

# *Prestige 2302R*

*VoIP Station Gateway*

## ***User's Guide***

Version 3.60

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# Federal Communications Commission (FCC) Interference Statement

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

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

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

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

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

## Notice 1

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

## Certifications

Go to [www.zyxel.com](http://www.zyxel.com)

- 1 Select your product from the drop-down list box on the ZyXEL home page to go to that product's page.
- 2 Select the certification you wish to view from this page.

## Safety Warnings

For your safety, be sure to read and follow all warning notices and instructions.

- To reduce the risk of fire, use only No. 26 AWG (American Wire Gauge) or larger telecommunication line cord.
- Do NOT open the device or unit. Opening or removing covers can expose you to dangerous high voltage points or other risks. ONLY qualified service personnel can service the device. Please contact your vendor for further information.
- Use ONLY the dedicated power supply for your device. Connect the power cord or power adaptor to the right supply voltage (110V AC in North America or 230V AC in Europe).
- Do NOT use the device if the power supply is damaged as it might cause electrocution.
- If the power supply is damaged, remove it from the power outlet.
- Do NOT attempt to repair the power supply. Contact your local vendor to order a new power supply.
- Place connecting cables carefully so that no one will step on them or stumble over them. Do NOT allow anything to rest on the power cord and do NOT locate the product where anyone can walk on the power cord.
- If you wall mount your device, make sure that no electrical, gas or water pipes will be damaged.
- Do NOT install nor use your device during a thunderstorm. There may be a remote risk of electric shock from lightning.
- Do NOT expose your device to dampness, dust or corrosive liquids.
- Do NOT use this product near water, for example, in a wet basement or near a swimming pool.
- Make sure to connect the cables to the correct ports.
- Do NOT obstruct the device ventilation slots, as insufficient airflow may harm your device.
- Do NOT store things on the device.
- Connect ONLY suitable accessories to the device.

# ZyXEL Limited Warranty

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

## Note

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

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

# 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	SUPPORT E-MAIL	TELEPHONE <sup>A</sup>	WEB SITE	REGULAR MAIL
LOCATION	SALES E-MAIL	FAX	FTP SITE	
WORLDWIDE	support@zyxel.com.tw	+886-3-578-3942	www.zyxel.com www.europe.zyxel.com	ZyXEL Communications Corp. 6 Innovation Road II Science Park Hsinchu 300 Taiwan
	sales@zyxel.com.tw	+886-3-578-2439	ftp.zyxel.com ftp.europe.zyxel.com	
NORTH AMERICA	support@zyxel.com	+1-800-255-4101 +1-714-632-0882	www.us.zyxel.com	ZyXEL Communications Inc. 1130 N. Miller St. Anaheim CA 92806-2001 U.S.A.
	sales@zyxel.com	+1-714-632-0858	ftp.us.zyxel.com	
GERMANY	<a href="mailto:support@zyxel.de">support@zyxel.de</a>	+49-2405-6909-0	www.zyxel.de	ZyXEL Deutschland GmbH. Adenauerstr. 20/A2 D-52146 Wuerselen Germany
	sales@zyxel.de	+49-2405-6909-99		
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		+33 (0)4 72 52 19 20		
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	<a href="mailto:sales@zyxel.es">sales@zyxel.es</a>	+34 913 005 345		
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	sales@zyxel.fi	+358-9-4780 8448		

a. "+" is the (prefix) number you enter to make an international telephone call.





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# Preface

Congratulations on your purchase of the Prestige 2302R VoIP station gateway.

**Note:** Register your product online to receive e-mail notices of firmware upgrades and information at [www.zyxel.com](http://www.zyxel.com) for global products, or at [www.us.zyxel.com](http://www.us.zyxel.com) for North American products.

Your Prestige is easy to install and configure.

## About This User's Guide

This User's Guide is designed to guide you through the configuration of your Prestige using the web configurator or the SMT. 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 solely on features not configurable by web configurator.

**Note:** 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.

## Related Documentation

- Supporting Disk

Refer to the included CD for support documents.

- Quick Start Guide

The Quick Start Guide is designed to help you get up and running right away. It contains a detailed easy-to-follow connection diagram, and information on setting up your network and configuring for Internet access.

- 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](http://www.zyxel.com) for an online glossary of networking terms and additional support documentation.










## User Guide Feedback

Help us help you. E-mail all User Guide-related comments, questions or suggestions for improvement to [techwriters@zyxel.com.tw](mailto: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.

## Syntax Conventions

- “Enter” means for you to type one or more characters. “Select” or “Choose” means for you to use one predefined choices.
- 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 2302R may be referred to as the Prestige or the device in this user’s guide.

## Graphics Icons Key

<p>Prestige</p> 	<p>Computer</p> 	<p>Notebook Computer</p> 
<p>Server</p> 	<p>Switch</p> 	<p>Router</p> 
<p>Telephone</p> 	<p>Modem</p> 	<p>Trunking Gateway</p> 

# CHAPTER 1

## Introducing the Prestige

This chapter introduces the main features and applications of the Prestige.

### 1.1 Prestige 2302R VoIP Station Gateway Series Overview

The Prestige 2302R VoIP (Voice over IP) station gateway lets you use traditional analog telephones to make telephone calls over the Internet. The Prestige uses SIP (Session Initiation Protocol), an internationally recognized standard for implementing VoIP.

You can call any landline or mobile telephone as well as IP telephones. You don't need to know if the recipient's connection type is an IP, cellular or landline based service. Calls received from IP telephones work exactly as you would expect from the traditional telephone service.

The NAT and DHCP server features allow you to use an Ethernet hub or switch to set up a private network and allow multiple computers to share a single Internet connection.

The Prestige's web configurator allows easy management and configuration. See your User's Guide for more details on all Prestige features.

The Prestige 2302RL adds the PSTN (Public Switched Telephone Network) lifeline feature. PSTN lifeline lets you have VoIP phone service and PSTN phone service at the same time.

### 1.2 Features

Your Prestige is packed with a number of features that make it flexible and easy to use.

#### **10/100Mbps Auto-negotiating Fast Ethernet Interfaces**

The 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.

#### **Auto-crossover 10/100 Mbps Ethernet Interfaces**

The Ethernet interfaces automatically adjust to either a crossover or straight-through Ethernet cable.

#### **Reset Button**

The Prestige reset button is built into the rear panel. Use this button to restore the factory default password to 1234; IP address to 192.168.1.1, subnet mask to 255.255.255.0 and DHCP server enabled with a pool of 32 IP addresses starting at 192.168.1.33.

## Multiple Telephones

A Ringer Equivalence Number (REN) is used to determine the number of devices that may be connected to the telephone line. The Prestige has a REN of five, which means it can support five devices per telephone port.

## PSTN Lifeline

The Prestige 2302RL has a **LINE** port for connecting a PSTN line. You can receive incoming PSTN phone calls even while someone else connected to the Prestige is making VoIP phone calls. You can dial a (prefix) number to make an outgoing PSTN call. You can still make PSTN phone calls if the Prestige 2302RL loses power.

## Dynamic Jitter Buffer

The Prestige has a built-in adaptive, buffer that helps to smooth out the variations in delay (jitter) for voice traffic. This helps ensure good voice quality for your conversations.

## Standards Compliance

The Prestige complies with the following standards.

- SIP version 2 (RFC 3261)
- SDP (RFC 2327)
- RTP (RFC 1889)
- RTCP (RFC 1890)
- SIP NAT Traversal (STUN) (RFC 3489)

## Multiple SIP Accounts

The Prestige allows you to simultaneously use multiple voice (SIP) accounts and assign them to one or both telephone ports.

## STUN

Simple Traversal of User Datagram Protocol (UDP) through Network Address Translators (STUN) allows SIP to pass through NAT routers.

## Outbound Proxy

Some VoIP service providers use a SIP outbound server to handle voice calls. This allows the Prestige to work from behind any type of NAT router and eliminates the need for STUN or a SIP ALG (Application Layer Gateway).

## Multiple Voice Channels

The Prestige can simultaneously handle multiple voice channels (telephone calls). Additionally you can answer an incoming phone call on a VoIP account, even while someone else is using the account for a phone call.

## Voice Coding

The Prestige can use the following voice codecs (coder/decoders).



- G.711
- G.729

### **Voice Activity Detection/Silence Suppression**

Voice Activity Detection (VAD) reduces the bandwidth that a call uses by not transmitting “silent packets” when you are not speaking.

### **Comfort Noise Generation**

When the Prestige uses VAD, it generates and sends comfort (background) noise when you are not speaking.

### **Echo Cancellation**

The Prestige supports G.168, an ITU-T standard for eliminating the echo caused by the sound of your voice reverberating in the telephone receiver while you talk.

### **QoS (Quality of Service)**

Quality of Service (QoS) mechanisms help to provide better service on a per-flow basis. The Prestige supports Type of Service (ToS) and Differentiated Services (DiffServ). This allows the Prestige to tag voice frames so they can be prioritized over the network.

### **Fax Tone Detection and Pass-through**

The Prestige automatically detects fax messages and sends them over PCM G.711.

### **Auto Provisioning**

Auto provisioning automatically updates your Prestige's configurable settings via a TFTP, HTTP or HTTPS server.

### **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).

### **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.

## **DHCP (Dynamic Host Configuration Protocol)**

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

## **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.

## **Port Forwarding**

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

## **Dynamic DNS Support**

With Dynamic DNS (Domain Name System) 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 service provider.

## **IP Multicast**

Deliver IP packets to a specific group of hosts using IP multicast. IGMP (Internet Group Management Protocol) is the protocol used to support multicast groups. The latest version is version 2 (see RFC 2236); the Prestige supports both versions 1 and 2.

## **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 LAN interface with the Prestige itself as the gateway for each network.

## **PPPoE**

PPPoE (Point-to-Point Protocol over Ethernet) facilitates the interaction of a host with an Internet modem to achieve access to high-speed data networks via a familiar "dial-up networking" user interface.

## **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 a TCP/IP-based network.

PPTP supports on-demand, multi-protocol and virtual private networking over public networks, such as the Internet. The Prestige supports one PPTP server connection at any given time.

## **RoadRunner Support**

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

## **Firmware Upgrades**

Use the web configurator to upload updated firmware to your Prestige.

## **Embedded FTP and TFTP Servers**

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

## **SNMP**

SNMP (Simple Network Management Protocol) is a protocol used for exchanging management information between network devices. SNMP is a member of the TCP/IP protocol suite. Your Prestige supports SNMP agent functionality, which allows a manager station to manage and monitor the Prestige through the network. The Prestige supports SNMP version one (SNMPv1) and version two (SNMPv2).

## **Logging and Tracing**

- Built-in message logging and packet tracing.
- Syslog facility support.

## **Ease of Installation**

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

## **1.3 LEDs**

The following graphic displays the labels of the LEDs.

**Figure 1** LEDs



**Table 1** LED Descriptions

LED	COLOR	STATUS	DESCRIPTION
PWR/VoIP	Green	On	The Prestige is receiving power.
		Blinking	The Prestige is self-testing.
	Orange	On	The VoIP SIP registration was successful.
		Off	The Prestige is not receiving power.
WAN	Green	On	The Prestige has an Ethernet connection with the cable/DSL modem.
		Blinking	The Prestige is sending/receiving data to /from the cable/DSL modem.
		Off	The Prestige doesn't have an Ethernet connection with the cable/DSL modem.
LAN	Green	On	The Prestige has an Ethernet connection with a computer.
		Blinking	The Prestige is sending/receiving data to /from the computer.
		Off	The Prestige does not have an Ethernet connection with a computer.
Phone 1-2	Green	On	The telephone(s) connected to this port is (are) in use.
		Blinking	The telephone(s) connected to this port is (are) ringing.
		Off	The telephone(s) connected to this port is (are) not in use.

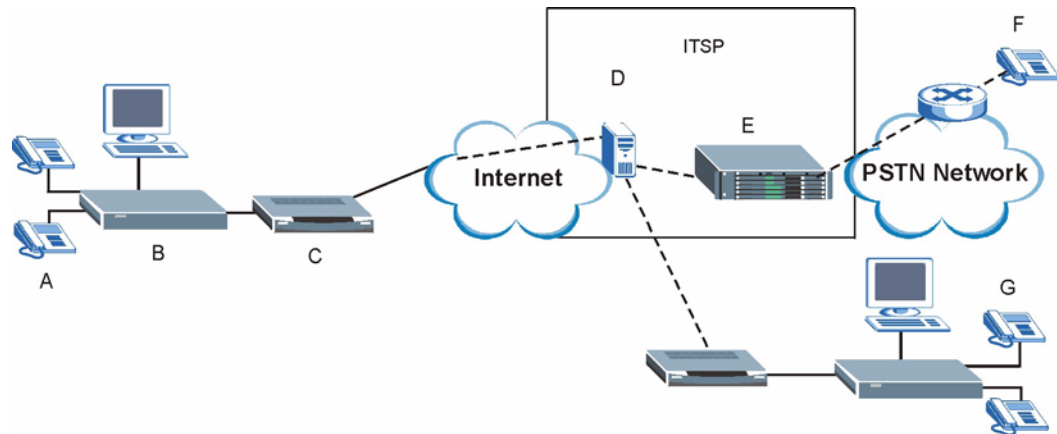
## 1.4 Applications

Here are some examples of how you can use your Prestige.

### 1.4.1 Make Calls via Internet Telephony Service Provider

In a home or small office environment, you can use the Prestige to make and receive VoIP telephone calls through an Internet Telephony Service Provider (ITSP).

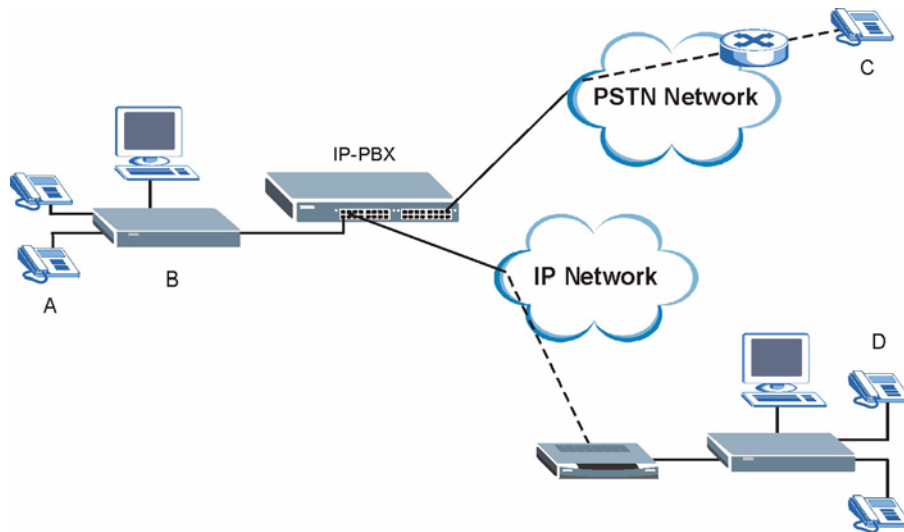
The following figure shows a basic example of how you would make a VoIP call through an ITSP. You use your analog phone (A in the figure) and the Prestige (B) changes the call into VoIP. The Prestige then sends your call through your modem or router (C) to the Internet and the ITSP's SIP server (D). The VoIP call server forwards calls to PSTN phones (F) through a trunking gateway (E) to the PSTN network. The VoIP call server forwards calls to IP phones (G) through the Internet.

**Figure 2** Internet Telephony Service Provider Application

### 1.4.2 Make Calls via IP-PBX

If your company has an IP-PBX (Internet Protocol Private Branch Exchange), you can use the Prestige to make and receive VoIP telephone calls through it.

In this example, you use your analog phone (A in the figure) and the Prestige (B) changes the call into VoIP and sends it to the IP-PBX. The IP-PBX forwards calls to PSTN phones (C) to the PSTN network. The IP-PBX forwards calls to IP phones (D) through an IP network (this could include the Internet).

**Figure 3** IP-PBX Application



# CHAPTER 2

## Introducing the Web Configurator

This chapter describes how to access the Prestige web configurator and provides an overview of its screens.

### 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

- 1 Make sure your Prestige hardware is properly connected and prepare your computer/ computer network to connect to the Prestige (refer to [Appendix B on page 275](#)).
- 2 Launch your web browser.
- 3 Type "192.168.1.1" (the Prestige's default LAN IP address) as the URL.

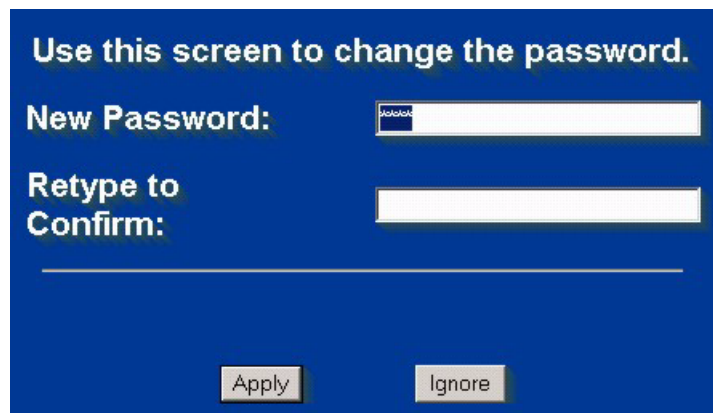
**Figure 4** Web Site Address



- 4 Type "1234" (default) as the password and click **Login**. In some versions, the default password appears automatically - if this is the case, click **Login**.

**Figure 5** Enter Password

- 5** You should see a screen asking you to change your password (highly recommended) as shown next. Type a new password (and retype it to confirm) and click **Apply** or click **Ignore**.

**Figure 6** Change Password

- 6** You should now see the web configurator **MAIN MENU** screen ([Figure 7 on page 42](#)).

**Note:** The Prestige automatically logs you out if the management session is idle for five minutes. Simply log back in if this happens to you.

## 2.3 Resetting the Prestige

If you forget your password or cannot access the web configurator, 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. The password will also be reset to “1234”.

### 2.3.1 Procedure To Use The Reset Button

Make sure the **PWR/VoIP** LED is on (not blinking) before you begin this procedure.



- 1** Press the **RESET** button for five to ten seconds (release it when the **PWR/VoIP** LED begins to blink). When the **PWR/VoIP** LED starts blinking, the defaults have been restored and the Prestige restarts. Otherwise, go to step 2.
- 2** Disconnect and reconnect the Prestige's power.
- 3** Wait for the **PWR/VoIP** LED to stop blinking and stay on steady.
- 4** Press the **RESET** button for five to ten seconds (release it when the **PWR/VoIP** LED begins to blink). When the **PWR/VoIP** LED starts blinking, the defaults have been restored and the Prestige restarts. Otherwise, go to step 2.

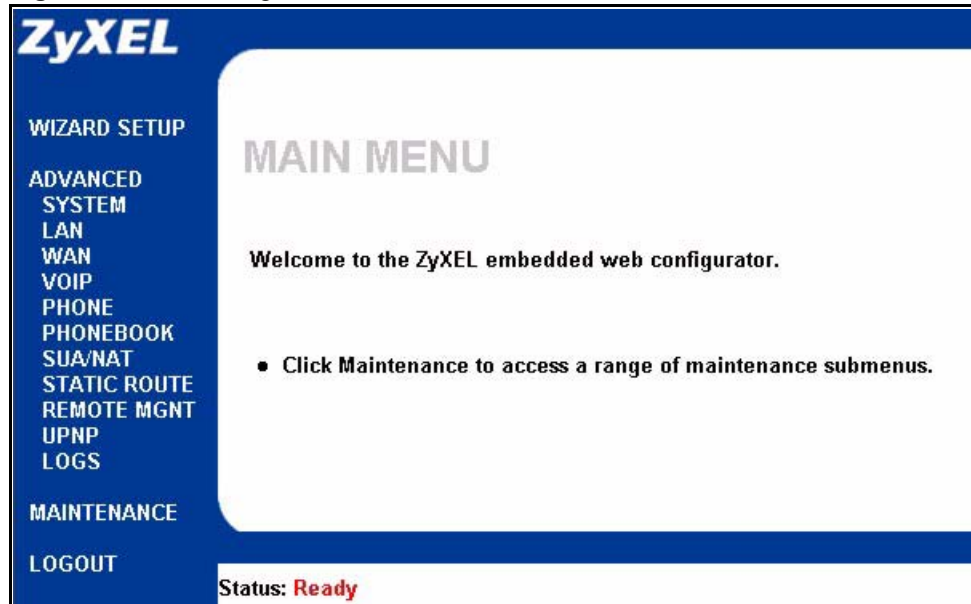
## 2.4 Navigating the Prestige Web Configurator

The following summarizes how to navigate the web configurator from the **MAIN MENU** screen.

**Note:** Click the Help icon (located in the top right corner of most screens) to view online help.

- Click **WIZARD** for initial configuration.
- Click a link under **ADVANCED** to configure Prestige features.
- Click **MAINTENANCE** to view information about your Prestige or upgrade configuration/firmware files. Maintenance includes the **Status**, **DHCP Table**, **F/W** (firmware) **Upload**, **Configuration** (Backup, Restore, Defaults) and **Restart** screens.
- Click **LOGOUT** at any time to exit the web configurator.

**Figure 7** Web Configurator



The following table describes the sub-menus.

**Table 2** Web Configurator Screens Summary

LINK	TAB	FUNCTION
WIZARD SETUP		Use these screens for initial configuration including general setup, ISP parameters for Internet Access, WAN IP/DNS Server/MAC address assignment and VoIP.
SYSTEM	General	Use this screen to configure general system settings.
	DDNS	Use this screen to set up dynamic DNS.
	Password	Use this screen to change your password.
	Time Setting	Use this screen to change your Prestige's time and date.
LAN	IP	Use this screen to configure LAN DHCP and TCP/IP settings.
	Static DHCP	Use this screen to assign fixed IP addresses on the LAN.
	IP Alias	Use this screen to partition your LAN interface into subnets.
WAN	Route	This screen allows you to configure route priority.
	WAN ISP	Use this screen to change your Prestige's WAN ISP settings.
	WAN IP	Use this screen to change your Prestige's WAN IP settings.
	WAN MAC	Use this screen to change your Prestige's WAN MAC settings.
	Traffic Redirect	Use this screen to configure your traffic redirect properties and parameters.
VOIP	VoIP	Use this screen to configure your Prestige's Voice over IP settings.
	QoS	Use this screen to configure your Prestige's Quality of Service settings.
PHONE	Phone Port	Use this screen to configure your Prestige's phone settings.

**Table 2** Web Configurator Screens Summary (continued)

LINK	TAB	FUNCTION
PHONE BOOK	Speed Dial	Use this screen to configure speed dial for SIP phone numbers that you call often.
	Lifeline	Use this screen to configure your Prestige's settings for PSTN calls (Prestige 2302RL only).
SUA/NAT	SUA Server	Use this screen to configure servers behind the Prestige.
	Address Mapping	Use this screen to configure network address translation mapping rules.
	Trigger Port	Use this screen to change your Prestige's trigger port settings.
STATIC ROUTE	IP Static Route	Use this screen to configure IP static routes.
REMOTE MGMT	WWW	Use this screen to configure through which interface(s) and from which IP address(es) users can use HTTP to manage the Prestige.
	TELNET	Use this screen to configure through which interface(s) and from which IP address(es) users can use Telnet to manage the Prestige.
	FTP	Use this screen to configure through which interface(s) and from which IP address(es) users can use FTP to access the Prestige.
	SNMP	Use this screen to configure your Prestige's settings for Simple Network Management Protocol management.
	DNS	Use this screen to configure through which interface(s) and from which IP address(es) users can send DNS queries to the Prestige.
	Security	Use this screen to change your anti-probing settings.
UPnP	UPnP	Use this screen to enable UPnP on the Prestige.
LOGS	View Log	Use this screen to view the logs for the categories that you selected.
	Log Settings	Use this screen to change your Prestige's log settings.
MAINTENANCE	Status	This screen contains administrative and system-related information.
	F/W Upload	Use this screen to upload firmware to your Prestige
	Configuration	Use this screen to backup and restore the configuration or reset the factory defaults to your Prestige.
	Restart	This screen allows you to reboot the Prestige without turning the power off.
LOGOUT		Click this label to exit the web configurator.

## 2.5 Common Screen Command Buttons

The following table shows common command buttons found on many web configurator screens.

**Table 3** Common Screen Command Buttons

Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset/Cancel	Click <b>Reset</b> or <b>Cancel</b> to begin configuring this screen afresh.



# CHAPTER 3

## System Screens

This chapter provides information on the **SYSTEM** screens.

### 3.1 System Overview

This chapter describes how to configure the Prestige's general, DDNS, password and time settings.

### 3.2 DNS Overview

You can configure DNS (Domain Name System) setup in the following places.

- 1 Use the **SYSTEM General** screen to configure the Prestige to use a DNS server to resolve domain names for Prestige system features like DDNS and the time server.
- 2 Use the **LAN IP** screen to configure the DNS server information that the Prestige sends to the DHCP client devices on the LAN.
- 3 Use the **Remote Management DNS** screen to configure the Prestige to accept or discard DNS queries.

### 3.3 General Screen

The **General** screen contains administrative and system-related information. **System Name** is for identification purposes. However, because some ISPs check this name you should enter your computer's "Computer Name".

- In Windows 95/98 click **Start, Settings, Control Panel, Network**. Click the **Identification** tab, note the entry for the **Computer Name** field and enter it as the **System Name**.
- In Windows 2000, click **Start, Settings and 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 **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**.

### 3.3.1 Domain 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.

### 3.3.2 DNS Server Address Assignment

Use DNS (Domain Name System) to map a domain name to its corresponding IP address and vice versa, for instance, the IP address of www.zyxel.com is 204.217.0.2. The DNS server is extremely important because without it, you must know the IP address of a computer before you can access it.

The Prestige can get the DNS server addresses in the following ways.

- 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 the **SYSTEM General** screen.
- 2** If the ISP did not give you DNS server information, leave the **DNS Server** fields in the **SYSTEM General** screen set to 0.0.0.0 for the ISP to dynamically assign the DNS server IP addresses.

## 3.4 System General Configuration

Click **SYSTEM** in the navigation panel and then **General** to display the following screen.

**Figure 8** System General

The following table describes the labels in this screen.

**Table 4** System General

LABEL	DESCRIPTION
System Name	This is for identification purposes. Enter your computer's "Computer Name". This name can be up to 30 alphanumeric characters long. Spaces are not allowed, but dashes "-" and underscores "_" are accepted.
Domain 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. Use up to 38 alphanumeric characters. Spaces are not allowed, but dashes "-" and periods "." are accepted.
Administrator Inactivity Timer	Type how many minutes a management session can be left idle before the session times out. The default is 5 minutes. After it times out you have to log in with your password again. Very long idle timeouts may have security risks. A value of "0" means a management session never times out, no matter how long it has been left idle (not recommended).
System DNS Servers	DNS (Domain Name System) is for mapping a domain name to its corresponding IP address and vice versa, e.g., the IP address of www.zyxel.com is 204.217.0.2. The DNS server is extremely important because without it, you must know the IP address of a computer before you can access it.
First DNS Server Second DNS Server Third DNS Server	Select <b>From ISP</b> if your ISP dynamically assigns DNS server information (and the Prestige's WAN IP address). The field to the right displays the (read-only) DNS server IP address that the ISP assigns. Select <b>User-Defined</b> if you have the IP address of a DNS server. Enter the DNS server's IP address in the field to the right. Select <b>None</b> if you do not want to configure DNS servers. If you do not configure a system DNS server, you must use IP addresses when configuring DDNS and the time server.

**Table 4** System General (continued)

LABEL	DESCRIPTION
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.

## 3.5 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 domain name (for instance myhost.dns.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](http://www.dyndns.org). This is for people with a dynamic IP from their ISP or DHCP server that would still like to have a domain name. The Dynamic DNS service provider will give you a password or key.

### 3.5.1 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](http://www.yourhost.dyndns.org) and still reach your hostname.

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

## 3.6 Configuring Dynamic DNS

To change your Prestige's DDNS, click **SYSTEM**, then the **DDNS** tab. The screen appears as shown.



**Figure 9** DDNS

The following table describes the labels in this screen.

**Table 5** DDNS

LABEL	DESCRIPTION
Enable DDNS	Select this check box to use dynamic DNS.
Service Provider	Select the name of your Dynamic DNS service provider.
DDNS Type	Select the type of service that you are registered for from your Dynamic DNS service provider.
Host Names 1~3	Enter the host names in the three fields provided. You can specify up to two host names in each field separated by a comma (",").
User Name	Enter your user name.
Password	Enter the password assigned to you.
Enable Wildcard Option	Select the check box to enable DynDNS Wildcard.
Enable off line option (Only applies to custom DNS)	This option is available when <b>CustomDNS</b> is selected in the <b>DDNS Type</b> field. Check with your Dynamic DNS service provider to have traffic redirected to a URL (that you can specify) while you are off line.
IP Address Update Policy:	
Use WAN IP Address	Select this option to have the Prestige update the domain name with the WAN port's IP address.

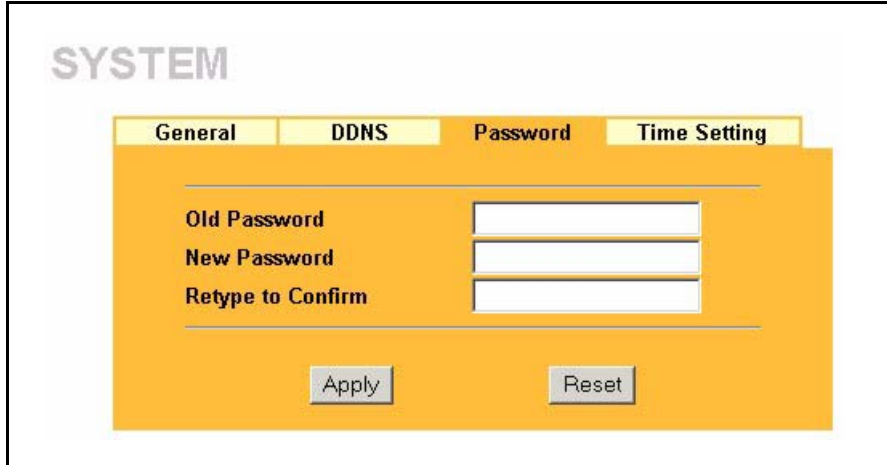
**Table 5** DDNS

LABEL	DESCRIPTION
DDNS server auto detect IP Address	Select this option to update the IP address of the host name(s) automatically by the DDNS server. It is recommended that you select this option. Select this option only when there are one or more NAT routers between the Prestige and the DDNS server. This feature has the DDNS server automatically detect and use the IP address of the NAT router that has a public IP address. <b>Note:</b> The DDNS server may not be able to detect the proper IP address if there is an HTTP proxy server between the Prestige and the DDNS server.
Use Specified IP Address	Select this option to update the IP address of the host name(s) to the IP address specified below. Use this option if you have a static IP address.
IP Addr:	Enter the IP address if you select the <b>User Specify</b> option.
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.

### 3.7 Configuring Password

To change your Prestige's password (recommended), click **SYSTEM** in the navigation panel, and then the **Password** tab. The screen appears as shown.

**Figure 10** Password



The following table describes the labels in this screen.

**Table 6** 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 (up to 30 characters). Note that as you type a password, the screen displays an asterisk (*) for each character you type.
Retype to Confirm	Type the new password again in this field.

**Table 6** Password (continued)

LABEL	DESCRIPTION
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.

## 3.8 Pre-defined NTP Time Servers List

The Prestige uses the following pre-defined list of NTP time servers if you do not specify a time server or it cannot synchronize with the time server you specified.

**Note:** The Prestige can use this pre-defined list of time servers regardless of the Time Protocol you select.

When the Prestige uses the pre-defined list of NTP time servers, it randomly selects one server and tries to synchronize with it. If the synchronization fails, then the Prestige goes through the rest of the list in order from the first one tried until either it is successful or all the pre-defined NTP time servers have been tried.

**Table 7** Pre-defined NTP Time Servers

ntp1.cs.wisc.edu
ntp1.gbg.netnod.se
ntp2.cs.wisc.edu
tock.usno.navy.mil
ntp3.cs.wisc.edu
ntp.cs.strath.ac.uk
ntp1.sp.se
time1.stupi.se
tick.stdtime.gov.tw
tock.stdtime.gov.tw
time.stdtime.gov.tw

## 3.9 Configuring Time Setting

To change your Prestige's time and date, click **SYSTEM** in the navigation panel, then the **Time Setting** tab. The screen appears as shown. Use this screen to configure the Prestige's time based on your local time zone.

**Figure 11** Time Setting

The following table describes the labels in this screen.

**Table 8** Time Setting

LABEL	DESCRIPTION
Time Protocol	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. <b>Daytime (RFC 867)</b> format is day/month/year/time zone of the server. <b>Time (RFC 868)</b> format displays a 4-byte integer giving the total number of seconds since 1970/1/1 at 0:0:0. The default, <b>NTP (RFC 1305)</b> , is similar to Time (RFC 868). Select <b>None</b> to enter the time and date manually.
Time Server Address	Enter the IP address or URL of your time server. Check with your ISP or network administrator if you are unsure of this information.
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 <b>None</b> in the <b>Time Protocol</b> field, enter the new time in this field and then click <b>Apply</b> .
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 8** Time Setting (continued)

LABEL	DESCRIPTION
New Date	This field displays the last updated date from the time server. When you select <b>None</b> in the <b>Time Protocol</b> field, enter the new date in this field and then click <b>Apply</b> .
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 <b>Daylight Savings</b> .
End Date	Enter the month and day that your daylight-savings time ends on if you selected <b>Daylight Savings</b> .
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.



# CHAPTER 4

## LAN Setup

This chapter describes how to configure LAN settings.

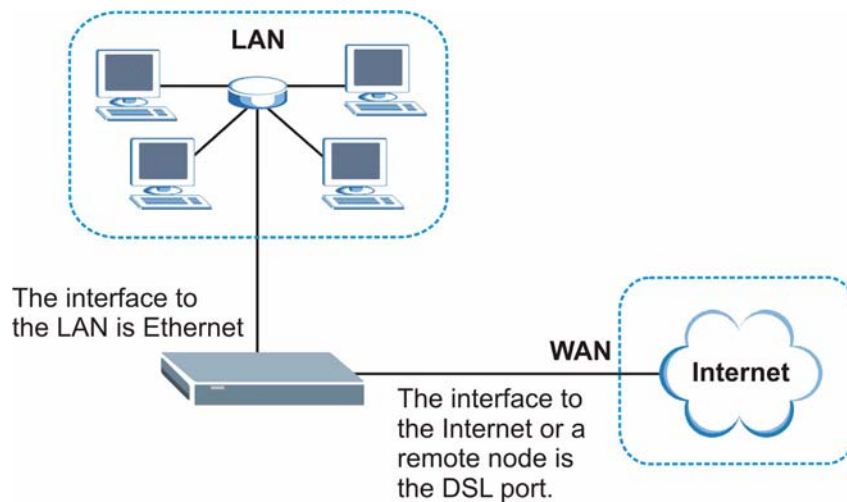
### 4.1 LAN Overview

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, manage IP addresses, and partition your physical network into logical networks.

#### 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 and the other outside the WAN network as shown next.

**Figure 12** 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. 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 ISPs 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 the **LAN Setup** screen 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 **LAN Setup** screen. 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.

- 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.
- The Prestige acts as a DNS proxy when the **Primary** and **Secondary DNS Server** fields are left blank in the **LAN Setup** screen.



## 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:

- **Both** - the Prestige will broadcast its routing table periodically and incorporate the RIP information that it receives.
- **In Only** - the Prestige will not send any RIP packets but will accept all RIP packets received.
- **Out Only** - the Prestige will send out RIP packets but will not accept any RIP packets received.
- **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** and **LAN Setup** to open the following screen.

Figure 13 LAN Setup

The following table describes the fields in this screen.

Table 9 LAN Setup

LABEL	DESCRIPTION
DHCP	
DHCP Server	Enable the DHCP server to have the Prestige assign IP addresses, an IP default gateway and DNS servers to Windows 95, Windows NT and other systems that support the DHCP client. When DHCP is used, the following items need to be set:
IP Pool Starting Address	This field specifies the first of the contiguous addresses in the IP address pool.
Pool Size	This field specifies the size or count of the IP address pool.
DNS Servers Assigned by DHCP Server The Prestige passes a DNS (Domain Name System) server IP address (in the order you specify here) to the DHCP clients. The Prestige only passes this information to the LAN DHCP clients when you select the <b>DHCP Server</b> check box. When you clear the <b>DHCP Server</b> check box, DHCP service is disabled and you must have another DHCP sever on your LAN, or else the computers must have their DNS server addresses manually configured.	

**Table 9** LAN Setup (continued)

LABEL	DESCRIPTION
First DNS Server Second DNS Server Third DNS Server	<p>Select <b>From ISP</b> if your ISP dynamically assigns DNS server information (and the Prestige's WAN IP address). The field to the right displays the (read-only) DNS server IP address that the ISP assigns.</p> <p>Select <b>User-Defined</b> if you have the IP address of a DNS server. Enter the DNS server's IP address in the field to the right. If you chose <b>User-Defined</b>, but leave the IP address set to 0.0.0.0, <b>User-Defined</b> changes to <b>None</b> after you click <b>Apply</b>. If you set a second choice to <b>User-Defined</b>, and enter the same IP address, the second <b>User-Defined</b> changes to <b>None</b> after you click <b>Apply</b>.</p> <p>Select <b>DNS Relay</b> to have the Prestige act as a DNS proxy. The Prestige's LAN IP address displays in the field to the right (read-only). The Prestige tells the DHCP clients on the LAN that the Prestige itself is the DNS server. When a computer on the LAN sends a DNS query to the Prestige, the Prestige forwards the query to the Prestige's system DNS server (configured in the <b>SYSTEM General</b> screen) and relays the response back to the computer. You can only select <b>DNS Relay</b> for one of the three servers; if you select DNS Relay for a second or third DNS server, that choice changes to <b>None</b> after you click <b>Apply</b>.</p> <p>Select <b>None</b> if you do not want to configure DNS servers. If you do not configure a DNS server, you must know the IP address of a computer in order to access it.</p>
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).
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 ( <b>IGMP-v1</b> ) and <b>IGMP-v2</b> . Select <b>None</b> to disable it.
RIP Direction	Select the RIP direction from <b>None</b> , <b>Both</b> , <b>In Only</b> and <b>Out Only</b> .
RIP Version	Select the RIP version from <b>RIP-1</b> , <b>RIP-2B</b> and <b>RIP-2M</b> .
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.

## 4.6 Configuring Static DHCP

The **Static DHCP** screen allows you to assign IP addresses on the LAN to specific individual computers based on their MAC Addresses.

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.

To change your Prestige's static DHCP settings, click **LAN**, then the **Static DHCP** tab. The screen appears as shown.

**Figure 14** LAN: Static DHCP

The screenshot shows a configuration window for LAN Static DHCP. It features a table with 8 rows and 3 columns: '#', 'MAC Address', and 'IP Address'. The 'IP Address' column is pre-filled with '0.0.0.0'. Below the table are 'Apply' and 'Reset' buttons.

The following table describes the labels in this screen.

**Table 10** LAN: Static DHCP

LABEL	DESCRIPTION
#	This is the index number of the Static IP table entry (row).
MAC Address	Type the MAC address (with colons) of a computer on your LAN.
IP Address	This field specifies the size, or count of the IP address pool.
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.

## 4.7 Configuring 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.

**Note:** Make sure that the subnets of the logical networks do not overlap.

The following figure shows a LAN divided into subnets A, B, and C.

**Figure 15** Physical Network & Partitioned Logical Networks



To change your Prestige's IP alias settings, click **LAN**, then the **IP Alias** tab. The screen appears as shown.

**Figure 16** IP Alias

The screenshot shows the 'LAN' configuration page with the 'IP Alias' tab selected. The page has a yellow background and contains two sections for IP aliases. Each section has a checkbox to enable it, followed by input fields for IP Address, IP Subnet Mask, and dropdown menus for RIP Direction and RIP Version. At the bottom, there are 'Apply' and 'Reset' buttons.

IP	Static DHCP	IP Alias
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> IP Alias 1
IP Address		0.0.0.0
IP Subnet Mask		0.0.0.0
RIP Direction		None
RIP Version		RIP-1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> IP Alias 2
IP Address		0.0.0.0
IP Subnet Mask		0.0.0.0
RIP Direction		None
RIP Version		RIP-1

The following table describes the labels in this screen.

**Table 11** IP Alias

LABEL	DESCRIPTION
IP Alias 1, 2	Select the check box to configure another LAN network for the Prestige.
IP Address	Enter the IP address of your Prestige' in dotted decimal notation. Alternatively, click the right mouse button to copy and/or paste the IP address.
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.
RIP Direction	RIP (Routing Information Protocol, RFC1058 and RFC 1389) allows a router to exchange routing information with other routers. The <b>RIP Direction</b> field controls the sending and receiving of RIP packets. Select the RIP direction from <b>Both/In Only/Out Only/None</b> . When set to <b>Both</b> or <b>Out Only</b> , the Prestige will broadcast its routing table periodically. When set to <b>Both</b> or <b>In Only</b> , it will incorporate the RIP information that it receives; when set to <b>None</b> , it will not send any RIP packets and will ignore any RIP packets received.
RIP Version	The <b>RIP Version</b> field controls the format and the broadcasting method of the RIP packets that the Prestige sends (it recognizes both formats when receiving). <b>RIP-1</b> 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 <b>RIP-2B</b> and <b>RIP-2M</b> sends the routing data in RIP-2 format; the difference being that <b>RIP-2B</b> uses subnet broadcasting while <b>RIP-2M</b> uses multicasting. Multicasting can reduce the load on non-router machines since they generally do not listen to the RIP multicast address and so will not receive the RIP packets. However, if one router uses multicasting, then all routers on your network must use multicasting, also. By default, RIP direction is set to <b>Both</b> and the Version set to <b>RIP-1</b> .
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.





