 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.

Only use firmware for your Prestige's specific model. Refer to the label on the bottom of your Prestige.

```
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) may 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 27-1 Filename Conventions

FILE TYPE	INTERNAL NAME	EXTERNAL NAME	DESCRIPTION
Configuration File	Rom-0	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.	*.rom
Firmware	Ras	This is the generic name for the ZyNOS firmware on the Prestige.	*.bin

27.2 Backup Configuration

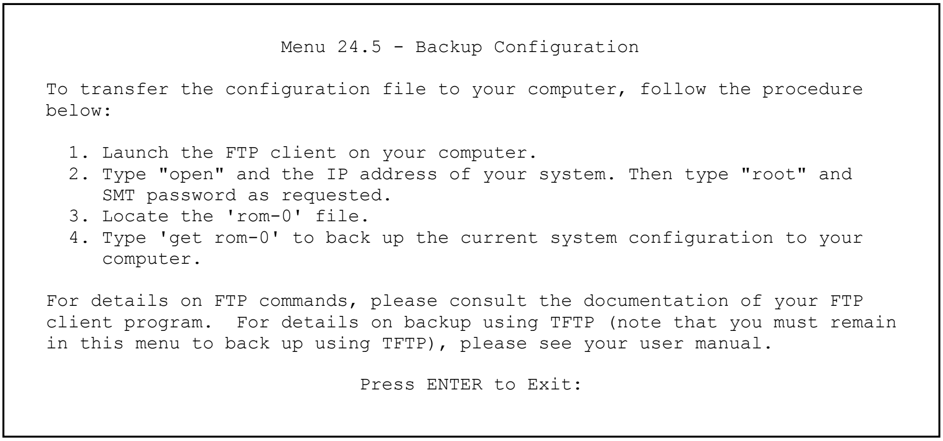
The Prestige displays different messages explaining different ways to backup, restore and upload files in menus 24.5, 24.6, 24. 7.1 and 24.7.2; depending on whether you use the console port or Telnet.

Option 5 from **Menu 24 – System Maintenance** allows you to backup the current Prestige configuration to your computer. Backup is highly recommended once your Prestige is functioning properly. FTP is the preferred methods for backing up your current configuration to your computer since they 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.

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.

27.2.1 Backup Configuration

Follow the instructions as shown in the next screen.



```
                    Menu 24.5 - Backup Configuration

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

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

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

                           Press ENTER to Exit:
```

Figure 27-1 Telnet in Menu 24.5

27.2.2 Using the FTP Command from the Command Line

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.

27.2.3 Example of FTP Commands from the Command Line

```
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 27-2 FTP Session Example

27.2.4 GUI-based FTP Clients

The following table describes some of the commands that you may see in GUI-based FTP clients.

Table 27-2 General Commands for GUI-based 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	You must use binary mode when uploading the configuration or firmware file. 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).

27.2.5 TFTP and FTP over WAN Will Not Work When

TFTP, FTP and Telnet over WAN will not work when:

1. You have disable Telnet service in menu 24.11.
2. You have applied a filter in menu 3.1 (LAN) or in menu 11.5 (WAN) to block Telnet service.

3. The IP address in the **Secured Client IP** field in menu 24.11 does not match the client IP. If it does not match, the Prestige will disconnect the Telnet session immediately.
4. You have an SMT console session running.

27.2.6 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.

27.2.7 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.

27.2.8 GUI-based TFTP Clients

The following table describes some of the fields that you may see in GUI-based TFTP clients.

Table 27-3 General Commands for GUI-based TFTP Clients

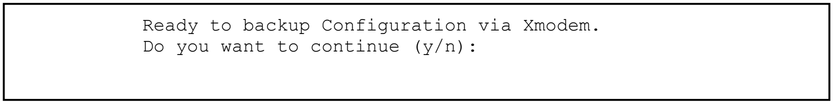
COMMAND	DESCRIPTION
Host	Enter the IP address of the Prestige. 192.168.1.1 is the Prestige's default IP address when shipped.
Send/Fetch	Use "Send" to upload the file to the Prestige and "Fetch" to back up the file on your computer.
Local File	Enter the path and name of the firmware file (*.bin extension) 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 *section 27.2.5* to read about configurations that disallow TFTP and FTP over WAN.

27.2.9 Backup Via Console Port (only for the Prestige 650H/HW)

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

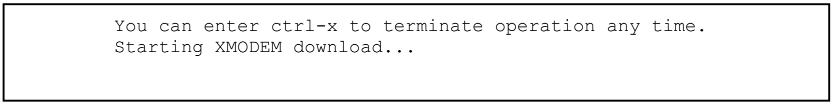
Step 1. Display menu 24.5 and enter "y" at the following screen.



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

Figure 27-3 Menu 24.5 System Maintenance - Backup Configuration

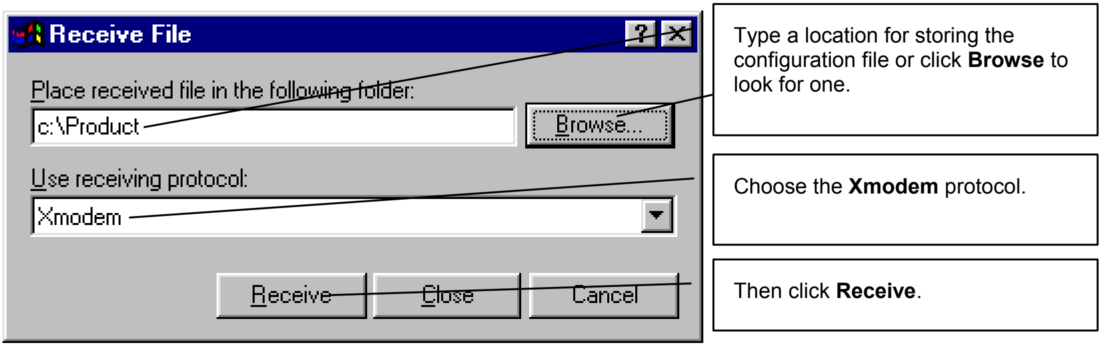
Step 2. The following screen indicates that the Xmodem download has started.



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

Figure 27-4 Menu 24.5 System Maintenance – Starting Xmodem Download Screen

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



Place received file in the following folder: c:\Product

Use receiving protocol: Xmodem

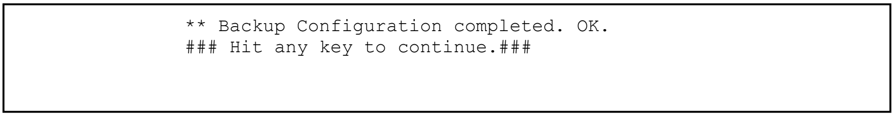
Type a location for storing the configuration file or click **Browse** to look for one.

Choose the **Xmodem** protocol.

Then click **Receive**.

Figure 27-5 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 27-6 Successful Backup Confirmation Screen

27.3 Restore Configuration

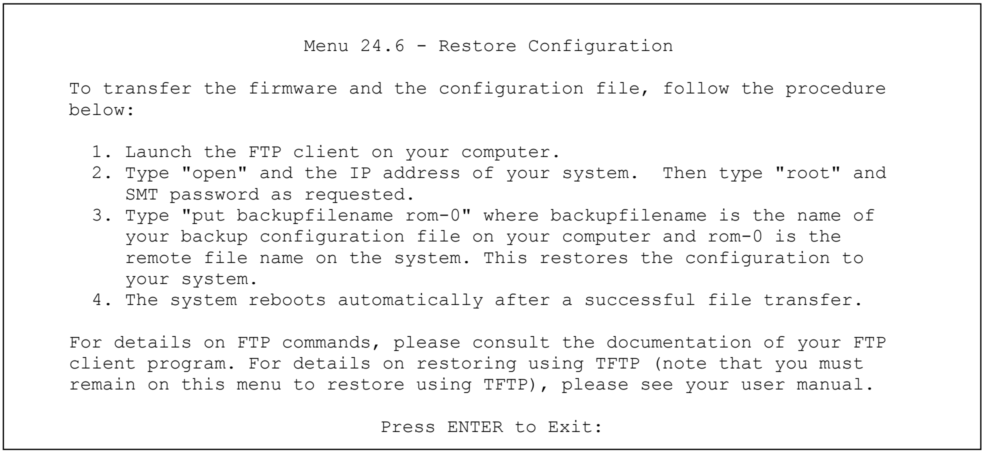
This section shows you how to restore a previously saved configuration. Note that this function erases the current configuration before restoring a previous back up configuration; please do not attempt to restore unless you have a backup configuration file stored on disk.

FTP is the preferred method for restoring your current computer configuration to your Prestige since FTP is faster. Please note that you must wait for the system to automatically restart after the file transfer is complete.

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

27.3.1 Restore Using FTP

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



```
                        Menu 24.6 - Restore Configuration

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

      1. Launch the FTP client on your computer.
      2. Type "open" and the IP address of your system.  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 computer and rom-0 is the
         remote file name on the system. This restores the configuration to
         your system.
      4. The system reboots automatically after a successful file transfer.

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

                               Press ENTER to Exit:
```

Figure 27-7 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 “config.rom” on your computer to the Prestige. 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.

27.3.2 Restore Using FTP 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 27-8 Restore Using FTP Session Example

Refer to *section 27.2.5* to read about configurations that disallow TFTP and FTP over WAN.

27.3.3 Restore Via Console Port (only for the Prestige 650H/HW)

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):
```

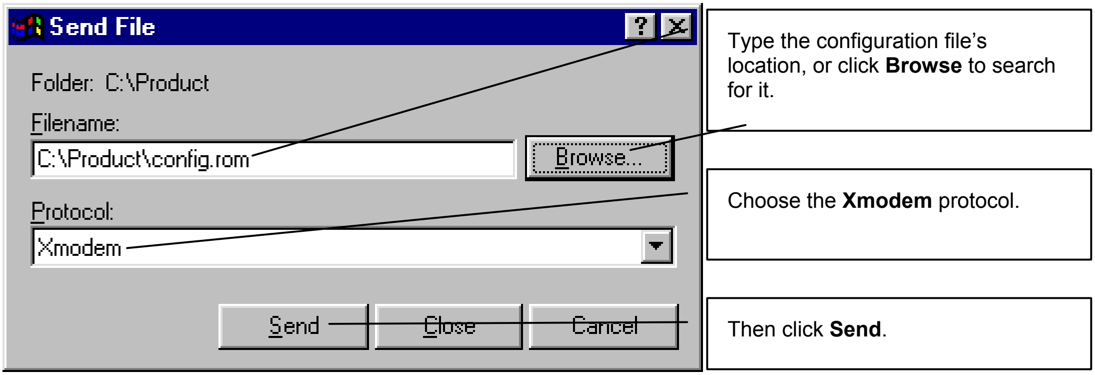
Figure 27-9 System Maintenance – Restore Configuration

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

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

Figure 27-10 System Maintenance – Starting Xmodem Download Screen

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



Folder: C:\Product

Filename: C:\Product\config.rom

Protocol: Xmodem

Type the configuration file's location, or click **Browse** to search for it.

Choose the **Xmodem** protocol.

Then click **Send**.

Figure 27-11 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 27-12 Successful Restoration Confirmation Screen

27.4 Uploading Firmware and Configuration Files

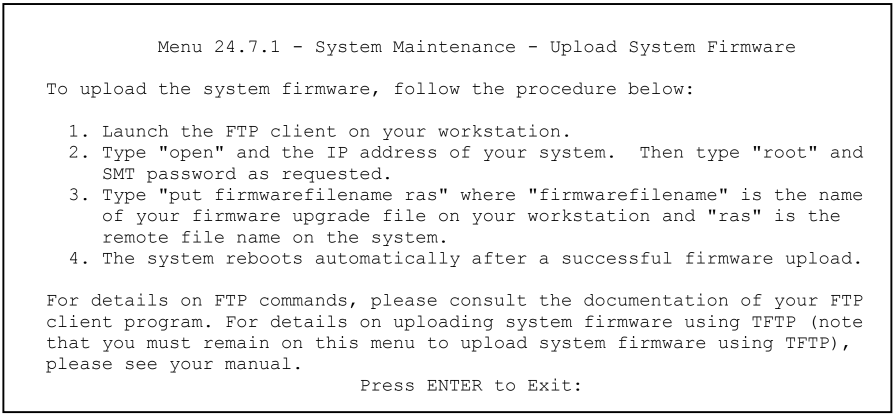
This section shows you how to upload firmware and configuration files. You can upload configuration files by following the procedure in the previous *Restore Configuration* section or by following the instructions in **Menu 24.7.2 – System Maintenance – Upload System Configuration File** (for console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

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

27.4.1 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.

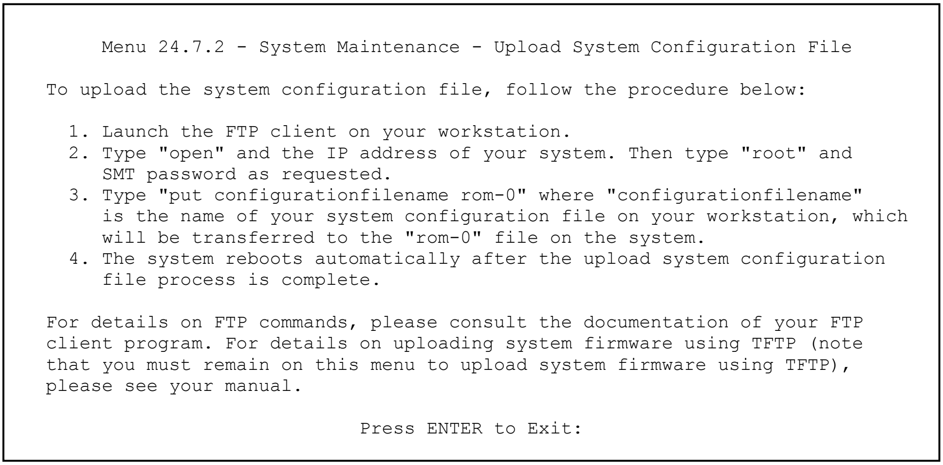


```
          Menu 24.7.1 - System Maintenance - Upload System Firmware

  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 27-13 Telnet Into Menu 24.7.1 Upload System Firmware

27.4.2 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 27-14 Telnet Into Menu 24.7.2 System Maintenance

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

27.4.3 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.

The Prestige automatically restarts after a successful file upload.

27.4.4 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 27-15 FTP Session Example of Firmware File Upload

More commands (found in GUI-based FTP clients) are listed earlier in this chapter.

Refer to *section 27.2.5* to read about configurations that disallow TFTP and FTP over WAN.

27.4.5 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.

27.4.6 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 and "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).

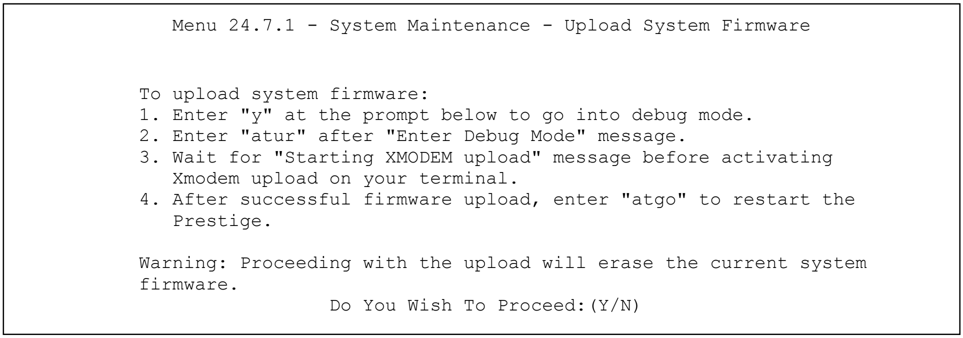
Commands that you may see in GUI-based TFTP clients are listed earlier in this chapter.

27.4.7 Uploading Via Console Port (only for the Prestige 650H/HW)

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.

