P-334WT

802.11g Wireless Broadband Router with Firewall

User's Guide

Version 3.60
1/2006

ZyXEL

Copyright

Disclaimer

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

Trademarks

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

Federal Communications Commission (FCC) Interference Statement

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

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

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

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

- 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.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Certifications

1. Go to www.zyxel.com.
2. Select your product from the drop-down list box on the ZyXEL home page to go to that product's page.
3. 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 or higher value, and will be solely at the discretion of ZyXEL. This warranty shall not apply if the product has been 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 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.

Registration

Register your product online to receive e-mail notices of firmware upgrades and information at www.zyxel.com for global products, or at www.us.zyxel.com for North American products.

Customer Support

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

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

METHOD / LOCATION	SUPPORT E-MAIL / SALES E-MAIL	TELEPHONE[A] / FAX	WEB SITE / FTP SITE	REGULAR MAIL
CORPORATE HEADQUARTERS (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	
CZECH REPUBLIC	info@cz.zyxel.com	+420-241-091-350	www.zyxel.cz	ZyXEL Communications Czech s.r.o. Modranská 621 143 01 Praha 4 - Modrany Ceská Republika
	info@cz.zyxel.com	+420-241-091-359		
DENMARK	support@zyxel.dk	+45-39-55-07-00	www.zyxel.dk	ZyXEL Communications A/S Columbusvej 2860 Soeborg Denmark
	sales@zyxel.dk	+45-39-55-07-07		
FINLAND	support@zyxel.fi	+358-9-4780-8411	www.zyxel.fi	ZyXEL Communications Oy Malminkaari 10 00700 Helsinki Finland
	sales@zyxel.fi	+358-9-4780 8448		
FRANCE	info@zyxel.fr	+33-4-72-52-97-97	www.zyxel.fr	ZyXEL France 1 rue des Vergers Bat. 1 / C 69760 Limonest France
		+33-4-72-52-19-20		
GERMANY	support@zyxel.de	+49-2405-6909-0	www.zyxel.de	ZyXEL Deutschland GmbH. Adenauerstr. 20/A2 D-52146 Wuerselen Germany
	sales@zyxel.de	+49-2405-6909-99		
HUNGARY	support@zyxel.hu	+36-1-3361649	www.zyxel.hu	ZyXEL Hungary 48, Zoldlomb Str. H-1025, Budapest Hungary
	info@zyxel.hu	+36-1-3259100		
KAZAKHSTAN	http://zyxel.kz/support	+7-3272-590-698	www.zyxel.kz	ZyXEL Kazakhstan 43, Dostyk ave.,Office 414 Dostyk Business Centre 050010, Almaty Republic of Kazakhstan
	sales@zyxel.kz	+7-3272-590-689		
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	
NORWAY	support@zyxel.no	+47-22-80-61-80	www.zyxel.no	ZyXEL Communications A/S Nils Hansens vei 13 0667 Oslo Norway
	sales@zyxel.no	+47-22-80-61-81		

METHOD / LOCATION	SUPPORT E-MAIL / SALES E-MAIL	TELEPHONE[A] / FAX	WEB SITE / FTP SITE	REGULAR MAIL
POLAND	info@pl.zyxel.com	+48-22-5286603 +48-22-5206701	www.pl.zyxel.com	ZyXEL Communications ul.Emilli Plater 53 00-113 Warszawa Poland
RUSSIA	http://zyxel.ru/support sales@zyxel.ru	+7-095-542-89-29 +7-095-542-89-25	www.zyxel.ru	ZyXEL Russia Ostrovityanova 37a Str. Moscow, 117279 Russia
SPAIN	support@zyxel.es sales@zyxel.es	+34-902-195-420 +34-913-005-345	www.zyxel.es	ZyXEL Communications Alejandro Villegas 33 1º, 28043 Madrid Spain
SWEDEN	support@zyxel.se sales@zyxel.se	+46-31-744-7700 +46-31-744-7701	www.zyxel.se	ZyXEL Communications A/S Sjöporten 4, 41764 Göteborg Sweden
UKRAINE	support@ua.zyxel.com sales@ua.zyxel.com	+380-44-247-69-78 +380-44-494-49-32	www.ua.zyxel.com	ZyXEL Ukraine 13, Pimonenko Str. Kiev, 04050 Ukraine
UNITED KINGDOM	support@zyxel.co.uk sales@zyxel.co.uk	+44-1344 303044 08707 555779 (UK only) +44-1344 303034	www.zyxel.co.uk ftp.zyxel.co.uk	ZyXEL Communications UK Ltd.,11 The Courtyard, Eastern Road, Bracknell, Berkshire, RG12 2XB, United Kingdom (UK)

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

Table of Contents

List of Figures

List of Tables

Preface

Congratulations on your purchase of the P-334WT, 802.11g Wireless Broadband Router with Firewall. This manual is designed to guide you through the configuration of your Prestige for its various applications.

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.

This manual may refer to the P-334WT, 802.11g Wireless Broadband Router with Firewall as the Prestige.

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.

- Compact Guide

  The Compact Guide is designed to help you get up and running right away. They contain connection information and instructions on getting started.

- Web Configurator Online Help

  Embedded web help for descriptions of individual screens and supplementary information.

- ZyXEL Glossary and Web Site

  Please refer to www.zyxel.com for an online glossary of networking terms and additional support documentation.

User Guide Feedback

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

Syntax Conventions

- "Enter" means for you to type one or more characters. "Select" or "Choose" means for you to use one predefined choice.
- The SMT menu titles and labels are in **Bold Times New Roman** font. Predefined field choices are in **Bold Arial** font. Command and arrow keys are enclosed in square brackets. [ENTER] means the Enter, or carriage return key; [ESC] means the Escape key and [SPACE BAR] means the Space Bar.
- Mouse action sequences are denoted using a comma. For example, "In Windows, click **Start**, **Settings** and then **Control Panel**" means first click the **Start** button, then point your mouse pointer to **Settings** and then click **Control Panel**.
- "e.g.," is a shorthand for "for instance", and "i.e.," means "that is" or "in other words".

Graphics Icons Key

Prestige 	Computer 	Notebook computer 
Server 	DSLAM 	Firewall 
Modem 	Switch 	Router 

CHAPTER 1
Getting to Know Your Prestige

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

1.1 Prestige Overview

The Prestige is the ideal secure wireless firewall router for all data passing between the Internet and LAN's.

By integrating NAT, firewall, media bandwidth management and VPN capability, ZyXEL's Prestige is a complete security solution that protects your Intranet and efficiently manages data traffic on your network.

The embedded web configurator is easy to operate.

In the Prestige product name, "W" denotes wireless functionality. The P-334WT has an embedded mini-PCI module for 802.11g Wireless LAN connectivity.

Note: Only use firmware for your Prestige's specific model.

1.2 Prestige Features

The following sections describe Prestige features.

1.2.1 Physical Features

10/100 Mbps Auto-negotiating Ethernet/Fast Ethernet Interface(s)

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

Auto-negotiation allows data transfer of 100 Mbps in full-duplex mode

Auto-crossover 10/100 Mbps Ethernet Interface(s)

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

4-Port Switch

A combination of switch and router makes your Prestige a cost-effective and viable network solution. You can add up to four computers to the Prestige without the cost of a hub. Add more than four computers to your LAN by using a hub.

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.

1.2.2 Non-Physical Features

Bandwidth Management

ZyXEL's Bandwidth Management allows you to specify bandwidth classes based on an application and/or subnet. You can allocate specific amounts of bandwidth capacity (bandwidth budgets) to different bandwidth classes.

Trend Micro Security Services

TMSS (Trend Micro Security Services) identifies vulnerabilities and protects computers and networks that have Internet connections. **TMSS** is enabled by default on the Prestige but you must register at the **TMSS** web page. After you register, you can configure **TMSS** using the Prestige web configurator.

IPSec VPN Capability

Establish a Virtual Private Network (VPN) to connect with business partners and branch offices using data encryption and the Internet to provide secure communications without the expense of leased site-to-site lines. The Prestige VPN is based on the IPSec standard and is fully interoperable with other IPSec-based VPN products.

Firewall

The Prestige is a stateful inspection firewall with DoS (Denial of Service) protection. By default, when the firewall is activated, all incoming traffic from the WAN to the LAN is blocked unless it is initiated from the LAN. The Prestige firewall supports TCP/UDP inspection, DoS detection and prevention, real time alerts, reports and logs.

Content Filtering

The Prestige can also block access to web sites containing keywords that you specify. You can define time periods and days during which content filtering is enabled and include or exclude a range of users on the LAN from content filtering.

Packet Filtering

The packet filtering mechanism blocks unwanted traffic from entering/leaving your network.

Time and Date

The Prestige allows you to get the current time and date from an external server when you turn on your Prestige. You can also set the time manually.

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.

Call Scheduling

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

PPPoE

PPPoE 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.

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 LAN network.

SNMP

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

Network Address Translation (NAT)

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

Traffic Redirect

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

Port Forwarding

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

DHCP (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.

Any IP

The Any IP feature allows a computer to access the Internet without changing the network settings (such as IP address and subnet mask) of the computer, when the IP addresses of the computer and the Prestige are not in the same subnet.

Full Network Management

The embedded web configurator is an all-platform web-based utility that allows you to easily access the Prestige's management settings and configure the firewall. Most functions of the Prestige are also software configurable via the SMT (System Management Terminal) interface. The SMT is a menu-driven interface that you can access over a telnet connection.

RoadRunner Support

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

Logging and Tracing

- Built-in message logging and packet tracing.
- Unix syslog facility support.
- Firewall logs.
- Content filtering logs.

Upgrade Prestige Firmware via LAN

The firmware of the Prestige can be upgraded via the LAN (refer to the **Maintenance-Tools-Firmware** screen).

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.

1.2.3 Wireless Features

Wireless LAN

The Prestige supports the IEEE 802.11g standard, which is fully compatible with the IEEE 802.11b standard, meaning that you can have both IEEE 802.11b and IEEE 802.11g wireless clients in the same wireless network.

Note: The P-334WT may be prone to RF (Radio Frequency) interference from other 2.4 GHz devices such as microwave ovens, wireless phones, Bluetooth enabled devices, and other wireless LANs.

Wi-Fi Protected Access

Wi-Fi Protected Access (WPA) is a subset of the IEEE 802.11i security specification standard. Key differences between WPA and WEP are user authentication and improved data encryption.

WPA(2)

Wi-Fi Protected Access (WPA) is a subset of the IEEE 802.11i standard. WPA 2 (IEEE 802.11i) is a wireless security standard that defines stronger encryption, authentication and key management than WPA.

Key differences between WPA(2) and WEP are improved data encryption and user authentication.

Antenna

The Prestige is equipped with a 2dBi fixed antenna to provide clear radio signal between the wireless stations and the access points.

Wireless LAN MAC Address Filtering

Your Prestige can check the MAC addresses of wireless stations against a list of allowed or denied MAC addresses.

WEP Encryption

WEP (Wired Equivalent Privacy) encrypts data frames before transmitting over the wireless network to help keep network communications private.

OTIST (One Touch Intelligent Security Technology)

OTIST allows your Prestige to assign its ESSID and security settings (WEP or WPA-PSK) to the ZyXEL wireless adapters that support OTIST and are within transmission range. The ZyXEL wireless adapters must also have OTIST enabled.

G-Plus

G-plus is an enhancement to the IEEE 802.11g wireless standard. It increases wireless transmission speeds by allowing larger frames to be sent.

Wireless List

With the wireless list, you can see the list of the wireless stations that are currently using the Prestige to access your wired network.

Wireless LAN Channel Usage

The Wireless Channel Usage displays whether the radio channels are used by other wireless devices within the transmission range of the Prestige. This allows you to select the channel with minimum interference for your Prestige.

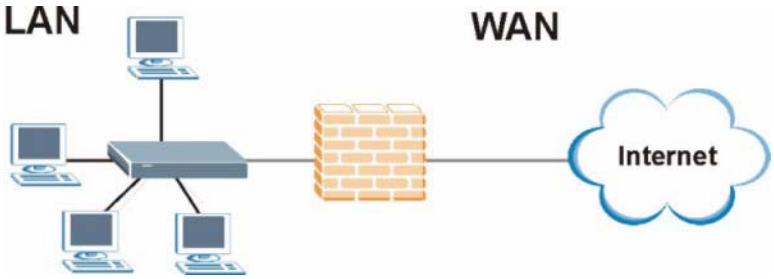
1.3 Applications for the Prestige

Here are some examples of what you can do with your Prestige.

1.3.1 Secure Broadband Internet Access via Cable or DSL Modem

You can connect a cable modem, DSL or wireless modem to the Prestige for broadband Internet access via an Ethernet or a wireless port on the modem. The Prestige guarantees not only high speed Internet access, but secure internal network protection and traffic management as well.

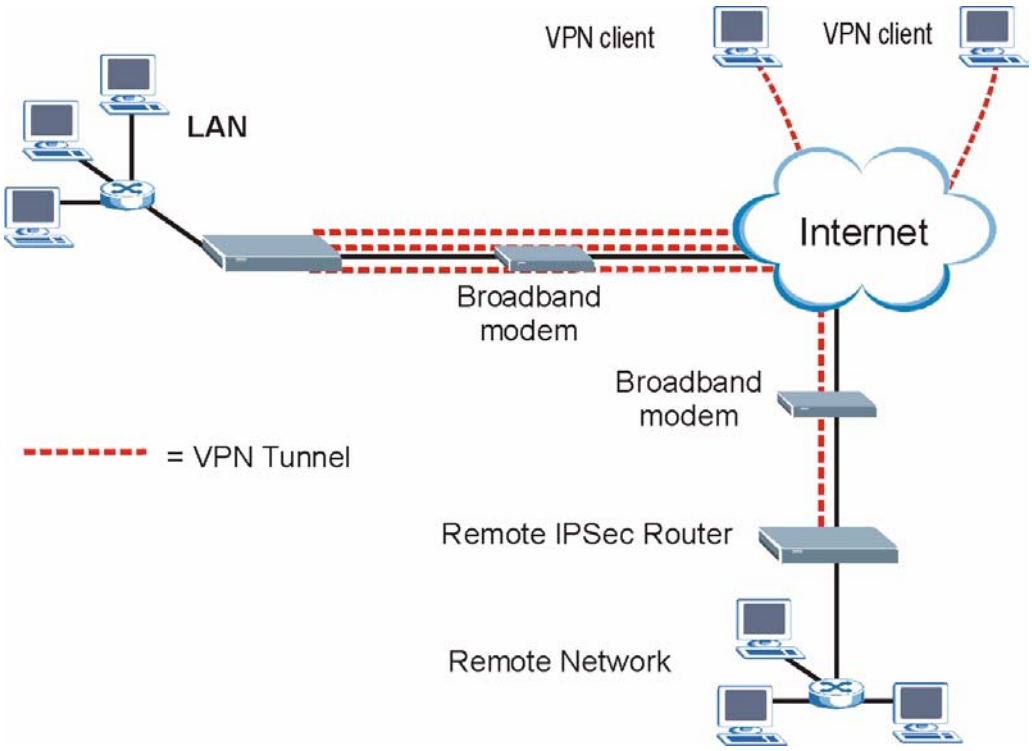
Figure 1 Secure Internet Access via Cable, DSL or Wireless Modem



1.3.2 VPN Application

Prestige VPN is an ideal cost-effective way to connect branch offices and business partners over the Internet without the need (and expense) for leased lines between sites.

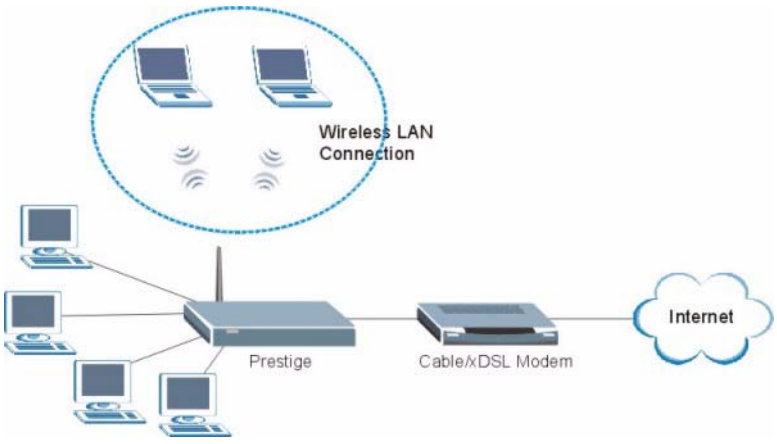
Figure 2 VPN Application



1.3.3 Wireless LAN Application

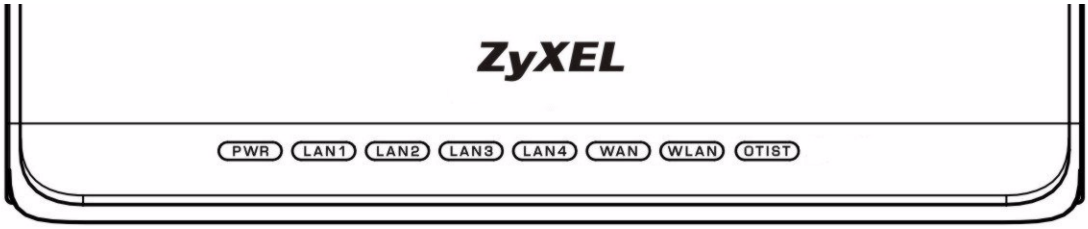
Add a wireless LAN to your existing network without expensive network cables. Wireless stations can move freely anywhere in the coverage area and use resources on the wired network.

Figure 3 Internet Access Application Example



1.3.4 Front Panel LEDs

Figure 4 P-334WT Front Panel



The following table describes the LEDs.

Table 1 Front Panel LEDs

LED	COLOR	STATUS	DESCRIPTION
PWR	Green	On	The Prestige is receiving power and functioning properly.
		Blinking	The Prestige is performing testing.
	Red	On	Power to the Prestige is too low.
	None	Off	The Prestige is not receiving power.
LAN 1-4	Green	On	The Prestige has a successful 10Mb Ethernet connection.
		Blinking	The Prestige is sending/receiving data.
	Amber	On	The Prestige has a successful 100Mb Ethernet connection.
		Blinking	The Prestige is sending/receiving data.
	None	Off	The LAN is not connected.
WAN	Green	On	The Prestige has a successful 10Mb WAN connection.
		Blinking	The Prestige is sending/receiving data.
	Amber	On	The Prestige has a successful 100Mb Ethernet connection.
		Blinking	The Prestige is sending/receiving data.
	None	Off	The WAN connection is not ready, or has failed.
WLAN	Green	On	The Prestige is ready, but is not sending/receiving data through the wireless LAN.
		Blinking	The Prestige is sending/receiving data through the wireless LAN.
	None	Off	The wireless LAN is not ready or has failed.
OTIST	Green	Blinking	OTIST is in progress
		On	OTIST is activated and the wireless security settings are given to a wireless client. The LED remains on unless the WLAN settings are changed.
	None	Off	OTIST is not activated or WLAN settings are manually configured after OTIST is successful.

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 web configurator is an HTML-based management interface that allows easy Prestige setup and management via Internet browser. Use Internet Explorer 6.0 and later or Netscape Navigator 7.0 and later versions. The recommended screen resolution is 1024 by 768 pixels.

In order to use the web configurator you need to allow:

- Web browser pop-up windows from your device. Web pop-up blocking is enabled by default in Windows XP SP (Service Pack) 2.
- JavaScripts (enabled by default).
- Java permissions (enabled by default).

Refer to the Troubleshooting chapter to see how to make sure these functions are allowed in Internet Explorer.

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 the Quick Start Guide).
2. Launch your web browser.
3. Type "192.168.1.1" as the URL.
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**.
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 5 Change Password Screen

Note: The management session automatically times out when the time period set in the **Administrator Inactivity Timer** field expires (default five minutes). Simply log back into the Prestige 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 use the **RESET** button at the back of the Prestige to reload the factory-default configuration file. This means that you will lose all configurations that you had previously and the password will be reset to "1234".

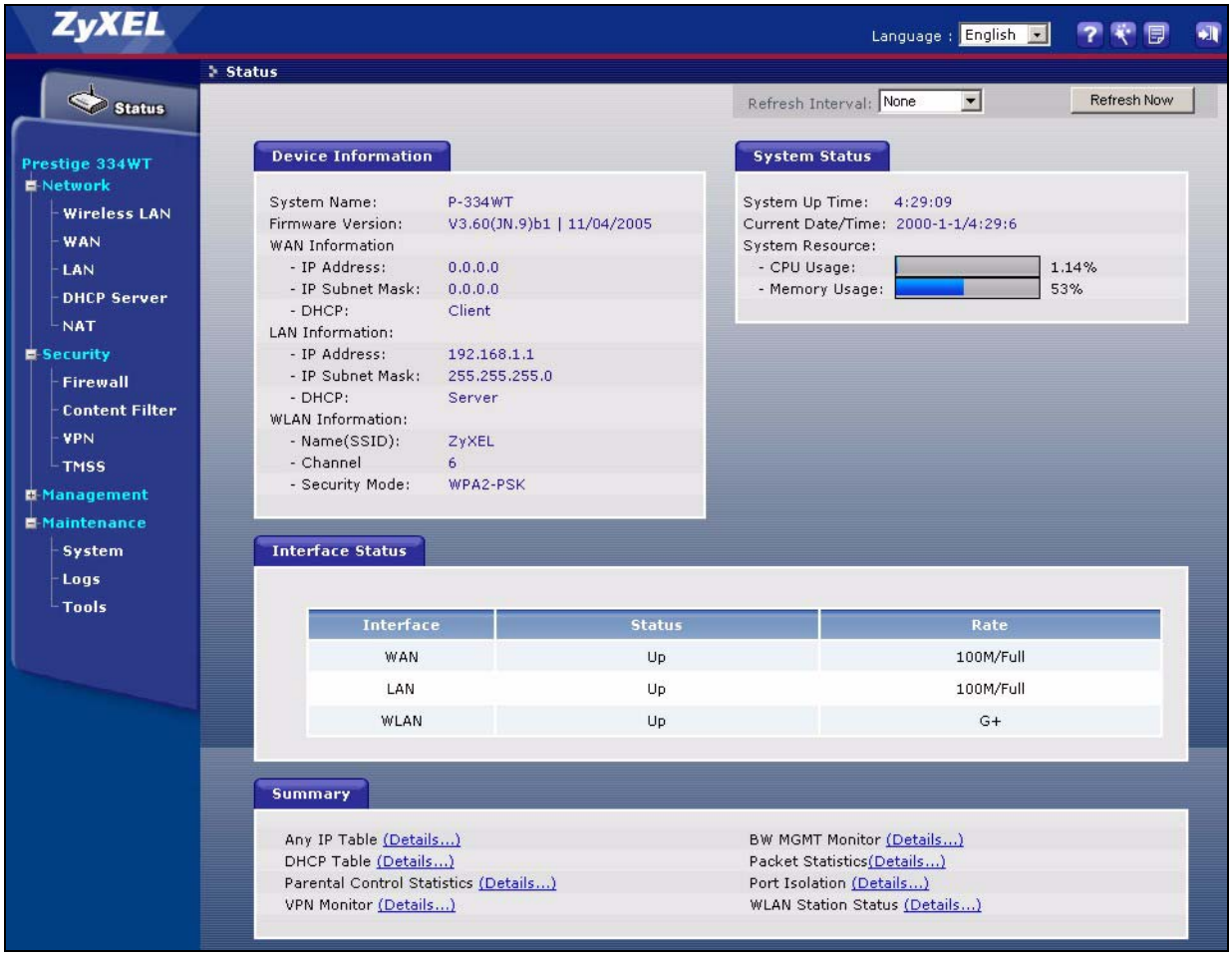
2.3.1 Procedure to Use the Reset Button

1. Make sure the **PWR** LED is on (not blinking).
2. Press the **RESET** button for ten seconds or until the **PWR** LED begins to blink and then release it. When the **PWR** LED begins to blink, the defaults have been restored and the Prestige restarts.

2.4 Navigating the Prestige Web Configurator

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

Figure 6 Web Configurator Status Screen



The following table describes the icons shown in the **Status** screen.

Table 2 Status Screen Icon Key

ICON	DESCRIPTION
	Select a language from the drop-down list box to have the web configurator display in that language.
	Click this icon to open a web help page relevant to the screen you are currently configuring.
	Click this icon to open the setup wizard. The Prestige has a connection wizard and a bandwidth management wizard.
	Click this icon to view copyright and a link for related product information.
	Click this icon at any time to exit the web configurator.

Table 2 Status Screen Icon Key

ICON	DESCRIPTION
	Select a number of seconds or **None** from the drop-down list box to refresh all screen statistics automatically at the end of every time interval or to not refresh the screen statistics.
	Click this button to refresh the status screen statistics.

The following table describes the labels shown in the **Status** screen.

Table 3 Web Configurator Status Screen

LABEL	DESCRIPTION
Device Information	
System Name	This is the **System Name** you enter in the **Maintenance**, **System**, **General** screen. It is for identification purposes.
Firmware Version	This is the ZyNOS Firmware version and the date created. ZyNOS is ZyXEL's proprietary Network Operating System design.
WAN Information	
- IP Address	This shows the WAN port's IP address.
- IP Subnet Mask	This shows the WAN port's subnet mask.
- DHCP	This shows the WAN port's DHCP role - **Client** or **None**.
LAN Information	
- IP Address	This shows the LAN port's IP address.
- IP Subnet Mask	This shows the LAN port's subnet mask.
- DHCP	This shows the LAN port's DHCP role - **Server**, **Relay** or **None**.
WLAN Information	
- Name(SSID)	This shows a descriptive name used to identify the Prestige in the wireless LAN.
- Channel	This shows the channel number which the Prestige uses over the wireless LAN.
- Security Mode	This shows the level of wireless security the Prestige is using.
System Status	
System Uptime	This is the total time the Prestige has been on.
Current Date/Time	This field displays your Prestige's present date and time along with the difference from the Greenwich Mean Time (GMT) zone. The difference from GMT is based on the time zone. It is also adjusted for Daylight Saving Time if you set the Prestige to use it.
System Resource	
- CPU Usage	This number shows how many kilobytes of the heap memory the Prestige is using. Heap memory refers to the memory that is not used by ZyNOS (ZyXEL Network Operating System) and is thus available for running processes like NAT, VPN and the firewall. The bar displays what percent of the Prestige's heap memory is in use. The bar turns from green to red when the maximum is being approached.
- Memory Usage	This number shows the Prestige's total heap memory (in kilobytes). The bar displays what percent of the Prestige's heap memory is in use. The bar turns from green to red when the maximum is being approached.

Table 3 Web Configurator Status Screen

LABEL	DESCRIPTION
Interface Status	
Interface	This displays the Prestige port types. The port types are: **WAN**, **LAN** and **WLAN**.
Status	For the LAN and WAN ports, this field displays **Down** (line is down) or **Up** (line is up or connected). For the WLAN, it displays **Up** when the WLAN is enabled or **Down** when the WLAN is disabled.
Rate	For the LAN ports, this displays the port speed and duplex setting or **N/A** when the line is disconnected. For the WAN port, it displays the port speed and duplex setting if you're using Ethernet encapsulation and **Idle** (line (ppp) idle), **Dial** (starting to trigger a call) and **Drop** (dropping a call) if you're using PPPoE or PPTP encapsulation. This field displays **N/A** when the line is disconnected. For the WLAN, it displays the transmission rate when the WLAN is enabled and **N/A** when the WLAN is disabled.
Summary	
Any IP Table	Use this screen to view a list of IP addresses and MAC addresses of computers, which are not in the same subnet as the Prestige.
DHCP Table	Use this screen to view current DHCP client information.
Parental Control Statistics	Use this screen to view a record of attempted entries to web pages or actual entries to web pages from a list of website categories.
VPN Monitor	Use this screen to display active VPN connections.
BW MGNT Monitor	Use this screen to view the Prestige's bandwidth usage and allotments.
Packet Statistics	Use this screen to view port status and packet specific statistics.
Port Isolation	Use this screen to view the port isolation settings and status.
WLAN Station Status	Use this screen to view the wireless stations that are currently associated to the Prestige.

2.4.1 Navigation Panel

After you enter the password, use the sub-menus on the navigation panel to configure Prestige features.

The following table describes the sub-menus.

Table 4 Screens Summary

LINK	TAB	FUNCTION
Status		This screen shows the Prestige's general device, system and interface status information. Use this screen to access the wizard, and summary statistics tables.
Network		

Table 4 Screens Summary

LINK	TAB	FUNCTION
Wireless LAN	General	Use this screen to configure wireless LAN.
	OTIST	This screen allows you to assign wireless clients the Prestige's wireless security settings.
	MAC Filter	Use the MAC filter screen to configure the Prestige to block access to devices or block the devices from accessing the Prestige.
	Advanced	This screen allows you to configure your Prestige roaming capabilities.
	QoS	WMM QoS allows you to prioritize wireless traffic according to the delivery requirements of the individual and applications.
WAN	Internet Connection	This screen allows you to configure ISP parameters, WAN IP address assignment and the WAN MAC address.
	Advanced	Use this screen to configure DNS servers and other advanced properties.
	Traffic Redirect	Use this screen to configure your traffic redirect properties and parameters.
LAN	IP	Use this screen to configure LAN settings.
	IP Alias	Use this screen to partition your LAN interface into subnets.
	Advanced	Use this screen to enable Any IP and other advanced properties.
DHCP Server	General	Use this screen to enable the Prestige's DHCP server and to have DNS servers assigned by the DHCP server.
	Static DHCP	Use this screen to assign IP addresses on the LAN to specific individual computers based on their MAC addresses.
	Client List	Use this screen to view current DHCP client information and to always assign an IP address to a MAC address (and host name).
NAT	General	Use this screen to enable NAT.
	Port Forwarding	Use this screen to configure servers behind the Prestige.
	Trigger Port	Use this screen to change your Prestige's port triggering settings.
Security		
Firewall	General	Use this screen to activate/deactivate the firewall.
	Services	This screen shows a summary of the firewall rules, and allows you to edit/ add a firewall rule.
Content Filter	Filter	Use this screen to block certain web features and sites containing certain keywords in the URL.
	Schedule	Use this screen to set the days and times for the Prestige to perform content filtering.
VPN	Summary	Use this screen to view the rule summary.
	Rule Setup	Use this screen to configure VPN connections.
	SA Monitor	Use this screen to display and manage active VPN connections.
	Global Setting	Use this screen to allow NetBIOS through an IPSec tunnel.

Table 4 Screens Summary

LINK	TAB	FUNCTION
TMSS	General	Use this screen to enable or disable TMSS.
	Exception List	Use this screen to decide which computers in the network you can apply TMSS.
	Virus Protection	Use this screen to check the computers in the network for Trend Micro Internet Security.
	Parental Control	Use this screen to allow a parent (LAN administrator) to control a LAN user's Internet access privileges by blocking specified website categories.
	Port Isolation	Use this screen to decide in what situation a port will be separated from other ports and/or allow the ports to bypass port isolation checking.
Management		
Static Route	Static Route Rules	Use this screen to configure IP static routes.
Bandwidth MGMT	Configuration	Use this screen to enable bandwidth management on an interface and edit a corresponding rule.
	Monitor	Use this screen to view the Prestige's bandwidth usage and allotments.
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	General	Use this screen to enable UPnP on the Prestige.
Maintenance		
System	General	This screen contains administrative.
	Dynamic DNS	Use this screen to set up dynamic DNS.
	Time Setting	Use this screen to change your Prestige's time and date.
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.
Tools	Firmware	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.

2.4.2 Summary: Any IP Table

Click the **Any IP Table (Details...)** hyperlink in the **Status** screen. The Any IP table shows current read-only information (including the IP address and the MAC address) of all network devices that use the Any IP feature to communicate with the Prestige.

Figure 7 Summary: Any IP Table

The following table describes the labels in this screen.

Table 5 Summary: Any IP Table

LABEL	DESCRIPTION
#	This field displays the index number.
IP Address	This field displays the IP address of the network device.
MAC Address	This field displays the MAC (Media Access Control) address of the computer with the displayed IP address. Every Ethernet device has a unique MAC address. The MAC address is assigned at the factory and consists of six pairs of hexadecimal characters, for example, 00:A0:C5:00:00:02.
Refresh	Click **Refresh** to update this screen.

2.4.3 Summary: DHCP Table

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

Click the **DHCP Table (Details...)** hyperlink in the **Status** screen. 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 Prestige's DHCP server.

Figure 8 Summary: DHCP Table

The following table describes the labels in this screen.

Table 6 Summary: 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 **Host Name** 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.
Refresh	Click **Refresh** to renew the screen.

2.4.4 Summary: Parental Controls Statistics

Click the **Parental Control Statistics (Details...)** hyperlink in the **Status** screen. This screen shows the current parental control mode and displays a record of attempted entries to web pages or actual entries to web pages from a list of categories.

2.4.4.1 General Control Mode and Per-User Control Mode

General control mode is the simplest way to configure Parental Control. In general control mode, the same restrictions apply to all network users.

Per-user control mode allows you to give different restrictions to each user of your network. In Per-user control mode, all users must log in before accessing the Internet.

Figure 9 Summary: Parental Control Statistics

The following table describes the labels in this screen.

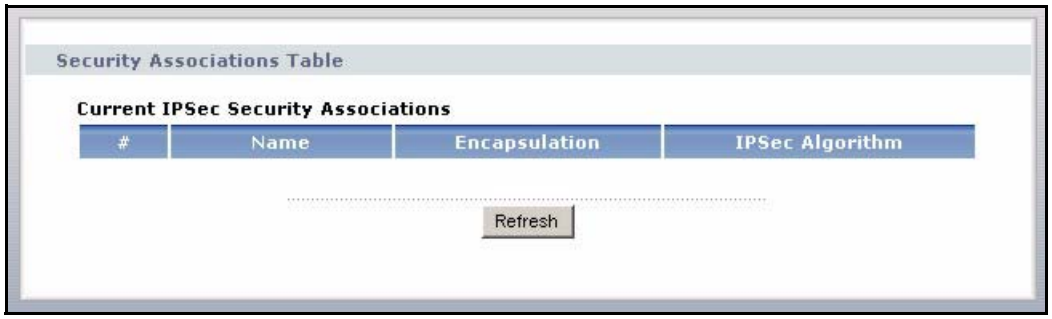
Table 7 Summary: Parental Control Statistics

LABEL	DESCRIPTION
Control Mode	This displays the current parental control mode (**General Control** or **Per-User Control**).
Username	This field displays only when you enable the per-user control mode. This is the name of the user (you configured in the **Parental Control** screen) allowed to access the Internet and view the unrestricted web content using the Prestige as a gateway.
Category	All parental control categories are displayed as shown.
Access Attempts	This field displays the number of attempts that have been made to access web page(s) from a category of web pages that you have selected in the **Parental Control** screen.
Actual Accesses	This field displays the number of times access has been made to web page(s) from a category of web pages that you have *not* selected in the **Parental Control** screen or that have been accesses by exempted computers.
Reset	Click **Reset** to clear all of the fields in this screen.
Refresh	Click **Refresh** to renew the statistics screen.

2.4.5 Summary: VPN Monitor

Click the **VPN Monitor (Details...)** hyperlink in the **Status** screen. Read-only information here includes encapsulation mode and security protocol.

Figure 10 Summary: VPN Monitor



The following table describes the labels in this screen.

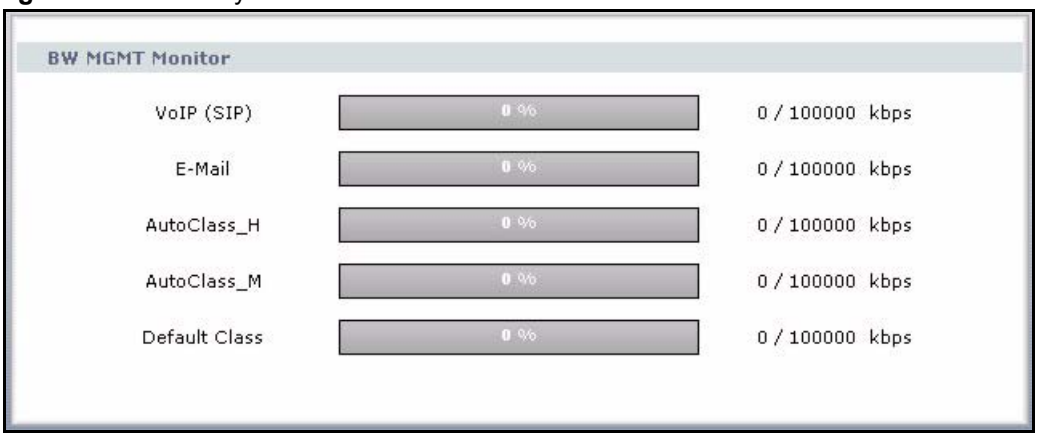
Table 8 Summary: VPN Monitor

TABLE	DESCRIPTION
#	This is the security association index number.
Name	This field displays the identification name for this VPN policy.
Encapsulation	This field displays **Tunnel** or **Transport** mode.
IPSec Algorithm	This field displays the security protocols used for an SA. Both AH and ESP increase Prestige processing requirements and communications latency (delay).
Refresh	Click **Refresh** to renew the screen.

2.4.6 Summary: Bandwidth Management Monitor

Select the **BW MGMT Monitor (Details...)** hyperlink in **Status** screen. View the bandwidth usage of the WAN configured bandwidth rules. This is also shown as bandwidth usage over the bandwidth budget for each rule. The gray section of the bar represents the percentage of unused bandwidth and the orange color represents the percentage of bandwidth in use.

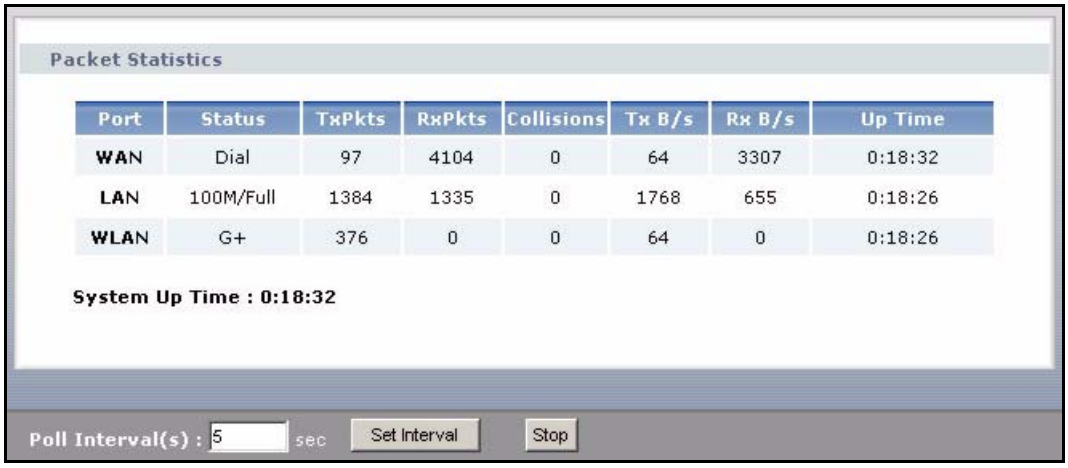
Figure 11 Summary: BW MGMT Monitor



2.4.7 Summary: Packet Statistics

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

Figure 12 Summary: Packet Statistics



The following table describes the labels in this screen.

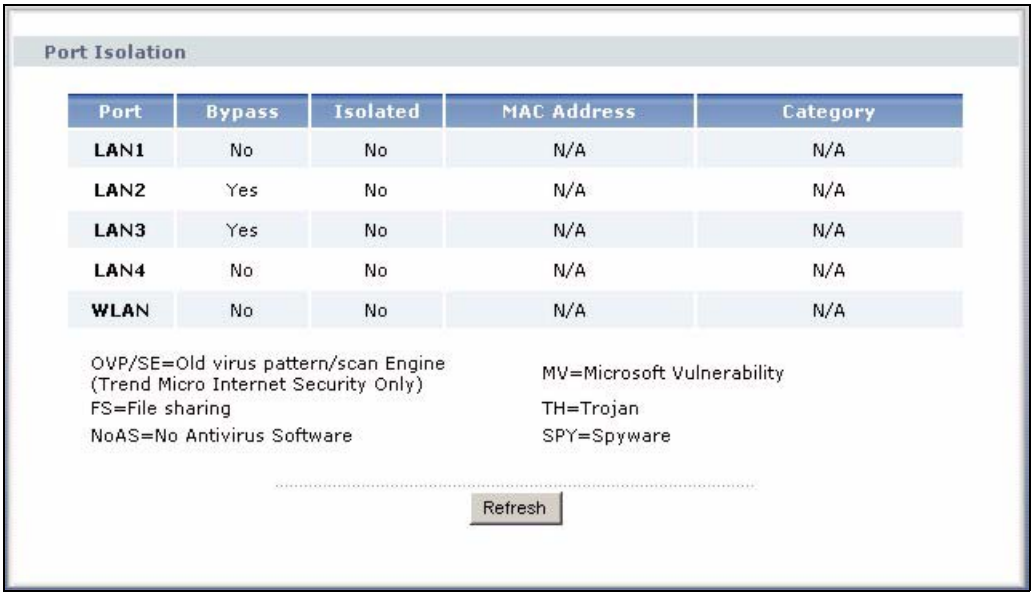
Table 9 Summary: Packet Statistics

LABEL	DESCRIPTION
Port	This is the WAN, LAN or WLAN port.
Status	For the LAN ports, this displays the port speed and duplex setting or **Down** when the line is disconnected. For the WAN port, it displays the port speed and duplex setting if you're using Ethernet encapsulation and **Idle** (line (ppp) idle), **Dial** (starting to trigger a call) and **Drop** (dropping a call) if you're using PPPoE or PPTP encapsulation. This field displays **Down** when the line is disconnected. For the WLAN, it displays the transmission rate when the WLAN is enabled and **Down** when the WLAN is disabled.
TxPkts	This is the number of transmitted packets on this port.
RxPkts	This is the number of received packets on this port.
Collisions	This is the number of collisions on this port.
Tx B/s	This displays the transmission speed in bytes per second on this port.
Rx B/s	This displays the reception speed in bytes per second on this port.
Up Time	This is the total amount of time the line has been up.
System Up Time	This is the total time the Prestige has been on.
Poll Interval(s)	Enter the time interval for refreshing statistics in this field.
Set Interval	Click this button to apply the new poll interval you entered in the **Poll Interval(s)** field.
Stop	Click **Stop** to stop refreshing statistics, click **Stop**.