# CHAPTER 5

## WAN Screens

This chapter describes how to configure WAN settings.

### 5.1 WAN Overview

Use this chapter to configure the settings for your WAN connection.

### 5.2 TCP/IP Priority (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 the routes have the same metric, the Prestige uses the following pre-defined priorities:

- 1 WAN:** designated by the ISP or a static route (see [Chapter 11 on page 123](#))
- 2 Traffic Redirect** (see [Section 5.10 on page 77](#))

For example, if **WAN** has a metric of "1" and **Traffic Redirect** has a metric of "2", the **WAN** connection acts as the primary default route. If the **WAN** route fails to connect to the Internet, the Prestige tries **Traffic Redirect** next.

### 5.3 Configuring Route

Click **WAN** to open the **Route** screen.

**Figure 17** WAN: Route

The following table describes the labels in this screen.

**Table 12** WAN: Route

LABEL	DESCRIPTION
WAN Traffic Redirect	The default WAN connection is "1" as your broadband connection via the WAN port should always be your preferred method of accessing the WAN. The default priority of the routes is <b>WAN</b> and then <b>Traffic Redirect</b> .
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.

## 5.4 Configuring WAN ISP

To change your Prestige's WAN ISP settings, click **WAN**, then the **WAN ISP** tab. The screen differs by the encapsulation.

### 5.4.1 Ethernet Encapsulation

The screen shown next is for **Ethernet** encapsulation.

**Figure 18** Ethernet Encapsulation

The following table describes the labels in this screen.

**Table 13** Ethernet Encapsulation

LABEL	DESCRIPTION
Encapsulation	You must choose the Ethernet option when the WAN port is used as a regular Ethernet.
Service Type	Choose from <b>Standard</b> , <b>Telstra</b> (RoadRunner Telstra authentication method), <b>RR-Manager</b> (Roadrunner Manager authentication method) or <b>RR-Toshiba</b> (Roadrunner Toshiba authentication method). The following fields do not appear with the <b>Standard</b> service type.
User Name	Type the user name given to you by your ISP.
Password	Type the password associated with the user name above.
Retype to Confirm	Type the password again to make sure that you have entered it correctly.
Login Server IP Address	Type the authentication server IP address here if your ISP gave you one.
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.

## 5.4.2 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 **PPP over Ethernet** 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.

The screen shown next is for **PPPoE** encapsulation.

**Figure 19** PPPoE Encapsulation

The following table describes the labels in this screen.

**Table 14** PPPoE Encapsulation

LABEL	DESCRIPTION
ISP Parameters for Internet Access	
Encapsulation	The <b>PPP over Ethernet</b> choice is for a dial-up connection using PPPoE. The Prestige supports PPPoE (Point-to-Point Protocol over Ethernet). PPPoE is an IETF Draft standard (RFC 2516) specifying how a personal computer (PC) interacts with a broadband modem (i.e. xDSL, cable, wireless, etc.) connection. Operationally, PPPoE saves significant effort for both the end user and ISP/carrier, as it requires no specific configuration of the broadband modem at the customer site. By implementing PPPoE directly on the router rather than individual computers, the computers on the LAN do not need PPPoE software installed, since the router does that part of the task. Further, with NAT, all of the LAN's computers will have access.
Service Name	Type the PPPoE service name provided to you. PPPoE uses a service name to identify and reach the PPPoE server.
User Name	Type the User Name given to you by your ISP.
Password	Type the password associated with the User Name above.
Retype to Confirm	Type your password again to make sure that you have entered is correctly.
Nailed-Up Connection	Select <b>Nailed-Up Connection</b> if you do not want the connection to time out.
Idle Timeout	This value specifies the time in seconds that elapses before the router automatically disconnects from the PPPoE server.
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.

### 5.4.3 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.

The screen shown next is for **PPTP** encapsulation.

**Figure 20** PPTP Encapsulation

The following table describes the labels in this screen.

**Table 15** PPTP Encapsulation

LABEL	DESCRIPTION
ISP Parameters for Internet Access	
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. The Prestige supports only one PPTP server connection at any given time.  To configure a PPTP client, you must configure the <b>User Name</b> and <b>Password</b> fields for a PPP connection and the PPTP parameters for a PPTP connection.
User Name	Type the user name given to you by your ISP.
Password	Type the password associated with the User Name above.
Retype to Confirm	Type your password again to make sure that you have entered is correctly.
Nailed-up Connection	Select <b>Nailed-Up Connection</b> if you do not want the connection to time out.

**Table 15** PPTP Encapsulation

LABEL	DESCRIPTION
Idle Timeout	This value specifies the time in seconds that elapses before the Prestige automatically disconnects from the PPTP server.
PPTP Configuration	
Get automatically from ISP	Select this option If your ISP did not assign you a fixed IP address. This is the default selection.
Use fixed IP address	Select this option If the ISP assigned a fixed IP address.
My IP Address	Type the (static) IP address assigned to you by your ISP if you selected <b>Use fixed IP address</b> .
My 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. You can only configure this field if you selected <b>Use fixed IP address</b> .
Server IP Address	Type the IP address of the PPTP server if you selected <b>Use fixed IP address</b> .
Connection ID/Name	Type your identification name for the PPTP server.
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.

## 5.5 WAN IP Address Assignment

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

**Table 16** Private IP Address Ranges

10.0.0.0	-	10.255.255.255
172.16.0.0	-	172.31.255.255
192.168.0.0	-	192.168.255.255

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

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



## 5.6 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. 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.

## 5.7 Configuring WAN IP

To change your Prestige's WAN IP settings, click **WAN**, then the **WAN IP** tab. This screen varies according to the type of encapsulation you select.

If your ISP did *not* assign you a fixed IP address, click **Get automatically from ISP (Default)**; otherwise click **Use fixed IP Address** and enter the IP address in the field provided.

**Figure 21** WAN: IP

The following table describes the labels in this screen.

**Table 17** WAN: IP

LABEL	DESCRIPTION
WAN IP Address Assignment	
Get automatically from ISP	Select this option If your ISP did not assign you a fixed IP address. This is the default selection.
Use fixed IP address	Select this option If the ISP assigned a fixed IP address.
My WAN IP Address	Enter your WAN IP address in this field if you selected <b>Use Fixed IP Address</b> .
My WAN IP Subnet Mask (Ethernet only)	Type your network's IP subnet Mask.
Remote IP Address	Enter the Remote IP Address (if your ISP gave you one) in this field.
Gateway/Remote IP Address	Enter the gateway IP address (if your ISP gave you one) in this field if you selected <b>Use Fixed IP Address</b> .

Table 17 WAN: IP

LABEL	DESCRIPTION
Network Address Translation	<p>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).</p> <p>Choose <b>None</b> to disable NAT.</p> <p>Choose <b>SUA Only</b> if you have a single public IP address. SUA (Single User Account) is a subset of NAT that supports two types of mapping: <b>Many-to-One</b> and <b>Server</b>.</p> <p>Choose <b>Full Feature</b> if you have multiple public IP addresses. <b>Full Feature</b> mapping types include: <b>One-to-One</b>, <b>Many-to-One</b> (SUA/PAT), <b>Many-to-Many Overload</b>, <b>Many-One-to-One</b> and <b>Server</b>. When you select <b>Full Feature</b> you must configure at least one address mapping set!</p> <p>For more information about NAT refer to the <i>NAT</i> chapter in this <i>User's Guide</i>.</p>
Metric (PPPoE and PPTP only)	<p>This field sets this route's priority among the routes the Prestige uses.</p> <p>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".</p>
Private (PPPoE and PPTP only)	<p>This parameter determines if the Prestige will include the route to this remote node in its RIP broadcasts. If set to Yes, this route is kept private and not included in RIP broadcast. If No, the route to this remote node will be propagated to other hosts through RIP broadcasts.</p>
RIP Direction	<p>RIP (Routing Information Protocol) allows a router to exchange routing information with other routers. The <b>RIP Direction</b> field controls the sending and receiving of RIP packets.</p> <p>Choose <b>Both</b>, <b>None</b>, <b>In Only</b> or <b>Out Only</b>.</p> <p>When set to <b>Both</b> or <b>Out Only</b>, the Prestige will broadcast its routing table periodically.</p> <p>When set to <b>Both</b> or <b>In Only</b>, the Prestige will incorporate RIP information that it receives.</p> <p>When set to <b>None</b>, the Prestige will not send any RIP packets and will ignore any RIP packets received.</p> <p>By default, <b>RIP Direction</b> is set to <b>Both</b>.</p>
RIP Version	<p>The <b>RIP Version</b> field controls the format and the broadcasting method of the RIP packets that the Prestige sends (it recognizes both formats when receiving).</p> <p>Choose <b>RIP-1</b>, <b>RIP-2B</b> or <b>RIP-2M</b>.</p> <p><b>RIP-1</b> is universally supported; but <b>RIP-2</b> carries more information. RIP-1 is probably adequate for most networks, unless you have an unusual network topology. Both <b>RIP-2B</b> and <b>RIP-2M</b> sends the routing data in RIP-2 format; the difference being that RIP-2B uses subnet broadcasting while RIP-2M uses multicasting. Multicasting can reduce the load on non-router machines since they generally do not listen to the RIP multicast address and so will not receive the RIP packets. However, if one router uses multicasting, then all routers on your network must use multicasting, also. By default, the <b>RIP Version</b> field is set to <b>RIP-1</b>.</p>

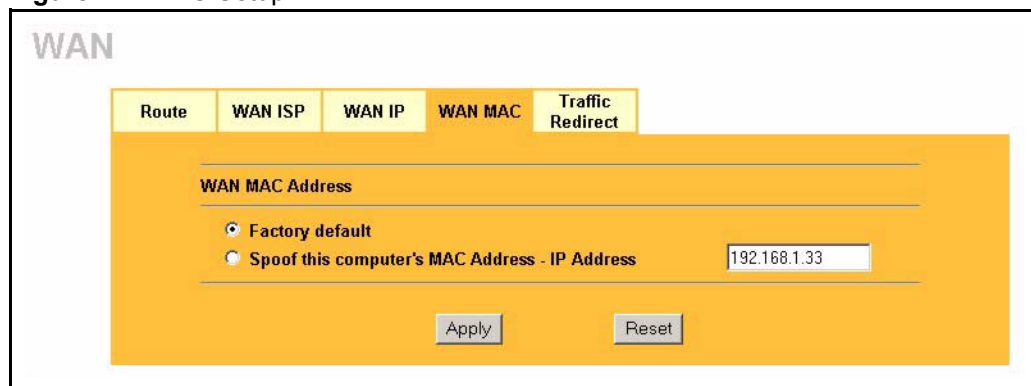
**Table 17** WAN: IP

LABEL	DESCRIPTION
Multicast	Choose <b>None</b> (default), <b>IGMP-V1</b> or <b>IGMP-V2</b> . 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.
Windows Networking (NetBIOS over TCP/IP): NetBIOS (Network Basic Input/Output System) are TCP or UDP broadcast packets that enable a computer to connect to and communicate with a LAN. For some dial-up services such as PPPoE or PPTP, NetBIOS packets cause unwanted calls. However it may sometimes be necessary to allow NetBIOS packets to pass through to the WAN in order to find a computer on the WAN.	
Allow between LAN and WAN	Select this check box to forward NetBIOS packets from the LAN to the WAN and from the WAN to the LAN.  Clear this check box to block all NetBIOS packets going from the LAN to the WAN and from the WAN to the LAN.
Allow Trigger Dial	Select this option to allow NetBIOS packets to initiate calls.
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.

## 5.8 Configuring WAN MAC

To change your Prestige's WAN MAC settings, click **WAN**, then the **WAN MAC** tab. The screen appears as shown.

**Figure 22** MAC Setup



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.

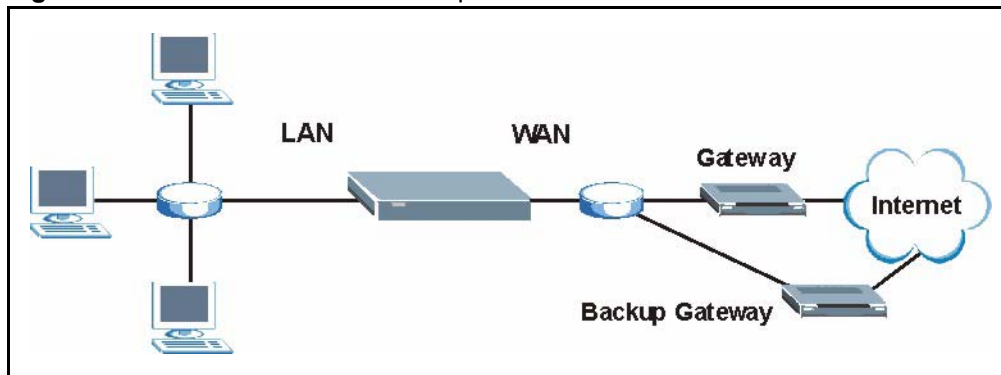
The MAC address screen allows users to configure the WAN port's MAC address by either using the factory default or cloning your computer's MAC address. Choose **Factory Default** to select the factory assigned default MAC Address.

Otherwise, click **Spoof this computer's MAC address - IP Address** and enter the IP address of your computer. Once it is successfully configured, the address will be copied to the rom file (ZyNOS configuration file). It will not change unless you change the setting or upload a different ROM file. It is recommended that you clone the MAC address prior to hooking up the **WAN Port**.

## 5.9 Traffic Redirect

Traffic redirect forwards WAN traffic to a backup gateway when the Prestige cannot connect to the Internet through its normal gateway.

**Figure 23** Traffic Redirect WAN Setup



## 5.10 Configuring Traffic Redirect

To change your Prestige's traffic redirect settings, click **WAN**, then the **Traffic Redirect** tab. The screen appears as shown.

**Figure 24** WAN: Traffic Redirect

The following table describes the labels in this screen.

**Table 18** Traffic Redirect

LABEL	DESCRIPTION
Active	Select this check box to have the Prestige use traffic redirect if the normal WAN connection goes down.
Backup Gateway IP Address	Type 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".
Check WAN IP Address	Configuration of this field is optional. If you do not enter an IP address here, the Prestige will use the default gateway IP address. Configure this field to test your Prestige's WAN accessibility. Type the IP address of a reliable nearby computer (for example, your ISP's DNS server address). If you are using PPTP or PPPoE Encapsulation, type "0.0.0.0" to configure the Prestige to check the PVC (Permanent Virtual Circuit) or PPTP tunnel.
Fail Tolerance	Type the number of times your Prestige may attempt and fail to connect to the Internet before traffic is forwarded to the backup gateway.
Period (sec)	Type the number of seconds for the Prestige to wait between checks to see if it can connect to the WAN IP address ( <b>Check WAN IP Address</b> field) or default gateway. Allow more time if your destination IP address handles lots of traffic.
Timeout (sec)	Type the number of seconds for your Prestige to wait for a ping response from the IP Address in the <b>Check WAN IP Address</b> field before it times out. The WAN connection is considered "down" after the Prestige times out the number of times specified in the <b>Fail Tolerance</b> field. Use a higher value in this field if your network is busy or congested.

**Table 18** Traffic Redirect

LABEL	DESCRIPTION
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.





# CHAPTER 6

## Introduction to VoIP

This chapter provides background information on VoIP and SIP.

### 6.1 VoIP Introduction

VoIP (Voice over IP) is the sending of voice signals over the Internet Protocol. This allows you to make phone calls and send faxes over the Internet at a fraction of the cost of using the traditional circuit-switched telephone network. You can also use servers to run telephone service applications like PBX services and voice mail. Internet Telephony Service Provider (ITSP) companies provide VoIP service. A company could alternatively set up an IP-PBX and provide its own VoIP service.

Circuit-switched telephone networks require 64 kilobits per second (kbps) in each direction to handle a telephone call. VoIP can use advanced voice coding techniques with compression to reduce the required bandwidth.

### 6.2 Introduction to SIP

The Session Initiation Protocol (SIP) is an application-layer control (signaling) protocol that handles the setting up, altering and tearing down of voice and multimedia sessions over the Internet.

SIP signaling is separate from the media for which it handles sessions. The media that is exchanged during the session can use a different path from that of the signaling. SIP handles telephone calls and can interface with traditional circuit-switched telephone networks.

#### 6.2.1 SIP Identities

A SIP account uses an identity (sometimes referred to as a SIP address). A complete SIP identity is called a SIP URI (Uniform Resource Identifier). A SIP account's URI identifies the SIP account in a way similar to the way an e-mail address identifies an e-mail account. The format of a SIP identity is SIP-Number@SIP-Service-Domain.

##### 6.2.1.1 SIP Number

The SIP number is the part of the SIP URI that comes before the “@” symbol. A SIP number can use letters like in an e-mail address (johndoe@your-ITSP.com for example) or numbers like a telephone number (1122334455@VoIP-provider.com for example).

##### 6.2.1.2 SIP Service Domain

The SIP service domain of the VoIP service provider is the domain name in a SIP URI. For example, if the SIP address is [1122334455@VoIP-provider.com](mailto:1122334455@VoIP-provider.com), then “VoIP-provider.com” is the SIP service domain.

## 6.2.2 SIP Call Progression

The following figure displays the basic steps in the setup and tear down of a SIP call. A calls B.

**Table 19** SIP Call Progression

<b>A</b>		<b>B</b>
1. INVITE		
		2. Ringing
		3. OK
4. ACK		
	5. Dialogue (voice traffic)	
6. BYE		
		7. OK

- 1** A sends a SIP INVITE request to B. This message is an invitation for B to participate in a SIP telephone call.
- 2** B sends a response indicating that the telephone is ringing.
- 3** B sends an OK response after the call is answered.
- 4** A then sends an ACK message to acknowledge that B has answered the call.
- 5** Now A and B exchange voice media (talk).
- 6** After talking, A hangs up and sends a BYE request.
- 7** B replies with an OK response confirming receipt of the BYE request and the call is terminated.

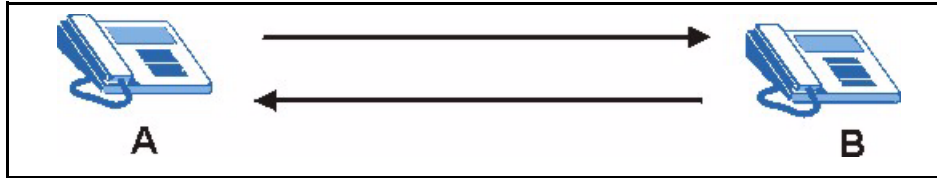
## 6.2.3 SIP Client Server

SIP is a client-server protocol. A SIP client is an application program or device that sends SIP requests. A SIP server responds to the SIP requests.

When you use SIP to make a VoIP call, it originates at a client and terminates at a server. A SIP client could be a computer or a SIP phone. One device can act as both a SIP client and a SIP server.

### 6.2.3.1 SIP User Agent

A SIP user agent can make and receive VoIP telephone calls. This means that SIP can be used for peer-to-peer communications even though it is a client-server protocol. In the following figure, either A or B can act as a SIP user agent client to initiate a call. A and B can also both act as a SIP user agent to receive the call.

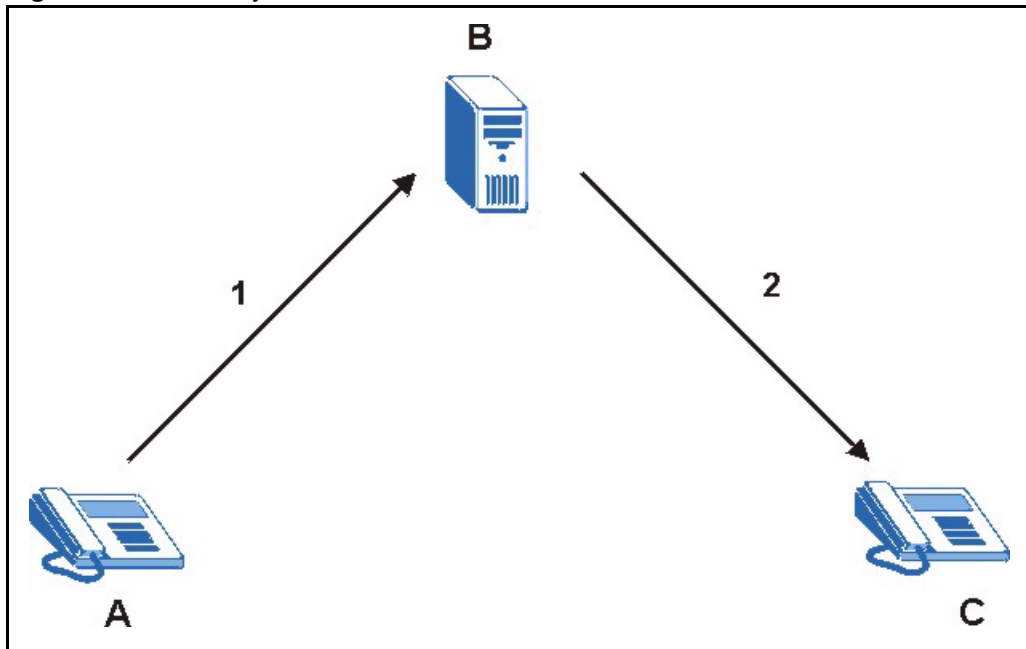
**Figure 25** SIP User Agent

### 6.2.3.2 SIP Proxy Server

A SIP proxy server receives requests from clients and forwards them to another server.

In the following example, you want to use client device A to call someone who is using client device C.

- 1 The client device (A in the figure) sends a call invitation to the SIP proxy server (B).
- 2 The SIP proxy server forwards the call invitation to C.

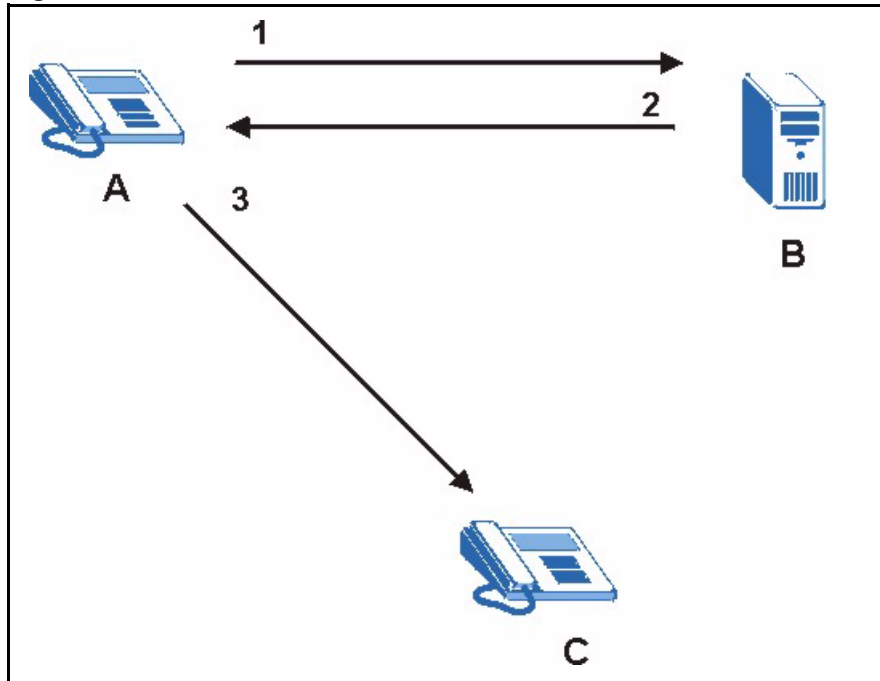
**Figure 26** SIP Proxy Server

### 6.2.3.3 SIP Redirect Server

A SIP redirect server accepts SIP requests, translates the destination address to an IP address and sends the translated IP address back to the device that sent the request. Then the client device that originally sent the request can send requests to the IP address that it received back from the redirect server. Redirect servers do not initiate SIP requests.

In the following example, you want to use client device A to call someone who is using client device C.

- 1 Client device A sends a call invitation for C to the SIP redirect server (B).
- 2 The SIP redirect server sends the invitation back to A with C's IP address (or domain name).
- 3 Client device A then sends the call invitation to client device C.

**Figure 27** SIP Redirect Server

#### 6.2.3.4 SIP Register Server

A SIP register server maintains a database of SIP identity-to-IP address (or domain name) mapping. The register server checks your user name and password when you register.

#### 6.2.4 RTP

When you make a VoIP call using SIP, the RTP (Real time Transport Protocol) is used to handle voice data transfer. See RFC 1889 for details on RTP.

### 6.3 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 is changed to a different IP address known within another network.

In the simplest form, NAT changes the source IP address of a packet received from a device to another IP address before forwarding the packet towards the destination. When the response comes back, NAT translates the destination address back to the device's IP address and forwards it to the device.

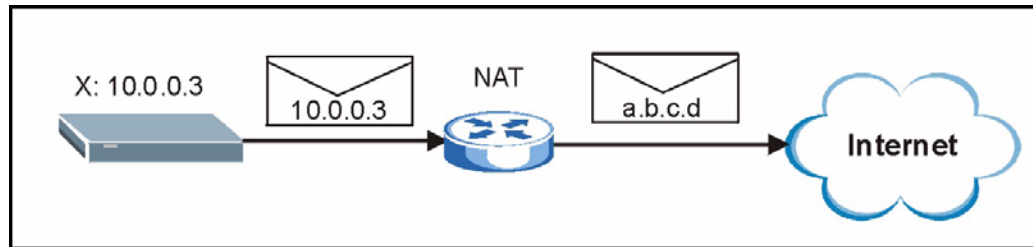
NAT routers are commonly used to translate private (or internal) IP addresses in packet headers to public (or external) IP addresses and vice versa. A NAT router maps a private IP address and port pair to a public IP address and port, and whenever the NAT router receives a packet with that public IP address and port, it knows how to reroute the packet back to the private IP address and port.

### 6.3.1 NAT Example

See the following figure. The Prestige (X) sends packets to the Internet. The Prestige's IP address is 10.0.0.3 (a private IP address). The NAT router maps the private source IP address to a public source IP address (a.b.c.d).

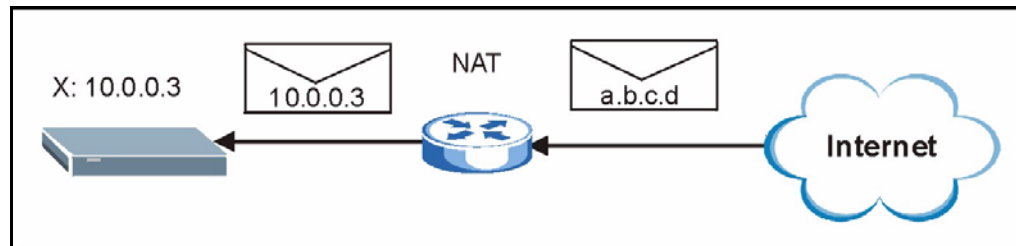
**Note:** The NAT figures in this chapter use lower-case letters (like a.b.c.d for example) to represent public IP addresses.

**Figure 28** NAT: Outgoing



When the NAT router receives packets with destination address IP address a.b.c.d, the NAT router changes a.b.c.d back to the private IP address 10.0.0.3 and sends it to the Prestige.

**Figure 29** NAT: Incoming



### 6.3.2 NAT Types

This section discusses the following NAT types:

- Full Cone
- Restricted Cone
- Port Restricted Cone
- Symmetric

The examples in this section describe NAT translation between private and public IP addresses.

“SA” is used in this section’s figures to represent the Source Address. The SA consists of the source IP address and port number.

“DA” is used in this section’s figures to represent the Destination Address. The DA consists of the destination IP address and port number.

In the figures, a SA or DA is written as the IP address followed by a colon and then the port number. “10.0.0.3:80” for example is IP address 10.0.0.3 and port number 80.

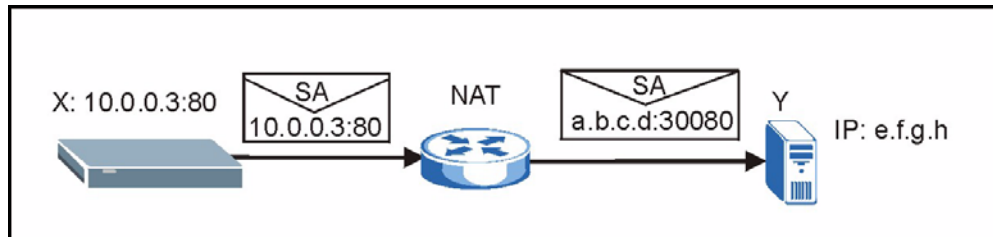
### 6.3.2.1 Full Cone NAT

In full cone NAT, the NAT router maps the source address of all outgoing packets to one IP address and port on another network. The NAT router also maps packets coming to that address and port on the other network back to the original source address.

#### 6.3.2.1.1 Full Cone NAT: Outgoing

See the following figure. The Prestige (X) uses port 80 to send some packets to server Y. The Prestige's IP address is 10.0.0.3 (a private IP address). The NAT router receives the packets from the Prestige with the private source address 10.0.0.3:80 and changes them to use public source address a.b.c.d:30080 before forwarding them on to Y.

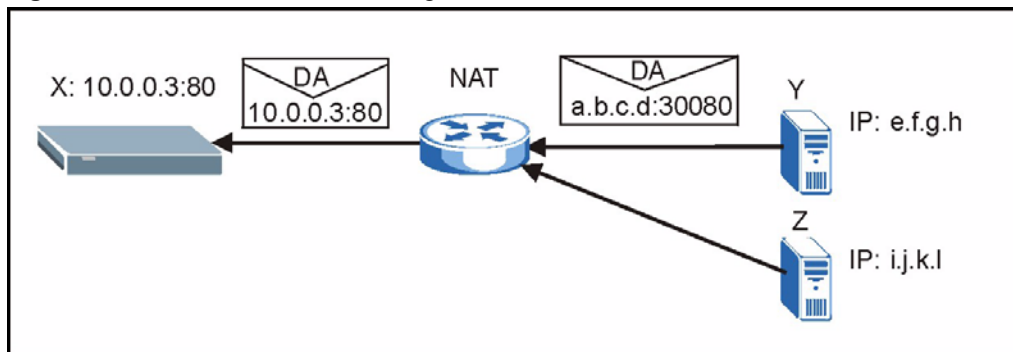
**Figure 30** Full Cone NAT: Outgoing



#### 6.3.2.1.2 Full Cone NAT: Incoming

Servers Y and Z can both send packets to IP address a.b.c.d and port 30080. The NAT router changes the destination address to the private IP address 10.0.0.3 and port 80 and sends it to the Prestige.

**Figure 31** Full Cone NAT: Incoming

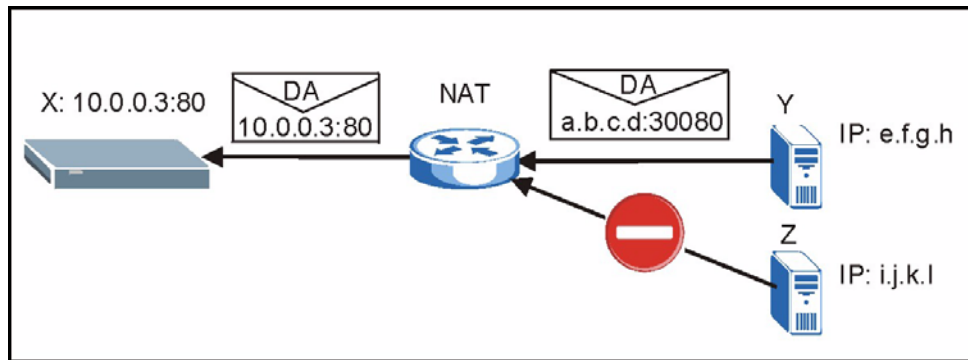


### 6.3.2.2 Restricted Cone NAT

For all outgoing packets, restricted cone NAT maps the source address to one IP address and port on another network. This is the same as full cone NAT (see [Section 6.3.2.1.1 on page 86](#) for an example).

However, packets can only be sent back through NAT from an IP address to which packets have been sent from the original source address.

In the following example, X already sent a packet to Y, so Y can send a packet to X. X did not send a packet to Z, so Z cannot send packets to X.

**Figure 32** Restricted Cone NAT: Incoming

### 6.3.2.3 Port Restricted Cone NAT

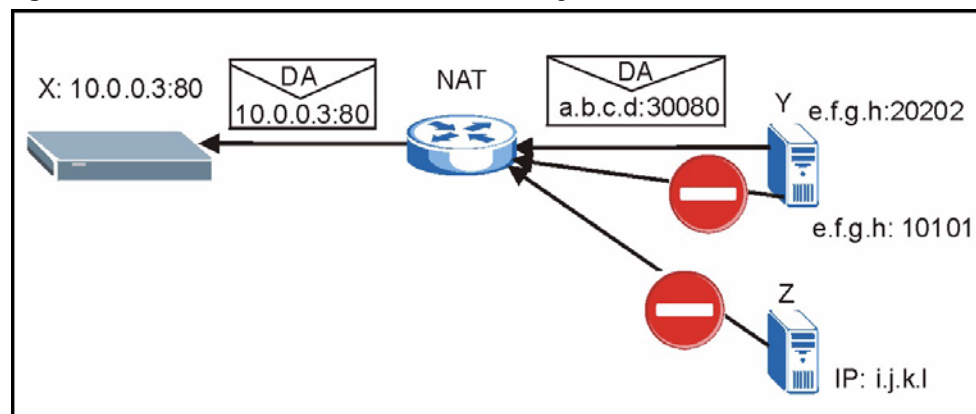
For all outgoing packets, port restricted cone NAT maps the source address to one IP address and port on another network. This is the same as full cone NAT (see [Section 6.3.2.1.1 on page 86](#) for an example).

However, packets can only be sent back through NAT from an IP address and port number to which packets have been sent from the original source address.

In the following example, X already sent a packet to Y at e.f.g.h:20202. This means that Y can send a packet to X from e.f.g.h:20202.

X did not send a packet to Y at e.f.g.h:10101, so Y cannot send a packet to X from e.f.g.h:10101.

X did not send a packet to Z, so Z cannot send packets to X.

**Figure 33** Port Restricted Cone NAT: Incoming

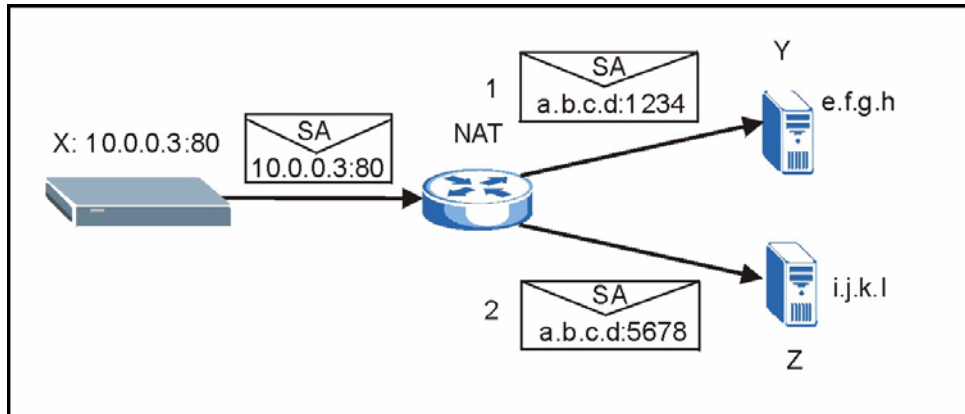
### 6.3.2.4 Symmetric NAT

The full, restricted and port restricted cone NAT types use the same mapping for an outgoing packet's source address regardless of the destination IP address and port.

In symmetric NAT, the mapping of an outgoing packet's source address to a source address in another network is different for each different destination IP address.

In the following figure, X sends a packet to Y from IP address 10.0.0.3:80. The NAT router maps the packet's SA to a.b.c.d:1234 (see 1 in the figure). X also sends a packet to Z, but this time the NAT router maps the SA to a.b.c.d:5678 (see 2 in the figure).

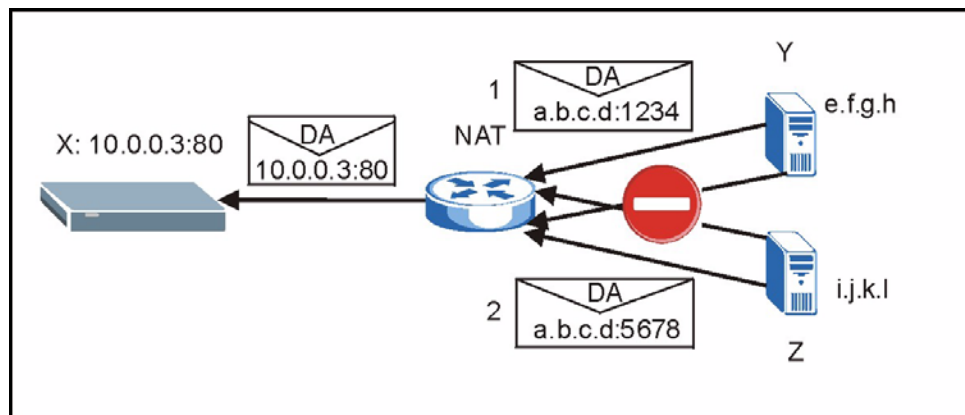
**Figure 34** Symmetric NAT: Outgoing



In the following figure, Y can send packets to a.b.c.d:1234 (see 1 in the figure) since that mapping was used when X sent a packet to Y. Y cannot send packets to a.b.c.d:5678 (2 in the figure).

Z can send packets to IP address a.b.c.d:45678 (2 in the figure) since that mapping was used when X sent a packet to Z. Z cannot send packets to a.b.c.d:1234 (1 in the figure).

**Figure 35** Symmetric NAT: Incoming



## 6.4 NAT and SIP

The Prestige must register its public IP address with a SIP register server. If there is a NAT router between the Prestige and the SIP register server, the Prestige probably has a private IP address. The Prestige lists its IP address in the SIP message that it sends to the SIP register server. NAT does not translate this IP address in the SIP message. The SIP register server gets the Prestige's IP address from inside the SIP message and maps it to your SIP identity. If the Prestige has a private IP address listed in the SIP message, the SIP server cannot map it to your SIP identity.

A SIP ALG (Application Layer Gateway) or the Use NAT, STUN, and outbound proxy features allow the Prestige to list its public IP address in the SIP messages.



## 6.5 SIP ALG

Some NAT routers may include a SIP Application Layer Gateway (ALG). A SIP ALG allows SIP calls to pass through NAT by examining and translating IP addresses embedded in the data stream. When the Prestige registers with the SIP register server, the SIP ALG translates the Prestige's private IP address inside the SIP data stream to a public IP address. You do not need to use STUN or an outbound proxy if your Prestige is behind a SIP ALG.

## 6.6 Use NAT

If you know the NAT router's public IP address and SIP port number, you can use the Use NAT feature to manually configure the Prestige to use a them in the SIP messages. This eliminates the need for STUN or a SIP ALG.

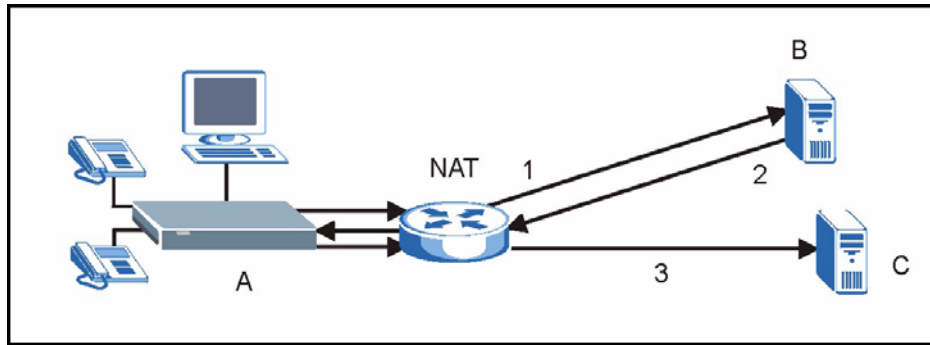
You must also configure the NAT router to forward traffic with this port number to the Prestige.

## 6.7 STUN

STUN (Simple Traversal of User Datagram Protocol (UDP) through Network Address Translators) allows the Prestige to find the presence and types of NAT routers and/or firewalls between it and the public Internet. STUN also allows the Prestige to find the public IP address that NAT assigned, so the Prestige can embed it in the SIP data stream. STUN does not work with symmetric NAT routers (see [Section 6.3.2.4 on page 87](#)) or firewalls. See RFC 3489 for details on STUN.

The following figure shows how STUN works.

- 1** The Prestige (A) sends SIP packets to the STUN server (B).
- 2** The STUN server (B) finds the public IP address and port number that the NAT router used on the Prestige's SIP packets and sends them to the Prestige.
- 3** The Prestige uses the public IP address and port number in the SIP packets that it sends to the SIP server (C).

**Figure 36** STUN

## 6.8 Outbound Proxy

Your VoIP service provider may host a SIP outbound proxy server to handle all of the Prestige's VoIP traffic. This allows the Prestige to work with any type of NAT router and eliminates the need for STUN or a SIP ALG. Turn off a SIP ALG on a NAT router in front of the Prestige to keep it from retranslating the IP address (since this is already handled by the outbound proxy server).

## 6.9 Pulse Code Modulation

Pulse Code Modulation (PCM) measures analog signal amplitudes at regular time intervals and converts them into bits.

## 6.10 Voice Coding

A codec (coder/decoder) codes analog voice signals into digital signals and decodes the digital signals back into voice signals. The Prestige supports the following codecs.

### 6.10.1 G.711

G.711 is a Pulse Code Modulation (PCM) waveform codec. G.711 provides very good sound quality but requires 64kbps of bandwidth.

### 6.10.2 G.729

G.729 is an Analysis-by-Synthesis (AbS) hybrid waveform codec that uses a filter based on information about how the human vocal tract produces sounds. G.729 provides good sound quality and reduces the required bandwidth to 8kbps.