27.4.8 Uploading Firmware File Via Console Port (only for the Prestige 650H/HW)

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



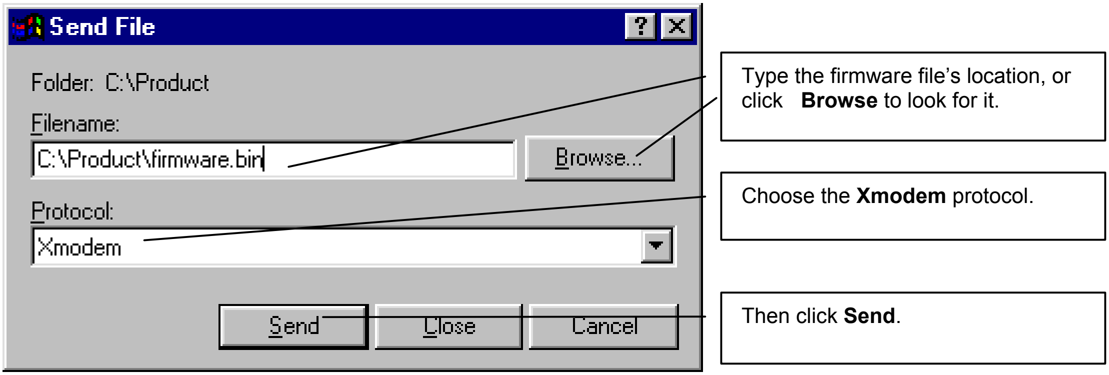
```
              Menu 24.7.1 - System Maintenance - Upload System Firmware


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

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

Figure 27-16 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.

27.4.9 Example Xmodem Firmware Upload Using HyperTerminal

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



Type the firmware file's location, or click **Browse** to look for it.

Choose the **Xmodem** protocol.

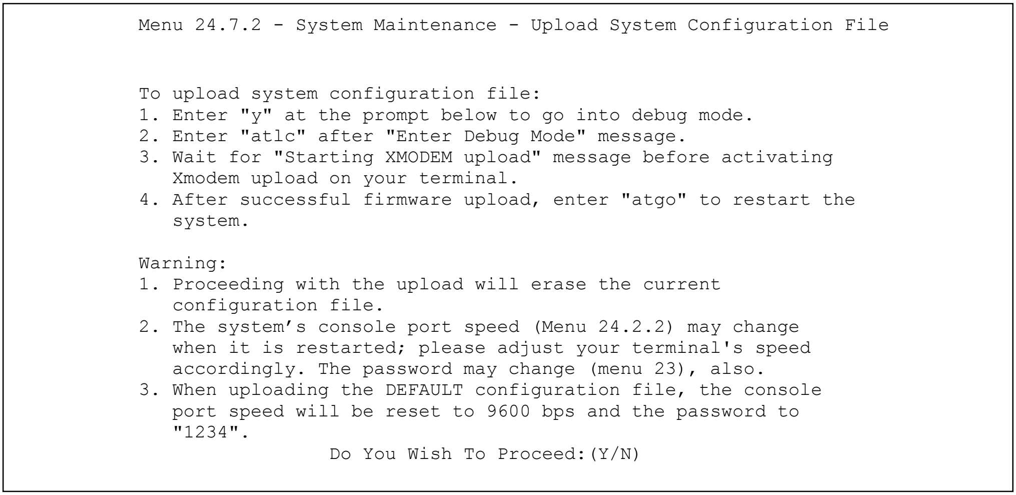
Then click **Send**.

Figure 27-17 Example Xmodem Upload

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

27.4.10 Uploading 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 System Configuration File**. Follow the instructions as shown in the next screen.



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


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

Warning:
1. Proceeding with the upload will erase the current
   configuration file.
2. The system’s console port speed (Menu 24.2.2) may change
   when it is restarted; please adjust your terminal's speed
   accordingly. The password 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)
```

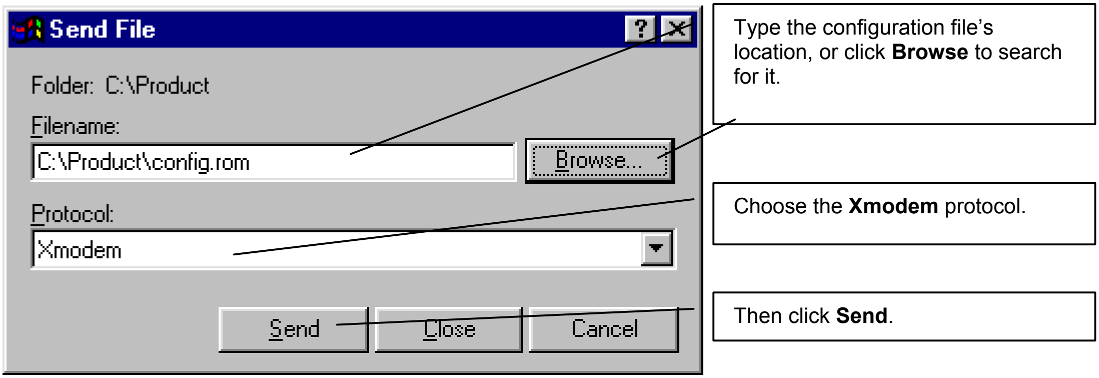
Figure 27-18 Menu 24.7.2 as seen using the Console Port

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.

27.4.11 Example Xmodem Configuration Upload Using HyperTerminal

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



Folder: C:\Product

Filename: C:\Product\config.rom

Protocol: Xmodem

Type the configuration file's location, or click **Browse** to search for it.

Choose the **Xmodem** protocol.

Then click **Send**.

Figure 27-19 Example Xmodem Upload

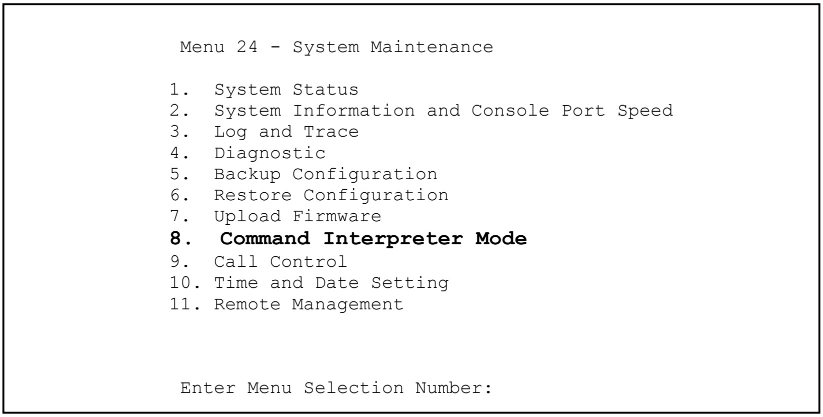
After the configuration upload process has completed, restart the Prestige by entering "atgo".

Chapter 28 System Maintenance

This chapter leads you through SMT menus 24.8 to 24.10.

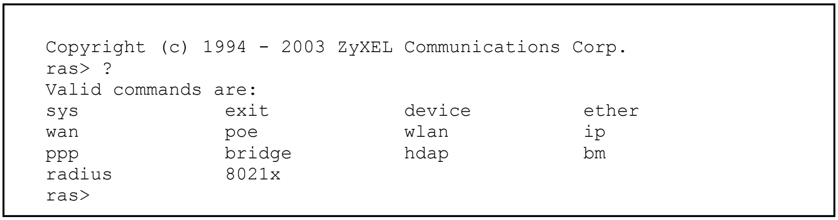
28.1 Command Interpreter Mode Overview

The Command Interpreter (CI) is a part of the main system firmware. The CI provides much of the same functionality as the SMT, while adding some low-level setup and diagnostic functions. Enter the CI from the SMT by selecting menu 24.8. See the included disk 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.  Upload Firmware
8.  Command Interpreter Mode
9.  Call Control
10. Time and Date Setting
11. Remote Management



 Enter Menu Selection Number:
```

Figure 28-1 Command Mode in Menu 24



```
Copyright (c) 1994 - 2003 ZyXEL Communications Corp.
ras> ?
Valid commands are:
sys             exit            device          ether
wan             poe             wlan            ip
ppp             bridge          hdap            bm
radius          8021x
ras>
```

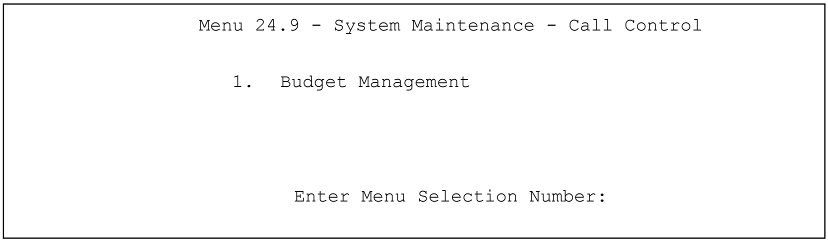
Figure 28-2 Valid Commands

28.2 Call Control Support

Call Control Support is only applicable when **Encapsulation** is set to **PPPoE** 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.

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.

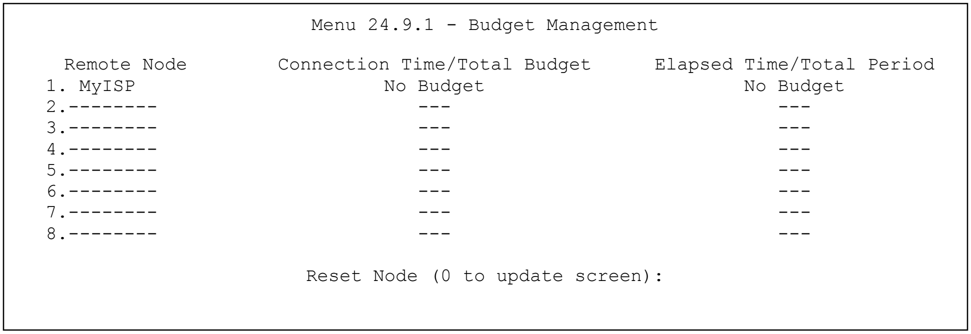


```
                 Menu 24.9 - System Maintenance - Call Control

                    1.   Budget Management



                          Enter Menu Selection Number:
```

Figure 28-3 Menu 24.9 System Maintenance : Call Control

28.2.1 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. MyISP                     No Budget                        No Budget
  2.--------                      ---                              ---
  3.--------                      ---                              ---
  4.--------                      ---                              ---
  5.--------                      ---                              ---
  6.--------                      ---                              ---
  7.--------                      ---                              ---
  8.--------                      ---                              ---

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

Figure 28-4 Menu 24.9.1 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 when PPPoE encapsulation is selected.

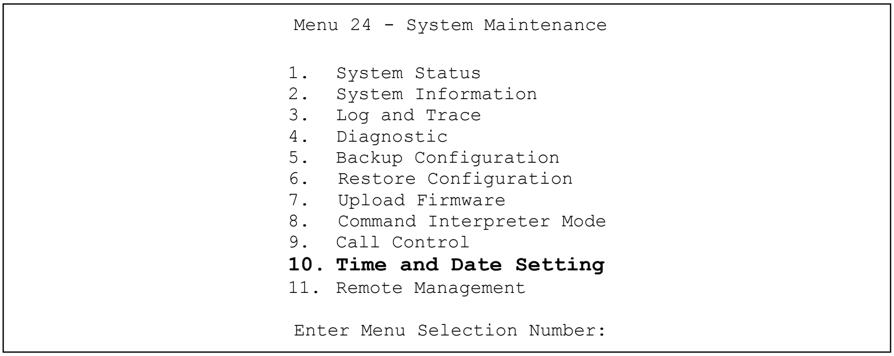
Table 28-1 Menu 24.9.1 Budget Management

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.		

28.3 Time and Date Setting

The Prestige keeps track of the time and date. There is also 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.

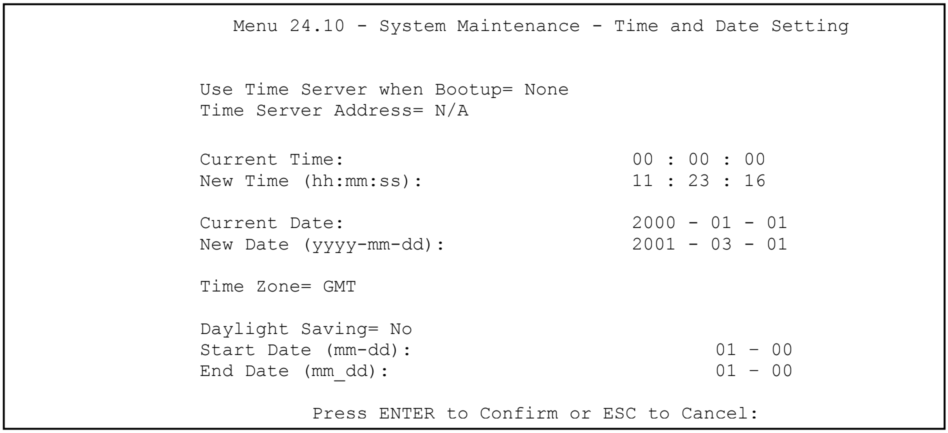
Select menu 24 in the main menu to open **Menu 24 System Maintenance**, as shown next.



```
                         Menu 24 - System Maintenance

                         1.   System Status
                         2.   System Information
                         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

                          Enter Menu Selection Number:
```

Figure 28-5 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 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 - 00
               End Date (mm_dd):                           01 - 00

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

Figure 28-6 Menu 24.10 System Maintenance: Time and Date Setting

Table 28-2 Menu 24.10 System Maintenance: Time and Date Setting

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**. The default, enter the time manually.
Time Server Address	Enter the IP address or domain name of your time server. Check with your ISP/network administrator if you are unsure of this information.
Current Time New Time	This field displays an updated time only when you reenter this menu. Enter the new time in hour, minute and second format.
Current Date New Date	This field displays an updated date only when you re-enter this menu. Enter the new date in year, month and day format.
Time Zone	Press [SPACE BAR] and then [ENTER] to set the time difference between your time zone and Greenwich Mean Time (GMT).
Daylight Saving Start Date End Date	If you use daylight savings time, then choose **Yes**. If using daylight savings time, enter the month and day that it starts on. 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.	

28.3.1 Resetting the Time

The Prestige resets the time in three instances:

i. On leaving menu 24.10 after making changes.

ii. When the Prestige starts up, if there is a time server configured in menu 24.10.

iii. 24-hour intervals after starting.

Chapter 29
Remote Management

This chapter covers remote management (SMT menu 24.11). Remote management is not available on all models.

29.1 Remote Management Overview

Remote management allows you to determine which services/protocols can access which Prestige interface (if any) from which computers.

29.2 Configuring Remote Management

To disable remote management of a service, select **Disable** in the corresponding **Server Access** field.

Enter 11 from menu 24 to display **Menu 24.11 — Remote Management Control**.

29.2.1 Remote Management Setup

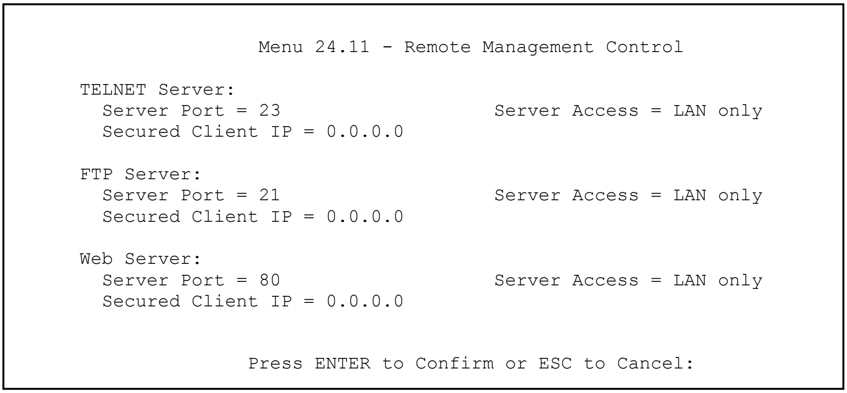
You may manage your Prestige from a remote location via:

the Internet (**WAN only**), the **LAN only**, **All** (LAN and WAN) or **Disable** (neither).

- WAN only (Internet)
- LAN only
- ALL (LAN and WAN)
- Disable (Neither)

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.

Enter 11, from menu 24, to display **Menu 24.11 — Remote Management Control** (shown next).



```
                Menu 24.11 - Remote Management Control

    TELNET Server:
      Server Port = 23                  Server Access = LAN 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


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

Figure 29-1 Menu 24.11 Remote Management Control

The following table describes the fields in this menu.

Table 29-1 Menu 24.11 Remote Management Control

FIELD	DESCRIPTION	EXAMPLE
Telnet Server FTP Server Web Server	Each of these read-only labels denotes a service that you may use to remotely manage the Prestige.	
Server Port	This field shows the port number for the remote management service. You may change the port number for a service if needed, but you must use the same port number to use that service for remote management.	23
Server Access	Select the access interface (if any) by pressing the [SPACE BAR]. Choices are: **LAN only**, **WAN only**, **All** or **Disable**. The default is **LAN only**.	**LAN only**
Secured Client IP	The default 0.0.0.0 allows any client to use this service to remotely manage the Prestige. Enter an IP address to restrict access to a client with a matching IP address.	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.		

29.2.2 Remote Management Limitations

Remote management over LAN or WAN will not work when:

1. A filter in menu 3.1 (LAN) or in menu 11.5 (WAN) is applied to block a Telnet, FTP or Web service.
2. You have disabled that service in menu 24.11.
3. 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 session immediately.
4. There is already another remote management session of the same type (Telnet, FTP or Web) running. You may only have one remote management session of the same type running at one time.
5. There is a web remote management session running with a Telnet session. A Telnet session will be disconnected if you begin a web session; it will not begin if there already is a web session.

29.3 Remote Management and NAT

When NAT is enabled:

- Use the Prestige's WAN IP address when configuring from the WAN.
- Use the Prestige's LAN IP address when configuring from the LAN.

29.4 System Timeout

There is a system timeout of five minutes (300 seconds) for Telnet/web/FTP connections. 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 or when `sys stdio` has been changed on the command line.

Chapter 30
IP Policy Routing

This chapter covers setting and applying policies used for IP routing.