2.4.8 Summary: Port Isolation

Click the **Port Isolation (Details...)** hyperlink in the **Status** screen to view the port isolation status and settings on each port.

Figure 13 Summary: Port Isolation



The following table describes the labels in this screen.

Table 10 Summary: Wireless Association List

LABEL	DESCRIPTION
Port	This is the LAN or WLAN port.
Bypass	This displays whether port isolation is performed on the port.
Isolated	This displays whether the port is separated and the network or computer(s) connected to the port cannot communicate with other network or computer(s) connected to other port(s).
MAC Address	This displays the MAC address(es) of the computer(s) which is infected by viruses or vulnerable according to the selected categories.
Category	This displays the reason why the port is isolated.
Refresh	Click **Refresh** to redisplay the current screen.

2.4.9 Summary: Wireless Station Status

Click the **WLAN Station Status (Details...)** hyperlink in the **Status** screen. View the wireless stations that are currently associated to the Prestige in the **Association List** screen.

2.4.9.1 WMM QoS

WMM (Wi-Fi MultiMedia) QoS (Quality of Service) ensures quality of service in wireless networks for multimedia applications.

WMM allows you to prioritize wireless traffic according to the delivery requirements of the individual and applications.

WMM is a part of the IEEE 802.11e QoS enhancement to certified Wi-Fi wireless networks.

Figure 14 Summary: Wireless Association List

The following table describes the labels in this screen.

Table 11 Summary: Wireless Association List

LABEL	DESCRIPTION
#	This is the index number of an associated wireless station.
MAC Address	This field displays the MAC address of an associated wireless station.
QoS	This field displays whether WMM (Wi-Fi MultiMedia) QoS (Quality of Service) priority is applied to traffic between the Prestige and the wireless station.
Association Time	This field displays the time a wireless station first associated with the Prestige.
Refresh	Click **Refresh** to redisplay the current screen.

CHAPTER 3
Connection Wizard

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

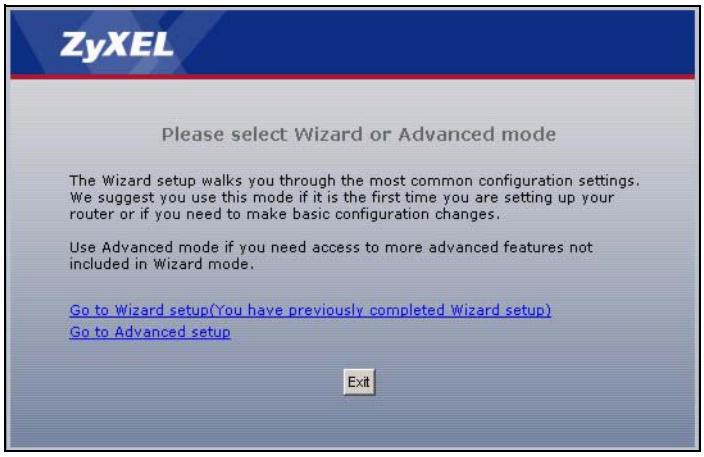
3.1 Wizard Setup

The web configurator's Wizard setup helps you configure your device to access the Internet. Refer to your ISP (Internet Service Provider) checklist in the Quick Start Guide to know what to enter in each field. Leave a field blank if you don't have that information.

1 After you access the Prestige Web configurator, click the **Go to Wizard setup** hyperlink.

You can click the **Go to Advanced setup** hyperlink to skip this wizard setup and configure advanced features.

Figure 15 Select Wizard or Advanced Mode



2 Choose your language from the drop-down list box.

3 Click the **Next** button to proceed to the next screen.

Figure 16 Select a Language

4 Read the on-screen information and click **Next**.

Figure 17 Welcome to the Connection Wizard

3.2 Connection Wizard: STEP 1: System Information

System Information contains administrative and system-related information.

3.2.1 System Name

System Name is for identification purposes. However, because some ISPs check this name you should enter your computer's "Computer Name".

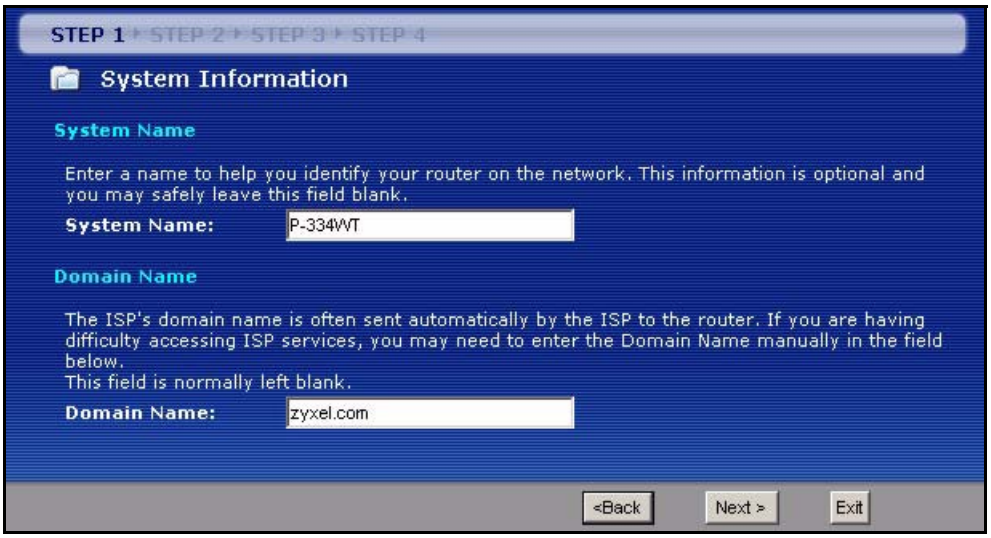
- In Windows 95/98 click **Start**, **Settings**, **Control Panel**, **Network**. Click the Identification tab, note the entry for the **Computer Name** field and enter it as the **System Name**.
- In Windows 2000, click **Start**, **Settings** and **Control Panel** and then double-click **System**.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

3.2.2 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.

Click **Next** to configure the Prestige for Internet access.

Figure 18 Wizard Step 1: System Information



The following table describes the labels in this screen.

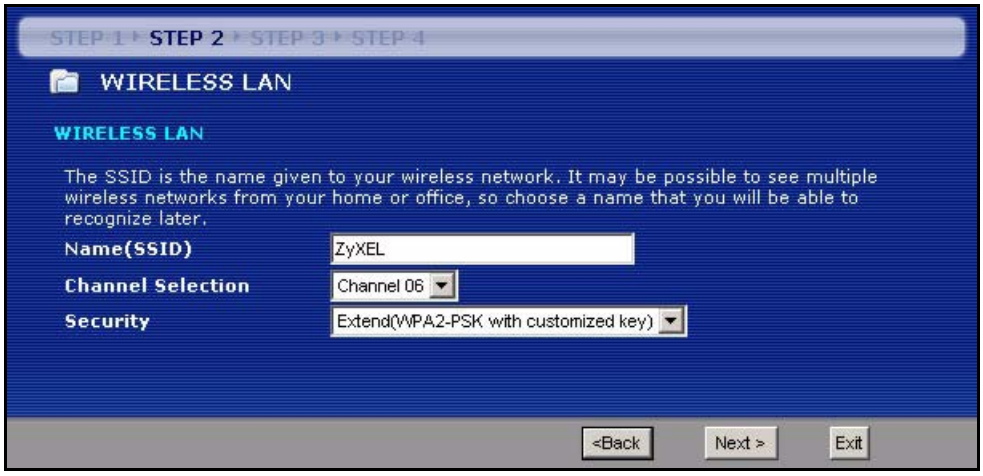
Table 12 Wizard Step 1: System Information

LABEL	DESCRIPTION
System Name	System Name is a unique name to identify the Prestige in an Ethernet network. Enter a descriptive name. This name can be up to 30 alphanumeric characters long. Spaces are not allowed, but dashes "-" and underscores "_" are accepted.
Domain Name	Type the domain name (if you know it) here. If you leave this field blank, the ISP may assign a domain name via DHCP. The domain name entered by you is given priority over the ISP assigned domain name.
Back	Click **Back** to display the previous screen.
Next	Click **Next** to proceed to the next screen.
Exit	Click **Exit** to close the wizard screen without saving.

3.3 Connection Wizard: STEP 2: Wireless LAN

Set up your wireless LAN using the following screen.

Figure 19 Wizard Step 2: Wireless LAN



The following table describes the labels in this screen.

Table 13 Wizard Step 2: Wireless LAN

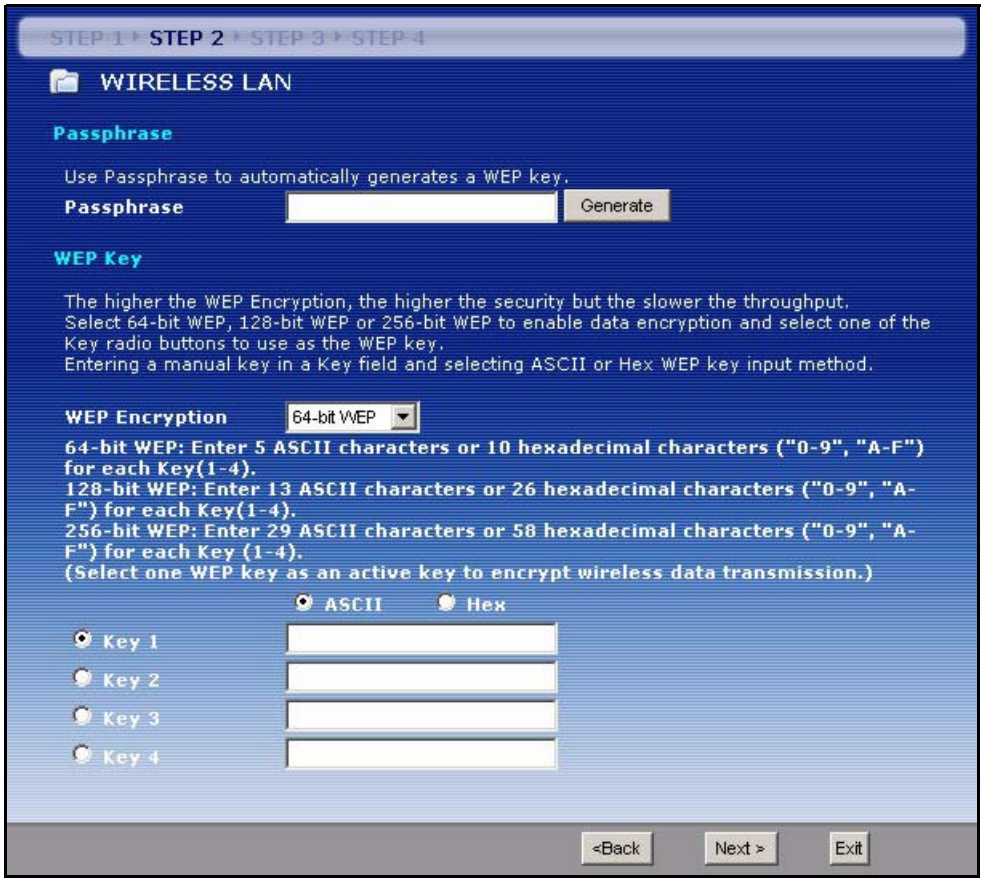
LABEL	DESCRIPTION
Name(SSID)	Enter a descriptive name (up to 32 printable 7-bit ASCII characters) for the wireless LAN. If you change this field on the Prestige, make sure all wireless stations use the same SSID in order to access the network.
Channel Selection	The range of radio frequencies used by IEEE 802.11b/g wireless devices is called a channel. Select a channel ID that is not already in use by a neighboring device.
Security	Select a **Security** level from the drop-down list box. Choose **Auto** to use OTIST to generate a pre-shared key and only if your wireless clients support OTIST. If you choose this option, skip directly to section 3.3.3. Choose **None** to have no wireless LAN security configured. If you do not enable any wireless security on your Prestige, your network is accessible to any wireless networking device that is within range. If you choose this option, skip directly to section 3.3.3. Choose **Basic** security if you want to configure WEP Encryption parameters. If you choose this option, go directly to section 3.3.1. Choose **Extend** (WPA-PSK or WPA2-PSK) security to configure a Pre-Shared Key. Choose this option only if your wireless clients support WPA-PSK or WPA2-PSK respectively. If you choose this option, skip directly to section 3.3.2.
Back	Click **Back** to display the previous screen.
Next	Click **Next** to proceed to the next screen.
Exit	Click **Exit** to close the wizard screen without saving.

Note: The wireless stations and Prestige must use the same SSID, channel ID and WEP encryption key (if WEP is enabled), WPA-PSK (if WPA-PSK is enabled) or WPA2-PSK (if WPA2-PSK is enabled) for wireless communication.

3.3.1 Basic(WEP) Security

Choose **Basic(WEP)** to setup WEP Encryption parameters.

Figure 20 Wizard Step 2: Basic(WEP) Security



The following table describes the labels in this screen.

Table 14 Wizard Step 2: Basic(WEP) Security

LABEL	DESCRIPTION
Passphrase	Type a Passphrase (up to 32 printable characters) and click **Generate**. The Prestige automatically generates a WEP key.
WEP Encryption	Select **64-bit WEP**, **128-bit WEP** or **256-bit WEP** to allow data encryption.
ASCII	Select this option in order to enter ASCII characters as the WEP keys.
HEX	Select this option to enter hexadecimal characters as the WEP keys. The preceding "0x" is entered automatically.
Key 1 to Key 4	The WEP keys are used to encrypt data. Both the Prestige and the wireless stations must use the same WEP key for data transmission. If you chose **64-bit WEP**, then enter any 5 ASCII characters or 10 hexadecimal characters ("0-9", "A-F"). If you chose **128-bit WEP**, then enter 13 ASCII characters or 26 hexadecimal characters ("0-9", "A-F"). If you chose **256-bit WEP**, then enter 29 ASCII characters or 58 hexadecimal characters ("0-9", "A-F"). You must configure at least one key, only one key can be activated at any one time. The default key is key 1.

Table 14 Wizard Step 2: Basic(WEP) Security

LABEL	DESCRIPTION
Back	Click **Back** to display the previous screen.
Next	Click **Next** to proceed to the next screen.
Exit	Click **Exit** to close the wizard screen without saving.

3.3.2 Extend(WPA-PSK or WPA2-PSK) Security

Choose **Extend(WPA-PSK)** or **Extend(WPA2-PSK)** security in the Wireless LAN setup screen to set up a **Pre-Shared Key**.

Figure 21 Wizard Step 2: Extend(WPA-PSK or WPA2-PSK) Security

The following table describes the labels in this screen.

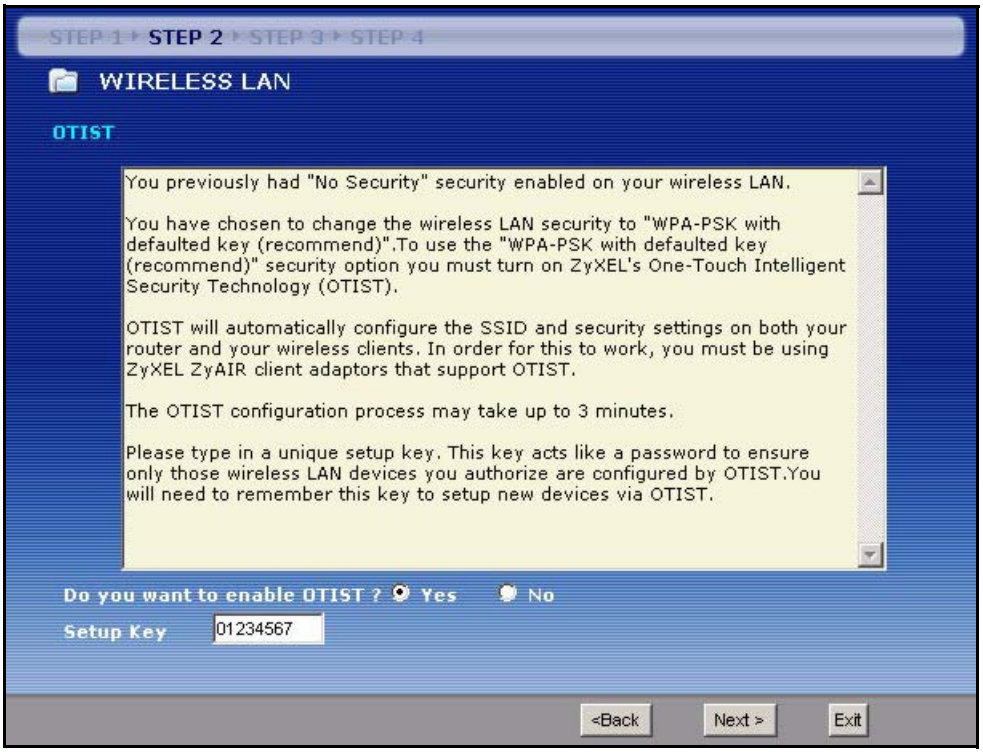
Table 15 Wizard Step 2: Extend(WPA-PSK or WPA2-PSK) Security

LABEL	DESCRIPTION
Pre-Shared Key	Type from 8 to 63 case-sensitive ASCII characters. You can set up the most secure wireless connection by configuring WPA in the wireless LAN screens. You need to configure an authentication server to do this.
Back	Click **Back** to display the previous screen.
Next	Click **Next** to proceed to the next screen.
Exit	Click **Exit** to close the wizard screen without saving.

3.3.3 OTIST

The following screen allows you to enable Prestige One-Touch Intelligent Security Technology (OTIST). One-Touch Intelligent Security Technology (OTIST) allows your Prestige to assign wireless clients the Prestige's SSID and static WEP or WPA-PSK encryption settings. The wireless client must also support OTIST and have OTIST enabled. See Section 4.5 on page 99 for more information.

Figure 22 Wizard Step 2: OTIST



The following table describes the labels in this screen.

Table 16 Wizard Step 2: OTIST

LABEL	DESCRIPTION
Do you want to enable OTIST?	Select the **Yes** radio button and click **Next** to proceed with the setup wizard and enable OTIST only when you click **Finish** in the final wizard screen. Click **No** and then **Next** to proceed to the following screen.
Setup Key	The default OTIST **Setup Key** is "01234567". This key can be changed in the web configurator. Be sure to use the same OTIST **Setup Key** on the Prestige and wireless clients.
Back	Click **Back** to display the previous screen.
Next	Click **Next** to proceed to the next screen.
Exit	Click **Exit** to close the wizard screen without saving.

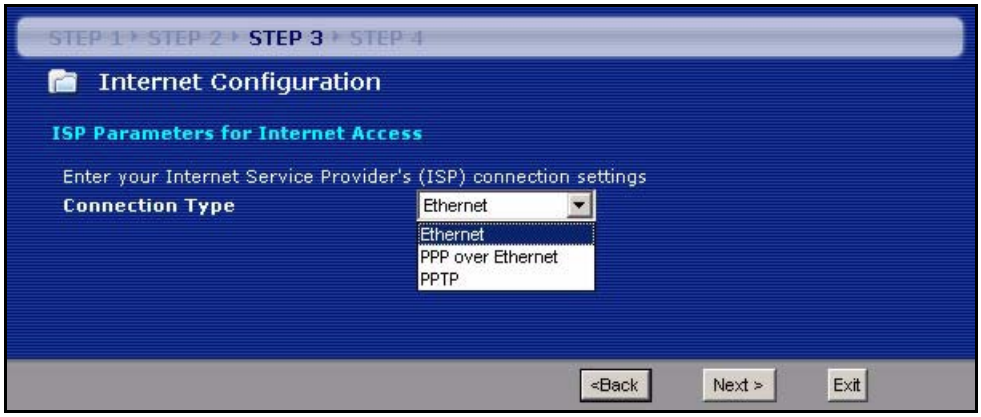
Refer to the chapter on wireless LAN for more information.

3.4 Connection Wizard: STEP 3: Internet Configuration

The Prestige offers three Internet connection types. They are **Ethernet**, **PPP over Ethernet** or **PPTP**. The wizard attempts to detect which WAN connection type you are using. If the wizard does not detect a connection type, you must select one from the drop-down list box. Check with your ISP to make sure you use the correct type.

This wizard screen varies according to the connection type that you select.

Figure 23 Wizard Step 3: ISP Parameters.



The following table describes the labels in this screen,

Table 17 Wizard Step 3: ISP Parameters

CONNECTION TYPE	DESCRIPTION
Ethernet	Select the **Ethernet** option when the WAN port is used as a regular Ethernet.
PPPoE	Select the **PPP over Ethernet** option for a dial-up connection. If your ISP gave you a an IP address and/or subnet mask, then select **PPTP**.
PPTP	Select the **PPTP** option for a dial-up connection.

3.4.1 Ethernet Connection

Choose **Ethernet** when the WAN port is used as a regular Ethernet.

Figure 24 Wizard Step 3: Ethernet Connection

3.4.2 PPPoE Connection

Point-to-Point Protocol over Ethernet (PPPoE) functions as a dial-up connection. PPPoE is an IETF (Internet Engineering Task Force) standard specifying how a host personal computer interacts with a broadband modem (for example DSL, cable, wireless, etc.) to achieve access to high-speed data networks.

For the service provider, PPPoE offers an access and authentication method that works with existing access control systems (for instance, RADIUS).

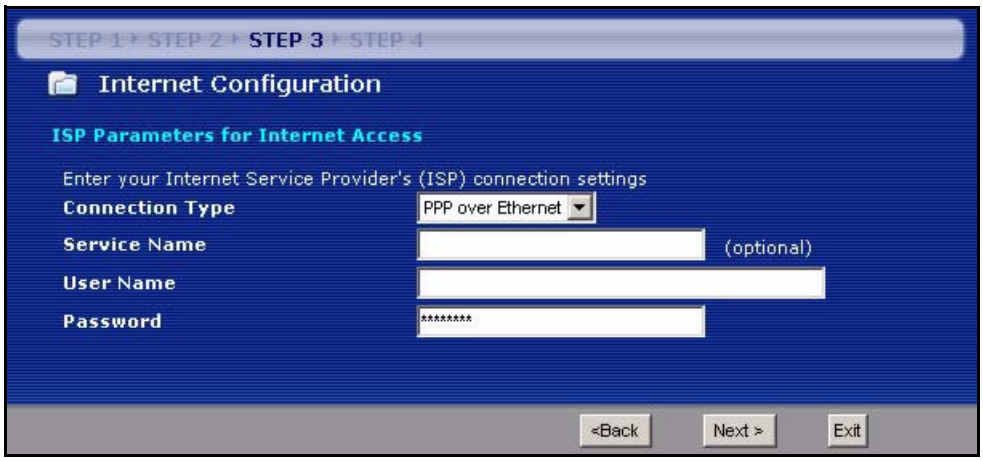
One of the benefits of PPPoE is the ability to let end users access one of multiple network services, a function known as dynamic service selection. This enables the service provider to easily create and offer new IP services for specific users.

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

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

Refer to the appendix for more information on PPPoE.

Figure 25 Wizard Step 3: PPPoE Connection



The following table describes the labels in this screen.

Table 18 Wizard Step 3: PPPoE Connection

LABEL	DESCRIPTION
ISP Parameter for Internet Access	
Connection Type	Select the **PPP over Ethernet** option for a dial-up connection.
Service Name	Type the name of your service provider.
User Name	Type the user name given to you by your ISP.
Password	Type the password associated with the user name above.

Table 18 Wizard Step 3: PPPoE Connection

LABEL	DESCRIPTION
Back	Click **Back** to return to the previous screen.
Next	Click **Next** to continue.
Exit	Click **Exit** to close the wizard screen without saving.

3.4.3 PPTP Connection

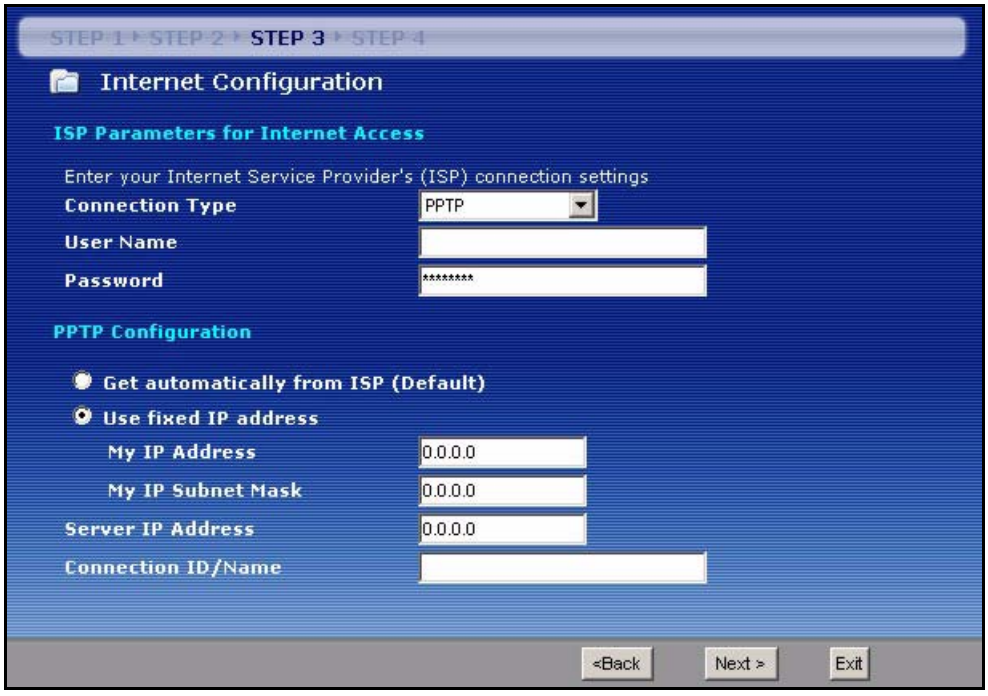
Point-to-Point Tunneling Protocol (PPTP) is a network protocol that enables transfers of data from a remote client to a private server, creating a Virtual Private Network (VPN) using TCP/IP-based networks.

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

Refer to the appendix for more information on PPTP.

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

Figure 26 Wizard Step 3: PPTP Connection



The following table describes the fields in this screen

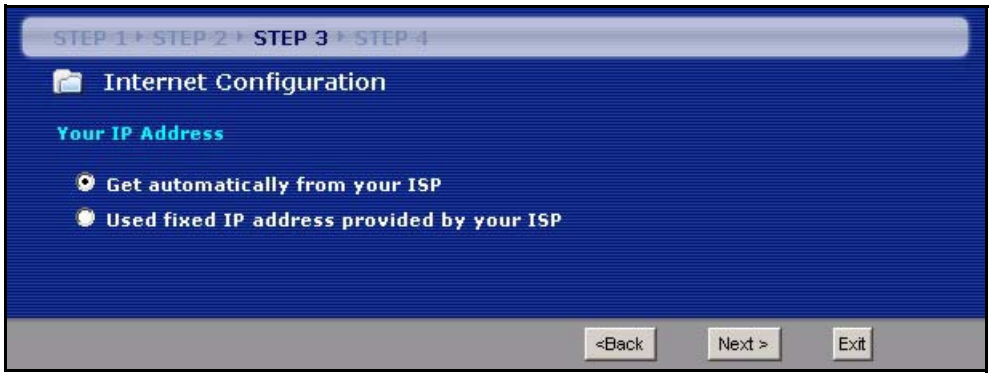
Table 19 Wizard Step 3: PPTP Connection

LABEL	DESCRIPTION
ISP Parameters for Internet Access	
Connection Type	Select **PPTP** from the drop-down list box. To configure a PPTP client, you must configure the **User Name** and **Password** 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.
PPTP Configuration	
Get automatically from ISP	Select this radio button if your ISP did not assign you a fixed IP address.
Use fixed IP address	Select this radio button, provided by your ISP to give the Prestige a fixed, unique IP address.
My IP Address	Type the (static) IP address assigned to you by your ISP.
My IP Subnet Mask	Type the subnet mask assigned to you by your ISP (if given).
Server IP Address	Type the IP address of the PPTP server.
Connection ID/ Name	Enter the connection ID or connection name in this field. It must follow the "c:id" and "n:name" format. For example, C:12 or N:My ISP. This field is optional and depends on the requirements of your ISP.
Back	Click **Back** to return to the previous screen.
Next	Click **Next** to continue.
Exit	Click **Exit** to close the wizard screen without saving.

3.4.4 Your IP Address

The following wizard screen allows you to assign a fixed IP address or give the Prestige an automatically assigned IP address depending on your ISP.

Figure 27 Wizard Step 3: Your IP Address



The following table describes the labels in this screen

Table 20 Wizard Step 3: Your IP Address

LABEL	DESCRIPTION
Get automatically from your ISP	Select this option If your ISP did not assign you a fixed IP address. This is the default selection. If you choose this option, skip directly to section 3.4.9.
Use fixed IP address provided by your ISP	Select this option if you were given IP address and/or DNS server settings by the ISP. The fixed IP address should be in the same subnet as your broadband modem or router.
Back	Click **Back** to return to the previous screen.
Next	Click **Next** to continue.
Exit	Click **Exit** to close the wizard screen without saving.

3.4.5 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 21 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.

3.4.6 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.

3.4.7 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.

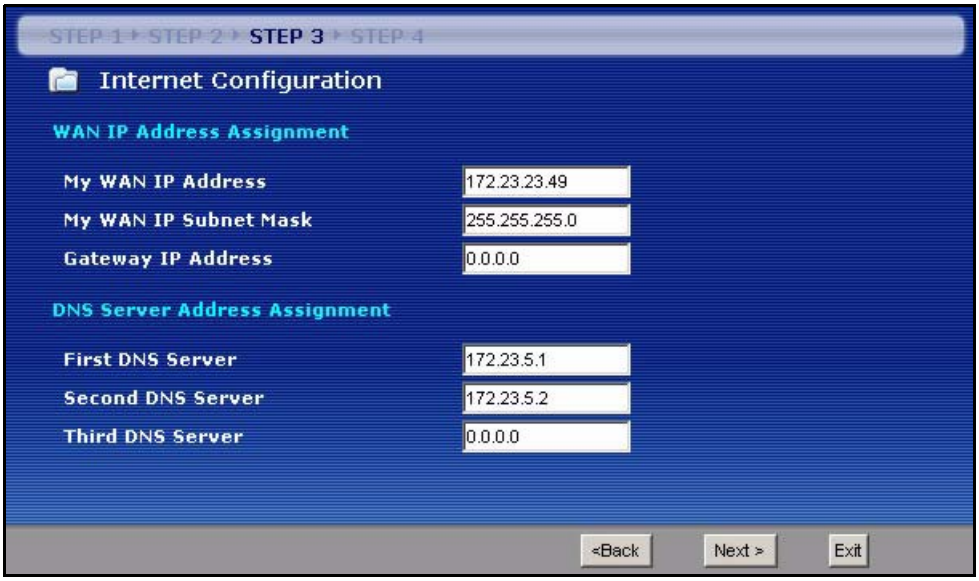
The Prestige can get the DNS server addresses in the following ways.

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 **Wizard** and/or **DHCP Server** screen.
2. If the ISP did not give you DNS server information, leave the **DNS Server** fields set to **0.0.0.0** in the **Wizard** screen and/or set to **From ISP** in the **DHCP Server** screen for the ISP to dynamically assign the DNS server IP addresses.

3.4.8 WAN IP and DNS Server Address Assignment

The following wizard screen allows you to assign a fixed WAN IP address and DNS server addresses.

Figure 28 Wizard Step 3: WAN IP and DNS Server Addresses



The following table describes the labels in this screen

Table 22 Wizard Step 3: WAN IP and DNS Server Addresses

LABEL	DESCRIPTION
WAN IP Address Assignment	
My WAN IP Address	Enter your WAN IP address in this field. The WAN IP address should be in the same subnet as your DSL/Cable modem or router.
My WAN IP Subnet Mask	Enter the IP subnet mask in this field.
Gateway IP Address	Enter the gateway IP address in this field.
System DNS Server Address Assignment (if applicable) 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 computer before you can access it. The Prestige uses a system DNS server (in the order you specify here) to resolve domain names for VPN, DDNS and the time server.	
First DNS Server Second DNS Server Third DNS Server	Enter the DNS server's IP address in the fields provided. If you do not configure a system DNS server, you must use IP addresses when configuring VPN, DDNS and the time server.
Back	Click **Back** to return to the previous screen.
Next	Click **Next** to continue.
Exit	Click **Exit** to close the wizard screen without saving.

3.4.9 WAN MAC Address

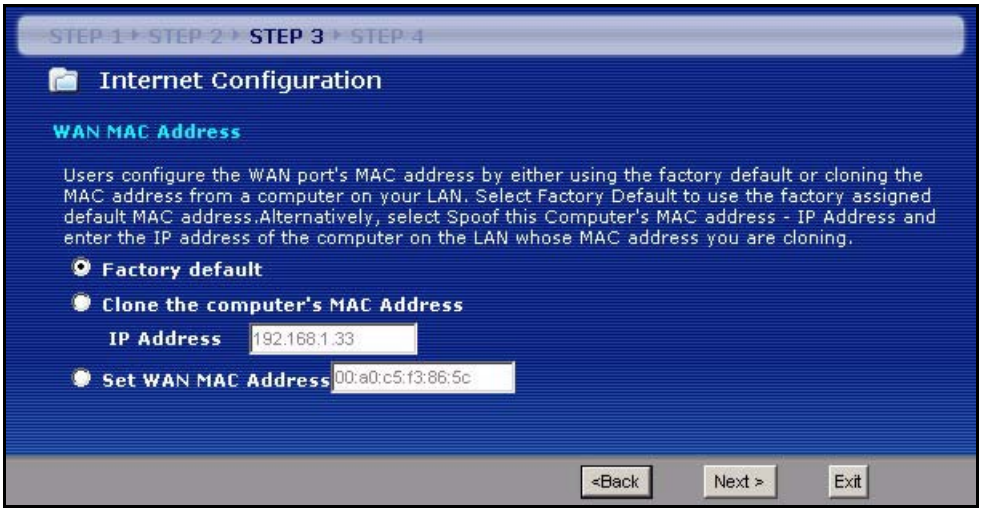
Every Ethernet device has a unique MAC (Media Access Control) address. The MAC address is assigned at the factory and consists of six pairs of hexadecimal characters, for example, 00:A0:C5:00:00:02.

Table 23 Example of Network Properties for LAN Servers with Fixed IP Addresses

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

This screen allows users to configure the WAN port's MAC address by either using the Prestige's MAC address, copying the MAC address from a computer on your LAN or manually entering a MAC address. 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 advisable to clone the MAC address from a computer on your LAN even if your ISP does not presently require MAC address authentication.

Figure 29 Wizard Step 3: WAN MAC Address



The following table describes the fields in this screen.

Table 24 Wizard Step 3: WAN MAC Address

LABEL	DESCRIPTION
Factory Default	Select **Factory Default** to use the factory assigned default MAC address.
Clone the computer's MAC address	Select this option and enter the IP address of the computer on the LAN whose MAC you are cloning. It is advisable to clone the MAC address from a computer on your LAN even if your ISP does not presently require MAC address authentication.
Set WAN MAC Address	Select this option and enter the MAC address you want to use.

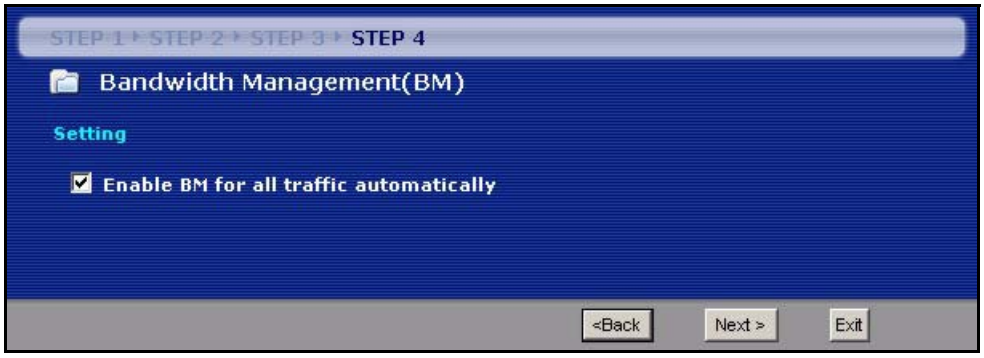
Table 24 Wizard Step 3: WAN MAC Address

LABEL	DESCRIPTION
Back	Click **Back** to return to the previous screen.
Next	Click **Next** to continue.
Exit	Click **Exit** to close the wizard screen without saving.

3.5 Connection Wizard: STEP 4: Bandwidth management

Bandwidth management allows you to control the amount of bandwidth going out through the Prestige's WAN, LAN or WLAN port and prioritize the distribution of the bandwidth according to the traffic type. This helps keep one service from using all of the available bandwidth and shutting out other users.

Figure 30 Wizard Step 4: Bandwidth Management



The following fields describe the label in this screen.

Table 25 Wizard Step 4: Bandwidth Management

LABEL	DESCRIPTION
Enable BM for all traffic automatically	Select the check box to have the Prestige apply bandwidth management to traffic going out through the Prestige's WAN, LAN or WLAN port. Bandwidth is allocated according to the traffic type automatically. Real-time packets, such as VoIP traffic always get higher priority.
Back	Click **Back** to return to the previous screen.
Next	Click **Next** to continue.
Exit	Click **Exit** to close the wizard screen without saving.

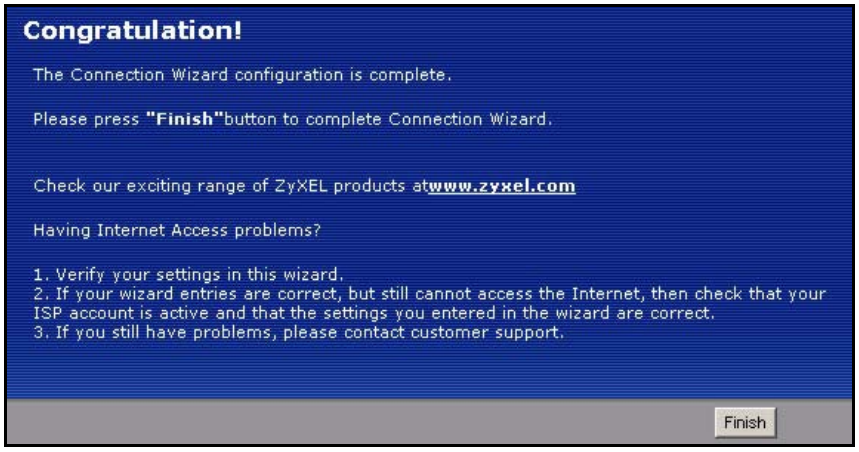
3.6 Connection Wizard Complete

Click **Apply** to save your configuration.

Figure 31 Connection Wizard Save

Follow the on-screen instructions and click **Finish** to complete the wizard setup.

Figure 32 Connection Wizard Complete



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

CHAPTER 4
Wireless LAN

This chapter discusses how to configure Wireless LAN.

4.1 Introduction

A wireless LAN can be as simple as two computers with wireless LAN adapters communicating in a peer-to-peer network or as complex as a number of computers with wireless LAN adapters communicating through access points which bridge network traffic to the wired LAN.

Note: See the WLAN appendix for more detailed information on WLANs.

4.2 Wireless Security Overview

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

Wireless security methods available on the Prestige are data encryption, wireless client authentication, restricting access by device MAC address and hiding the Prestige identity.

4.2.1 Encryption

- Use WPA(2) security if you have WPA(2)-aware wireless clients and a RADIUS server. WPA has user authentication and improved data encryption over WEP.
- Use WPA(2)-PSK if you have WPA(2)-aware wireless clients but no RADIUS server.
- If you don't have WPA(2)-aware wireless clients, then use WEP key encrypting. A higher bit key offers better security at a throughput trade-off. You can use passphrase to automatically generate 64-bit or 128-bit WEP keys or manually enter 64-bit, 128-bit or 256-bit WEP keys.

4.2.2 Authentication

WPA has user authentication and you can also configure IEEE 802.1x to use a RADIUS server to authenticate wireless clients before joining your network.