## 6.11 PSTN Call Setup Signaling

PSTNs (Public Switched Telephone Network)s use DTMF or pulse dialing to set up telephone calls.

(Dual-Tone MultiFrequency (DTMF) signaling uses pairs of frequencies (one lower frequency and one higher frequency) to set up calls. It is also known as Touch Tone®. Each of the keys on a DTMF telephone corresponds to a different pair of frequencies.

Pulse dialing sends a series of clicks to the local phone office in order to dial numbers.<sup>1</sup>

---

1. The Prestige supports DTMF at the time of writing.



# CHAPTER 7

## VoIP Screens

This chapter describes how to configure VoIP and QoS settings.

### 7.1 VoIP Introduction

VoIP is the sending of voice signals over the Internet Protocol. This chapter covers the configuration of the **VoIP** screens.

### 7.2 VoIP Configuration

Click **VoIP** in the navigation panel to display the following screen. Use this screen to configure the Prestige's VoIP settings. You should have a voice account already set up and have VoIP information from your VoIP service provider.

**Figure 37** VoIP

The screenshot shows the VoIP configuration interface. It features a yellow background and a navigation panel at the top with 'VoIP' and 'QoS' tabs. The 'VoIP' tab is active. Below the tabs, there is a 'SIP Account' dropdown menu set to 'SIP1'. A checkbox labeled 'Active' is checked. The 'SIP Settings' section includes fields for SIP Number (ChangeMe), SIP Local Port (5060), SIP Server Address (server.sip.net), SIP Server Port (5060), REGISTER Server Address (server.sip.net), REGISTER Server Port (5060), and SIP Service Domain (server.sip.net). The 'Authentication' section has fields for Authentication User-ID (ChangeMe) and Authentication Password. The 'Caller ID' section has a checked checkbox for 'Sending Caller ID'. The 'Incoming Call apply to' section has checked checkboxes for 'Phone1' and 'Phone2'. At the bottom, there is an 'Advanced Settings' button labeled 'Settings', and 'Apply' and 'Reset' buttons.

**Table 20** VoIP

<b>LABEL</b>	<b>DESCRIPTION</b>
SIP Account	You can configure the Prestige to use multiple SIP accounts. Select one to configure its settings on the Prestige.
Active	Select this check box to have the Prestige use this SIP account. Clear the check box to have the Prestige not use this SIP account.
SIP Number	Enter your SIP number in this field (use the number or text that comes before the @ symbol in a full SIP URI). You can use up to 127 ASCII characters.
SIP Local Port	Use this field to configure the Prestige's listening port for SIP. Leave this field set to the default if you were not given a local port number for SIP.
SIP Server Address	Type the IP address or domain name of the SIP server in this field. It doesn't matter whether the SIP server is a proxy, redirect or register server. You can use up to 95 ASCII characters.
SIP Server Port	Enter the SIP server's listening port for SIP in this field. Leave this field set to the default if your VoIP service provider did not give you a server port number for SIP.
REGISTER Server Address	Enter the SIP register server's IP address or domain name in this field. You can use up to 95 ASCII characters. <b>If you were not given a register server address, then enter the address from the SIP Server Address field again here.</b>
REGISTER Server Port	Enter the SIP register server's listening port for SIP in this field. <b>If you were not given a register server port, then enter the port from the SIP Server Port field again here.</b>
SIP Service Domain	Enter the SIP service domain name in this field (the domain name that comes after the @ symbol in a full SIP URI). You can use up to 127 ASCII Extended set characters.
Authentication User ID	This is the user name for registering this SIP account with the SIP register server. Type the user name exactly as it was given to you. You can use up to 95 ASCII characters.
Authentication Password	Type the password associated with the user name above. You can use up to 95 ASCII Extended set characters.
Block Caller ID	Select this check box to not show identification information when you make VoIP phone calls. Clear the check box to show identification information when you make VoIP phone calls.
Incoming Call apply to	Phone <b>1</b> and <b>Phone 2</b> correspond to the Prestige's physical <b>PHONE 1</b> and <b>2</b> ports, respectively. Select whether you want to receive calls for this SIP account on <b>Phone 1</b> , <b>Phone 2</b> or both. If you select both, you will not know which SIP account a call is coming in on.
Advanced Settings	Click <b>Settings</b> to open a screen where you can configure the Prestige's advanced VoIP settings like SIP server settings, the RTP port range and the coding type.
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.

## 7.3 Advanced VoIP Settings Configuration

Click **VoIP** in the navigation panel, select a SIP account and then click **Settings** to display the following screen.

Figure 38 VoIP Advanced

**VoIP**

**QoS**

**Advanced VoIP Settings :SIP1**

**SIP Server Settings**

URL Type

Expiration Duration  (20-65535)

Register Re-send timer  (1-65535)

Session Expires  (30-3600)

Min-SE  (20-1800)

**RTP Port Range**

From  (1025-65535)

To  (1025-65535)

**Voice Compression**

Preferred Compression Type

**STUN**

Active

Server Address

Server Port  (1024-65535)

**Use NAT**

Active

Server Address

Server Port  (1024-65535)

**Outbound Proxy**

Active

Server Address

Server Port  (1024-65535)

Enable NAT Keep Alive

Keep Alive Interval  (30-65535)

**Dual-Tone-Multi-Frequency (DTMF)**

DTMF Mode

The following table describes the labels in this screen.

**Table 21** VoIP Advanced

LABEL	DESCRIPTION
Advanced VoIP Settings	This read-only field displays the number of the SIP account that you are configuring. The changes that you save in this page affect the Prestige's settings with the SIP account displayed here.
SIP Server Settings	
URL Type	Select <b>SIP</b> to have the Prestige include the domain name with the SIP number in the SIP messages that it sends. Select <b>TEL</b> to have the Prestige use the SIP number without a domain name in the SIP messages that it sends.
Expiration Duration	This field sets how long an entry remains registered with the SIP register server. After this time period expires, the SIP register server deletes the Prestige's entry from the database of registered SIP numbers. The register server can use a different time period. The Prestige sends another registration request after half of this configured time period has expired.
Register Resend Timer	Use this field to set how long the Prestige waits before sending a repeat registration request if a registration attempt fails or there is no response from the registration server.
Session Expires	Use this field to set the longest time that the Prestige will allow a SIP session to remain idle (without traffic) before dropping it.
Min-SE	When two SIP devices negotiate a SIP session, they must negotiate a common expiration time for idle SIP sessions. This field sets the shortest expiration time that the Prestige will accept. The Prestige checks the session expiration values of incoming SIP INVITE requests against the minimum session expiration value that you configure here. If the session expiration of an incoming INVITE request is less than the value you configure here, the Prestige negotiates with the other SIP device to increase the session expiration value to match the Prestige's minimum session expiration value.
RTP Port Range	Real time Transport Protocol is used to handle voice data transfer. Use this field to configure the Prestige's listening port range for RTP traffic. Leave these fields set to the defaults if you were not given a range of RTP ports to use.
Preferred Compression Type	<p>Use this field to select the type of voice coder/decoder (codec) that you want the Prestige to use. G.711 provides higher voice quality than G.729 but requires 64kbps of bandwidth while G.729 only requires 8kbps.</p> <p>Select <b>G.711&gt;G.729</b> if you want the Prestige to first attempt to use the G.711 codec and then the G.729 codec if the peer is not set up to use G.711.</p> <p>Select <b>G.711 only</b> if you want the Prestige to only use the G.711 codec when making VoIP calls. You will not be able to connect to a peer that is not set up to use G.711.</p> <p>Select <b>G.729&gt;G.711</b> if you want the Prestige to first attempt to use the G.729 codec and then the G.711 codec if the peer is not set up to use G.729.</p> <p>Select <b>G.729 only</b> if you want the Prestige to only use the G.729 codec when making VoIP calls. You will not be able to connect to a peer that is not set up to use G.729.</p>
STUN	<p>Use STUN if there is a NAT router between the Prestige and the VoIP service provider's SIP server.</p> <p>You do not need to use STUN if the NAT router is also a SIP ALG.</p>
Server Address	Your VoIP service provider must host a STUN server in order for you to use STUN. Type the IP address or domain name of the STUN server in this field. You can use up to 127 ASCII characters.



**Table 21** VoIP Advanced (continued)

LABEL	DESCRIPTION
Server Port	Enter the STUN server's listening port for STUN requests in this field. Leave this field set to the default if your VoIP service provider did not give you a server port number for STUN.
Use NAT	Enable this feature to use a NAT router's public IP address and SIP port number in the Prestige's SIP messages. You can use up to 127 ASCII characters. You must also configure the NAT router to forward traffic with this port number to the Prestige. This eliminates the need for STUN or a SIP ALG.
IP Address	Enter the NAT router's public IP address or domain name (up to 127 ASCII characters) in this field.
Port	Enter the port number that your SIP sessions use with the public IP address of the NAT router.
Outbound Proxy	Enable this feature if your VoIP service provider has a SIP outbound server to handle voice calls. This allows the Prestige to work with any type of NAT router and eliminates the need for STUN or a SIP ALG. Turn off a SIP ALG on a NAT router in front of the Prestige to keep it from retranslating the IP address (since this is already handled by the outbound proxy server).
Server Address	Enter the IP address or domain name (up to 95 ASCII characters) of the SIP outbound proxy server in this field.
Server Port	Enter the SIP outbound proxy server's listening port for SIP outbound proxy requests in this field. Leave this field set to the default if your VoIP service provider did not give you a server port number for the SIP outbound proxy server.
NAT Keep Alive	You must have outbound proxy enabled to use NAT keep alive. Enable NAT keep alive to have the Prestige send SIP notify messages to the SIP server. Use this to keep a NAT router located between the Prestige and the SIP server from timing out and dropping your Prestige's SIP NAT sessions.
Keep Alive Interval	Set how often (in seconds) the Prestige should send SIP notify messages to the SIP server.
DTMF Mode	The Dual Tone MultiFrequency (DTMF) mode sets how the Prestige handles the tones that your telephone makes when you push its buttons. It is recommended that you use the same mode that your VoIP service provider uses. Select <b>RFC 2833</b> to send the DTMF tones in RTP packets. Select <b>PCM</b> (Pulse Code Modulation) to include the DTMF tones in the voice data stream. This method works best when you are using a codec that does not use compression (like G.711). Codecs that use compression (like G.729) could distort the tones. Select <b>SIP INFO</b> to send the DTMF tones in SIP messages.
Back	Click <b>Back</b> to return to the VoIP screen without saving configuration changes.
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.

## 7.4 Quality of Service (QoS)

Quality of Service (QoS) refers to both a network's ability to deliver data with minimum delay, and the networking methods used to provide bandwidth for real-time multimedia applications.

## 7.4.1 Type Of Service (ToS)

Network traffic can be classified by setting the ToS (Type Of Service) values at the data source (for example, at the Prestige) so a server can decide the best method of delivery, that is the least cost, fastest route and so on.

## 7.4.2 DiffServ

DiffServ is a class of service (CoS) model that marks packets so that they receive specific per-hop treatment at DiffServ-compliant network devices along the route based on the application types and traffic flow. Packets are marked with DiffServ Code Points (DSCPs) indicating the level of service desired. This allows the intermediary DiffServ-compliant network devices to handle the packets differently depending on the code points without the need to negotiate paths or remember state information for every flow. In addition, applications do not have to request a particular service or give advanced notice of where the traffic is going.<sup>1</sup>

### 7.4.2.1 DSCP and Per-Hop Behavior

DiffServ defines a new DS (Differentiated Services) field to replace the Type of Service (TOS) field in the IP header. The DS field contains a 2-bit unused field and a 6-bit DSCP field which can define up to 64 service levels. The following figure illustrates the DS field.

DSCP is backward compatible with the three precedence bits in the ToS octet so that non-DiffServ compliant, ToS-enabled network device will not conflict with the DSCP mapping.

**Figure 39** DiffServ: Differentiated Service Field

DSCP (6-bit)	Unused (2-bit)
-----------------	-------------------

The DSCP value determines the forwarding behavior, the PHB (Per-Hop Behavior), that each packet gets across the DiffServ network. Based on the marking rule, different kinds of traffic can be marked for different priorities of forwarding. Resources can then be allocated according to the DSCP values and the configured policies.

## 7.4.3 VLAN

Virtual Local Area Network (VLAN) allows a physical network to be partitioned into multiple logical networks. Only stations within the same group can communicate with each other.

Your Prestige can add IEEE 802.1Q VLAN ID tags to voice frames that it sends to the network. This allows the Prestige to communicate with a SIP server that is a member of the same VLAN group. Some ISPs use the VLAN tag to identify voice traffic and give it priority over other traffic.

---

1. The Prestige does not support DiffServ at the time of writing.

## 7.5 QoS Configuration

Click **VoIP** in the navigation panel and then **QoS** to display the following screen.

**Figure 40** QoS

The following table describes the labels in this screen.

**Table 22** QoS

LABEL	DESCRIPTION
SIP TOS Priority	Type a priority for voice transmissions. The Prestige applies Type of Service priority tags with this priority to voice traffic that it transmits. Priorities 6 and 7 are reserved for network control traffic. It is recommended that you use priority 5 for SIP.
RTP TOS Priority	Type a priority for voice transmissions. The Prestige applies Type of Service priority tags with this priority to RTP traffic that it transmits. Priorities 6 and 7 are reserved for network control traffic. It is recommended that you use priority 5 for RTP.
Enable VLAN Tag	Enable VLAN tagging if the Prestige needs to be a member of a VLAN group in order to communicate with the SIP server. Your LAN and gateway must also be set up to use VLAN tags. Some switches also give priority to voice traffic based on its VLAN tag. Disable VLAN tagging if the Prestige does not need to be a member of a VLAN group to communicate with the SIP server.
Voice VLAN ID	Type the VLAN ID (VID) from 0 to 4095 for the Prestige to add to voice Ethernet frames that it sends out to the network.
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.



# CHAPTER 8

## Phone

This chapter covers how to adjust the Prestige's phone settings.

### 8.1 Phone Introduction

You can configure the volume, echo cancellation and VAD settings for each individual phone port on the Prestige. You can also select which SIP account to use for making outgoing calls.

#### 8.1.1 Voice Activity Detection/Silence Suppression

Voice Activity Detection (VAD) detects whether or not speech is present. This lets the Prestige reduce the bandwidth that a call uses by not transmitting "silent packets" when you are not speaking.

#### 8.1.2 Comfort Noise Generation

When using VAD, the Prestige generates and sends comfort noise when you are not speaking. Comfort noise uses the lowest possible transmission bandwidth to match the background noise. The comfort noise lets the person at the other end of the connection know that the line is still connected (total silence would easily be mistaken for a lost connection).

#### 8.1.3 Echo Cancellation

G.168 is an ITU-T standard for eliminating the echo caused by the sound of your voice reverberating in the telephone receiver while you talk.

### 8.2 Phone Port Configuration

Click **PHONE** in the navigation panel to display the following screen. Use this screen to configure phone port settings that are specific to an individual phone port.

**Figure 41** Phone Port



The following table describes the labels in this screen.

**Table 23** Phone Port

LABEL	DESCRIPTION
Phone Port Settings	Use this field to select the phone port that you want to configure.
Speaking Volume	Use this field to set the loudness that the Prestige uses for the speech signal that it sends to the peer device. -1 is the quietest and 1 is the loudest.
Listening Volume	Use this field to set the loudness that the Prestige uses for the speech signal that it receives from the peer device and sends to your phone. -1 is the quietest and 1 is the loudest.
Outgoing Call use	<b>SIP 1</b> and <b>SIP 2</b> correspond to the Prestige's SIP accounts. Select whether you want the phone(s) attached to this phone port to use SIP account 1, 2 or both when you make a call. If you select both SIP accounts, the Prestige will first try to use SIP account 2 and then SIP account 1 when you make a call.
G.168 Active	Select this check box to cancel the echo caused by the sound of your voice reverberating in the telephone receiver while you talk.
VAD Support	Select this check box to use Voice Activity Detection (VAD) to reduce the bandwidth that a call uses. The Prestige will generate and send comfort noise when you are not talking.
Dialing Interval	When you are dialing a telephone number the Prestige waits this long after you stop pressing the buttons before initiating the call. Select how many seconds you want the Prestige to wait after the last input on the telephone's keypad before dialing (making) a call.

**Table 23** Phone Port (continued)

LABEL	DESCRIPTION
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.

## 8.3 Common Phone Port Configuration

Click **PHONE** in the navigation panel and then **Common** to display the following screen. Use this screen to configure general phone port settings.

**Figure 42** Phone Port Common

The following table describes the labels in this screen.

**Table 24** Phone Port Common

LABEL	DESCRIPTION
Country Code	Use the drop-down list box to select the country where your Prestige is located.
Immediate Dial	Use immediate dial to have the Prestige make calls right away instead of waiting for the dialing interval (the time period it waits to make sure you are done pressing the keys). In order to use immediate dial, enable it here. Then press the pound (#) key on your telephone's keypad after dialing a phone number (this has the Prestige make the call right away).
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.





# CHAPTER 9

## Phone Book

This chapter covers how to configure the Prestige's phone book.

### 9.1 Phone Book Introduction

You can use the phone book feature to configure speed dial entries and the lifeline settings.

#### 9.1.1 Speed Dial

Speed dial provides shortcuts for dialing frequently used (VoIP) phone numbers.

##### 9.1.1.1 Peer-to-Peer Calls

You can call another VoIP device directly without going through a SIP server. You must set up a speed dial entry in the phone book in order to do this. Select **Non-Proxy (Use IP or URL)** in the **Type** column and enter the callee's IP address or domain name. The Prestige sends SIP INVITE requests to the peer VoIP device when you use the speed dial entry.

You do not need to configure a SIP account in order to make a peer-to-peer VoIP call.

#### 9.1.2 Lifeline (Prestige 2302RL)

With lifeline you can make and receive regular phone calls. Use a prefix number to make a regular call. When the Prestige 2302RL does not have power, you can make regular calls without dialing a prefix number.

You can also specify phone numbers that should always use the regular phone service (without having to dial a prefix number). Do this for emergency numbers (like those for contacting police, fire or emergency medical services).

### 9.2 Speed Dial Configuration

Click **PHONEBOOK** in the navigation panel and then **Speed Dial** to display the following screen.

**Figure 43** Phone Book

The following table describes the labels in this screen.

**Table 25** Phone Book

LABEL	DESCRIPTION
Add New Entry	Use this section of the screen to edit and save new or existing speed dial phone book entries.
Speed Dial	Select a speed dial key combination from the drop-down list box.
SIP Number	Enter the SIP number of the party that you will call (use the number or text that comes before the @ symbol in a full SIP URI). You can use up to 127 ASCII characters.
Name	Enter a descriptive name to identify the party that you will use this entry to call. You can use up to 127 ASCII characters.
Type	Select <b>Use Proxy</b> if calls to this party use your SIP account configured in the <b>VoIP</b> screen. Select <b>Non-Proxy (Use IP or URL)</b> if calls to this party use a different SIP server or go directly to the callee's VoIP phone (peer-to-peer). Enter the SIP server's or the party's IP address or domain name (up to 127 ASCII Extended set characters).
Add	Click this button to save the entry in the speed dial phone book. The speed dial entry displays in the <b>Speed Dial Phone Book</b> section of the screen.
Speed Dial Phone Book	This section of the screen displays the currently saved speed dial entries. You can configure up to 10 entries and use them to make calls.
Speed Dial	This is the entry's speed dial key combination. Press this key combination on a telephone attached to the Prestige in order to call the party named in this entry.
Name	This is the descriptive name of the party that you will use this speed dial entry to call.

**Table 25** Phone Book (continued)

LABEL	DESCRIPTION
SIP Number	This is the SIP number of the party that you will call.
Type	This field displays <b>Use Proxy</b> if calls to this party use one of your SIP accounts. This field displays the SIP server's or the party's IP address or domain name if calls to this party do not use one of your SIP accounts.
Delete	Click this button to remove an entry from the speed dial phone book.
Edit	Click this button to change the speed dial entry. The speed dial entry displays in the <b>Add New Entry</b> section of the screen where you can edit it.
Clear	Click this button to remove all of the entries from the speed dial phone book.

## 9.3 Lifeline Configuration (Prestige 2302RL)

Click **PHONEBOOK** in the navigation panel and then **Lifeline** to display the following screen.

**Figure 44** Lifeline

The following table describes the labels in this screen.

**Table 26** Lifeline

LABEL	DESCRIPTION
PSTN Pre-fix Number	Specify the prefix number for dialing regular calls.
Relay to PSTN	Use these fields to specify phone numbers to which the Prestige will always send calls through the regular phone service without the need of dialing a prefix number. These numbers must be for phones on the PSTN (not VoIP phones).
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.



# CHAPTER 10

## Network Address Translation (NAT) Screens

This chapter discusses how to configure NAT on the Prestige.

### 10.1 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 is changed to a different IP address known within another network.

#### 10.1.1 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 27** NAT Definitions

TERM	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.

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

## 10.1.2 What NAT Does

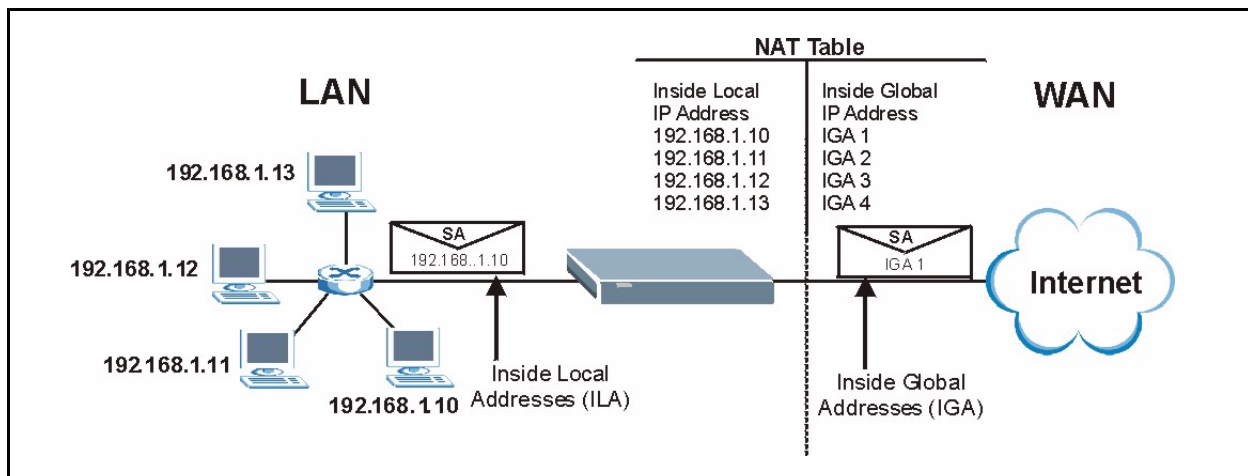
In the simplest form, NAT changes the source IP address in a packet received from a subscriber (the inside local address) to another (the inside global address) before forwarding the packet to the WAN side. When the response comes back, NAT translates the destination address (the inside global address) 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. If you do not define any servers (for Many-to-One and Many-to-Many Overload mapping), NAT offers the additional benefit of firewall protection. 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)*.

## 10.1.3 How NAT Works

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

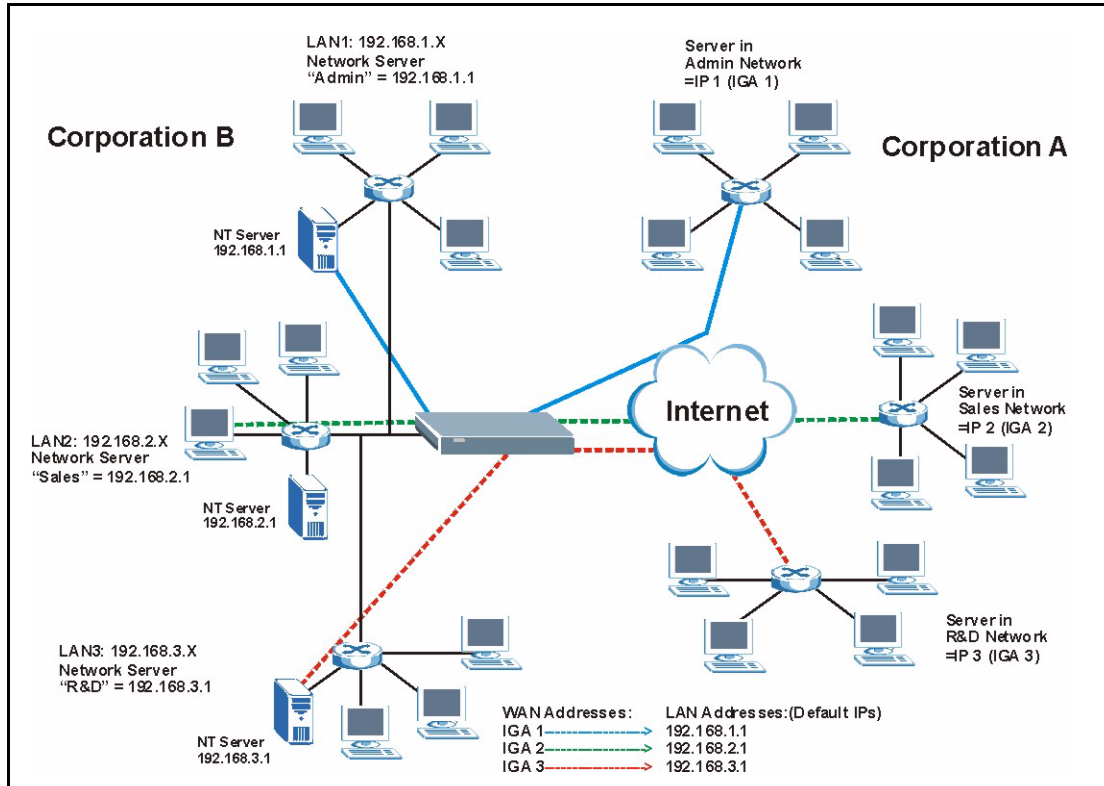
**Figure 45** How NAT Works



## 10.1.4 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 46** NAT Application With IP Alias



## 10.1.5 NAT Mapping Types

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

- **One-to-One:** In One-to-One mode, the Prestige maps one local IP address to one global IP address.
- **Many to One:** In Many-to-One mode, the Prestige maps multiple local IP addresses to one global IP address. This is equivalent to SUA (i.e., PAT, port address translation), ZyXEL's Single User Account feature (the SUA Only option).
- **Many-to-Many Overload:** In Many-to-Many Overload mode, the Prestige maps the multiple local IP addresses to shared global IP addresses.
- **Many One-to-One:** In Many-One-to-One mode, the Prestige maps each local IP address to a unique global IP address.
- **Server:** This type allows you to specify inside servers of different services behind the NAT to be accessible to the outside world.

**Note:** Port numbers do not change for One-to-One and Many One-to-One NAT mapping types.

The following table summarizes these types.

**Table 28** NAT Mapping Types

TYPE	IP MAPPING	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 One-to-One	ILA1↔ IGA1 ILA2↔ IGA2 ILA3↔ IGA3 ...	M-1-1
Server	Server 1 IP↔ IGA1 Server 2 IP↔ IGA1 Server 3 IP↔ IGA1	Server

## 10.2 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. Select either **SUA Only** or **Full Feature** in the **WAN IP** screen.

**Note:** Choose **SUA Only** if you have just one public WAN IP address for your Prestige.

**Note:** Choose **Full Feature** if you have multiple public WAN IP addresses for your Prestige.

## 10.3 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.

### 10.3.1 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

**Note:** If you do not assign a Default Server IP Address, the Prestige discards all packets received for ports that are not specified in this screen or remote management.

### 10.3.2 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.

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

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

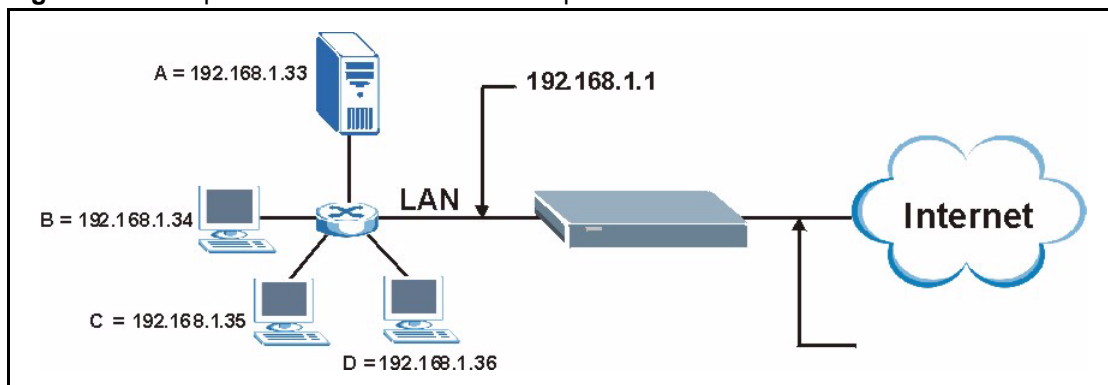
**Table 29** Services and Port Numbers

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

### 10.3.3 Configuring Servers Behind SUA (Example)

Let's say you want to assign ports 21-25 to one FTP, Telnet and SMTP server (A in the example), port 80 to another (B in the example) and assign a default server IP address of 192.168.1.35 to a third (C in the example). You assign the LAN IP addresses and the ISP assigns the WAN IP address. The NAT network appears as a single host on the Internet

**Figure 47** Multiple Servers Behind NAT Example



## 10.4 Configuring SUA Server

**Note:** If you do not assign a Default Server IP Address, the Prestige discards all packets received for ports that are not specified in this screen or remote management.

Click **SUA/NAT** to open the **SUA Server** screen.

Refer to [Table 29 on page 114](#) for port numbers commonly used for particular services.

**Figure 48** SUA/NAT Setup

The following table describes the labels in this screen.

**Table 30** SUA/NAT Setup

LABEL	DESCRIPTION
Default Server	In addition to the servers for specified services, NAT supports a default server. A default server receives packets from ports that are not specified in this screen. If you do not assign a <b>Default Server</b> IP Address, the Prestige discards all packets received for ports that are not specified in this screen or remote management.
#	Number of an individual SUA server entry.
Active	Select this check box to enable the SUA server entry. Clear this check box to disallow forwarding of these ports to an inside server without having to delete the entry.
Name	Enter a name to identify this port-forwarding rule.
Start Port	Type a port number in this field. To forward only one port, type the port number again in the <b>End Port</b> field. To forward a series of ports, type the start port number here and the end port number in the <b>End Port</b> field.

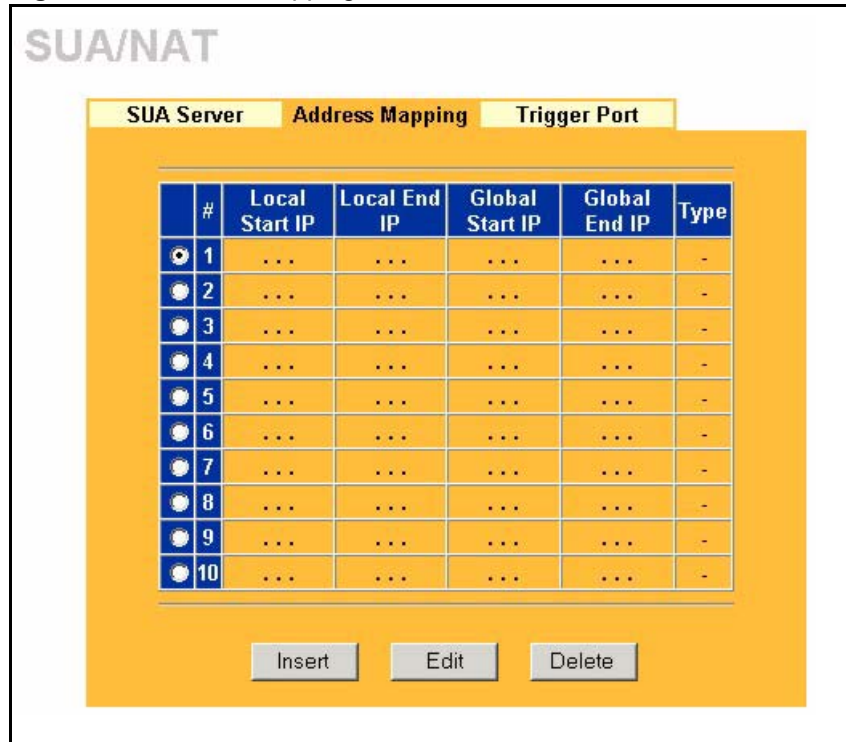
**Table 30** SUA/NAT Setup

LABEL	DESCRIPTION
End Port	Type a port number in this field. To forward only one port, type the port number in the <b>Start Port</b> field above and then type it again in this field. To forward a series of ports, type the last port number in a series that begins with the port number in the <b>Start Port</b> field above.
Server IP Address	Enter the inside IP address of the server here.
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.

## 10.5 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 **SUA/NAT**, then the **Address Mapping** tab. The screen appears as shown.

**Figure 49** Address Mapping


The following table describes the labels in this screen.

**Table 31** Address Mapping

LABEL	DESCRIPTION
Local Start IP	This refers to the Inside Local Address (ILA), which is the starting local IP address. If the rule is for all local IP addresses, then this field displays 0.0.0.0 as the <b>Local Start IP</b> address. Local IP addresses are <b>N/A</b> for <b>Server</b> port mapping.
Local End IP	This is the end Inside Local Address (ILA). If the rule is for all local IP addresses, then this field displays 255.255.255.255 as the <b>Local End IP</b> address. This field is <b>N/A</b> for <b>One-to-One</b> and <b>Server</b> mapping types.
Global Start IP	This refers to the Inside Global IP Address (IGA). 0.0.0.0 is for a dynamic IP address from your ISP with <b>Many-to-One</b> and <b>Server</b> mapping types.
Global End IP	This is the end Inside Global Address (IGA). This field is <b>N/A</b> for <b>One-to-One</b> , <b>Many-to-One</b> and <b>Server</b> mapping types.
Type	<ol style="list-style-type: none"> <li>1. <b>1-1</b> (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.</li> <li>2. <b>M-1</b> (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.</li> <li>3. <b>M-M-Ov</b> (Many-to-Many Overload) mode maps multiple local IP addresses to shared global IP addresses.</li> <li>4. <b>M-1-1</b> (Many One-to-One) mode maps each local IP address to unique global IP addresses.</li> <li>5. <b>Server</b> allows you to specify inside servers of different services behind the NAT to be accessible to the outside world.</li> </ol>
Insert	Click <b>Insert</b> to insert a new mapping rule before an existing one.

**Table 31** Address Mapping

LABEL	DESCRIPTION
Edit	Click <b>Edit</b> to go to the <b>Address Mapping Rule</b> screen.
Delete	Click <b>Delete</b> to delete an address mapping rule.

## 10.5.1 Configuring Address Mapping

To edit an address mapping rule, select the radio button of a rule and click the **Edit** button to display the screen shown next.

**Figure 50** Address Mapping Edit

The following table describes the labels in this screen.

**Table 32** Address Mapping Edit

LABEL	DESCRIPTION
Type	Choose the port mapping type from one of the following. <b>One-to-One:</b> One-to-One mode maps one local IP address to one global IP address. <b>Many to One:</b> 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 (the SUA Only option). <b>Many-to-Many Overload:</b> Many-to-Many Overload mode maps the multiple local IP addresses to shared global IP addresses. <b>Many One-to-One:</b> Many-One-to-One mode maps each local IP address to a unique global IP address. <b>Server:</b> 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 Inside Local IP Address (ILA). Local IP addresses are <b>N/A</b> for <b>Server</b> port mapping.

**Table 32** Address Mapping Edit

LABEL	DESCRIPTION
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 <b>Local Start IP</b> address and 255.255.255.255 as the <b>Local End IP</b> address. This field is <b>N/A</b> for <b>One-to-One</b> and <b>Server</b> 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.
Global End IP	This is the ending Inside Global IP Address (IGA). This field is <b>N/A</b> for <b>One-to-One</b> , <b>Many-to-One</b> and <b>Server</b> mapping types.
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Cancel	Click <b>Cancel</b> to return to the previous screen and not save your changes.

## 10.6 Trigger Port Forwarding

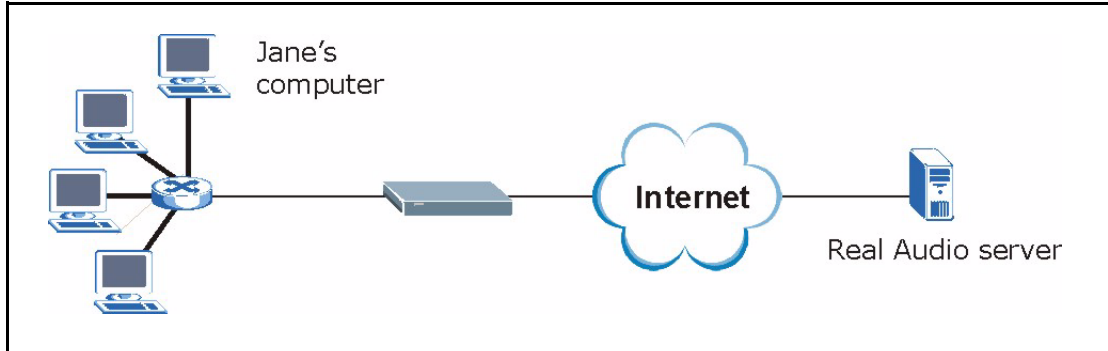
Some services use a dedicated range of ports on the client side and a dedicated range of ports on the server side. With regular port forwarding you set a forwarding port in NAT to forward a service (coming in from the server on the WAN) to the IP address of a computer on the client side (LAN). The problem is that port forwarding only forwards a service to a single LAN IP address. In order to use the same service on a different LAN computer, you have to manually replace the LAN computer's IP address in the forwarding port with another LAN computer's IP address,

Trigger port forwarding solves this problem by allowing computers on the LAN to dynamically take turns using the service. The Prestige records the IP address of a LAN computer that sends traffic to the WAN to request a service with a specific port number and protocol (a "trigger" port). When the Prestige's WAN port receives a response with a specific port number and protocol ("incoming" port), the Prestige forwards the traffic to the LAN IP address of the computer that sent the request. After that computer's connection for that service closes, another computer on the LAN can use the service in the same manner. This way you do not need to configure a new IP address each time you want a different LAN computer to use the application.

### 10.6.1 Trigger Port Forwarding Example

The following is an example of trigger port forwarding.

**Figure 51** Trigger Port Forwarding Process: Example



- 1 Jane requests a file from the Real Audio server (port 7070).
- 2 Port 7070 is a “trigger” port and causes the Prestige to record Jane’s computer IP address. The Prestige associates Jane's computer IP address with the "incoming" port range of 6970-7170.
- 3 The Real Audio server responds using a port number ranging between 6970-7170.
- 4 The Prestige forwards the traffic to Jane’s computer IP address.
- 5 Only Jane can connect to the Real Audio server until the connection is closed or times out. The Prestige times out in three minutes with UDP (User Datagram Protocol), or two hours with TCP/IP (Transfer Control Protocol/Internet Protocol).

## 10.6.2 Two Points To Remember About Trigger Ports

- 1 Trigger events only happen on data that is going coming from inside the Prestige and going to the outside.
- 2 If an application needs a continuous data stream, that port (range) will be tied up so that another computer on the LAN can’t trigger it.

## 10.7 Configuring Trigger Port Forwarding

To change your Prestige’s trigger port settings, click **SUA/NAT** and the **Trigger Port** tab. The screen appears as shown.

**Note:** Only one LAN computer can use a trigger port (range) at a time



Figure 52 Trigger Port

SUA/NAT

SUA Server    Addr Mapping    **Trigger Port**

#	Name	Incoming		Trigger	
		Start Port	End Port	Start Port	End Port
1		0	0	0	0
2		0	0	0	0
3		0	0	0	0
4		0	0	0	0
5		0	0	0	0
6		0	0	0	0
7		0	0	0	0
8		0	0	0	0
9		0	0	0	0
10		0	0	0	0
11		0	0	0	0
12		0	0	0	0

Apply    Reset

The following table describes the labels in this screen.

Table 33 Trigger Port

LABEL	DESCRIPTION
#	This is the rule index number (read-only).
Name	Type a unique name (up to 15 characters) for identification purposes. All characters are permitted - including spaces.
Incoming	Incoming is a port (or a range of ports) that a server on the WAN uses when it sends out a particular service. The Prestige forwards the traffic with this port (or range of ports) to the client computer on the LAN that requested the service.
Start Port	Type a port number or the starting port number in a range of port numbers.
End Port	Type a port number or the ending port number in a range of port numbers.
Trigger	The trigger port is a port (or a range of ports) that causes (or triggers) the Prestige to record the IP address of the LAN computer that sent the traffic to a server on the WAN.
Start Port	Type a port number or the starting port number in a range of port numbers.
End Port	Type a port number or the ending port number in a range of port numbers.
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.



# CHAPTER 11

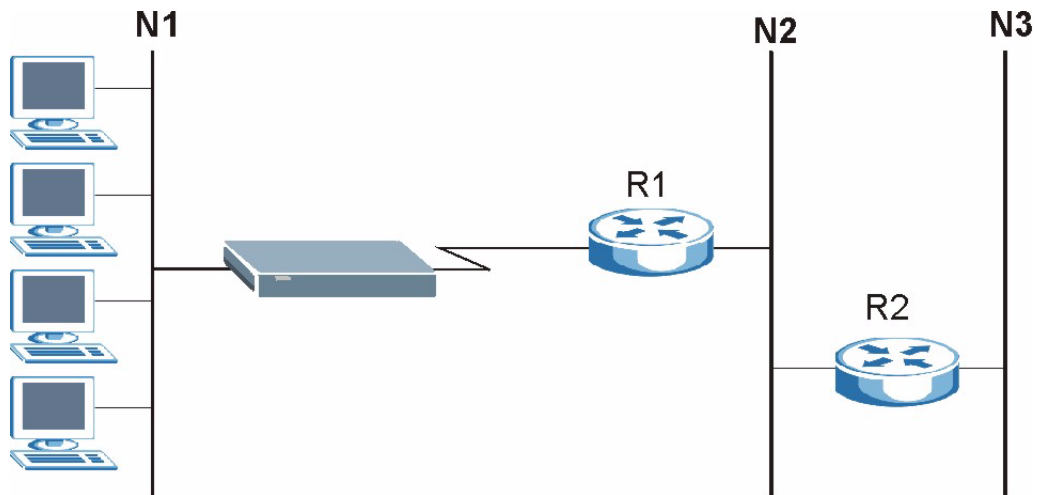
## Static Route

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

### 11.1 Static Route Overview

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 doesn't know that there is a route through the same remote node Router 1 (via gateway Router 2). The static routes are for you to tell the Prestige about the networks beyond the remote nodes.