30.1 IP Policy Routing Overview

Traditionally, routing is based on the destination address only and the IAD takes the shortest path to forward a packet. IP Routing Policy (IPPR) provides a mechanism to override the default routing behavior and alter the packet forwarding based on the policy defined by the network administrator. Policy-based routing is applied to incoming packets on a per interface basis, prior to the normal routing.

30.2 Benefits of IP Policy Routing

- Source-Based Routing – Network administrators can use policy-based routing to direct traffic from different users through different connections.
- Quality of Service (QoS) – Organizations can differentiate traffic by setting the precedence or TOS (Type of Service) values in the IP header at the periphery of the network to enable the backbone to prioritize traffic.
- Cost Savings – IPPR allows organizations to distribute interactive traffic on high-bandwidth, high-cost paths while using low-cost paths for batch traffic.
- Load Sharing – Network administrators can use IPPR to distribute traffic among multiple paths.

30.3 Routing Policy

Individual routing policies are used as part of the overall IPPR process. A policy defines the matching criteria and the action to take when a packet meets the criteria. The action is taken only when all the criteria are met. The criteria includes the source address and port, IP protocol (ICMP, UDP, TCP, etc.), destination address and port, TOS and precedence (fields in the IP header) and length. The inclusion of length criterion is to differentiate between interactive and bulk traffic. Interactive applications, for example, telnet, tend to have short packets, while bulk traffic, for example, file transfer, tends to have large packets.

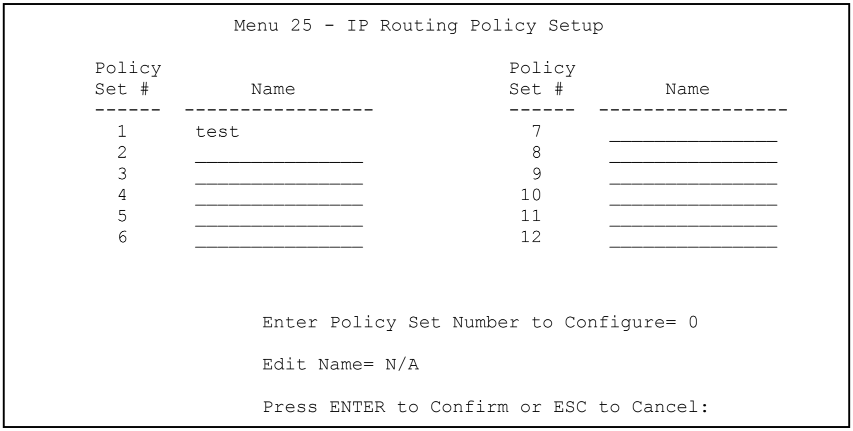
The actions that can be taken include:

- routing the packet to a different gateway (and hence the outgoing interface).
- setting the TOS and precedence fields in the IP header.

IPPR follows the existing packet filtering facility of RAS in style and in implementation. The policies are divided into sets, where related policies are grouped together. A user defines the policies before applying them to an interface or a remote node, in the same fashion as the filters. There are 12 policy sets with six policies in each set.

30.4 IP Routing Policy Setup

Menu 25 shows all the policies defined.



```
                        Menu 25 - IP Routing Policy Setup

        Policy                                  Policy
        Set #        Name                       Set #        Name
        ------  -----------------               ------  -----------------
          1      test                             7      _______________
          2      _______________                  8      _______________
          3      _______________                  9      _______________
          4      _______________                 10      _______________
          5      _______________                 11      _______________
          6      _______________                 12      _______________


                     Enter Policy Set Number to Configure= 0

                     Edit Name= N/A

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

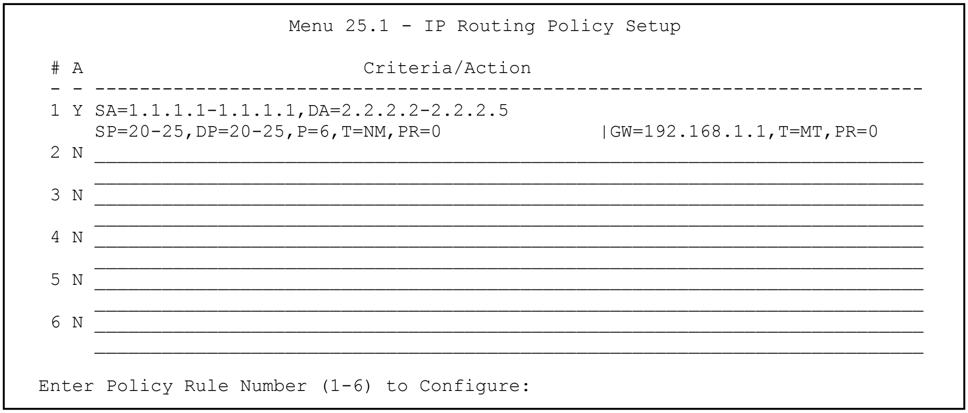
Figure 30-1 Menu 25 IP Routing Policy Setup

To setup a routing policy, perform the following procedures:

Step 1. Type 25 in the main menu to open **Menu 25 – IP Routing Policy Setup.**

Step 2. Type the index of the policy set you want to configure to open **Menu 25.1 – IP Routing Policy Setup**.

Menu 25.1 shows the summary of a policy set, including the criteria and the action of a single policy, and whether a policy is active or not. Each policy contains two lines. The former part is the criteria of the incoming packet and the latter is the action. Between these two parts, separator "|" means the action is taken on criteria matched and separator "=" means the action is taken on criteria not matched.



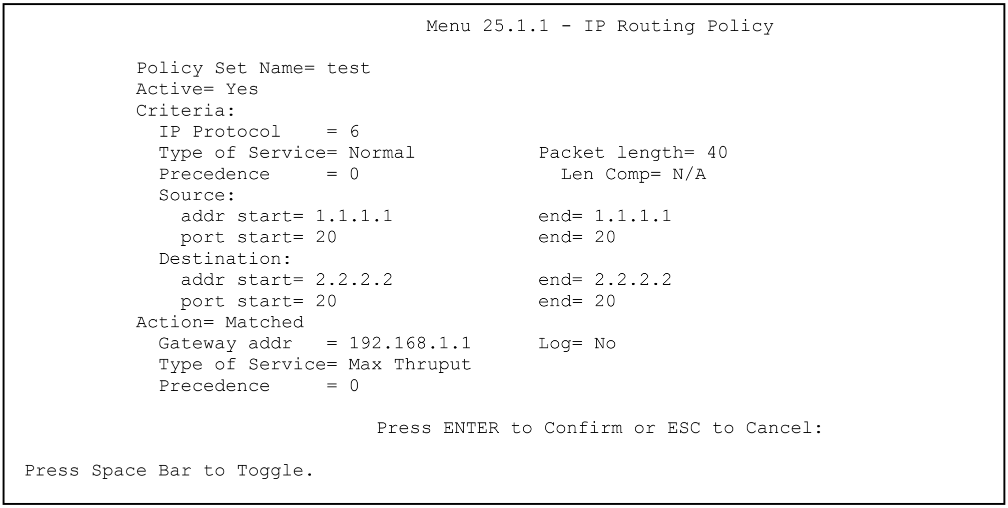
```
                          Menu 25.1 - IP Routing Policy Setup

   # A                           Criteria/Action
   - - --------------------------------------------------------------------------
   1 Y SA=1.1.1.1-1.1.1.1,DA=2.2.2.2-2.2.2.5
       SP=20-25,DP=20-25,P=6,T=NM,PR=0              |GW=192.168.1.1,T=MT,PR=0
   2 N ___________________________________________________________________________
       ___________________________________________________________________________
   3 N ___________________________________________________________________________
       ___________________________________________________________________________
   4 N ___________________________________________________________________________
       ___________________________________________________________________________
   5 N ___________________________________________________________________________
       ___________________________________________________________________________
   6 N ___________________________________________________________________________
       ___________________________________________________________________________

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

Figure 30-2 Menu 25.1 IP Routing Policy Setup

Table 30-1 Menu 25.1 IP Routing Policy Setup

ABBREVIATION		MEANING
Criterion	SA	Source IP Address
	SP	Source Port
	DA	Destination IP Address
	DP	Destination Port
	P	IP layer 4 protocol number (TCP=6, UDP=17…)
	T	Type of service of incoming packet
	PR	Precedence of incoming packet
Action	GW	Gateway IP address
	T	Outgoing Type of service
	P	Outgoing Precedence
Service	NM	Normal
	MD	Minimum Delay
	MT	Maximum Throughput
	MR	Maximum Reliability
	MC	Minimum Cost

Type a number from 1 to 6 to display **Menu 25.1.1 – IP Routing Policy** (see the next figure). This menu allows you to configure a policy rule.



```
                                    Menu 25.1.1 - IP Routing Policy

          Policy Set Name= test
          Active= Yes
          Criteria:
            IP Protocol    = 6
            Type of Service= Normal           Packet length= 40
            Precedence     = 0                  Len Comp= N/A
            Source:
              addr start= 1.1.1.1             end= 1.1.1.1
              port start= 20                  end= 20
            Destination:
              addr start= 2.2.2.2             end= 2.2.2.2
              port start= 20                  end= 20
          Action= Matched
            Gateway addr   = 192.168.1.1      Log= No
            Type of Service= Max Thruput
            Precedence     = 0

                               Press ENTER to Confirm or ESC to Cancel:

Press Space Bar to Toggle.
```

Figure 30-3 Menu 25.1.1 IP Routing Policy

The following table describes the fields in this menu.

Table 30-2 Menu 25.1.1 IP Routing Policy

FIELD	DESCRIPTION
Policy Set Name	This is the policy set name assigned in **Menu 25 – IP Routing Policy Setup**.
Active	Press [SPACE BAR] and then [ENTER] to select **Yes** to activate or No to deactivate the policy. Inactive policies are displayed with a minus sign "-" in SMT menu 25.
Criteria :	
IP Protocol	IP layer 4 protocol, for example, **UDP**, **TCP**, **ICMP**, etc.
Type of Service	Prioritize incoming network traffic by choosing from **Don't Care**, **Normal**, **Min Delay**, **Max Thruput, Min Cost** or **Max Reliable**.
Precedence	Precedence value of the incoming packet. Press [SPACE BAR] and then [ENTER] to select a value from **0** to **7** or **Don't Care**.
Packet Length	Type the length of incoming packets (in bytes). The operators in the **Len Comp** (next field) apply to packets of this length.

Table 30-2 Menu 25.1.1 IP Routing Policy

FIELD	DESCRIPTION
Len Comp	Press [SPACE BAR] and then [ENTER] to choose from **Equal**, **Not Equal**, **Less**, **Greater**, **Less or Equal** or **Greater or Equal**.
Source:	
addr start / end	Source IP address range from start to end.
port start / end	Source port number range from start to end; applicable only for TCP/UDP.
Destination:	
addr start / end	Destination IP address range from start to end.
port start / end	Destination port number range from start to end; applicable only for TCP/UDP.
Action	Specifies whether action should be taken on criteria **Matched** or **Not Matched**.
Gateway addr	Defines the outgoing gateway address. The gateway must be on the same subnet as the Prestige if it is on the LAN, otherwise, the gateway must be the IP address of a remote node. The default gateway is specified as 0.0.0.0.
Type of Service	Set the new TOS value of the outgoing packet. Prioritize incoming network traffic by choosing **No Change**, **Normal**, **Min Delay**, **Max Thruput**, **Max Reliable** or **Min Cost**.
Precedence	Set the new outgoing packet precedence value. Values are **0** to **7** or **No Change**.
Log	Press [SPACE BAR] and then [ENTER] to select **Yes** to make an entry in the system log when a policy is executed.
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.	

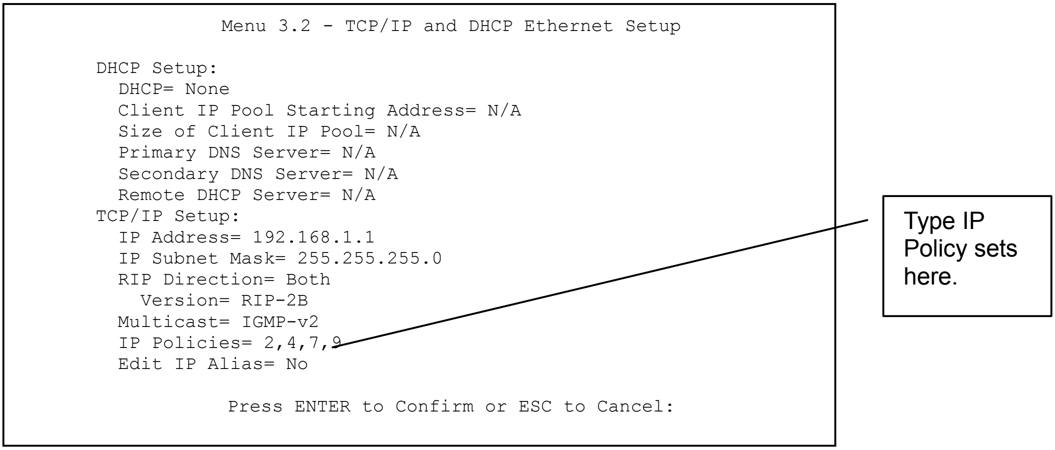
30.5 Applying an IP Policy

This section shows you where to apply the IP policies after you design them.

30.5.1 Ethernet IP Policies

From **Menu 3 — Ethernet Setup**, type 2 to go to **Menu 3.2 — TCP/IP and DHCP Ethernet Setup**.

You can choose up to four IP policy sets (from 12) by typing their numbers separated by commas, for example, 2, 4, 7, 9.

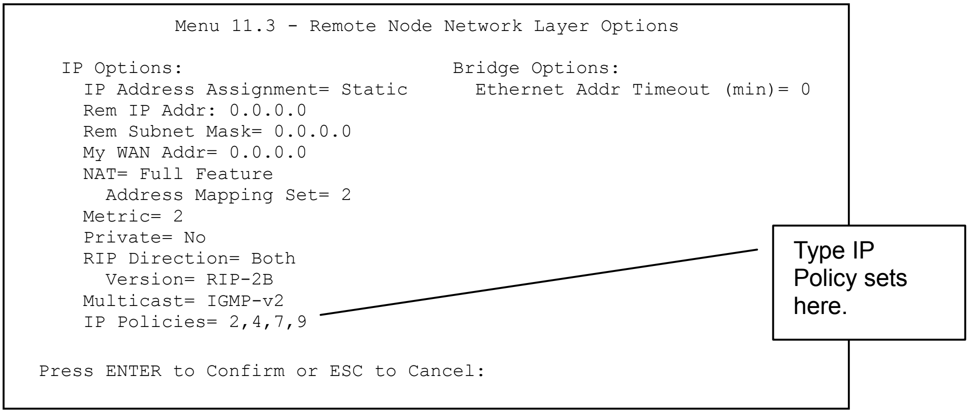


```
                   Menu 3.2 - TCP/IP and DHCP Ethernet Setup

        DHCP Setup:
          DHCP= None
          Client IP Pool Starting Address= N/A
          Size of Client IP Pool= N/A
          Primary DNS Server= N/A
          Secondary DNS Server= N/A
          Remote DHCP Server= N/A
        TCP/IP Setup:
          IP Address= 192.168.1.1
          IP Subnet Mask= 255.255.255.0
          RIP Direction= Both
            Version= RIP-2B
          Multicast= IGMP-v2
          IP Policies= 2,4,7,9
          Edit IP Alias= No

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

Type IP Policy sets here.

Figure 30-4 Menu 3.2 TCP/IP and DHCP Ethernet Setup

Go to menu 11.3 (shown next) and type the number(s) of the IP Routing Policy set(s) as appropriate. You can cascade up to four policy sets by typing their numbers separated by commas.



```
               Menu 11.3 - Remote Node Network Layer Options

     IP Options:                         Bridge Options:
       IP Address Assignment= Static       Ethernet Addr Timeout (min)= 0
       Rem IP Addr: 0.0.0.0
       Rem Subnet Mask= 0.0.0.0
       My WAN Addr= 0.0.0.0
       NAT= Full Feature
         Address Mapping Set= 2
       Metric= 2
       Private= No
       RIP Direction= Both
         Version= RIP-2B
       Multicast= IGMP-v2
       IP Policies= 2,4,7,9

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

Type IP Policy sets here.

Figure 30-5 Menu 11.3 Remote Node Network Layer Options

30.6 IP Policy Routing Example

If a network has both Internet and remote node connections, you can route Web packets to the Internet using one policy and route FTP packets to a remote network using another policy. See the next figure.