- Use RADIUS authentication if you have a RADIUS server. See the appendices for information on protocols used when a client authenticates with a RADIUS server via the Prestige.

4.2.3 Restricted Access

The **MAC Filter** screen allows you to configure the AP to give exclusive access to devices (**Allow**) or exclude them from accessing the AP (**Deny**).

4.2.4 Hide Prestige Identity

If you hide the ESSID, then the Prestige cannot be seen when a wireless client scans for local APs. The trade-off for the extra security of "hiding" the Prestige may be inconvenient for some valid WLAN clients.

4.2.5 G-plus

G-plus is an enhancement to the IEEE 802.11g wireless standard. G-plus combines multiple frames into a larger frame size. This increases wireless transmission speeds by allowing larger frames (up to 4 KB) to be sent.

Note: G-plus speed applies only to unicast traffic (not broadcast or multicast). G-plus is automatically disabled if wireless transmission speeds fall below 11 Mbps.

4.2.6 Using OTIST

To automatically configure the wireless security settings and set the wireless client to use the same SSID and WEP or WPA-PSK settings, use the OTIST setup wizard or the advanced wireless OTIST screen.

To manually configure the security setting, enter the WEP or WPA-PSK keys and SSID in the wireless screen. After that, you can enter the same settings in the wireless client or run OTIST to have the wireless client acquire the SSID and key automatically.

If you change the SSID or the keys after OTIST, you need to run OTIST again or enter them manually in the wireless client.

Note: You must activate and start OTIST on both the Prestige and the wireless client at the same time.

See the wireless client Quick Start Guide for information on wireless client OTIST setup. For more information on OTIST see Section 4.5.1 on page 100.

4.3 Configuring Wireless LAN on the Prestige

1. Configure the **SSID** and **WEP** in the **Wireless** screen. If you configure **WEP**, you can't configure **WPA** or **WPA-PSK**.
2. Use the **MAC Filter** screen to restrict access to your wireless network by MAC address.
3. Configure the RADIUS authentication database settings in the **Wireless** screen.

4 If you have OTIST-enabled clients, configure **OTIST** in the **OTIST** screen. **OTIST** transfers device SSID and WEP or WPA-PSK key settings (if enabled) to wireless clients.

The following figure shows the relative effectiveness of these wireless security methods available on your Prestige.

Table 26 Wireless Security Levels

Security Level	Security Type
Least Secure	Unique SSID (Default)
	Unique SSID with Hide SSID Enabled
	MAC Address Filtering
	WEP Encryption
	IEEE802.1x EAP with RADIUS Server Authentication
	Wi-Fi Protected Access (WPA)
Most Secure	WPA2

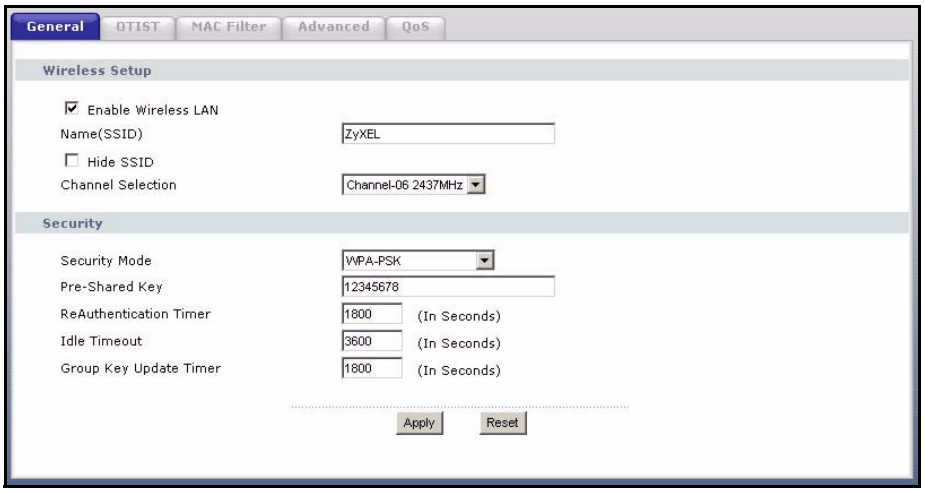
Note: You must enable the same wireless security settings on the Prestige and on all wireless clients that you want to associate with it.

4.4 General Wireless LAN Screen

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

Click the **Wireless LAN** link under **Network** to open the **Wireless** screen.

Figure 33 Wireless



The following table describes the general wireless LAN labels in this screen.

Table 27 Wireless

LABEL	DESCRIPTION
Enable Wireless LAN	Click the check box to activate wireless LAN.
Name(SSID)	(Service Set IDentity) The SSID identifies the Service Set with which a wireless station is associated. Wireless stations associating to the access point (AP) must have the same SSID. Enter a descriptive name (up to 32 printable 7-bit ASCII characters) for the wireless LAN.
Hide SSID	Select this check box to hide the SSID in the outgoing beacon frame so a station cannot obtain the SSID through scanning using a site survey tool.
Channel Selection	Set the operating frequency/channel depending on your particular region. Select a channel from the drop-down list box. Refer to the Connection Wizard chapter for more information on channels.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to reload the previous configuration for this screen.

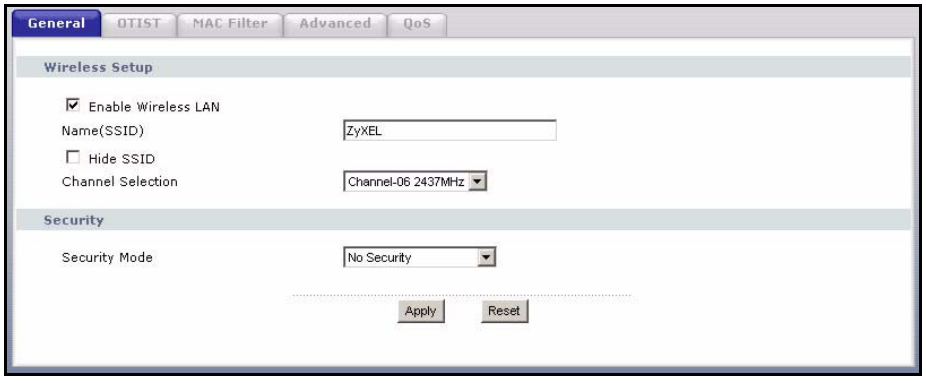
See the rest of this chapter for information on the other labels in this screen.

4.4.1 No Security

Select **No Security** to allow wireless stations to communicate with the access points without any data encryption.

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

Figure 34 Wireless: No Security



The following table describes the labels in this screen.

Table 28 Wireless No Security

LABEL	DESCRIPTION
Security Mode	Choose **No Security** from the drop-down list box.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to reload the previous configuration for this screen.

4.4.2 WEP Encryption

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

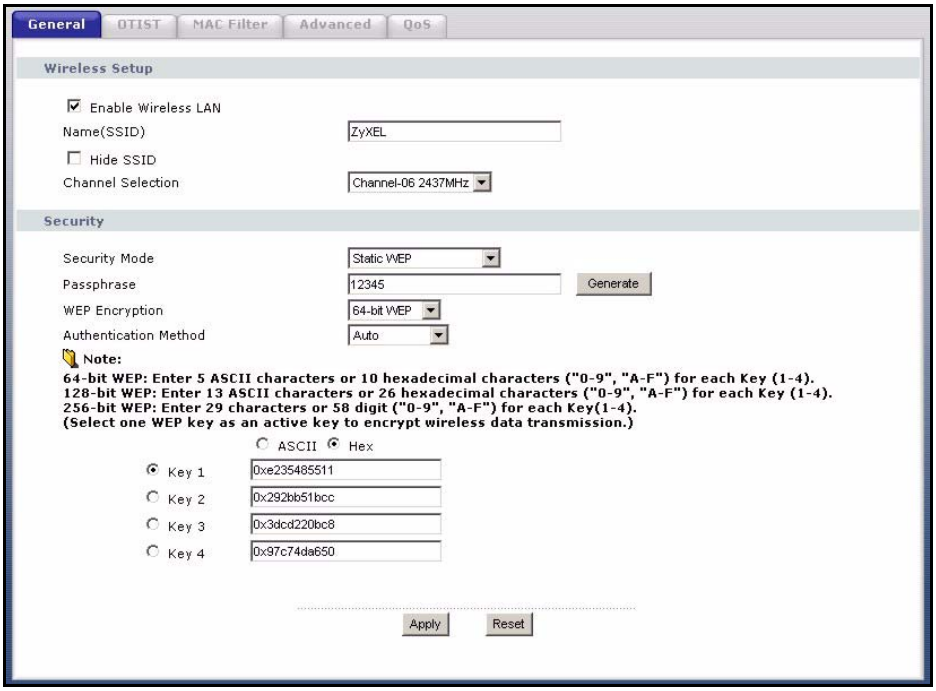
Your Prestige allows you to configure up to four 64-bit, 128-bit or 256-bit WEP keys but only one key can be enabled at any one time.

In order to configure and enable WEP encryption; click **Wireless LAN** and **Wireless** to the display the **Wireless General** screen.

4.4.3 Static WEP Encryption

In order to configure and enable WEP encryption; click the **Wireless LAN** link under **Network** to display the **Wireless General** screen. Select **Static WEP** from the **Security Mode** list.

Figure 35 Wireless: Static WEP Encryption



The following table describes the wireless LAN security labels in this screen.

Table 29 Wireless: Static WEP Encryption

LABEL	DESCRIPTION
Passphrase	Enter a Passphrase (up to 32 printable characters) and clicking **Generate**. The Prestige automatically generates a WEP key.
WEP Encryption	Select **64-bit WEP**, **128-bit WEP** or **256-bit WEP** to enable data encryption.
Authentication Method	This field is activated when you select **64-bit WEP**, **128-bit WEP** or **256-bit WEP** in the **WEP Encryption** field. Select **Auto**, **Open System** or **Shared Key** from the drop-down list box.
ASCII	Select this option in order to enter ASCII characters as WEP key.
Hex	Select this option in order to enter hexadecimal characters as a WEP key. The preceding "0x", that identifies a hexadecimal key, is entered automatically.
Key 1 to Key 4	The WEP keys are used to encrypt data. Both the Prestige and the wireless stations must use the same WEP key for data transmission. If you chose **64-bit WEP**, then enter any 5 ASCII characters or 10 hexadecimal characters ("0-9", "A-F"). If you chose **128-bit WEP**, then enter 13 ASCII characters or 26 hexadecimal characters ("0-9", "A-F"). If you chose **256-bit WEP**, then enter 29 ASCII characters or 58 hexadecimal characters ("0-9", "A-F"). You must configure at least one key, only one key can be activated at any one time. The default key is key 1.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to reload the previous configuration for this screen.

4.4.4 Introduction to WPA and WPA2

Wi-Fi Protected Access (WPA) is a subset of the IEEE 802.11i standard. WPA is preferred to WEP as WPA has user authentication and improved data encryption. WPA improves data encryption by using Temporal Key Integrity Protocol (TKIP), Message Integrity Check (MIC) and IEEE 802.1x. WPA2 uses Advanced Encryption Standard (AES) to offer stronger encryption than WPA. See the appendix for more information on WPA user authentication and WPA encryption.

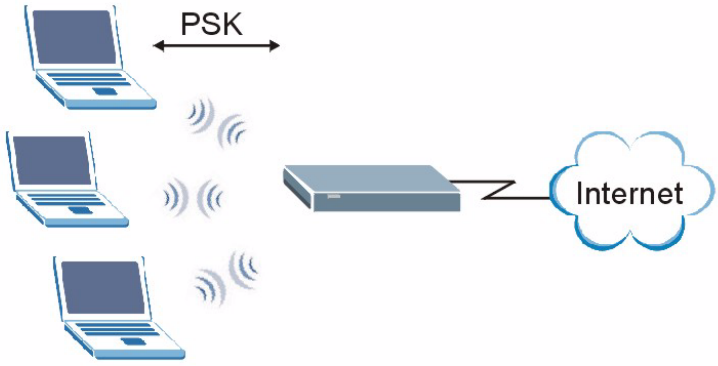
If both an AP and the wireless clients support WPA2 and you have an external RADIUS server, use WPA2 for stronger data encryption. If you don't have an external RADIUS server, you should use WPA2-PSK (WPA2-Pre-Shared Key) that only requires a single (identical) password entered into each access point, wireless gateway and wireless client. As long as the passwords match, a wireless client will be granted access to a WLAN.

4.4.5 WPA(2)-PSK Application Example

A WPA(2)-PSK application looks as follows.

1. First enter identical passwords into the AP and all wireless clients. The Pre-Shared Key (PSK) must consist of between 8 and 63 ASCII characters (including spaces and symbols).
2. The AP checks each wireless client's password and (only) allows it to join the network if the password matches.
3. The AP derives and distributes keys to the wireless clients.
4. The AP and wireless clients use the TKIP or AES encryption process to encrypt data exchanged between them.

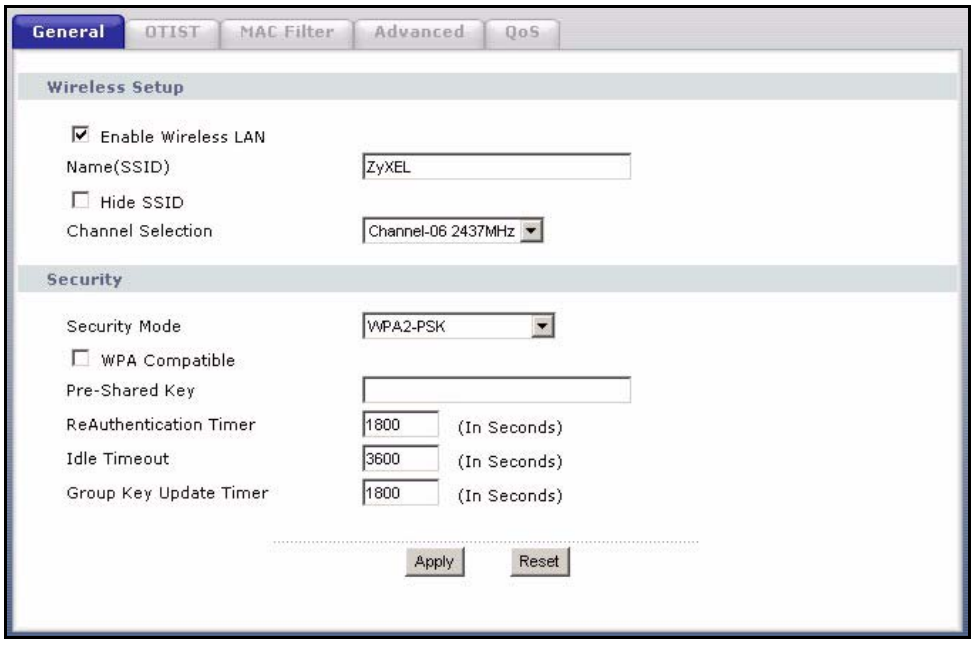
Figure 36 WPA(2)-PSK Authentication



4.4.6 WPA-PSK/WPA2-PSK Authentication Screen

Click the **Wireless LAN** link under **Network** to display the **Wireless General** screen.

Figure 37 Wireless: WPA-PSK/WPA2-PSK



The following table describes the labels in this screen.

Table 30 Wireless: WPA-PSK/WPA2-PSK

LABEL	DESCRIPTION
WPA Compatible	This check box is available only when you select **WPA2-PSK** or **WPA2** in the **Security Mode** field. Select the check box to have both WPA2 and WPA wireless clients be able to communicate with the Prestige even when the Prestige is using WPA2-PSK or WPA2.
Pre-Shared Key	The encryption mechanisms used for **WPA/WPA2** and **WPA-PSK/WPA2-PSK** are the same. The only difference between the two is that **WPA-PSK/WPA2-PSK** uses a simple common password, instead of user-specific credentials. Type a pre-shared key from 8 to 63 case-sensitive ASCII characters (including spaces and symbols).
ReAuthentication Timer (in seconds)	Specify how often wireless stations have to resend usernames and passwords in order to stay connected. Enter a time interval between 10 and 9999 seconds. The default time interval is 1800 seconds (30 minutes). **Note:** If wireless station authentication is done using a RADIUS server, the reauthentication timer on the RADIUS server has priority.
Idle Timeout	The Prestige automatically disconnects a wireless station from the wired network after a period of inactivity. The wireless station needs to enter the username and password again before access to the wired network is allowed. The default time interval is 3600 seconds (or 1 hour).

Table 30 Wireless: WPA-PSK/WPA2-PSK

LABEL	DESCRIPTION
Group Key Update Timer	The **Group Key Update Timer** is the rate at which the AP (if using **WPA-PSK/ WPA2-PSK** key management) or **RADIUS** server (if using **WPA/WPA2** key management) sends a new group key out to all clients. The re-keying process is the WPA/WPA2 equivalent of automatically changing the WEP key for an AP and all stations in a WLAN on a periodic basis. Setting of the **Group Key Update Timer** is also supported in **WPA-PSK/WPA2-PSK** mode. The Prestige default is **1800** seconds (30 minutes).
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to reload the previous configuration for this screen.

4.4.7 Wireless Client WPA Supplicants

A wireless client supplicant is the software that runs on an operating system instructing the wireless client how to use WPA. At the time of writing, the most widely available supplicant is the WPA patch for Windows XP, Funk Software's Odyssey client.

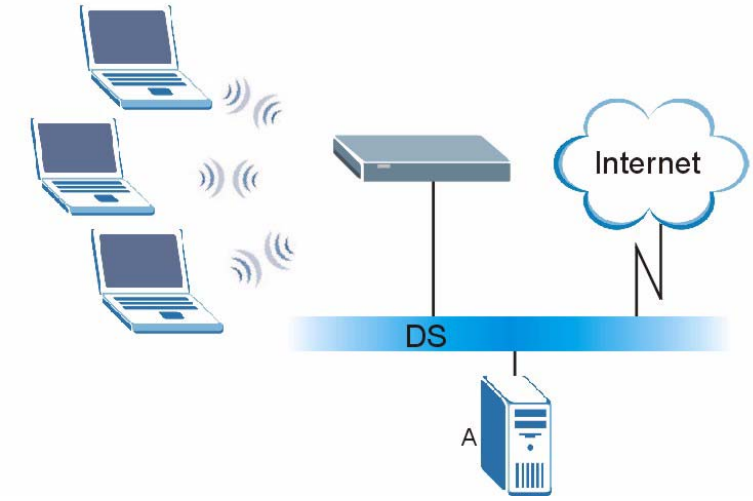
The Funk Software's Odyssey client is bundled free (at the time of writing) with the Prestige client adaptor(s). This adds WPA capability to Windows XP's built-in "Zero Configuration" wireless client.

4.4.8 WPA(2) with RADIUS Application Example

You need the IP address of the RADIUS server, its port number (default is 1812), and the RADIUS shared secret. A WPA(2) application example with an external RADIUS server looks as follows. "A" is the RADIUS server. "DS" is the distribution system.

1. The AP passes the wireless client's authentication request to the RADIUS server.
2. The RADIUS server then checks the user's identification against its database and grants or denies network access accordingly.
3. The RADIUS server distributes a Pairwise Master Key (PMK) key to the AP that then sets up a key hierarchy and management system, using the pair-wise key to dynamically generate unique data encryption keys to encrypt every data packet that is wirelessly communicated between the AP and the wireless clients.

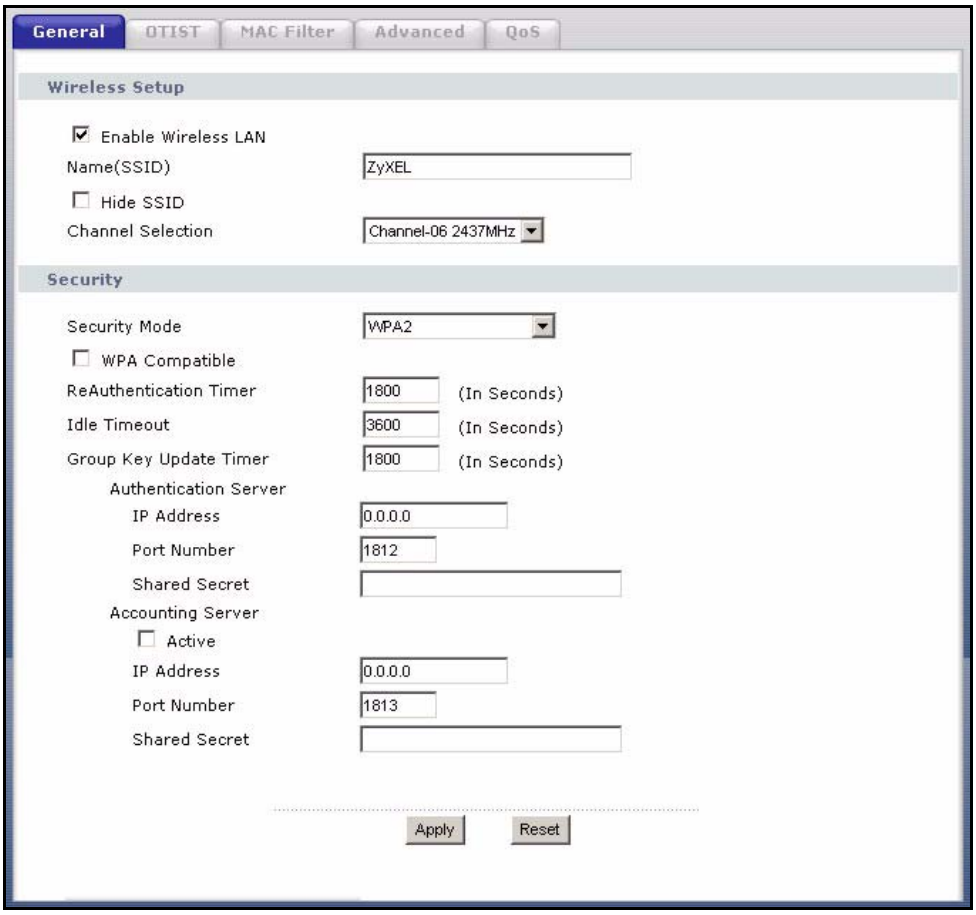
Figure 38 WPA(2) with RADIUS Application Example



4.4.9 WPA/WPA2 Authentication Screen

Click the **Wireless LAN** link under **Network** to display the **Wireless General** screen.

Figure 39 Wireless: WPA/WPA2



The following table describes the labels in this screen.

Table 31 Wireless: WPA/WPA2

LABEL	DESCRIPTION
WPA Compatible	This check box is available only when you select **WPA2-PSK** or **WPA2** in the **Security Mode** field. Select the check box to have both WPA2 and WPA wireless clients be able to communicate with the Prestige even when the Prestige is using WPA2-PSK or WPA2.
ReAuthentication Timer (in seconds)	Specify how often wireless stations have to resend usernames and passwords in order to stay connected. Enter a time interval between 10 and 9999 seconds. The default time interval is 1800 seconds (30 minutes). **Note:** If wireless station authentication is done using a RADIUS server, the reauthentication timer on the RADIUS server has priority.
Idle Timeout	The Prestige automatically disconnects a wireless station from the wired network after a period of inactivity. The wireless station needs to enter the username and password again before access to the wired network is allowed. The default time interval is 3600 seconds (or 1 hour).
Group Key Update Timer	The **Group Key Update Timer** is the rate at which the AP (if using **WPA-PSK/ WPA2-PSK** key management) or RADIUS server (if using **WPA/WPA2** key management) sends a new group key out to all clients. The re-keying process is the WPA/WPA2 equivalent of automatically changing the WEP key for an AP and all stations in a WLAN on a periodic basis. Setting of the **Group Key Update Timer** is also supported in **WPA-PSK/WPA2-PSK** mode. The Prestige default is **1800** seconds (30 minutes).
Authentication Server	
IP Address	Enter the IP address of the external authentication server in dotted decimal notation.
Port Number	Enter the port number of the external authentication server. The default port number is **1812**. You need not change this value unless your network administrator instructs you to do so with additional information.
Shared Secret	Enter a password (up to 31 alphanumeric characters) as the key to be shared between the external authentication server and the Prestige. The key must be the same on the external authentication server and your Prestige. The key is not sent over the network.
Accounting Server	
Active	Select **Yes** from the drop down list box to enable user accounting through an external authentication server.
IP Address	Enter the IP address of the external accounting server in dotted decimal notation.
Port Number	Enter the port number of the external accounting server. The default port number is **1813**. You need not change this value unless your network administrator instructs you to do so with additional information.
Shared Secret	Enter a password (up to 31 alphanumeric characters) as the key to be shared between the external accounting server and the Prestige. The key must be the same on the external accounting server and your Prestige. The key is not sent over the network.

Table 31 Wireless: WPA/WPA2

LABEL	DESCRIPTION
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to reload the previous configuration for this screen.

4.4.10 IEEE 802.1x Overview

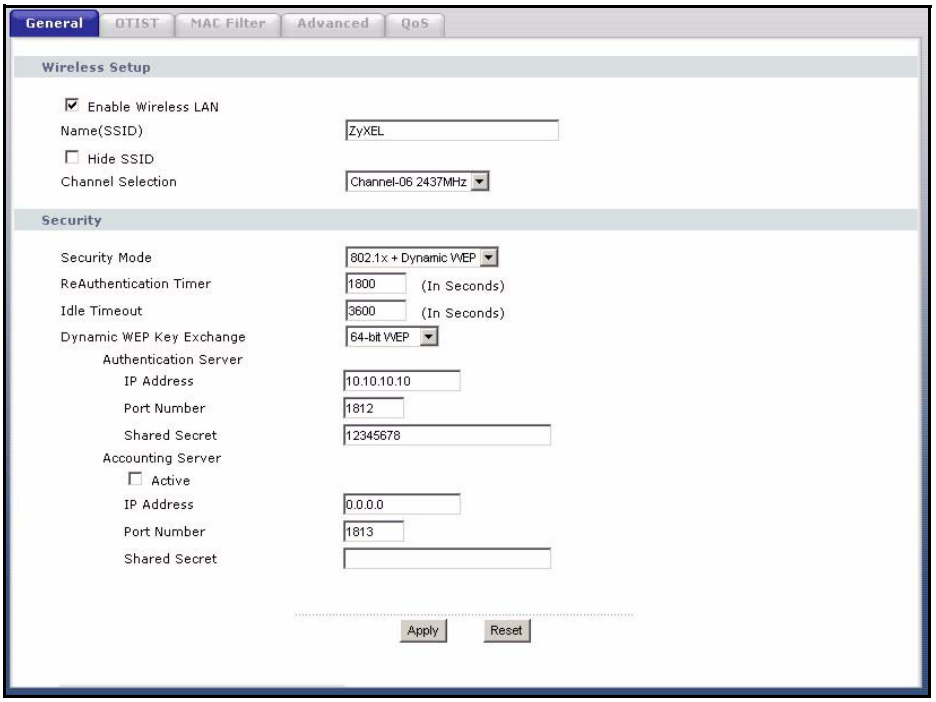
You need the following for IEEE 802.1x authentication.

- A computer with an IEEE 802.11 a/b/g wireless LAN adapter and equipped with a web browser (with JavaScript enabled) and/or Telnet.
- A wireless station computer must be running IEEE 802.1x-compliant software. Not all Windows operating systems support IEEE 802.1x (see the Microsoft web site for details). For other operating systems, see their documentation. If your operating system does not support IEEE 802.1x, then you may need to install IEEE 802.1x client software.
- An optional network RADIUS server for remote user authentication and accounting.

4.4.11 IEEE 802.1x and Dynamic WEP Key Exchange

In order to configure and enable IEEE 802.1x and dynamic WEP key exchange; click the **Wireless LAN** link under **Network** to display the **Wireless General** screen. Select **802.1x + Dynamic WEP** from the **Security Mode** list.

Figure 40 Wireless: 802.1x and Dynamic WEP



The following table describes the labels in this screen.

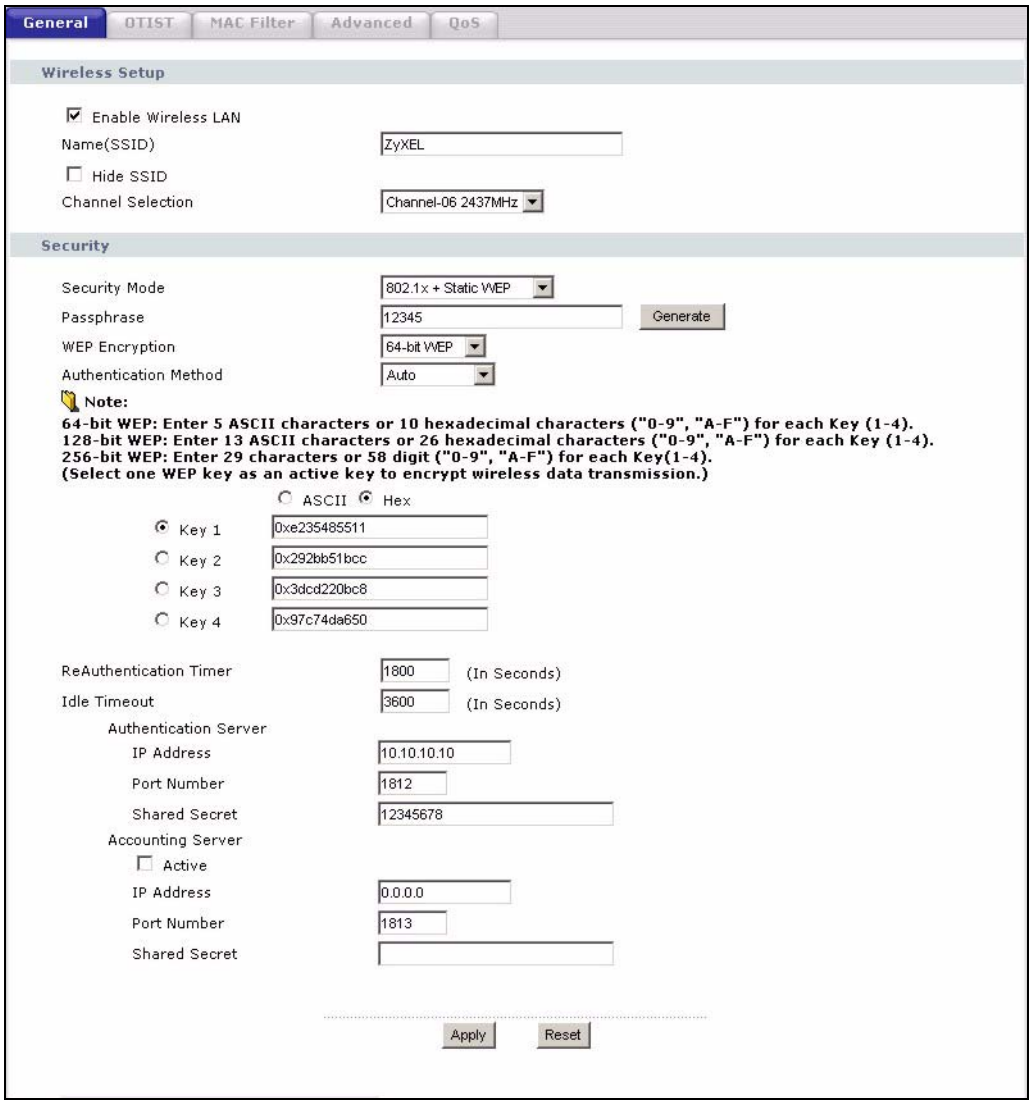
Table 32 Wireless: 802.1x and Dynamic WEP

LABEL	DESCRIPTION
ReAuthentication Timer (in seconds)	Specify how often wireless stations have to resend usernames and passwords in order to stay connected. Enter a time interval between 10 and 9999 seconds. The default time interval is 1800 seconds (30 minutes). **Note:** If wireless station authentication is done using a RADIUS server, the reauthentication timer on the RADIUS server has priority.
Idle Timeout	The Prestige automatically disconnects a wireless station from the wired network after a period of inactivity. The wireless station needs to enter the username and password again before access to the wired network is allowed. The default time interval is 3600 seconds (or 1 hour).
Dynamic WEP Key Exchange	Select **64-bit WEP** or **128-bit WEP** to enable data encryption. Up to 32 stations can access the Prestige when you configure dynamic WEP key exchange.
Authentication Server	
IP Address	Enter the IP address of the external authentication server in dotted decimal notation.
Port Number	Enter the port number of the external authentication server. The default port number is **1812**. You need not change this value unless your network administrator instructs you to do so with additional information.
Shared Secret	Enter a password (up to 31 alphanumeric characters) as the key to be shared between the external authentication server and the Prestige. The key must be the same on the external authentication server and your Prestige. The key is not sent over the network.
Accounting Server	
Active	Select **Yes** from the drop down list box to enable user accounting through an external authentication server.
IP Address	Enter the IP address of the external accounting server in dotted decimal notation.
Port Number	Enter the port number of the external accounting server. The default port number is **1813**. You need not change this value unless your network administrator instructs you to do so with additional information.
Shared Secret	Enter a password (up to 31 alphanumeric characters) as the key to be shared between the external accounting server and the Prestige. The key must be the same on the external accounting server and your Prestige. The key is not sent over the network.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to reload the previous configuration for this screen.

4.4.12 IEEE 802.1x and Static WEP Key Exchange

In order to configure and enable IEEE 802.1x and static WEP key exchange; click the **Wireless LAN** link under **Network** to display the **Wireless General** screen. Select **802.1x + Static WEP** from the **Security Mode** list.

Figure 41 Wireless: 802.1x and Static WEP



The following table describes the labels in this screen.

Table 33 Wireless: 802.1x and Static WEP

LABEL	DESCRIPTION
Passphrase	Enter a Passphrase (up to 32 printable characters) and clicking **Generate**. The Prestige automatically generates a WEP key.
WEP Encryption	Select **64-bit WEP**, **128-bit WEP** or **256-bit WEP** to enable data encryption.
Authentication Method	This field is activated when you select **64-bit WEP**, **128-bit WEP** or **256-bit WEP** in the WEP Encryption field. Select Auto, Open System or Shared Key from the drop-down list box.
ASCII	Select this option in order to enter ASCII characters as the WEP keys.
Hex	Select this option in order to enter hexadecimal characters as the WEP keys. The preceding "0x", that identifies a hexadecimal key, is entered automatically.

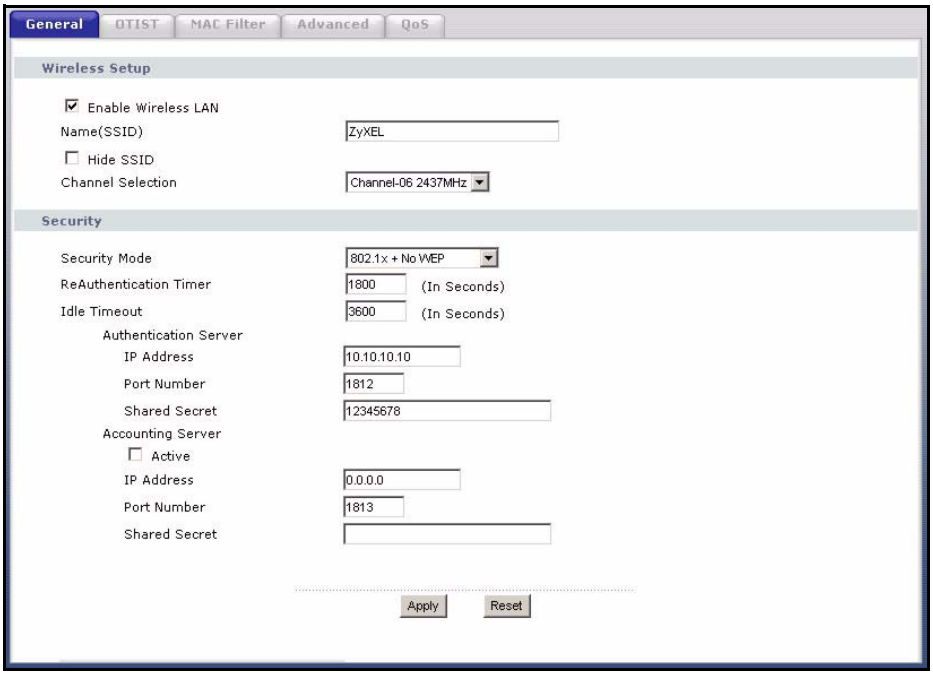
Table 33 Wireless: 802.1x and Static WEP

LABEL	DESCRIPTION
Key 1 to Key 4	The WEP keys are used to encrypt data. Both the Prestige and the wireless stations must use the same WEP key for data transmission. If you chose **64-bit WEP**, then enter any 5 ASCII characters or 10 hexadecimal characters ("0-9", "A-F"). If you chose **128-bit WEP**, then enter 13 ASCII characters or 26 hexadecimal characters ("0-9", "A-F"). If you chose **256-bit WEP**, then enter 29 ASCII characters or 58 hexadecimal characters ("0-9", "A-F"). You must configure at least one key, only one key can be activated at any one time. The default key is key 1.
ReAuthentication Timer (in seconds)	Specify how often wireless stations have to reenter usernames and passwords in order to stay connected. Enter a time interval between 10 and 9999 seconds. The default time interval is 1800 seconds (30 minutes). **Note:** If wireless station authentication is done using a RADIUS server, the reauthentication timer on the RADIUS server has priority.
Idle Timeout	The Prestige automatically disconnects a wireless station from the wired network after a period of inactivity. The wireless station needs to enter the username and password again before access to the wired network is allowed. The default time interval is 3600 seconds (or 1 hour).
Authentication Server	
IP Address	Enter the IP address of the external authentication server in dotted decimal notation.
Port Number	Enter the port number of the external authentication server. The default port number is **1812**. You need not change this value unless your network administrator instructs you to do so with additional information.
Shared Secret	Enter a password (up to 31 alphanumeric characters) as the key to be shared between the external authentication server and the Prestige. The key must be the same on the external authentication server and your Prestige. The key is not sent over the network.
Accounting Server	
Active	Select **Yes** from the drop down list box to enable user accounting through an external authentication server.
IP Address	Enter the IP address of the external accounting server in dotted decimal notation.
Port Number	Enter the port number of the external accounting server. The default port number is **1813**. You need not change this value unless your network administrator instructs you to do so with additional information.
Shared Secret	Enter a password (up to 31 alphanumeric characters) as the key to be shared between the external accounting server and the Prestige. The key must be the same on the external accounting server and your Prestige. The key is not sent over the network.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to reload the previous configuration for this screen.

4.4.13 IEEE 802.1x + no WEP

In order to configure and enable 802.1x; click the **Wireless LAN** link under **Network** to display the **Wireless General** screen. Select **802.1x + No WEP** from the **Security Mode** list.

Figure 42 Wireless: 802.1x



The following table describes the labels in this screen.

Table 34 Wireless: 802.1x and No WEP

LABEL	DESCRIPTION
ReAuthentication Timer (in seconds)	Specify how often wireless stations have to reenter usernames and passwords in order to stay connected. Enter a time interval between 10 and 9999 seconds. The default time interval is 1800 seconds (30 minutes). **Note:** If wireless station authentication is done using a RADIUS server, the reauthentication timer on the RADIUS server has priority.
Idle Timeout	The Prestige automatically disconnects a wireless station from the wired network after a period of inactivity. The wireless station needs to enter the username and password again before access to the wired network is allowed. The default time interval is 3600 seconds (or 1 hour).
Authentication Server	
IP Address	Enter the IP address of the external authentication server in dotted decimal notation.
Port Number	Enter the port number of the external authentication server. The default port number is **1812**. You need not change this value unless your network administrator instructs you to do so with additional information.

Table 34 Wireless: 802.1x and No WEP

LABEL	DESCRIPTION
Shared Secret	Enter a password (up to 31 alphanumeric characters) as the key to be shared between the external authentication server and the Prestige. The key must be the same on the external authentication server and your Prestige. The key is not sent over the network.
Accounting Server	
Active	Select **Yes** from the drop down list box to enable user accounting through an external authentication server.
IP Address	Enter the IP address of the external accounting server in dotted decimal notation.
Port Number	Enter the port number of the external accounting server. The default port number is **1813**. You need not change this value unless your network administrator instructs you to do so with additional information.
Shared Secret	Enter a password (up to 31 alphanumeric characters) as the key to be shared between the external accounting server and the Prestige. The key must be the same on the external accounting server and your Prestige. The key is not sent over the network.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to reload the previous configuration for this screen.

4.5 OTIST

OTIST (One-Touch Intelligent Security Technology) allows your Prestige to set the wireless client to use the same wireless settings as the Prestige.

Note: The wireless client must support OTIST and have OTIST enabled.

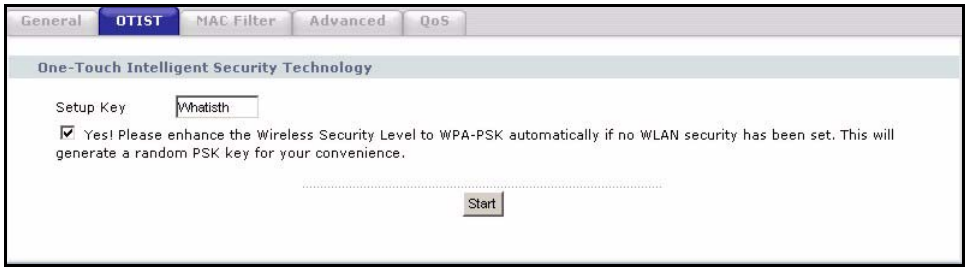
The following are the wireless settings that the Prestige assigns to the wireless client if OTIST is enabled on both devices and the OTIST setup keys are the same.