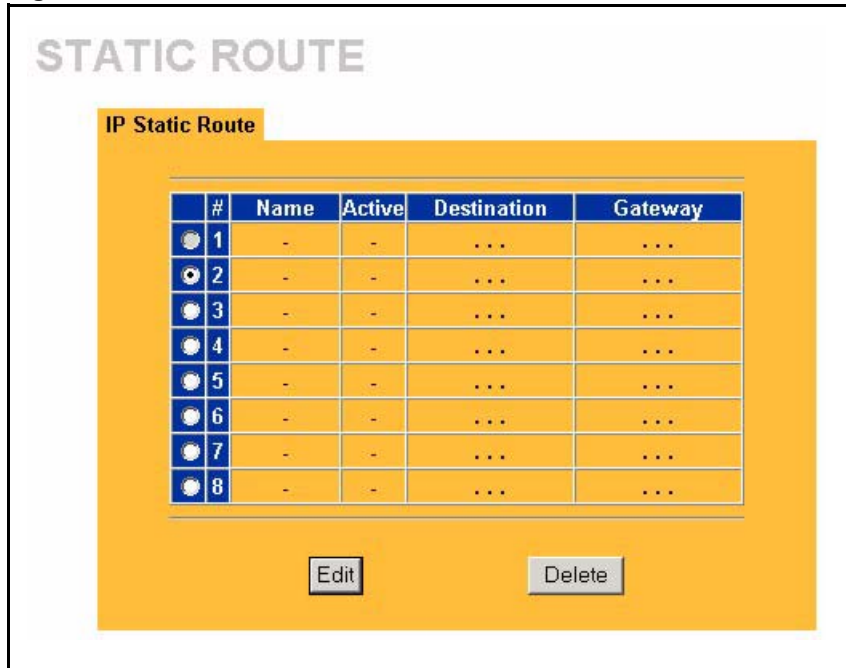
**Figure 53** Example of Static Routing Topology



### 11.2 Configuring IP Static Route

Click **STATIC ROUTE** to open the **IP Static Route** screen shown next.

**Figure 54** IP Static Route



The following table describes the labels in this screen.

**Table 34** IP Static Route

LABEL	DESCRIPTION
#	This is the number of an individual static route.
Name	This is the name that describes or identifies this route.
Active	This field shows whether this static route is active ( <b>Yes</b> ) or not ( <b>No</b> ).
Destination	This parameter specifies the IP network address of the final destination. Routing is always based on network number.
Gateway	This is the IP address of the gateway. The gateway is a router or switch on the same network segment as the device's LAN or WAN port. The gateway helps forward packets to their destinations.
Edit	Select the radio button next to a static route index number and then click <b>Edit</b> to set up a static route on the Prestige.
Delete	Select the radio button next to a static route index number and then click <b>Delete</b> to remove a static route on the Prestige.

### 11.2.1 Configuring a Static Route Entry

Select a static route index number and click **Edit**. The screen shown next appears. Fill in the required information for each static route.

**Figure 55** Edit IP Static Route

**STATIC ROUTE**

Route Name

Active

Destination IP Address

IP Subnet Mask

Gateway IP Address

Metric

Private

The following table describes the labels in this screen.

**Table 35** Edit IP Static Route

LABEL	DESCRIPTION
Route Name	Enter the name of the IP static route. Leave this field blank to delete this static route.
Active	This field allows you to activate/deactivate this static route.
Destination IP Address	This parameter specifies the IP network address of the final destination. Routing is always based on network number. If you need to specify a route to a single host, use a subnet mask of 255.255.255.255 in the subnet mask field to force the network number to be identical to the host ID.
IP Subnet Mask	Enter the IP subnet mask here.
Gateway IP Address	Enter the IP address of the gateway. The gateway is a router or switch on the same network segment as the device's LAN or WAN port. The gateway helps forward packets to their destinations.
Metric	Metric represents the "cost" of transmission for routing purposes. IP routing uses hop count as the measurement of cost, with a minimum of 1 for directly connected networks. Enter a number that approximates the cost for this link. The number need not be precise, but it must be between 1 and 15. In practice, 2 or 3 is usually a good number.
Private	This parameter determines if the Prestige will include this route to a remote node in its RIP broadcasts. Select this check box to keep this route private and not included in RIP broadcasts. Clear this check box to propagate this route to other hosts through RIP broadcasts.
Apply	Click <b>Apply</b> to save your changes back to the Prestige.
Cancel	Click <b>Cancel</b> to exit this screen without saving.



# CHAPTER 12

## Remote Management Screens

This chapter provides information on the **Remote Management** screens.

### 12.1 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)
- ALL (LAN and WAN)
- LAN only
- Neither (Disable).

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

You may only have one remote management session running at a time. The Prestige automatically disconnects a remote management session of lower priority when another remote management session of higher priority starts. The priorities for the different types of remote management sessions are as follows.

- 1 Telnet
- 2 HTTP

#### 12.1.1 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 already another remote management session with an equal or higher priority running. You may only have one remote management session running at one time.

## 12.1.2 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.

## 12.1.3 System Timeout

There is a default system management idle timeout of five minutes (three hundred seconds). The Prestige automatically logs you out if the management session remains idle for longer than this timeout period. The management session does not time out when a statistics screen is polling. You can change the timeout period in the **SYSTEM General** screen.

## 12.2 Configuring WWW

To change your Prestige's remote HTTP access settings, click **REMOTE MGMT** to display the **WWW** screen.

**Figure 56** Remote Management: WWW

The screenshot shows the 'REMOTE MANAGEMENT' configuration page with the 'WWW' tab selected. The configuration fields are as follows:

Field	Value
Server Port	80
Server Access	LAN & WAN
Secured Client IP	All
Address	0.0.0.0

The following table describes the labels in this screen.

**Table 36** Remote Management: WWW

LABEL	DESCRIPTION
Server Port	You may change the server port number for a service if needed, however you must use the same port number in order to use that service for remote management.
Server Access	Select the interface(s) through which a computer may access the Prestige using this service.

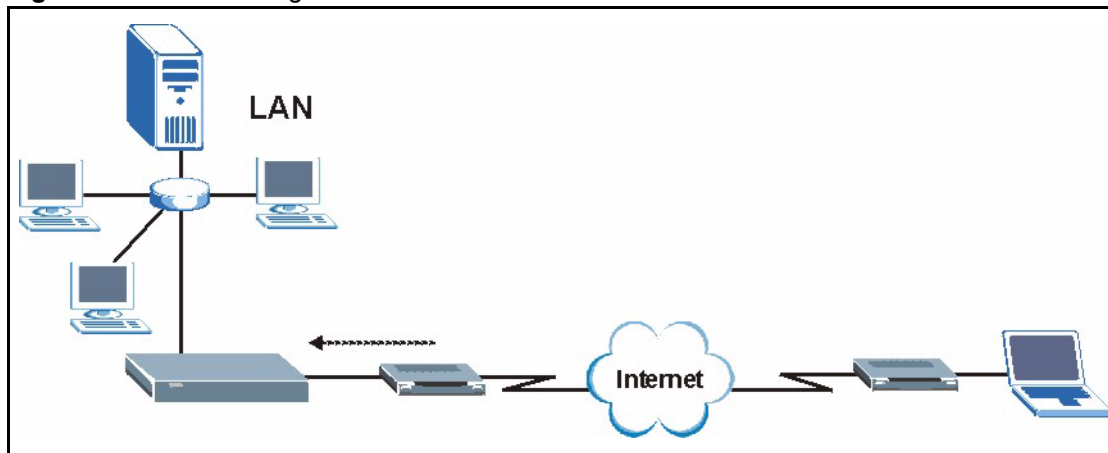


**Table 36** Remote Management: WWW

LABEL	DESCRIPTION
Secured Client IP Address	A secured client is a "trusted" computer that is allowed to communicate with the Prestige using this service. Select <b>All</b> to allow any computer to access the Prestige using this service. Choose <b>Selected</b> to just allow the computer with the IP address that you specify to access the Prestige using this service.
Apply	Click <b>Apply</b> to save your customized settings and exit this screen.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.

## 12.3 Configuring Telnet

You can configure your Prestige for remote Telnet access as shown next. The administrator uses Telnet from a computer on a remote network to access the Prestige.

**Figure 57** Telnet Configuration on a TCP/IP Network

## 12.4 Configuring TELNET

Click **REMOTE MGMT** and the **TELNET** tab to display the screen as shown.

**Figure 58** Remote Management: Telnet

The following table describes the labels in this screen.

**Table 37** Remote Management: Telnet

LABEL	DESCRIPTION
Server Port	You may change the server port number for a service if needed, however you must use the same port number in order to use that service for remote management.
Server Access	Select the interface(s) through which a computer may access the Prestige using this service.
Secured Client IP Address	A secured client is a “trusted” computer that is allowed to communicate with the Prestige using this service. Select <b>All</b> to allow any computer to access the Prestige using this service. Choose <b>Selected</b> to just allow the computer with the IP address that you specify to access the Prestige using this service.
Apply	Click <b>Apply</b> to save your customized settings and exit this screen.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.

## 12.5 Configuring FTP

You can upload and download the Prestige’s firmware and configuration files using FTP, please see the chapter on firmware and configuration file maintenance for details. To use this feature, your computer must have an FTP client.

To change your Prestige’s FTP settings, click **REMOTE MGMT**, then the **FTP** tab. The screen appears as shown.

**Figure 59** Remote Management: FTP

The following table describes the labels in this screen.

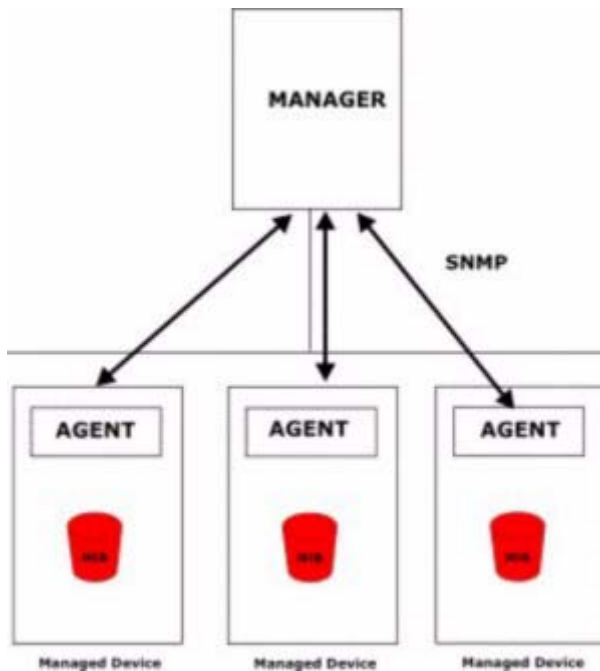
**Table 38** Remote Management: FTP

LABEL	DESCRIPTION
Server Port	You may change the server port number for a service if needed, however you must use the same port number in order to use that service for remote management.
Server Access	Select the interface(s) through which a computer may access the Prestige using this service.
Secured Client IP Address	A secured client is a “trusted” computer that is allowed to communicate with the Prestige using this service. Select <b>All</b> to allow any computer to access the Prestige using this service. Choose <b>Selected</b> to just allow the computer with the IP address that you specify to access the Prestige using this service.
Apply	Click <b>Apply</b> to save your customized settings and exit this screen.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.

## 12.6 SNMP

Simple Network Management Protocol (SNMP) 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 (SNMPv2). The next figure illustrates an SNMP management operation. SNMP is only available if TCP/IP is configured.

**Note:** SNMP is only available if TCP/IP is configured.

**Figure 60** SNMP Management Model

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

An agent is a management software module that resides in a managed device (the Prestige). An agent translates the local management information from the managed device into a form compatible with SNMP. The manager is the console through which network administrators perform network management functions. It executes applications that control and monitor managed devices.

The managed devices contain object variables/managed objects that define each piece of information to be collected about a device. Examples of variables include such as number of packets received, node port status etc. A Management Information Base (MIB) is a collection of managed objects. SNMP allows a manager and agents to communicate for the purpose of accessing these objects.

SNMP itself is a simple request/response protocol based on the manager/agent model. The manager issues a request and the agent returns responses using the following protocol operations:

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

## 12.6.1 Supported MIBs

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

## 12.6.2 SNMP Traps

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

**Table 39** SNMP Traps

TRAP #	TRAP NAME	DESCRIPTION
0	coldStart (defined in <i>RFC-1215</i> )	A trap is sent after booting (power on).
1	warmStart (defined in <i>RFC-1215</i> )	A trap is sent after booting (software reboot).
4	authenticationFailure (defined in <i>RFC-1215</i> )	A trap is sent to the manager when receiving any SNMP get or set requirements with the 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, CLI command "sys reboot", etc.).
6b	For fatal error :	A trap is sent with the message of the fatal code if the system reboots because of fatal errors.

## 12.6.3 Configuring SNMP

To change your Prestige's SNMP settings, click **REMOTE MGMT**, then the **SNMP** tab. The screen appears as shown.

**Figure 61** Remote Management: SNMP

The following table describes the labels in this screen.

**Table 40** Remote Management: SNMP

LABEL	DESCRIPTION
SNMP Configuration	
Get Community	Enter the <b>Get Community</b> , which is the password for the incoming Get and GetNext requests from the management station. The default is public and allows all requests.
Set Community	Enter the <b>Set community</b> , which is the password for incoming Set requests from the management station. The default is public and allows all requests.
Trap	
Community	Type the trap community, which is the password sent with each trap to the SNMP manager. The default is public and allows all requests.
Destination	Type the IP address of the station to send your SNMP traps to.
SNMP	
Service Port	You may change the server port number for a service if needed, however you must use the same port number in order to use that service for remote management.
Service Access	Select the interface(s) through which a computer may access the Prestige using this service.

**Table 40** Remote Management: SNMP

LABEL	DESCRIPTION
Secured Client IP Address	A secured client is a "trusted" computer that is allowed to communicate with the Prestige using this service. Select <b>All</b> to allow any computer to access the Prestige using this service. Choose <b>Selected</b> to just allow the computer with the IP address that you specify to access the Prestige using this service.
Apply	Click <b>Apply</b> to save your customized settings and exit this screen.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.

## 12.7 Configuring DNS

Use DNS (Domain Name System) to map a domain name to its corresponding IP address and vice versa. See [Section 3.3.2 on page 46](#) for background information.

To change your Prestige's DNS settings, click **REMOTE MGMT**, then the **DNS** tab. The screen appears as shown.

**Figure 62** Remote Management: DNS

The screenshot shows the 'REMOTE MANAGEMENT' interface with the 'DNS' tab selected. The configuration options are as follows:

- Service Port:** 53
- Service Access:** LAN & WAN
- Secured Client IP Address:** Selected
- IP Address Input:** 0.0.0.0

Buttons for 'Apply' and 'Reset' are visible at the bottom of the configuration area.

The following table describes the labels in this screen.

**Table 41** Remote Management: DNS

LABEL	DESCRIPTION
Server Port	The DNS service port number is 53 and cannot be changed here.
Server Access	Select the interface(s) through which a computer may send DNS queries to the Prestige.

**Table 41** Remote Management: DNS

LABEL	DESCRIPTION
Secured Client IP Address	A secured client is a “trusted” computer that is allowed to send DNS queries to the Prestige. Select <b>All</b> to allow any computer to send DNS queries to the Prestige. Choose <b>Selected</b> to just allow the computer with the IP address that you specify to send DNS queries to the Prestige.
Apply	Click <b>Apply</b> to save your customized settings and exit this screen.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.

## 12.8 Configuring Security

To change your Prestige’s security settings, click **REMOTE MGMT**, then the **Security** tab. The screen appears as shown.

If an outside user attempts to probe an unsupported port on your Prestige, an ICMP response packet is automatically returned. This allows the outside user to know the Prestige exists. Your Prestige supports anti-probing, which prevents the ICMP response packet from being sent. This keeps outsiders from discovering your Prestige when unsupported ports are probed.



**Figure 63** Security

The following table describes the labels in this screen.

**Table 42** Security

LABEL	DESCRIPTION
ICMP	Internet Control Message Protocol is a message control and error-reporting protocol between a host server and a gateway to the Internet. ICMP uses Internet Protocol (IP) datagrams, but the messages are processed by the TCP/IP software and directly apparent to the application user.
Respond to Ping on	The Prestige will not respond to any incoming Ping requests when <b>Disable</b> is selected. Select <b>LAN</b> to reply to incoming LAN Ping requests. Select <b>WAN</b> to reply to incoming WAN Ping requests. Otherwise select <b>LAN &amp; WAN</b> to reply to both incoming LAN and WAN Ping requests.
Do not respond to requests for unauthorized services	Select this option to prevent hackers from finding the Prestige by probing for unused ports. If you select this option, the Prestige will not respond to port request(s) for unused ports, thus leaving the unused ports and the Prestige unseen. By default this option is not selected and the Prestige will reply with an ICMP Port Unreachable packet for a port probe on its unused UDP ports, and a TCP Reset packet for a port probe on its unused TCP ports.
Apply	Click <b>Apply</b> to save your customized settings and exit this screen.
Reset	Click <b>Reset</b> to begin configuring this screen afresh.



# CHAPTER 13

## Universal Plug-and-Play (UPnP)

*This chapter introduces the UPnP feature in the web configurator.*

### 13.1 Introducing Universal Plug and Play

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.

#### 13.1.1 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.

#### 13.1.2 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 [Chapter 10 on page 109](#) chapter for further information about NAT.

#### 13.1.3 Cautions with UPnP

Network information and configuration may 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.

## 13.2 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.

The Prestige only sends UPnP multicasts to 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.

### 13.2.1 Configuring UPnP

From the **Site Map** in the main menu, click **UPnP** in the navigation panel to display the screen shown next.

**Figure 64** Configuring UPnP

UPnP

UPnP

Device Name: ZyXEL Prestige 2302R

Enable the Universal Plug and Play (UPnP) Feature

Allow users to make configuration changes through UPnP

Note: For UPnP to function normally, the HTTP service must be available for LAN computers using UPnP.

Apply Reset

The following table describes the fields in this screen.

**Table 43** Configuring UPnP

LABEL	DESCRIPTION
Device Name	This identifies your device in UPnP applications.
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 <b>Apply</b> to save the setting to the Prestige.
Cancel	Click <b>Cancel</b> to return to the previously saved settings.

## 13.3 Installing UPnP in Windows Example

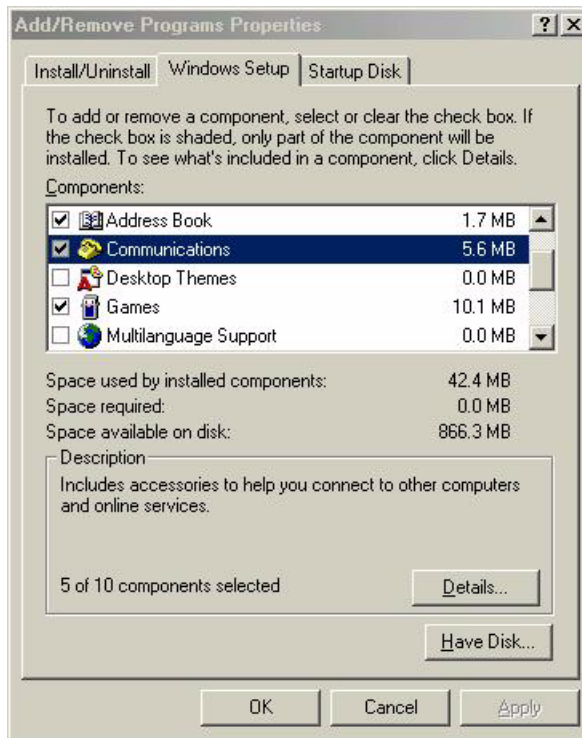
This section shows how to install UPnP in Windows Me and Windows XP.

### 13.3.1 Installing UPnP in Windows Me

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

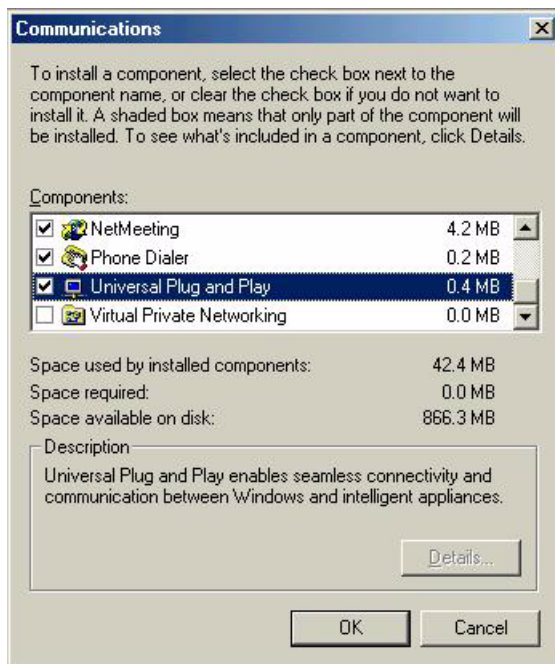
- 1 Click **Start** and **Control Panel**. Double-click **Add/Remove Programs**.
- 2 Click on the **Windows Setup** tab and select **Communication** in the **Components** selection box. Click **Details**.

**Figure 65** Add/Remove Programs: Windows Setup: Communication



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

**Figure 66** Add/Remove Programs: Windows Setup: Communication: Components



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

**5** Restart the computer when prompted.

### 13.3.2 Installing UPnP in Windows XP

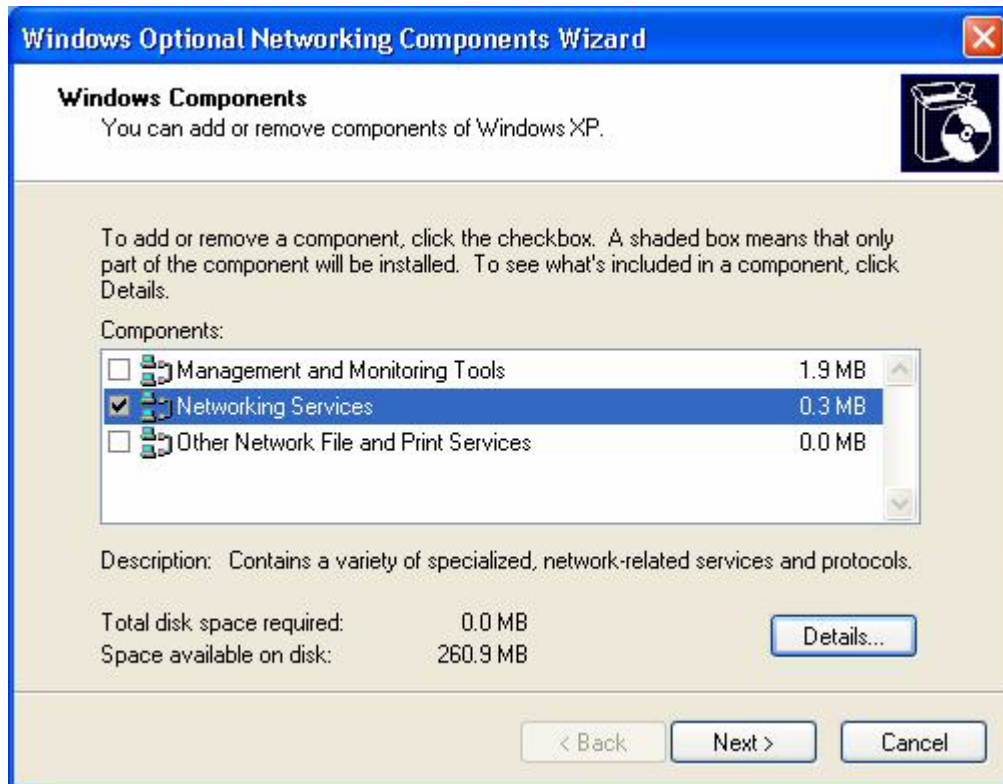
Follow the steps below to install the UPnP in Windows XP.

- 1 Click **Start** and **Control Panel**.
- 2 Double-click **Network Connections**.
- 3 In the **Network Connections** window, click **Advanced** in the main menu and select **Optional Networking Components ....**

**Figure 67** Network Connections

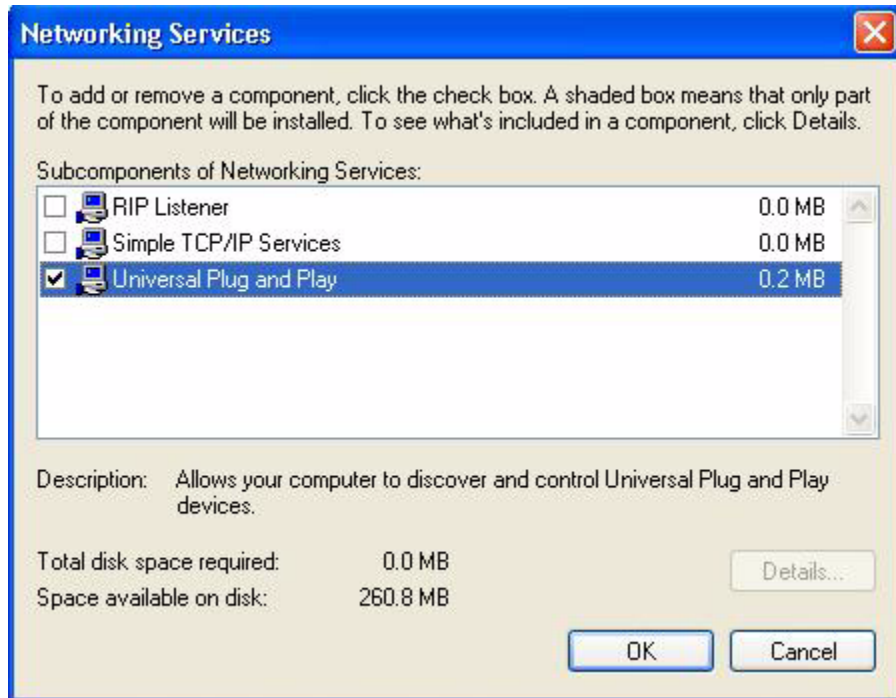


- 4 The **Windows Optional Networking Components Wizard** window displays. Select **Networking Service** in the **Components** selection box and click **Details**.

**Figure 68** Windows Optional Networking Components Wizard

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



**Figure 69** Networking Services

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

## 13.4 Using UPnP in Windows XP Example

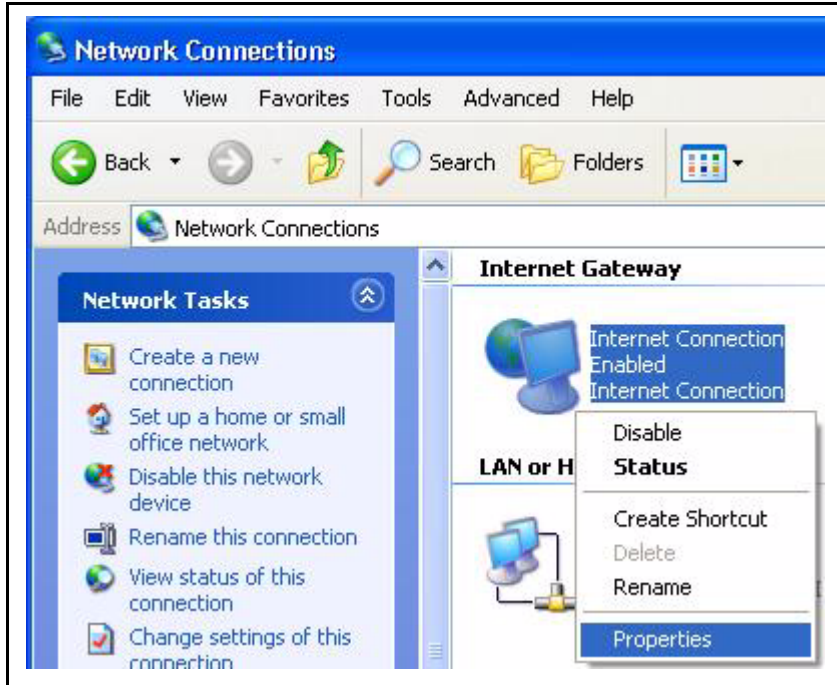
This section shows you how to use the UPnP feature in Windows XP. You must already have UPnP installed in Windows XP and UPnP activated on the Prestige.

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

### 13.4.1 Auto-discover Your UPnP-enabled Network Device

- 1 Click **Start** and **Control Panel**. Double-click **Network Connections**. An icon displays under Internet Gateway.
- 2 Right-click the icon and select **Properties**.

**Figure 70** Network Connections

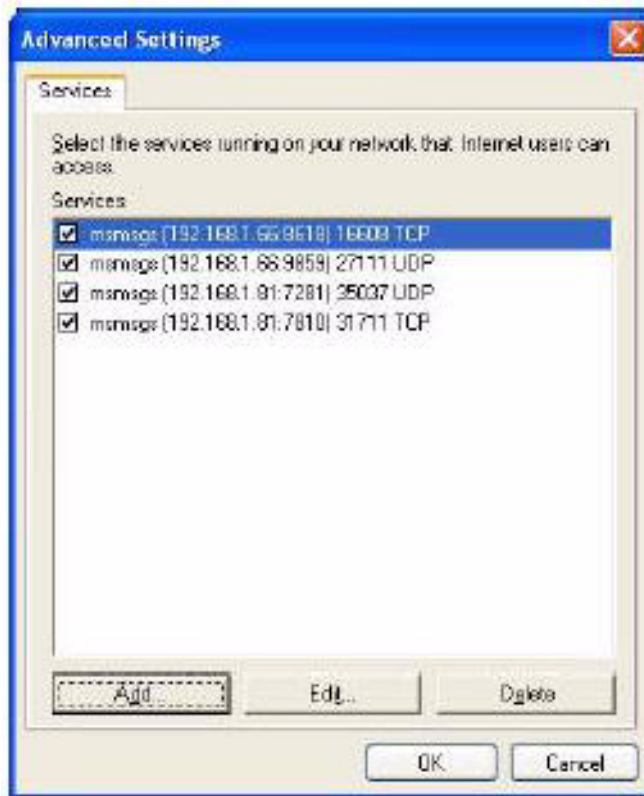


- 3** In the **Internet Connection Properties** window, click **Settings** to see the port mappings there were automatically created.

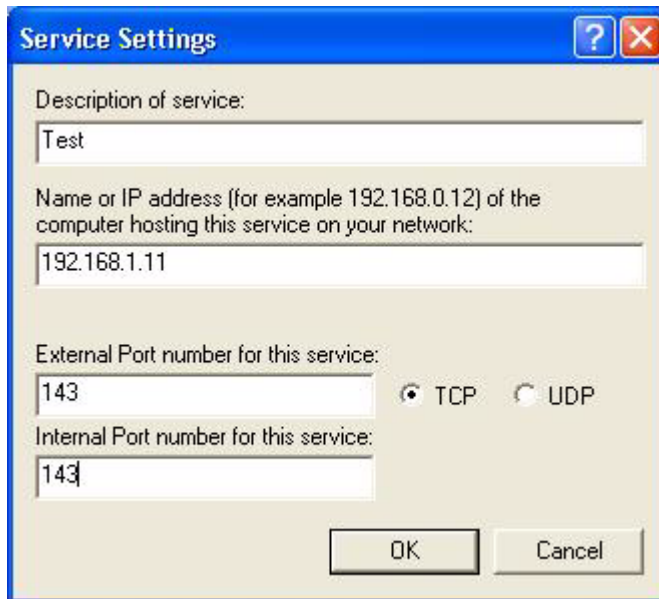
**Figure 71** Internet Connection Properties

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

**Figure 72** Internet Connection Properties: Advanced Settings



**Figure 73** Internet Connection Properties: Advanced Settings: Add



- 5** When the UPnP-enabled device is disconnected from your computer, all port mappings will be deleted automatically.
- 6** Select **Show icon in notification area when connected** option and click **OK**. An icon displays in the system tray.

**Figure 74** System Tray Icon

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

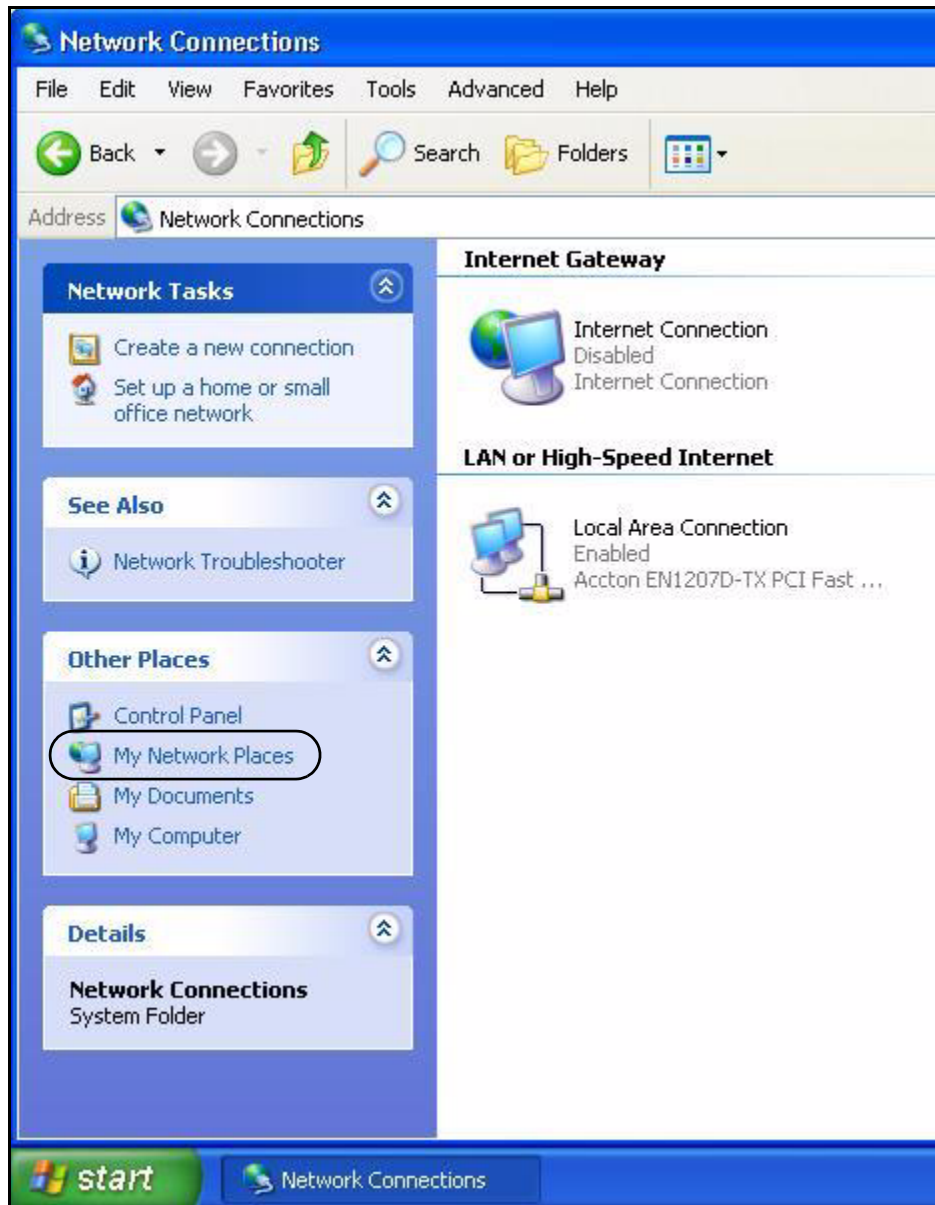
**Figure 75** Internet Connection Status

## 13.4.2 Web Configurator Easy Access

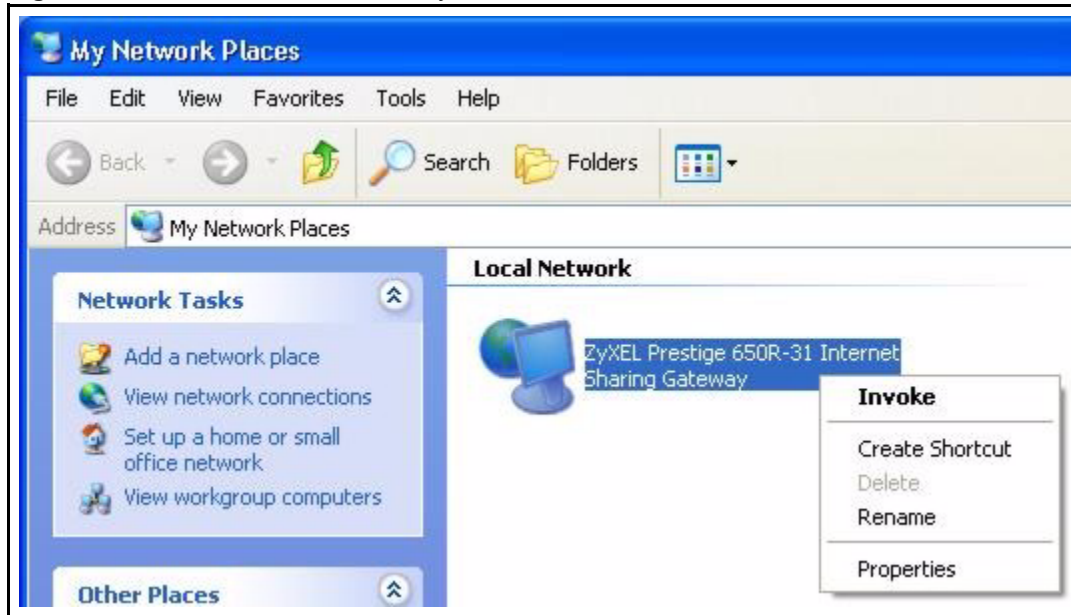
With UPnP, you can access the web-based configurator on the Prestige without finding out the IP address of the Prestige first. This comes helpful if you do not know the IP address of the Prestige.

Follow the steps below to access the web configurator.

- 1 Click **Start** and then **Control Panel**.
- 2 Double-click **Network Connections**.
- 3 Select **My Network Places** under **Other Places**.

**Figure 76** Network Connections

- 4 An icon with the description for each UPnP-enabled device displays under **Local Network**.
- 5 Right-click on the icon for your Prestige and select **Invoke**. The web configurator login screen displays.

**Figure 77** Network Connections: My Network Places

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

**Figure 78** Network Connections: My Network Places: Properties: Example





# CHAPTER 14

## Logs

This chapter contains information about configuring general log settings and viewing the logs.

### 14.1 Configuring View Log

The web configurator allows you to look at all of the logs in one location.

Click **LOGS** to open the **View Log** screen. The **View Log** screen displays logs for the categories that you selected in the **Log Settings** screen (see [Figure 80 on page 158](#)).

You can view logs and alert messages in this screen. Log entries in red indicate alerts. Once the log table is full, old logs are deleted as new logs are created.

Click a column heading to sort the entries. A triangle indicates the direction of the sort order.

**Figure 79** View Log

The screenshot shows the 'View Log' screen with a table of log entries. The table has the following data:

#	Time ▲	Message	Source	Destination	Note
1	01/01/2000 00:58:18	User login from WEB successfully	192.168.1.33		User:admin
2	01/01/2000 00:57:57	DHCP server assigns 192.168.1.33 to TW11746			
3	01/01/2000 00:57:52	DHCP server assigns 192.168.1.33 to TW11746			
4	01/01/2000 00:57:47	DHCP server assigns 192.168.1.33 to TW11746			
5	01/01/2000 00:00:59	User login from WEB successfully	192.168.1.33		User:admin
6	01/01/2000 00:00:28	DHCP server assigns 192.168.1.33 to TW11746			

The following table describes the labels in this screen.

**Table 44** View Log

LABEL	DESCRIPTION
Display	Select a log category from the drop down list box to display logs within the selected category. To view all logs, select <b>All Logs</b> . The number of categories shown in the drop down list box depends on the selection in the <b>Log Settings</b> page.
Email Log Now	Click <b>Email Log Now</b> to send the log screen to the e-mail address specified in the <b>Log Settings</b> page.
Refresh	Click <b>Refresh</b> to renew the log screen.
Clear Log	Click <b>Clear Log</b> to clear all the logs.
Time	This field displays the time the log was recorded.
Message	This field states the reason for the log.
Source	This field lists the source IP address and the port number of the incoming packet.
Destination	This field lists the destination IP address and the port number of the incoming packet.
Note	This field displays additional information about the log entry.

### 14.1.1 Log Message Descriptions

The following tables provide descriptions of example log messages.

**Table 45** System Error Logs

LOG MESSAGE	DESCRIPTION
WAN connection is down.	A WAN connection is down. You cannot access the network through this interface.
%s exceeds the max. number of session per host!	This attempt to create a NAT session exceeds the maximum number of NAT session table entries allowed to be created per host.

**Table 46** System Maintenance Logs

LOG MESSAGE	DESCRIPTION
Time calibration is successful	The device has adjusted its time based on information from the time server.
Time calibration failed	The device failed to get information from the time server.
WAN interface gets IP: %s	The WAN interface got a new IP address from the DHCP, PPPoE, PPTP or dial-up server.
DHCP client gets %s	A DHCP client got a new IP address from the DHCP server.
DHCP client IP expired	A DHCP client's IP address has expired.
DHCP server assigns %s	The DHCP server assigned an IP address to a client.