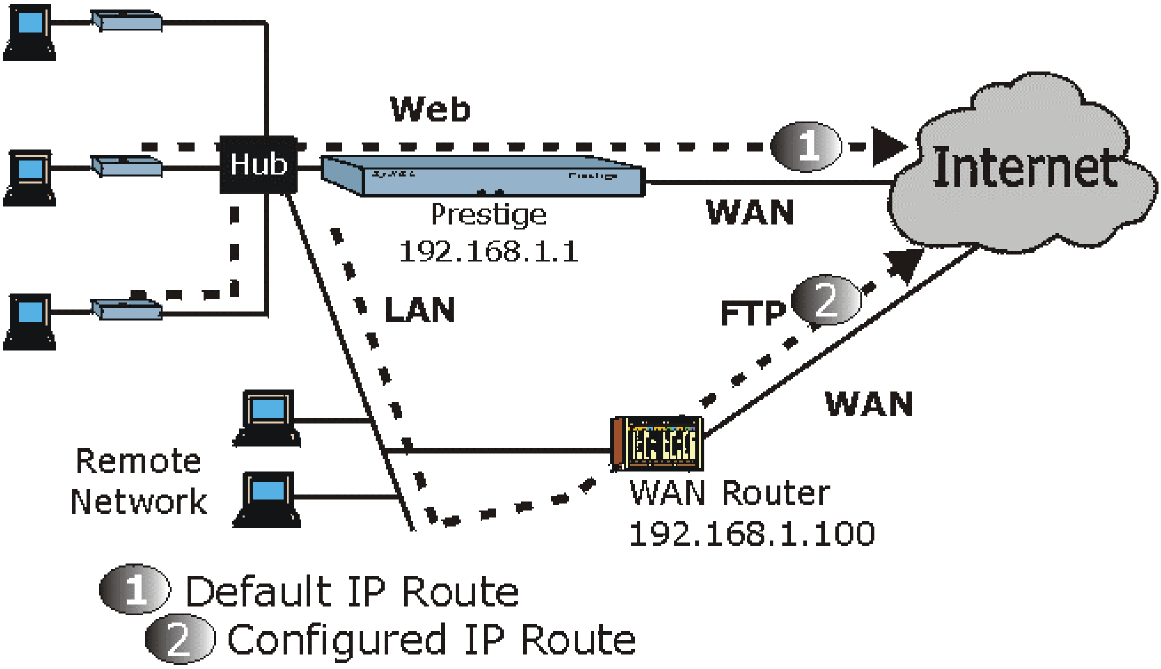
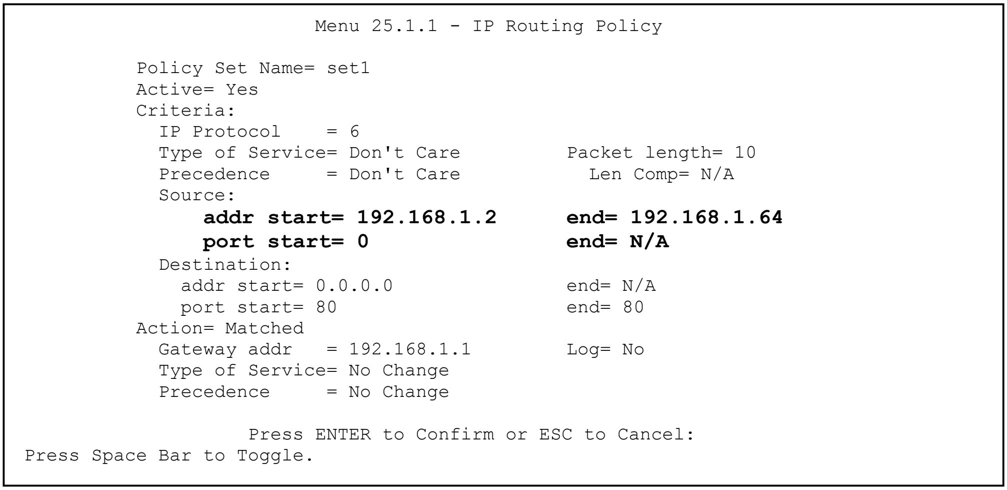


Figure 30-6 Example of IP Policy Routing

To force Web packets coming from clients with IP addresses of 192.168.1.33 to 192.168.1.64 to be routed to the Internet via the WAN port of the Prestige, follow the steps as shown next.

Step 1. Create a routing policy set in menu 25.

Step 2. Create a rule for this set in **Menu 25.1.1 — IP Routing Policy** as shown next.



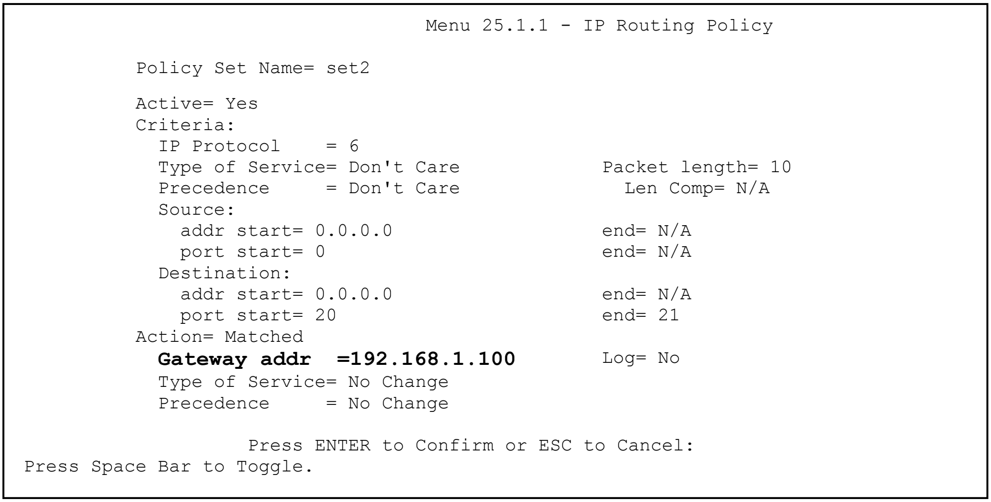
```
                           Menu 25.1.1 - IP Routing Policy

           Policy Set Name= set1
           Active= Yes
           Criteria:
             IP Protocol    = 6
             Type of Service= Don't Care         Packet length= 10
             Precedence     = Don't Care           Len Comp= N/A
             Source:
                 addr start= 192.168.1.2      end= 192.168.1.64
                 port start= 0                end= N/A
             Destination:
               addr start= 0.0.0.0               end= N/A
               port start= 80                    end= 80
           Action= Matched
             Gateway addr   = 192.168.1.1        Log= No
             Type of Service= No Change
             Precedence     = No Change

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

Figure 30-7 IP Routing Policy Example

Step 3. Check **Menu 25.1 — IP Routing Policy Setup** to see if the rule is added correctly.

Step 4. Create another policy set in menu 25.

Step 5. Create a rule in menu 25.1 for this set to route packets from any host (IP=0.0.0.0 means any host) with protocol TCP and port FTP access through another gateway (192.168.1.100).

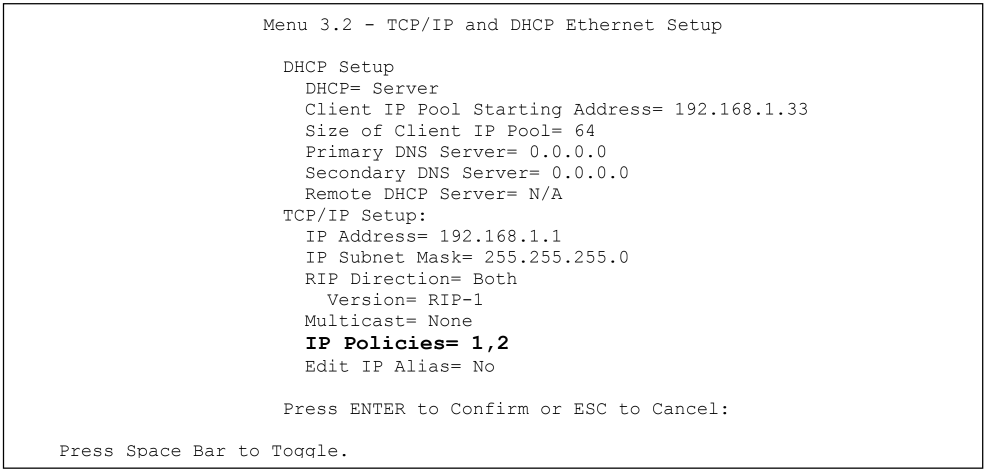


```
                          Menu 25.1.1 - IP Routing Policy

          Policy Set Name= set2

          Active= Yes
          Criteria:
            IP Protocol    = 6
            Type of Service= Don't Care            Packet length= 10
            Precedence     = Don't Care              Len Comp= N/A
            Source:
              addr start= 0.0.0.0                  end= N/A
              port start= 0                        end= N/A
            Destination:
              addr start= 0.0.0.0                  end= N/A
              port start= 20                       end= 21
          Action= Matched
            Gateway addr  =192.168.1.100           Log= No
            Type of Service= No Change
            Precedence     = No Change

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

Figure 30-8 IP Routing Policy Example

Step 6. Check **Menu 25.1 — IP Routing Policy Setup** to see if the rule is added correctly.

Step 7. Apply both policy sets in menu 3.2 as shown next.



```
                        Menu 3.2 - TCP/IP and DHCP Ethernet Setup

                          DHCP Setup
                            DHCP= Server
                            Client IP Pool Starting Address= 192.168.1.33
                            Size of Client IP Pool= 64
                            Primary DNS Server= 0.0.0.0
                            Secondary DNS Server= 0.0.0.0
                            Remote DHCP Server= N/A
                          TCP/IP Setup:
                            IP Address= 192.168.1.1
                            IP Subnet Mask= 255.255.255.0
                            RIP Direction= Both
                              Version= RIP-1
                            Multicast= None
                            IP Policies= 1,2
                            Edit IP Alias= No

                          Press ENTER to Confirm or ESC to Cancel:

    Press Space Bar to Toggle.
```

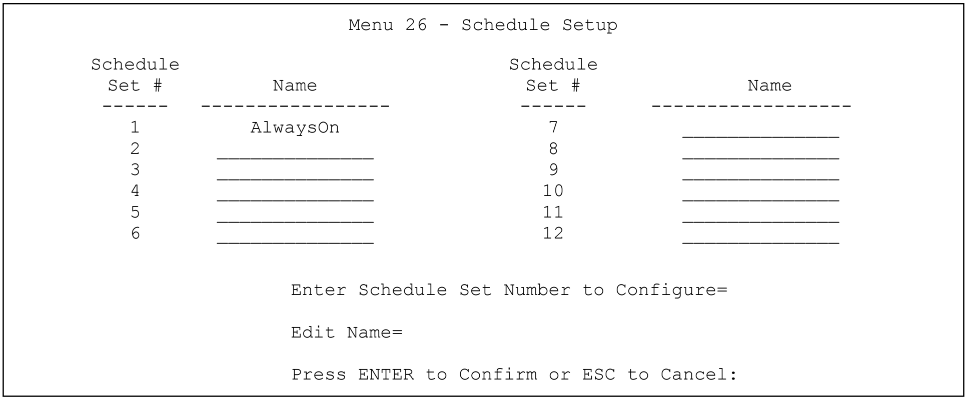
Figure 30-9 Applying IP Policies Example

Chapter 31 Call Scheduling

Call scheduling (applicable for PPPoA or PPPoE encapsulation only) allows you to dictate when a remote node should be called and for how long.

31.1 Call Scheduling Overview

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 specify a time period for the VCR to record). You can apply up to 4 schedule sets in **Menu 11.1 — Remote Node Profile**. 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          AlwaysOn                      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:
```

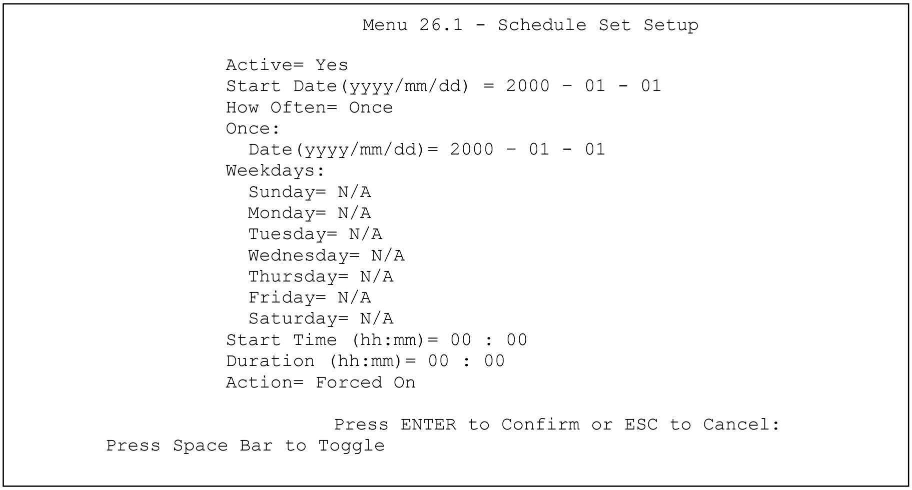
Figure 31-1 Menu 26 Schedule Setup

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 [SPACE BAR] **and then** [ENTER] **(or delete) in the** Edit Name **field.**

To setup a schedule set, select the schedule set you want to setup from menu 26 (1-12) and press [ENTER] to see **Menu 26.1 — Schedule Set Setup** as shown next.



```
                       Menu 26.1 - Schedule Set Setup

           Active= Yes
           Start Date(yyyy/mm/dd) = 2000 - 01 - 01
           How Often= Once
           Once:
             Date(yyyy/mm/dd)= 2000 - 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)= 00 : 00
           Duration (hh:mm)= 00 : 00
           Action= Forced On

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

Figure 31-2 Menu 26.1 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 up until the end of the **Duration**.

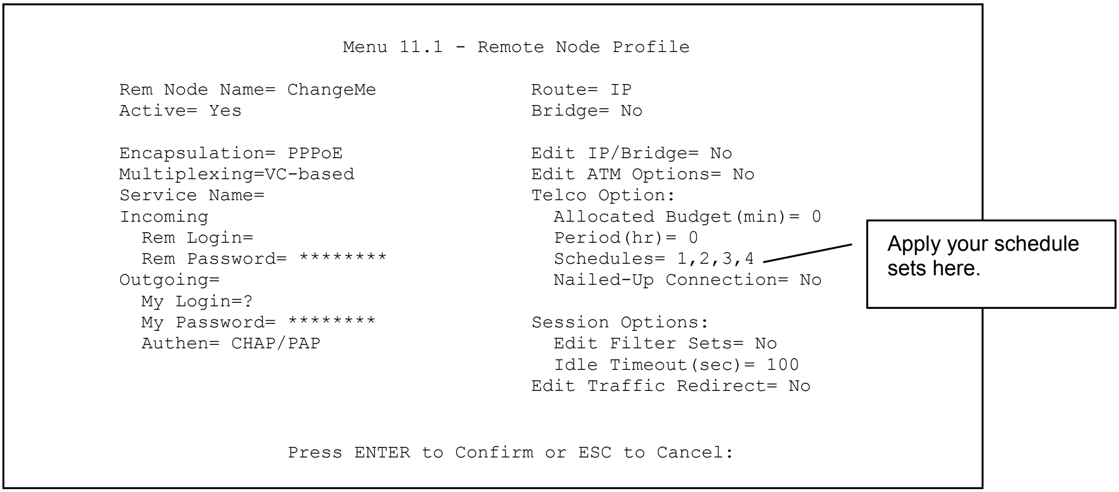
Table 31-1 Menu 26.1 Schedule Set Setup

FIELD	DESCRIPTION	EXAMPLE
Active	Press [SPACE BAR] to select **Yes** or **No**. Choose **Yes** and press [ENTER] to activate the schedule set.	**Yes**
Start Date	Enter the start date when you wish the set to take effect in year -month-date format. Valid dates are from the present to 2036-February-5.	2000-01-01

Table 31-1 Menu 26.1 Schedule Set Setup

FIELD	DESCRIPTION	EXAMPLE
How Often	Should this schedule set recur weekly or be used just once only? Press the [SPACE BAR] and then [ENTER] to select **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**
Once: Date	If you selected **Once** in the **How Often** field above, then enter the date the set should activate here in year-month-date format.	2000-01-01
Weekday: Day	If you selected **Weekly** in the **How Often** field above, then select the day(s) when the set should activate (and recur) by going to that day(s) and pressing [SPACE BAR] to select **Yes**, then press [ENTER].	**Yes** **No** **N/A**
Start Time	Enter the start time when you wish the schedule set to take effect in hour-minute format.	09:00
Duration	Enter the maximum length of time this connection is allowed in hour-minute format.	08:00
Action	**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**
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.		