- SSID
- Security (WEP or WPA-PSK)

Note: This will replace the pre-configured wireless settings on the wireless clients.

Click the **Wireless LAN** link under **Network** and then the **OTIST** tab. The following screen displays.

Figure 43 OTIST



The following table describes the labels in this screen.

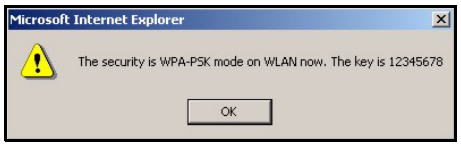
Table 35 OTIST

LABEL	DESCRIPTION
Setup Key	Type an OTIST **Setup Key** of exactly eight ASCII characters in length. The default OTIST setup key is "01234567". **Note:** If you change the OTIST setup key here, you must also make the same change on the wireless client(s).
Yes!	If you want to configure your own WPA-PSK and have OTIST use that WPA-PSK, you must: • Configure a WPA-PSK in the **Wireless General** screen. • Clear the **Yes!** checkbox in the **OTIST** screen and click **Apply**. **Note:** If you already have a WPA-PSK configured in the **Wireless General** screen, and you run OTIST with **Yes!** selected, OTIST will not replace the WPA-PSK. Clear the checkbox in the OTIST screen. If you want OTIST to automatically generate a WPA-PSK, you must: • Change your security to **None** in the **Wireless General** screen. • Select the **Yes!** checkbox in the **OTIST** screen and click **Apply**. • The wireless screen displays an auto generated WPA-PSK and is now in WPA-PSK security mode. The WPA-PSK security settings are assigned to the wireless client when you start OTIST.
Start	Click **Start** to encrypt the wireless security data using the setup key and have the Prestige set the wireless station to use the same wireless settings as the Prestige. You must also activate and start OTIST on the wireless station at the same time. The process takes three minutes to complete.

4.5.1 Activating OTIST

After you click **Start**, a dialog box displays the security mode and the WEP key or pre-shared key depending on which mode is configured. Click **OK** to proceed with the OTIST setup.

Figure 44 OTIST Start



Note: The process takes three minutes. During this time the Prestige assigns its security settings to OTIST-enabled wireless clients within range that have selected to associate with this Prestige.

Figure 45 OTIST Process

When the previous screen closes, your current Prestige security configuration is automatically saved to the wireless clients.

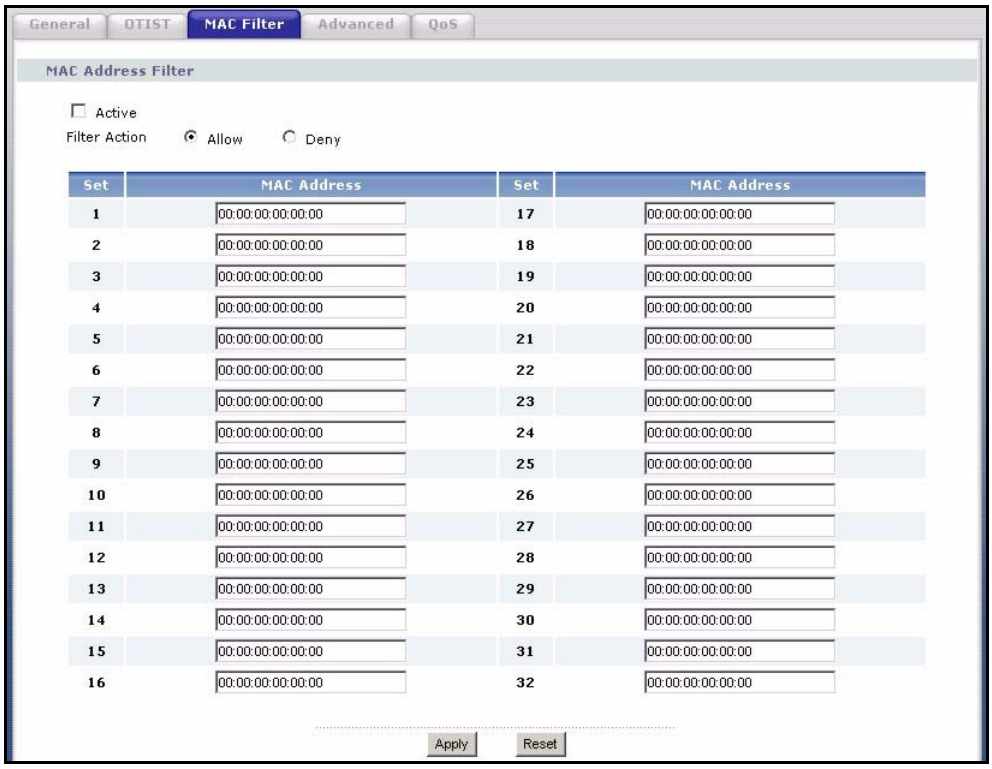
Note: See your wireless client documentation for information on enabling OTIST on it. If there are multiple OTIST-enabled Prestiges within range and with the same OTIST setup key, then the wireless client must choose which Prestige should assign its settings to it.

4.6 MAC Filter

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

To change your Prestige's MAC filter settings, click the **Wireless LAN** link under **Network** and then the **MAC Filter** tab. The screen appears as shown.

Figure 46 MAC Address Filter



The following table describes the labels in this menu.

Table 36 MAC Address Filter

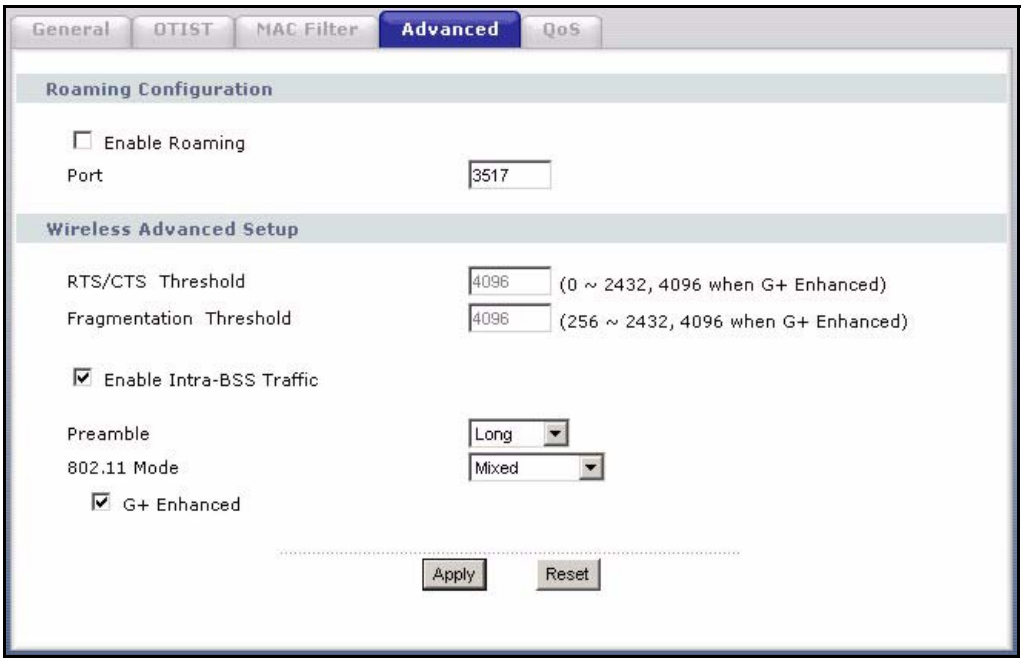
LABEL	DESCRIPTION
Active	Select **Yes** from the drop down list box to enable MAC address filtering.
Filter Action	Define the filter action for the list of MAC addresses in the **MAC Address** table. Select **Deny** to block access to the Prestige, MAC addresses not listed will be allowed to access the Prestige Select **Allow** to permit access to the Prestige, MAC addresses not listed will be denied access to the Prestige.
Set	This is the index number of the MAC address.
MAC Address	Enter the MAC addresses of the wireless station that are allowed or denied access to the Prestige in these address fields. Enter the MAC addresses in a valid MAC address format, that is, six hexadecimal character pairs, for example, 12:34:56:78:9a:bc.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to reload the previous configuration for this screen.

4.7 Wireless LAN Advanced Screen

See the appendix for background information on roaming.

To enable roaming on your Prestige, click the **Wireless LAN** link under **Network** and then the **Advanced** tab. The screen appears as shown.

Figure 47 Advanced



The following table describes the labels in this screen.

Table 37 Advanced

LABEL	DESCRIPTION
Roaming Configuration	
Enable Roaming	Select the check box to enable roaming on the Prestige if you have two or more Prestiges on the same subnet. **Note:** All APs on the same subnet and the wireless stations must have the same SSID to allow roaming.
Port	Enter the port number to communicate roaming information between APs. The port number must be the same on all APs. The default is 3517. Make sure this port is not used by other services.
Wireless Advanced Setup	
RTS/CTS Threshold	Enter a value between 0 and 2432. If you select the **G+ Enhanced** checkbox, a value of 4096 is displayed.
Fragmentation Threshold	It is the maximum data fragment size that can be sent. Enter a value between 256 and 2432. If you select the **G+ Enhanced** checkbox, a value of 4096 is displayed.
Enable Intra-BSS Traffic	Intra-BSS traffic is traffic between wireless stations in the same BSS. Select this check box to enable Intra-BSS traffic. When Intra-BSS is enabled, wireless stations in the same BSS can access the wired network and communicate with each other. When Intra-BSS is disabled, wireless stations in the same BSS can still access the wired network but cannot communicate with each other.

Table 37 Advanced

LABEL	DESCRIPTION
Preamble	Select a preamble type from the drop-down list menu. Choices are **Long**, **Short** or **Dynamic**. The default setting is **Long**. See the section on preamble for more information.
802.11 Mode	Select **802.11b Only** to allow only IEEE 802.11b compliant WLAN devices to associate with the Prestige. Select **802.11g Only** to allow only IEEE 802.11g compliant WLAN devices to associate with the Prestige. Select **Mixed** to allow either IEEE802.11b or IEEE802.11g compliant WLAN devices to associate with the Prestige. The transmission rate of your Prestige might be reduced.
G+ Enhanced	Select **G+ Enhanced** checkbox to allow any ZyXEL WLAN devices that support this feature to associate with the Prestige at higher transmission speeds. This permits the Prestige to transmit at a higher speed than the **802.11g Only** mode.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to reload the previous configuration for this screen.

4.8 WMM QoS

WMM (Wi-Fi MultiMedia) QoS (Quality of Service) ensures quality of service in wireless networks for multimedia applications.

WMM allows you to prioritize wireless traffic according to the delivery requirements of the individual and applications.

WMM is a part of the IEEE 802.11e QoS enhancement to certified Wi-Fi wireless networks.

4.8.1 WMM QoS Example

When WMM QoS is not enabled, all traffic streams are given the same access throughput to the wireless network. If the introduction of another traffic stream creates a data transmission demand that exceeds the current network capacity, then the new traffic stream reduces the throughput of the other traffic streams.

When WMM QoS is enabled, the streams are prioritized according to the needs of the application. You can assign different priorities to different applications. This prevents reductions in data transmission for applications that are sensitive.

4.8.2 WMM QoS Priorities

The following table describes the priorities that you can apply to traffic that the Prestige sends to the wireless network.

Table 38 WMM QoS Priorities

PRIORITY LEVELS:	
Highest	Typically used for voice traffic or video that is especially sensitive to jitter (variations in delay). Use the highest priority to reduce latency for improved voice quality.
High	Typically used for video traffic which has some tolerance for jitter but needs to be prioritized over other data traffic.
Mid	Typically used for traffic from applications or devices that lack QoS capabilities. Use mid priority for traffic that is less sensitive to latency, but is affected by long delays, such as Internet surfing.
Low	This is typically used for non-critical "background" traffic such as bulk transfers and print jobs that are allowed but that should not affect other applications and users. Use low priority for applications that do not have strict latency and throughput requirements.

4.8.3 Services

The commonly used services and port numbers are shown in the following table. Please refer to RFC 1700 for further information about port numbers. Next to the name of the service, two fields appear in brackets. The first field indicates the IP protocol type (TCP, UDP, or ICMP). The second field indicates the IP port number that defines the service. (Note that there may be more than one IP protocol type. For example, look at the DNS service. (UDP/TCP:53) means UDP port 53 and TCP port 53.

Table 39 Commonly Used Services

SERVICE	DESCRIPTION
AIM/New-ICQ(TCP:5190)	AOL's Internet Messenger service, used as a listening port by ICQ.
AUTH(TCP:113)	Authentication protocol used by some servers.
BGP(TCP:179)	Border Gateway Protocol.
BOOTP_CLIENT(UDP:68)	DHCP Client.
BOOTP_SERVER(UDP:67)	DHCP Server.
CU-SEEME(TCP/UDP:7648, 24032)	A popular videoconferencing solution from White Pines Software.
DNS(UDP/TCP:53)	Domain Name Server, a service that matches web names (e.g. www.zyxel.com) to IP numbers.
FINGER(TCP:79)	Finger is a UNIX or Internet related command that can be used to find out if a user is logged on.
FTP(TCP:20.21)	File Transfer Program, a program to enable fast transfer of files, including large files that may not be possible by e-mail.
H.323(TCP:1720)	NetMeeting uses this protocol.

Table 39 Commonly Used Services

SERVICE	DESCRIPTION
HTTP(TCP:80)	Hyper Text Transfer Protocol - a client/server protocol for the world wide web.
HTTPS(TCP:443)	HTTPS is a secured http session often used in e-commerce.
ICQ(UDP:4000)	This is a popular Internet chat program.
IKE(UDP:500)	The Internet Key Exchange algorithm is used for key distribution and management.
IPSEC_TUNNEL(AH:0)	The IPSEC AH (Authentication Header) tunneling protocol uses this service.
IPSEC_TUNNEL(ESP:0)	The IPSEC ESP (Encapsulation Security Protocol) tunneling protocol uses this service.
IRC(TCP/UDP:6667)	This is another popular Internet chat program.
MSN Messenger(TCP:1863)	Microsoft Networks' messenger service uses this protocol.
MULTICAST(IGMP:0)	Internet Group Multicast Protocol is used when sending packets to a specific group of hosts.
NEW-ICQ(TCP:5190)	An Internet chat program.
NEWS(TCP:144)	A protocol for news groups.
NFS(UDP:2049)	Network File System - NFS is a client/server distributed file service that provides transparent file sharing for network environments.
NNTP(TCP:119)	Network News Transport Protocol is the delivery mechanism for the USENET newsgroup service.
PING(ICMP:0)	Packet INternet Groper is a protocol that sends out ICMP echo requests to test whether or not a remote host is reachable.
POP3(TCP:110)	Post Office Protocol version 3 lets a client computer get e-mail from a POP3 server through a temporary connection (TCP/IP or other).
PPTP(TCP:1723)	Point-to-Point Tunneling Protocol enables secure transfer of data over public networks. This is the control channel.
PPTP_TUNNEL(GRE:0)	Point-to-Point Tunneling Protocol enables secure transfer of data over public networks. This is the data channel.
RCMD(TCP:512)	Remote Command Service.
REAL_AUDIO(TCP:7070)	A streaming audio service that enables real time sound over the web.
REXEC(TCP:514)	Remote Execution Daemon.
RLOGIN(TCP:513)	Remote Login.
RTELNET(TCP:107)	Remote Telnet.
RTSP(TCP/UDP:554)	The Real Time Streaming (media control) Protocol (RTSP) is a remote control for multimedia on the Internet.
SFTP(TCP:115)	Simple File Transfer Protocol.
SMTP(TCP:25)	Simple Mail Transfer Protocol is the message-exchange standard for the Internet. SMTP enables you to move messages from one e-mail server to another.
SNMP(TCP/UDP:161)	Simple Network Management Program.
SNMP-TRAPS(TCP/UDP:162)	Traps for use with the SNMP (RFC:1215).
SQL-NET(TCP:1521)	Structured Query Language is an interface to access data on many different types of database systems, including mainframes, midrange systems, UNIX systems and network servers.

Table 39 Commonly Used Services

SERVICE	DESCRIPTION
SSH(TCP/UDP:22)	Secure Shell Remote Login Program.
STRM WORKS(UDP:1558)	Stream Works Protocol.
SYSLOG(UDP:514)	Syslog allows you to send system logs to a UNIX server.
TACACS(UDP:49)	Login Host Protocol used for (Terminal Access Controller Access Control System).
TELNET(TCP:23)	Telnet is the login and terminal emulation protocol common on the Internet and in UNIX environments. It operates over TCP/IP networks. Its primary function is to allow users to log into remote host systems.
TFTP(UDP:69)	Trivial File Transfer Protocol is an Internet file transfer protocol similar to FTP, but uses the UDP (User Datagram Protocol) rather than TCP (Transmission Control Protocol).
VDOLIVE(TCP:7000)	Another videoconferencing solution.

4.9 QoS Screen

The QoS screen by default allows you to automatically give a service a priority level according to the ToS value in the IP header of the packets it sends.

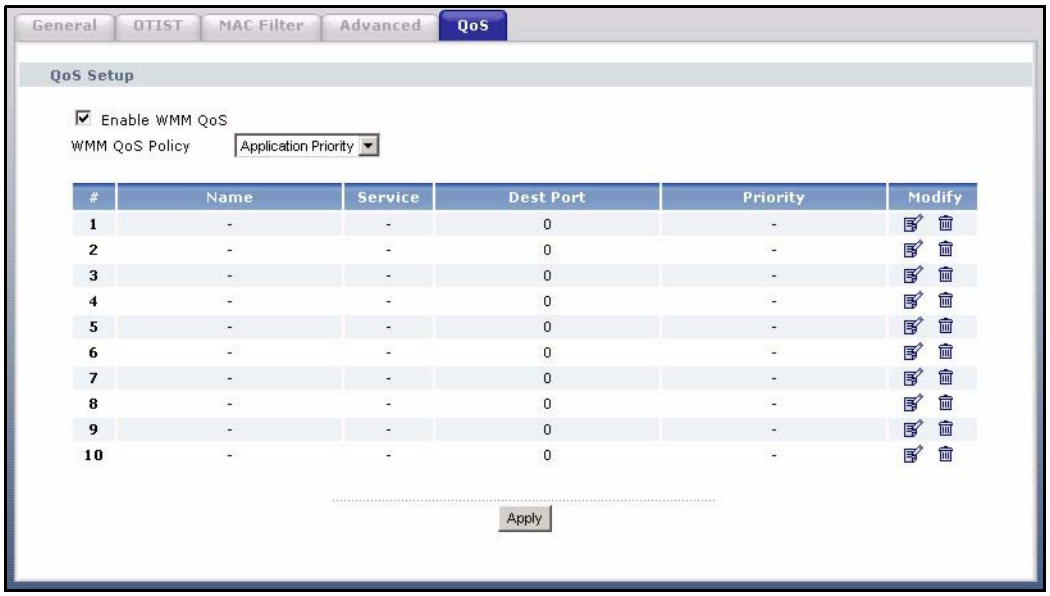
4.9.1 ToS (Type of Service) and WMM QoS

ToS defines the DS (Differentiated Service) field in the IP packet header. The ToS value of outgoing packets is between 0 and 255. 0 is the lowest priority.

WMM QoS checks the ToS in the header of transmitted data packets. It gives the application a priority according to this number. If the ToS is not specified, then transmitted data is treated as normal or best-effort traffic.

Click the **Wireless LAN** link under **Network** and the **QoS** tab. The following screen displays.

Figure 48 QoS



The following table describes the fields in this screen.

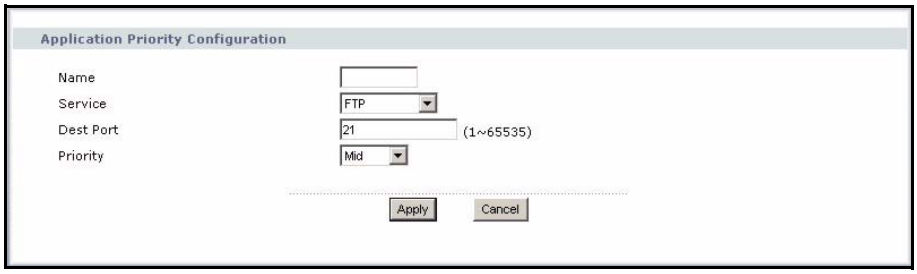
Table 40 QoS

LABEL	DESCRIPTION
QoS Setup	
Enable WMM QoS	Select the check box to enable WMM QoS on the Prestige.
WMM QoS Policy	Select **Default** to have the Prestige automatically give a service a priority level according to the ToS value in the IP header of packets it sends. Select **Application Priority** from the drop-down list box to display a table of application names, services, ports and priorities to which you want to apply WMM QoS.
#	This is the number of an individual application entry.
Name	This field displays a description given to an application entry.
Service	This field displays either **FTP**, **WWW**, **E-mail** or a **User defined** service to which you want to apply WMM QoS.
Dest Port	This field displays the destination port number to which the application sends traffic.
Priority	This field displays the WMM QoS priority for traffic bandwidth.
Modify	Click the **Edit** icon to open the **Application Priority Configuration** screen. Modify an existing application entry or create a application entry in the **Application Priority Configuration** screen. Click the **Remove** icon to delete an application entry.
Apply	Click **Apply** to save your changes back to the Prestige.

4.10 Application Priority Configuration Screen

To edit a WMM QoS application entry, click the edit icon under **Modify**. The following screen displays.

Figure 49 Application Priority Configuration



The following table describes the fields in this screen.

Table 41 Application Priority Configuration

LABEL	DESCRIPTION
Application Priority Configuration	
Name	Type a description of the application priority.
Service	The following is a description of the applications you can prioritize with WMM QoS. Select a service from the drop-down list box. • **FTP** File Transfer Program enables fast transfer of files, including large files that may not be possible by e-mail. FTP uses port number 21. • **E-Mail** Electronic mail consists of messages sent through a computer network to specific groups or individuals. Here are some default ports for e-mail: POP3 - port 110 IMAP - port 143 SMTP - port 25 HTTP - port 80 • **WWW** The World Wide Web is an Internet system to distribute graphical, hyper-linked information, based on Hyper Text Transfer Protocol (HTTP) - a client/server protocol for the World Wide Web. The Web is not synonymous with the Internet; rather, it is just one service on the Internet. Other services on the Internet include Internet Relay Chat and Newsgroups. The Web is accessed through use of a browser. • **User defined** User-defined services are user specific services configured using known ports and applications.
Dest Port	This displays the port the selected service uses. Type a port number in the field provided if you want to use a different port to the default port. See Table 55 on page 140 for information on port numbers.
Priority	Select a priority from the drop-down list box.
Apply	Click **Apply** to save your changes back to the Prestige.
Cancel	Click **Cancel** to return to the previous screen.

CHAPTER 5
WAN

This chapter describes how to configure WAN settings.

5.1 WAN Overview

See the chapter about the connection wizard for more information on the fields in the WAN screens.

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 the IP Static Route Setup chapter)
2. **Traffic Redirect** (see Section 5.7 on page 122)

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 WAN MAC Address

The MAC address screen allows users to configure the WAN port's MAC address by either using the factory default or cloning the MAC address from a computer on your LAN. 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 the computer on the LAN whose MAC you are cloning. 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.

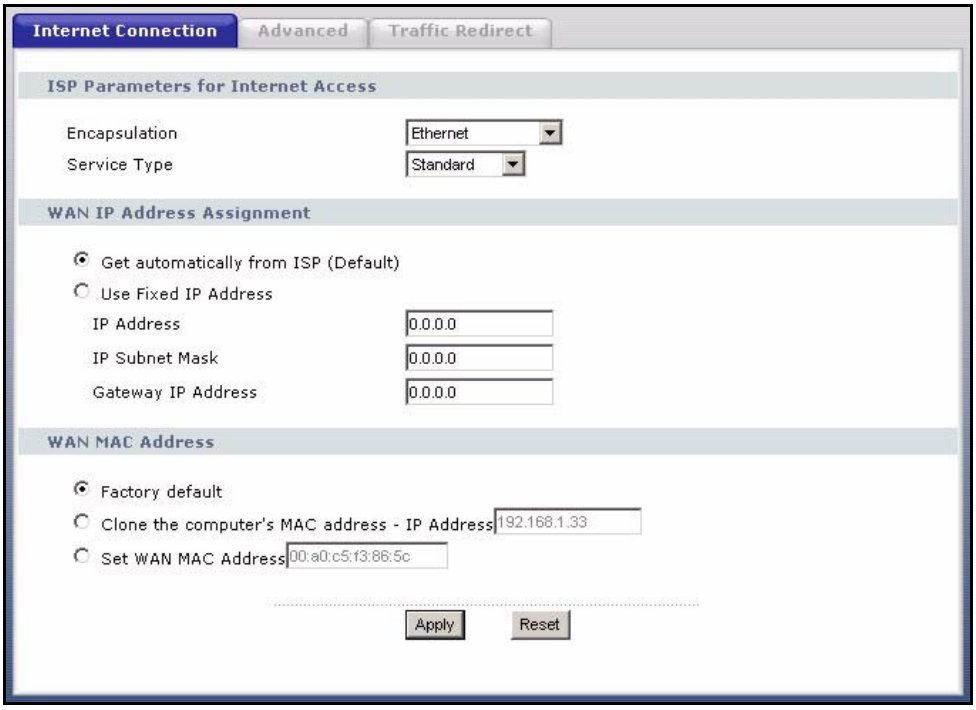
5.4 WAN ISP Screen

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 50 Ethernet Encapsulation



The following table describes the labels in this screen.

Table 42 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 **Standard**, **Telstra** (RoadRunner Telstra authentication method), **RR-Manager** (Roadrunner Manager authentication method), **RR-Toshiba** (Roadrunner Toshiba authentication method) or **Telia Login**. The following fields do not appear with the **Standard** 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 your password again to make sure that you have entered is correctly.
Login Server IP Address	Type the authentication server IP address here if your ISP gave you one. This field is not available for **Telia Login**.

Table 42 Ethernet Encapsulation

LABEL	DESCRIPTION
Login Server (Telia Login only)	Type the domain name of the Telia login server, for example login1.telia.com.
ReloginEvery(min) (Telia Login only)	The Telia server logs the Prestige out if the Prestige does not log in periodically. Type the number of minutes from 1 to 59 (30 default) for the Prestige to wait between logins.
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.
IP Address	Enter your WAN IP address in this field if you selected **Use Fixed IP Address.**
Remote IP Subnet Mask	Enter the **Remote IP Subnet Mask** (if your ISP gave you one) in this field.
Backup Gateway IP Address	Enter a **Backup Gateway IP Address** (if your ISP gave you one) in this field.
WAN MAC Address	The MAC address section allows users to configure the WAN port's MAC address by either using the Prestige's MAC address, copying the MAC address from a computer on your LAN or manually entering a MAC address.
Factory default	Select **Factory default** to use the factory assigned default MAC Address.
Clone the computer's MAC address	Select **Clone the computer's MAC address - IP Address** and enter the IP address of the computer on the LAN whose MAC you are cloning. 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.
Set WAN MAC Address	Select this option and enter the MAC address you want to use.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** 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 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).

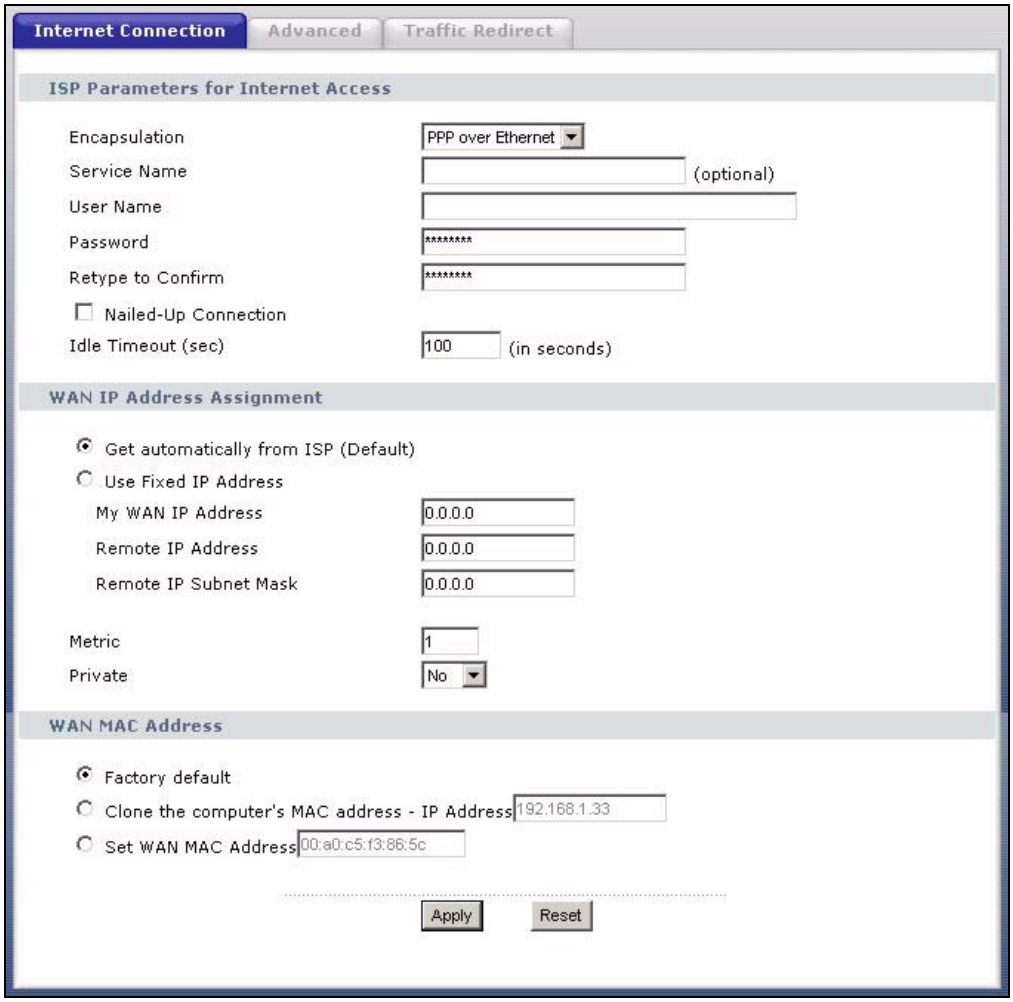
One of the benefits of PPPoE is the ability to let you access one of multiple network services, a function known as dynamic service selection. This enables the service provider to easily create and offer new IP services for individuals.

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 51 PPPoE Encapsulation



The following table describes the labels in this screen.

Table 43 PPPoE Encapsulation

LABEL	DESCRIPTION
ISP Parameters for Internet Access	
Encapsulation	The **PPP over Ethernet** 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 **Nailed-Up Connection** 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.
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 **Use Fixed IP Address**.
Remote IP Address	Enter the remote IP address (if your ISP gave you one) in this field.
Remote IP Subnet Mask	Enter the remote IP subnet mask in this field.
Metric (PPPoE and PPTP only)	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".
Private (PPPoE and PPTP only)	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.
WAN MAC Address	The MAC address section allows users to configure the WAN port's MAC address by using the Prestige's MAC address, copying the MAC address from a computer on your LAN or manually entering a MAC address.
Factory default	Select **Factory default** to use the factory assigned default MAC Address.

Table 43 PPPoE Encapsulation

LABEL	DESCRIPTION
Clone the computer's MAC address	Select **Clone the computer's MAC address - IP Address** and enter the IP address of the computer on the LAN whose MAC you are cloning. 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.
Set WAN MAC Address	Select this option and enter the MAC address you want to use.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to begin configuring this screen afresh.

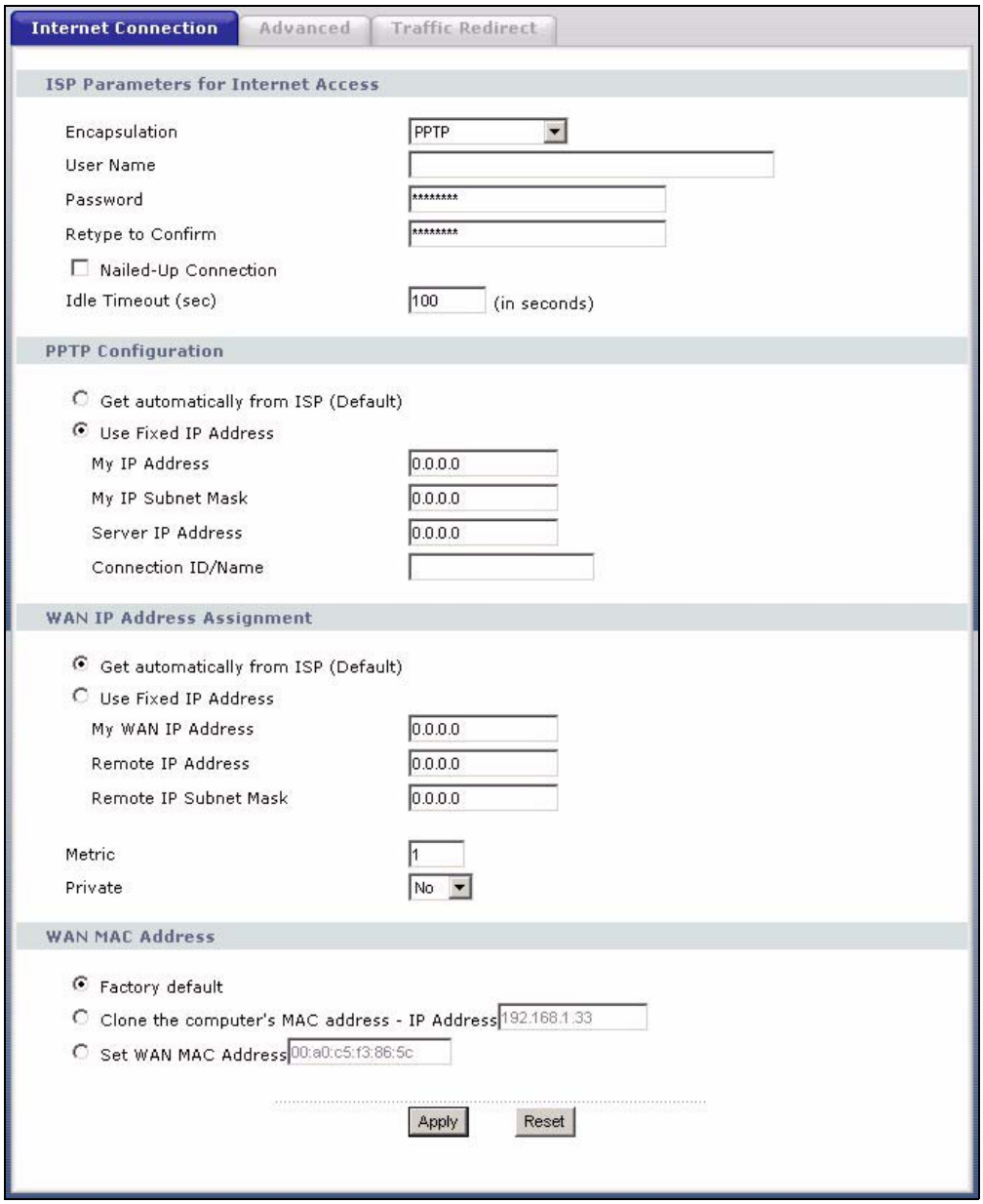
5.4.3 PPTP Encapsulation

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 52 PPTP Encapsulation



The following table describes the labels in this screen.

Table 44 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 **User Name** and **Password** 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 **Nailed-Up Connection** if you do not want the connection to time out.
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.
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.
Server IP Address	Type the IP address of the PPTP server.
Connection ID/ Name	Type your identification name for the PPTP server.
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 **Use Fixed IP Address**.
Remote IP Address	Enter the remote IP address (if your ISP gave you one) in this field.
Remote IP Subnet Mask	Enter the remote IP subnet mask in this field.
Metric (PPPoE and PPTP only)	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".

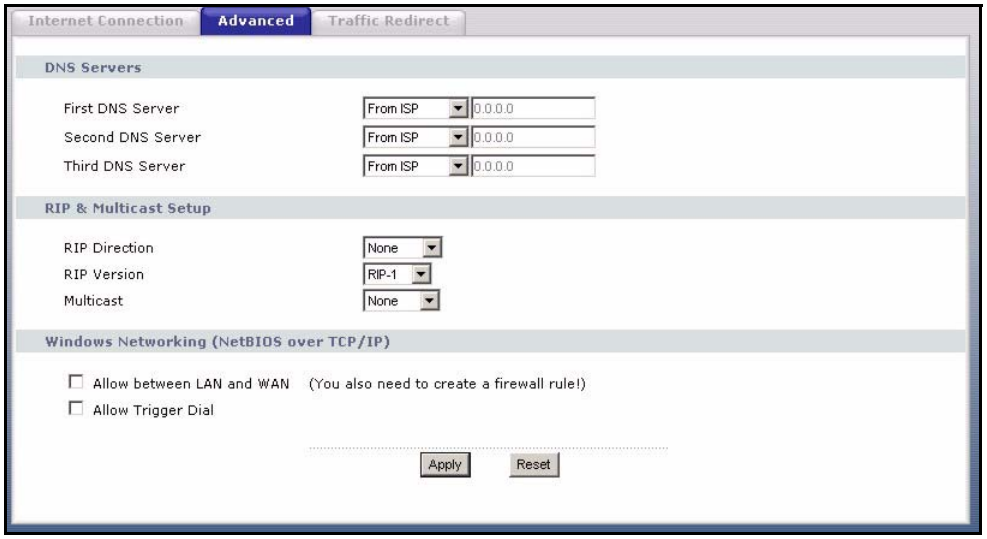
Table 44 PPTP Encapsulation

LABEL	DESCRIPTION
Private (PPPoE and PPTP only)	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.
WAN MAC Address	The MAC address section allows users to configure the WAN port's MAC address by either using the Prestige's MAC address, copying the MAC address from a computer on your LAN or manually entering a MAC address.
Factory default	Select **Factory default** to use the factory assigned default MAC Address.
Clone the computer's MAC address	Select **Clone the computer's MAC address - IP Address** and enter the IP address of the computer on the LAN whose MAC you are cloning. 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.
Set WAN MAC Address	Select this option and enter the MAC address you want to use.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to begin configuring this screen afresh.

5.5 Advanced WAN Screen

To change your Prestige's advanced WAN settings, click the **WAN** link under Network, and the **Advanced** tab. The screen appears as shown.

Figure 53 Advanced



The following table describes the labels in this screen.

Table 45 Advanced

LABEL	DESCRIPTION
DNS Servers	
First DNS Server Second DNS Server Third DNS Server	Select **From ISP** 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 **User-Defined** 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 **User-Defined**, but leave the IP address set to 0.0.0.0, **User-Defined** changes to **None** after you click **Apply**. If you set a second choice to **User-Defined**, and enter the same IP address, the second **User-Defined** changes to **None** after you click **Apply**. Select **None** 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.
RIP and Multicast Setup	
RIP Direction	RIP (Routing Information Protocol, RFC1058 and RFC 1389) allows a router to exchange routing information with other routers. The **RIP Direction** field controls the sending and receiving of RIP packets. Select the RIP direction from **Both**/**In Only**/**Out Only**/**None**. When set to **Both** or **Out Only**, the Prestige will broadcast its routing table periodically. When set to **Both** or **In Only**, it will incorporate the RIP information that it receives; when set to **None**, it will not send any RIP packets and will ignore any RIP packets received. **Both** is the default.
RIP Version	The **RIP Version** field controls the format and the broadcasting method of the RIP packets that the Prestige sends (it recognizes both formats when receiving). **RIP-1** is universally supported but RIP-2 carries more information. RIP-1 is probably adequate for most networks, unless you have an unusual network topology. Both **RIP-2B** and **RIP-2M** sends the routing data in RIP-2 format; the difference being that **RIP-2B** uses subnet broadcasting while **RIP-2M** uses multicasting. Multicasting can reduce the load on non-router machines since they generally do not listen to the RIP multicast address and so will not receive the RIP packets. However, if one router uses multicasting, then all routers on your network must use multicasting, also. By default, RIP direction is set to **Both** and the Version set to **RIP-1**.
Multicast	Select **IGMP V-1** or **IGMP V-2** or **None**. 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. If your firewall is enabled with the default policy set to block WAN to LAN traffic, you also need to enable the default WAN to LAN firewall rule that forwards NetBIOS traffic. 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.

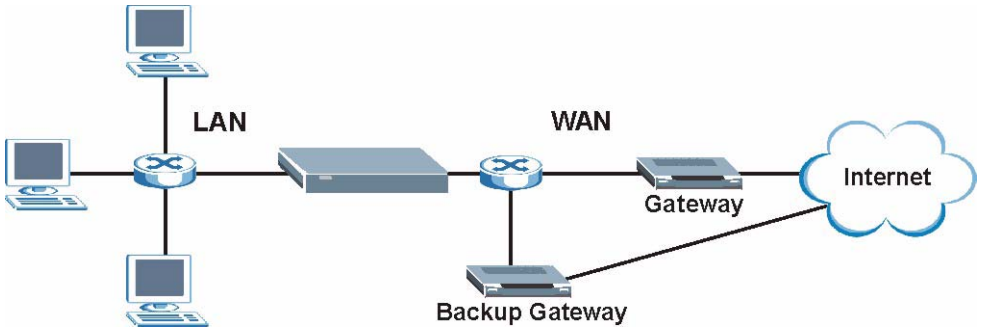
Table 45 Advanced

LABEL	DESCRIPTION
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to begin configuring this screen afresh.