**Table 46** System Maintenance Logs (continued)

LOG MESSAGE	DESCRIPTION
Successful WEB login	Someone has logged on to the device's web configurator interface.
WEB login failed	Someone has failed to log on to the device's web configurator interface.
TELNET Login Successfully	Someone has logged on to the router via telnet.
TELNET Login Fail	Someone has failed to log on to the router via telnet.
Successful FTP login	Someone has logged on to the device via ftp.
FTP login failed	Someone has failed to log on to the device via ftp.
NAT Session Table is Full!	The maximum number of NAT session table entries has been exceeded and the table is full.
Time initialized by Daytime Server	The device got the time and date from the Daytime server.
Time initialized by Time server	The device got the time and date from the time server.
Time initialized by NTP server	The device got the time and date from the NTP server.
Connect to Daytime server fail	The device was not able to connect to the Daytime server.
Connect to Time server fail	The device was not able to connect to the Time server.
Connect to NTP server fail	The device was not able to connect to the NTP server.
Too large ICMP packet has been dropped	The device dropped an ICMP packet that was too large.
Configuration Change: PC = 0x%x, Task ID = 0x%x	The device is saving configuration changes.

**Table 47** SIP Logs

LOG MESSAGE	DESCRIPTION
SIP Registration Success by SIP:SIP Phone Number	The listed SIP account was successfully registered with a SIP register server.
SIP Registration Fail by SIP:SIP Phone Number	An attempt to register the listed SIP account with a SIP register server was not successful.
SIP UnRegistration Success by SIP:SIP Phone Number	The listed SIP account's registration was deleted from the SIP register server.
SIP UnRegistration Fail by SIP:SIP Phone Number	An attempt to delete the listed SIP account's registration from the SIP register server failed.

**Table 48** RTP Logs

LOG MESSAGE	DESCRIPTION
Error, RTP init fail	The initialization of an RTP session failed.
Error, Call fail: RTP connect fail	A VoIP phone call failed because the RTP session could not be established.
Error, RTP connection cannot close	The termination of an RTP session failed.

**Table 49** FSM Logs: Caller Side

LOG MESSAGE	DESCRIPTION
VoIP Call Start Ph[Phone Port Number] <- Outgoing Call Number	Someone used a phone connected to the listed phone port to initiate a VoIP call to the listed destination.
VoIP Call Established Ph[Phone Port] -> Outgoing Call Number	Someone used a phone connected to the listed phone port to make a VoIP call to the listed destination.
VoIP Call End Phone[Phone Port]	A VoIP phone call made from a phone connected to the listed phone port has terminated.

**Table 50** FSM Logs: Callee Side

LOG MESSAGE	DESCRIPTION
VoIP Call Start from SIP[SIP Port Number]	A VoIP phone call came to the Prestige from the listed SIP number.
VoIP Call Established Ph[Phone Port] <- Outgoing Call Number	A VoIP phone call was set up from the listed SIP number to the Prestige.
VoIP Call End Phone[Phone Port]	A VoIP phone call that came into the Prestige has terminated.

**Table 51** Lifeline Logs

LOG MESSAGE	DESCRIPTION
PSTN Call Start	A PSTN call has been initiated.
PSTN Call End	A PSTN call has terminated.
PSTN Call Established	A PSTN call has been set up.

## 14.2 Configuring Log Settings

To change your log settings, click **LOGS** and then **Log Settings**. The **Log Settings** screen opens.

Use the **Log Settings** screen to configure to where the Prestige is to send the logs; the schedule for when the Prestige is to send the logs and which logs and/or immediate alerts the Prestige is to send.

An alert is a type of log that warrants more serious attention. Some categories such as **System Errors** consist of both logs and alerts. You may differentiate them by their color in the **View Log** screen. Alerts are displayed in red and logs are displayed in black.

**Figure 80** Log Settings

**LOGS**

**View Log** | **Log Settings**

---

**Address Info**

Mail Server  (Outgoing SMTP Server Name or IP Address)

Mail Subject

Send Log to  (E-Mail Address)

Send Alerts to  (E-Mail Address)

---

**Syslog Logging**

Active

Syslog Server IP Address  (Server Name or IP Address)

Log Facility

---

**Send Log**

Log Schedule

Day for Sending Log

Time for Sending Log  (Hour)  (Minute)

Clear log after sending mail

---

<p><b>Log</b></p> <p><input checked="" type="checkbox"/> System Maintenance</p> <p><input checked="" type="checkbox"/> System Errors</p> <p><input type="checkbox"/> Access Control</p> <p><input type="checkbox"/> TCP Reset</p> <p><input type="checkbox"/> Packet Filter</p> <p><input type="checkbox"/> ICMP</p> <p><input type="checkbox"/> Remote Management</p> <p><input checked="" type="checkbox"/> CDR</p> <p><input checked="" type="checkbox"/> PPP</p> <p><input checked="" type="checkbox"/> SIP</p>	<p><b>Send Immediate Alert</b></p> <p><input type="checkbox"/> System Errors</p> <p><input type="checkbox"/> Access Control</p>
---	---

---

The following table describes the labels in this screen.

**Table 52** Log Settings

LABEL	DESCRIPTION
Address Info	
Mail Server	Enter the server name or the IP address of the mail server for the e-mail addresses specified below. If this field is left blank, logs and alert messages will not be sent via e-mail.
Mail Subject	Type a title that you want to be in the subject line of the log e-mail message that the Prestige sends.
Send Log to	Logs are sent to the e-mail address specified in this field. If this field is left blank, logs will not be sent via e-mail.
Send Alerts to	Enter the e-mail address where the alert messages will be sent. If this field is left blank, alert messages will not be sent via e-mail.
Syslog Logging	Syslog logging sends a log to an external syslog server used to store logs.
Active	Click <b>Active</b> to enable syslog logging.
Syslog Server IP Address	Enter the server name or IP address of the syslog server that will log the selected categories of logs.
Log Facility	Select a location from the drop down list box. The log facility allows you to log the messages to different files in the syslog server. Refer to the documentation of your syslog program for more details.
Send Log	
Log Schedule	<p>This drop-down menu is used to configure the frequency of log messages being sent as E-mail:</p> <ul style="list-style-type: none"> <li>• Daily</li> <li>• Weekly</li> <li>• Hourly</li> <li>• When Log is Full</li> <li>• None.</li> </ul> <p>If the <b>Weekly</b> or the <b>Daily</b> option is selected, specify a time of day when the E-mail should be sent. If the <b>Weekly</b> option is selected, then also specify which day of the week the E-mail should be sent. If the <b>When Log is Full</b> option is selected, an alert is sent when the log fills up. If you select <b>None</b>, no log messages are sent.</p>
Day for Sending Log	This field is only available when you select <b>Weekly</b> in the <b>Log Schedule</b> field. Use the drop down list box to select which day of the week to send the logs.
Time for Sending Log	Enter the time of the day in 24-hour format (for example 23:00 equals 11:00 pm) to send the logs.
Clear log after sending mail	Select the check box to clear all logs after logs and alert messages are sent via e-mail.
Log	Select the categories of logs that you want to record.
Send Immediate Alert	Select the categories of alerts for which you want the Prestige to immediately send e-mail alerts.
Apply	Click <b>Apply</b> to save your customized settings and exit this screen.
Reset	Click <b>Reset</b> to reconfigure all the fields in this screen.





# CHAPTER 15

## Maintenance

This chapter explains how to use the maintenance screens.

### 15.1 Maintenance Overview

The maintenance screens can help you view system information, upload new firmware, manage configuration and restart your Prestige.

### 15.2 Status Screen

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

**Figure 81** System Status

The screenshot displays the 'SYSTEM STATUS' screen with a navigation bar containing 'Status', 'DHCP Table', 'F/W Upload', 'Configuration', and 'Restart'. The main content area is orange and contains the following information:

- System Name :** P2302R
- Model Name :** Prestige 2302R
- ZyNOS Firmware Version:** V3.60(MM.0)b2 | 11/28/2004
- Routing Protocols :** IP
- WAN Port:**
  - IP Address :** 0.0.0.0
  - IP Subnet Mask :** 0.0.0.0
  - DHCP :** Client
- LAN Port**
  - IP Address :** 192.168.1.1
  - IP Subnet Mask :** 255.255.255.0
  - DHCP :** Server
- VoIP status :**
  - SIP1**
    - SIP Registration Status :** Register fail
    - Used Port :** 5060/UDP
    - Register** (button)
  - SIP2**
    - SIP Registration Status :** Not Register
    - Used Port :** 5060/UDP
    - Register** (button)

The following table describes the labels in this screen.

**Table 53** System Status

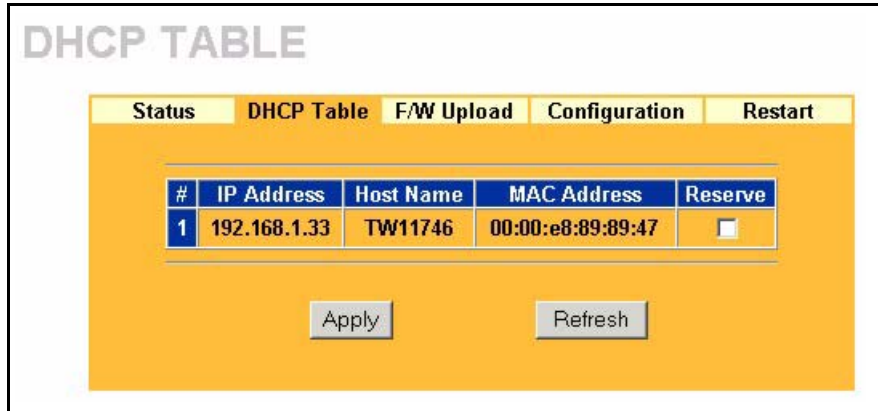
LABEL	DESCRIPTION
System Name	This is the <b>System Name</b> you chose in the <b>SYSTEM General</b> screen. It is for identification purposes
Model Name	The model name identifies your device type. The model name should also be on a sticker on your device. If you are uploading firmware, be sure to upload firmware for this exact model name.
ZyNOS Firmware Version:	This is the ZyNOS firmware version and the date the firmware was created. ZyNOS is ZyXEL's proprietary Network Operating System.
Routing Protocols	This shows the routing protocol that the Prestige handles - <b>IP</b> . This is not configurable.
WAN Port	
IP Address	This is the WAN port IP address.
IP Subnet Mask	This is the WAN port subnet mask.
DHCP	This is the WAN port DHCP role - <b>Client</b> or <b>None</b> .
LAN Port	
IP Address	This is the LAN port IP address.
IP Subnet Mask	This is the LAN port subnet mask.
DHCP	This is the LAN port DHCP role - <b>Server</b> , <b>Relay</b> or <b>None</b> .
VoIP status	
SIP1/SIP 2	This is the SIP account configured on the Prestige
SIP Registration Status	This is the SIP registration status of the SIP account. This field displays <b>Registered</b> when the Prestige has successfully registered the SIP account with the SIP register server. This field displays <b>Not Registered</b> when the Prestige has not successfully registered the SIP account with the SIP register server.
Register/Unregister	Click <b>Register</b> to have the Prestige attempt to register the SIP account with the SIP register server. Click <b>Unregister</b> to delete the SIP account's registration on the SIP register server. This removes the SIP registration server's SIP identity-to-IP address (or domain name) mapping for this SIP account, it does not cancel your SIP account.
Used Port	This field displays the Prestige's listening port for SIP traffic on this SIP account.

## 15.3 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 DHCP server, the Prestige provides the TCP/IP configuration for the clients. If the Prestige is not configured as a DHCP server, 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.

**Figure 82** Maintenance DHCP Table



The following table describes the labels in this screen.

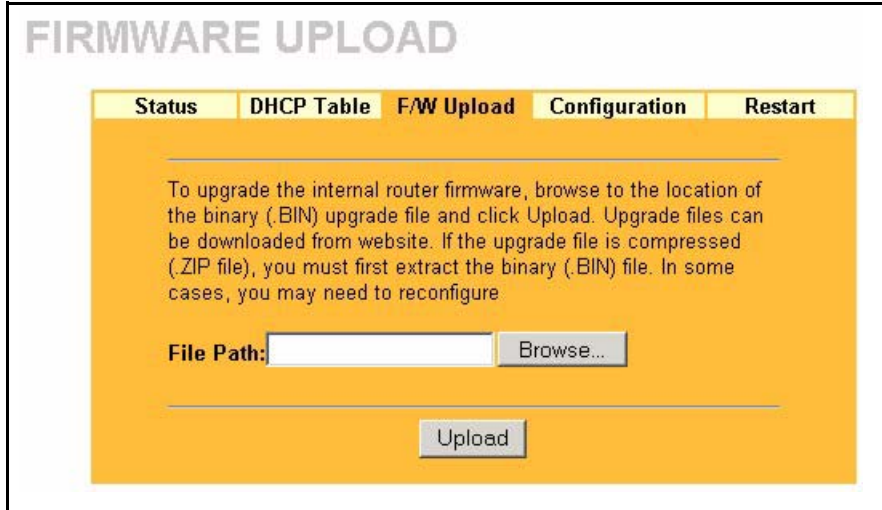
**Table 54** Maintenance DHCP Table

LABEL	DESCRIPTION
#	This is the index number of the host computer.
IP Address	This field displays the IP address relative to the # field listed above.
Host Name	This field displays the computer host name.
MAC Address	This field shows the MAC address of the computer with the name in the <b>Host Name</b> field.  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.
Reserve	Select this check box to have the Prestige always assign this IP address to this MAC address (and host name).
Apply	Click <b>Apply</b> to have the MAC address and IP address also display in the <b>LAN Static DHCP</b> screen (where you can edit them).
Refresh	Click <b>Refresh</b> to renew the screen.

## 15.4 F/W Upload Screen

Find firmware at [www.zyxel.com](http://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 HTTP (Hypertext Transfer Protocol) and may take up to two minutes. After a successful upload, the system will reboot. Click **MAINTENANCE** in the navigation panel and then the **F/W UPLOAD** tab. Follow the instructions in this screen to upload firmware to your Prestige.

**Figure 83** Firmware Upload



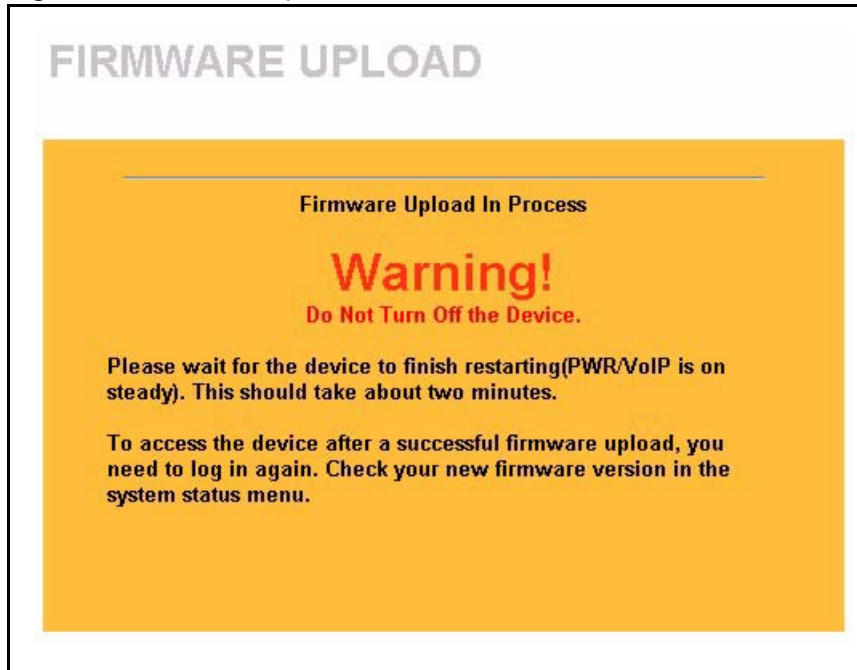
The following table describes the labels in this screen.

**Table 55** Firmware Upload

LABEL	DESCRIPTION
File Path	Type in the location of the file you want to upload in this field or click <b>Browse...</b> to find it.
Browse...	Click <b>Browse...</b> to find the .bin file you want to upload. Remember that you must decompress compressed (.zip) files before you can upload them.
Upload	Click <b>Upload</b> to begin the upload process. This process may take up to two minutes.

**Note:** Do not turn off the device while firmware upload is in progress!

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

**Figure 84** Firmware Upload In Process

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

**Figure 85** 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 **Return** to go back to the **F/W Upload** screen.

**Figure 86** Firmware Upload Error



## 15.5 Configuration Screen

Click **MAINTENANCE** in the navigation panel and then the **Configuration** tab. Information related to factory defaults, backup configuration, and restoring configuration appears as shown next.

**Figure 87** Configuration

**MAINTENANCE**

Status | DHCP Table | F/W Upload | **Configuration** | Restart

---

**Backup Configuration**

Click Backup to save the current configuration of your system to your computer.

Backup

---

**Restore Configuration**

To restore a previously saved configuration file to your system, browse to the location of the configuration file and click Upload.

File Path:  Browse...

Upload

---

**Back to Factory Defaults**

Click Reset to clear all user-entered configuration information and return to factory defaults. After resetting, the

- Password will be 1234
- LAN IP address will be 192.168.1.1
- Default Ethernet setting will be "Get IP address automatically"

Reset

### 15.5.1 Backup Configuration

**Backup Configuration** allows you to back up (save) the device's current configuration to a file on your computer. Once your device is configured and functioning properly, it is highly recommended that you back up your configuration file before making configuration changes. The backup configuration file will be useful in case you need to return to your previous settings.

Click **Backup** to save the device's current configuration to your computer.

### 15.5.2 Restore Configuration

**Restore Configuration** allows you to upload a new or previously saved configuration file from your computer to your Prestige.

**Table 56** Restore Configuration

LABEL	DESCRIPTION
File Path	Type in the location of the file you want to upload in this field or click <b>Browse...</b> to find it.

**Table 56** Restore Configuration (continued)

LABEL	DESCRIPTION
Browse...	Click <b>Browse...</b> to find the file you want to upload. Remember that you must decompress compressed (.ZIP) files before you can upload them.
Upload	Click <b>Upload</b> to begin the upload process.

**Note:** Do not turn off the device while configuration file upload is in progress.

After you see a “configuration upload successful” screen, you must then wait one minute before logging into the device again.

**Figure 88** Configuration Upload Successful



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

**Figure 89** Network Temporarily Disconnected



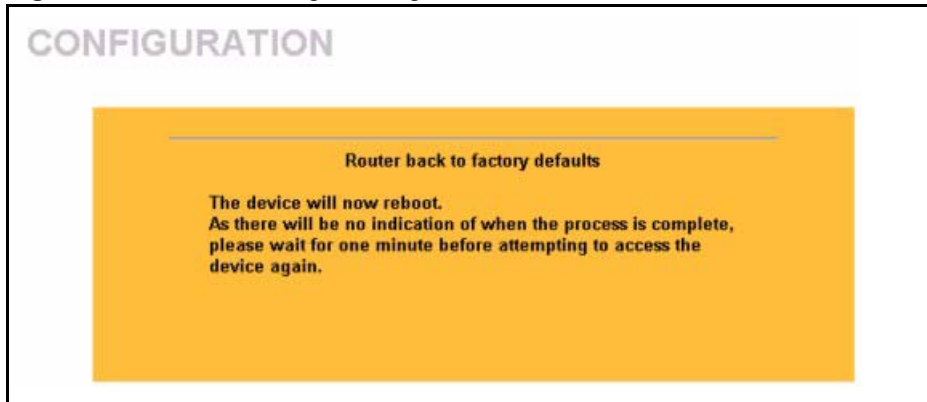
If you uploaded the default configuration file you may need to change the IP address of your computer to be in the same subnet as that of the default management IP address (192.168.5.1). See your Quick Start Guide or the appendices for details on how to set up your computer’s IP address.

If the upload was not successful, a **Configuration Upload Error** screen will appear. Click **Return** to go back to the **Configuration** screen.

### 15.5.3 Back to Factory Defaults

Clicking the **Reset** button in this section clears all user-entered configuration information and returns the Prestige to its factory defaults as shown on the screen. The following warning screen will appear.



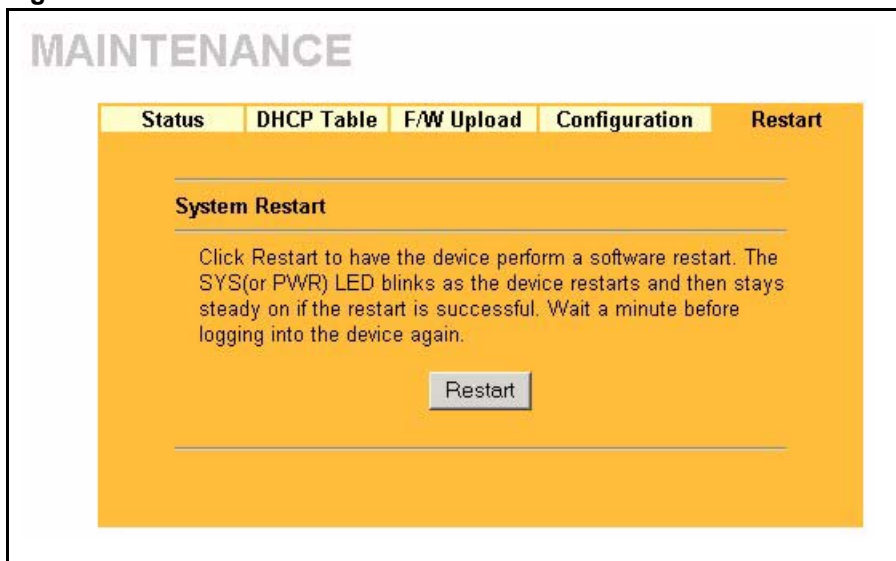
**Figure 90** Reset Warning Message

You can also press the **RESET** button on the rear panel to reset the factory defaults of your Prestige. For more information on the **RESET** button, see [Section 2.3 on page 40](#).

## 15.6 Restart Screen

System restart allows you to reboot the Prestige without turning the power off.

Click **MAINTENANCE** in the navigation panel and then **Restart**. Click **Restart** to have the Prestige reboot. This does not affect the Prestige's configuration.

**Figure 91** Restart Screen



# CHAPTER 16

## Introducing the SMT

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

### 16.1 SMT Introduction

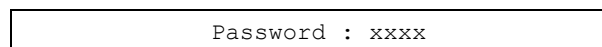
The Prestige's SMT (System Management Terminal) is a menu-driven interface that you can access through a telnet connection. This chapter shows you how to access the SMT (System Management Terminal) menus, how to navigate the SMT and how to configure SMT menus.

### 16.2 Accessing the SMT via Telnet

The following procedure details how to telnet into your Prestige.

- 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**.
- 2 For your first login, enter the default password "1234". As you type the password, the screen displays an asterisk "\*" for each character you type.

**Figure 92** Login Screen



```
Password : xxxx
```

- 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. You can use the web configurator or the CI commands to change the inactivity time out period.

### 16.3 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 57** 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 <b>No</b> to <b>Yes</b> then press [ENTER].	Fields beginning with "Edit" lead to hidden menus and have a default setting of <b>No</b> . Press [SPACE BAR] once to change <b>No</b> to <b>Yes</b> , and 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.  When you are at the top of a menu, press the [UP] arrow key to move to the bottom of a menu.
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 <b>ChangeMe</b>	All fields with the symbol <?> must be filled in order to be able to save the new configuration.  All fields with <b>ChangeMe</b> 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.  Make sure you save your settings in each screen that you configure.
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.

**Figure 93** SMT Main Menu

```

Copyright (c) 1994 - 2005 ZyXEL Communications Corp.
Prestige 2302R Main Menu

Getting Started
  1. General Setup
  2. WAN Setup
  3. LAN Setup
  4. Internet Access Setup

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

Advanced Management
  21. Filter Set Configuration
  22. SNMP Configuration
  23. System Password
  24. System Maintenance
  26. Schedule Setup

99. Exit

Enter Menu Selection Number:

```

### 16.3.1 System Management Terminal Interface Summary

The following table describes the fields in the previous screen.

**Table 58** Main Menu Summary

#	MENU TITLE	DESCRIPTION
1	General Setup	Use this menu to set up your general information.
2	WAN Setup	Use this menu to clone a MAC address from a computer on your LAN.
3	LAN Setup	Use this menu to set up your LAN connection.
4	Internet Access Setup	Configure your Internet Access setup (Internet address, gateway, login, etc.) with this menu.
11	Remote Node Setup	Use this menu to configure detailed remote node settings (your ISP is also a remote node) as well as apply WAN filters.
12	Static Routing Setup	Use this menu to set up static routes.
15	NAT Setup	Use this menu to specify inside servers when NAT is enabled.
21	Filter Set Configuration	Use this menu to configure filters.
22	SNMP Configuration	Use this menu to set up SNMP related parameters.
23	System Security	Use this menu to change your password.
24	System Maintenance	This menu provides system status, diagnostics, software upload, etc.
26	Schedule Setup	Use this menu to schedule outgoing calls.
99	Exit	Use this to exit from SMT and return to a blank screen.

## 16.3.2 Prestige SMT Menu Overview

The following table gives you an overview of your Prestige's various SMT menus.

**Table 59** SMT Menu Overview

MENUS	SUB MENUS		
1 General Setup	1.1 Configure Dynamic DNS		
2 WAN Setup			
3 LAN Setup	3.1 LAN Port Filter Setup		
	3.2 TCP/IP and DHCP Setup	3.2.1 IP Alias Setup	
4 Internet Access Setup			
11 Remote Node Setup	11.1 Remote Node Profile		
	11.3 Remote Node Network Layer Options		
	11.5 Remote Node Filter		
	11.6 Traffic Redirect Setup		
12 Static Routing Setup	12.1 Edit Static Route Setup		
15 NAT Setup	15.1 Address Mapping Sets	15.1.1 Address Mapping Rules	15.1.1.x Address Mapping Rule
	15.2 Port Forwarding Setup		
	15.3 Trigger Port Setup		
21 Filter Set Configuration	21.x Filter Rules Summary	21.x.x Generic Filter Rule	
		21.x.x TCP/IP Filter Rule	
23 Password			
24 System Maintenance	24.1 System Status		
	24.2 System Information and Console Port Speed	24.2.1 System Information	
		24.2.2 Console Port Speed	
	24.3 Log and Trace	24.3.2 Syslog Logging	
		24.3.4 Call-Triggering Packet	
	24.4 Diagnostic		
	24.5 Backup Configuration		
	24.6 Restore Configuration		
	24.7 Upload Firmware	24.7.1 Upload System Firmware	
		24.7.2 Upload System Configuration File	
	24.8 Command Interpreter Mode		
	24.9 Call Control	24.9.1 Budget Management	
24.9.2 Call History			
24.10 Time and Date Setting			
24.11 Remote Management Setup			

## 16.4 Changing the System Password

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

- 1 Enter 23.1 in the main menu to display **Menu 23.1 - System Security - Change Password.**
- 2 Type your existing system password in the **Old Password** field, for example “1234”, and press [ENTER]

**Figure 94** Menu 23 System Password

```
Menu 23.1 - System Security - Change Password

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

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

- 3 Type your new system password in the **New Password** field (up to 30 characters), and press [ENTER].
- 4 Re-type your new system password in the **Retype to confirm** field for confirmation and press [ENTER].

**Note:** When you type in a password, the screen displays an “\*” for each character typed





# CHAPTER 17

## Menu 1 General Setup

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

### 17.1 General Setup Introduction

See [Chapter 3 on page 45](#) for background information on general setup.

### 17.2 General Setup Configuration

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

**Figure 95** Menu 1 General Setup.

```

Menu 1 - General Setup

System Name=
Domain Name= zyxel.com.tw
First System DNS Server= From ISP
IP Address= N/A
Second System DNS Server= From ISP
IP Address= N/A
Third System DNS Server= From ISP
IP Address= N/A
Edit Dynamic DNS= No
Press ENTER to Confirm or ESC to Cancel:

```

The following table describes the fields in this menu.

**Table 60** Menu 1 General Setup

FIELD	DESCRIPTION
System Name	Choose a descriptive name for identification purposes. It is recommended you enter your computer's "Computer name" in this field. This name can be up to 30 alphanumeric characters long. Spaces are not allowed, but dashes "-" and underscores "_" are accepted.
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 domain name" to see the current domain name used by your router. Use up to 38 alphanumeric characters. Spaces are not allowed, but dashes "-" and periods "." are accepted.  The domain name entered by you is given priority over the ISP assigned domain name. If you want to clear this field just press [SPACE BAR] and then [ENTER].

**Table 60** Menu 1 General Setup (continued)

FIELD	DESCRIPTION
First System DNS Server Second System DNS Server Third System DNS Server	<p>DNS (Domain Name System) is for mapping 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 machine before you can access it. The Prestige uses a system DNS server (in the order you specify here) to resolve domain names for DDNS and the time server.</p> <p>Press [SPACE BAR] and then [ENTER] to select an option. Select <b>From ISP</b> if your ISP dynamically assigns DNS server information (and the Prestige's WAN IP address). The <b>IP Address</b> field below displays the (read-only) DNS server IP address that the ISP assigns.</p> <p>Select <b>User-Defined</b> if you have the IP address of a DNS server. Enter the DNS server's IP address in the <b>IP Address</b> field. If you select <b>User-Defined</b>, but leave the IP address set to 0.0.0.0, <b>User-Defined</b> changes to <b>None</b> after you save your changes. If you set a second choice to <b>User-Defined</b>, and enter the same IP address, the second <b>User-Defined</b> changes to <b>None</b> after you save your changes.</p> <p>Select <b>None</b> if you do not want to configure DNS servers. If you do not configure a system DNS server, you must use IP addresses when configuring DDNS and the time server.</p>
Edit Dynamic DNS	Press [SPACE BAR] and then [ENTER] to select <b>Yes</b> or <b>No</b> (default). Select <b>Yes</b> to configure <b>Menu 1.1: Configure Dynamic DNS</b> discussed next.
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.	

## 17.2.1 Procedure to Configure Dynamic DNS

**Note:** 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.

**Figure 96** Menu 1.1 Configure Dynamic DNS

```

Menu 1.1 - Configure Dynamic DNS

Service Provider= WWW.DynDNS.ORG
Active= Yes
DDNSType= DynamicDNS
Host1=
Host2=
Host3=
USER=
Password= *****
Enable Wildcard= No
Offline= N/A
Edit Update IP Address:
  Use Server Detected IP= No
  User Specified IP Address= No
  IP Address= N/A

Press ENTER to Confirm or ESC to Cancel:

```

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

**Table 61** Menu 1.1 Configure Dynamic DNS

FIELD	DESCRIPTION
Service Provider	This is the name of your Dynamic DNS service provider.
Active	Press [SPACE BAR] to select <b>Yes</b> and then press [ENTER] to make dynamic DNS active.
DDNSType	Press [SPACE BAR] and then [ENTER] to select <b>DynamicDNS</b> if you have a dynamic IP address(es). Select <b>StaticDNS</b> if you have a static IP address(es). Select <b>CustomDNS</b> to have dyns.org provide DNS service for a domain name that you already have from a source other than dyndns.org.
Host 1- 3	Enter your host name(s) in the fields provided. You can specify up to two host names separated by a comma in each field.
USER	Enter your user name.
Password	Enter the password assigned to you.
Enable Wildcards	Your Prestige supports DYNDNS Wildcard. Press [SPACE BAR] and then [ENTER] to select <b>Yes</b> or <b>No</b> . This field is <b>N/A</b> when you choose DDNS client as your service provider.
Offline	This field is only available when <b>CustomDNS</b> is selected in the <b>DDNS Type</b> field. Press [SPACE BAR] and then [ENTER] to select <b>Yes</b> . When <b>Yes</b> is selected, <a href="http://www.dyndns.org/">http://www.dyndns.org/</a> traffic is redirected to a URL that you have previously specified (see <a href="http://www.dyndns.org/">www.dyndns.org</a> for details).
Edit Update IP Address: You can select <b>Yes</b> in either the <b>Use Server Detected IP</b> field (recommended) or the <b>User Specified IP Address</b> field, but not both. With the <b>Use Server Detected IP</b> and <b>User Specified IP Address</b> fields both set to <b>No</b> , the DDNS server automatically updates the IP address of the host name(s) with the Prestige's WAN IP address. DDNS does not work with a private IP address. When both fields are set to <b>No</b> , the Prestige must have a public WAN IP address in order for DDNS to work.	

**Table 61** Menu 1.1 Configure Dynamic DNS (continued)

FIELD	DESCRIPTION
Use Server Detected IP	Press [SPACE BAR] to select <b>Yes</b> and then press [ENTER] to have the DDNS server automatically update the IP address of the host name(s) with the public IP address that the Prestige uses or is behind. You can set this field to <b>Yes</b> whether the IP address is public or private, static or dynamic.
User Specified IP Address	Press [SPACE BAR] to select <b>Yes</b> and then press [ENTER] to update the IP address of the host name(s) to the IP address specified below. Only select <b>Yes</b> if the Prestige uses or is behind a static public IP address.
IP Address	Enter the static public IP address if you select <b>Yes</b> in the <b>User Specified IP Address</b> field.
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.	

**Note:** The IP address updates when you reconfigure menu 1 or perform DHCP client renewal

# CHAPTER 18

## Menu 2 WAN Setup

This chapter describes how to configure the WAN using menu 2.

### 18.1 Introduction to WAN

This chapter explains how to configure settings for your WAN port. Refer to [Chapter 5 on page 65](#) for background information.

### 18.2 WAN Setup

From the main menu, enter 2 to open menu 2.

**Figure 97** Menu 2 WAN Setup

```

Menu 2 - WAN Setup

MAC Address:
Assigned By= Factory default
IP Address= N/A

Press ENTER to Confirm or ESC to Cancel:

```

The following table describes the fields in this menu.

**Table 62** Menu 2 WAN Setup

FIELD	DESCRIPTION
MAC Address	
Assigned By	Press [SPACE BAR] and then [ENTER] to choose one of two methods to assign a MAC Address. Choose <b>Factory Default</b> to select the factory assigned default MAC Address. Choose <b>IP address attached on LAN</b> to use the MAC Address of that computer whose IP you give in the following field.
IP Address	This field is applicable only if you choose the <b>IP address attached on LAN</b> method in the <b>Assigned By</b> field. Enter the IP address of the computer on the LAN whose MAC you are cloning.
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 19

## Menu 3 LAN Setup

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

### 19.1 LAN Setup

This chapter describes how to configure the Ethernet using **Menu 3 — LAN Setup**. From the main menu, enter 3 to display menu 3. See [Chapter 4 on page 55](#) for background information.

**Figure 98** Menu 3 LAN Setup

```
Menu 3 - LAN Setup

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

Enter Menu Selection Number:
```

#### 19.1.1 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

**Figure 99** Menu 3.1 LAN Port Filter Setup.

```
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:
```

If you need to define filters, please read [Chapter 24 on page 221](#) first, then return to this menu to define the filter sets.

## 19.2 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 — LAN Setup**. When menu 3 appears, press 2 and press [ENTER] to display **Menu 3.2 — TCP/IP and DHCP Ethernet Setup**, as shown next:

**Figure 100** Menu 3.2 TCP/IP and DHCP Ethernet Setup

```

Menu 3.2 - TCP/IP and DHCP Ethernet Setup

DHCP= Server                      TCP/IP Setup:
Client IP Pool:                   IP Address= 192.168.1.1
  Starting Address= 192.168.1.33  IP Subnet Mask= 255.255.255.0
  Size of Client IP Pool= 32      RIP Direction= Both
First DNS Server= From ISP        Version= RIP-1
  IP Address= N/A                Multicast= None
Second DNS Server= From ISP       Edit IP Alias= No
  IP Address= N/A
Third DNS Server= DNS Relay
  IP Address= N/A
DHCP Server Address= N/A

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

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

**Table 63** DHCP Ethernet Setup Fields

FIELD	DESCRIPTION
DHCP	This field enables/disables the DHCP server. If set to <b>Server</b> , your Prestige will act as a DHCP server. If set to <b>None</b> , the DHCP server will be disabled. If set to <b>Relay</b> the Prestige acts as a surrogate DHCP server and relays requests and responses between the remote server and the clients. When set to <b>Server</b> , the following items need to be set:
Client IP Pools	
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.



**Table 63** DHCP Ethernet Setup Fields (continued)

FIELD	DESCRIPTION
First DNS Server Second DNS Server Third DNS Server	<p>The Prestige passes a DNS (Domain Name System) server IP address (in the order you specify here) to the DHCP clients.</p> <p>Select <b>From ISP</b> if your ISP dynamically assigns DNS server information (and the Prestige's WAN IP address). The <b>IP Address</b> field below displays the (read-only) DNS server IP address that the ISP assigns.</p> <p>Select <b>User-Defined</b> if you have the IP address of a DNS server. Enter the DNS server's IP address in the <b>IP Address</b> field below. If you chose <b>User-Defined</b>, but leave the IP address set to 0.0.0.0, <b>User-Defined</b> changes to <b>None</b> after you save your changes. If you set a second choice to <b>User-Defined</b>, and enter the same IP address, the second <b>User-Defined</b> changes to <b>None</b> after you save your changes.</p> <p>Select <b>DNS Relay</b> to have the Prestige act as a DNS proxy. The Prestige's LAN IP address displays in the <b>IP Address</b> field below (read-only). The Prestige tells the DHCP clients on the LAN that the Prestige itself is the DNS server. When a computer on the LAN sends a DNS query to the Prestige, the Prestige forwards the query to the Prestige's system DNS server (configured in menu 1) and relays the response back to the computer. You can only select <b>DNS Relay</b> for one of the three servers; if you select DNS Relay for a second or third DNS server, that choice changes to <b>None</b> after you save your changes.</p> <p>Select <b>None</b> if you do not want to configure DNS servers. If you do not configure a DNS server, you must know the IP address of a machine in order to access it.</p>
DHCP Server Address	If <b>Relay</b> is selected in the <b>DHCP</b> field above, then type the IP address of the actual, remote DHCP server here.

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

**Table 64** Menu 3.2: LAN TCP/IP Setup Fields

FIELD	DESCRIPTION
TCP/IP Setup:	
IP Address	Enter the IP address of your Prestige in dotted decimal notation
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.
RIP Direction	Press [SPACE BAR] and then [ENTER] to select the RIP direction. Options are: <b>Both, In Only, Out Only</b> or <b>None</b> .
Version	Press [SPACE BAR] and then [ENTER] to select the RIP version. Options are: <b>RIP-1, RIP-2B</b> or <b>RIP-2M</b> .
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 ( <b>IGMP-v1</b> ) and version 2 ( <b>IGMP-v2</b> ). Press [SPACE BAR] and then [ENTER] to enable IP Multicasting or select <b>None</b> (default) to disable it.
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 select <b>Yes</b> and then press [ENTER] to display menu 3.2.1
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.	

## 19.2.1 IP Alias Setup

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.

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

Press [ENTER] to open **Menu 3.2.1 - IP Alias Setup**, as shown next.

**Figure 101** Menu 3.2.1: IP Alias Setup

```

Menu 3.2.1 - IP Alias Setup

IP Alias 1= Yes
IP Address=
IP Subnet Mask= 0.0.0.0
RIP Direction= None
    Version= RIP-1
Incoming protocol filters=
Outgoing protocol filters=
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:
    
```

Use the instructions in the following table to configure IP alias parameters.

**Table 65** Menu 3.2.1: IP Alias Setup

FIELD	DESCRIPTION
IP Alias 1, 2	Choose <b>Yes</b> to configure the LAN network for the Prestige.
IP Address	Enter the IP address of your Prestige in dotted decimal notation.
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.
RIP Direction	Press [SPACE BAR] and then [ENTER] to select the RIP direction. Options are <b>Both, In Only, Out Only</b> or <b>None</b> .
Version	Press [SPACE BAR] and then [ENTER] to select the RIP version. Options are <b>RIP-1, RIP-2B</b> or <b>RIP-2M</b> .
Incoming protocol filters	Enter the filter set(s) you wish to apply to the incoming traffic between this node and the Prestige.

**Table 65** Menu 3.2.1: IP Alias Setup (continued)

FIELD	DESCRIPTION
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.	



# CHAPTER 20

## Internet Access

This chapter shows you how to configure your Prestige for Internet access.

### 20.1 Introduction to Internet Access Setup

Use information from your ISP along with the instructions in this chapter to set up your Prestige to access the Internet. There are three different menu 4 screens depending on whether you chose **Ethernet**, **PPTP** or **PPPoE** Encapsulation. Contact your ISP to determine what encapsulation type you should use.

### 20.2 Ethernet Encapsulation

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

If you choose **Ethernet** in menu 4 you will see the next menu.