Once your schedule sets are configured, you must then apply them to the desired remote node(s). Enter 11 from the **Main Menu** and then enter the target remote node index. Using [SPACE BAR], select **PPPoE** or **PPPoA** in the **Encapsulation** field and then press [ENTER] to make the schedule sets field available as shown next.



```
                          Menu 11.1 - Remote Node Profile

          Rem Node Name= ChangeMe            Route= IP
          Active= Yes                        Bridge= No

          Encapsulation= PPPoE               Edit IP/Bridge= No
          Multiplexing=VC-based              Edit ATM Options= No
          Service Name=                      Telco Option:
          Incoming                             Allocated Budget(min)= 0
            Rem Login=                         Period(hr)= 0
            Rem Password= ********             Schedules= 1,2,3,4
          Outgoing=                            Nailed-Up Connection= No
            My Login=?
            My Password= ********            Session Options:
            Authen= CHAP/PAP                   Edit Filter Sets= No
                                               Idle Timeout(sec)= 100
                                             Edit Traffic Redirect= No


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

Apply your schedule sets here.

Figure 31-3 Applying Schedule Set(s) to a Remote Node (PPPoE)

You can apply up to four schedule sets, separated by commas, for one remote node. Change the schedule set numbers to your preference(s).

Part IX:

Appendices and Index

This part contains troubleshooting, additional background information and an index of key terms.

Appendix A Troubleshooting

This chapter covers potential problems and the corresponding remedies.

A.1 Using LEDs to Diagnose Problems

The LEDs are useful aides for finding possible problem causes.

A.1.1 Power LED

The **PWR** LED on the front panel does not light up.

Chart A-1 Troubleshooting Power LED

STEPS	CORRECTIVE ACTION
1	Make sure that the Prestige's power adaptor is connected to the Prestige and plugged in to an appropriate power source. Use only the supplied power adaptor.
2	Check that the Prestige and the power source are both turned on and the Prestige is receiving sufficient power.
3	Turn the Prestige off and on.
4	If the error persists, you may have a hardware problem. In this case, you should contact your vendor.

A.1.2 LAN LED

The **LAN** LED on the front panel does not light up.

Chart A-2 Troubleshooting LAN LED

STEPS	CORRECTIVE ACTION
1	Check the Ethernet cable connections between your Prestige and the computer or hub.
2	Check for faulty Ethernet cables.
3	Make sure your computer's Ethernet card is working properly.
4	If these steps fail to correct the problem, contact your local distributor for assistance.

A.1.3 DSL LED

The **DSL** LED on the front panel does not light up.

Chart A-3 Troubleshooting DSL LED

STEPS	CORRECTIVE ACTION
1	Check the telephone wire and connections between the Prestige DSL port and the wall jack.
2	Make sure that the telephone company has checked your phone line and set it up for DSL service.
3	Reset your ADSL line to reinitialize your link to the DSLAM. For details, refer to the *Maintenance* chapter (web configurator) or the System Information and Diagnosis chapter (SMT).
4	If these steps fail to correct the problem, contact your local distributor for assistance.

A.2 Console Port

I cannot access the Prestige via the console port.

Chart A-4 Troubleshooting Console Port

STEPS	CORRECTIVE ACTION	
1	Make sure the Prestige is connected to your computer's serial port.	
2	Make sure the communications program is configured correctly. The communications software should be configured as follows:	VT100 terminal emulation. 9600 bps is the default speed on leaving the factory. Try other speeds in case the speed has been changed. No parity, 8 data bits, 1 stop bit, data flow set to none.
3	Make sure you entered the correct password. The default password is "1234". If you have forgot your username or password, refer to *Section A.5*.	

A.3 Telnet

I cannot telnet into the Prestige.

Chart A-5 Troubleshooting Telnet

STEPS	CORRECTIVE ACTION
1	Check the LAN port and the other Ethernet connections.

Chart A-5 Troubleshooting Telnet

STEPS	CORRECTIVE ACTION
2	Make sure you are using the correct IP address of the Prestige. Check the IP address of the Prestige.
3	Ping the Prestige from your computer. If you cannot ping the Prestige, check the IP addresses of the Prestige and your computer. Make sure your computer is set to get a dynamic IP address; or if you want to use a static IP address on your computer, make sure that it is on the same subnet as the Prestige.
4	Make sure you entered the correct password. The default password is "1234". If you have forgot your username or password, refer to *Section A.5*.
5	If these steps fail to correct the problem, contact the distributor.

A.4 Web Configurator

I cannot access the web configurator.

Chart A-6 Troubleshooting Web Configurator

STEPS	CORRECTIVE ACTION
1	Make sure you are using the correct IP address of the Prestige. Check the IP address of the Prestige.
2	Make sure that there is not an SMT console session running.
3	Check that you have enabled web service access. If you have configured a secured client IP address, your computer's IP address must match it. Refer to the chapter on remote management for details.
4	For WAN access, you must configure remote management to allow server access from the Wan (or all).
5	Your computer's and the Prestige's IP addresses must be on the same subnet for LAN access.
6	If you changed the Prestige's LAN IP address, then enter the new one as the URL.
7	Remove any filters in SMT menu 3.1 (LAN) or menu 11.5 (WAN) that block web service.
8	See also *Section A.9*.

The web configurator does not display properly.

Chart A-7 Troubleshooting Internet Browser Display

STEPS	CORRECTIVE ACTION
1	Make sure you are using Internet Explorer 5.0 and later versions.
2	Delete the temporary web files and log in again. In Internet Explorer, click **Tools**, **Internet Options** and then click the **Delete Files ...** button. When a **Delete Files** window displays, select **Delete all offline content** and click **OK**. (Steps may vary depending on the version of your Internet browser.)

A.5 Login Username and Password

I forgot my login username and/or password.

Chart A-8 Troubleshooting Login Username and Password

STEPS	CORRECTIVE ACTION
1	If you have changed the password and have now forgotten it, you will need to upload the default configuration file. This will erase all custom configurations and restore all of the factory defaults including the password.
2	Press the **RESET** button for five seconds, and then release it. When the **SYS** LED begins to blink, the defaults have been restored and the Prestige restarts. Or refer to the *Resetting the Prestige* section for uploading a configuration file via console port.
3	The default username is "admin". The default password is "1234". The **Password** and **Username** fields are case-sensitive. Make sure that you enter the correct password and username using the proper casing.
4	It is highly recommended to change the default username and password. Make sure you store the username and password in a save place.

A.6 LAN Interface

I cannot access the Prestige from the LAN or ping any computer on the LAN.

Chart A-9 Troubleshooting LAN Interface

STEPS	CORRECTIVE ACTION
1	Check the Ethernet LEDs on the front panel. A LAN LED should be on if the port is connected to a computer or hub. If the 10M/100M LEDs on the front panel are both off, refer to *Section A.1.2*.

Chart A-9 Troubleshooting LAN Interface

STEPS	CORRECTIVE ACTION
2	Make sure that the IP address and the subnet mask of the Prestige and your computer(s) are on the same subnet.

A.7 WAN Interface

Initialization of the ADSL connection failed.

Chart A-10 Troubleshooting ADSL Connection

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

I cannot get a WAN IP address from the ISP.

Chart A-11 Troubleshooting WAN Interface

STEPS	CORRECTIVE ACTION
1	The ISP provides the WAN IP address after authenticating you. Authentication may be through the user name and password, the MAC address or the host name.
2	The username and password apply to PPPoE and PPoA encapsulation only. Make sure that you have entered the correct **Service Type**, **User Name** and **Password** (be sure to use the correct casing). Refer to the *WAN Setup* chapter (web configurator) or the *Internet Access* chapter (SMT).

A.8 Internet Access

I cannot access the Internet.

Chart A-12 Troubleshooting Internet Access

STEPS	CORRECTIVE ACTION
1	Make sure the Prestige is turned on and connected to the network.

Chart A-12 Troubleshooting Internet Access

STEPS	CORRECTIVE ACTION
2	If the DSL LED is off, refer to *Section A.1.3*.
3	Verify your WAN settings. Refer to the *WAN Setup* chapter (web configurator) or the *Internet Access* chapter (SMT).
4	Make sure you entered the correct user name and password.
5	For wireless stations, check that both the Prestige and wireless station(s) are using the same ESSID, channel and WEP keys (if WEP encryption is activated).

Internet connection disconnects.

Chart A-13 Troubleshooting Internet Connection

STEPS	CORRECTIVE ACTION
1	Check the schedule rules. Refer to the *Call Scheduling* chapter (SMT).
2	If you use PPPoA or PPPoE encapsulation, check the idle time-out setting. Refer to the *WAN* chapter (web configurator) or the *Remote Node Configuration* chapter (SMT).
3	Contact your ISP.

A.9 Remote Management

I cannot remotely manage the Prestige from the LAN or WAN.

Chart A-14 Troubleshooting Remote Management

STEPS	CORRECTIVE ACTION
1	Refer to the *Remote Management Limitations* section in the *Firmware and Configuration File Management* chapter (SMT) for scenarios when remote management may not be possible.
2	Use the Prestige's WAN IP address when configuring from the WAN. Use the Prestige's LAN IP address when configuring from the LAN.
3	Refer to *Section A.6* for instructions on checking your LAN connection. Refer to *Section A.7* for instructions on checking your WAN connection.
4	See also the *Section A.4*.

A.10 Remote Node Connection

I cannot connect to a remote node or ISP.

Chart A-15 Troubleshooting Connecting to a Remote Node or ISP

STEPS	CORRECTIVE ACTION
1	Check menu 4 or WAN screen to verify that the username and password are entered properly.
2	In menu 11.1, verify your login name and password for the remote node.
3	If these steps fail, you may need to verify your login and password with your ISP.

Appendix B IP Subnetting

IP Addressing

Routers "route" based on the network number. The router that delivers the data packet to the correct destination host uses the host ID.

IP Classes

An IP address is made up of four octets (eight bits), written in dotted decimal notation, for example, 192.168.1.1. IP addresses are categorized into different classes. The class of an address depends on the value of its first octet.

- Class "A" addresses have a 0 in the left most bit. In a class "A" address the first octet is the network number and the remaining three octets make up the host ID.
- Class "B" addresses have a 1 in the left most bit and a 0 in the next left most bit. In a class "B" address the first two octets make up the network number and the two remaining octets make up the host ID.
- Class "C" addresses begin (starting from the left) with 1 1 0. In a class "C" address the first three octets make up the network number and the last octet is the host ID.