5.6 Traffic Redirect

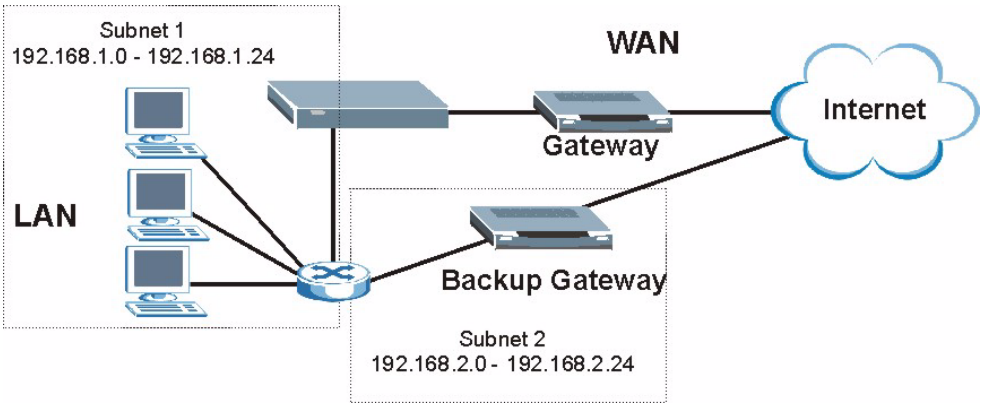
Traffic redirect forwards WAN traffic to a backup gateway when the Prestige cannot connect to the Internet through its normal gateway. Connect the backup gateway on the WAN so that the Prestige still provides firewall protection.

Figure 54 Traffic Redirect WAN Setup



The following network topology allows you to avoid triangle route security issues (see the appendices) when the backup gateway is connected to the LAN. Use IP alias to configure the LAN into two or three logical networks with the Prestige itself as the gateway for each LAN network. Put the protected LAN in one subnet (Subnet 1 in the following figure) and the backup gateway in another subnet (Subnet 2). Configure a LAN to LAN/Prestige firewall rule that forwards packets from the protected LAN (Subnet 1) to the backup gateway (Subnet 2).

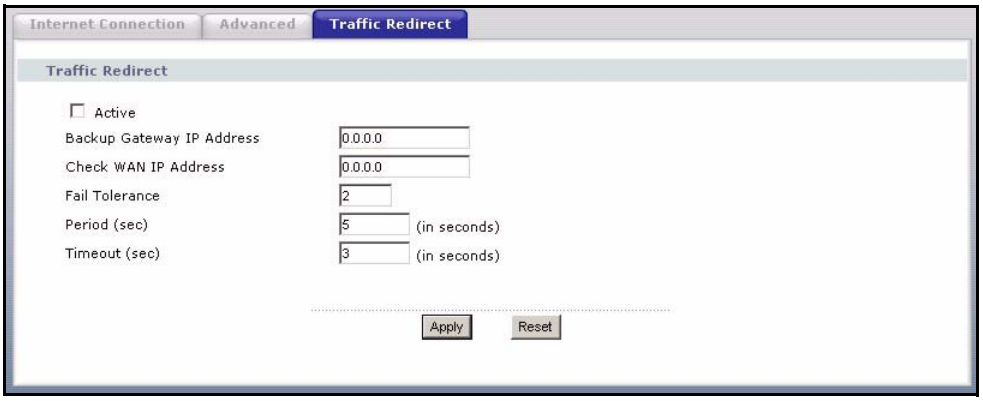
Figure 55 Traffic Redirect LAN Setup



5.7 Traffic Redirect Screen

To change your Prestige's Traffic Redirect settings, click the **WAN** link under **Network** and the **Traffic Redirect** tab. The screen appears as shown.

Figure 56 WAN: Traffic Redirect



The following table describes the labels in this screen.

Table 46 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.
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 (seconds)	Type the number of seconds for the Prestige to wait between checks to see if it can connect to the WAN IP address (**Check WAN IP Address** field) or default gateway. Allow more time if your destination IP address handles lots of traffic.
Timeout (seconds)	Type the number of seconds for your Prestige to wait for a ping response from the IP Address in the **Check WAN IP Address** field before it times out. The WAN connection is considered "down" after the Prestige times out the number of times specified in the **Fail Tolerance** field. Use a higher value in this field if your network is busy or congested.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to begin configuring this screen afresh.

CHAPTER 6
LAN

This chapter describes how to configure LAN settings.

6.1 LAN Overview

Local Area Network (LAN) is a shared communication system to which many computers are attached. The LAN screens can help you configure a LAN DHCP server, manage IP addresses, and partition your physical network into logical networks.

6.1.1 IP Pool Setup

The Prestige is pre-configured with a pool of 32 IP addresses starting from 192.168.1.33 to 192.168.1.64. This configuration leaves 31 IP addresses (excluding the Prestige itself) in the lower range for other server computers, for instance, servers for mail, FTP, TFTP, web, etc., that you may have.

6.1.2 System DNS Servers

Refer to the IP Address and Subnet Mask section in the **Connection Wizard** chapter.

6.2 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.

6.2.1 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.

6.2.2 IP Address and Subnet Mask

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

6.2.3 RIP Setup

RIP (Routing Information Protocol, RFC 1058 and RFC 1389) allows a router to exchange routing information with other routers. **RIP Direction** controls the sending and receiving of RIP packets. When set to **Both** or **Out Only**, the Prestige will broadcast its routing table periodically. When set to **Both** or **In Only**, it will incorporate the RIP information that it receives; when set to **None**, it will not send any RIP packets and will ignore any RIP packets received.

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

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

6.2.4 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.

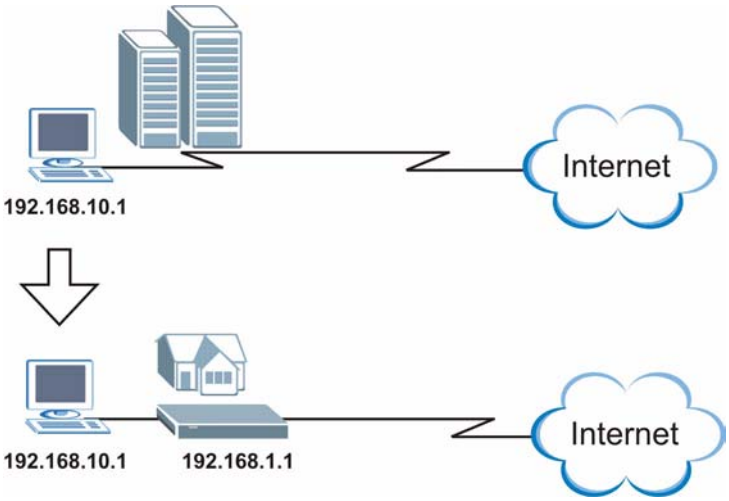
6.3 Any IP

Traditionally, you must set the IP addresses and the subnet masks of a computer and the Prestige to be in the same subnet to allow the computer to access the Internet (through the Prestige). In cases where your computer is required to use a static IP address in another network, you may need to manually configure the network settings of the computer every time you want to access the Internet via the Prestige.

With the Any IP feature and NAT enabled, the Prestige allows a computer to access the Internet without changing the network settings (such as IP address and subnet mask) of the computer, when the IP addresses of the computer and the Prestige are not in the same subnet. Whether a computer is set to use a dynamic or static (fixed) IP address, you can simply connect the computer to the Prestige and access the Internet.

The following figure depicts a scenario where a computer is set to use a static private IP address in the corporate environment. In a residential house where a Prestige is installed, you can still use the computer to access the Internet without changing the network settings, even when the IP addresses of the computer and the Prestige are not in the same subnet.

Figure 57 Any IP Example Application



The Any IP feature does not apply to a computer using either a dynamic IP address or a static IP address that is in the same subnet as the Prestige's IP address.

Note: You *must* enable NAT to use the Any IP feature on the Prestige.

6.3.1 How Any IP Works

Address Resolution Protocol (ARP) is a protocol for mapping an Internet Protocol address (IP address) to a physical machine address, also known as a Media Access Control or MAC address, on the local area network. IP routing table is defined on IP Ethernet devices (the Prestige) to decide which hop to use, to help forward data along to its specified destination.

The following lists out the steps taken, when a computer tries to access the Internet for the first time through the Prestige.

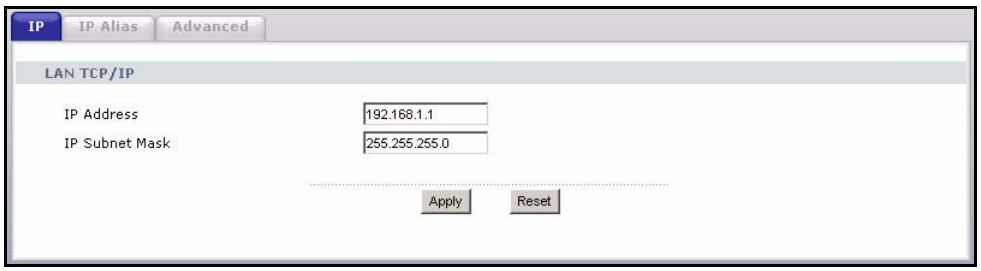
1. When a computer (which is in a different subnet) first attempts to access the Internet, it sends packets to its default gateway (which is not the Prestige) by looking at the MAC address in its ARP table.
2. When the computer cannot locate the default gateway, an ARP request is broadcast on the LAN.
3. The Prestige receives the ARP request and replies to the computer with its own MAC address.
4. The computer updates the MAC address for the default gateway to the ARP table. Once the ARP table is updated, the computer is able to access the Internet through the Prestige.
5. When the Prestige receives packets from the computer, it creates an entry in the IP routing table so it can properly forward packets intended for the computer.

After all the routing information is updated, the computer can access the Prestige and the Internet as if it is in the same subnet as the Prestige.

6.4 IP Screen

Click the **LAN** link under **Network** to open the **IP** screen.

Figure 58 LAN IP



The following table describes the labels in this screen.

Table 47 LAN IP

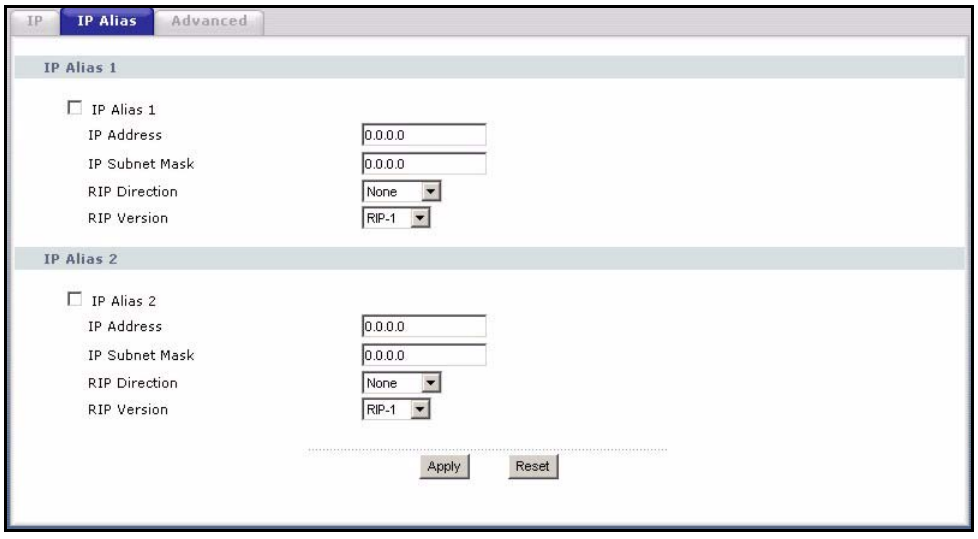
LABEL	DESCRIPTION
LAN TCP/IP	
IP Address	Type the IP address of your Prestige in dotted decimal notation 192.168.1.1 (factory default).
IP Subnet Mask	The subnet mask specifies the network number portion of an IP address. Your Prestige will automatically calculate the subnet mask based on the IP address that you assign. Unless you are implementing subnetting, use the subnet mask computed by the Prestige 255.255.255.0.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to begin configuring this screen afresh.

6.5 LAN 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.

To change your Prestige's IP Alias settings, click the **LAN** link under **Network** and the **IP Alias** tab. The screen appears as shown.

Figure 59 LAN IP Alias



The following table describes the labels in this screen.

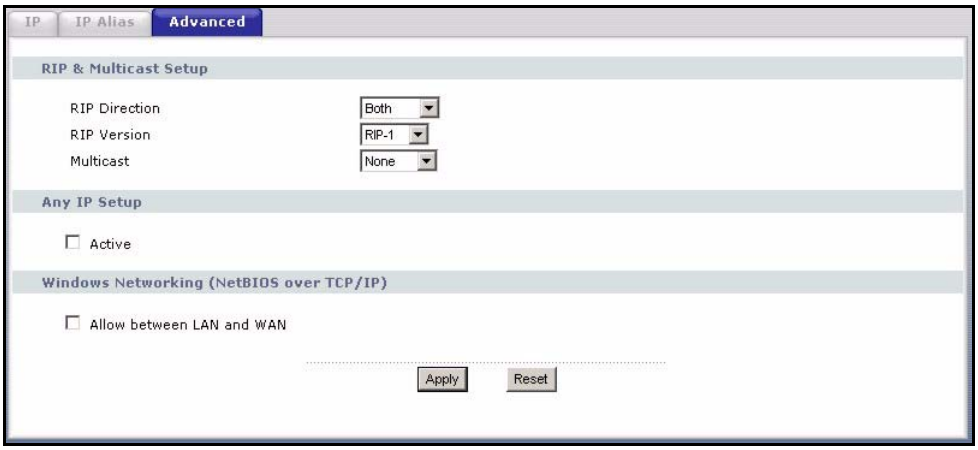
Table 48 LAN IP Alias

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.
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 **RIP Direction** field controls the sending and receiving of RIP packets. Select the RIP direction from **Both**/**In Only**/**Out Only**/**None**. When set to **Both** or **Out Only**, the Prestige will broadcast its routing table periodically. When set to **Both** or **In Only**, it will incorporate the RIP information that it receives; when set to **None**, it will not send any RIP packets and will ignore any RIP packets received.
RIP Version	The **RIP Version** field controls the format and the broadcasting method of the RIP packets that the Prestige sends (it recognizes both formats when receiving). **RIP-1** is universally supported but RIP-2 carries more information. RIP-1 is probably adequate for most networks, unless you have an unusual network topology. Both **RIP-2B** and **RIP-2M** sends the routing data in RIP-2 format; the difference being that **RIP-2B** uses subnet broadcasting while **RIP-2M** uses multicasting. Multicasting can reduce the load on non-router machines since they generally do not listen to the RIP multicast address and so will not receive the RIP packets. However, if one router uses multicasting, then all routers on your network must use multicasting, also. By default, RIP direction is set to **Both** and the Version set to **RIP-1**.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to begin configuring this screen afresh.

6.6 Advanced LAN Screen

To change your Prestige's advanced IP settings, click the **LAN** link under **Network** and the **Advanced** tab. The screen appears as shown.

Figure 60 Advanced



The following table describes the labels in this screen.

Table 49 Advanced

LABEL	DESCRIPTION
RIP Direction	RIP (Routing Information Protocol, RFC1058 and RFC 1389) allows a router to exchange routing information with other routers. The **RIP Direction** field controls the sending and receiving of RIP packets. Select the RIP direction from **Both**/**In Only**/**Out Only**/**None**. When set to **Both** or **Out Only**, the Prestige will broadcast its routing table periodically. When set to **Both** or **In Only**, it will incorporate the RIP information that it receives; when set to **None**, it will not send any RIP packets and will ignore any RIP packets received. **Both** is the default.
RIP Version	The **RIP Version** field controls the format and the broadcasting method of the RIP packets that the Prestige sends (it recognizes both formats when receiving). **RIP-1** is universally supported but RIP-2 carries more information. RIP-1 is probably adequate for most networks, unless you have an unusual network topology. Both **RIP-2B** and **RIP-2M** sends the routing data in RIP-2 format; the difference being that **RIP-2B** uses subnet broadcasting while **RIP-2M** uses multicasting. Multicasting can reduce the load on non-router machines since they generally do not listen to the RIP multicast address and so will not receive the RIP packets. However, if one router uses multicasting, then all routers on your network must use multicasting, also. By default, RIP direction is set to **Both** and the Version set to **RIP-1**.
Multicast	Select **IGMP V-1** or **IGMP V-2** or **None**. 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.
Any IP Setup	
Active	Select this option to activate the Any-IP feature. This allows a computer to access the Internet without changing the network settings (such as IP address and subnet mask) of the computer, even when the IP addresses of the computer and the Prestige are not in the same subnet. When you disable the Any-IP feature, only computers with dynamic IP addresses or static IP addresses in the same subnet as the Prestige's LAN IP address can connect to the Prestige or access the Internet through the Prestige.

Table 49 Advanced

LABEL	DESCRIPTION
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. If your firewall is enabled with the default policy set to block WAN to LAN traffic, you also need to enable the default WAN to LAN firewall rule that forwards NetBIOS traffic. Clear this check box to block all NetBIOS packets going from the LAN to the WAN and from the WAN to the LAN.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to begin configuring this screen afresh.

CHAPTER 7
DHCP Server

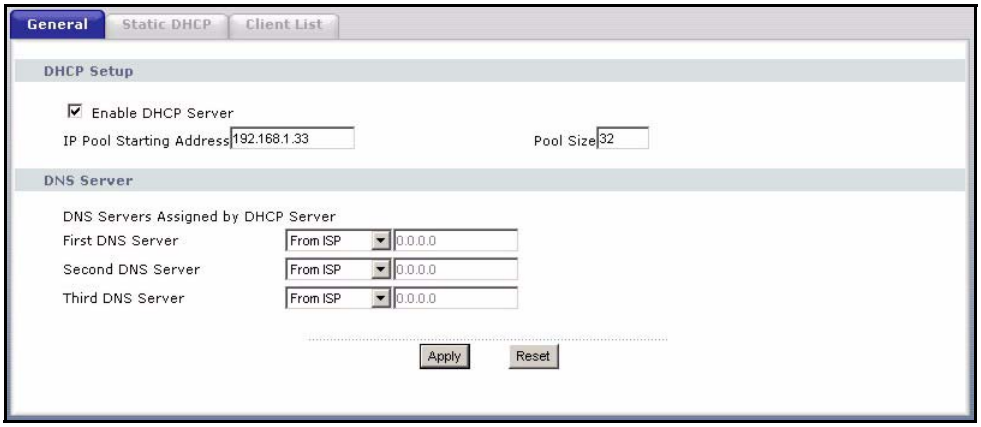
7.1 DHCP

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

7.2 DHCP Screen

Click the **DHCP Server** link under **Network** and the **General** tab. The following screen displays.

Figure 61 General



The following table describes the labels in this screen.

Table 50 General

LABEL	DESCRIPTION
Enable DHCP Server	DHCP (Dynamic Host Configuration Protocol, RFC 2131 and RFC 2132) allows individual clients (computers) to obtain TCP/IP configuration at startup from a server. Leave the **Enable DHCP Server** check box selected unless your ISP instructs you to do otherwise. Clear it to disable the Prestige acting as a DHCP server. When configured as a server, the Prestige provides TCP/IP configuration for the clients. If not, DHCP service is disabled and you must have another DHCP server on your LAN, or else the computers must be manually configured. When set as a server, fill in the following four fields.
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 **DHCP Server** check box. When you clear the **DHCP Server** 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.	
First DNS Server Second DNS Server Third DNS Server	Select **From ISP** 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 **User-Defined** 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 **User-Defined**, but leave the IP address set to 0.0.0.0, **User-Defined** changes to **None** after you click **Apply**. If you set a second choice to **User-Defined**, and enter the same IP address, the second **User-Defined** changes to **None** after you click **Apply**. Select **DNS Relay** 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 **SYSTEM General** screen) and relays the response back to the computer. You can only select **DNS Relay** for one of the three servers; if you select DNS Relay for a second or third DNS server, that choice changes to **None** after you click **Apply**. Select **None** 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.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to begin configuring this screen afresh.

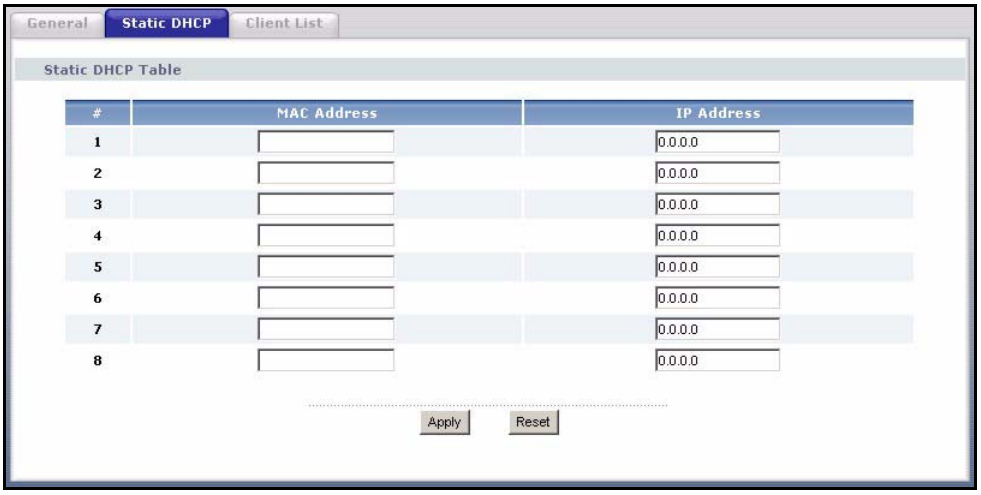
7.3 Static DHCP Screen

This table 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 the **DHCP Server** link under **Network** and the **Static DHCP** tab. The following screen displays.

Figure 62 Static DHCP



The following table describes the labels in this screen.

Table 51 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	Type the LAN IP address of a computer on your LAN.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to begin configuring this screen afresh.

7.4 Client List Screen

The DHCP table shows current DHCP client information (including **IP Address**, **Host Name** and **MAC Address**) of all network clients using the Prestige's DHCP server.

Configure this screen to always assign an IP address to a MAC address (and host name). Click the **DHCP Server** link under **Network** and the **Client List** tab.

Note: You can also view a read-only client list by clicking the **DHCP Table (Details...)** hyperlink in the **Status** screen.

The following screen displays.

Figure 63 Client List

The following table describes the labels in this screen.

Table 52 Client List

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	The MAC (Media Access Control) or Ethernet address on a LAN (Local Area Network) is unique to your computer (six pairs of hexadecimal notation). A network interface card such as an Ethernet adapter has a hardwired address that is assigned at the factory. This address follows an industry standard that ensures no other adapter has a similar address.
Reserve	Select this check box to have the Prestige always assign this IP address to this MAC address (and host name). You can select up to 8 entries in this table. After you click **Apply**, the MAC address and IP address also display in the **Static DHCP** screen (where you can edit them).
Refresh	Click **Refresh** to reload the DHCP table.

CHAPTER 8
Network Address Translation (NAT)

This chapter discusses how to configure NAT on the Prestige.

8.1 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.

8.1.1 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 53 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.

8.1.2 What NAT Does

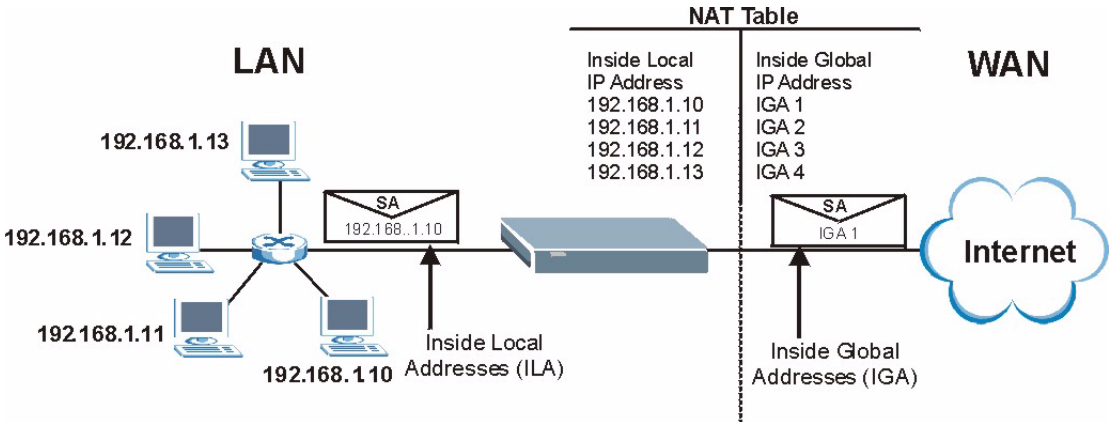
In the simplest form, NAT changes the source IP address in a packet received from a subscriber (the inside local address) to another (the inside global address) before forwarding the packet to the WAN side. When the response comes back, NAT translates the destination address (the inside global address)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

8.1.3 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.

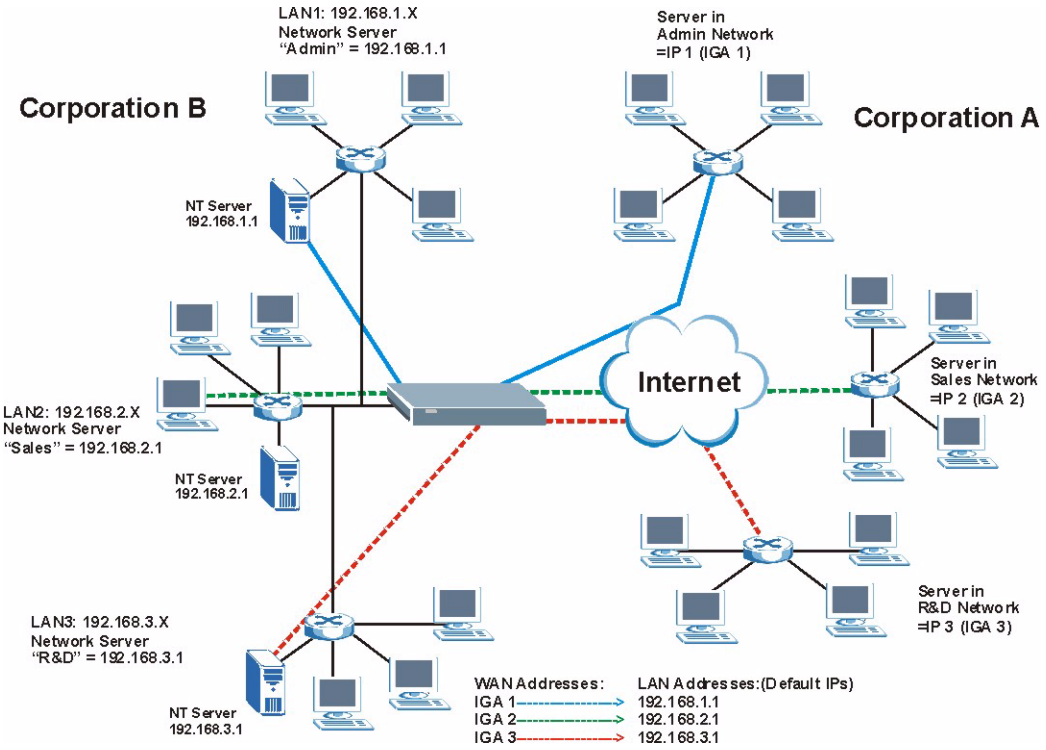
Figure 64 How NAT Works



8.1.4 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 65 NAT Application With IP Alias



8.1.5 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 54 NAT Mapping Types

TYPE	IP MAPPING	SMT ABBREVIATION
One-to-One	ILA1←→ IGA1	1-1
Many-to-One (SUA/PAT)	ILA1←→ IGA1 ILA2←→ IGA1 …	M-1
Many-to-Many Overload	ILA1←→ IGA1 ILA2←→ IGA2 ILA3←→ IGA1 ILA4←→ IGA2 …	M-M Ov
Many 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

8.2 Using NAT

Note: You must create a firewall rule in addition to setting up SUA/NAT, to allow traffic from the WAN to be forwarded through the Prestige.

8.2.1 SUA (Single User Account) Versus NAT

SUA (Single User Account) is a ZyNOS implementation of a subset of NAT that supports two types of mapping, **Many-to-One** and **Server**. 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. You can configure **Full Feature** in the SMT menus only.

8.3 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.

8.3.1 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.

8.3.2 Port Forwarding: Services and Port Numbers

A SUA 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 **Port Forwarding** 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.

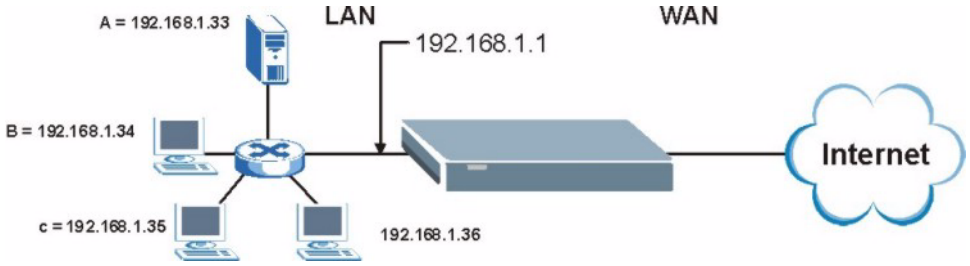
Table 55 Services and Port Numbers

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

8.3.3 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

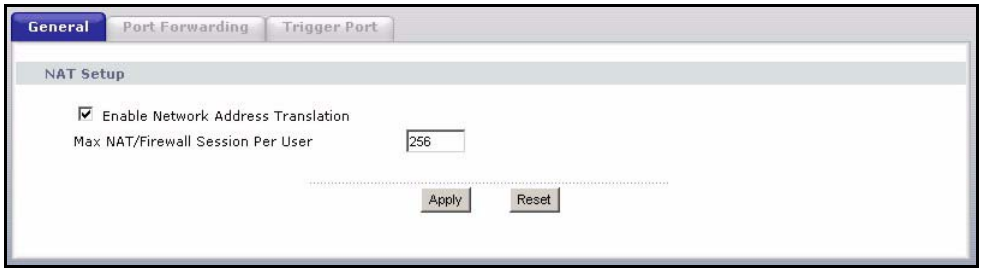
Figure 66 Multiple Servers Behind NAT Example



8.4 General NAT Screen

Click the **NAT** link under **Network** to open the **General** screen.

Figure 67 NAT General



The following table describes the labels in this screen.

Table 56 NAT General

LABEL	DESCRIPTION
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). Select the check box to enable NAT.
Max NAT/Firewall Session Per User	Type a number ranging from 1 to 2048 to limit the number of NAT/firewall sessions that a host can create.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to begin configuring this screen afresh.

8.5 Port Forwarding Screen

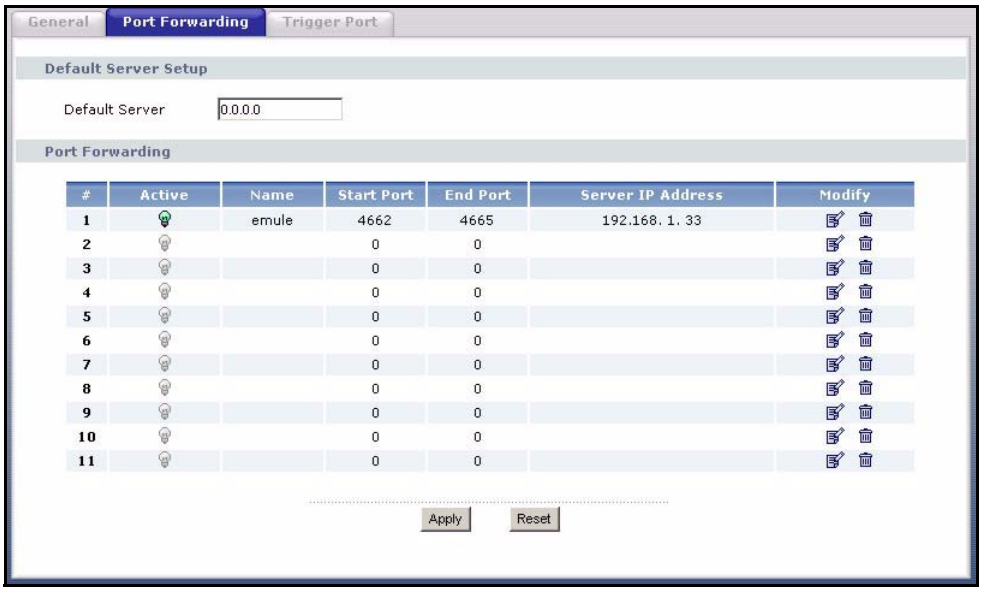
Ordering your rules is important because the Prestige applies the rules in the order that you specify. When a rule matches the current packet, the Prestige takes the corresponding action and the remaining rules are ignored. If there are any empty rules before your new configured rule, your configured 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.

Refer to Table 55 on page 140 for port numbers commonly used for particular services.

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.

To change your Prestige's port forwarding settings, click the **NAT** link under **Network** and the **Port Forwarding** tab. The screen appears as shown.

Figure 68 Port Forwarding



The following table describes the labels in this screen.

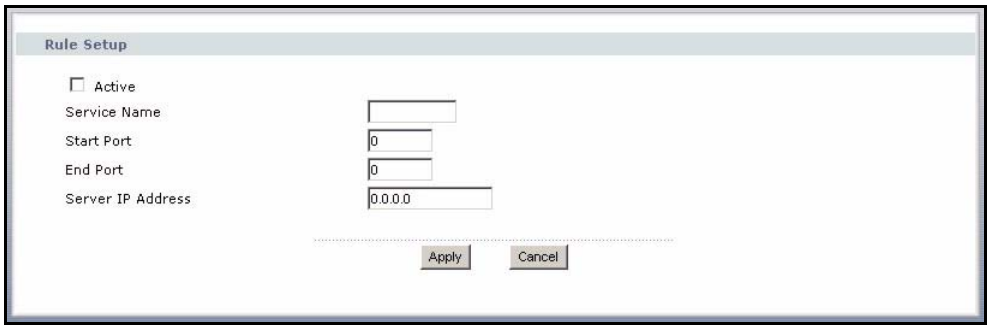
Table 57 Port Forwarding

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 **Default Server** IP Address, the Prestige discards all packets received for ports that are not specified in this screen or remote management.
#	Number of an individual port forwarding server entry.
Active	This icon is turned on when the port forwarding entry is enabled. Select the edit icon under **Modify** and select the **Active** checkbox in the **Rule Setup** screen to enable the port forwarding entry. Clear the checkbox to disable forwarding of these ports to an inside server without having to delete the entry.
Name	This field displays a name to identify this port-forwarding rule.
Start Port	This field displays a start port number.
End Port	This field displays an end port number. If the same port number as the **Start Port** is displayed then a single port is forwarded. If a different number to the **Start Port** number is displayed then a range of ports are forwarded.
Server IP Address	This field displays the inside IP address of the server.
Modify	Click the **Edit** icon to open the **Rule Setup** screen. Modify an existing rule or create a new rule in the **Rule Setup** screen. Click the **Remove** icon to delete a rule.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to begin configuring this screen afresh.

8.5.1 Port Forwarding Rule Setup

To edit a port forwarding rule, click the edit icon under **Modify**. The following screen displays.

Figure 69 Port Forwarding Rule Setup



The following table describes the labels in this screen.

Table 58 Port Forwarding Rule Setup

LABEL	DESCRIPTION
Active	Select the check box to enable this port forwarding entry. Clear the checkbox to disallow forwarding of these ports to an inside server without having to delete the entry.
Service Name	Type a name to identify this port-forwarding rule.
Start Port	Type a start port number. To forward only one port, enter it again in the **End Port** field. To specify a range of ports, enter the last port to be forwarded in the **End Port** field.
End Port	Type an end port number.
Server IP Address	Type the inside IP address of the server.
Apply	Click **Apply** to save your changes back to the Prestige.
Cancel	Click **Cancel** to return to the previous screen and not save your changes.

8.6 Trigger Port Forwarding

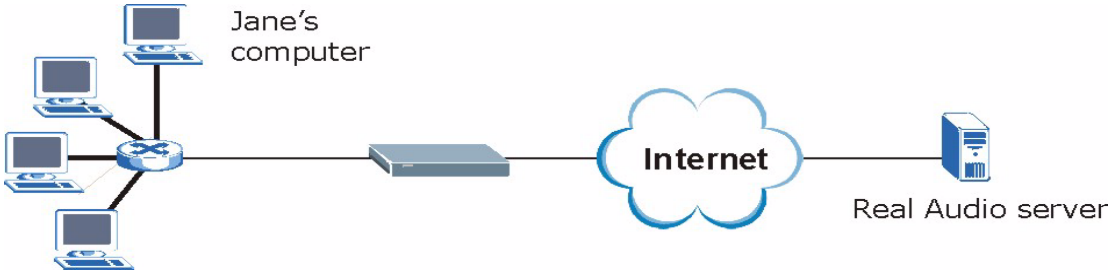
Some services use a dedicated range of ports on the client side and a dedicated range of ports on the server side. With regular port forwarding you set a forwarding port in NAT to forward a service (coming in from the server on the WAN) to the IP address of a computer on the client side (LAN). The problem 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.

8.6.1 Trigger Port Forwarding Example

The following is an example of trigger port forwarding.

Figure 70 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).

8.6.2 Two Points To Remember About Trigger Ports

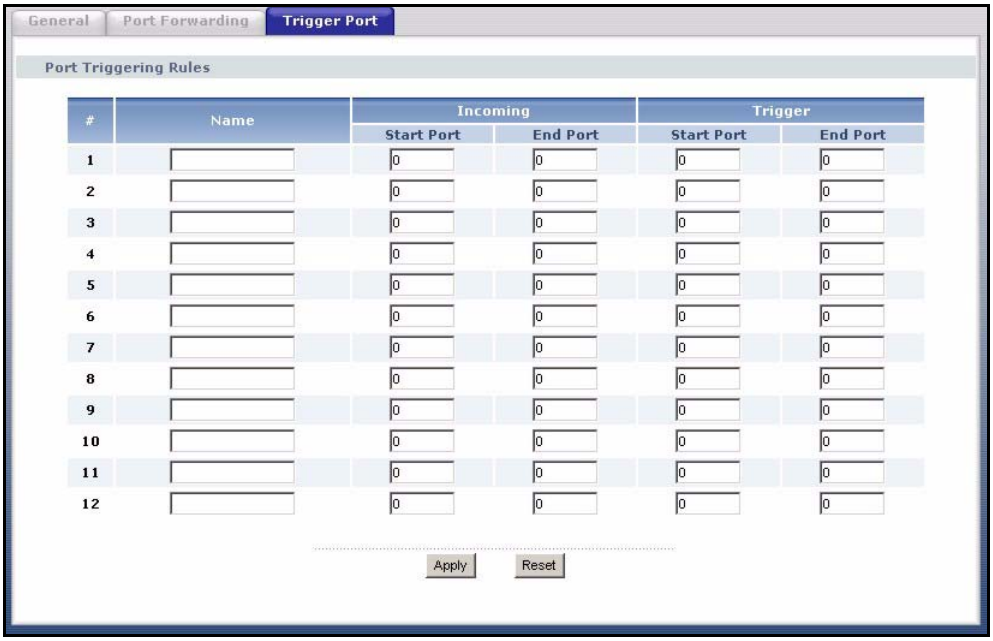
1. Trigger events only happen on data that is going coming from inside the Prestige and going to the outside.
2. If an application needs a continuous data stream, that port (range) will be tied up so that another computer on the LAN can't trigger it.

8.7 Trigger Port Forwarding Screen

To change your Prestige's trigger port settings, click the **NAT** link under **Network** 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 71 Trigger Port



The following table describes the labels in this screen.

Table 59 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 **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to begin configuring this screen afresh.

CHAPTER 9
Firewall

This chapter gives some background information on firewalls and explains how to get started with the Prestige firewall.

9.1 Introduction to Firewall

9.1.1 What is a Firewall?

Originally, the term *firewall* referred to a construction technique designed to prevent the spread of fire from one room to another. The networking term "firewall" is a system or group of systems that enforces an access-control policy between two networks. It may also be defined as a mechanism used to protect a trusted network from an untrusted network. Of course, firewalls cannot solve every security problem. A firewall is one of the mechanisms used to establish a network security perimeter in support of a network security policy. It should never be the only mechanism or method employed. For a firewall to guard effectively, you must design and deploy it appropriately. This requires integrating the firewall into a broad information-security policy. In addition, specific policies must be implemented within the firewall itself.

9.1.2 Stateful Inspection Firewall.

Stateful inspection firewalls restrict access by screening data packets against defined access rules. They make access control decisions based on IP address and protocol. They also "inspect" the session data to assure the integrity of the connection and to adapt to dynamic protocols. These firewalls generally provide the best speed and transparency; however, they may lack the granular application level access control or caching that some proxies support. Firewalls, of one type or another, have become an integral part of standard security solutions for enterprises.