**Figure 102** Menu 4 Internet Access Setup

```
Menu 4 - Internet Access Setup

ISP's Name= MyISP
Encapsulation= Ethernet
Service Type= Standard
  My Login= N/A
  My Password= N/A
  Retype to Confirm= N/A
  Login Server= N/A

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

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

The following table describes the fields in this menu.

**Table 66** Internet Access Setup (Ethernet)

FIELD	DESCRIPTION
ISP's Name	Enter the name of your Internet Service Provider, e.g., myISP. This information is for identification purposes only.
Encapsulation	Press [SPACE BAR] and then press [ENTER] to choose <b>Ethernet</b> . The encapsulation method influences your choices for the <b>IP Address</b> field.
Service Type	Press [SPACE BAR] and then [ENTER] to select <b>Standard</b> , <b>RR-Toshiba</b> (RoadRunner Toshiba authentication method), <b>RR-Manager</b> (RoadRunner Manager authentication method) or <b>RR-Telstra</b> . Choose a RoadRunner flavor if your ISP is Time Warner's RoadRunner; otherwise choose <b>Standard</b> .
Note: DSL users must choose the <b>Standard</b> option only. The <b>My Login</b> , <b>My Password</b> and <b>Login Server</b> fields are not applicable in this case.	
My Login	Enter the login name given to you by your ISP.
My Password	Type your password again for confirmation.
Retype to Confirm	Enter your password again to make sure that you have entered is correctly.
Login Server	The Prestige will find the RoadRunner Server IP if this field is left blank. If it does not, then you must enter the authentication server IP address.
IP Address Assignment	If your ISP did not assign you a fixed IP address, press [SPACE BAR] and then [ENTER] to select <b>Dynamic</b> , otherwise select <b>Static</b> and enter the IP address and subnet mask in the following fields.
IP Address	Enter the (fixed) IP address assigned to you by your ISP (static IP address assignment is selected in the previous field).
IP Subnet Mask	Enter the subnet mask associated with your static IP.
Gateway IP Address	Enter the gateway IP address associated with your static IP.
Network Address Translation	<p>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).</p> <p>Choose <b>None</b> to disable NAT.</p> <p>Choose <b>SUA Only</b> if you have a single public IP address. SUA (Single User Account) is a subset of NAT that supports two types of mapping: <b>Many-to-One</b> and <b>Server</b>.</p> <p>Choose <b>Full Feature</b> if you have multiple public IP addresses. <b>Full Feature</b> mapping types include: <b>One-to-One</b>, <b>Many-to-One</b> (SUA/PAT), <b>Many-to-Many Overload</b>, <b>Many- One-to-One</b> and <b>Server</b>. When you select <b>Full Feature</b> you must configure at least one address mapping set!</p> <p>Please see the NAT chapter for a more detailed discussion on the Network Address Translation feature.</p>
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.	

## 20.3 Configuring the PPTP Client

**Note:** The Prestige supports only one PPTP server connection at any given time

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

After configuring **My Login** and **Password** for PPP connection, press [SPACE BAR] and then [ENTER] in the **Encapsulation** field in **Menu 4 -Internet Access Setup** to choose **PPTP** as your encapsulation option. This brings up the following screen.

**Figure 103** Internet Access Setup (PPTP)

```

Menu 4 - Internet Access Setup

ISP's Name= MyISP
Encapsulation= PPTP
Service Type= N/A
My Login=
My Password= *****
Retype to Confirm= *****
Idle Timeout= 100
IP Address Assignment= Dynamic
IP Address= N/A
IP Subnet Mask= N/A
Gateway IP Address= N/A
Network Address Translation= SUA Only

Press ENTER to Confirm or ESC to Cancel:

```

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

**Table 67** New Fields in Menu 4 (PPTP)

FIELD	DESCRIPTION
Encapsulation	Press [SPACE BAR] and then press [ENTER] to choose <b>PPTP</b> . The encapsulation method influences your choices for the <b>IP Address</b> field.
Idle Timeout	This value specifies the time, in seconds, that elapses before the Prestige automatically disconnects from the PPTP server.

## 20.4 Configuring the PPPoE Client

If you enable PPPoE in menu 4, you will see the next screen. For more information on PPPoE, please see the appendix.

**Figure 104** Internet Access Setup (PPPoE)

```

Menu 4 - Internet Access Setup

ISP's Name= MyISP
Encapsulation= PPPoE
Service Type= N/A
My Login=
My Password= *****
Retye to Confirm= *****
Idle Timeout= 100
IP Address Assignment= Dynamic
IP Address= N/A
IP Subnet Mask= N/A
Gateway IP Address= N/A
Network Address Translation= SUA Only

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

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

**Table 68** New Fields in Menu 4 (PPPoE)

FIELD	DESCRIPTION
Encapsulation	Press [SPACE BAR] and then press [ENTER] to choose <b>PPPoE</b> . The encapsulation method influences your choices in the <b>IP Address</b> field.
Idle Timeout	This value specifies the time in seconds that elapses before the Prestige automatically disconnects from the PPPoE server.

If you need a PPPoE service name to identify and reach the PPPoE server, please go to menu 11 and enter the PPPoE service name provided to you in the **Service Name** field.

## 20.5 Basic Setup Complete

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



# CHAPTER 21

## Remote Node Configuration

This chapter covers remote node configuration.

### 21.1 Introduction to Remote Node Setup

A remote node is required for placing calls to a remote gateway. A remote node represents both the remote gateway and the network behind it across a WAN connection. Note that when you use menu 4 to set up Internet access, you are actually configuring a remote node. The following describes how to configure **Menu 11.1 Remote Node Profile**, **Menu 11.3 - Remote Node Network Layer Options**, **Menu 11.5 - Remote Node Filter** and **Menu 11.6 - Traffic Redirect Setup**.

### 21.2 Remote Node Profile Setup

From the main menu, select menu option 11 to open **Menu 11 Remote Node Profile** (shown below).

The following explains how to configure the remote node profile menu.

#### 21.2.1 Ethernet Encapsulation

There are two variations of menu 11 depending on whether you choose **Ethernet Encapsulation** or **PPPoE Encapsulation**. You must choose the **Ethernet** option when the WAN port is used as a regular Ethernet. The first menu 11.1 screen you see is for Ethernet encapsulation shown next.

**Figure 105** Menu 11.1 Remote Node Profile for Ethernet Encapsulation

```

Menu 11.1 - Remote Node Profile

Rem Node Name= MyISP           Route= IP
Active= Yes                    Edit IP= No
Encapsulation= Ethernet       Session Options:
Service Type= Standard        Edit Filter Sets= No
Service Name= N/A
Outgoing:
  My Login= N/A
  My Password= N/A            Edit Traffic Redirect= No
  Retype to Confirm= N/A
  Server= N/A

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

The following table describes the fields in this menu.

**Table 69** Menu 11.1 Remote Node Profile for Ethernet Encapsulation

FIELD	DESCRIPTION
Rem Node Name	Enter a descriptive name for the remote node. This field can be up to eight characters.
Active	Press [SPACE BAR] and then [ENTER] to select <b>Yes</b> (activate remote node) or <b>No</b> (deactivate remote node).
Encapsulation	<b>Ethernet</b> is the default encapsulation. Press [SPACE BAR] and then [ENTER] to change to <b>PPPoE</b> or <b>PPTP</b> encapsulation.
Service Type	Press [SPACE BAR] and then [ENTER] to select from <b>Standard</b> , <b>RR-Toshiba</b> (RoadRunner Toshiba authentication method), <b>RR-Manager</b> (RoadRunner Manager authentication method), or <b>RR-Telstra</b> . Choose one of the RoadRunner methods if your ISP is Time Warner's RoadRunner; otherwise choose <b>Standard</b> .
Outgoing	
My Login	This field is applicable for <b>PPPoE</b> encapsulation only. Enter the login name assigned by your ISP when the Prestige calls this remote node. Some ISPs append this field to the <b>Service Name</b> field above (e.g., jim@poellic) to access the PPPoE server.
My Password	Enter the password assigned by your ISP when the Prestige calls this remote node. Valid for <b>PPPoE</b> encapsulation only.
Retype to Confirm	Type your password again to make sure that you have entered it correctly.
Server	This field is valid only when <b>RoadRunner</b> is selected in the <b>Service Type</b> field. The Prestige will find the RoadRunner Server IP automatically if this field is left blank. If it does not, then you must enter the authentication server IP address here.
Route	This field refers to the protocol that will be routed by your Prestige – IP is the only option for the Prestige.
Edit IP	This field leads to a "hidden" menu. Press [SPACE BAR] to select <b>Yes</b> and press [ENTER] to go to <b>Menu 11.3 - Remote Node Network Layer Options</b> .
Session Options	

**Table 69** Menu 11.1 Remote Node Profile for Ethernet Encapsulation (continued)

FIELD	DESCRIPTION
Edit Filter Sets	This field leads to another "hidden" menu. Use [SPACE BAR] to select <b>Yes</b> and press [ENTER] to open menu 11.5 to edit the filter sets. See the <i>Remote Node Filter</i> section for more details.
Edit Traffic Redirect	Press [SPACE BAR] to select <b>Yes</b> or <b>No</b> . Select <b>Yes</b> and press [ENTER] to configure <b>Menu 11.6 Traffic Redirect Setup</b> . Select <b>No</b> (default) if you do not want to configure this feature.
Once you have configured this menu, press [ENTER] at the message "Press ENTER to Confirm..." to save your configuration, or press [ESC] at any time to cancel.	

## 21.2.2 PPPoE Encapsulation

The Prestige supports PPPoE (Point-to-Point Protocol over Ethernet). You can only use PPPoE encapsulation when you're using the Prestige with a DSL modem as the WAN device. If you change the Encapsulation to **PPPoE**, then you will see the next screen. Please see the appendix for more information on PPPoE.

**Figure 106** Menu 11.1 Remote Node Profile for PPPoE Encapsulation

```

Menu 11.1 - Remote Node Profile

Rem Node Name= MyISP           Route= IP
Active= Yes                    Edit IP= No
Encapsulation= PPPoE          Telco Option:
Service Type= Standard        Allocated Budget(min)= 0
Service Name=                 Period(hr)= 0
Outgoing:                     Schedules=
  My Login=                   Nailed-Up Connection= No
  My Password= *****
  Retype to Confirm= *****
  Authen= CHAP/PAP

Session Options:
  Edit Filter Sets= No
  Idle Timeout(sec)= 100
  Edit Traffic Redirect= No

Press ENTER to Confirm or ESC to Cancel:

```

### 21.2.2.1 Outgoing Authentication Protocol

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

### 21.2.2.2 Nailed-Up Connection

A nailed-up connection is a dial-up line where the connection is always up regardless of traffic demand. The Prestige does two things when you specify a nailed-up connection. The first is that idle timeout is disabled. The second is that the Prestige will try to bring up the connection 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.

The following table describes the fields not already described in [Table 69 on page 194](#).

**Table 70** Fields in Menu 11.1 (PPPoE Encapsulation Specific)

FIELD	DESCRIPTION
Service Name	If you are using <b>PPPoE</b> encapsulation, then type the name of your PPPoE service here. Only valid with <b>PPPoE</b> encapsulation.
Authen	This field sets the authentication protocol used for outgoing calls. Options for this field are: <ul style="list-style-type: none"> <li>• <b>CHAP/PAP</b> - Your Prestige will accept either <b>CHAP</b> or <b>PAP</b> when requested by this remote node.</li> <li>• <b>CHAP</b>- accept CHAP only.</li> <li>• <b>PAP</b>- accept PAP only.</li> </ul>
Telco Option	
Allocated Budget	The field 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 <b>Allocated Budget</b> is (10 minutes) and the <b>Period(hr)</b> is 1 (hour).
Schedules	You can apply up to four schedule sets here. For more details please refer to the <i>Call Schedule Setup</i> chapter.
Nailed-Up Connection	This field specifies if you want to make the connection to this remote node a nailed-up connection. More details are given earlier in this section.
Session Options	
Idle Timeout	Type the length of idle time (when there is no traffic from the Prestige to the remote node) in seconds that can elapse before the Prestige automatically disconnects the PPPoE connection. This option only applies when the Prestige initiates the call.

### 21.2.3 PPTP Encapsulation

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

**Figure 107** Menu 11.1 Remote Node Profile for PPTP Encapsulation

```

Menu 11.1 - Remote Node Profile

Rem Node Name= MyISP           Route= IP
Active= Yes

Encapsulation= PPTP           Apply Alias= None
Service Type= Standard        Edit IP= No
Service Name= N/A             Telco Option:
Outgoing:                     Allocated Budget(min)= 0
    My Login=                  Period(hr)= 0
    My Password= *****      Schedules=
    Retype to Confirm= ***** Nailed-Up Connection= No
    Authen= CHAP/PAP
    PPTP My IP: Static         Session Options:
    My IP Addr=                Edit Filter Sets= No
    My IP Mask=                Idle Timeout(sec)= 100
    Server IP Addr=            Edit Traffic Redirect= No
    Connection ID/Name=

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

The next table shows how to configure fields in menu 11.1 not previously discussed.

**Table 71** Menu 11.1 Remote Node Profile for PPTP Encapsulation

FIELD	DESCRIPTION
Encapsulation	Press [SPACE BAR] and then [ENTER] to select <b>PPTP</b> . You must also go to menu 11.3 to check the IP Address setting once you have selected the encapsulation method.
PPTP My IP	If your ISP did not assign you an explicit IP address, press [SPACE BAR] and then [ENTER] to select <b>Dynamic</b> ; otherwise select <b>Static</b> and enter the IP address & subnet mask in the following fields.
My IP Addr	Enter the IP address of the WAN Ethernet port.
My IP Mask	Enter the subnet mask of the WAN Ethernet port.
Server IP Addr	Enter the IP address of the ANT modem.
Connection ID/ Name	Enter the connection ID or connection name in the ANT. It must follow the "c:id" and "n:name" format. This field is optional and depends on the requirements of your DSL modem.

## 21.3 Edit IP

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

**Figure 108** Menu 11.3 Remote Node Network Layer Options for Ethernet Encapsulation

```

Menu 11.3 - Remote Node Network Layer Options

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

Network Address Translation= SUA Only
Metric= 1
Private= N/A
RIP Direction= None
    Version= N/A
Multicast= None

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

This menu displays the **My WAN Addr** field for **PPPoE** and **PPTP** encapsulations and **Gateway IP Addr** field for **Ethernet** encapsulation. The following table describes the fields in this menu.

**Table 72** Remote Node Network Layer Options

FIELD	DESCRIPTION
IP Address Assignment	If your ISP did not assign you an explicit IP address, press [SPACE BAR] and then [ENTER] to select <b>Dynamic</b> ; otherwise select <b>Static</b> and enter the IP address & subnet mask in the following fields.
(Rem) IP Address	If you have a static IP Assignment, enter the IP address assigned to you by your ISP.
(Rem) IP Subnet Mask	If you have a static IP Assignment, enter the subnet mask assigned to you.
Gateway IP Addr	This field is applicable to <b>Ethernet</b> encapsulation only. Enter the gateway IP address assigned to you if you are using a static IP address.
My WAN Addr	This field is applicable to <b>PPPoE</b> and <b>PPTP</b> encapsulations only. Some implementations, especially the UNIX derivatives, require the WAN link to have a separate IP network number from the LAN and each end must have a unique address within the WAN network number. If this is the case, enter the IP address assigned to the WAN port of your Prestige. Note that this is the address assigned to your local Prestige, not the remote router.
Network Address Translation	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). Choose <b>None</b> to disable NAT. Choose <b>SUA Only</b> if you have a single public IP address. SUA (Single User Account) is a subset of NAT that supports two types of mapping: <b>Many-to-One</b> and <b>Server</b> . Choose <b>Full Feature</b> if you have multiple public IP addresses. <b>Full Feature</b> mapping types include: <b>One-to-One</b> , <b>Many-to-One</b> (SUA/PAT), <b>Many-to-Many Overload</b> , <b>Many- One-to-One</b> and <b>Server</b> . When you select <b>Full Feature</b> you must configure at least one address mapping set! See the <i>NAT chapter</i> for a full discussion on this feature.

**Table 72** Remote Node Network Layer Options (continued)

FIELD	DESCRIPTION
Metric	Enter a number from 1 to 15 to set this route's priority among the Prestige's routes (see <a href="#">Section 5.2 on page 65</a> for more on metric) The smaller the number, the higher priority the route has.
Private	This field is valid only for PPTP/PPPoE encapsulation. This parameter determines if the Prestige will include the route to this remote node in its RIP broadcasts. If set to <b>Yes</b> , this route is kept private and not included in RIP broadcast. If <b>No</b> , the route to this remote node will be propagated to other hosts through RIP broadcasts.
RIP Direction	Press [SPACE BAR] and then [ENTER] to select the RIP direction from <b>Both/ None/ In Only/Out Only</b> . See the <i>LAN Setup</i> chapter for more information on RIP. The default for RIP on the WAN side is <b>None</b> . It is recommended that you do not change this setting.
Version	Press [SPACE BAR] and then [ENTER] to select the RIP version from <b>RIP-1/RIP-2B/ RIP-2M</b> or <b>None</b> .
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 ( <b>IGMP-v1</b> ) and version 2 ( <b>IGMP-v2</b> ). Press [SPACE BAR] to enable IP Multicasting or select <b>None</b> to disable it. See the <i>LAN Setup</i> chapter for more information on this feature.
Once you have completed filling in <b>Menu 11.3 Remote Node Network Layer Options</b> , press [ENTER] at the message "Press ENTER to Confirm..." to save your configuration and return to menu 11, or press [ESC] at any time to cancel.	

## 21.4 Remote Node Filter

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

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

**Figure 109** Menu 11.5: Remote Node Filter (Ethernet Encapsulation)

```
Menu 11.5 - Remote Node Filter

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

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

**Figure 110** Menu 11.5: Remote Node Filter (PPPoE or PPTP Encapsulation)

```
Menu 11.5 - Remote Node Filter

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

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

## 21.4.1 Traffic Redirect Setup

Configure parameters that determine when the Prestige will forward traffic to the backup gateway using **Menu 11.6 — Traffic Redirect Setup**.



**Figure 111** Menu 11.6: Traffic Redirect Setup

```

Menu 11.6 - Traffic Redirect Setup

Active= Yes
Configuration:
Backup Gateway IP Address= 0.0.0.0
Metric= 15
Check WAN IP Address= 0.0.0.0
Fail Tolerance= 2
Period(sec)= 5
Timeout(sec)= 3

Press ENTER to Confirm or ESC to Cancel:

```

The following table describes the fields in this screen.

**Table 73** Menu 11.6: Traffic Redirect Setup

FIELD	DESCRIPTION
Active	Press [SPACE BAR] and select <b>Yes</b> (to enable) or <b>No</b> (to disable) traffic redirect setup. The default is <b>No</b> .
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	Enter a number from 1 to 15 to set this route's priority among the Prestige's routes (see <a href="#">Section 5.2 on page 65</a> for more on metric). The smaller the number, the higher priority the route has.
Check WAN IP Address	Enter the IP address of a reliable nearby computer (for example, your ISP's DNS server address) to test your Prestige's WAN accessibility. The Prestige uses the default gateway IP address if you do not enter an IP address here. If you are using PPTP or PPPoE Encapsulation, enter "0.0.0.0" to configure the Prestige to check the PVC (Permanent Virtual Circuit) or PPTP tunnel.
Fail Tolerance	Enter the number of times your Prestige may attempt and fail to connect to the Internet before traffic is forwarded to the backup gateway. Two to five is usually a good number.
Period (sec)	Enter the time interval (in seconds) between WAN connection checks. Five to 60 is usually a good number.
Timeout (sec)	Enter the number of seconds the Prestige waits for a ping response from the IP Address in the <b>Check WAN IP Address</b> field before it times out. The number in this field should be less than the number in the <b>Period</b> field. Three to 50 is usually a good number. The WAN connection is considered "down" after the Prestige times out the number of times specified in the <b>Fail Tolerance</b> field.
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

## Static Route Setup

This chapter shows how to setup IP static routes.

### 22.1 Static Route Introduction

See [Chapter 11 on page 123](#) for background information on IP static routes.

### 22.2 IP Static Route Setup

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

**Figure 112** Menu 12 IP Static Route Setup

```
Menu 12 - IP Static Route Setup

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

Enter selection number:
```

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

**Figure 113** Menu12.1 Edit IP Static Route

```

Menu 12.1 - Edit IP Static Route

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

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

The following table describes the fields for **Menu 12.1 – Edit IP Static Route Setup**.

**Table 74** Menu12.1 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 <i>IP Subnet Mask</i> 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.
Private	This parameter determines if the Prestige will include the route to this remote node in its RIP broadcasts. If set to <b>Yes</b> , this route is kept private and is not included in RIP broadcasts. If <b>No</b> , 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 23

## Network Address Translation (NAT)

This chapter discusses how to configure NAT on the Prestige.

### 23.1 NAT Introduction

See [Chapter 10 on page 109](#) for background information on NAT.

### 23.2 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**.

**Figure 114** Menu 4 Applying NAT for Internet Access

```
Menu 4 - Internet Access Setup

ISP's Name= MyISP
Encapsulation= Ethernet
  Service Type= Standard
  My Login= N/A
  My Password= N/A
  Retype to Confirm= N/A
  Login Server= N/A

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

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

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

- 1 Enter 11 from the main menu.
- 2 When menu 11 appears, as shown in the following figure, type the number of the remote node that you want to configure.

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

**Figure 115** Menu 11.3 Applying NAT to the Remote Node

```

Menu 11.3 - Remote Node Network Layer Options

IP Address Assignment= Dynamic
IP Address= N/A
IP Subnet Mask= N/A
Gateway IP Addr= N/A
Network Address Translation= SUA Only
Metric= 1
Private= N/A
RIP Direction= None
  Version= N/A
Multicast= None

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

The following table describes the options for Network Address Translation.

**Table 75** Applying NAT in Menus 4 & 11.3

FIELD	DESCRIPTION
NAT	Press [SPACE BAR] and then [ENTER] to select <b>Full Feature</b> 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 <b>Address Mapping Set</b> field (menu 15.1 - see section).
	Select <b>None</b> to disable NAT.
	When you select <b>SUA Only</b> , the SMT uses Address Mapping Set 255 (menu 15.1 - see section). Choose <b>SUA Only</b> if you have just one public WAN IP address for your Prestige.

## 23.3 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. **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.

**Figure 116** Menu 15 NAT Setup

```

Menu 15 - NAT Setup

1. Address Mapping Sets
2. Port Forwarding Setup
3. Trigger Port Setup

Enter Menu Selection Number:

```

### 23.3.1 Address Mapping Sets

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

**Figure 117** Menu 15.1 Address Mapping Sets

```

Menu 15.1 - Address Mapping Sets

1. NAT_SET
255. SUA (read only)

Enter Menu Selection Number:

```

Enter 255 to display the next screen (see [Section 10.3 on page 112](#) for more on SUA). The fields in this menu cannot be changed.

**Figure 118** Menu 15.1.255 SUA Address Mapping Rules

```

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:

```

The following table explains the fields in this menu.

**Table 76** SUA Address Mapping Rules

FIELD	DESCRIPTION
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.
Idx	This is the index or rule number.
Local Start IP	<b>Local Start IP</b> is the starting local IP address (ILA).
Local End IP	<b>Local End IP</b> 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.
Global Start IP	This is the starting global IP address (IGA). If you have a dynamic IP, enter 0.0.0.0 as the <b>Global Start IP</b> .
Global End IP	This is the ending global IP address (IGA).
Type	These are the mapping types. <b>Server</b> allows us to specify multiple servers of different types behind NAT to this machine. See later for some examples.
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.	

**Note:** Menu 15.1.255 is read-only.

### 23.3.1.1 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.



**Figure 119** Menu 15.1.1 First Set

```

Menu 15.1.1 - Address Mapping Rules

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

                Action= Edit          Select Rule=

                Press ENTER to Confirm or ESC to Cancel:

```

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

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

### 23.3.1.2 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 77** Menu 15.1.1 First Set

FIELD	DESCRIPTION
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.
Action	The default is <b>Edit</b> . <b>Edit</b> means you want to edit a selected rule (see following field). <b>Insert Before</b> means to insert a rule before the rule selected. The rules after the selected rule will then be moved down by one rule. <b>Delete</b> means to delete the selected rule and then all the rules after the selected one will be advanced one rule. <b>None</b> disables the <b>Select Rule</b> item.
Select Rule	When you choose <b>Edit</b> , <b>Insert Before</b> or <b>Delete</b> in the previous field the cursor jumps to this field to allow you to select the rule to apply the action in question.

**Note:** 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**.

**Note:** An End IP address must be numerically greater than its corresponding IP Start address

**Figure 120** Menu 15.1.1.1 Editing/Configuring an Individual Rule in a Set

```

Menu 15.1.1.1 Address Mapping Rule

Type= One-to-One
Local IP:
  Start= 0.0.0.0
  End = N/A
Global IP:
  Start= 0.0.0.0
  End = N/A

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

The following table explains the fields in this menu.

**Table 78** Menu 15.1.1.1 Editing/Configuring an Individual Rule in a Set

FIELD	DESCRIPTION
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. <b>Server</b> allows you to specify multiple servers of different types behind NAT to this computer. See <i>section</i> for an example.
Local IP	Only local IP fields are <b>N/A</b> for server; Global IP fields <b>MUST</b> be set for <b>Server</b> .
Start	This is the starting local IP address (ILA).
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 <b>N/A</b> for One-to-One and Server types.
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 <b>Global IP Start</b> . Note that <b>Global IP Start</b> can be set to 0.0.0.0 only if the types are <b>Many-to-One</b> or <b>Server</b> .
End	This is the ending inside global IP address (IGA). This field is <b>N/A</b> for <b>One-to-One</b> , <b>Many-to-One</b> and <b>Server</b> types.
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.	

## 23.4 Configuring a Server behind NAT

Follow these steps to configure a server behind NAT:

- 1 Enter 15 in the main menu to go to **Menu 15 - NAT Setup**.
- 2 Enter 2 to display **Menu 15.2 - NAT Server Setup** as shown next.

**Figure 121** Menu 15.2 NAT Server Setup

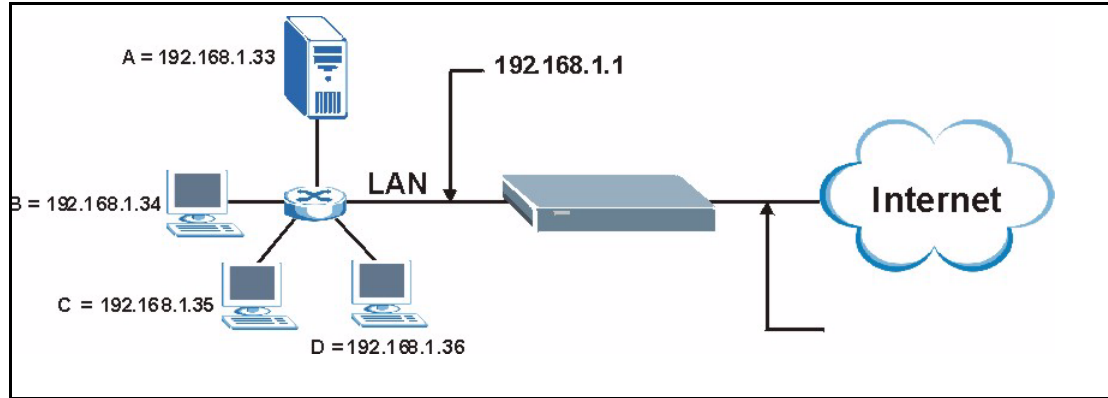
Menu 15.2 - NAT Server Setup			
Rule	Start Port No.	End Port No.	IP Address
1.	Default	Default	0.0.0.0
2.	21	25	192.168.1.33
3.	0	0	0.0.0.0
4.	0	0	0.0.0.0
5.	0	0	0.0.0.0
6.	0	0	0.0.0.0
7.	0	0	0.0.0.0
8.	0	0	0.0.0.0
9.	0	0	0.0.0.0
10.	0	0	0.0.0.0
11.	0	0	0.0.0.0
12.	1026	1026	RR Reserved

Press ENTER to Confirm or ESC to Cancel:

- 3 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.
- 4 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.
- 5 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.

You assign the private network IP addresses. The NAT network appears as a single host on the Internet. A is the FTP/Telnet/SMTP server.

**Figure 122** Multiple Servers Behind NAT Example



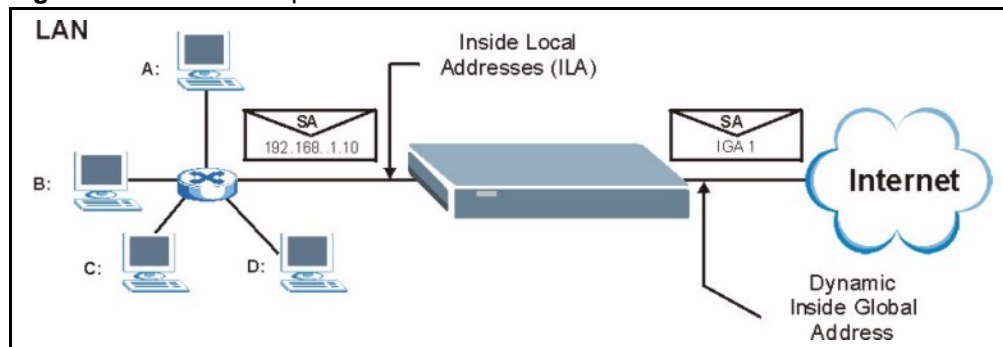
## 23.5 General NAT Examples

The following are some examples of NAT configuration.

### 23.5.1 Example 1: Internet Access Only

In the following Internet access example, you only need one rule where the ILAs (Inside Local Addresses) of computers A through D map to one dynamic IGA (Inside Global Address) assigned by your ISP.

**Figure 123** NAT Example 1



**Figure 124** Menu 4 Internet Access & NAT Example

```

Menu 4 - Internet Access Setup

ISP's Name= MyISP
Encapsulation= Ethernet
Service Type= Standard
My Login= N/A
My Password= N/A
Retype to Confirm= N/A
Login Server= N/A

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

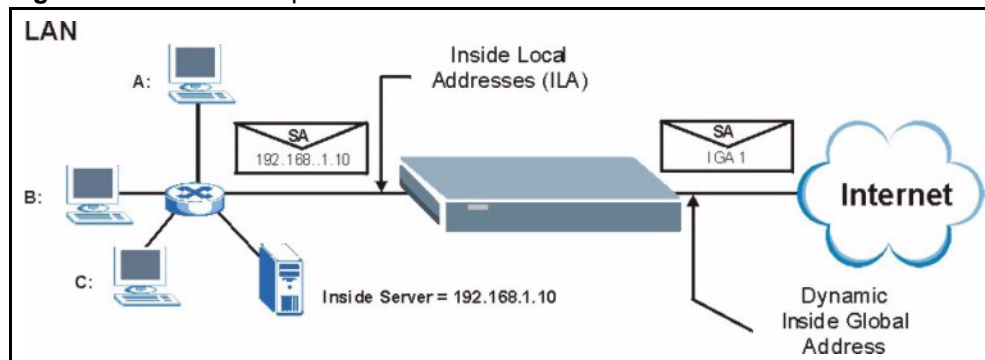
Press ENTER to Confirm or ESC to Cancel:

```

From menu 4, choose the **SUA Only** option from the **Network Address Translation** field. This is the Many-to-One mapping discussed in [Section 23.5 on page 212](#). 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.

### 23.5.2 Example 2: Internet Access with an Inside Server

The dynamic Inside Global Address is assigned by the ISP.

**Figure 125** 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.

**Figure 126** Menu 15.2 Specifying an Inside Server

Menu 15.2 - NAT Server Setup			
Rule	Start Port No.	End Port No.	IP Address
1.	<b>Default</b>	<b>Default</b>	<b>192.168.1.10</b>
2.	0	0	0.0.0.0
3.	0	0	0.0.0.0
4.	0	0	0.0.0.0
5.	0	0	0.0.0.0
6.	0	0	0.0.0.0
7.	0	0	0.0.0.0
8.	0	0	0.0.0.0
9.	0	0	0.0.0.0
10.	0	0	0.0.0.0
11.	0	0	0.0.0.0
12.	1026	1026	192.168.1.1

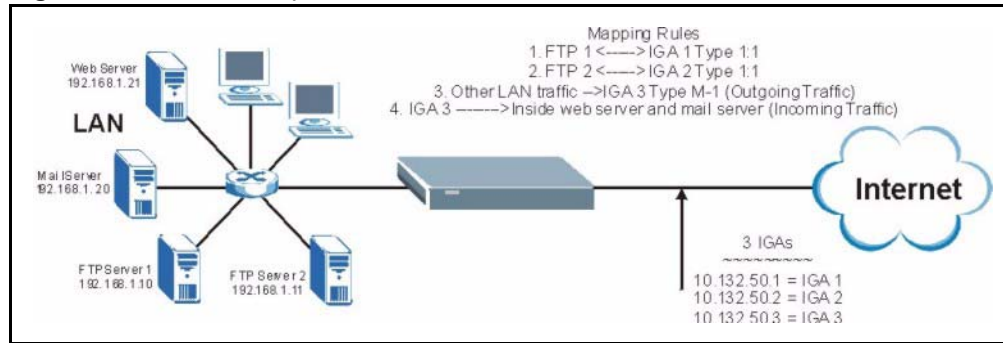
Press ENTER to Confirm or ESC to Cancel:

### 23.5.3 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 unidirectional as follows.

- 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).
- 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).
- 3** Map the other outgoing LAN traffic to IGA3 (**Many : 1** mapping).
- 4** You also map your third IGA to the web server and mail server on the LAN. Type **Server** allows you to specify multiple servers, of different types, to other computers behind NAT on the LAN.

The example situation looks somewhat like this:

**Figure 127 NAT Example 3**

- 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). See [Figure 108 on page 198](#).
- 2** Then enter 15 from the main menu.
- 3** Enter 1 to configure the Address Mapping Sets.
- 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.
- 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 129 on page 216](#).
- 6** Repeat the previous step for rules 2 to 4 as outlined above.
- 7** When finished, menu 15.1.1.1 should look like as shown in [Figure 130 on page 216](#).

**Figure 128 NAT Example 3: Menu 11.3**

```

Menu 11.3 - Remote Node Network Layer Options

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

Network Address Translation = Full Feature
Metric= 1
Private= N/A
RIP Direction= None
  Version= N/A
Multicast= None

Enter here to CONFIRM or ESC to CANCEL:

```

The following figures show how to configure the first rule.

**Figure 129** Example 3: Menu 15.1.1.1

```

Menu 15.1.1.1 Address Mapping Rule

Type= One-to-One
Local IP:
  Start= 192.168.1.10
  End = N/A
Global IP:
  Start= 10.132.50.1
  End = N/A

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

**Figure 130** Example 3: Final Menu 15.1.1

```

Menu 15.1.1 - Address Mapping Rules
Set Name= NAT_SET
Idx  Local Start IP  Local End IP  Global Start IP  Global End IP  Type
-----
1.  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= None          Select Rule= N/A

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

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

**8** Enter 15 from the main menu.

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

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



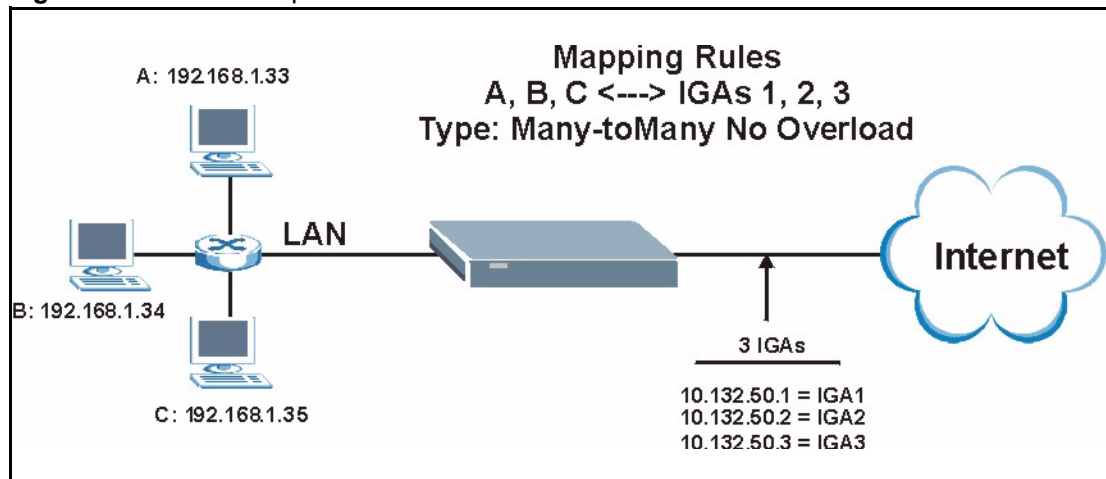
**Figure 131** Example 3: Menu 15.2

Menu 15.2 - NAT Server Setup			
Rule	Start Port No.	End Port No.	IP Address
1.	Default	Default	0.0.0.0
2.	80	80	192.168.1.21
3.	25	25	192.168.1.20
4.	0	0	0.0.0.0
5.	0	0	0.0.0.0
6.	0	0	0.0.0.0
7.	0	0	0.0.0.0
8.	0	0	0.0.0.0
9.	0	0	0.0.0.0
10.	0	0	0.0.0.0
11.	0	0	0.0.0.0
12.	1026	1026	192.168.1.1

Press ENTER to Confirm or ESC to Cancel:  
 HTTP:80 FTP:21 Telnet:23 SMTP:25 POP3:110 PPTP:1723

### 23.5.4 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 132** NAT Example 4

**Note:** 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

**Figure 133** Example 4: Menu 15.1.1.1 Address Mapping Rule.

```

Menu 15.1.1.1 Address Mapping Rule

Type= Many-One-to-One
Local IP:
  Start= 192.168.1.10
  End  = 192.168.1.12
Global IP:
  Start= 10.132.50.1
  End  = 10.132.50.3

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

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

**Figure 134** Example 4: Menu 15.1.1 Address Mapping Rules

```

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:
    
```

## 23.6 Configuring Trigger Port Forwarding

**Note:** Only one LAN computer can use a trigger port (range) at a time.

Enter 3 in menu 15 to display **Menu 15.3 — Trigger Port Setup**, shown next.

**Figure 135** Menu 15.3 Trigger Port Setup

Menu 15.3 - Trigger Port Setup					
Rule	Name	Incoming		Trigger	
		Start Port	End Port	Start Port	End Port
1.	Real Audio	6970	7170	7070	7070
2.		0	0	0	0
3.		0	0	0	0
4.		0	0	0	0
5.		0	0	0	0
6.		0	0	0	0
7.		0	0	0	0
8.		0	0	0	0
9.		0	0	0	0
10.		0	0	0	0
11.		0	0	0	0
12.		0	0	0	0

Press ENTER to Confirm or ESC to Cancel:

The following table describes the fields in this screen.

**Table 79** Menu 15.3 Trigger Port Setup

FIELD	DESCRIPTION
Rule	This is the rule index number.
Name	Enter a unique name for identification purposes. You may enter up to 15 characters in this field. All characters are permitted - including spaces.
Incoming	Incoming is a port (or a range of ports) that a server on the WAN uses when it sends out a particular service. The Prestige forwards the traffic with this port (or range of ports) to the client computer on the LAN that requested the service.
Start Port	Enter a port number or the starting port number in a range of port numbers.
End Port	Enter a port number or the ending port number in a range of port numbers.
Trigger	The trigger port is a port (or a range of ports) that causes (or triggers) the Prestige to record the IP address of the LAN computer that sent the traffic to a server on the WAN.
Start Port	Enter a port number or the starting port number in a range of port numbers.
End Port	Enter a port number or the ending port number in a range of port numbers.
Press [ENTER] at the message "Press ENTER to Confirm..." to save your configuration, or press [ESC] at any time to cancel.	



# CHAPTER 24

## Filter Configuration

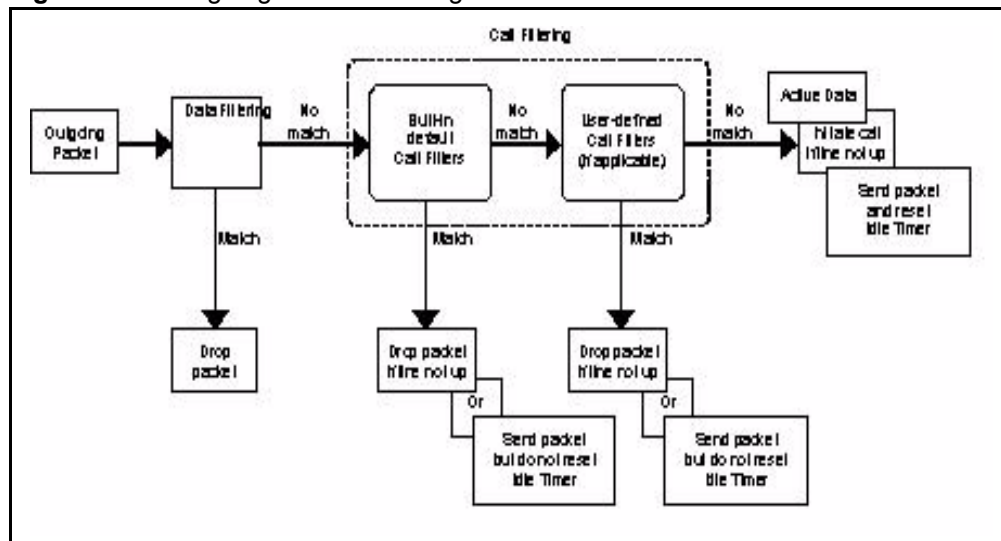
This chapter shows you how to create and apply filters.