- Class "D" addresses begin with 1 1 1 0. Class "D" addresses are used for multicasting. (There is also a class "E" address. It is reserved for future use.)

Chart B-1 Classes of IP Addresses

IP ADDRESS:		OCTET 1	OCTET 2	OCTET 3	OCTET 4
Class A	0	Network number	Host ID	Host ID	Host ID
Class B	10	Network number	Network number	Host ID	Host ID
Class C	110	Network number	Network number	Network number	Host ID

Host IDs of all zeros or all ones are not allowed.

Therefore:

- A class "C" network (8 host bits) can have 2^8 –2 or 254 hosts.
- A class "B" address (16 host bits) can have 2^{16} –2 or 65534 hosts.

A class "A" address (24 host bits) can have 2^{24} –2 hosts (approximately 16 million hosts).

Since the first octet of a class "A" IP address must contain a "0", the first octet of a class "A" address can have a value of 0 to 127.

Similarly the first octet of a class "B" must begin with "10", therefore the first octet of a class "B" address has a valid range of 128 to 191. The first octet of a class "C" address begins with "110", and therefore has a range of 192 to 223.

Chart B-2 Allowed IP Address Range By Class

CLASS	ALLOWED RANGE OF FIRST OCTET (BINARY)	ALLOWED RANGE OF FIRST OCTET (DECIMAL)
Class A	**0**0000000 to **0**1111111	0 to 127
Class B	**10**000000 to **10**111111	128 to 191
Class C	**110**00000 to **110**11111	192 to 223
Class D	**1110**0000 to **1110**1111	224 to 239

Subnet Masks

A subnet mask is used to determine which bits are part of the network number, and which bits are part of the host ID (using a logical AND operation). A subnet mask has 32 bits; each bit of the mask corresponds to a bit of the IP address. If a bit in the subnet mask is a "1" then the corresponding bit in the IP address is part of the network number. If a bit in the subnet mask is "0" then the corresponding bit in the IP address is part of the host ID.

Subnet masks are expressed in dotted decimal notation just as IP addresses are. The "natural" masks for class A, B and C IP addresses are as follows.

Chart B-3 "Natural" Masks

CLASS	NATURAL MASK
A	255.0.0.0
B	255.255.0.0
C	255.255.255.0

Subnetting

With subnetting, the class arrangement of an IP address is ignored. For example, a class C address no longer has to have 24 bits of network number and 8 bits of host ID. With subnetting, some of the host ID bits are converted into network number bits. By convention, subnet masks always consist of a continuous sequence of ones beginning from the left most bit of the mask, followed by a continuous sequence of zeros, for a total number of 32 bits.

Since the mask is always a continuous number of ones beginning from the left, followed by a continuous number of zeros for the remainder of the 32 bit mask, you can simply specify the number of ones instead of writing the value of each octet. This is usually specified by writing a "/" followed by the number of bits in the mask after the address.

For example, 192.1.1.0 /25 is equivalent to saying 192.1.1.0 with mask 255.255.255.128.

The following table shows all possible subnet masks for a class "C" address using both notations.

Chart B-4 Alternative Subnet Mask Notation

SUBNET MASK IP ADDRESS	SUBNET MASK "1" BITS	LAST OCTET BIT VALUE
255.255.255.0	/24	0000 0000
255.255.255.128	/25	1000 0000
255.255.255.192	/26	1100 0000
255.255.255.224	/27	1110 0000
255.255.255.240	/28	1111 0000
255.255.255.248	/29	1111 1000
255.255.255.252	/30	1111 1100

The first mask shown is the class "C" natural mask. Normally if no mask is specified it is understood that the natural mask is being used.

Example: Two Subnets

As an example, you have a class "C" address 192.168.1.0 with subnet mask of 255.255.255.0.

	NETWORK NUMBER	HOST ID
IP Address	192.168.1.	0
IP Address (Binary)	11000000.10101000.00000001.	00000000
Subnet Mask	255.255.255.	0
Subnet Mask (Binary)	11111111.11111111.11111111.	00000000

The first three octets of the address make up the network number (class "C"). You want to have two separate networks.

Divide the network 192.168.1.0 into two separate subnets by converting one of the host ID bits of the IP address to a network number bit. The "borrowed" host ID bit can be either "0" or "1" thus giving two subnets; 192.168.1.0 with mask 255.255.255.128 and 192.168.1.128 with mask 255.255.255.128.

In the following charts, shaded/bolded last octet bit values indicate host ID bits "borrowed" to form network ID bits. The number of "borrowed" host ID bits determines the number of subnets you can have. The remaining number of host ID bits (after "borrowing") determines the number of hosts you can have on each subnet.

Chart B-5 Subnet 1

	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address	192.168.1.	0
IP Address (Binary)	11000000.10101000.00000001.	**0**0000000
Subnet Mask	255.255.255.	128
Subnet Mask (Binary)	11111111.11111111.11111111.	**1**0000000
Subnet Address: 192.168.1.0		Lowest Host ID: 192.168.1.1
Broadcast Address: 192.168.1.127		Highest Host ID: 192.168.1.126

Chart B-6 Subnet 2

	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address	192.168.1.	128
IP Address (Binary)	11000000.10101000.00000001.	**1**0000000
Subnet Mask	255.255.255.	128
Subnet Mask (Binary)	11111111.11111111.11111111.	**1**0000000
Subnet Address: 192.168.1.128		Lowest Host ID: 192.168.1.129
Broadcast Address: 192.168.1.255		Highest Host ID: 192.168.1.254

The remaining 7 bits determine the number of hosts each subnet can have. Host IDs of all zeros represent the subnet itself and host IDs of all ones are the broadcast address for that subnet, so the actual number of hosts available on each subnet in the example above is $2^7 - 2$ or 126 hosts for each subnet.

192.168.1.0 with mask 255.255.255.128 is the subnet itself, and 192.168.1.127 with mask 255.255.255.128 is the directed broadcast address for the first subnet. Therefore, the lowest IP address that can be assigned to an actual host for the first subnet is 192.168.1.1 and the highest is 192.168.1.126. Similarly the host ID range for the second subnet is 192.168.1.129 to 192.168.1.254.

Example: Four Subnets

The above example illustrated using a 25-bit subnet mask to divide a class “C” address space into two subnets. Similarly to divide a class “C” address into four subnets, you need to “borrow” two host ID bits to give four possible combinations of 00, 01, 10 and 11. The subnet mask is 26 bits (11111111.11111111.11111111.**11**000000) or 255.255.255.192. Each subnet contains 6 host ID bits, giving 2^6-2 or 62 hosts for each subnet (all 0’s is the subnet itself, all 1’s is the broadcast address on the subnet).

Chart B-7 Subnet 1

	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address	192.168.1.	0
IP Address (Binary)	11000000.10101000.00000001.	**00**000000
Subnet Mask (Binary)	11111111.11111111.11111111.	**11**000000
Subnet Address: 192.168.1.0	Lowest Host ID: 192.168.1.1	
Broadcast Address: 192.168.1.63	Highest Host ID: 192.168.1.62	

Chart B-8 Subnet 2

	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address	192.168.1.	64
IP Address (Binary)	11000000.10101000.00000001.	**01**000000
Subnet Mask (Binary)	11111111.11111111.11111111.	**11**000000
Subnet Address: 192.168.1.64	Lowest Host ID: 192.168.1.65	
Broadcast Address: 192.168.1.127	Highest Host ID: 192.168.1.126	

Chart B-9 Subnet 3

	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address	192.168.1.	128
IP Address (Binary)	11000000.10101000.00000001.	**10**000000
Subnet Mask (Binary)	11111111.11111111.11111111.	**11**000000
Subnet Address: 192.168.1.128	Lowest Host ID: 192.168.1.129	
Broadcast Address: 192.168.1.191	Highest Host ID: 192.168.1.190	

Chart B-10 Subnet 4

	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address	192.168.1.	192
IP Address (Binary)	11000000.10101000.00000001.	**11**000000
Subnet Mask (Binary)	11111111.11111111.11111111.	**11**000000
Subnet Address: 192.168.1.192		Lowest Host ID: 192.168.1.193
Broadcast Address: 192.168.1.255		Highest Host ID: 192.168.1.254

Example Eight Subnets

Similarly use a 27-bit mask to create 8 subnets (001, 010, 011, 100, 101, 110).

The following table shows class C IP address last octet values for each subnet.

Chart B-11 Eight Subnets

SUBNET	SUBNET ADDRESS	FIRST ADDRESS	LAST ADDRESS	BROADCAST ADDRESS
1	0	1	30	31
2	32	33	62	63
3	64	65	94	95
4	96	97	126	127
5	128	129	158	159
6	160	161	190	191
7	192	193	222	223
8	224	223	254	255

The following table is a summary for class "C" subnet planning.

Chart B-12 Class C Subnet Planning

NO. "BORROWED" HOST BITS	SUBNET MASK	NO. SUBNETS	NO. HOSTS PER SUBNET
1	255.255.255.128 (/25)	2	126
2	255.255.255.192 (/26)	4	62
3	255.255.255.224 (/27)	8	30
4	255.255.255.240 (/28)	16	14

Chart B-12 Class C Subnet Planning

NO. "BORROWED" HOST BITS	SUBNET MASK	NO. SUBNETS	NO. HOSTS PER SUBNET
5	255.255.255.248 (/29)	32	6
6	255.255.255.252 (/30)	64	2
7	255.255.255.254 (/31)	128	1

Subnetting With Class A and Class B Networks.

For class "A" and class "B" addresses the subnet mask also determines which bits are part of the network number and which are part of the host ID.

A class "B" address has two host ID octets available for subnetting and a class "A" address has three host ID octets (see *Chart B-1*) available for subnetting.

The following table is a summary for class "B" subnet planning.

Chart B-13 Class B Subnet Planning

NO. "BORROWED" HOST BITS	SUBNET MASK	NO. SUBNETS	NO. HOSTS PER SUBNET
1	255.255.128.0 (/17)	2	32766
2	255.255.192.0 (/18)	4	16382
3	255.255.224.0 (/19)	8	8190
4	255.255.240.0 (/20)	16	4094
5	255.255.248.0 (/21)	32	2046
6	255.255.252.0 (/22)	64	1022
7	255.255.254.0 (/23)	128	510
8	255.255.255.0 (/24)	256	254
9	255.255.255.128 (/25)	512	126
10	255.255.255.192 (/26)	1024	62
11	255.255.255.224 (/27)	2048	30

Chart B-13 Class B Subnet Planning

NO. "BORROWED" HOST BITS	SUBNET MASK	NO. SUBNETS	NO. HOSTS PER SUBNET
12	255.255.255.240 (/28)	4096	14
13	255.255.255.248 (/29)	8192	6
14	255.255.255.252 (/30)	16384	2
15	255.255.255.254 (/31)	32768	1

Appendix C
Wireless LAN and IEEE 802.11

A wireless LAN (WLAN) provides a flexible data communications system that you can use to access various services (navigating the Internet, email, printer services, etc.) without the any expensive network cabling infrastructure. In effect a wireless LAN environment provides you the freedom to stay connected to the network while in the coverage area.

Benefits of a Wireless LAN

1. Access to network services in areas otherwise hard or expensive to wire, such as historical buildings, buildings with asbestos materials and classrooms.
2. Doctors and nurses can access a complete patient's profile on a handheld or notebook computer upon entering a patient's room.
3. It allows flexible workgroups a lower total cost of ownership for networks that are frequently reconfigured.
4. Conference room users can access the network as they move from meeting to meeting- accessing up-to-date information that facilitates the ability to communicate decisions "on the fly".
5. It provides campus-wide networking coverage, allowing enterprises the roaming capability to set up easy-to-use wireless networks that transparently covers an entire campus.

IEEE 802.11

The 1997 completion of the IEEE 802.11 standard for wireless LANs (WLANs) was a first important step in the evolutionary development of wireless networking technologies. The standard was developed to maximize interoperability between differing brands of wireless LANs and to introduce a variety of performance improvements and benefits. On September 16, 1999, the 802.11b provided much higher data rates of up to 11Mbps, while maintaining the 802.11 protocol.