9.1.3 About the Prestige Firewall

The Prestige firewall is a stateful inspection firewall and is designed to protect against Denial of Service attacks when activated (click the **General** tab under **Firewall** and then click the **Enable Firewall** check box). The Prestige's purpose is to allow a private Local Area Network (LAN) to be securely connected to the Internet. The Prestige can be used to prevent theft, destruction and modification of data, as well as log events, which may be important to the security of your network.

The Prestige is installed between the LAN and a broadband modem connecting to the Internet. This allows it to act as a secure gateway for all data passing between the Internet and the LAN.

The Prestige has one Ethernet WAN port and four Ethernet LAN ports, which are used to physically separate the network into two areas.The WAN (Wide Area Network) port attaches to the broadband (cable or DSL) modem to the Internet.

The LAN (Local Area Network) port attaches to a network of computers, which needs security from the outside world. These computers will have access to Internet services such as e-mail, FTP and the World Wide Web. However, "inbound access" is not allowed (by default) unless the remote host is authorized to use a specific service.

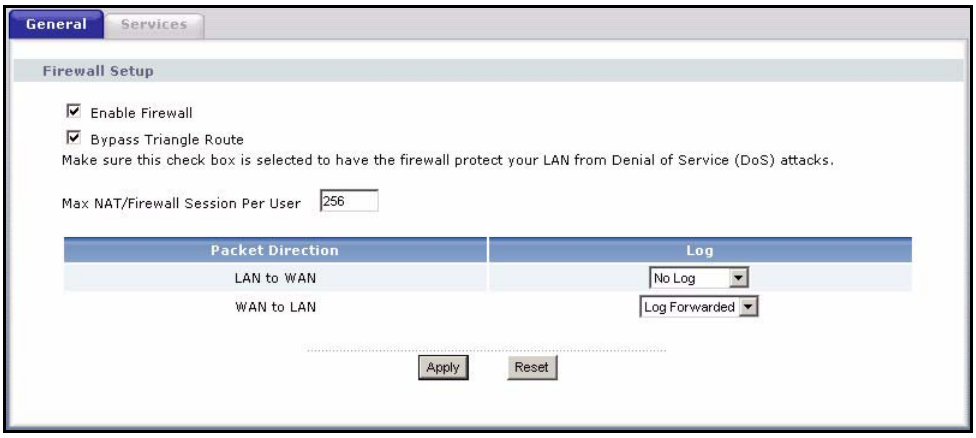
9.1.4 Guidelines For Enhancing Security With Your Firewall

1. Change the default password via web configurator.
2. Think about access control before you connect to the network in any way, including attaching a modem to the port.
3. Limit who can access your router.
4. Don't enable any local service (such as SNMP or NTP) that you don't use. Any enabled service could present a potential security risk. A determined hacker might be able to find creative ways to misuse the enabled services to access the firewall or the network.
5. For local services that are enabled, protect against misuse. Protect by configuring the services to communicate only with specific peers, and protect by configuring rules to block packets for the services at specific interfaces.
6. Protect against IP spoofing by making sure the firewall is active.
7. Keep the firewall in a secured (locked) room.

9.2 General Firewall Screen

Click the **Firewall** link under **Security** to open the **General** screen.

Figure 72 General



The following table describes the labels in this screen.

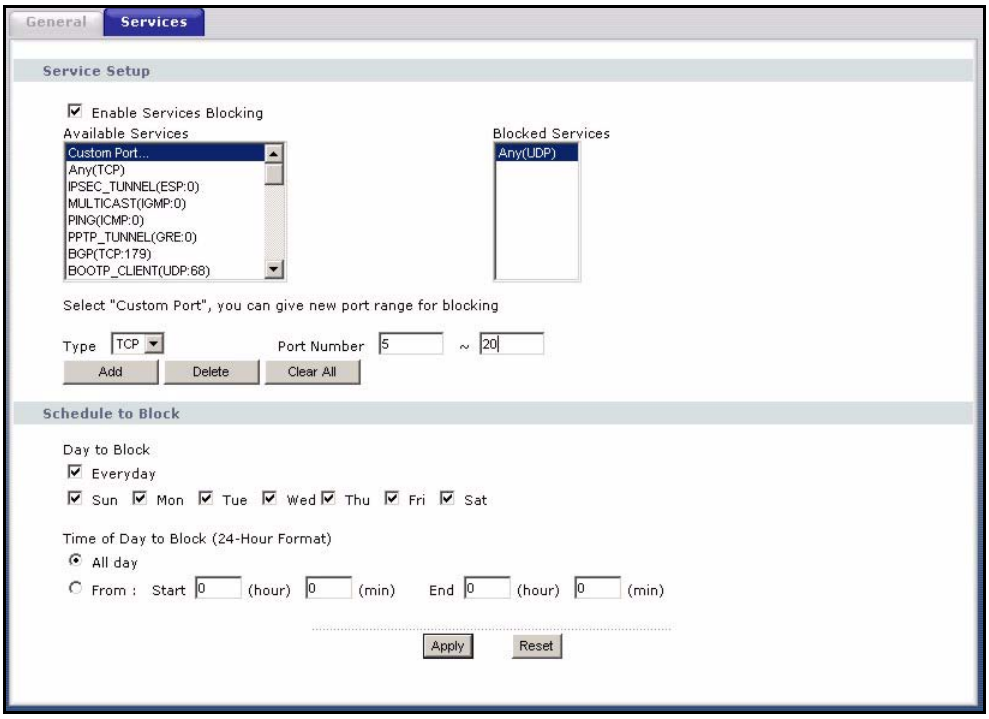
Table 60 Firewall General

LABEL	DESCRIPTION
Enable Firewall	Select this check box to activate the firewall. The Prestige performs access control and protects against Denial of Service (DoS) attacks when the firewall is activated.
Bypass Triangle Route	Select this check box to have the Prestige firewall ignore the use of triangle route topology on the network. See the appendix for more on triangle route topology.
Max NAT/Firewall Session Per User	Type a number ranging from 1 to 2048 to limit the number of NAT/firewall sessions that a host can create.
LAN to WAN	To log packets related to firewall rules, make sure that **Access Control** under **Log** is selected in the **Logs**, **Log Settings** screen.
Log	Choose what **LAN to WAN** packets to log. Choose from: **No Log** **Log Blocked** (blocked LAN to WAN services which appear in the **Blocked Services** textbox in the **Services** screen (with **Enable Services Blocking** selected)) **Log All** (log all **LAN to WAN** packets)
WAN to LAN	To log packets related to firewall rules, make sure that **Access Control** under **Log** is selected in the **Logs**, **Log Settings** screen.
Log	Choose what **WAN to LAN** and WAN to WAN/Prestige packets to log. Choose from: **No Log** **Log Forwarded** (see how to forward WAN to LAN traffic in the next section) **Log All** (log all **WAN to LAN** packets).
Apply	Click **Apply** to save the settings.
Reset	Click **Reset** to start configuring this screen again.

9.3 Services Screen

Click the **Firewall** link under **Security** and the **Services** tab. The screen appears as shown next. Use this screen to enable service blocking, enter/delete/modify the services you want to block and the date/time you want to block them.

Figure 73 Services



The following table describes the labels in this screen.

Table 61 Firewall Services

LABEL	DESCRIPTION
Enable Services Blocking	Select this check box to enable this feature.
Available Service	This is a list of pre-defined services (ports) you may prohibit your LAN computers from using. Select the port you want to block using the drop-down list and click **Add** to add the port to the **Blocked Service** field.
Blocked Service	This is a list of services (ports) that will be inaccessible to computers on your LAN once you enable service blocking.
Custom Port	A custom port is a service that is not available in the pre-defined **Available Services** list and you must define using the next two fields.
Type	Choose the IP port (**TCP** or **UDP**) that defines your customized port from the drop down list box.
Port Number	Enter the port number range that defines the service. For example, if you want to define the Gnutella service, then select **TCP** type and enter a port range from 6345 to 6349.
Add	Select a service from the **Available Services** drop-down list and then click **Add** to add a service to the **Blocked Service**.
Delete	Select a service from the **Blocked Services** list and then click **Delete** to remove this service from the list.
Clear All	Click **Clear All** to empty the **Blocked Service**.
Day to Block:	Select a check box to configure which days of the week (or everyday) you want the content filtering to be active.

Table 61 Firewall Services

LABEL	DESCRIPTION
Time of Day to Block (24-Hour Format)	Select the time of day you want service blocking to take effect. Configure blocking to take effect all day by selecting the **All Day** check box. You can also configure specific times that by entering the start time in the **Start (hour)** and **Start (min)** fields and the end time in the **End (hour)** and **End (min)** fields. Enter times in 24-hour format, for example, "3:00pm" should be entered as "15:00".
Apply	Click **Apply** to save the settings.
Reset	Click **Reset** to start configuring this screen again.

CHAPTER 10
Content Filtering

This chapter provides a brief overview of content filtering using the embedded web GUI.

10.1 Introduction to Content Filtering

Internet content filtering allows you to create and enforce Internet access policies tailored to their needs. Content filtering is the ability to block certain web features or specific URL keywords and should not be confused with packet filtering via SMT menu 21.1.

10.2 Restrict Web Features

The Prestige can block web features such as ActiveX controls, Java applets, cookies and disable web proxies.

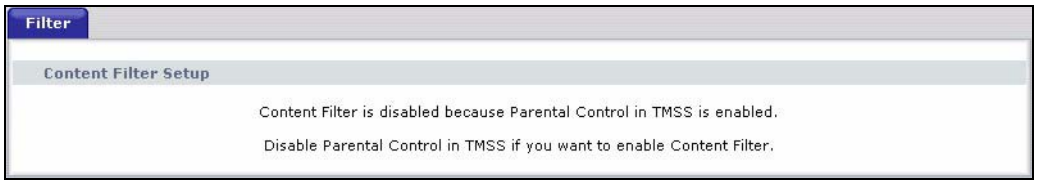
10.3 Days and Times

The Prestige also allows you to define time periods and days during which the Prestige performs content filtering.

10.4 Filter Screen

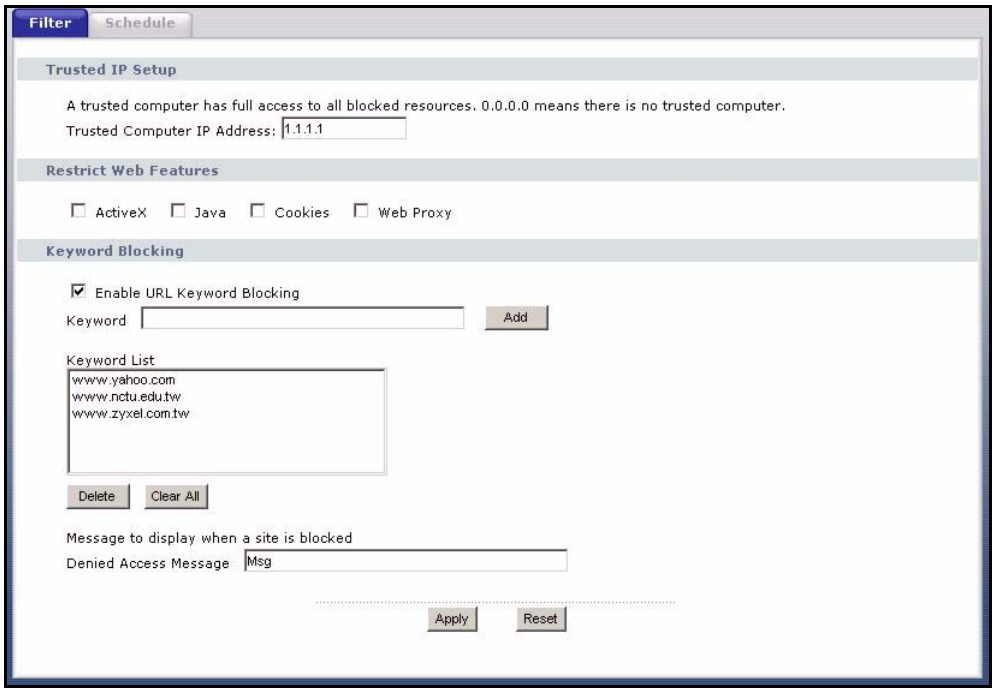
Click the **Content Filter** link under **Security** to open the **Filter** screen. You will see the following message if **Parental Control** in TMSS is enabled. If you want to use content filtering, you must disable **Parental Control**.

Figure 74 Content Filter Disabled



Once you disable **Parental Control**, you can configure the **Content Filter** screen as shown in the following figure.

Figure 75 Content Filter: Filter



The following table describes the labels in this screen.

Table 62 Content Filter: Filter

LABEL	DESCRIPTION
Trusted IP Setup	To enable this feature, type an IP address of any one of the computers in your network that you want to have as a trusted computer. This allows the trusted computer to have full access to all features that are configured to be blocked by content filtering. Leave this field blank to have no trusted computers.
Restrict Web Features	Select the box(es) to restrict a feature. When you download a page containing a restricted feature, that part of the web page will appear blank or grayed out.
ActiveX	A tool for building dynamic and active Web pages and distributed object applications. When you visit an ActiveX Web site, ActiveX controls are downloaded to your browser, where they remain in case you visit the site again.
Java	A programming language and development environment for building downloadable Web components or Internet and intranet business applications of all kinds.
Cookies	Used by Web servers to track usage and provide service based on ID.
Web Proxy	A server that acts as an intermediary between a user and the Internet to provide security, administrative control, and caching service. When a proxy server is located on the WAN it is possible for LAN users to circumvent content filtering by pointing to this proxy server.
Enable URL Keyword Blocking	The Prestige can block Web sites with URLs that contain certain keywords in the domain name or IP address. For example, if the keyword "bad" was enabled, all sites containing this keyword in the domain name or IP address will be blocked, e.g., URL http://www.website.com/bad.html would be blocked. Select this check box to enable this feature.
Keyword	Type a keyword in this field. You may use any character (up to 64 characters). Wildcards are not allowed. You can also enter a numerical IP address.

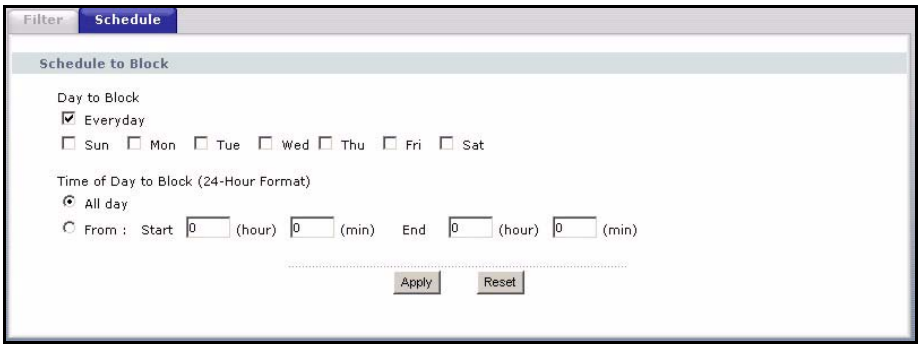
Table 62 Content Filter: Filter

LABEL	DESCRIPTION
Keyword List	This list displays the keywords already added.
Add	Click **Add** after you have typed a keyword. Repeat this procedure to add other keywords. Up to 64 keywords are allowed. When you try to access a web page containing a keyword, you will get a message telling you that the content filter is blocking this request.
Delete	Highlight a keyword in the lower box and click **Delete** to remove it. The keyword disappears from the text box after you click **Apply**.
Clear All	Click this button to remove all of the listed keywords.
Message to display when a site is blocked.	
Denied Access Message	Enter a message to be displayed when a user tries to access a restricted web site. The default message is Please contact your network administrator!!
Apply	Click **Apply** to save your changes.
Reset	Click **Reset** to begin configuring this screen afresh

10.5 Schedule

Click the **Content Filter** link under **Security** and the **Schedule** tab. The following screen displays.

Figure 76 Content Filter: Schedule



The following table describes the labels in this screen.

Table 63 Content Filter: Schedule

LABEL	DESCRIPTION
Day to Block	Select check boxes for the days that you want the Prestige to perform content filtering. Select the **Everyday** check box to have content filtering turned on all days of the week.
Time of Day to Block (24-Hour Format)	Time of Day to Block allows the administrator to define during which time periods content filtering is enabled. Time of Day to Block restrictions only apply to the keywords (see above). Restrict web server data, such as ActiveX, Java, Cookies and Web Proxy are not affected. Enter the time period, in 24-hour format, during which content filtering will be enforced. Select the **All Day** check box to have content filtering always active on the days selected in **Day to Block** with time of day limitations not enforced.
Apply	Click **Apply** to save your customized settings and exit this screen.
Reset	Click **Reset** to begin configuring this screen afresh

10.6 Customizing Keyword Blocking URL Checking

You can use commands to set how much of a website's URL the content filter is to check for keyword blocking. See the appendices for information on how to access and use the command interpreter.

10.6.1 Domain Name or IP Address URL Checking

By default, the Prestige checks the URL's domain name or IP address when performing keyword blocking.

This means that the Prestige checks the characters that come before the first slash in the URL.

For example, with the URL www.zyxel.com.tw/news/pressroom.php, content filtering only searches for keywords within www.zyxel.com.tw.

10.6.2 Full Path URL Checking

Full path URL checking has the Prestige check the characters that come before the last slash in the URL.

For example, with the URL www.zyxel.com.tw/news/pressroom.php, full path URL checking searches for keywords within www.zyxel.com.tw/news/.

Use the `ip urlfilter customize actionFlags 6 [disable | enable]` command to extend (or not extend) the keyword blocking search to include the URL's full path.

10.6.3 File Name URL Checking

Filename URL checking has the Prestige check all of the characters in the URL.

For example, filename URL checking searches for keywords within the URL www.zyxel.com.tw/news/pressroom.php.

Use the `ip urlfilter customize actionFlags 8 [disable | enable]` command to extend (or not extend) the keyword blocking search to include the URL's complete filename.

CHAPTER 11
Introduction to IPSec

This chapter introduces the basics of IPSec VPNs.

11.1 VPN Overview

A VPN (Virtual Private Network) provides secure communications between sites without the expense of leased site-to-site lines. A secure VPN is a combination of tunneling, encryption, authentication, access control and auditing technologies/services used to transport traffic over the Internet or any insecure network that uses the TCP/IP protocol suite for communication.

11.1.1 IPSec

Internet Protocol Security (IPSec) is a standards-based VPN that offers flexible solutions for secure data communications across a public network like the Internet. IPSec is built around a number of standardized cryptographic techniques to provide confidentiality, data integrity and authentication at the IP layer.

11.1.2 Security

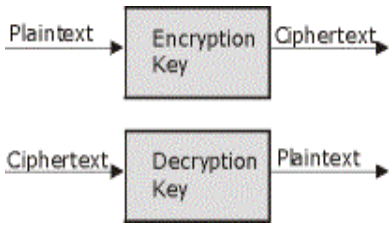
A Security Association (SA) is a contract between two parties indicating what security parameters, such as keys and algorithms they will use.

11.1.3 Other Terminology

11.1.3.1 Encryption

Encryption is a mathematical operation that transforms data from "plaintext" (readable) to "ciphertext" (scrambled text) using a "key". The key and clear text are processed by the encryption operation, which leads to the data scrambling that makes encryption secure. Decryption is the opposite of encryption: it is a mathematical operation that transforms "ciphertext" to plaintext. Decryption also requires a key.

Figure 77 Encryption and Decryption



11.1.3.2 Data Confidentiality

The IPSec sender can encrypt packets before transmitting them across a network.

11.1.3.3 Data Integrity

The IPSec receiver can validate packets sent by the IPSec sender to ensure that the data has not been altered during transmission.

11.1.3.4 Data Origin Authentication

The IPSec receiver can verify the source of IPSec packets. This service depends on the data integrity service.

11.1.4 VPN Applications

The Prestige supports the following VPN applications.

- Linking Two or More Private Networks Together

  Connect branch offices and business partners over the Internet with significant cost savings and improved performance when compared to leased lines between sites.

- Accessing Network Resources When NAT Is Enabled

  When NAT is enabled, remote users are not able to access hosts on the LAN unless the host is designated a public LAN server for that specific protocol. Since the VPN tunnel terminates inside the LAN, remote users will be able to access all computers that use private IP addresses on the LAN.

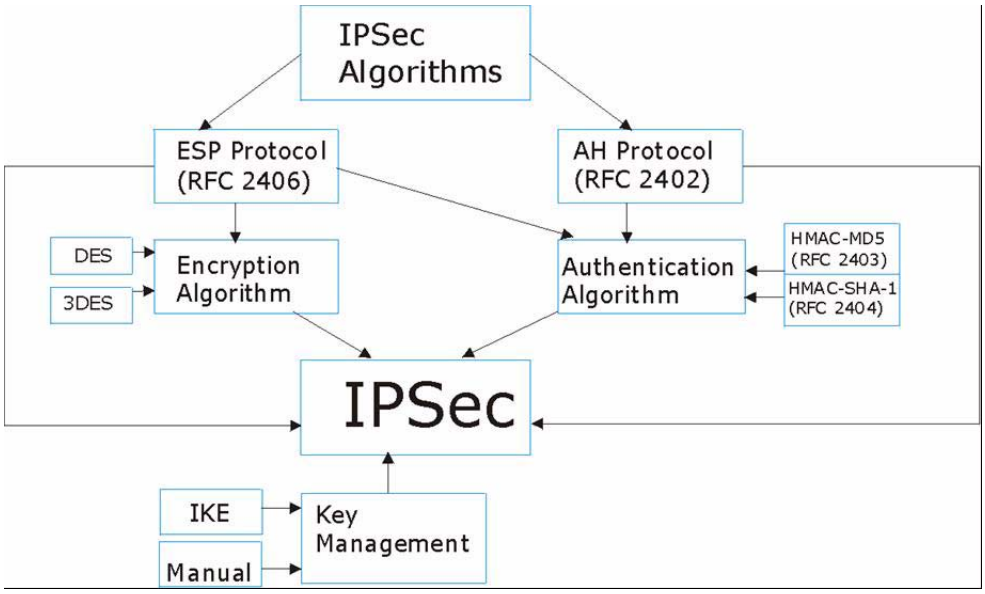
- Unsupported IP Applications

  A VPN tunnel may be created to add support for unsupported emerging IP applications. See the chapter on Getting to Know Your Prestige for an example of a VPN application.

11.2 IPSec Architecture

The overall IPSec architecture is shown as follows.

Figure 78 IPSec Architecture



11.2.1 IPSec Algorithms

The **ESP** (Encapsulating Security Payload) Protocol (RFC 2406) and **AH** (Authentication Header) protocol (RFC 2402) describe the packet formats and the default standards for packet structure (including implementation algorithms).

The Encryption Algorithm describes the use of encryption techniques such as DES (Data Encryption Standard) and Triple DES algorithms.

The Authentication Algorithms, HMAC-MD5 (RFC 2403) and HMAC-SHA-1 (RFC 2404, provide an authentication mechanism for the **AH** and **ESP** protocols. Please see Section 12.2 on page 165 for more information.

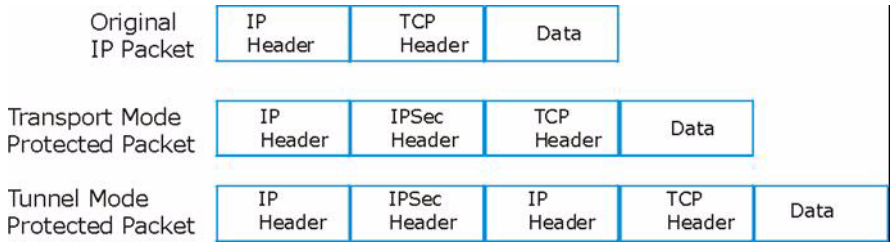
11.2.2 Key Management

Key management allows you to determine whether to use IKE (ISAKMP) or manual key configuration in order to set up a VPN.

11.3 Encapsulation

The two modes of operation for IPSec VPNs are **Transport** mode and **Tunnel** mode.

Figure 79 Transport and Tunnel Mode IPSec Encapsulation



11.3.1 Transport Mode

Transport mode is used to protect upper layer protocols and only affects the data in the IP packet. In **Transport** mode, the IP packet contains the security protocol (**AH** or **ESP**) located after the original IP header and options, but before any upper layer protocols contained in the packet (such as TCP and UDP).

With **ESP,** protection is applied only to the upper layer protocols contained in the packet. The IP header information and options are not used in the authentication process. Therefore, the originating IP address cannot be verified for integrity against the data.

With the use of **AH** as the security protocol, protection is extended forward into the IP header to verify the integrity of the entire packet by use of portions of the original IP header in the hashing process.

11.3.2 Tunnel Mode

Tunnel mode encapsulates the entire IP packet to transmit it securely. A **Tunnel** mode is required for gateway services to provide access to internal systems. **Tunnel** mode is fundamentally an IP tunnel with authentication and encryption. This is the most common mode of operation. **Tunnel** mode is required for gateway to gateway and host to gateway communications. **Tunnel** mode communications have two sets of IP headers:

- **Outside header**: The outside IP header contains the destination IP address of the VPN gateway.
- **Inside header**: The inside IP header contains the destination IP address of the final system behind the VPN gateway. The security protocol appears after the outer IP header and before the inside IP header.

11.4 IPSec and NAT

Read this section if you are running IPSec on a host computer behind the Prestige.

NAT is incompatible with the **AH** protocol in both **Transport** and **Tunnel** mode. An IPSec VPN using the **AH** protocol digitally signs the outbound packet, both data payload and headers, with a hash value appended to the packet. When using **AH** protocol, packet contents (the data payload) are not encrypted.

A NAT device in between the IPSec endpoints will rewrite either the source or destination address with one of its own choosing. The VPN device at the receiving end will verify the integrity of the incoming packet by computing its own hash value, and complain that the hash value appended to the received packet doesn't match. The VPN device at the receiving end doesn't know about the NAT in the middle, so it assumes that the data has been maliciously altered.

IPSec using **ESP** in **Tunnel** mode encapsulates the entire original packet (including headers) in a new IP packet. The new IP packet's source address is the outbound address of the sending VPN gateway, and its destination address is the inbound address of the VPN device at the receiving end. When using **ESP** protocol with authentication, the packet contents (in this case, the entire original packet) are encrypted. The encrypted contents, but not the new headers, are signed with a hash value appended to the packet.

Tunnel mode **ESP** with authentication is compatible with NAT because integrity checks are performed over the combination of the "original header plus original payload," which is unchanged by a NAT device. **Transport** mode **ESP** with authentication is not compatible with NAT, although NAT traversal provides a way to use **Transport** mode **ESP** when there is a NAT router between the IPSec endpoints (see Section 12.7 on page 169 for details).

Table 64 VPN and NAT

SECURITY PROTOCOL	MODE	NAT
AH	Transport	N
AH	Tunnel	N
ESP	Transport	N
ESP	Tunnel	Y

CHAPTER 12
VPN Screens

This chapter introduces the VPN web configurator. See the chapter on logs for information on viewing logs and the Appendices for IPSec log descriptions.

12.1 VPN/IPSec Overview

Use the screens documented in this chapter to configure rules for VPN connections and manage VPN connections.

12.2 IPSec Algorithms

The **ESP** and **AH** protocols are necessary to create a Security Association (SA), the foundation of an IPSec VPN. An SA is built from the authentication provided by the **AH** and **ESP** protocols. The primary function of key management is to establish and maintain the SA between systems. Once the SA is established, the transport of data may commence.

12.2.1 AH (Authentication Header) Protocol

AH protocol (RFC 2402) was designed for integrity, authentication, sequence integrity (replay resistance), and non-repudiation but not for confidentiality, for which the **ESP** was designed.

In applications where confidentiality is not required or not sanctioned by government encryption restrictions, an **AH** can be employed to ensure integrity. This type of implementation does not protect the information from dissemination but will allow for verification of the integrity of the information and authentication of the originator.

12.2.2 ESP (Encapsulating Security Payload) Protocol

The **ESP** protocol (RFC 2406) provides encryption as well as the services offered by AH. **ESP** authenticating properties are limited compared to the AH due to the non-inclusion of the IP header information during the authentication process. However, **ESP** is sufficient if only the upper layer protocols need to be authenticated.

An added feature of the **ESP** is payload padding, which further protects communications by concealing the size of the packet being transmitted.

.

Table 65 AH and ESP

	ESP	AH
Encryption	**DES** (default) Data Encryption Standard (DES) is a widely used method of data encryption using a secret key. DES applies a 56-bit key to each 64-bit block of data.	
	3DES Triple DES (3DES) is a variant of DES, which iterates three times with three separate keys (3 x 56 = 168 bits), effectively doubling the strength of DES.	
	AES Advanced Encryption Standard is a newer method of data encryption that also uses a secret key. This implementation of AES applies a 128-bit key to 128-bit blocks of data. AES is faster than 3DES.	
	Select NULL to set up a phase 2 tunnel without encryption.	
Authentication	**MD5** (default) MD5 (Message Digest 5) produces a 128-bit digest to authenticate packet data.	**MD5** (default) MD5 (Message Digest 5) produces a 128-bit digest to authenticate packet data.
	SHA1 SHA1 (Secure Hash Algorithm) produces a 160-bit digest to authenticate packet data.	**SHA1** SHA1 (Secure Hash Algorithm) produces a 160-bit digest to authenticate packet data.

12.3 My IP Address

My IP Address is the WAN IP address of the Prestige. If this field is configured as 0.0.0.0, then the Prestige will use the current Prestige WAN IP address (static or dynamic) to set up the VPN tunnel. The Prestige has to rebuild the VPN tunnel if the **My IP Address** changes after setup.

12.4 Secure Gateway Address

Secure Gateway Address is the WAN IP address or domain name of the remote IPSec router (secure gateway).

If the remote secure gateway has a static WAN IP address, enter it in the **Secure Gateway Address** field. You may alternatively enter the remote secure gateway's domain name (if it has one) in the **Secure Gateway Address** field.

You can also enter a remote secure gateway's domain name in the **Secure Gateway Address** field if the remote secure gateway has a dynamic WAN IP address and is using DDNS. The Prestige has to rebuild the VPN tunnel each time the remote secure gateway's WAN IP address changes (there may be a delay until the DDNS servers are updated with the remote gateway's new WAN IP address).

12.4.1 Dynamic Secure Gateway Address

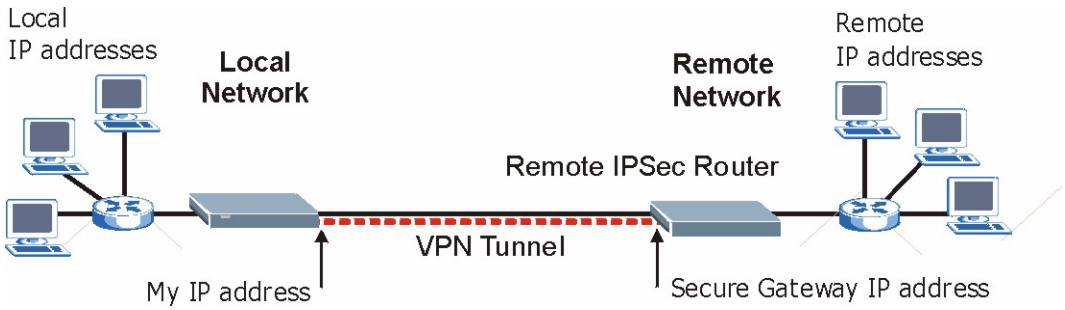
If the remote secure gateway has a dynamic WAN IP address and does not use DDNS, enter 0.0.0.0 as the secure gateway's address. In this case only the remote secure gateway can initiate SAs. This may be useful for telecommuters initiating a VPN tunnel to the company network.

Note: The Secure Gateway IP Address may be configured as 0.0.0.0 only when using IKE key management and not Manual key management.

12.5 VPN Summary Screen

The following figure helps explain the main fields in the web configurator.

Figure 80 IPSec Summary Fields



Local and remote IP addresses must be static.

Click the **VPN** link under **Security** to open the **VPN Summary** screen. This is a read-only menu of your IPSec rules (tunnels). Edit or create an IPSec rule by clicking the edit icon under the **Modify** field to configure the associated submenus.

Figure 81 VPN Summary

The following table describes the labels in this screen.

Table 66 VPN Summary

LABEL	DESCRIPTION
#	The VPN policy index number.
Active	This field displays whether the VPN policy is active or not. The icon is turned on when this VPN policy is active. Click the edit icon under **Modify** and select the **Active** checkbox in the **Rule Setup** screen to activate the VPN policy. Clear the checkbox to deactivate this VPN policy without having to delete the entry.
Local Addr.	This is the IP address of the computer on your local network behind your Prestige.
Remote Addr.	This is the IP address(es) of computer(s) on the remote network behind the remote IPSec router. A single (static) IP address is displayed when the **Remote Address Start** and **Remote Address End/Mask** fields in the **Rule Setup IKE** (or **Manual**) screen are both configured to the same IP address. The beginning and ending (static) IP addresses, in a range of computers are displayed when the **Remote Address Start** and **Remote Address End/Mask** fields in the **Rule Setup IKE** (or **Manual**) screen are configured for a range of IP addresses. A (static) IP address and a subnet mask are displayed when the **Remote Address Start** and **Remote Address End/Mask** fields in the **Rule Setup IKE** (or **Manual**) screen are configured for a subnet. This field displays **0.0.0.0** when the **Secure Gateway Address** field is set to **0.0.0.0**. In this case only the remote IPSec router can initiate the VPN.
Encap.	This field displays **Tunnel** or **Transport** mode (**Tunnel** is the default selection).
Algorithm	This field displays the security protocols used for an SA. Both **AH** and **ESP** increase Prestige processing requirements and communications latency (delay).
Gateway	This is the static WAN IP address or URL of the remote IPSec router. This field displays **0.0.0.0** when you configure the **Secure Gateway Addr** field in the **Rule Setup IKE** screen to **0.0.0.0.**
Modify	Click the **Edit** icon to open the rule setup screen. Modify a VPN policy or create a new VPN policy in the **Rule Setup** screen. Click the **Remove** icon to delete a VPN policy. When a VPN policy is deleted, subsequent policies do not move up in the list.

12.6 Keep Alive

When you initiate an IPSec tunnel with keep alive enabled, the Prestige automatically renegotiates the tunnel when the IPSec SA lifetime period expires (Section 12.2 on page 165 for more on the IPSec SA lifetime). In effect, the IPSec tunnel becomes an "always on" connection after you initiate it. Both IPSec routers must have a Prestige-compatible keep alive feature enabled in order for this feature to work.

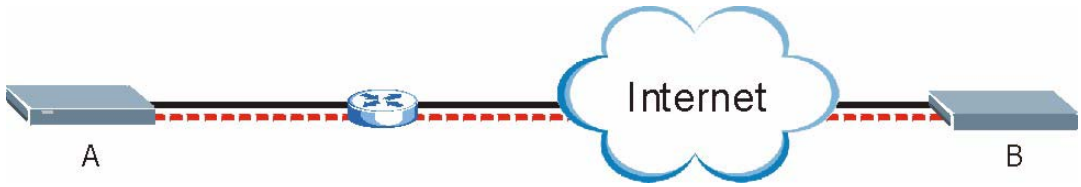
If the Prestige has its maximum number of simultaneous IPSec tunnels connected to it and they all have keep alive enabled, then no other tunnels can take a turn connecting to the Prestige because the Prestige never drops the tunnels that are already connected.

Note: When there is outbound traffic with no inbound traffic, the Prestige automatically drops the tunnel after two minutes.

12.7 NAT Traversal

NAT traversal allows you to set up a VPN connection when there are NAT routers between IPSec routers A and B.

Figure 82 NAT Router Between IPSec Routers



Normally you cannot set up a VPN connection with a NAT router between the two IPSec routers because the NAT router changes the header of the IPSec packet. In the previous figure, IPSec router **A** sends an IPSec packet in an attempt to initiate a VPN. The NAT router changes the IPSec packet's header so it does not match the header for which IPSec router **B** is checking. Therefore, IPSec router **B** does not respond and the VPN connection cannot be built.

NAT traversal solves the problem by adding a UDP port 500 header to the IPSec packet. The NAT router forwards the IPSec packet with the UDP port 500 header unchanged. IPSec router **B** checks the UDP port 500 header and responds. IPSec routers **A** and **B** build a VPN connection.

12.7.1 NAT Traversal Configuration

For NAT traversal to work you must:

- Use ESP security protocol (in either transport or tunnel mode).
- Use IKE keying mode.
- Enable NAT traversal on both IPSec endpoints.

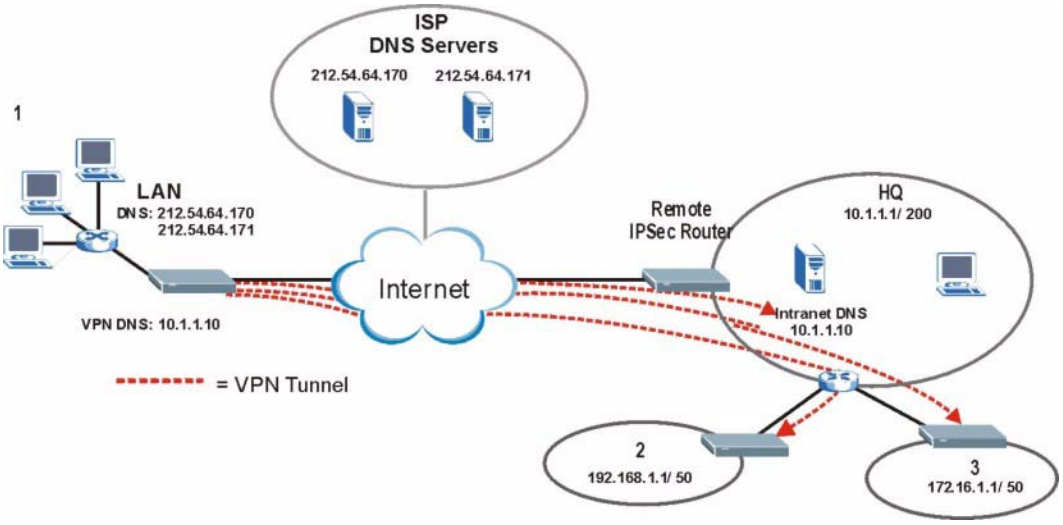
In order for IPSec router **A** (see the figure) to receive an initiating IPSec packet from IPSec router **B**, set the NAT router to forward UDP port 500 to IPSec router **A**.

12.7.2 Remote DNS Server

In cases where you want to use domain names to access Intranet servers on a remote network that has a DNS server, you must identify that DNS server. You cannot use DNS servers on the LAN or from the ISP since these DNS servers cannot resolve domain names to private IP addresses on the remote network

The following figure depicts an example where three VPN tunnels are created from Prestige A; one to branch office 2, one to branch office 3 and another to headquarters. In order to access computers that use private domain names on the headquarters (HQ) network, the Prestige at branch office 1 uses the Intranet DNS server in headquarters. The DNS server feature for VPN does not work with Windows 2000 or Windows XP.

Figure 83 VPN Host using Intranet DNS Server Example



Note: If you do not specify an Intranet DNS server on the remote network, then the VPN host must use IP addresses to access the computers on the remote network.

12.8 ID Type and Content

With aggressive negotiation mode (see Section 12.11.1 on page 177), the Prestige identifies incoming SAs by ID type and content since this identifying information is not encrypted. This enables the Prestige to distinguish between multiple rules for SAs that connect from remote IPSec routers that have dynamic WAN IP addresses. Telecommuters can use separate passwords to simultaneously connect to the Prestige from IPSec routers with dynamic IP addresses (see Section 12.17 on page 187 for a telecommuter configuration example).

Note: Regardless of the ID type and content configuration, the Prestige does not allow you to save multiple active rules with overlapping local and remote IP addresses.

With main mode (see Section 12.11.1 on page 177), the ID type and content are encrypted to provide identity protection. In this case the Prestige can only distinguish between up to eight different incoming SAs that connect from remote IPSec routers that have dynamic WAN IP addresses. The Prestige can distinguish up to eight incoming SAs because you can select

between three encryption algorithms (DES and 3DES), two authentication algorithms (MD5 and SHA1) and two key groups (DH1 and DH2) when you configure a VPN rule (see Section 12.12 on page 178). The ID type and content act as an extra level of identification for incoming SAs.

The type of ID can be a domain name, an IP address or an e-mail address. The content is the IP address, domain name, or e-mail address.

Table 67 Local ID Type and Content Fields

LOCAL ID TYPE	CONTENT
IP	Type the IP address of your computer or leave the field blank to have the Prestige automatically use its own IP address.
DNS	Type a domain name (up to 31 characters) by which to identify this Prestige.
E-mail	Type an e-mail address (up to 31 characters) by which to identify this Prestige.
The domain name or e-mail address that you use in the **Content** field is used for identification purposes only and does not need to be a real domain name or e-mail address.	