### 24.1 Introduction to Filters

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

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

**Figure 136** Outgoing Packet Filtering Process



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

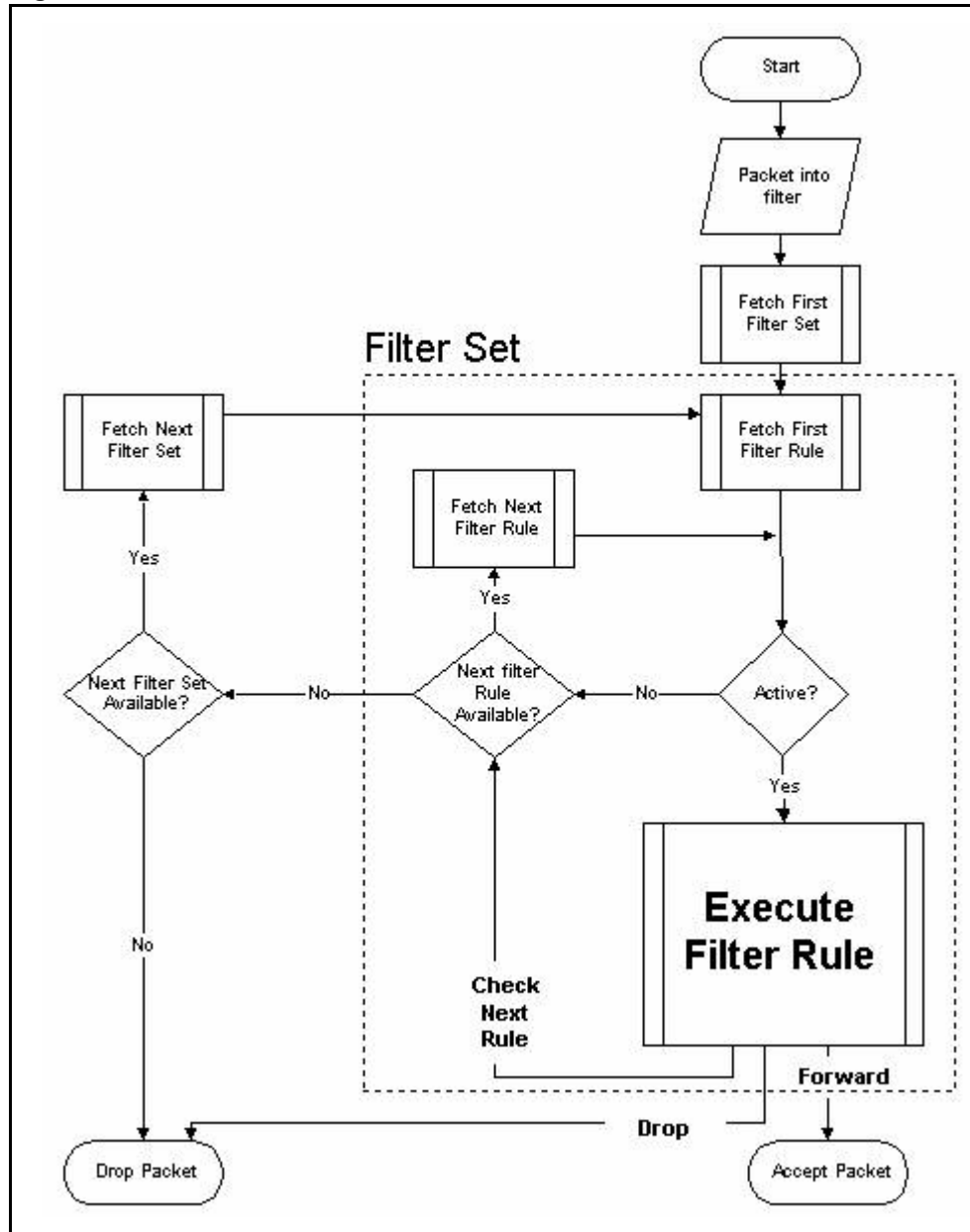
## 24.1.1 The Filter Structure of the Prestige

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

Sets of factory default filter rules have been configured in menu 21 to prevent NetBIOS traffic from triggering calls and to prevent incoming telnet sessions. 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. See also [Figure 140 on page 228](#) for the logic flow when executing an IP filter.

Figure 137 Filter Rule Process



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

## 24.2 Configuring a Filter Set

The Prestige includes filtering for NetBIOS over TCP/IP packets by default. To configure another filter set, follow the procedure below.

- 1 Enter 21 in the main menu to open menu 21.

**Figure 138** Menu 21.1: Filter Set Configuration

```

Menu 21 - Filter Set Configuration

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

Enter Filter Set Number to Configure= 0
Edit Comments= N/A
Press ENTER to Confirm or ESC to Cancel:
    
```

- 2** Select the filter set you wish to configure (1-12) and press [ENTER].
- 3** Enter a descriptive name or comment in the **Edit Comments** field and press [ENTER].
- 4** Press [ENTER] at the message [Press ENTER to confirm] to open **Menu 21.x - Filter Rules Summary**.

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

**Table 80** Abbreviations Used in the Filter Rules Summary Menu

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



The protocol dependent filter rules abbreviation are listed as follows:

**Table 81** Rule Abbreviations Used

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

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

### 24.2.1 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.x for the rule.

To speed up filtering, all rules in a filter set must be of the same class, i.e., protocol filters or generic filters. The class of a filter set is determined by the first rule that you create. When applying the filter sets to a port, separate menu fields are provided for protocol and device filter sets. If you include a protocol filter set in a device filter field or vice versa, the Prestige will warn you and will not allow you to save.

### 24.2.2 Configuring a 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.x - TCP/IP Filter Rule**, as shown next

**Figure 139** Menu 21.1.1 TCP/IP Filter Rule.

```

Menu 21.1.1 - TCP/IP Filter Rule

Filter #: 1,1
Filter Type= TCP/IP Filter Rule
Active= Yes
IP Protocol= 0      IP Source Route= No
Destination: IP Addr= 0.0.0.0
                IP Mask= 0.0.0.0
                Port #= 137
                Port # Comp= Equal
Source: IP Addr= 0.0.0.0
                IP Mask= 0.0.0.0
                Port #=
                Port # Comp= None
TCP Estab= 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:
    
```

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

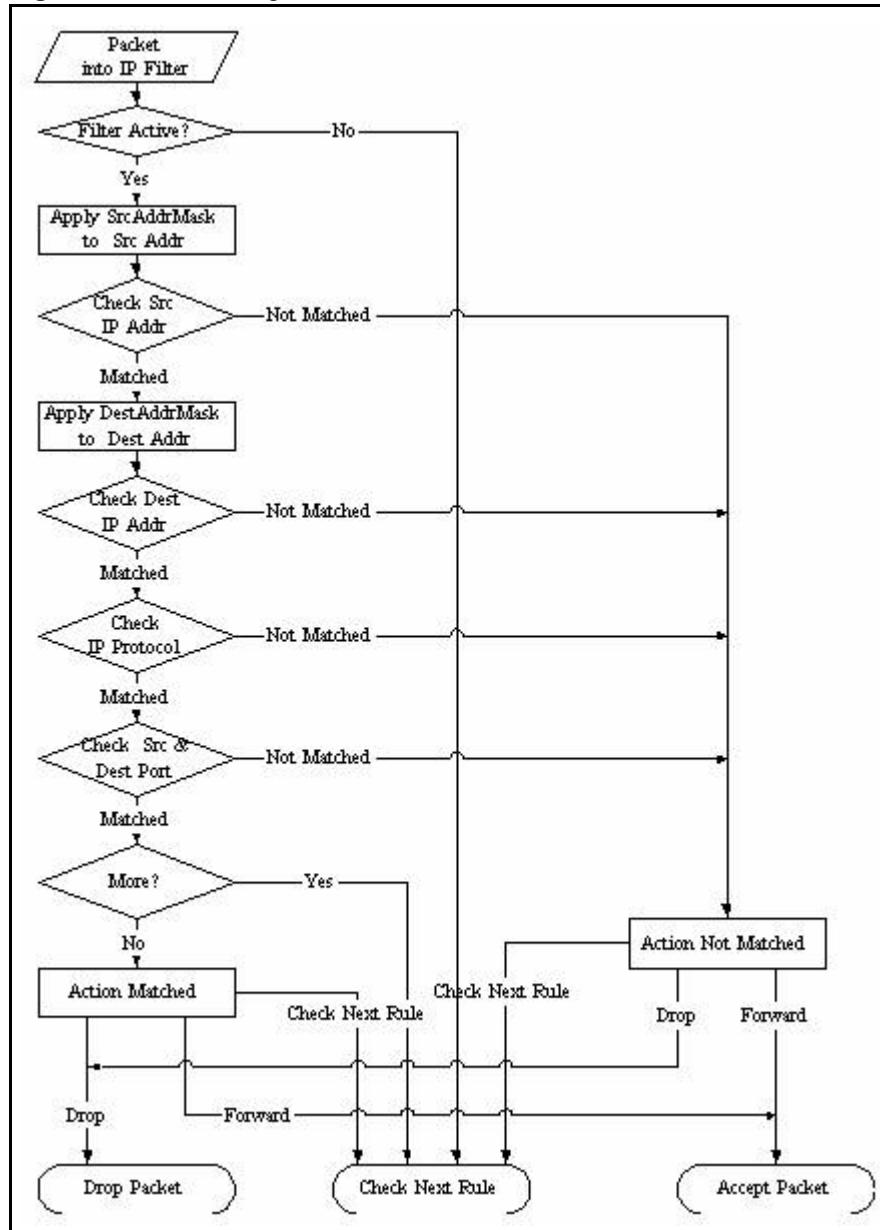
**Table 82** TCP/IP Filter Rule

FIELD	DESCRIPTION
Active	Press [SPACE BAR] and then [ENTER] to select <b>Yes</b> to activate the filter rule or <b>No</b> to deactivate it.
IP Protocol	Protocol refers to the upper layer protocol, e.g., TCP is 6, UDP is 17 and ICMP is 1. Type a value between 0 and 255. A value of 0 matches ANY protocol.
IP Source Route	Press [SPACE BAR] and then [ENTER] to select <b>Yes</b> to apply the rule to packets with an IP source route option. Otherwise the packets must not have a source route option. The majority of IP packets do not have source route.
Destination	
IP Address	Enter the destination IP Address of the packet you wish to filter. This field is ignored if it is 0.0.0.0.
IP Mask	Enter the IP mask to apply to the <b>Destination: IP Addr.</b>
Port #	Enter the destination port of the packets that you wish to filter. The range of this field is 0 to 65535. This field is ignored if it is 0.
Port # Comp	Press [SPACE BAR] and then [ENTER] to select the comparison to apply to the destination port in the packet against the value given in <b>Destination: Port #</b> . Options are <b>None, Equal, Not Equal, Less</b> and <b>Greater</b> .
Source	
IP Address	Enter the source IP Address of the packet you wish to filter. This field is ignored if it is 0.0.0.0.
IP Mask	Enter the IP mask to apply to the <b>Source: IP Addr.</b>

**Table 82** TCP/IP Filter Rule (continued)

FIELD	DESCRIPTION
Port #	Enter the source port of the packets that you wish to filter. The range of this field is 0 to 65535. This field is ignored if it is 0.
Port # Comp	Press [SPACE BAR] and then [ENTER] to select the comparison to apply to the source port in the packet against the value given in <b>Source: Port #</b> . Options are <b>None, Equal, Not Equal, Less</b> and <b>Greater</b> .
TCP Estab	This field is applicable only when the IP Protocol field is 6, TCP. Press [SPACE BAR] and then [ENTER] to select <b>Yes</b> , to have the rule match packets that want to establish a TCP connection (SYN=1 and ACK=0); if <b>No</b> , it is ignored.
More	Press [SPACE BAR] and then [ENTER] to select <b>Yes</b> or <b>No</b> . If <b>Yes</b> , a matching packet is passed to the next filter rule before an action is taken; if <b>No</b> , the packet is disposed of according to the action fields. If <b>More</b> is <b>Yes</b> , then <b>Action Matched</b> and <b>Action Not Matched</b> will be <b>N/A</b> .
Log	Press [SPACE BAR] and then [ENTER] to select a logging option from the following: <b>None</b> – No packets will be logged. <b>Action Matched</b> - Only packets that match the rule parameters will be logged. <b>Action Not Matched</b> - Only packets that do not match the rule parameters will be logged. <b>Both</b> – All packets will be logged.
Action Matched	Press [SPACE BAR] and then [ENTER] to select the action for a matching packet. Options are <b>Check Next Rule, Forward</b> and <b>Drop</b> .
Action Not Matched	Press [SPACE BAR] and then [ENTER] to select the action for a packet not matching the rule. Options are <b>Check Next Rule, Forward</b> and <b>Drop</b> .
When you have <b>Menu 21.x.x - TCP/IP Filter Rule</b> configured, press [ENTER] at the message "Press ENTER to Confirm" to save your configuration, or press [ESC] to cancel. This data will now be displayed on <b>Menu 21.x - Filter Rules Summary</b> .	

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

**Figure 140** Executing an IP Filter

### 24.2.3 Configuring a Generic Filter Rule

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

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

To configure a generic rule, select **Generic Filter Rule** in the **Filter Type** field in menu 21.x.x and press [ENTER] to open Generic Filter Rule, as shown below.

**Figure 141** Menu 21.1.1 Generic Filter Rule

```

Menu 21.1.1 - Generic Filter Rule

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

Press ENTER to Confirm or ESC to Cancel:

```

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

**Table 83** Generic Filter Rule Menu Fields

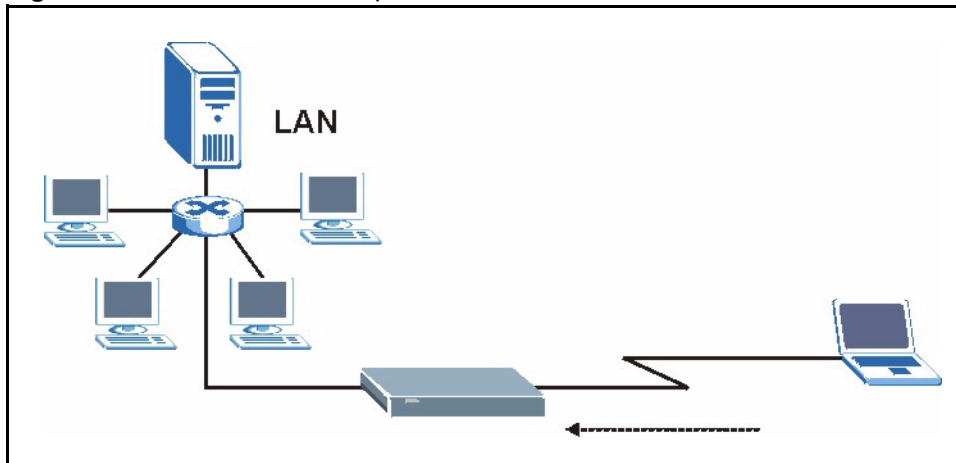
FIELD	DESCRIPTION
Filter #	This is the filter set, filter rule co-ordinates, i.e., 2,3 refers to the second filter set and the third rule of that set.
Filter Type	Use [SPACE BAR] and then [ENTER] to select a rule type. Parameters displayed below each type will be different. TCP/IP filter rules are used to filter IP packets while generic filter rules allow filtering of non-IP packets. Options are <b>Generic Filter Rule</b> and <b>TCP/IP Filter Rule</b> .
Active	Select <b>Yes</b> to turn on the filter rule or <b>No</b> to turn it off.
Offset	Enter the starting byte of the data portion in the packet that you wish to compare. The range for this field is from 0 to 255.
Length	Enter the byte count of the data portion in the packet that you wish to compare. The range for this field is 0 to 8.
Mask	Enter the mask (in Hexadecimal notation) to apply to the data portion before comparison.
Value	Enter the value (in Hexadecimal notation) to compare with the data portion.
More	If <b>Yes</b> , a matching packet is passed to the next filter rule before an action is taken; else the packet is disposed of according to the action fields. If <b>More</b> is <b>Yes</b> , then Action Matched and Action Not Matched will be <b>No</b> .
Log	Select the logging option from the following: <b>None</b> - No packets will be logged. <b>Action Matched</b> - Only packets that match the rule parameters will be logged. <b>Action Not Matched</b> - Only packets that do not match the rule parameters will be logged. <b>Both</b> - All packets will be logged.
Action Matched	Select the action for a packet matching the rule. Options are <b>Check Next Rule</b> , <b>Forward</b> and <b>Drop</b> .

**Table 83** Generic Filter Rule Menu Fields (continued)

FIELD	DESCRIPTION
Action Not Matched	Select the action for a packet not matching the rule. Options are <b>Check Next Rule</b> , <b>Forward</b> and <b>Drop</b> .
Once you have completed filling in <b>Menu 21.x.x - Generic Filter Rule</b> , press [ENTER] at the message "Press ENTER to Confirm" to save your configuration, or press [ESC] to cancel. This data will now be displayed on <b>Menu 21.x - Filter Rules Summary</b> .	

## 24.3 Example Filter

Let's look at an example to block outside users from accessing the Prestige via telnet.

**Figure 142** Telnet Filter Example

- 1 Enter 21 from the main menu to open **Menu 21 - Filter Set Configuration**.
- 2 Enter the index of the filter set you wish to configure (say 3) and press [ENTER].
- 3 Enter a descriptive name or comment in the **Edit Comments** field and press [ENTER].
- 4 Press [ENTER] at the message [Press ENTER to confirm] to open **Menu 21.3 - Filter Rules Summary**
- 5 Enter 1 to configure the first filter rule (the only filter rule of this set). Make the entries in this menu as shown in the following figure.

**Figure 143** Example Filter: Menu 21.3.1

```

Menu 21.3.1 - TCP/IP Filter Rule

Filter #: 3,1
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 #= 0
                Port # Comp= None
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 Toggle.

```

- Select **Yes** from the **Active** field to activate this rule.
- **6** is the TCP **IP Protocol**.
- The **Port #** for the telnet service (TCP protocol) is 23. See RFC 1060 for port numbers of well-known services.
- Select **Equal** from the **Port # Comp** field as you are looking for packets going to port 23 only.
- Select **Drop** in the **Action Matched** field so that the packet will be dropped if its destination is the telnet port.
- Select **Forward** from the **Action Not Matched** field so that the packet will be forwarded if its destination is not the telnet port.
- Press [SPACE BAR] and then [ENTER] to choose this filter rule type. The first filter rule type determines all subsequent filter types within a set.

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

**Figure 144** Example Filter Rules Summary: Menu 21.3

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
2	N		
3	N		
4	N		
5	N		
6	N		

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

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).

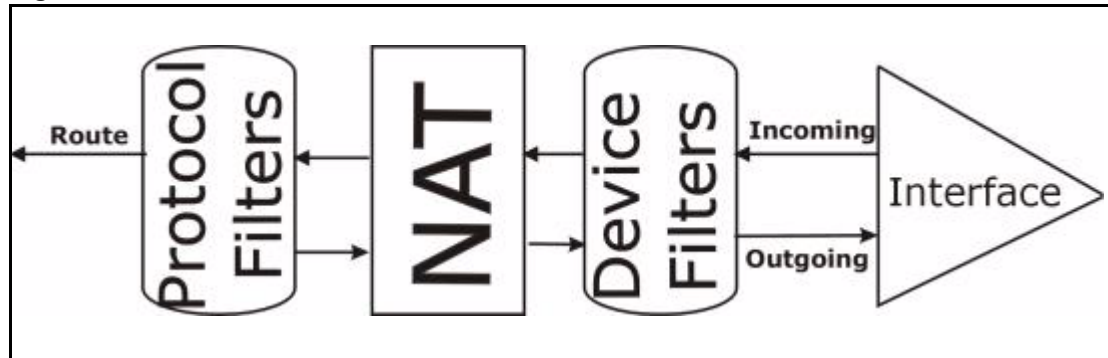
After you've created the filter set, you must apply it.

- 1 Enter 11 from the main menu to go to menu 11.
- 2 Go to the **Edit Filter Sets** field, press [SPACE BAR] to select **Yes** and press [ENTER].
- 3 This brings you to menu 11.5. Apply a filter set (our example filter set 3).
- 4 Press [ENTER] to confirm after you enter the set numbers and to leave menu 11.5.

## 24.4 Filter Types and NAT

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



**Figure 145** Protocol and Device Filter Sets

## 24.5 Applying a Filter

This section shows you where to apply the filter(s) after you design it (them). The Prestige already has filters to prevent NetBIOS traffic from triggering calls, and block incoming telnet, FTP and HTTP connections.

### 24.5.1 Applying LAN Filters

LAN traffic filter sets may be useful to block certain packets, reduce traffic and prevent security breaches. Go to menu 3.1 (shown next) and enter the number(s) of the filter set(s) that you want to apply as appropriate. You can choose up to four filter sets (from twelve) by entering their numbers separated by commas, e.g., 3, 4, 6, 11. Input filter sets filter incoming traffic to the Prestige and output filter sets filter outgoing traffic from the Prestige. For PPPoE or PPTP encapsulation, you have the additional option of specifying remote node call filter sets.

**Figure 146** Filtering LAN Traffic

```

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:

```

### 24.5.2 Applying Remote Node Filters

Go to menu 11.5 (shown below – note that call filter sets are only present for PPPoE encapsulation) and enter the number(s) of the filter set(s) as appropriate. You can cascade up to four filter sets by entering their numbers separated by commas. The Prestige already has filters to prevent NetBIOS traffic from triggering calls.

**Figure 147** Filtering Remote Node Traffic

```
Menu 11.5 - Remote Node Filter

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

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

# CHAPTER 25

## SNMP Configuration

This chapter explains SNMP Configuration menu 22.

### 25.1 SNMP Introduction

See [Section 12.6 on page 131](#) for background information on SNMP.

### 25.2 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.

**Figure 148** Menu 22 SNMP Configuration

```

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:

```

The following table describes the SNMP configuration parameters.

**Table 84** Menu 22 SNMP Configuration

FIELD	DESCRIPTION
SNMP:	
Get Community	Type the <b>Get Community</b> , which is the password for the incoming Get- and GetNext requests from the management station.
Set Community	Type the <b>Set</b> community, which is the password for incoming Set requests from the management station.
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.

**Table 84** Menu 22 SNMP Configuration (continued)

FIELD	DESCRIPTION
Trap:	
Community	Type the trap community, which is the password sent with each trap to the SNMP manager.
Destination	Type the IP address of the station to send your SNMP traps to.
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.	

## 25.3 SNMP Traps

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

**Table 85** SNMP Traps

TRAP #	TRAP NAME	DESCRIPTION
1	coldStart ( <i>defined in RFC-1215</i> )	A trap is sent after booting (power on).
2	warmStart ( <i>defined in RFC-1215</i> )	A trap is sent after booting (software reboot).
3	linkDown ( <i>defined in RFC-1215</i> )	A trap is sent with the port number when any of the links are down. See the following table.
4	linkUp ( <i>defined in RFC-1215</i> )	A trap is sent with the port number.
5	authenticationFailure ( <i>defined in RFC-1215</i> )	A trap is sent to the manager when receiving any SNMP gets or sets 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 port number is its interface index under the interface group.

**Table 86** Ports and Permanent Virtual Circuits

PORT	PVC (PERMANENT VIRTUAL CIRCUIT)
1	Ethernet LAN
2	1
3	2
...	...
13	12
14	xDSL

# CHAPTER 26

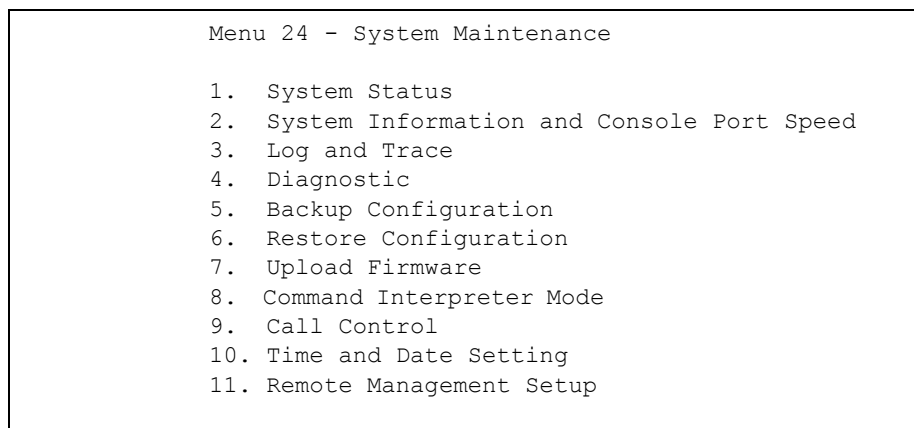
## System Information and Diagnosis

This chapter covers the information and diagnostic tools in SMT menus 24.1 to 24.4.

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.

**Figure 149** Menu 24 System Maintenance



### 26.1 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.

**Figure 150** Menu 24.1 System Maintenance: Status

```

Menu 24.1 - System Maintenance - Status                                00:49:12
                                                                    Sat. Jan. 01, 2000

Port  Status      TxPkts    RxPkts    Cols     Tx B/s    Rx B/s    Up Time
WAN   Down          0         0         0        0         0         0:00:00
LAN   100M/Full     0         0         0        0         0         0:49:10

Port  Ethernet Address      IP Address      IP Mask      DHCP
WAN   00:A0:C5:01:23:46     0.0.0.0        0.0.0.0      Client
LAN   00:A0:C5:01:23:45     192.168.1.1    255.255.255.0 Server

System up Time:      0:49:15

Name: P2302R
Routing: IP
ZyNOS F/W Version: V3.60(MM.0)b2 | 11/28/2004

Press Command:

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

The following table describes the fields present in **Menu 24.1 — System Maintenance — Status**. These fields are READ-ONLY and meant for diagnostic purposes. The upper right corner of the screen shows the time and date according to the format you set in menu 24.10.

**Table 87** System Maintenance: Status Menu Fields

FIELD	DESCRIPTION
Port	Identifies a port (WAN, LAN) on the Prestige.
Status	Shows the port speed and duplex setting if you're using <b>Ethernet Encapsulation</b> and <b>Down</b> (line is down), <b>idle</b> (line (ppp) idle), <b>dial</b> (starting to trigger a call) and <b>drop</b> (dropping a call) if you're using <b>PPPoE Encapsulation</b> .
TxPkts	The number of transmitted packets on this port.
RxPkts	The number of received packets on this port.
Cols	The number of collisions on this port.
Tx B/s	Shows the transmission speed in Bytes per second on this port.
Rx B/s	Shows the reception speed in Bytes per second on this port.
Up Time	Total amount of time the line has been up.
Ethernet Address	The Ethernet address of the port listed on the left.
IP Address	The IP address of the port listed on the left.
IP Mask	The IP mask of the port listed on the left.
DHCP	The DHCP setting of the port listed on the left.
System up Time	The total time the Prestige has been on.
Name	This is the Prestige's system name + domain name assigned in menu 1. For example, System Name= xxx; Domain Name= baboo.mickey.com Name= xxx.baboo.mickey.com
Routing	Refers to the routing protocol used.

**Table 87** System Maintenance: Status Menu Fields (continued)

FIELD	DESCRIPTION
ZyNOS F/W Version	The ZyNOS Firm Ware version and the date created.
You may enter 1 to drop the WAN connection, 9 to reset the counters or [ESC] to return to menu 24.	

## 26.2 System Information

To get to the System Information:

- 1** Enter 24 to display **Menu 24 — System Information and Console Port Speed**.
- 2** Enter 2 to display **Menu 24.2 — System Information**.
- 3** From this menu you have two choices as shown in the next figure:

**Figure 151** Menu 24.2 System Information and Console Port Speed

Menu 24.2 - System Information and Console Port Speed
System Information
Console Port Speed
Please enter selection:

### 26.2.1 System Information

Enter 1 in menu 24.2 to display the screen shown next

**Figure 152** Menu 24.2.1 System Maintenance: Information

```

Menu 24.2.1 - System Maintenance - Information

Name: P2302R
Routing: IP
ZyNOS F/W Version: V3.60(MM.0)b2 | 11/28/2004

LAN
Ethernet Address: 00:A0:C5:01:23:45
IP Address: 192.168.1.1
IP Mask: 255.255.255.0
DHCP: Server

Press ESC or RETURN to Exit:
    
```

The following table describes the fields in this menu.

**Table 88** Menu 24.2.1 System Maintenance: Information

FIELD	DESCRIPTION
Name	Displays the system name of your Prestige. This information can be changed in <b>Menu 1 – General Setup</b> .
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.
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.
DHCP	This field shows the DHCP setting (None, Relay or Server) of the Prestige.

## 26.2.2 Console Port Speed

**Note:** The console port is internal and reserved for technician use only.

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.



**Figure 153** Menu 24.2.2 System Maintenance: Change Console Port Speed

```

Menu 24.2.2 - System Maintenance - Change Console Port Speed

Console Port Speed: 9600

Press ENTER to Confirm or ESC to Cancel:

```

## 26.3 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 syslog facility for message logging.

### 26.3.1 Syslog Logging

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

**Figure 154** Menu 24.3.2 System Maintenance: Syslog Logging

```

Menu 24.3.2 - System Maintenance - Syslog Logging

Syslog:
Active= No
Syslog Server IP Address= 0.0.0.0
Log Facility= Local 1

Press ENTER to Confirm or ESC to Cancel:

```

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

**Table 89** Menu 24.3.2 System Maintenance: Syslog and Accounting

PARAMETER	DESCRIPTION
Syslog:	
Active	Press [SPACE BAR] and then [ENTER] to turn syslog on or off.
Syslog Server IP Address	Enter the IP Address of the server that will log the CDR (Call Detail Record) and system messages i.e., the syslog server.
Log Facility	Press [SPACE BAR] and then [ENTER] to select a Local option. The log facility allows you to log the message to different files in the server. Please refer to the documentation of your syslog program for more details.
When finished configuring this screen, press [ENTER] to confirm or [ESC] to cancel.	

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

### 26.3.1.1 CDR

```
CDR Message Format
SdcmSyslogSend ( 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 xxxxxx (L2TP, xxxxxx = Remote Call ID)
C01 Incoming Call xxxx (= connected speed) xxxxxx (= Remote Call ID)
L02 Tunnel Connected (L2TP)
C02 OutCall Connected xxxx (= connected speed) xxxxxx (= 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
```

### 26.3.1.2 Packet triggered

```
Packet triggered Message Format
SdcmSyslogSend( SYSLOG_PKTTRI, SYSLOG_NOTICE, String );
String = Packet trigger: Protocol=xx Data=xxxxxxxxxxxx...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=4500003c100100001f010004c0a86614ca849a7b08004a5c020001006162636465666768696a6b6c
6d6e6f7071727374
Jul 19 11:28:56 192.168.102.2 ZyXEL: Packet Trigger: Protocol=1,
Data=4500002c1b0140001f06b50ec0a86614ca849a7b0427001700195b3e00000000600220008cd40000
020405b4
Jul 19 11:29:06 192.168.102.2 ZyXEL: Packet Trigger: Protocol=1,
Data=45000028240140001f06ac12c0a86614ca849a7b0427001700195b451d1430135004000077600000
```

### 26.3.1.3 Filter log

```

Filter log Message Format
SdcmdSyslogSend(SYSLOG_FILLOG, SYSLOG_NOTICE, String );
String = IP[Src=xx.xx.xx.xx Dst=xx.xx.xx.xx prot spo=xxxx dpo=xxxx] S04>R01mD
IP[...] is the packet header and S04>R01mD means filter set 4 (S) and rule 1 (R), match
(m) drop (D).
Src: Source Address
Dst: Destination Address
prot: Protocol ("TCP","UDP","ICMP")
spo: Source port
dpo: Destination port
Mar 03 10:39:43 202.132.155.97 ZyXEL:
GEN[fffffffffnordff0080] }S05>R01mF
Mar 03 10:41:29 202.132.155.97 ZyXEL:
GEN[00a0c5f502fnord010080] }S05>R01mF
Mar 03 10:41:34 202.132.155.97 ZyXEL:
IP[Src=192.168.2.33 Dst=202.132.155.93 ICMP]}S04>R01mF
Mar 03 11:59:20 202.132.155.97 ZyXEL:
GEN[00a0c5f502fnord010080] }S05>R01mF
Mar 03 12:00:52 202.132.155.97 ZyXEL:
GEN[fffffffffff0080] }S05>R01mF
Mar 03 12:00:57 202.132.155.97 ZyXEL:
GEN[00a0c5f502010080] }S05>R01mF
Mar 03 12:01:06 202.132.155.97 ZyXEL:
IP[Src=192.168.2.33 Dst=202.132.155.93 TCP spo=01170 dpo=00021]}S04>R01mF

```

### 26.3.1.4 PPP log

```

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

```

## 26.3.2 Call-Triggering Packet

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

**Figure 155** Call-Triggering Packet Example

```

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

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

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

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

Press any key to continue...

```

## 26.4 Diagnostic

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

Follow the procedure next to get to Diagnostic:

- 1** From the main menu, type 24 to open **Menu 24 – System Maintenance**.
- 2** From this menu, type 4 to open **Menu 24.4 – System Maintenance – Diagnostic**.

**Figure 156** Menu 24.4 System Maintenance: Diagnostic

```

Menu 24.4 - System Maintenance - Diagnostic

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

System
  11. Reboot System

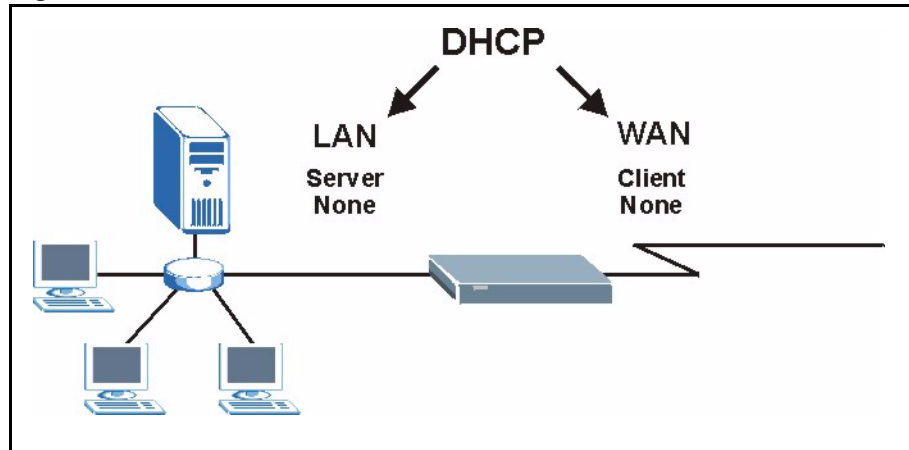
Enter Menu Selection Number:

Host IP Address= N/A
    
```

### 26.4.1 WAN DHCP

DHCP functionality can be enabled on the LAN or WAN as shown in the following figure. LAN DHCP has already been discussed. The Prestige can act either as a WAN DHCP client (**IP Address Assignment** field in menu 4 or menu 11.3 is **Dynamic** and the **Encapsulation** field in menu 4 or menu 11 is **Ethernet**) or **None**, (when you have a static IP). The **WAN Release** and **Renewal** fields in menu 24.4 conveniently allow you to release and/or renew the assigned WAN IP address, subnet mask and default gateway in a fashion similar to winipcfg.

**Figure 157** LAN & WAN DHCP



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

**Table 90** System Maintenance Menu Diagnostic

FIELD	DESCRIPTION
Ping Host	Enter 1 to ping any machine (with an IP address) on your LAN or WAN. Enter its IP address in the <b>Host IP Address</b> field below.
WAN DHCP Release	Enter 2 to release your WAN DHCP settings.

**Table 90** System Maintenance Menu Diagnostic (continued)

FIELD	DESCRIPTION
WAN DHCP Renewal	Enter 3 to renew your WAN DHCP settings.
Internet Setup Test	Enter 4 to test the Internet setup. You can also test the Internet setup in <b>Menu 4 - Internet Access</b> . Please refer to the <i>Internet Access</i> chapter for more details. This feature is only available for dial-up connections using PPPoE or PPTP encapsulation.
Reboot System	Enter 11 to reboot the Prestige.
Host IP Address=	If you entered 1 in <b>Ping Host</b> , then enter the IP address of the computer you want to ping in this field.
Enter the number of the selection you would like to perform or press [ESC] to cancel.	

# 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.

**Note:** 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 91** 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

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.

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.



**Figure 158** Telnet in Menu 24.5

```

Menu 24.5 - System Maintenance - Backup Configuration
To transfer the configuration file to your workstation, follow the procedure
below:
1. Launch the FTP client on your workstation.
2. Type "open" and the IP address of your Prestige. Then type "root" and
   SMT password as requested.
3. Locate the 'rom-0' file.
4. Type 'get rom-0' to back up the current Prestige configuration to
   your workstation.
For details on FTP commands, please consult the documentation of your FTP
client program. For details on backup using TFTP (note that you must remain
in this menu to back up using TFTP), please see your Prestige manual.
Press ENTER to Exit:

```

## 27.2.2 Using the FTP Command from the Command Line

- 1 Launch the FTP client on your computer.
- 2 Enter “open”, followed by a space and the IP address of your Prestige.
- 3 Press [ENTER] when prompted for a username.
- 4 Enter your password as requested (the default is “1234”).
- 5 Enter “bin” to set transfer mode to binary.
- 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.
- 7 Enter “quit” to exit the ftp prompt.

## 27.2.3 Example of FTP Commands from the Command Line

**Figure 159** FTP Session Example

```

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

```

## 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 92** 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	Transfer files in either ASCII (plain text format) or in binary mode. Configuration and firmware files should be transferred 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 Management Limitations

TFTP, FTP and Telnet over WAN will not work when:

- You have disabled Telnet service in menu 24.11.
- You have applied a filter in menu 3.1 (LAN) or in menu 11.5 (WAN) to block Telnet service.
- 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.
- There is an SMT console session running.

**Note:** The console port is internal and reserved for technician use only.

## 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.

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

- 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.
- 4 Launch the TFTP client on your computer and connect to the Prestige. Set the transfer mode to binary before starting data transfer.
- 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 93** 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.

## 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.

**Note:** 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

**Figure 160** Telnet into Menu 24.6.

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

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

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

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

- 1** Launch the FTP client on your computer.
- 2** Enter “open”, followed by a space and the IP address of your Prestige.
- 3** Press [ENTER] when prompted for a username.
- 4** Enter your password as requested (the default is “1234”).
- 5** Enter “bin” to set transfer mode to binary.
- 6** Find the “rom” file (on your computer) that you want to restore to your Prestige.

- 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.
- 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

**Figure 161** 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
```

## 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**.

**Note:** 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.

**Figure 162** Telnet Into Menu 24.7.1 Upload System Firmware

```
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 firmware filename 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:
```

## 27.4.2 Configuration File Upload

You see the following screen when you telnet into menu 24.7.2

**Figure 163** Telnet Into Menu 24.7.2 System Maintenance

```
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 configuration filename 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:
```

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

## 27.4.3 FTP File Upload Command from the DOS Prompt Example

- 1 Launch the FTP client on your computer.
- 2 Enter "open", followed by a space and the IP address of your Prestige.
- 3 Press [ENTER] when prompted for a username.

- 4 Enter your password as requested (the default is “1234”).
- 5 Enter “bin” to set transfer mode to binary.
- 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.
- 7 Enter “quit” to exit the ftp prompt.

**Note:** The Prestige automatically restarts after a successful file upload.

## 27.4.4 FTP Session Example of Firmware File Upload

**Figure 164** 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

```

More commands (found in GUI-based FTP clients) are listed earlier in this chapter.

## 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.

- 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.
- 2 Put the SMT in command interpreter (CI) mode by entering 8 in **Menu 24 – System Maintenance**.
- 3 Enter the command “sys stdio 0” to disable the management session idle timeout, so the TFTP transfer will not be interrupted. Enter “command sys stdio 5” to restore the five-minute management session idle timeout (default) when the file transfer is complete.

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



# CHAPTER 28

## System Maintenance

This chapter leads you through SMT menus 24.8 to 24.10.

### 28.1 Command Interpreter Mode

The Command Interpreter (CI) is a part of the main system firmware. The CI provides much of the same functionality as the SMT, while adding some low-level setup and diagnostic functions. Enter the CI from the SMT by selecting menu 24.8. See the included disk or the [zyxel.com](http://zyxel.com) web site for more detailed information on CI commands. Enter 8 from **Menu 24 — System Maintenance** to use the command prompt.

**Figure 165** Command Mode in Menu 24

```
Menu 24 - System Maintenance

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

Enter Menu Selection Number:
```

#### 28.1.1 Command Syntax

- The command keywords are in `courier new` font.
- Enter the command keywords exactly as shown, do not abbreviate.
- The required fields in a command are enclosed in angle brackets `<>`.
- The optional fields in a command are enclosed in square brackets `[]`.
- The `|` symbol means “or”.
- For example,

```
sys filter netbios config <type> <on|off>
```

- means that you must specify the type of netbios filter and whether to turn it on or off.

## 28.1.2 Command Usage

A list of commands can be found by typing `help` or `?` at the command prompt. Always type the full command. Type `exit` to return to the SMT main menu when finished.

**Figure 166** Valid Commands

```
Copyright (c) 1994 - 2004 ZyXEL Communications Corp.
P2302R> ?
Valid commands are:
sys             exit             ether           ip
dsp            voice
```

## 28.2 Call Control Support

The Prestige provides two call control functions: budget management and call history. Please note that this menu is only applicable when **Encapsulation** is set to **PPPoE** 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.

**Figure 167** Menu 24.9 System Maintenance: Call Control

```
Menu 24.9 - System Maintenance - Call Control

1. Budget Management
2. Call History

Enter Menu Selection Number:
```

### 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.

**Figure 168** Budget Management

Menu 24.9.1 - Budget Management		
Remote Node	Connection Time/Total Budget	Elapsed Time/Total Period
1.MyISP	No Budget	No Budget

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

**Table 94** Menu 24.9.1 - Budget Management

FIELD	DESCRIPTION
Remote Node	Enter the index number of the remote node you want to reset (just one in this case)
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).
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.
Enter "0" to update the screen or press [ESC] to return to the previous screen.	

## 28.2.2 Call History

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

**Figure 169** Menu 24.9.2 - Call History

Menu 24.9.2 - Call History							
	Phone Number	Dir	Rate	#call	Max	Min	Total
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
Enter Entry to Delete(0 to exit):							

The following table describes the fields in this menu.

**Table 95** Call History Fields

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

## 28.3 Time and Date Setting

The Prestige has 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 logs.

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

**Figure 170** Menu 24: System Maintenance

```

Menu 24 - System Maintenance

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

Enter Menu Selection Number:

```

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.

**Figure 171** Menu 24.10 System Maintenance: Time and Date Setting

```

Menu 24.10 - System Maintenance - Time and Date Setting

Time Protocol= NTP (RFC-1305)
Time Server Address= time-b.nist.gov

Current Time:                08 : 07 : 14
New Time (hh:mm:ss):        08 : 06 : 48

Current Date:                2003 - 12 - 24
New Date (yyyy-mm-dd):      2003 - 12 - 24

Time Zone= GMT

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

Press ENTER to Confirm or ESC to Cancel:

```

The following table describes the fields in this screen.