The IEEE 802.11 specifies three different transmission methods for the PHY, the layer responsible for transferring data between nodes. Two of the methods use spread spectrum RF signals, Direct Sequence Spread Spectrum (DSSS) and Frequency-Hopping Spread Spectrum (FHSS), in the 2.4 to 2.4825 GHz unlicensed ISM (Industrial, Scientific and Medical) band. The third method is infrared technology, using very high frequencies, just below visible light in the electromagnetic spectrum to carry data.

Ad-hoc Wireless LAN Configuration

The simplest WLAN configuration is an independent (Ad-hoc) WLAN that connects a set of computers with wireless nodes or stations (STA), which is called a Basic Service Set (BSS). In the most basic form, a wireless LAN connects a set of computers with wireless adapters. Any time two or more wireless adapters are within range of each other, they can set up an independent network, which is commonly referred to as an Ad-hoc network or Independent Basic Service Set (IBSS). See the following diagram of an example of an Ad-hoc wireless LAN.

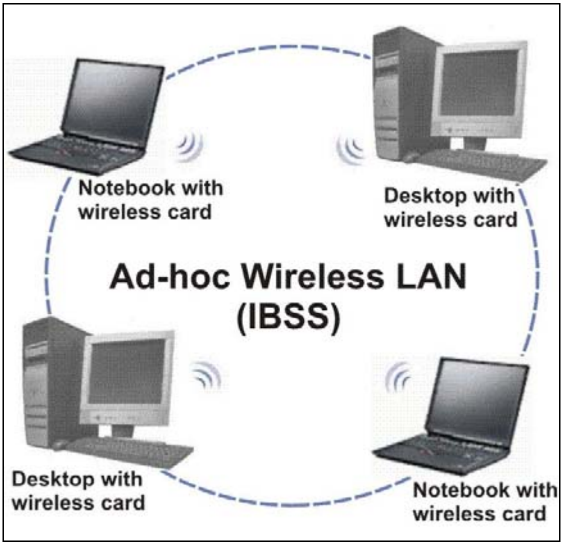

Notebook with wireless card
Desktop with wireless card
Ad-hoc Wireless LAN (IBSS)
Desktop with wireless card
Notebook with wireless card

Diagram C-1 Peer-to-Peer Communication in an Ad-hoc Network

Infrastructure Wireless LAN Configuration

For Infrastructure WLANs, multiple access points (APs) link the WLAN to the wired network and allow users to efficiently share network resources. The Access Points not only provide communication with the wired network but also mediate wireless network traffic in the immediate neighborhood. Multiple access points can provide wireless coverage for an entire building or campus. All communications between stations or between a station and a wired network client go through the access point.

The Extended Service Set (ESS) shown in the next figure consists of a series of overlapping BSSs (each containing an access point) connected together by means of a Distribution System (DS). Although the DS could be any type of network, it is almost invariably an Ethernet LAN. Mobile nodes can roam between access points and seamless campus-wide coverage is possible.

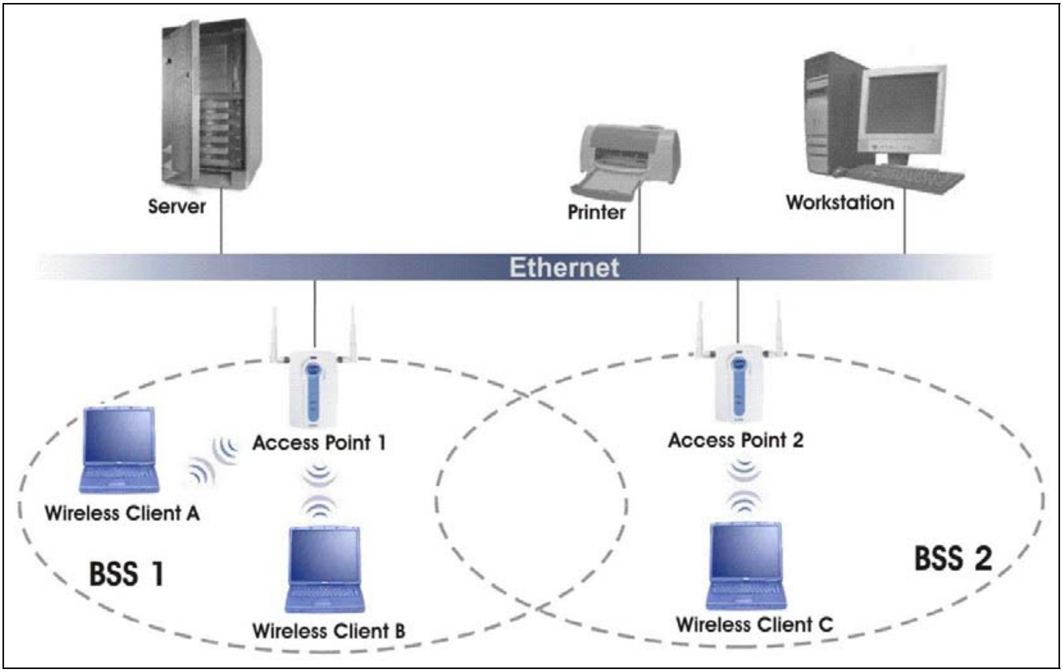


Diagram C-2 ESS Provides Campus-Wide Coverage

Appendix D 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 and 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.

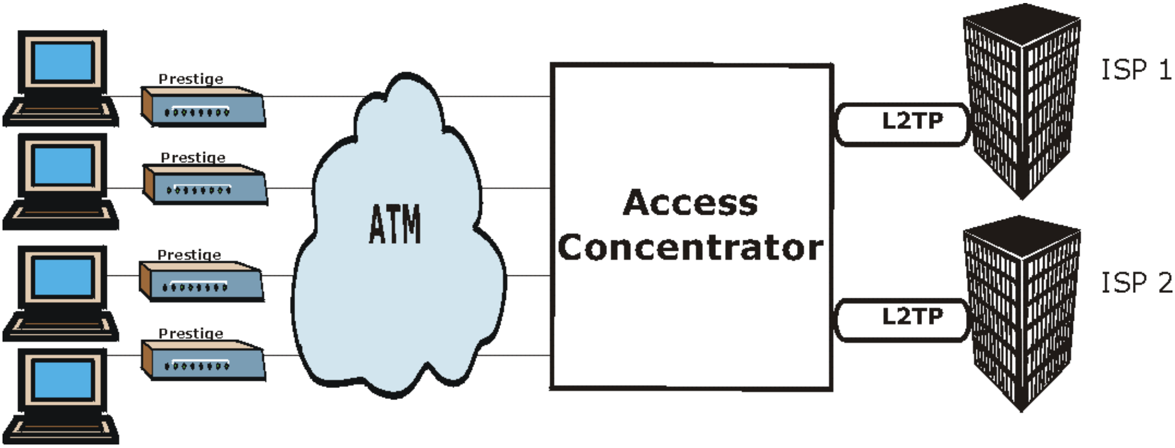


Diagram D-1 Single-PC per Router Hardware Configuration

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.

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.

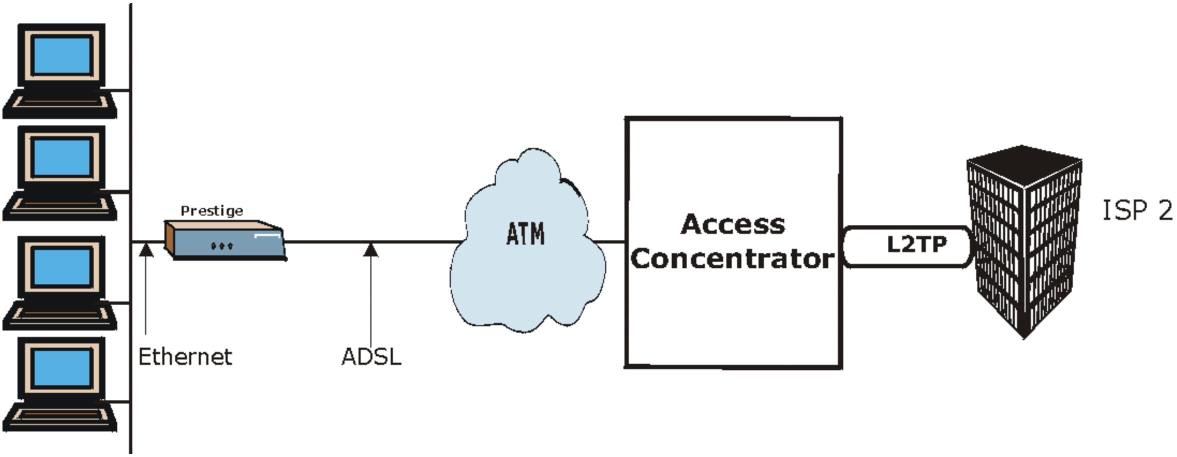


Diagram D-2 Prestige as a PPPoE Client

Appendix E
Virtual Circuit Topology

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

● Virtual Channel	Logical connections between ATM switches
● Virtual Path	A bundle of virtual channels
● Virtual Circuit	A series of virtual paths between circuit end points

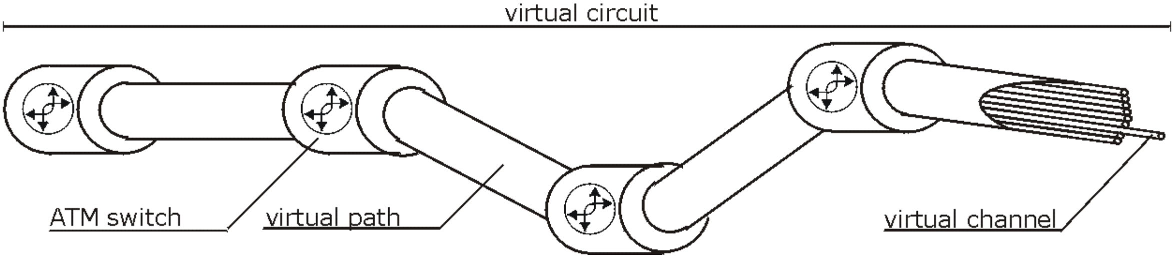


Diagram E-1 Virtual Circuit Topology

Think of a virtual path as a cable that contains a bundle of wires. The cable connects two points and wires within the cable provide individual circuits between the two points. In an ATM cell header, a VPI (Virtual Path Identifier) identifies a link formed by a virtual path; a VCI (Virtual Channel Identifier) identifies a channel within a virtual path.

The VPI and VCI identify a virtual path, that is, termination points between ATM switches. A series of virtual paths make up a virtual circuit.

Your service provider should supply you with VPI/VCI numbers.

Appendix F
Setting up Your Computer's IP Address

All computers must have a 10M or 100M Ethernet adapter card and TCP/IP installed.

Windows 95/98/Me/NT/2000/XP, Macintosh OS 7 and later operating systems and all versions of UNIX/LINUX include the software components you need to install and use TCP/IP on your computer. Windows 3.1 requires the purchase of a third-party TCP/IP application package.

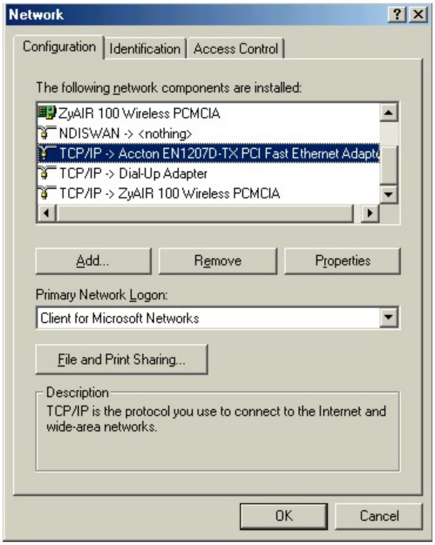
TCP/IP should already be installed on computers using Windows NT/2000/XP, Macintosh OS 7 and later operating systems.

After the appropriate TCP/IP components are installed, configure the TCP/IP settings in order to "communicate" with your network.

If you manually assign IP information instead of using dynamic assignment, make sure that your computers have IP addresses that place them in the same subnet as the Prestige's LAN port.

Windows 95/98/Me

Click **Start**, **Settings**, **Control Panel** and double-click the **Network** icon to open the **Network** window.



The following network components are installed:

- ZyAIR 100 Wireless PCMCIA
- NDISWAN -> <nothing>
- TCP/IP -> Accton EN1207D-TX PCI Fast Ethernet Adapte
- TCP/IP -> Dial-Up Adapter
- TCP/IP -> ZyAIR 100 Wireless PCMCIA

Primary Network Logon: Client for Microsoft Networks

Description
TCP/IP is the protocol you use to connect to the Internet and wide-area networks.

Installing Components

The **Network** window **Configuration** tab displays a list of installed components. You need a network adapter, the TCP/IP protocol and Client for Microsoft Networks.

If you need the adapter:

a. In the **Network** window, click **Add**.

b. Select **Adapter** and then click **Add**.

c. Select the manufacturer and model of your network adapter and then click **OK**.

If you need TCP/IP:

a. In the **Network** window, click **Add**.

b. Select **Protocol** and then click **Add**.

c. Select **Microsoft** from the list of **manufacturers**.

d. Select **TCP/IP** from the list of network protocols and then click **OK**.

If you need Client for Microsoft Networks:

a. Click **Add**.

b. Select **Client** and then click **Add**.

c. Select **Microsoft** from the list of manufacturers.

d. Select **Client for Microsoft Networks** from the list of network clients and then click **OK**.

e. Restart your computer so the changes you made take effect.

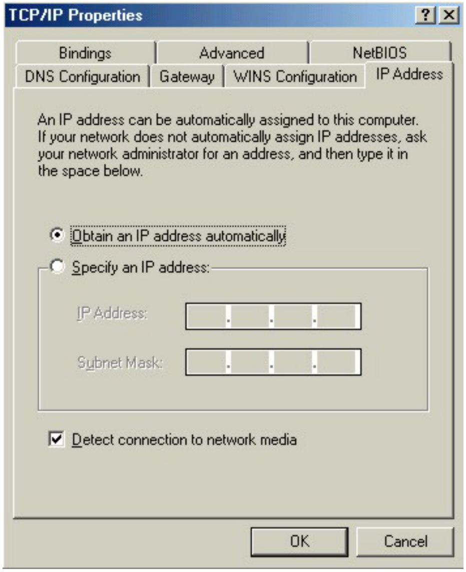
Configuring

1. In the **Network** window **Configuration** tab, select your network adapter's TCP/IP entry and click **Properties**.

2. Click the **IP Address** tab.

   -If your IP address is dynamic, select **Obtain an IP address automatically**.

   -If you have a static IP address, select **Specify an IP address** and type your information into the **IP Address** and **Subnet Mask** fields.



TCP/IP Properties

An IP address can be automatically assigned to this computer. If your network does not automatically assign IP addresses, ask your network administrator for an address, and then type it in the space below.

● Obtain an IP address automatically

○ Specify an IP address:

IP Address: . . .

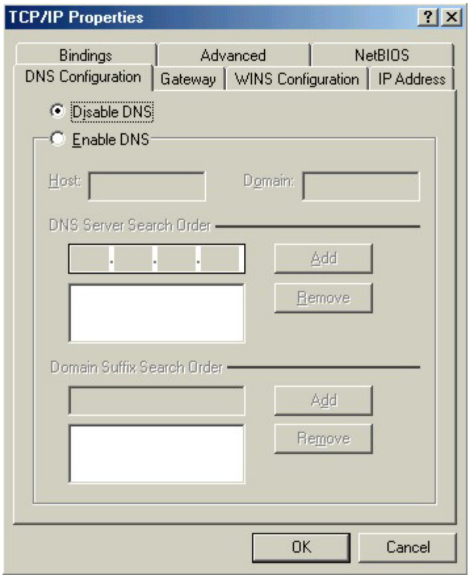
Subnet Mask: . . .

☑ Detect connection to network media

3. Click the **DNS** Configuration tab.

   -If you do not know your DNS information, select **Disable DNS**.

   -If you know your DNS information, select **Enable DNS** and type the information in the fields below (you may not need to fill them all in).



TCP/IP Properties

● Disable DNS

○ Enable DNS

Host: Domain:

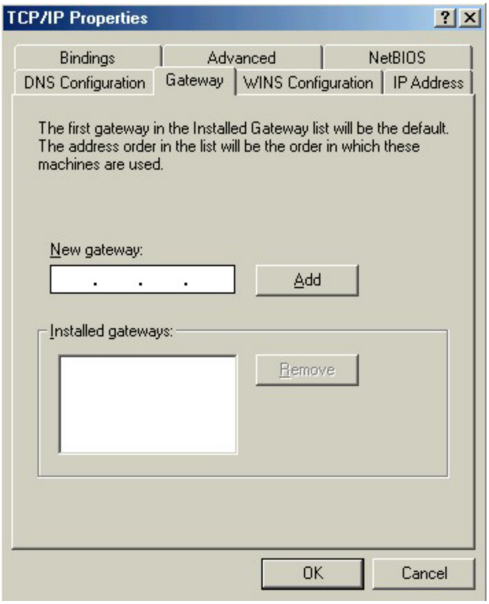
DNS Server Search Order

Domain Suffix Search Order

4. Click the **Gateway** tab.

   -If you do not know your gateway’s IP address, remove previously installed gateways.

   -If you have a gateway IP address, type it in the **New gateway field** and click **Add**.



The first gateway in the Installed Gateway list will be the default. The address order in the list will be the order in which these machines are used.

5. Click **OK** to save and close the **TCP/IP Properties** window.

6. Click **OK** to close the **Network** window. Insert the Windows CD if prompted.

7. Turn on your Prestige and restart your computer when prompted.

Verifying Settings

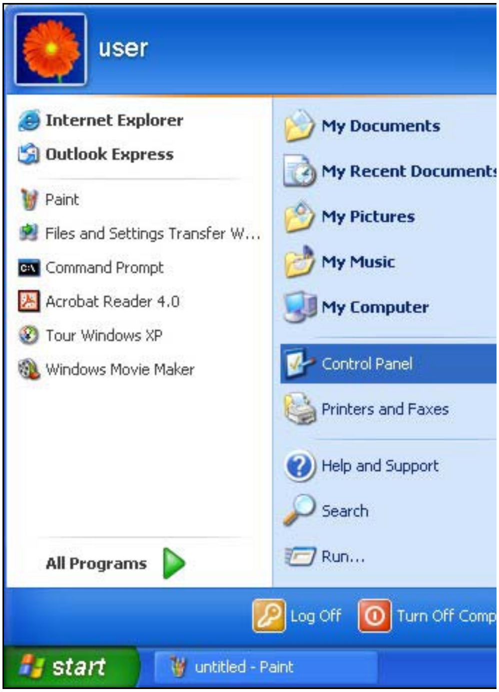
1. Click **Start** and then **Run**.

2. In the **Run** window, type "winipcfg" and then click **OK** to open the **IP Configuration** window.

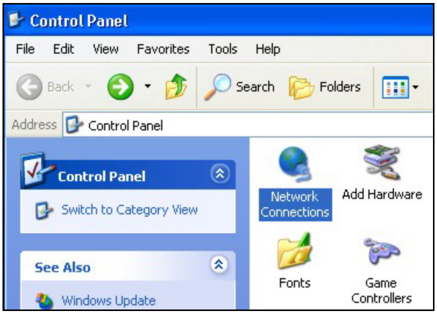
3. Select your network adapter. You should see your computer's IP address, subnet mask and default gateway.

Windows 2000/NT/XP

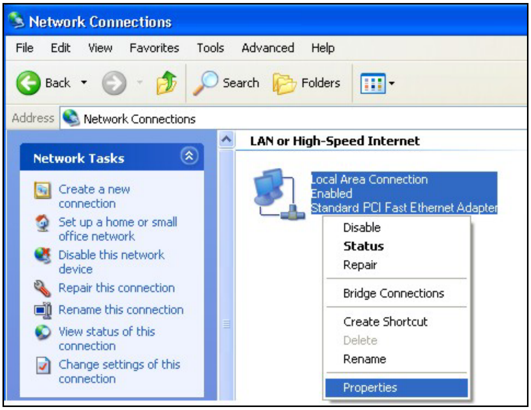
1. For Windows XP, click **start**, **Control Panel**. In Windows 2000/NT, click **Start**, **Settings**, **Control Panel**.



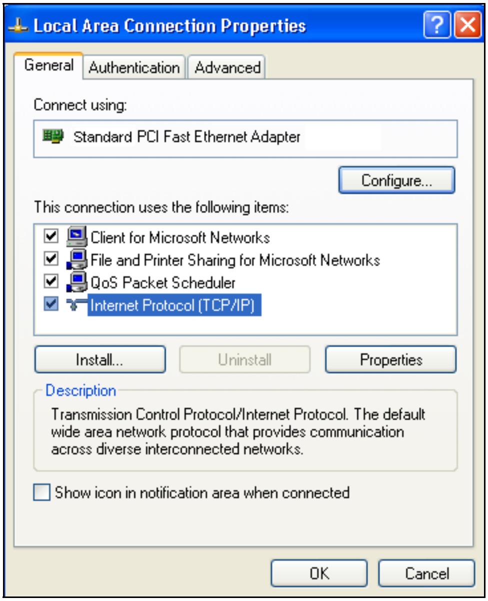
2. For Windows XP, click **Network Connections**. For Windows 2000/NT, click **Network and Dial-up Connections**.



3. Right-click **Local Area Connection** and then click **Properties**.



4. Select **Internet Protocol (TCP/IP)** (under the **General** tab in Win XP) and click **Properties**.



Local Area Connection Properties

Connect using:

Standard PCI Fast Ethernet Adapter

This connection uses the following items:

- ☑ Client for Microsoft Networks
- ☑ File and Printer Sharing for Microsoft Networks
- ☑ QoS Packet Scheduler
- ☑ Internet Protocol (TCP/IP)

Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

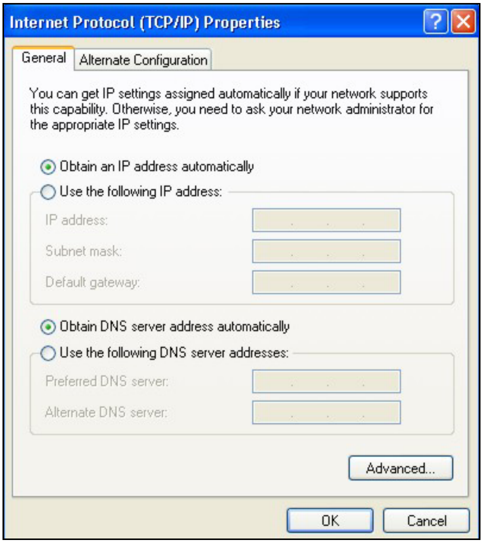
□ Show icon in notification area when connected

5. The **Internet Protocol TCP/IP Properties** window opens (the **General tab** in Windows XP).

   -If you have a dynamic IP address click **Obtain an IP address automatically**.

   -If you have a static IP address click **Use the following IP Address** and fill in the **IP address**, **Subnet mask**, and **Default gateway** fields.

   Click **Advanced**.



Internet Protocol (TCP/IP) Properties

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

● Obtain an IP address automatically

○ Use the following IP address:

IP address: . . .

Subnet mask: . . .

Default gateway: . . .

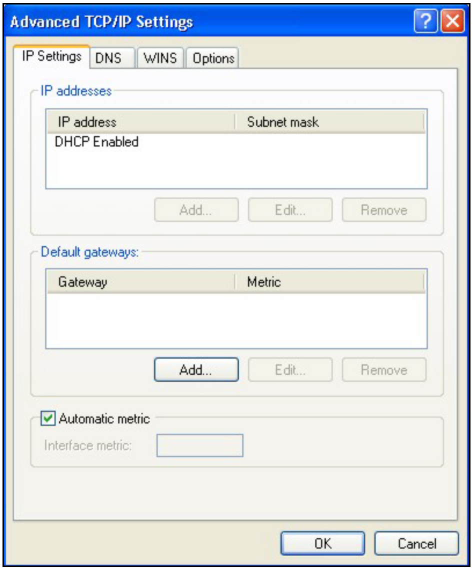
● Obtain DNS server address automatically

○ Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

6. -If you do not know your gateway's IP address, remove any previously installed gateways in the **IP Settin**gs tab and click **OK**.



Advanced TCP/IP Settings

IP addresses

IP address	Subnet mask
DHCP Enabled	

Default gateways:

Gateway	Metric

☑ Automatic metric

Interface metric:

Do one or more of the following if you want to configure additional IP addresses:

-In the **IP Settings** tab, in IP addresses, click **Add**.

-In **TCP/IP Address**, type an IP address in **IP address** and a subnet mask in **Subnet mask**, and then click **Add**.

-Repeat the above two steps for each IP address you want to add.

-Configure additional default gateways in the **IP Settings** tab by clicking **Add** in **Default gateways**.

-In **TCP/IP Gateway Address**, type the IP address of the default gateway in **Gateway**. To manually configure a default metric (the number of transmission hops), clear the **Automatic metric** check box and type a metric in **Metric**.

-Click **Add**.

-Repeat the previous three steps for each default gateway you want to add.

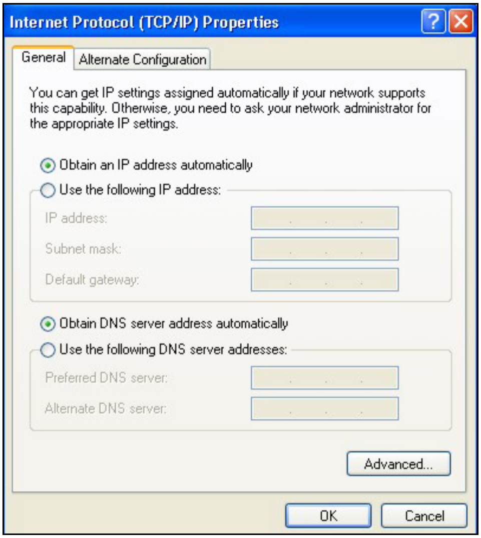
-Click **OK** when finished.

7. In the **Internet Protocol TCP/IP Properties** window (the **General tab** in Windows XP):

   -Click **Obtain DNS server address automatically** if you do not know your DNS server IP address(es).

   -If you know your DNS server IP address(es), click **Use the following DNS server addresses**, and type them in the **Preferred DNS server** and **Alternate DNS server** fields.

   If you have previously configured DNS servers, click **Advanced** and then the **DNS** tab to order them.



Internet Protocol (TCP/IP) Properties