Table 68 Peer ID Type and Content Fields

PEER ID TYPE	CONTENT
IP	Type the IP address of the computer with which you will make the VPN connection or leave the field blank to have the Prestige automatically use the address in the **Secure Gateway Address** field.
DNS	Type a domain name (up to 31 characters) by which to identify the remote IPSec router.
E-mail	Type an e-mail address (up to 31 characters) by which to identify the remote IPSec router.
The domain name or e-mail address that you use in the **Content** field is used for identification purposes only and does not need to be a real domain name or e-mail address. The domain name also does not have to match the remote router's IP address or what you configure in the **Secure Gateway Address** field below.	

12.8.1 ID Type and Content Examples

Two IPSec routers must have matching ID type and content configuration in order to set up a VPN tunnel.

The two Prestiges in this example can complete negotiation and establish a VPN tunnel

Table 69 Matching ID Type and Content Configuration Example

PRESTIGE A	PRESTIGE B
Local ID type: E-mail	Local ID type: IP
Local ID content: tom@yourcompany.com	Local ID content: 1.1.1.2
Peer ID type: IP	Peer ID type: E-mail
Peer ID content: 1.1.1.2	Peer ID content: tom@yourcompany.com

The two Prestiges in this example cannot complete their negotiation because Prestige **B**'s **Local ID type** is **IP**, but Prestige **A**'s **Peer ID type** is set to **E-mail**. An "ID mismatched" message displays in the IPSEC LOG.

Figure 84 Mismatching ID Type and Content Configuration Example

PRESTIGE A	PRESTIGE B
Local ID type: IP	Local ID type: IP
Local ID content: 1.1.1.10	Local ID content: 1.1.1.10
Peer ID type: E-mail	Peer ID type: IP
Peer ID content: aa@yahoo.com	Peer ID content: N/A

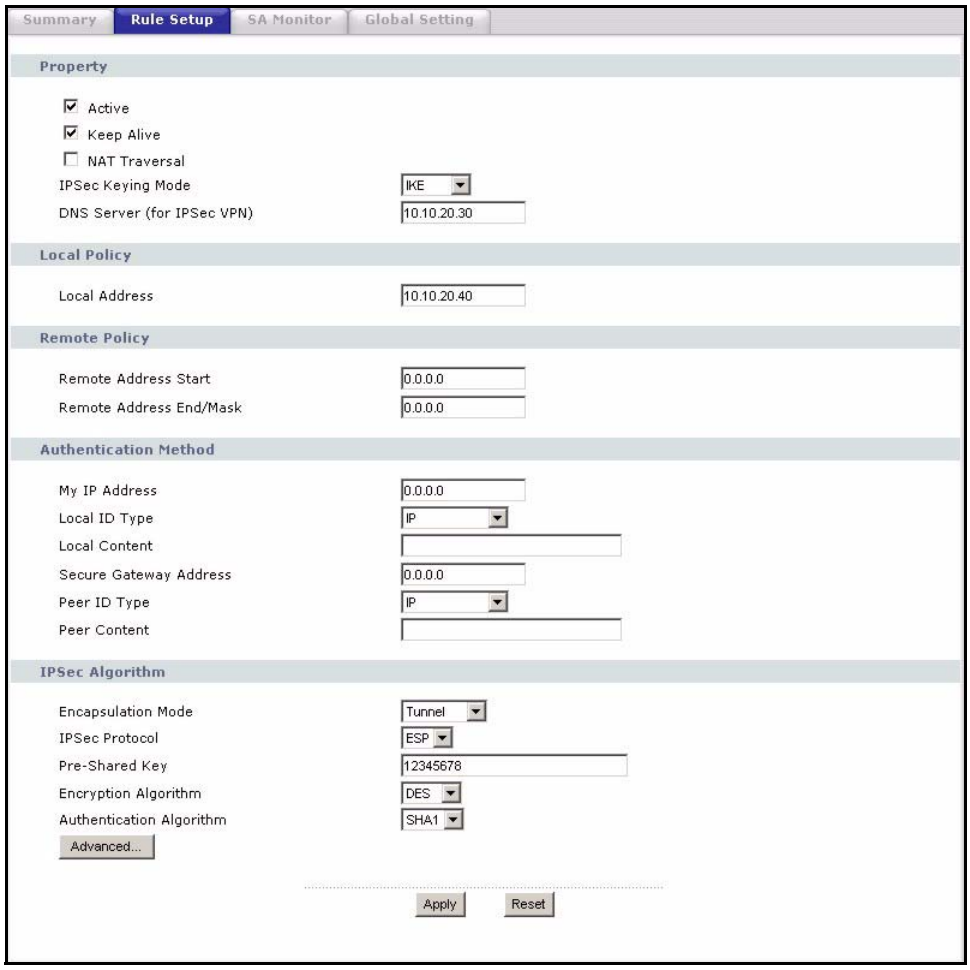
12.9 Pre-Shared Key

A pre-shared key identifies a communicating party during a phase 1 IKE negotiation (see Section 12.11 on page 176 for more on IKE phases). It is called "pre-shared" because you have to share it with another party before you can communicate with them over a secure connection.

12.10 VPN Rules

Click **Edit** on the **Summary** screen or click the **Rule Setup** tab to edit VPN rules.

Figure 85 VPN Rule Setup



The following table describes the labels in this screen.

Table 70 VPN Rule Setup

LABEL	DESCRIPTION
Active	Select this check box to activate this VPN tunnel. This option determines whether a VPN rule is applied before a packet leaves the firewall.
Keep Alive	Select this check box to have the Prestige automatically re-initiate the SA after the SA lifetime times out, even if there is no traffic. The remote IPSec router must also have keep alive enabled in order for this feature to work.
NAT Traversal	Select this check box to enable NAT traversal. NAT traversal allows you to set up a VPN connection when there are NAT routers between the two IPSec routers. The remote IPSec router must also have NAT traversal enabled. You can use NAT traversal with **ESP** protocol using **Transport** or **Tunnel** mode, but not with **AH** protocol nor with manual key management. In order for an IPSec router behind a NAT router to receive an initiating IPSec packet, set the NAT router to forward UDP port 500 to the IPSec router behind the NAT router.
IPSec Keying Mode	Select **IKE** or **Manual** from the drop-down list box. **IKE** provides more protection so it is generally recommended. **Manual** is a useful option for troubleshooting.

Table 70 VPN Rule Setup (continued)

LABEL	DESCRIPTION
DNS Server (for IPSec VPN)	If there is a private DNS server that services the VPN, type its IP address here. The Prestige assigns this additional DNS server to the Prestige's DHCP clients that have IP addresses in this IPSec rule's range of local addresses. A DNS server allows clients on the VPN to find other computers and servers on the VPN by their (private) domain names.
Local Address	The local IP address must be static and correspond to the remote IPSec router's configured remote IP addresses. Two active SAs can have the same local or remote IP address, but not both. You can configure multiple SAs between the same local and remote IP addresses, as long as only one is active at any time.
Remote Address Start	Remote IP addresses must be static and correspond to the remote IPSec router's configured local IP addresses. The remote address fields do not apply when the **Secure Gateway Address** field is configured to **0.0.0.0**. In this case only the remote IPSec router can initiate the VPN. Two active SAs cannot have the local and remote IP address(es) both the same. Two active SAs can have the same local or remote IP address, but not both. You can configure multiple SAs between the same local and remote IP addresses, as long as only one is active at any time. Enter a (static) IP address on the network behind the remote IPSec router.
Remote Address End/Mask	When the remote IP address is a single address, type it a second time here. When the remote IP address is a range, enter the end (static) IP address, in a range of computers on the network behind the remote IPSec router. When the remote IP address is a subnet address, enter a subnet mask on the network behind the remote IPSec router.
My IP Address	Enter the WAN IP address of your Prestige. The Prestige uses its current WAN IP address (static or dynamic) in setting up the VPN tunnel if you leave this field as **0.0.0.0**. The VPN tunnel has to be rebuilt if this IP address changes.
Local ID Type	Select **IP** to identify this Prestige by its IP address. Select **DNS** to identify this Prestige by a domain name. Select **E-mail** to identify this Prestige by an e-mail address.
Local Content	When you select **IP** in the **Local ID Type** field, type the IP address of your computer in the local **Content** field. The Prestige automatically uses the IP address in the **My IP Address** field (refer to the **My IP Address** field description) if you configure the local **Content** field to **0.0.0.0** or leave it blank. It is recommended that you type an IP address other than **0.0.0.0** in the local **Content** field or use the **DNS** or **E-mail** ID type in the following situations. When there is a NAT router between the two IPSec routers. When you want the remote IPSec router to be able to distinguish between VPN connection requests that come in from IPSec routers with dynamic WAN IP addresses. When you select **DNS** or **E-mail** in the **Local ID Type** field, type a domain name or e-mail address by which to identify this Prestige in the local **Content** field. Use up to 31 ASCII characters including spaces, although trailing spaces are truncated. The domain name or e-mail address is for identification purposes only and can be any string.
Secure Gateway Address	Type the WAN IP address or the URL (up to 31 characters) of the IPSec router with which you're making the VPN connection. Set this field to **0.0.0.0** if the remote IPSec router has a dynamic WAN IP address (the **IPSec Keying Mode** field must be set to **IKE**). The remote address fields do not apply when the **Secure Gateway Address** field is configured to **0.0.0.0**. In this case only the remote IPSec router can initiate the VPN.

Table 70 VPN Rule Setup (continued)

LABEL	DESCRIPTION
Peer ID Type	Select **IP** to identify the remote IPSec router by its IP address. Select **DNS** to identify the remote IPSec router by a domain name. Select **E-mail** to identify the remote IPSec router by an e-mail address.
Peer Content	The configuration of the peer content depends on the peer ID type. For **IP**, type the IP address of the computer with which you will make the VPN connection. If you configure this field to **0.0.0.0** or leave it blank, the Prestige will use the address in the **Secure Gateway Address** field (refer to the **Secure Gateway Address** field description). For **DNS** or **E-mail**, type a domain name or e-mail address by which to identify the remote IPSec router. Use up to 31 ASCII characters including spaces, although trailing spaces are truncated. The domain name or e-mail address is for identification purposes only and can be any string. It is recommended that you type an IP address other than **0.0.0.0** or use the **DNS** or **E-mail** ID type in the following situations: When there is a NAT router between the two IPSec routers. When you want the Prestige to distinguish between VPN connection requests that come in from remote IPSec routers with dynamic WAN IP addresses.
Encapsulation Mode	Select **Tunnel** mode or **Transport** mode from the drop-down list box.
IPSec Protocol	Select **ESP** if you want to use ESP (Encapsulation Security Payload). The ESP protocol (RFC 2406) provides encryption as well as some of the services offered by AH. If you select **ESP** here, you must select options from the **Encryption Algorithm** and **Authentication Algorithm** fields (described next). Select **AH** if you want to use AH (Authentication Header Protocol). The AH protocol (RFC 2402) was designed for integrity, authentication, sequence integrity (replay resistance), and non-repudiation but not for confidentiality, for which the ESP was designed. If you select **AH** here, you must select options from the **Authentication Algorithm** field (described later).
Pre-Shared Key	Type your pre-shared key in this field. A pre-shared key identifies a communicating party during a phase 1 IKE negotiation. It is called "pre-shared" because you have to share it with another party before you can communicate with them over a secure connection. Type from 8 to 31 case-sensitive ASCII characters or from 16 to 62 hexadecimal ("0-9", "A-F") characters. You must precede a hexadecimal key with a "0x" (zero x), which is not counted as part of the 16 to 62 character range for the key. For example, in "0x0123456789ABCDEF", "0x" denotes that the key is hexadecimal and "0123456789ABCDEF" is the key itself. Both ends of the VPN tunnel must use the same pre-shared key. You will receive a "PYLD_MALFORMED" (payload malformed) packet if the same pre-shared key is not used on both ends.
Encryption Algorithm	Select **DES** or **3DES** from the drop-down list box. The Prestige's encryption algorithm should be identical to the secure remote gateway. When **DES** is used for data communications, both sender and receiver must know the same secret key, which can be used to encrypt and decrypt the message. The **DES** encryption algorithm uses a 56-bit key. Triple **DES** (**3DES**) is a variation on **DES** that uses a 168-bit key. As a result, **3DES** is more secure than **DES**. It also requires more processing power, resulting in increased latency and decreased throughput.
Authentication Algorithm	Select **SHA1** or **MD5** from the drop-down list box. **MD5** (Message Digest 5) and **SHA1** (Secure Hash Algorithm) are hash algorithms used to authenticate packet data. The **SHA1** algorithm is generally considered stronger than **MD5**, but is slower. Select **MD5** for minimal security and **SHA-1** for maximum security.
Advanced	Click **Advanced** to configure more detailed settings of your IKE key management.

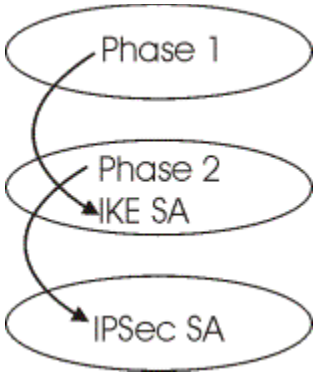
Table 70 VPN Rule Setup (continued)

LABEL	DESCRIPTION
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to begin configuring this screen afresh.

12.11 IKE Phases

There are two phases to every IKE (Internet Key Exchange) negotiation – phase 1 (Authentication) and phase 2 (Key Exchange). A phase 1 exchange establishes an IKE SA and the second one uses that SA to negotiate SAs for IPSec.

Figure 86 Two Phases to Set Up the IPSec SA



In phase 1 you must:

- Choose a negotiation mode.
- Authenticate the connection by entering a pre-shared key.
- Choose an encryption algorithm.
- Choose an authentication algorithm.
- Choose a Diffie-Hellman public-key cryptography key group (**DH1** or **DH2**).

Set the IKE SA lifetime. This field allows you to determine how long an IKE SA should stay up before it times out. An IKE SA times out when the IKE SA lifetime period expires. If an IKE SA times out when an IPSec SA is already established, the IPSec SA stays connected.

In phase 2 you must:

- Choose which protocol to use (**ESP** or **AH**) for the IKE key exchange.
- Choose an encryption algorithm.
- Choose an authentication algorithm
- Choose whether to enable Perfect Forward Secrecy (PFS) using Diffie-Hellman public-key cryptography – see Section 12.11.3 on page 177. Select **None** (the default) to disable PFS.

Choose **Tunnel** mode or **Transport** mode.

Set the IPSec SA lifetime. This field allows you to determine how long the IPSec SA should stay up before it times out. The Prestige automatically renegotiates the IPSec SA if there is traffic when the IPSec SA lifetime period expires. The Prestige also automatically renegotiates the IPSec SA if both IPSec routers have keep alive enabled, even if there is no traffic. If an IPSec SA times out, then the IPSec router must renegotiate the SA the next time someone attempts to send traffic.

12.11.1 Negotiation Mode

The phase 1 **Negotiation Mode** you select determines how the Security Association (SA) will be established for each connection through IKE negotiations.

- **Main Mode** ensures the highest level of security when the communicating parties are negotiating authentication (phase 1). It uses 6 messages in three round trips: SA negotiation, Diffie-Hellman exchange and an exchange of nonces (a nonce is a random number). This mode features identity protection (your identity is not revealed in the negotiation).
- **Aggressive Mode** is quicker than **Main Mode** because it eliminates several steps when the communicating parties are negotiating authentication (phase 1). However the trade-off is that faster speed limits its negotiating power and it also does not provide identity protection. It is useful in remote access situations where the address of the initiator is not know by the responder and both parties want to use pre-shared key authentication.

12.11.2 Diffie-Hellman (DH) Key Groups

Diffie-Hellman (DH) is a public-key cryptography protocol that allows two parties to establish a shared secret over an unsecured communications channel. Diffie-Hellman is used within IKE SA setup to establish session keys. 768-bit (Group 1 - **DH1**) and 1024-bit (Group 2 – **DH2**) Diffie-Hellman groups are supported. Upon completion of the Diffie-Hellman exchange, the two peers have a shared secret, but the IKE SA is not authenticated. For authentication, use pre-shared keys.

12.11.3 Perfect Forward Secrecy (PFS)

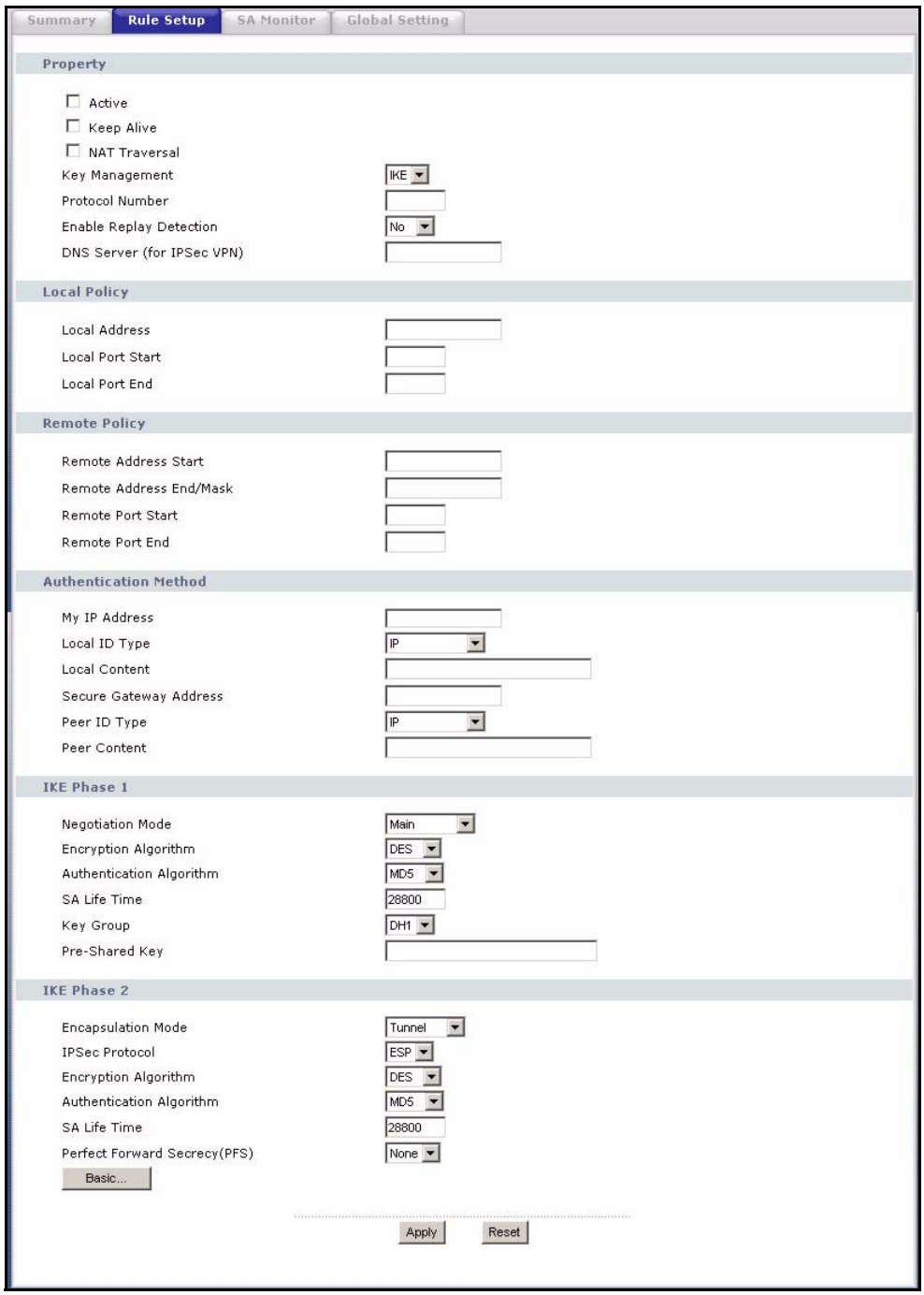
Enabling PFS means that the key is transient. The key is thrown away and replaced by a brand new key using a new Diffie-Hellman exchange for each new IPSec SA setup. With PFS enabled, if one key is compromised, previous and subsequent keys are not compromised, because subsequent keys are not derived from previous keys. The (time-consuming) Diffie-Hellman exchange is the trade-off for this extra security.

This may be unnecessary for data that does not require such security, so PFS is disabled (**None**) by default in the Prestige. Disabling PFS means new authentication and encryption keys are derived from the same root secret (which may have security implications in the long run) but allows faster SA setup (by bypassing the Diffie-Hellman key exchange).

12.12 Advanced Rule Setup Screen

Select **Advanced** at the bottom of the **Rule Setup** screen. The following screen displays.

Figure 87 Advanced Rule Setup



The following table describes the labels in this screen.

Table 71 Advanced Rule Setup

LABEL	DESCRIPTION
Active	Select this check box to activate this VPN policy.
Keep Alive	Select this check box to turn on the Keep Alive feature for this SA. Turn on Keep Alive to have the Prestige automatically reinitiate the SA after the SA lifetime times out, even if there is no traffic. The remote IPSec router must also have keep alive enabled in order for this feature to work.
NAT Traversal	Select this check box to enable NAT traversal. NAT traversal allows you to set up a VPN connection when there are NAT routers between the two IPSec routers. The remote IPSec router must also have NAT traversal enabled. You can use NAT traversal with **ESP** protocol using **Transport** or **Tunnel** mode, but not with **AH** protocol nor with manual key management. In order for an IPSec router behind a NAT router to receive an initiating IPSec packet, set the NAT router to forward UDP port 500 to the IPSec router behind the NAT router.
Key Management	The advanced configuration page is only available with the **IKE** IPSec keying mode. Click the **Basic** button below in order to be able to choose the **Manual** IPSec keying mode. Make sure the remote gateway has the same configuration in this field.
Protocol Number	Enter 1 for ICMP, 6 for TCP, 17 for UDP, etc. 0 is the default and signifies any protocol.
Enable Replay Detection	As a VPN setup is processing intensive, the system is vulnerable to Denial of Service (DOS) attacks The IPSec receiver can detect and reject old or duplicate packets to protect against replay attacks. Enable replay detection by setting this field to **Yes**.
DNS Server (for IPSec VPN)	If there is a private DNS server that services the VPN, type its IP address here. The Prestige assigns this additional DNS server to the Prestige's DHCP clients that have IP addresses in this IPSec rule's range of local addresses. A DNS server allows clients on the VPN to find other computers and servers on the VPN by their (private) domain names.
Local Address	The local IP address must be static and correspond to the remote IPSec router's configured remote IP addresses. Two active SAs can have the same local or remote IP address, but not both. You can configure multiple SAs between the same local and remote IP addresses, as long as only one is active at any time.
Local Port Start	0 is the default and signifies any port. Type a port number from 0 to 65535. Some of the most common IP ports are: 21, FTP; 53, DNS; 23, Telnet; 80, HTTP; 25, SMTP; 110, POP3.
Local Port End	Enter a port number in this field to define a port range. This port number must be greater than that specified in the previous field (or equal to it for configuring an individual port).

Table 71 Advanced Rule Setup (continued)

LABEL	DESCRIPTION
Remote Address Start	Remote IP addresses must be static and correspond to the remote IPSec router's configured local IP addresses. The remote address fields do not apply when the **Secure Gateway Address** field is configured to **0.0.0.0**. In this case only the remote IPSec router can initiate the VPN. Two active SAs cannot have the local and remote IP address(es) both the same. Two active SAs can have the same local or remote IP address, but not both. You can configure multiple SAs between the same local and remote IP addresses, as long as only one is active at any time. Enter a (static) IP address on the network behind the remote IPSec router.
Remote Address End/ Mask	When the remote IP address is a single address, type it a second time here. When the remote IP address is a range, enter the end (static) IP address, in a range of computers on the network behind the remote IPSec router. When the remote IP address is a subnet address, enter a subnet mask on the network behind the remote IPSec router.
Remote Port Start	0 is the default and signifies any port. Type a port number from 0 to 65535. Some of the most common IP ports are: 21, FTP; 53, DNS; 23, Telnet; 80, HTTP; 25, SMTP; 110, POP3
Remote Port End	Enter a port number in this field to define a port range. This port number must be greater than that specified in the previous field (or equal to it for configuring an individual port).
My IP Address	Enter the WAN IP address of your Prestige. The Prestige uses its current WAN IP address (static or dynamic) in setting up the VPN tunnel if you leave this field as **0.0.0.0**. The VPN tunnel has to be rebuilt if this IP address changes.
Local ID Type	Select **IP** to identify this Prestige by its IP address. Select **DNS** to identify this Prestige by a domain name. Select **E-mail** to identify this Prestige by an e-mail address.
Local Content	When you select **IP** in the **Local ID Type** field, type the IP address of your computer in the local **Content** field. The Prestige automatically uses the IP address in the **My IP Address** field (refer to the **My IP Address** field description) if you configure the local **Content** field to **0.0.0.0** or leave it blank. It is recommended that you type an IP address other than **0.0.0.0** in the local **Content** field or use the **DNS** or **E-mail** ID type in the following situations. • When there is a NAT router between the two IPSec routers. • When you want the remote IPSec router to be able to distinguish between VPN connection requests that come in from IPSec routers with dynamic WAN IP addresses. When you select **DNS** or **E-mail** in the **Local ID Type** field, type a domain name or e-mail address by which to identify this Prestige in the local **Content** field. Use up to 31 ASCII characters including spaces, although trailing spaces are truncated. The domain name or e-mail address is for identification purposes only and can be any string.
Secure Gateway Address	Type the WAN IP address or the URL (up to 31 characters) of the remote secure gateway with which you're making the VPN connection. Set this field to 0.0.0.0 if the remote secure gateway has a dynamic WAN IP address (the **IPSec Keying Mode** field must be set to **IKE**).
Peer ID Type	Select **IP** to identify the remote IPSec router by its IP address. Select **DNS** to identify the remote IPSec router by a domain name. Select **E-mail** to identify the remote IPSec router by an e-mail address.

Table 71 Advanced Rule Setup (continued)

LABEL	DESCRIPTION
Peer Content	The configuration of the peer content depends on the peer ID type. • For **IP**, type the IP address of the computer with which you will make the VPN connection. If you configure this field to **0.0.0.0** or leave it blank, the Prestige will use the address in the **Secure Gateway Address** field (refer to the **Secure Gateway Address** field description). • For **DNS** or **E-mail**, type a domain name or e-mail address by which to identify the remote IPSec router. Use up to 31 ASCII characters including spaces, although trailing spaces are truncated. The domain name or e-mail address is for identification purposes only and can be any string. It is recommended that you type an IP address other than **0.0.0.0** or use the **DNS** or **E-mail** ID type in the following situations: • When there is a NAT router between the two IPSec routers. When you want the Prestige to distinguish between VPN connection requests that come in from remote IPSec routers with dynamic WAN IP addresses.
IKE Phase 1	A phase 1 exchange establishes an IKE SA (Security Association).
Negotiation Mode	Select **Main** or **Aggressive** from the drop-down list box. The Prestige's negotiation mode should be identical to that on the remote secure gateway.
Encryption Algorithm	Select **DES** or **3DES** from the drop-down list box. The Prestige's encryption algorithm should be identical to the secure remote gateway. When DES is used for data communications, both sender and receiver must know the same secret key, which can be used to encrypt and decrypt the message. The DES encryption algorithm uses a 56-bit key. Triple DES (3DES) is a variation on DES that uses a 168-bit key. As a result, 3DES is more secure than DES. It also requires more processing power, resulting in increased latency and decreased throughput.
Authentication Algorithm	Select **SHA1** or **MD5** from the drop-down list box. The Prestige's authentication algorithm should be identical to the secure remote gateway. MD5 (Message Digest 5) and SHA1 (Secure Hash Algorithm) are hash algorithms used to authenticate the source and integrity of packet data. The SHA1 algorithm is generally considered stronger than MD5, but is slower. Select **SHA-1** for maximum security.
SA Life Time	Define the length of time before an IKE SA automatically renegotiates in this field. It may range from 60 to 3,000,000 seconds (almost 35 days). A short SA Life Time increases security by forcing the two VPN gateways to update the encryption and authentication keys. However, every time the VPN tunnel renegotiates, all users accessing remote resources are temporarily disconnected.
Key Group	You must choose a key group for phase 1 IKE setup. **DH1** (default) refers to Diffie-Hellman Group 1 a 768 bit random number. **DH2** refers to Diffie-Hellman Group 2 a 1024 bit (1Kb) random number.
Pre-Shared Key	Type your pre-shared key in this field. A pre-shared key identifies a communicating party during a phase 1 IKE negotiation. It is called "pre-shared" because you have to share it with another party before you can communicate with them over a secure connection.
IKE Phase 2	A phase 2 exchange uses the IKE SA established in phase 1 to negotiate the SA for IPSec.
Encapsulation Mode	Select **Tunnel** mode or **Transport** mode from the drop down list-box. The Prestige's encapsulation mode should be identical to the secure remote gateway.

Table 71 Advanced Rule Setup (continued)

LABEL	DESCRIPTION
IPSec Protocol	Select **ESP** or **AH** from the drop-down list box. The Prestige's IPSec Protocol should be identical to the secure remote gateway. The ESP (Encapsulation Security Payload) protocol (RFC 2406) provides encryption as well as the authentication offered by AH. If you select **ESP** here, you must select options from the Encryption Algorithm and Authentication Algorithm fields (described below). The AH protocol (Authentication Header Protocol) (RFC 2402) was designed for integrity, authentication, sequence integrity (replay resistance), and non-repudiation but not for confidentiality, for which the ESP was designed. If you select **AH** here, you must select options from the **Authentication Algorithm** field.
Encryption Algorithm	The encryption algorithm for the Prestige and the secure remote gateway should be identical. When **DES** is used for data communications, both sender and receiver must know the same secret key, which can be used to encrypt and decrypt the message. The DES encryption algorithm uses a 56-bit key. Triple DES (**3DES**) is a variation on DES that uses a 168-bit key. As a result, 3DES is more secure than DES. It also requires more processing power, resulting in increased latency and decreased throughput.
Authentication Algorithm	Select **SHA1** or **MD5** from the drop-down list box. MD5 (Message Digest 5) and SHA1 (Secure Hash Algorithm) are hash algorithms used to authenticate packet data. The SHA1 algorithm is generally considered stronger than MD5, but is slower. Select MD5 for minimal security and SHA-1 for maximum security.
SA Life Time	Define the length of time before an IKE SA automatically renegotiates in this field. It may range from 60 to 3,000,000 seconds (almost 35 days). A short SA Life Time increases security by forcing the two VPN gateways to update the encryption and authentication keys. However, every time the VPN tunnel renegotiates, all users accessing remote resources are temporarily disconnected.
Perfect Forward Secrecy (PFS)	Perfect Forward Secrecy (PFS) is disabled (None) by default in phase 2 IPSec SA setup. This allows faster IPSec setup, but is not so secure. Choose from **DH1** or **DH2** to enable PFS. **DH1** refers to Diffie-Hellman Group 1, a 768 bit random number. **DH2** refers to Diffie-Hellman Group 2, a 1024 bit (1Kb) random number (more secure, yet slower).
Basic...	Select **Basic...** to go to the previous VPN configuration screen.
Apply	Click **Apply** to save your changes.
Reset	Click **Reset** to begin configuring this screen afresh.

12.13 Manual Key

Manual key management is useful if you have problems with **IKE** key management.

12.13.1 Security Parameter Index (SPI)

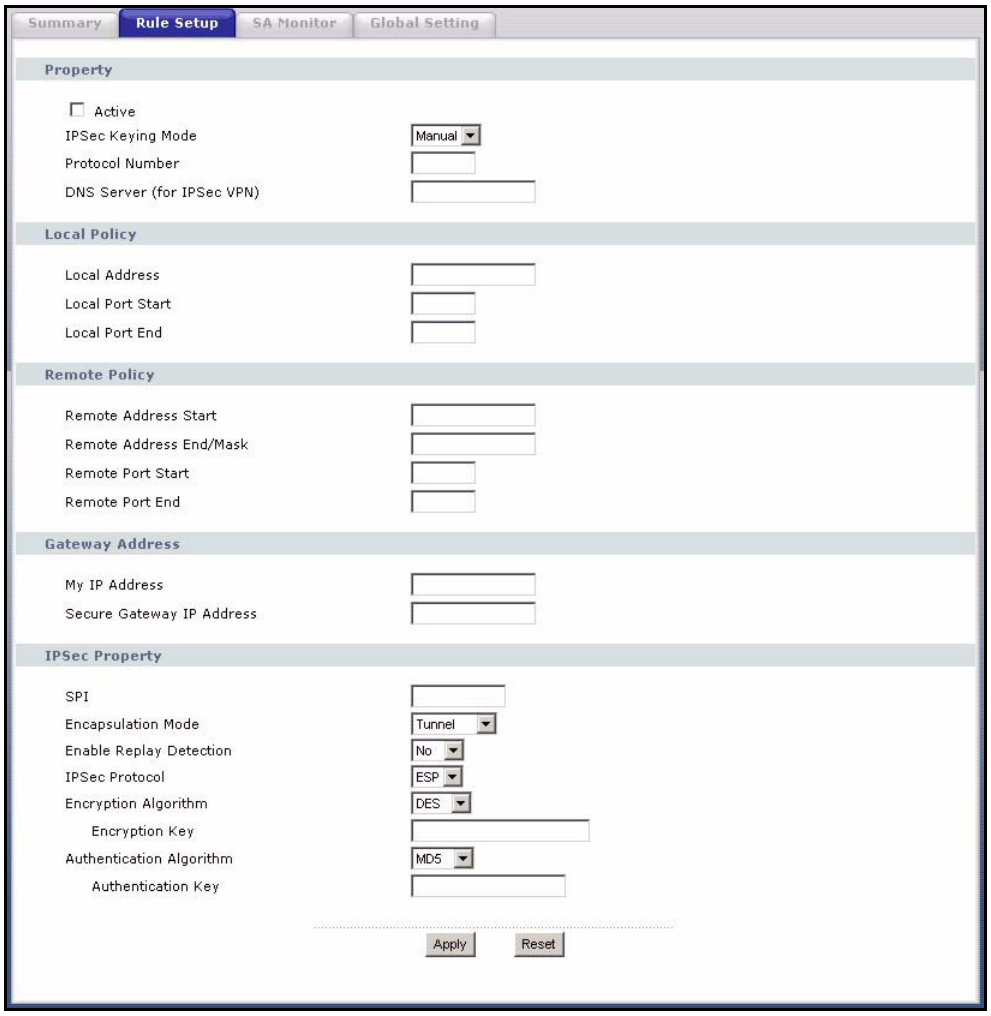
An SPI is used to distinguish different SAs terminating at the same destination and using the same IPSec protocol. This data allows for the multiplexing of SAs to a single gateway. The **SPI** (Security Parameter Index) along with a destination IP address uniquely identify a particular Security Association (SA). The **SPI** is transmitted from the remote VPN gateway to the local VPN gateway. The local VPN gateway then uses the network, encryption and key values that the administrator associated with the SPI to establish the tunnel.

Note: Current ZyXEL implementation assumes identical outgoing and incoming SPIs.

12.14 Manual Key Screen

You only configure **VPN Manual Key** when you select **Manual** in the **Key Management** field on the **Rule Setup** screen. The **Rule Setup Manual** screen as shown next.

Figure 88 Rule Setup with Manual Key



The following table describes the labels in this screen.

Table 72 Rule Setup with Manual Key

LABEL	DESCRIPTION
Active	Select this check box to activate this VPN policy.
IPSec Keying Mode	Select **IKE** or **Manual** from the drop-down list box. **Manual** is a useful option for troubleshooting if you have problems using **IKE** key management.
Protocol Number	Enter 1 for ICMP, 6 for TCP, 17 for UDP, etc. 0 is the default and signifies any protocol.

Table 72 Rule Setup with Manual Key

LABEL	DESCRIPTION
Local Address	The Local IP address must be static and correspond to the remote IPSec router's configured remote IP addresses. Two active SAs can have the same local or remote IP address, but not both. You can configure multiple SAs between the same local and remote IP addresses, as long as only one is active at any time.
Local Port Start	"0" is the default and signifies any port. Type a port number from 0 to 65535. Some of the most common IP ports are: 21, FTP; 53, DNS; 23, Telnet; 80, HTTP; 25, SMTP; 110, POP3.
Local Port End	Type a port number in this field to define a port range. This port number must be greater than that specified in the previous field. If Local Port Start is left at 0, Local Port End will also remain at 0.
Remote Address Start	Remote IP addresses must be static and correspond to the remote IPSec router's configured local IP addresses. The remote address fields do not apply when the **Secure Gateway IP Address** field is configured to **0.0.0.0**. In this case only the remote IPSec router can initiate the VPN. Two active SAs cannot have the local and remote IP address(es) both the same. Two active SAs can have the same local or remote IP address, but not both. You can configure multiple SAs between the same local and remote IP addresses, as long as only one is active at any time. Enter a (static) IP address on the network behind the remote IPSec router.
Remote Address End/ Mask	When the remote IP address is a single address, type it a second time here. When the remote IP address is a range, enter the end (static) IP address, in a range of computers on the network behind the remote IPSec router. When the remote IP address is a subnet address, enter a subnet mask on the network behind the remote IPSec router.
Remote Port Start	"0" is the default and signifies any port. Type a port number from 0 to 65535. Some of the most common IP ports are: 21, FTP; 53, DNS; 23, Telnet; 80, HTTP; 25, SMTP; 110, POP3.
Remote Port End	Enter a port number in this field to define a port range. This port number must be greater than that specified in the previous field. If **Remote Port Start** is left at 0, **Remote Port End** will also remain at 0.
DNS Server (for IPSec VPN)	If there is a private DNS server that services the VPN, type its IP address here. The Prestige assigns this additional DNS server to the Prestige's DHCP clients that have IP addresses in this IPSec rule's range of local addresses. A DNS server allows clients on the VPN to find other computers and servers on the VPN by their (private) domain names.
My IP Address	Enter the WAN IP address of your Prestige. The Prestige uses its current WAN IP address (static or dynamic) in setting up the VPN tunnel if you leave this field as **0.0.0.0**. The VPN tunnel has to be rebuilt if this IP address changes.
Secure Gateway IP Address	Type the WAN IP address or the URL (up to 31 characters) of the IPSec router with which you're making the VPN connection.
SPI	Type a number (base 10) from 1 to 999999 for the Security Parameter Index.
Encapsulation Mode	Select **Tunnel** mode or **Transport** mode from the drop-down list box.
Enable Replay Detection	As a VPN setup is processing intensive, the system is vulnerable to Denial of Service (DoS) attacks The IPSec receiver can detect and reject old or duplicate packets to protect against replay attacks. Select **Yes** from the drop-down menu to enable replay detection, or select **No** to disable it.

Table 72 Rule Setup with Manual Key

LABEL	DESCRIPTION
IPSec Protocol	Select **ESP** if you want to use ESP (Encapsulation Security Payload). The ESP protocol (RFC 2406) provides encryption as well as some of the services offered by AH. If you select **ESP** here, you must select options from the **Encryption Algorithm** and **Authentication Algorithm** fields (described next). Select **AH** if you want to use AH (Authentication Header Protocol). The AH protocol (RFC 2402) was designed for integrity, authentication, sequence integrity (replay resistance), and non-repudiation but not for confidentiality, for which the ESP was designed. If you select **AH** here, you must select options from the **Authentication Algorithm** field (described later).
Encryption Algorithm	Select **DES** or **3DES** from the drop-down list box. The Prestige's encryption algorithm should be identical to the secure remote gateway. When DES is used for data communications, both sender and receiver must know the same secret key, which can be used to encrypt and decrypt the message. The DES encryption algorithm uses a 56-bit key. Triple DES (3DES) is a variation on DES that uses a 168-bit key. As a result, 3DES is more secure than DES. It also requires more processing power, resulting in increased latency and decreased throughput.
Encryption Key (Only with ESP)	With **DES**, type a unique key 8 characters long. With **3DES**, type a unique key 24 characters long. Any characters may be used, including spaces, but trailing spaces are truncated.
Authentication Algorithm	Select **SHA1** or **MD5** from the drop-down list box. **MD5** (Message Digest 5) and **SHA1** (Secure Hash Algorithm) are hash algorithms used to authenticate packet data. The **SHA1** algorithm is generally considered stronger than **MD5**, but is slower. Select **MD5** for minimal security and **SHA-1** for maximum security.
Authentication Key	Type a unique authentication key to be used by IPSec if applicable. Enter 16 characters for **MD5** authentication or 20 characters for **SHA-1** authentication. Any characters may be used, including spaces, but trailing spaces are truncated.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to begin configuring this screen afresh.

12.15 SA Monitor Screen

In the web configurator, click the **VPN** link under **Security** and the **SA Monitor** tab. Use this screen to display and manage active VPN connections.

A Security Association (SA) is the group of security settings related to a specific VPN tunnel. This screen displays active VPN connections. Use **Refresh** to display active VPN connections. This screen is read-only. The following table describes the labels in this tab.

Note: When there is outbound traffic but no inbound traffic, the SA times out automatically after two minutes. A tunnel with no outbound or inbound traffic is "idle" and does not timeout until the SA lifetime period expires. See the Keep Alive section to have the Prestige renegotiate an IPSec SA when the SA lifetime expires, even if there is no traffic.

Figure 89 SA Monitor

The following table describes the labels in this screen.