**Table 96** Time and Date Setting Fields

FIELD	DESCRIPTION
Time Protocol	Enter the time service protocol that your timeserver sends when you turn on the Prestige. Not all timeservers 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. <b>Daytime (RFC 867)</b> format is day/month/year/time zone of the server. <b>Time (RFC-868)</b> format displays a 4-byte integer giving the total number of seconds since 1970/1/1 at 0:0:0. <b>NTP (RFC-1305)</b> is similar to <b>Time (RFC-868)</b> . <b>None</b> enter the time manually.
Time Server Address	Enter the IP address or domain name of your timeserver. Check with your ISP/network administrator if you are unsure of this information. The default is tick.stdtime.gov.tw
Current Time	This field displays an updated time only when you reenter this menu.
New Time	Enter the new time in hour, minute and second format.
Current Date	This field displays an updated date only when you reenter this menu.
New Date	Enter the new date in year, month and day format.
Time Zone	Press [SPACE BAR] and then [ENTER] to set the time difference between your time zone and Greenwich Mean Time (GMT).
Daylight Saving	Daylight Saving Time 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 daylight time in the evenings. If you use daylight saving time, then choose <b>Yes</b> .
Start Date	Enter the month and day that your daylight-saving time starts on if you selected <b>Yes</b> in the <b>Daylight Saving</b> field.
End Date	Enter the month and day that your daylight-saving time ends on if you selected <b>Yes</b> in the <b>Daylight Saving</b> field.
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:

- 1 On leaving menu 24.10 after making changes.
- 2 When the Prestige starts up, if there is a timeserver configured in menu 24.10.
- 3 24-hour intervals after starting.

# CHAPTER 29

## Remote Management

This chapter covers remote management (SMT menu 24.11).

### 29.1 Remote Management

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.

Enter 11 from menu 24 to bring up **Menu 24.11 – Remote Management Control**.

**Figure 172** Menu 24.11 – Remote Management Control

```

Menu 24.11 - Remote Management Control

TELNET Server:      Port = 23          Access = ALL
                   Secure Client IP = 0.0.0.0

FTP Server:         Port = 21          Access = ALL
                   Secure Client IP = 0.0.0.0

Web Server:         Port = 80          Access = ALL
                   Secure Client IP = 0.0.0.0

SNMP Service:       Port = 161         Access = LAN only
                   Secure Client IP = 0.0.0.0

DNS Service:        Port = 53          Access = LAN only
                   Secure Client IP = 0.0.0.0

Press ENTER to Confirm or ESC to Cancel:

```

The following table describes the fields in this screen.

**Table 97** Menu 24.11 – Remote Management Control

FIELD	DESCRIPTION
Telnet Server FTP Server Web Server SNMP Service DNS Service	Each of these read-only labels denotes a service or protocol.
Port	This field shows the port number for the service or protocol. You may change the port number if needed, but you must use the same port number to access the Prestige.
Access	Select the access interface (if any) by pressing [SPACE BAR], then [ENTER] to choose from: <b>LAN only</b> , <b>WAN only</b> , <b>ALL</b> or <b>Disable</b> .
Secure Client IP	The default 0.0.0.0 allows any client to use this service or protocol to access the Prestige. Enter an IP address to restrict access to a client with a matching IP address.
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.	

### 29.1.1 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 **Secure 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 with an equal or higher priority running. You may only have one remote management session running at one time.



# CHAPTER 30

## 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.

### 30.1 Introduction to Call Scheduling

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 videocassette 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.

**Figure 173** Menu 26 Schedule Setup

Menu 26 - Schedule Setup			
Schedule Set #	Name	Schedule Set #	Name
1	_____	7	_____
2	_____	8	_____
3	_____	9	_____
4	_____	10	_____
5	_____	11	_____
6	_____	12	_____

Enter Schedule Set Number to Configure= 0

Edit Name= N/A

Press ENTER to Confirm or ESC to Cancel:

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.

**Note:** 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.

**Figure 174** Menu 26.1 Schedule Set Setup

```

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:
    
```

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 98** Menu 26.1 Schedule Set Setup

FIELD	DESCRIPTION
Active	Press [SPACE BAR] to select <b>Yes</b> or <b>No</b> . Choose <b>Yes</b> and press [ENTER] to activate the schedule set.
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.
How Often	Should this schedule set recur weekly or be used just once only? Press the [SPACE BAR] and then [ENTER] to select <b>Once</b> or <b>Weekly</b> . Both these options are mutually exclusive. If <b>Once</b> is selected, then all weekday settings are <b>N/A</b> . When <b>Once</b> is selected, the schedule rule deletes automatically after the scheduled time elapses.
Once: Date	If you selected <b>Once</b> in the <b>How Often</b> field above, then enter the date the set should activate here in year-month-date format.
Weekday: Day	If you selected <b>Weekly</b> in the <b>How Often</b> 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 <b>Yes</b> , then press [ENTER].
Start Time	Enter the start time when you wish the schedule set to take effect in hour-minute format.
Duration	Enter the maximum length of time this connection is allowed in hour-minute format.

**Table 98** Menu 26.1 Schedule Set Setup (continued)

FIELD	DESCRIPTION
Action	<p><b>Forced On</b> 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 <b>Duration</b> field.</p> <p><b>Forced Down</b> means that the connection is blocked whether or not there is a demand call on the line.</p> <p><b>Enable Dial-On-Demand</b> means that this schedule permits a demand call on the line.</p> <p><b>Disable Dial-On-Demand</b> means that this schedule prevents a demand call on the line.</p>
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.

**Figure 175** Applying Schedule Set(s) to a Remote Node (PPPoE)

```

Menu 11.1 - Remote Node Profile

Rem Node Name= MyISP                Route= IP
Active= Yes                          Edit IP= No
Encapsulation= PPPoE                 Telco Option:
Service Type= Standard               Allocated Budget(min)= 0
Service Name=                        Period(hr)= 0
Outgoing:                             Schedules= 1,2,3,4
  My Login=                           Nailed-Up Connection= No
  My Password= *****
  Retype to Confirm= *****
  Authen= CHAP/PAP

Session Options:
  Edit Filter Sets= No
  Idle Timeout(sec)= 100

Edit Traffic Redirect= No

Press ENTER to Confirm or ESC to Cancel:

```

You can apply up to four schedule sets, separated by commas, for one remote node. Change the schedule set numbers to your preference(s).



# CHAPTER 31

## Troubleshooting

This chapter covers potential problems and the corresponding remedies.

### 31.1 Problems Starting Up the Prestige

**Table 99** Troubleshooting the Start-Up of Your Prestige

PROBLEM	CORRECTIVE ACTION
None of the LEDs turn on when I turn on the Prestige.	Make sure that the Prestige's power adaptor is connected to the Prestige and an appropriate power source. Check that the power source is turned on.
	Disconnect the Prestige's power and reconnect it.
	If the error persists, you may have a hardware problem. In this case, you should contact your vendor.

### 31.2 Problems with the LAN Interface

**Table 100** Troubleshooting the LAN Interface

PROBLEM	CORRECTIVE ACTION
I cannot access the Prestige from the LAN.	Check your Ethernet cable connections. Refer to the Quick Start Guide for LAN connection instructions.
	Check for faulty Ethernet cables.
	Make sure the computer's Ethernet adapter is installed and functioning properly.
I cannot ping any computer on the LAN.	The <b>LAN</b> LED on the front panel should be on. If it is off, check the cables between the Prestige and your computer or switch.
	Verify that the IP address and the subnet mask of the Prestige's LAN port and the computers are on the same subnet.

## 31.3 Problems with the WAN Interface

**Table 101** Troubleshooting the WAN Interface

PROBLEM	CORRECTIVE ACTION
The Prestige cannot get a WAN IP address from the ISP.	The ISP provides the WAN IP address after authentication. Authentication may be through the user name and password, the MAC address or the host name. Use the following corrective actions to make sure the ISP can authenticate your connection.
	You need a user name and password if you're using PPPoE or PPTP encapsulation. Make sure that you have entered the correct <b>Service Type</b> , <b>User Name</b> and <b>Password</b> (the user name and password are case sensitive). Refer to <a href="#">Section 5.4 on page 66</a> .
	If your ISP requires MAC address authentication, you can clone the MAC address from your computer on the LAN as the Prestige's WAN MAC address. Refer to <a href="#">Section 5.8 on page 76</a> .
	If your ISP requires host name authentication, configure your computer's name as the Prestige's system name. Refer to <a href="#">Section 3.3 on page 45</a> .

## 31.4 Problems with Internet Access

**Table 102** Troubleshooting Internet Access

PROBLEM	CORRECTIVE ACTION
I cannot access the Internet.	Make sure the Prestige is turned on and connected to the network.
	Verify your Ethernet settings (see <a href="#">Chapter 4 on page 55</a> and <a href="#">Chapter 5 on page 65</a> ).
	Make sure you entered the correct user name and password.
Internet connection disconnects.	Contact your ISP.

## 31.5 Problems with the Password

**Table 103** Troubleshooting the Password

PROBLEM	CORRECTIVE ACTION
I cannot access the Prestige.	The username is admin. The default password is 1234. The <b>Password</b> and <b>Username</b> fields are case-sensitive. Make sure that you enter the correct password and username using the proper casing. If you have changed the password and have now forgotten it, you will need to restore the default configuration file (see <a href="#">Section 2.3 on page 40</a> ). This restores all of the factory defaults including the password.

## 31.6 Problems with the Web Configurator

**Table 104** Troubleshooting the Web Configurator

PROBLEM	CORRECTIVE ACTION
I cannot access the web configurator.	<p>Also see <a href="#">Table 103 on page 270</a>.</p> <p>When NAT is enabled:</p> <ul style="list-style-type: none"> <li>• Use the Prestige's WAN IP address when configuring from the WAN.</li> <li>• Use the Prestige's LAN IP address when configuring from the LAN.</li> </ul> <p>If the Prestige's WAN or LAN IP address has changed, then enter the new one as the URL.</p> <p>If you disconnect your computer from one device and connect it to another device that has the same IP address, your computer's ARP (Address Resolution Protocol) table may contain an entry that maps the management IP address to the previous device's MAC address).</p> <p>In Windows, use <code>arp -d</code> at the command prompt to delete all entries in your computer's ARP table.</p> <p>You may also need to clear your Internet browser's cache.</p> <p>In Internet Explorer, click <b>Tools</b> and then <b>Internet Options</b> to open the <b>Internet Options</b> screen. In the <b>General</b> tab, click <b>Clear History</b>.</p>

## 31.7 Problems with a Telephone or the Telephone Port

**Table 105** Troubleshooting Telephone

PROBLEM	CORRECTIVE ACTION
There is no dial tone or I can't make calls.	<p>Check the telephone connections and telephone wire.</p> <p>Make sure you have the <b>VoIP</b> screen properly configured.</p> <p>You can also check the Prestige's IP addresses and VoIP status in the <b>Maintenance Status</b> screen.</p>

## 31.8 Problems with Voice Service

**Table 106** Troubleshooting Voice Service

PROBLEM	CORRECTIVE ACTION
<p>After VoIP is configured and working, others are unable to call you or you lose your connection during a call. There is a NAT router between the Prestige and the SIP server.</p>	<p>This could be caused by a short NAT UDP session timeout on the NAT router. When the SIP session's entry in the NAT table times out, the NAT router does not have any record to use for forwarding VoIP traffic to the Prestige.</p> <p>If possible, set the NAT router to use a longer NAT UDP session timeout.</p> <p>Otherwise, try one of the following:</p> <ul style="list-style-type: none"><li>• Shorten the registration expiration period (see the <b>Expiration Duration</b> field in the <b>VoIP Advanced</b> screen) in order to cause the Prestige to re-register with the SIP register server more frequently. Note that this will not help if the SIP register server enforces a long registration expiration period (since the Prestige will also use the period set by the SIP register server).</li><li>• Use STUN. If your VoIP service provider does not have a STUN server, you can still enable STUN and enter the IP address and port number of the SIP server in the STUN server fields. This causes the Prestige to send STUN requests to the SIP server. While this will not make STUN work (since there won't be any responses to the STUN requests), it should keep the NAT UDP session in the NAT router.</li></ul>



# Appendix A

## Hardware Specifications

### Ethernet Port Specifications

2 RJ-45, 10/100Mbps Half / Full Auto-negotiation, Auto-crossover

### Prestige Power Adaptor Specifications

**Table 107** Prestige Power Adaptor Specifications

<b>NORTH AMERICAN PLUG STANDARDS</b>	
AC Power Adapter Model	DV-1215A
Input Power	AC120Volts/60Hz/30W
Output Power	AC12Volts/1.25A
Power Consumption	11 W
Safety Standards	UL, CUL, CSA (UL 1310, CSA C22.2 No.223)
<b>NORTH AMERICAN PLUG STANDARDS</b>	
AC Power Adapter Model	AA-121A25
Input Power	AC120Volts/60Hz/19W
Output Power	AC 12Volts/ 1.25A
Power Consumption	11W
Safety Standards	UL, CUL (UL 1310, CSA C22.2 No.223)
<b>EUROPEAN PLUG STANDARDS</b>	
AC Power Adapter Model	AA-121A3BN
Input Power	AC230Volts/50Hz/140mA
Output Power	AC12Volts/1.3A
Power Consumption	11W
Safety Standards	ITS-GS, CE (EN 60950)



# Appendix B

## 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.

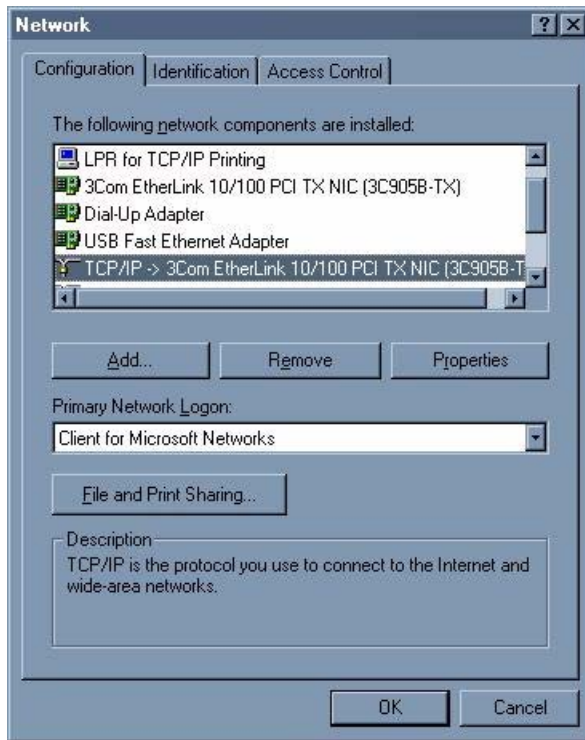
TCP/IP should already be installed on computers using Windows NT/2000/XP, Macintosh OS 7 and later operating systems.

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.

**Figure 176** Windows 95/98/Me: Network: Configuration

## 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:

- 1 In the **Network** window, click **Add**.
- 2 Select **Adapter** and then click **Add**.
- 3 Select the manufacturer and model of your network adapter and then click **OK**.

If you need TCP/IP:

- 1 In the **Network** window, click **Add**.
- 2 Select **Protocol** and then click **Add**.
- 3 Select **Microsoft** from the list of **manufacturers**.
- 4 Select **TCP/IP** from the list of network protocols and then click **OK**.

If you need Client for Microsoft Networks:

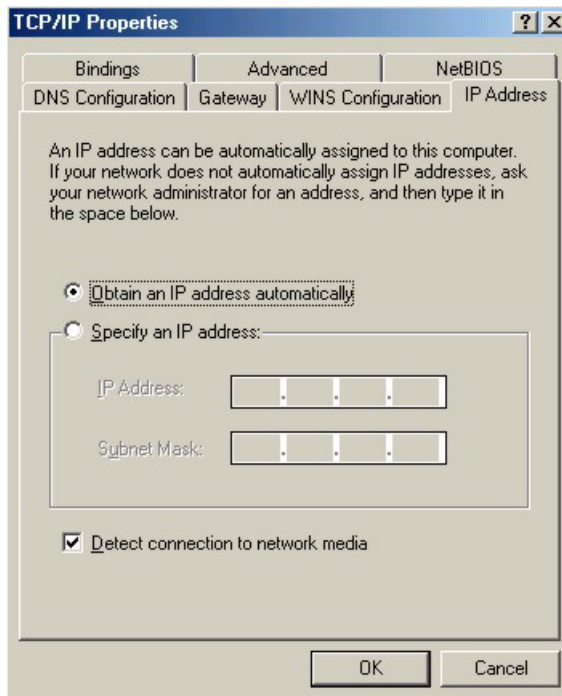
- 1 Click **Add**.
- 2 Select **Client** and then click **Add**.

- 3 Select **Microsoft** from the list of manufacturers.
- 4 Select **Client for Microsoft Networks** from the list of network clients and then click **OK**.
- 5 Restart your computer so the changes you made take effect.

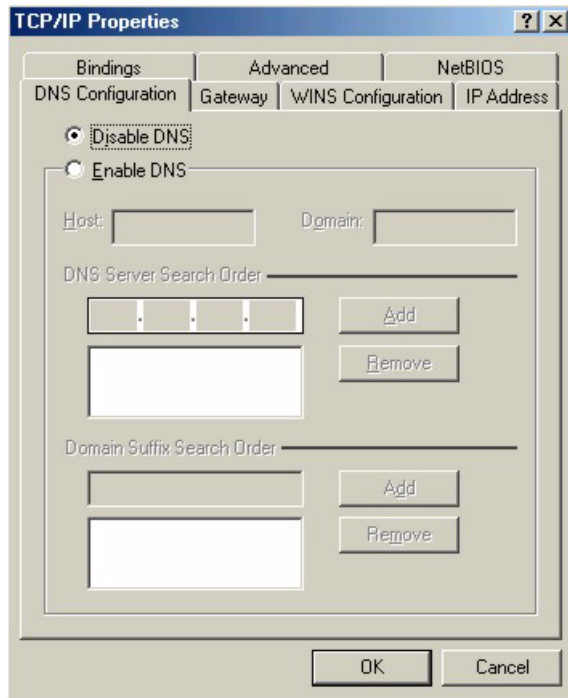
## Configuring

- 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.

**Figure 177** Windows 95/98/Me: TCP/IP Properties: IP Address



- 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).

**Figure 178** Windows 95/98/Me: TCP/IP Properties: DNS Configuration**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**.

**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.

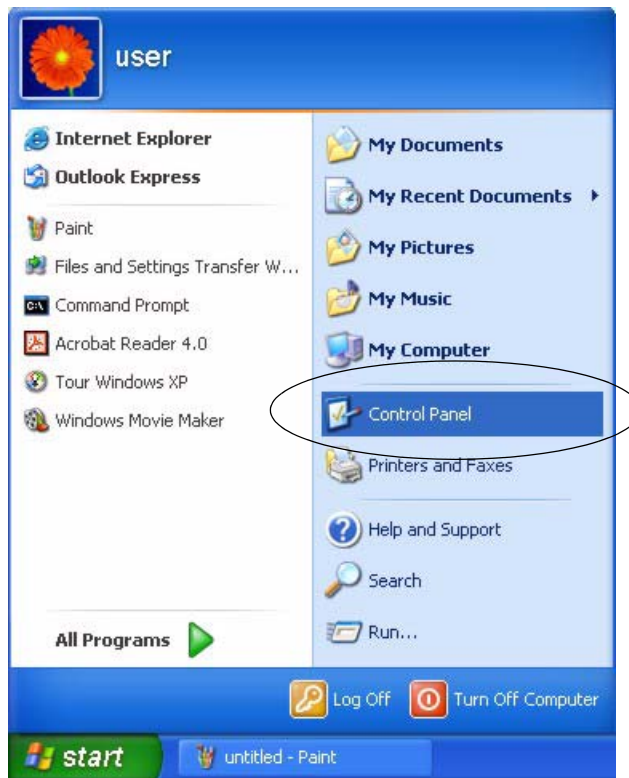
## Verifying Settings

**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

The following example figures use the default Windows XP GUI theme.

**1** Click **start** (**Start** in Windows 2000/NT), **Settings, Control Panel**.

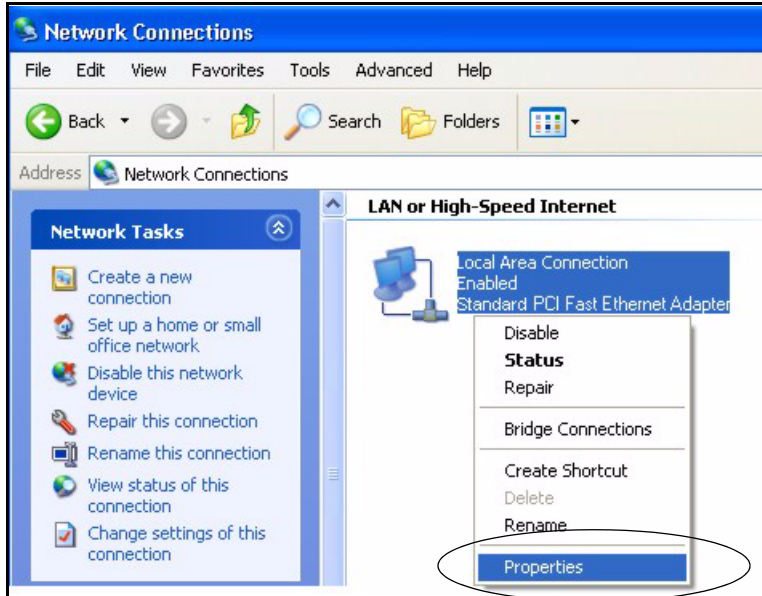
**Figure 179** Windows XP: Start Menu

**2** In the **Control Panel**, double-click **Network Connections (Network and Dial-up Connections)** in Windows 2000/NT).

**Figure 180** Windows XP: Control Panel

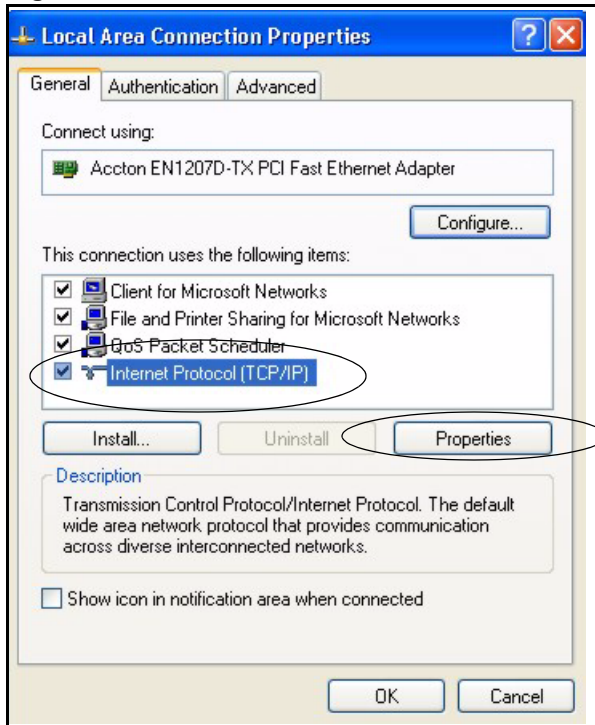
**3** Right-click **Local Area Connection** and then click **Properties**.

**Figure 181** Windows XP: Control Panel: Network Connections: Properties



**4** Select **Internet Protocol (TCP/IP)** (under the **General** tab in Win XP) and then click **Properties**.

**Figure 182** Windows XP: Local Area Connection Properties



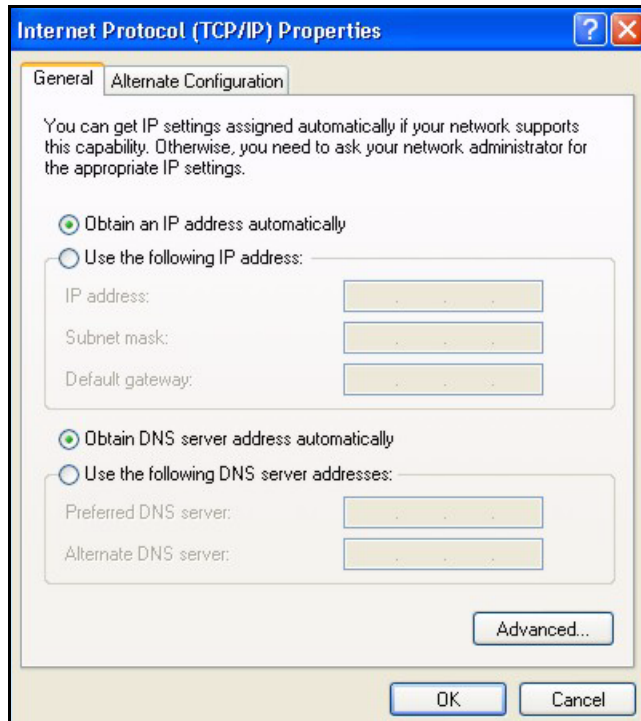
**5** The **Internet Protocol TCP/IP Properties** window opens (the **General** tab in Windows XP).

- 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**.

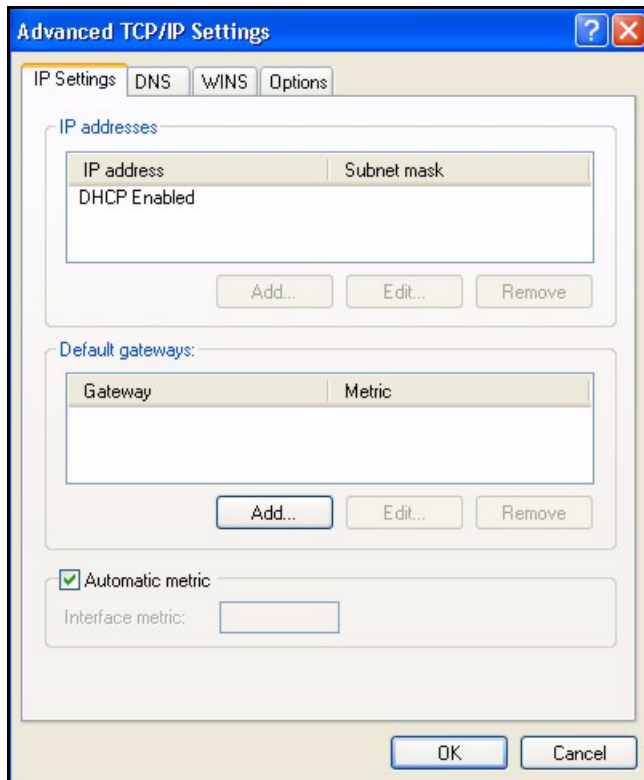
**Figure 183** Windows XP: Internet Protocol (TCP/IP) Properties



- 6** If you do not know your gateway's IP address, remove any previously installed gateways in the **IP Settings** tab and click **OK**.

Do one or more of the following if you want to configure additional IP addresses:

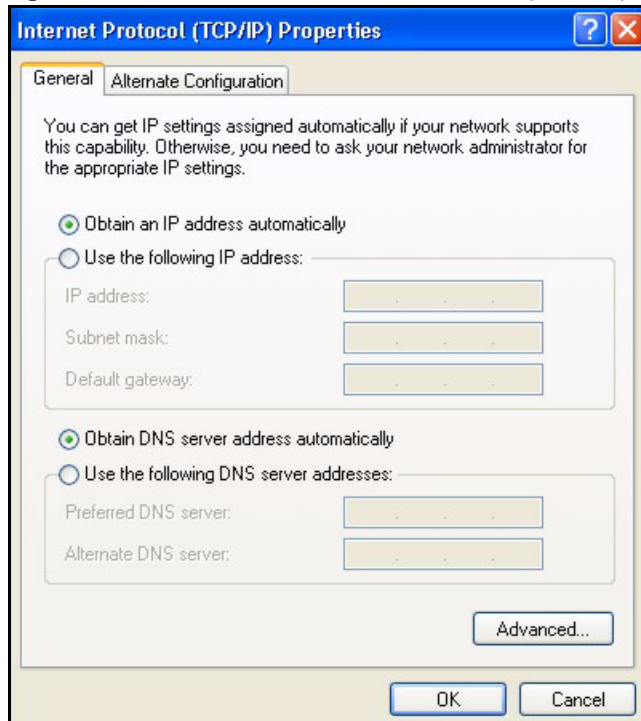
- In the **IP Settings** tab, in IP addresses, click **Add**.
- In **TCP/IP Address**, type an IP address in **IP address** and a subnet mask in **Subnet mask**, and then click **Add**.
- Repeat the above two steps for each IP address you want to add.
- Configure additional default gateways in the **IP 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.

**Figure 184** Windows XP: Advanced TCP/IP Properties

**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.

**Figure 185** Windows XP: Internet Protocol (TCP/IP) Properties

- 8** Click **OK** to close the **Internet Protocol (TCP/IP) Properties** window.
- 9** Click **Close (OK in Windows 2000/NT)** to close the **Local Area Connection Properties** window.
- 10** Close the **Network Connections** window (**Network and Dial-up Connections** in Windows 2000/NT).
- 11** Turn on your Prestige and restart your computer (if prompted).

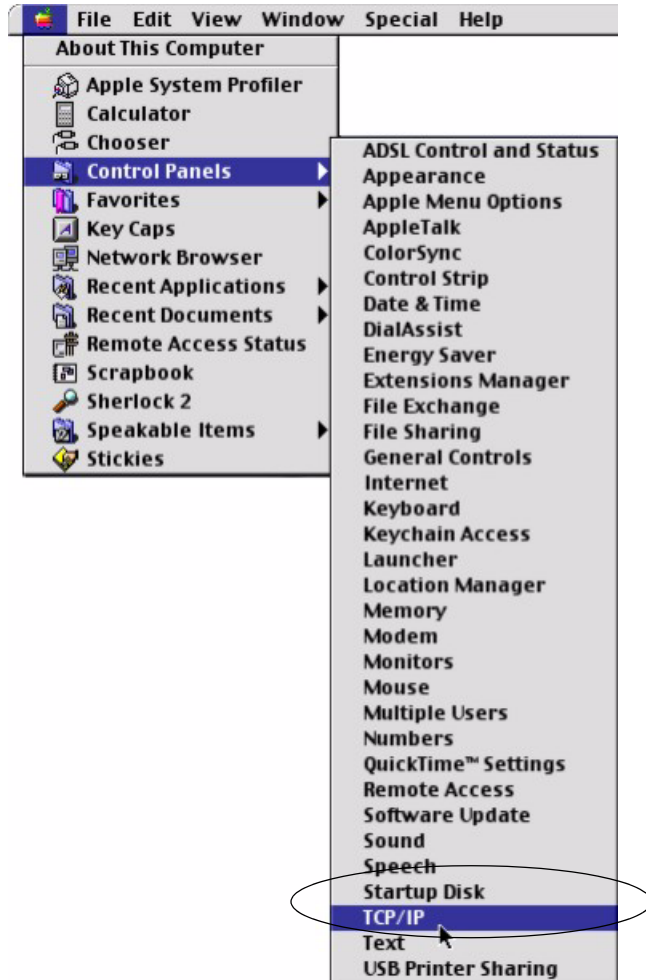
## Verifying Settings

- 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

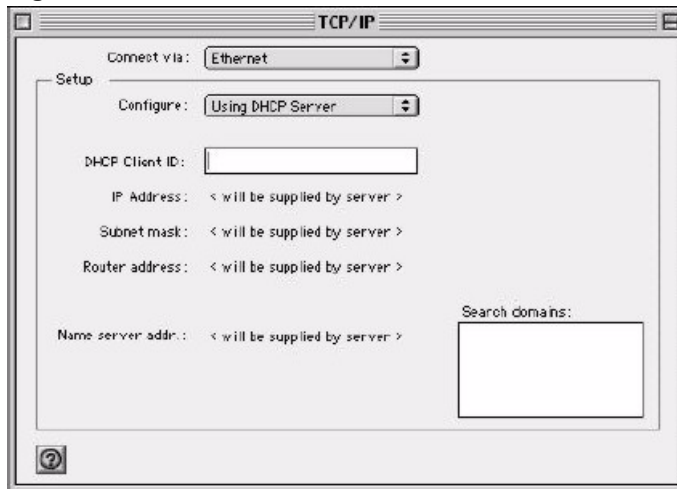
- 1** Click the **Apple** menu, **Control Panel** and double-click **TCP/IP** to open the **TCP/IP Control Panel**.

Figure 186 Macintosh OS 8/9: Apple Menu



2 Select **Ethernet built-in** from the **Connect via** list.

Figure 187 Macintosh OS 8/9: TCP/IP



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).

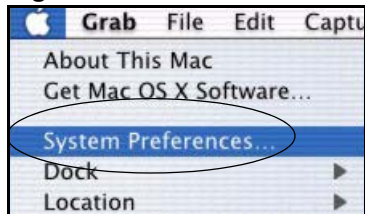
## Verifying Settings

Check your TCP/IP properties in the **TCP/IP Control Panel** window.

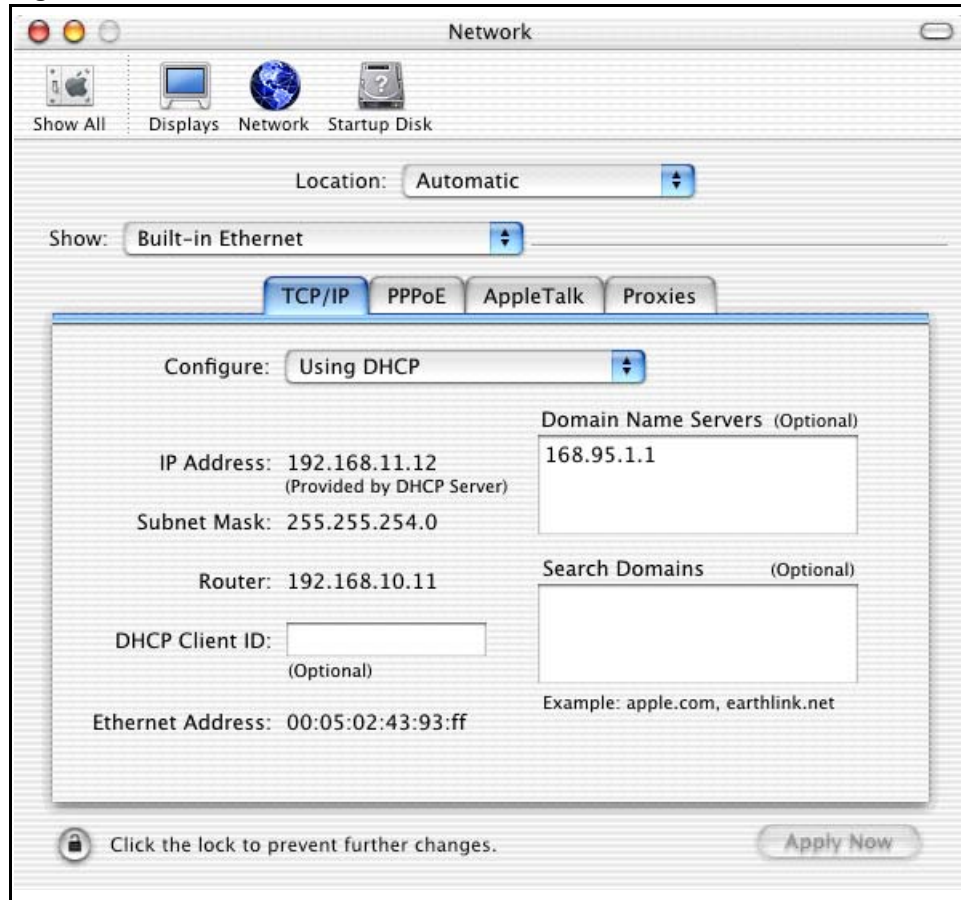
## Macintosh OS X

- 1 Click the **Apple** menu, and click **System Preferences** to open the **System Preferences** window.

**Figure 188** Macintosh OS X: Apple Menu



- 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.
- 3 For dynamically assigned settings, select **Using DHCP** from the **Configure** list.

**Figure 189** Macintosh OS X: Network

**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 C

## 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.)

**Table 108** 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

**Note:** 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.

**Table 109** Allowed IP Address Range By Class

CLASS	ALLOWED RANGE OF FIRST OCTET (BINARY)	ALLOWED RANGE OF FIRST OCTET (DECIMAL)
Class A	00000000 to 01111111	0 to 127
Class B	10000000 to 10111111	128 to 191
Class C	11000000 to 11011111	192 to 223
Class D	11100000 to 11101111	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 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.

**Table 110** “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.

**Table 111** 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.

**Table 112** Two Subnets Example

	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.

**Note:** 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.

**Table 113** Subnet 1

	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address	192.168.1.	0
IP Address (Binary)	11000000.10101000.00000001.	<b>00000000</b>
Subnet Mask	255.255.255.	128
Subnet Mask (Binary)	11111111.11111111.11111111.	<b>10000000</b>
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	

**Table 114** Subnet 2

	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address	192.168.1.	128
IP Address (Binary)	11000000.10101000.00000001.	<b>10000000</b>
Subnet Mask	255.255.255.	128
Subnet Mask (Binary)	11111111.11111111.11111111.	<b>10000000</b>
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 (11111111.11111111.11111111.11000000) 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).

**Table 115** Subnet 1

	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address	192.168.1.	0
IP Address (Binary)	11000000.10101000.00000001.	00000000
Subnet Mask (Binary)	11111111.11111111.11111111.	11000000
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	

**Table 116** Subnet 2

	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address	192.168.1.	64
IP Address (Binary)	11000000.10101000.00000001.	01000000
Subnet Mask (Binary)	11111111.11111111.11111111.	11000000
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	

**Table 117** Subnet 3

	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address	192.168.1.	128
IP Address (Binary)	11000000.10101000.00000001.	10000000
Subnet Mask (Binary)	11111111.11111111.11111111.	11000000
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	

**Table 118** Subnet 4

	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address	192.168.1.	192
IP Address (Binary)	11000000.10101000.00000001.	11000000
Subnet Mask (Binary)	11111111.11111111.11111111.	11000000
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.

**Table 119** 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.

**Table 120** 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
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 [Table 108 on page 287](#)) available for subnetting.

The following table is a summary for class “B” subnet planning.

**Table 121** 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
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 D

## PPPoE

### PPPoE in Action

An ADSL modem bridges a PPP session over Ethernet (PPP over Ethernet, RFC 2516) from your computer to an ATM PVC (Permanent Virtual Circuit) which connects to a DSL Access Concentrator where the PPP session terminates (see [Figure 190 on page 296](#)). 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:

It provides you with a familiar dial-up networking (DUN) user interface.

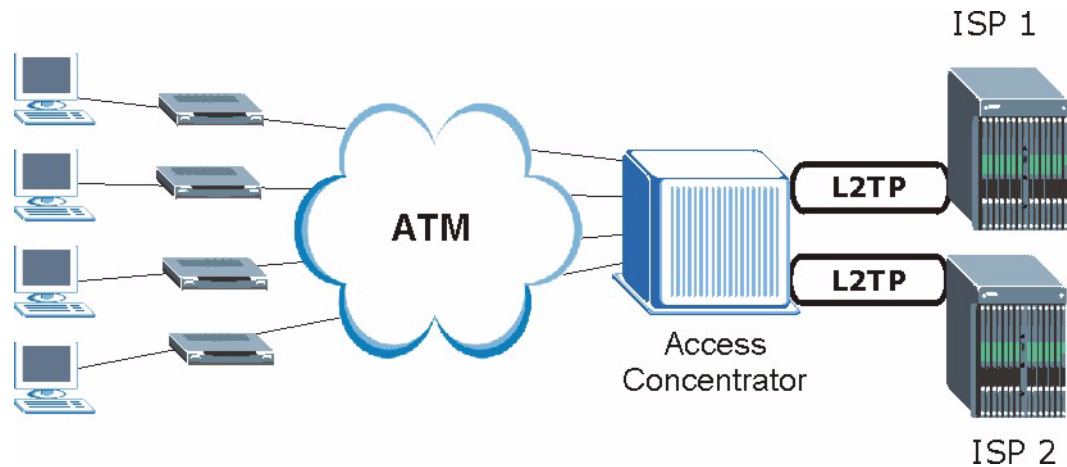
It lessens the burden on the carriers of provisioning virtual circuits all the way to the ISP on multiple switches for thousands of users. For GSTN (PSTN and ISDN), the switching fabric is already in place.

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 computers use traditional dial-up networking.

**Figure 190** Single-Computer per Router Hardware Configuration



## How PPPoE Works

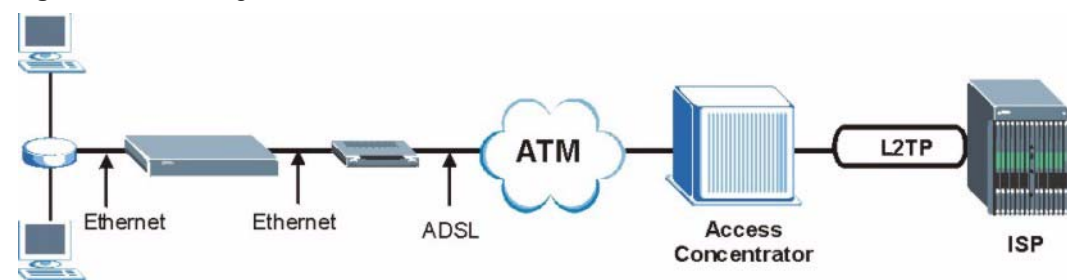
The PPPoE driver makes the Ethernet appear as a serial link to the computer and the computer runs PPP over it, while the modem bridges the Ethernet frames to the Access Concentrator (AC). Between the AC and an ISP, the AC is acting as a L2TP (Layer 2 Tunneling Protocol) LAC (L2TP Access Concentrator) 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 computer and the ISP.

## Prestige as a PPPoE Client

When using the Prestige as a PPPoE client, the computers 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 computers.

**Figure 191** Prestige as a PPPoE Client





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