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

● Obtain an IP address automatically

○ Use the following IP address:

IP address:

Subnet mask:

Default gateway:

● Obtain DNS server address automatically

○ Use the following DNS server addresses:

Preferred DNS server:

Alternate DNS server:

8. Click **OK** to close the **Internet Protocol (TCP/IP) Properties** window.

9. Click **OK** to close the **Local Area Connection Properties** window.

10. Turn on your Prestige and restart your computer (if prompted).

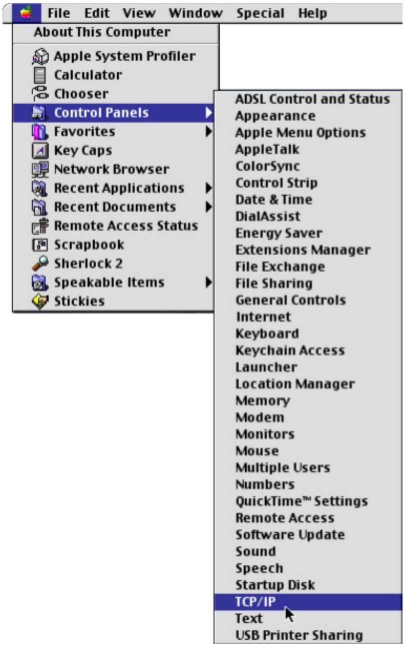
Verifying Settings

1. Click **Start**, **All Programs**, **Accessories** and then **Command Prompt**.

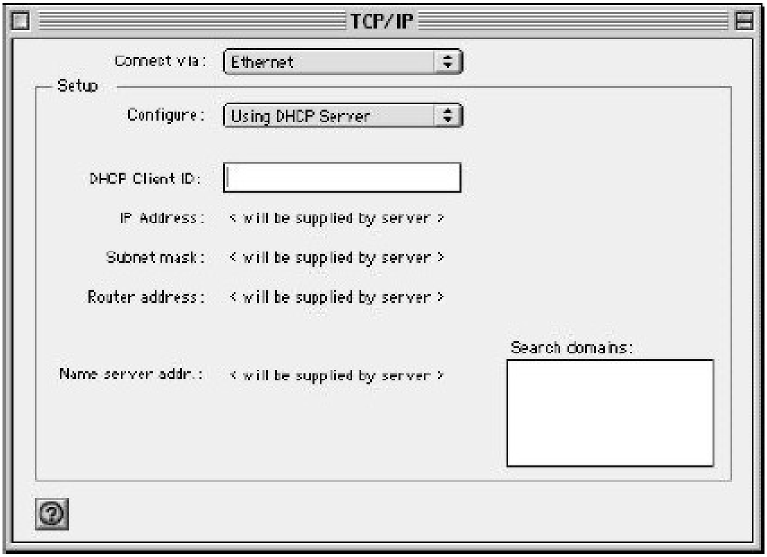
2. In the **Command Prompt** window, type "ipconfig" and then press [ENTER]. You can also open **Network Connections**, right-click a network connection, click **Status** and then click the **Support** tab.

Macintosh OS 8/9

1. Click the **Apple** menu, **Control Panel** and double-click **TCP/IP** to open the **TCP/IP Control Panel**.



2. Select **Ethernet built-in** from the **Connect via** list.



TCP/IP

Connect via: Ethernet

Setup

Configure: Using DHCP Server

DHCP Client ID:

IP Address: < will be supplied by server >

Subnet mask: < will be supplied by server >

Router address: < will be supplied by server >

Name server addr.: < will be supplied by server >

Search domains:

3. For dynamically assigned settings, select **Using DHCP Server** from the **Configure:** list.
4. For statically assigned settings, do the following:

   -From the **Configure** box, select **Manually**.

   -Type your IP address in the **IP Address** box.

   -Type your subnet mask in the **Subnet mask** box.

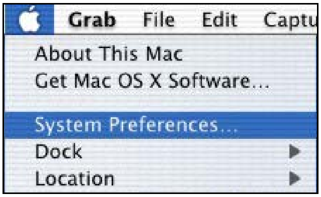
   -Type the IP address of your Prestige in the **Router address** box.
5. Close the **TCP/IP Control Panel**.
6. Click **Save** if prompted, to save changes to your configuration.
7. Turn on your Prestige and restart your computer (if prompted).

Verifying Settings

Check your TCP/IP properties in the **TCP/IP Control Panel** window.

Macintosh OS X

1. Click the **Apple** menu, and click **System Preferences** to open the **System Preferences** window.

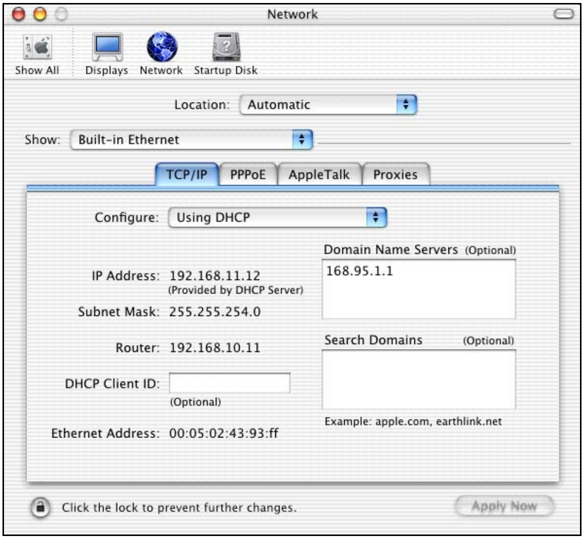


2. Click **Network** in the icon bar.

   - Select **Automatic** from the **Location** list.

   - Select **Built-in Ethernet** from the **Show** list.

   - Click the **TCP/IP** tab.



Location: Automatic

Show: Built-in Ethernet

Configure: Using DHCP

IP Address: 192.168.11.12
(Provided by DHCP Server)

Subnet Mask: 255.255.254.0

Router: 192.168.10.11

DHCP Client ID:
(Optional)

Ethernet Address: 00:05:02:43:93:ff

Domain Name Servers (Optional)
168.95.1.1

Search Domains (Optional)

Example: apple.com, earthlink.net

Click the lock to prevent further changes.

3. For dynamically assigned settings, select **Using DHCP** from the **Configure** list.

4. For statically assigned settings, do the following:

   -From the **Configure** box, select **Manually**.

   -Type your IP address in the **IP Address** box.

   -Type your subnet mask in the **Subnet mask** box.

   -Type the IP address of your Prestige in the **Router address** box.

5. Click **Apply Now** and close the window.

6. Turn on your Prestige and restart your computer (if prompted).

Verifying Settings

Check your TCP/IP properties in the **Network** window.

Appendix G Splitters and Microfilters

This appendix tells you how to install a POTS splitter or a telephone microfilter.

Connecting a POTS Splitter

When you use the Full Rate (G.dmt) ADSL standard, you can use a POTS (Plain Old Telephone Service) splitter to separate the telephone and ADSL signals. This allows simultaneous Internet access and telephone service on the same line. A splitter also eliminates the destructive interference conditions caused by telephone sets.

Install the POTS splitter at the point where the telephone line enters your residence, as shown in the following figure.

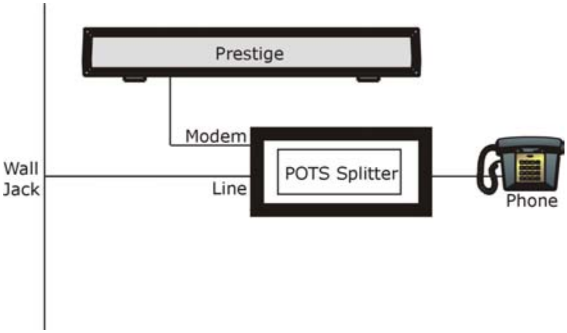


Diagram G-1 Connecting a POTS Splitter

Step 1. Connect the side labeled "Phone" to your telephone.

Step 2. Connect the side labeled "Modem" to your Prestige.

Step 3. Connect the side labeled "Line" to the telephone wall jack.

Telephone Microfilters

Telephone voice transmissions take place in the lower frequency range, 0 - 4KHz, while ADSL transmissions take place in the higher bandwidth range, above 4KHz. A microfilter acts as a low-pass filter, for your telephone, to ensure that ADSL transmissions do not interfere with your telephone voice transmissions. The use of a telephone microfilter is optional.

Step 1. Connect a phone cable from the wall jack to the single jack end of the Y- Connector.

Step 2. Connect a cable from the double jack end of the Y-Connector to the "wall side" of the microfilter.

Step 3. Connect another cable from the double jack end of the Y-Connector to the Prestige.

Step 4. Connect the "phone side" of the microfilter to your telephone as shown in the following figure.

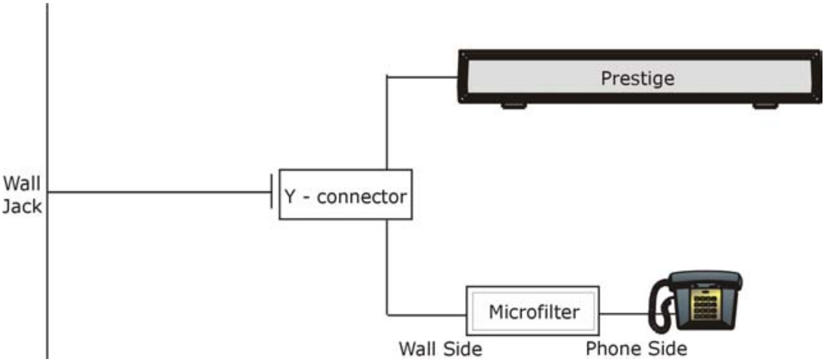


Diagram G-2 Connecting a Microfilter

Prestige With ISDN

This section relates to people who use their Prestige with ADSL over ISDN (digital telephone service) only. The following is an example installation for the Prestige with ISDN.

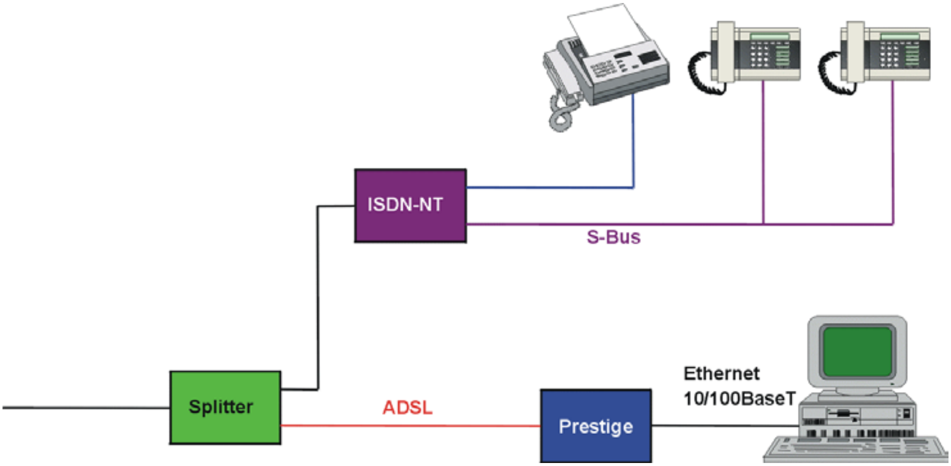


Diagram G-3 Prestige with ISDN

Appendix H
Power Adaptor Specifications

H.1 Prestige 650R-E1/-E3/-E7 ADSL Router

NORTH AMERICA PLUG STANDARDS	
AC Power Adapter model	DV-121AACS
Input power	AC120Volts/60Hz/23W max.
Output power	AC12Volts/1.0A
Power consumption	8 W
Safety standards	UL, CUL (UL 1310, CSA C22.2 No.223)
NORTH AMERICA PLUG STANDARDS	
AC Power Adapter model	AA-121A
Input power	AC120Volts/60Hz/18W max.
Output power	AC12Volts/1.0A
Power consumption	8 W
Safety standards	UL, CUL (UL 1310, CSA C22.2 No.223)
CHINESE PLUG STANDARDS	
AC Power Adapter model	DV-121AACCP-5720
Input power	AC220Volts/50Hz/18W
Output power	AC12Volts/1.0A
Power consumption	8 W
Safety standards	CCEE (GB8898)
CHINESE PLUG STANDARDS	
AC Power Adapter model	BH-48 (AA-121AP)
Input power	AC220Volts/50Hz
Output power	AC12Volts/1.0A

Power consumption	8 W
Safety standards	CCEE (GB8898)
EUROPEAN PLUG STANDARDS	
AC Power Adapter model	DV-121AACCP-5716
Input power	AC230Volts/50Hz/100mA
Output power	AC12Volts/1.0A
Power consumption	8 W
Safety standards	TUV-GS, CE (EN 60950)
EUROPEAN PLUG STANDARDS	
AC Power Adapter model	AA-121ABN
Input power	AC230Volts/50Hz/140mA
Output power	AC12Volts/1.0A
Power consumption	8 W
Safety standards	ITS-GS, CE (EN 60950)
UNITED KINGDOM PLUG STANDARDS	
AC Power Adapter model	AA-121AD
Input power	AC230Volts/50Hz/140mA
Output power	AC12Volts/1.0A
Power consumption	8 W
Safety standards	ITS-GS, CE (EN 60950, BS 7002)

H.2 Prestige 650R-11 ADSL Router

NORTH AMERICA PLUG STANDARDS	
AC Power Adapter model	DV-121AACS
Input power	AC120Volts/60Hz/23W
Output power	AC12Volts/1.0A
Power consumption	10 W
Safety standards	UL, CUL (UL 1310, CSA C22.2 No.223)

CHINESE PLUG STANDARDS	
AC Power Adapter model	DV-121AACCP-5720
Input power	AC220Volts/50Hz/18W
Output power	AC12Volts/1.0A
Power consumption	10 W
Safety standards	CCEE (GB8898)
EUROPEAN PLUG STANDARDS	
AC Power Adapter model	DV-121AACUP-5716
Input power	AC230Volts/50Hz/19W
Output power	AC12Volts/1.0A
Power consumption	10W
Safety standards	TUV, CE (EN 61558)

H.3 Prestige 650R-13/-17 ADSL Ethernet Router

NORTH AMERICA PLUG STANDARDS	
AC Power Adapter model	DV-121AACS
Input power	AC120Volts/60Hz/23W max.
Output power	AC12Volts/1.0A
Power consumption	12 W
Safety standards	UL, CUL (UL 1310, CSA C22.2 No.223)
NORTH AMERICA PLUG STANDARDS	
AC Power Adapter model	AA-121A
Input power	AC120Volts/60Hz/18W max.
Output power	AC12Volts/1.0A
Power consumption	12 W
Safety standards	UL, CUL (UL 1310, CSA C22.2 No.223)
CHINESE PLUG STANDARDS	
AC Power Adapter model	DV-121AACCP-5720

Input power	AC220Volts/50Hz/18W
Output power	AC12Volts/1.0A
Power consumption	12 W
Safety standards	CCEE (GB8898)
EUROPEAN PLUG STANDARDS	
AC Power Adapter model	AA-121ABN
Input power	AC230Volts/50Hz/140mA
Output power	AC12Volts/1.0A
Power consumption	12 W
Safety standards	ITS-GS, CE (EN 60950)

H.4 Prestige 650R-31/-33 ADSL over ISDN Router

NORTH AMERICA PLUG STANDARDS	
AC Power Adapter model	DV-121AACS
Input power	AC120Volts/60Hz/23W max.
Output power	AC12Volts/1.0A
Power consumption	8 W
Safety standards	UL, CUL (UL 1310, CSA C22.2 No.223)
NORTH AMERICA PLUG STANDARDS	
AC Power Adapter model	AA-121A
Input power	AC120Volts/60Hz/18W max.
Output power	AC12Volts/1.0A
Power consumption	8 W
Safety standards	UL, CUL (UL 1310, CSA C22.2 No.223)
CHINESE PLUG STANDARDS	
AC Power Adapter model	DV-121AACCP-5720
Input power	AC220Volts/50Hz/18W
Output power	AC12Volts/1.0A

Power consumption	8 W
Safety standards	CCEE (GB8898)
EUROPEAN PLUG STANDARDS	
AC Power Adapter model	AA-121ABN
Input power	AC230Volts/50Hz/140mA
Output power	AC12Volts/1.0A
Power consumption	8 W
Safety standards	ITS-GS, CE (EN 60950)
EUROPEAN PLUG STANDARDS	
AC Power Adapter model	DV-121AACCP-5716
Input power	AC230Volts/50Hz/100mA
Output power	AC12Volts/1.0A
Power consumption	8 W
Safety standards	TUV-GS, CE (EN 60950)
UNITED KINGDOM PLUG STANDARDS	
AC Power Adapter model	AA-121AD
Input power	AC230Volts/50Hz/140mA
Output power	AC12Volts/1.0A
Power consumption	8 W
Safety standards	ITS-GS, CE (EN 60950)

H.5 Prestige 650H-11/-13 ADSL Router with 4-Port Ethernet Switch

NORTH AMERICA PLUG STANDARDS	
AC Power Adapter model	DV-1215A
Input power	AC120Volts/60Hz/30W
Output power	AC 12Volts/ 1.25A
Power consumption	12 W

Safety standards	UL, CUL, CSA (UL 1310, CSA C22.2 No.223)
NORTH AMERICA PLUG STANDARDS	
AC Power Adapter model	AA-121A25
Input power	AC120Volts/60Hz/19W
Output power	AC 12Volts/ 1.25A
Power consumption	12 W
Safety standards	UL, CUL (UL 1310, CSA C22.2 No.223)
EUROPEAN PLUG STANDARDS	
AC Power Adapter model	**AA-121A3BN**
Input power	AC230Volts/50Hz/140mA
Output power	AC12Volts/1.3A
Power consumption	12 W
Safety standards	ITS-GS, CE (EN 60950)

H.6 Prestige 650HW-11/-13 ADSL Router with 4-Port Ethernet Switch/Wireless LAN

NORTH AMERICA PLUG STANDARDS	
AC Power Adapter model	DV-1215A
Input power	AC120Volts/60Hz/30W
Output power	AC 12Volts/ 1.25A
Power consumption	13 W
Safety standards	UL, CUL, CSA (UL 1310, CSA C22.2 No.223)
NORTH AMERICA PLUG STANDARDS	
AC Power Adapter model	AA-121A25
Input power	AC120Volts/60Hz/19W
Output power	AC 12Volts/ 1.25A
Power consumption	13 W
Safety standards	UL, CUL (UL 1310, CSA C22.2 No.223)

EUROPEAN PLUG STANDARDS	
AC Power Adapter model	**AA-121A3BN**
Input power	AC230Volts/50Hz/140mA
Output power	AC12Volts/1.3A
Power consumption	13 W
Safety standards	ITS-GS, CE (EN 60950)

H.7 Prestige 650HW-31/-33/-37; Prestige 650H-31/-33/-37 ADSL Router with 4-port Switch/Wireless

NORTH AMERICA PLUG STANDARDS	
AC Power Adapter model	DV-1215A
Input power	AC120Volts/60Hz/30W
Output power	AC 12Volts/ 1.25A
Power consumption	15 W
Safety standards	UL, CUL, CSA (UL 1310, CSA C22.2 No.223)
NORTH AMERICA PLUG STANDARDS	
AC Power Adapter model	AA-121A25
Input power	AC120Volts/60Hz/19W
Output power	AC 12Volts/ 1.25A
Power consumption	15 W
Safety standards	UL, CUL (UL 1310, CSA C22.2 No.223)
EUROPEAN PLUG STANDARDS	
AC Power Adapter model	AA-121A3BN
Input power	AC230Volts/50Hz/140mA
Output power	AC12Volts/1.3A
Power consumption	15 W
Safety standards	ITS-GS, CE (EN 60950)
UNITED KINGDOM PLUG STANDARDS	

AC Power Adapter model	AA-121A3D
Input power	AC230Volts/50Hz/140mA
Output power	AC12Volts/1.3A
Power consumption	15 W
Safety standards	ITS-GS, CE (EN 60950)

Appendix I
Index