Table 73 SA Monitor

LABEL	DESCRIPTION
#	This is the security association index number.
Name	This field displays the identification name for this VPN policy.
Encapsulation	This field displays Tunnel or Transport mode.
IPSec Algorithm	This field displays the security protocols used for an SA. Both AH and ESP increase Prestige processing requirements and communications latency (delay).
Previous Page (If applicable)	Click **Previous Page** to view more items in the summary.
Refresh	Click **Refresh** to display the current active VPN connection(s).
Next Page (If applicable)	Click **Next Page** to view more items in the summary.

12.16 Global Setting Screen

To change your Prestige's global settings, click the **VPN** link under **Security** and the **Global Setting** tab. The screen appears as shown.

Figure 90 Global Setting

The following table describes the labels in this screen.

Table 74 Global Setting

LABEL	DESCRIPTION
Windows Networking (NetBIOS over TCP/IP)	NetBIOS (Network Basic Input/Output System) are TCP or UDP broadcast packets that enable a computer to find other computers. It may sometimes be necessary to allow NetBIOS packets to pass through VPN tunnels in order to allow local computers to find computers on the remote network and vice versa.
Allow Through IP/Sec Tunnel	Select this check box to send NetBIOS packets through the VPN connection.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to begin configuring this screen afresh.

12.17 Telecommuter VPN/IPSec Examples

The following examples show how multiple telecommuters can make VPN connections to a single Prestige at headquarters from remote IPSec routers that use dynamic WAN IP addresses.

12.17.1 Telecommuters Sharing One VPN Rule Example

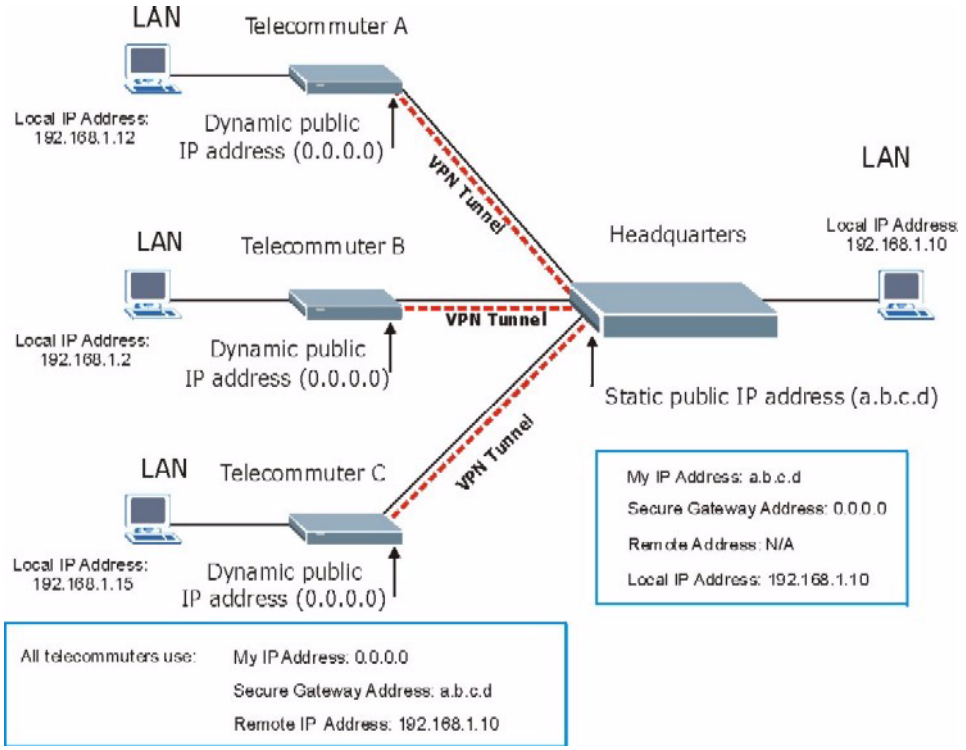
Multiple telecommuters can use one VPN rule to simultaneously access a Prestige at headquarters. They must all use the same IPSec parameters (including the pre-shared key) but the local IP addresses (or ranges of addresses) cannot overlap. See the following table and figure for an example.

Having everyone use the same pre-shared key may create a vulnerability. If the pre-shared key is compromised, all of the VPN connections using that VPN rule are at risk. A recommended alternative is to use a different VPN rule for each telecommuter and identify them by unique IDs (see Section 12.17.2 on page 188)..

Table 75 Telecommuter and Headquarters Configuration Example

	TELECOMMUTER	HEADQUARTERS
My IP Address:	0.0.0.0 (dynamic IP address assigned by the ISP)	Public static IP address
Secure Gateway IP Address:	Public static IP address or domain name.	0.0.0.0 With this IP address only the telecommuter can initiate the IPSec tunnel.

Figure 91 Telecommuters Sharing One VPN Rule Example

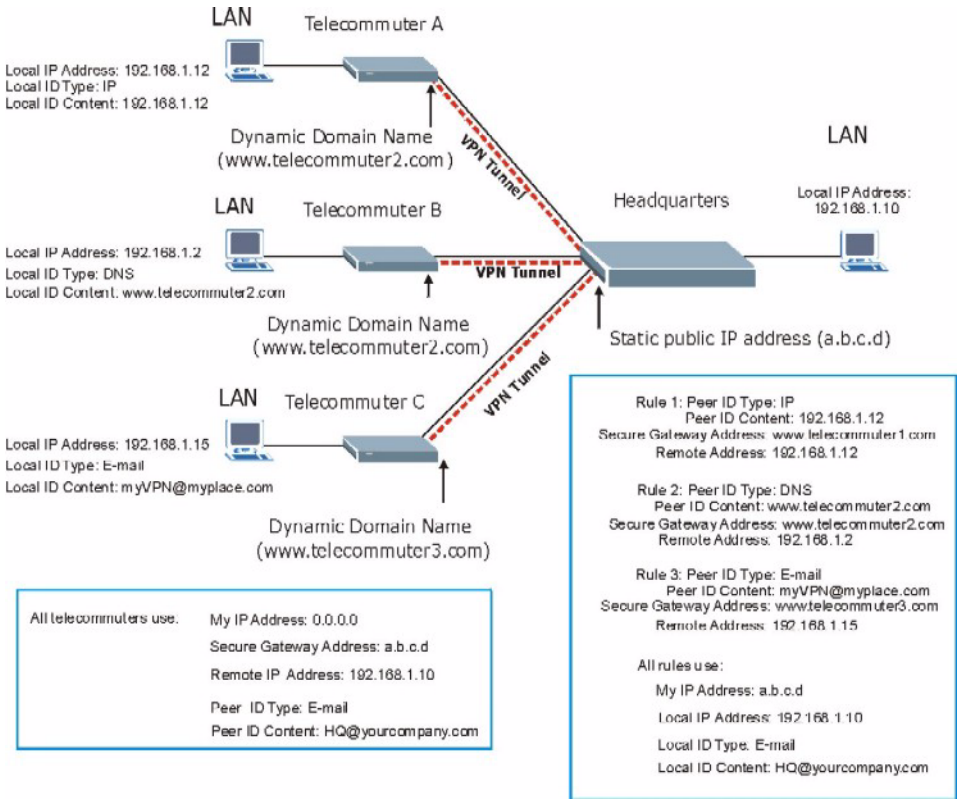


12.17.2 Telecommuters Using Unique VPN Rules Example

With aggressive negotiation mode (see Section 12.11.1 on page 177), the Prestige can use the ID types and contents to distinguish between VPN rules. Telecommuters can each use a separate VPN rule to simultaneously access a Prestige at headquarters. They can use different IPSec parameters (including the pre-shared key) and the local IP addresses (or ranges of addresses) can overlap.

See the following graphic for an example where three telecommuters each use a different VPN rule to initiate a VPN connection to a Prestige located at headquarters. The Prestige at headquarters identifies each by its secure gateway address (a dynamic domain name) and uses the appropriate VPN rule to establish the VPN connection.

Figure 92 Telecommuters Using Unique VPN Rules Example



12.18 VPN and Remote Management

If a VPN tunnel uses a remote management service port (Telnet, FTP, WWW SNMP, DNS or ICMP) and terminates at the Prestige's LAN or WAN port, configure remote management **(REMOTE MGNT)** to allow access for that service.

If the VPN tunnel terminates at the Prestige's LAN IP address, configure remote management for LAN, WAN server access or **LAN & WAN**.

If the VPN tunnel terminates at the Prestige's WAN IP address, configure remote management for WAN server access or **LAN & WAN**.

CHAPTER 13
Trend Micro Home Network Security (TMSS)

This chapter provides instructions for installing and configuring Trend Micro Home Network Security, also known as "TMSS". It includes the following sections:

For more information on using Trend Micro Home Network Security, refer to the Home Network Security User's Guide. This document is available in PDF format on the CD that came with your router.

13.1 Trend Micro Home Network Security Overview

This service bundle from Trend Micro has three components:

- **Trend Micro dashboard**
  This component is free for unlimited use. From the dashboard you can:
  - Scan your computer and entire network for security vulnerabilities
  - View individual computer and network-wide security reports
  - Detect and remove spyware
  - View attempts to access content restricted by Parental Controls
  - Purchase subscriptions for Parental Controls and Trend Micro Internet Security
- **Trend Micro Internet Security**
  You can install this program on up to 10 computers and try it free for 60 days. Its features include:
  - Real-time and scheduled scanning to remove viruses, Trojans, spyware, and other Internet threats
  - Personal firewall
  - Network intruder detection
  - Anti-spam
- **Router-based Parental Controls**
  This service restricts home network users from viewing inappropriate websites. It is free for the trial period specified, and when you register your free trial of Trend Micro Internet Security, your free use of Parental Controls is automatically extended to one year.

13.2 Installing the Trend Micro Dashboard

Note: The Trend Micro dashboard requires Microsoft™ Internet Explorer version 5.5 or later. If you are using a non-Microsoft browser or an earlier version of Internet Explorer, please install Internet Explorer 5.5 or later before continuing.

1 Make sure your computer is connected to the router and your Internet connection is working. Open an Internet Explorer browser window. A screen picturing your router appears (Figure 93). If this screen does not appear, type the following URL in your browser's address bar: http://tmss.trendmicro.com/dashboard.

Figure 93 TMSS First Time Access

2 Click **Continue**. The ActiveX™ download screen appears.

3 If a security warning message box opens, click **Install** or **Yes** to continue. In Windows XP, a yellow information bar may appear at the top of the screen. To continue, click the yellow bar and then click **Install ActiveX control**.

Figure 94 Security Warning Message Box

4 After a few seconds, the Trend Micro dashboard appears (Figure 95).

Note: If the dashboard screen does not appear, please refer to Section 13.2.1 on page 193.

Figure 95 Trend Micro Dashboard)

To start the Trend Micro dashboard in future, click **Trend Micro Security Services** in the Start menu or the icon in your browser's toolbar.

For online help while using the dashboard, click the icon in the top-right corner of any dashboard screen.

Note: Install the Trend Micro dashboard on all computers on your network.

13.2.1 Installing the Trend Micro Dashboard: Troubleshooting

Installing the Trend Micro dashboard requires downloading the Trend Micro ActiveX control. If you are unable to download the ActiveX control, please check your Internet Explorer security settings.

The Trend Micro ActiveX control is a "signed" ActiveX control, meaning it has a digital signature authenticating Trend Micro as the author. Your Internet Explorer default security settings permit the downloading of signed ActiveX downloads.

To restore your Internet Explorer default security settings:

1 Start Internet Explorer and then click **Tools** > **Internet Options**. The **Internet Options** box opens.

2 Click the **Security** tab and then click **Custom Level**. The **Security Settings** box opens.

3 Choose the following settings:

Table 76 Internet Explorer Default Security Settings

SETTING	CHOOSE
Download signed ActiveX controls	Prompt
Script ActiveX control marked safe for scripting	Enable
Run ActiveX controls and plug-ins	Enable
Java permissions	High safety
Active scripting	Enable
Scripting of Java applets	Enable

4 Click **OK** to close the **Security Settings** box. Click **OK** again to close the **Internet Options** box.

To install the dashboard after restoring your default security settings:

1 Type the following URL: http://tmss.trendmicro.com/dashboard.

2 A screen picturing your router appears. Click **Continue**. The ActiveX download screen appears.

3 If a security warning message box opens, click **Install** or **Yes** to continue. In Windows XP, a yellow information bar may appear at the top of the screen. Click the yellow bar, and then click **Install ActiveX control**.

After a few seconds, the Trend Micro dashboard will appear.

13.3 Activating Your Free Services

After you activate Home Network Security, the following free services are available:

- The Trend Micro dashboard's Security Scan and Anti-Spyware services (free for unlimited use).
- Trend Micro Internet Security (free for 60 days).
- The Parental Controls service (free for one year).

Activation requires three simple steps:

1 Registering a Trend Micro Customer Account on page 195

2 Installing Trend Micro Internet Security on page 197

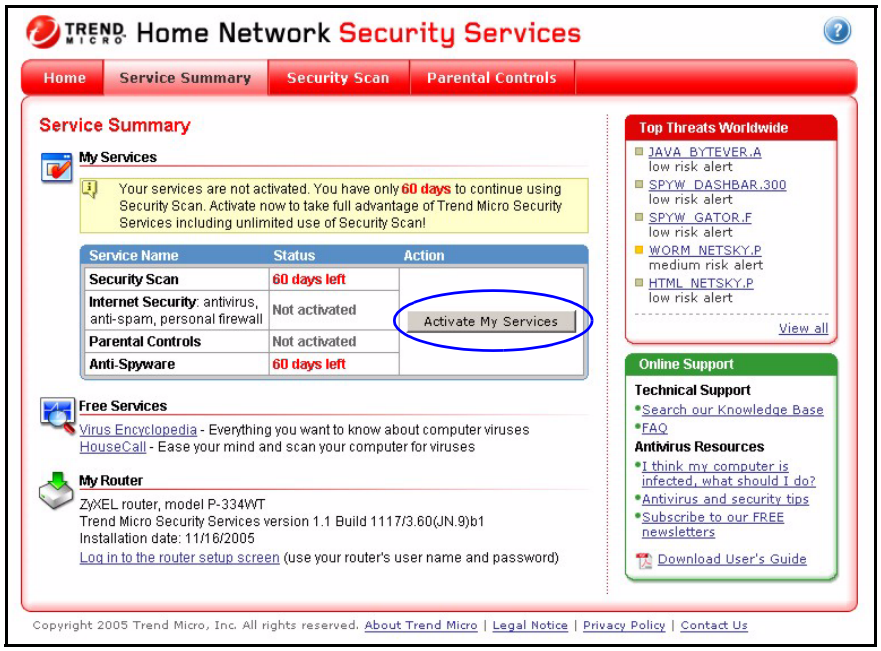
3 Registering Trend Micro Internet Security on page 200

13.3.1 Registering a Trend Micro Customer Account

To register a Trend Micro customer account:

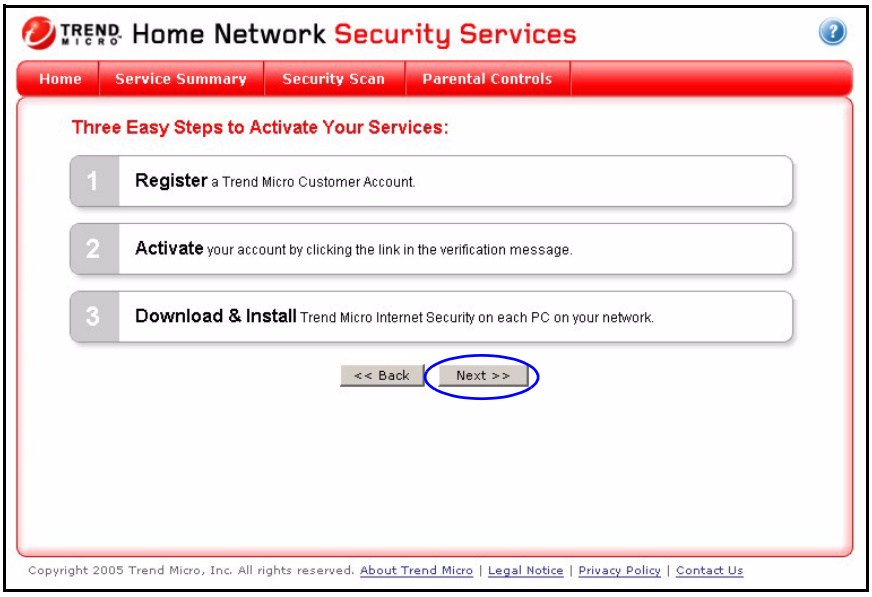
1. Start the dashboard by clicking **Trend Micro Security Services** in the Start menu or the icon in your browser's toolbar. The dashboard's home screen appears (Figure 95 on page 193).
2. Click the **Service Summary** tab. The **Service Summary** screen appears (Figure 96 on page 195).

Figure 96 Dashboard Service Summary Screen



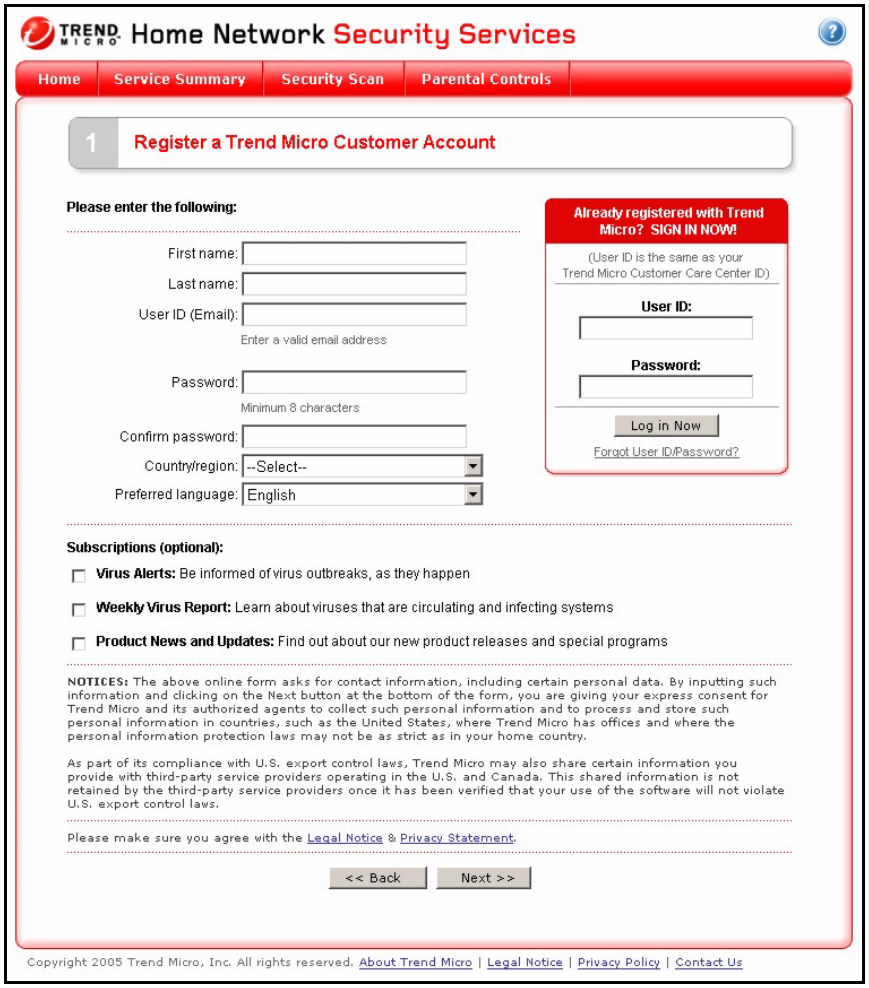
3. Click **Activate My Services**. The 3 Steps screen appears (Figure 97 on page 196).

Figure 97 3 Steps Screen



4 Click **Next**. The account registration screen appears (Figure 98 on page 196).

Figure 98 Account Registration Screen



5 On the account registration screen, type your name, email address, and other required information, and then click **Next**. The **Check Information** screen appears.

Note: If you already have a Trend Micro customer account, type your user ID and password, click **Log in Now**, and then click **Next**.

6 If the information on the **Check Information** screen is correct, click **Submit**. The **Registration Sent** screen appears.

7 Click **Continue** to return to the dashboard.

Trend Micro sends a verification message to the email address you entered as your user ID. To activate your account, click the link in this message.

Note: Trend Micro does not activate your account until you click the link in the verification message.

When you click the link in the verification message, the **Account Activated** screen appears. The **Account Activated** screen shows your Trend Micro Internet Security serial number. Please write this number down, as you will need it to install the program.

Note: Your Trend Micro Internet Security serial number is also contained in a second email message Trend Micro sends when you activate your account.

Please proceed to the next section, Installing Trend Micro Internet Security on page 197.

13.3.2 Installing Trend Micro Internet Security

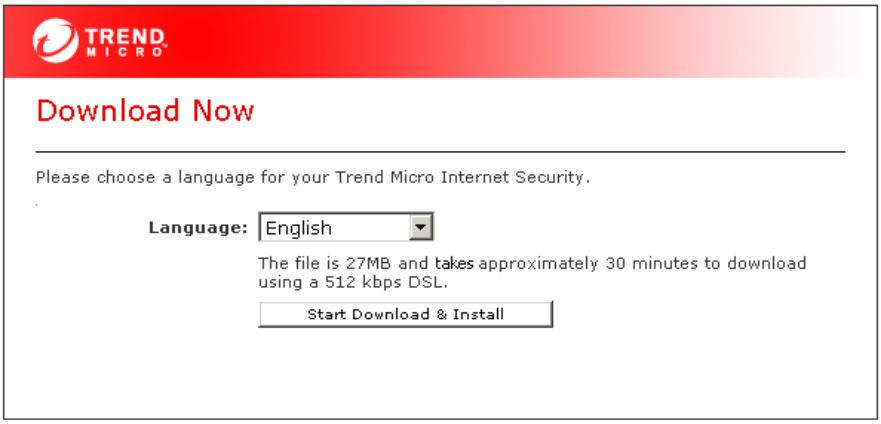
Note: Before proceeding, install the Trend Micro dashboard on all computers on your network. (See Section 13.2 on page 192.)

1 Start the dashboard by clicking **Trend Micro Security Services** in the Start menu or the  icon in your browser's toolbar.

2 Click the **Service Summary** tab. The **Service Summary** screen appears.

3 In the **My Services** area, click the Trend Micro Internet Security download link. The **Download Now** screen appears (Figure 99 on page 198).

Figure 99 Download Now Screen



4 Click **Start Download & Install**. A file download message box opens.

5 Click **Run** or **Open**, and then wait while Setup downloads the installation files. If a second message box opens asking "Do you want to run this software?", click **Run**. After downloading the files, the **Location to Save Files** screen appears.

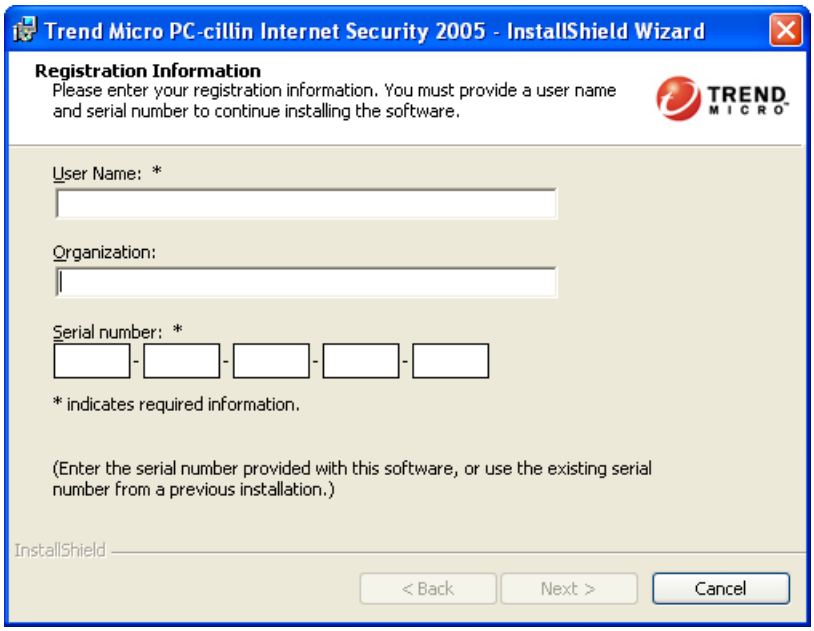
6 To save the installation files in the default location, click **Next**. To change the location, click **Change**, specify a new location, and then click **Next**. The license agreement screen appears.

7 Read the license agreement. If you accept its terms, click **I accept the terms in the license agreement** and then click **Next**. Setup scans the system memory, boot sector, and critical files. After scanning, the Registration Information screen appears (Figure 100 on page 199).

8 Type your name, Trend Micro Internet Security serial number, and organization (optional). Click **Next**. The **Installation Location** screen appears.

Note: When you activated your customer account, Trend Micro sent you an email message containing your Trend Micro Internet Security serial number.

Figure 100 Registration Information Screen



9 To install Trend Micro Internet Security in the default location, click **Next**. To change the location, click **Change**, specify a new location, and then click **Next**. The Installation Type screen appears.

10 For best results, select **Full** and click **Next**. The **Configuration Type** screen appears. Select **Recommended** and click **Next**. The **Ready to Install** screen appears.

11 Click **Install**. When installation completes, click **Yes** to restart your computer.

To start Internet Security, click **Trend Micro PC-cillin Internet Security** in the Start menu or the icon at the bottom-right corner of the desktop. For online help, click the **Help** icon on any Internet Security screen.

To protect your entire network, install Trend Micro Internet Security on all of your computers, as follows:

1 Install the Trend Micro dashboard (see Section 13.2 on page 192). Start the dashboard, click the **Service Summary** tab, and then click the Trend Micro Internet Security download link. The **Download Now** screen appears.

2 Click **Start Download & Install**, and then follow the on-screen instructions to install the program.

Note: Use the same serial number each time you install Trend Micro Internet Security. You can install the program on up to ten computers using this serial number.

13.3.3 Registering Trend Micro Internet Security

After installing Internet Security, register your software to get free updates to scanning components during the trial period, and free use of Parental Controls for one year. Registration is done only once, and covers up to ten computers.

To register Trend Micro Internet Security:

1. Click **Trend Micro PC-cillin Internet Security** in the Start menu or the icon at the bottom-right corner of your desktop. The main Internet Security screen appears.
2. Click **Updates and Registration**, and then click **Registration**. The **Registration** screen appears (Figure 101 on page 200).

Figure 101 Trend Micro Internet Security Registration Screen

3. Click **Register Now**. The **Account Confirmed** screen appears.

The **Account Confirmed** screen shows your Trend Micro Internet Security serial number and the expiration date of your trial subscription. To purchase an annual subscription now, click **Upgrade Now**.

13.4 TMSS Settings

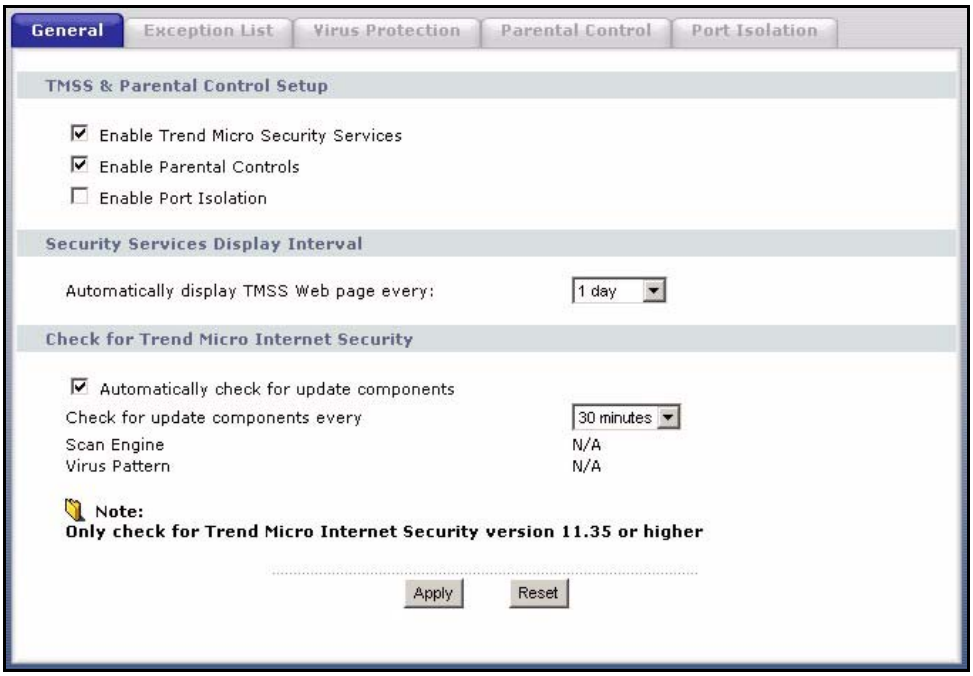
This section describes the following Trend Micro Home Network Security (TMSS) configuration screens:

To access the TMSS configuration screens, start the Prestige web configurator, click **Go to advanced setup**, and then click **Security** > **TMSS**.

13.4.1 TMSS General Screen

Click the **General** tab. The **General** screen appears.

Figure 102 TMSS General Screen



The following table describes the settings on this screen.

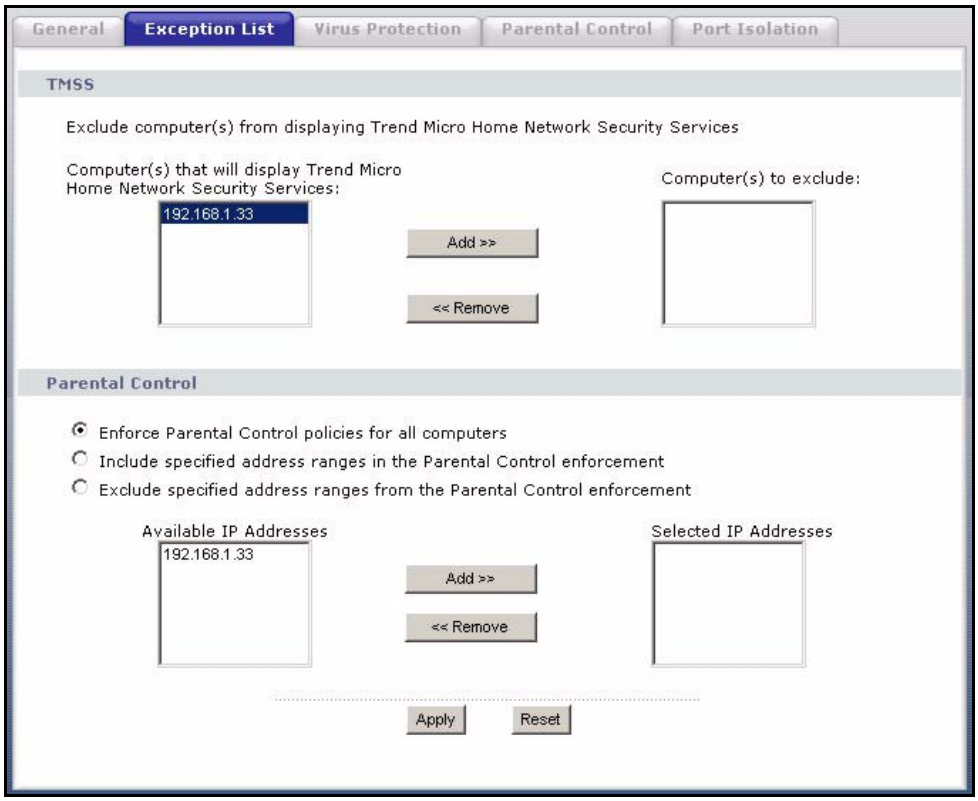
Table 77 Settings: General Screen

LABEL	DESCRIPTION
Enable Trend Micro Security Services	Select this check box to enable Trend Micro Home Network Security on your Prestige.
Enable Parental Controls	Select this check box to enable this feature on your Prestige.
Enable Port Isolation	Select this check box to activate port isolation on your Prestige. See Section 13.5 on page 212 for more information about port isolation.
Security Services Display Interval	
Automatically display TMSS Web page every:	Select how often you want the Trend MIcro dashboard to automatically appear in your web browser.
Check for Trend Micro Internet Security	
Automatically check for update components	Select this check box to have the Prestige download the latest scan engine and virus pattern version numbers (not the actual software) from the Trend Micro website. The Prestige can then check the version numbers currently on Prestige LAN computers and display the status on the Virus Protection screen.
Check for update components every	Select how often the Prestige automatically checks the Trend Micro ActiveUpdate server for updated components.
Scan engine	This field displays the latest Trend Micro antivirus scan engine version number that the Prestige has downloaded.
Virus pattern	This field displays the latest Trend Micro virus pattern version number that the Prestige has downloaded. **N/A** displays if there has been no reply to an update request.
Apply	Click **Apply** to save changes.
Reset	Click **Reset** to begin configuring this screen afresh.

13.4.2 Exception List Screen

Click the **Exception List** tab. The **Exception List** screen appears.

Figure 103 Exception List Screen



The following table describes the settings on this screen.

Table 78 Settings: Exception List Screen

LABEL	DESCRIPTION
Exclude computer(s) from displaying Trend Micro Home Network Security Services	
Computer(s) that will display Trend Micro Home Network Security Services:	This box lists the Prestige LAN computers that will automatically display the Trend Micro dashboard at the interval selected on the General screen.
Computer(s) to exclude:	This box lists the Prestige LAN computers that do not automatically display the Trend Micro dashboard. Select a computer IP address from the previous list box and then click **Add>>** to exclude it from automatically displaying the dashboard. Select a computer IP address from this list box and then click **<<Remove** to have it automatically display the Trend Micro dashboard.
Exception List	Use the Exception List to specify which computers are excluded from Parental Controls. All TMSS clients are displayed in the Available IP Addresses list box. Use the Add>> or <<Remove buttons to move computer IP addresses to the Selected IP Addresses list box and then select one of the following radio buttons to apply an action.
Enforce Parental Control policies for all computers	Select this radio button to enable Parental Controls on computers with IP addresses listed in the Available IP Addresses list box. This is the default setting.

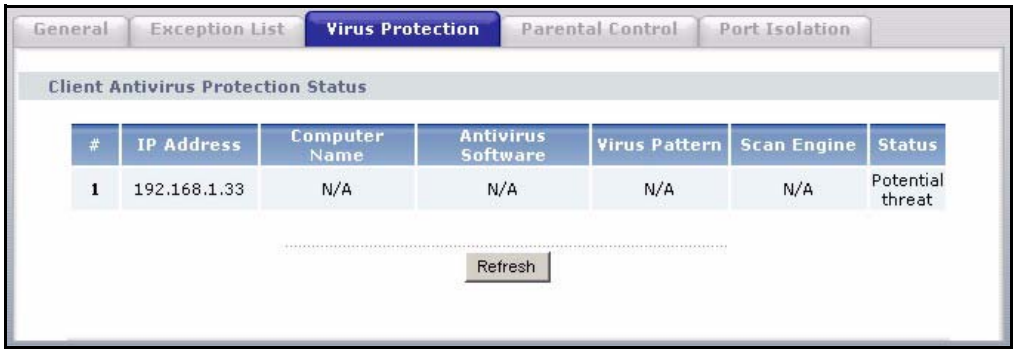
Table 78 Settings: Exception List Screen

LABEL	DESCRIPTION
Include specified address ranges in the Parental Control enforcement.	Select this radio button to enable Parental Controls only on the computers with IP addresses listed in the Selected IP Addresses list box.
Exclude specified address ranges from the Parental Control enforcement.	Select this radio button to disable Parental Controls on computers with IP addresses displayed in the Selected IP Addresses list box.
Available IP Addresses	This box displays the IP addresses of all TMSS clients.
Selected IP Addresses	This box displays the IP addresses of the computer(s) chosen from the Available IP Addresses box on which you want to enable or disable Parental Controls. Select an IP address in the Available IP Addresses list box and then click **Add>>** to move it to the Selected IP Addresses box. Select an IP address in the Selected IP Addresses list box and then click **<<Remove** to move it to the Available IP Addresses list box.
Apply	Click **Apply** to save the settings.
Reset	Click **Reset** to begin configuring this screen afresh.

13.4.3 Virus Protection Screen

Click the **Virus Protection** tab. The **Virus Protection** screen appears.

Figure 104 Virus Protection Screen



The following table describes the settings on this screen.

Table 79 Settings: Virus Protection Screen

LABEL	DESCRIPTION
Client Antivirus Protection Status	This table provides information on all TMSS client computers and the Prestige itself.
#	This field displays the index number of a TMSS client computer or the Prestige.

Table 79 Settings: Virus Protection Screen

LABEL	DESCRIPTION
IP Address	This field displays the IP address of a TMSS client computer or the Prestige.
Computer Name	This field displays the host name of a TMSS client computer or the Prestige system name.
Antivirus Software	This field displays the Trend Micro Internet Security version if this program is installed on the TMSS client computer. It displays **N/A** if Trend Micro Internet Security is not installed.
Virus Pattern	This field displays the current Trend Micro virus pattern version number on a TMSS client.
Scan Engine	This field displays the current Trend Micro antivirus scan engine version number on a TMSS client.
Status	This field indicates whether you have the latest Trend Micro antivirus software installed on a TMSS client computer. **Potential threat** displays if: • The Prestige had no response after an update request. • There is currently no Trend Micro antivirus software installed on the TMSS client. • The LAN computer is using a UNIX or Macintosh operating system. This message, when displayed for computers with these operating systems, does not indicate a "potential threat" but rather that TMSS cannot monitor them. **Needs update** displays if: • The Trend Micro antivirus component versions on the TMSS client are older than the version numbers downloaded to the Prestige. **Up to date** displays if: • The Trend Micro antivirus component version numbers on the TMSS client computer are the same as the numbers downloaded to the Prestige.
Apply	Click **Apply** to save the settings.
Reset	Click **Reset** to begin configuring this screen afresh.

13.4.4 Parental Control Screen

Click the **Parental Control** tab. The **Parental Control** screen appears.

Note: You need a **Parental Control** license (by creating a Trend Micro customer account) to activate and configure **Parental Control** categories on the Prestige.

13.4.4.1 General Control Mode and Per-User Control Mode

General control mode is the simplest way to configure Parental Control. In general control mode, the same restrictions apply to all network users.

Per-user control mode allows you to give different restrictions to each user of your network. In Per-user control mode, all users must log in before accessing the Internet.

13.4.4.2 Parents Override Password

This password allows mature users to view blocked web pages. You can also use it on the Trend Micro dashboard's Parental Controls screen to override Parental Controls for a specified period. In per-user control mode, select **Parents** as the user name to have full access to restricted web content.

Figure 105 Parental Control Screen: General Control Mode

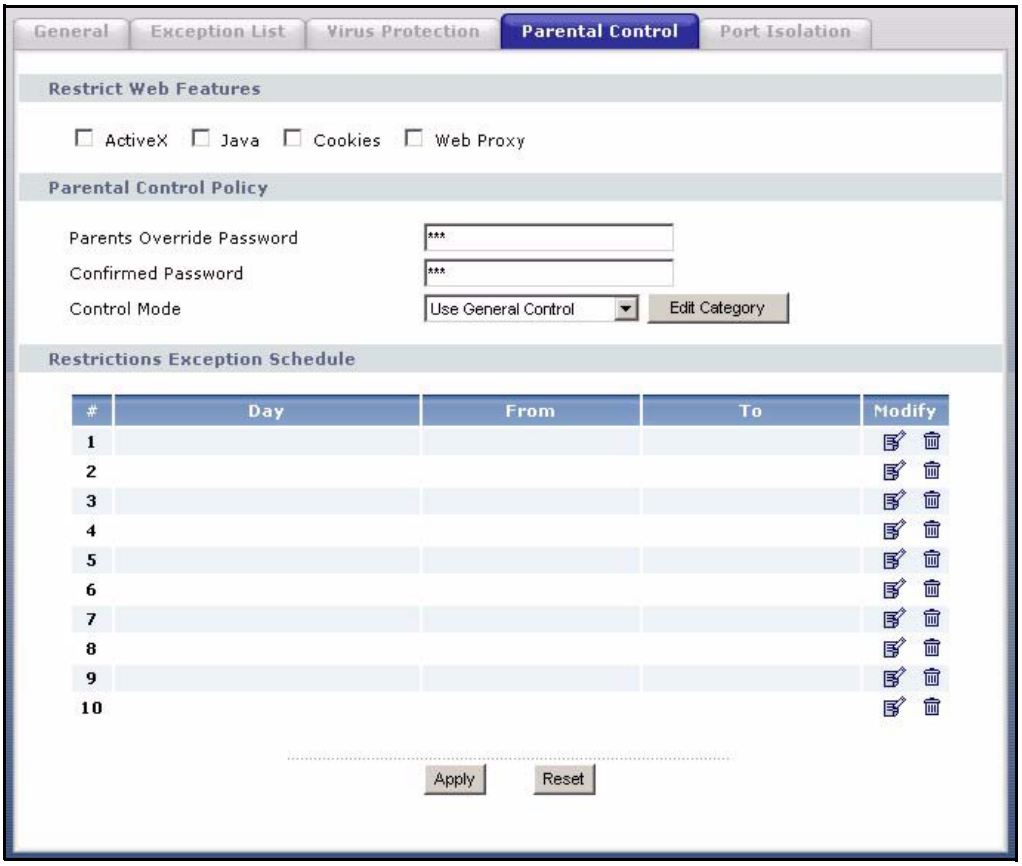
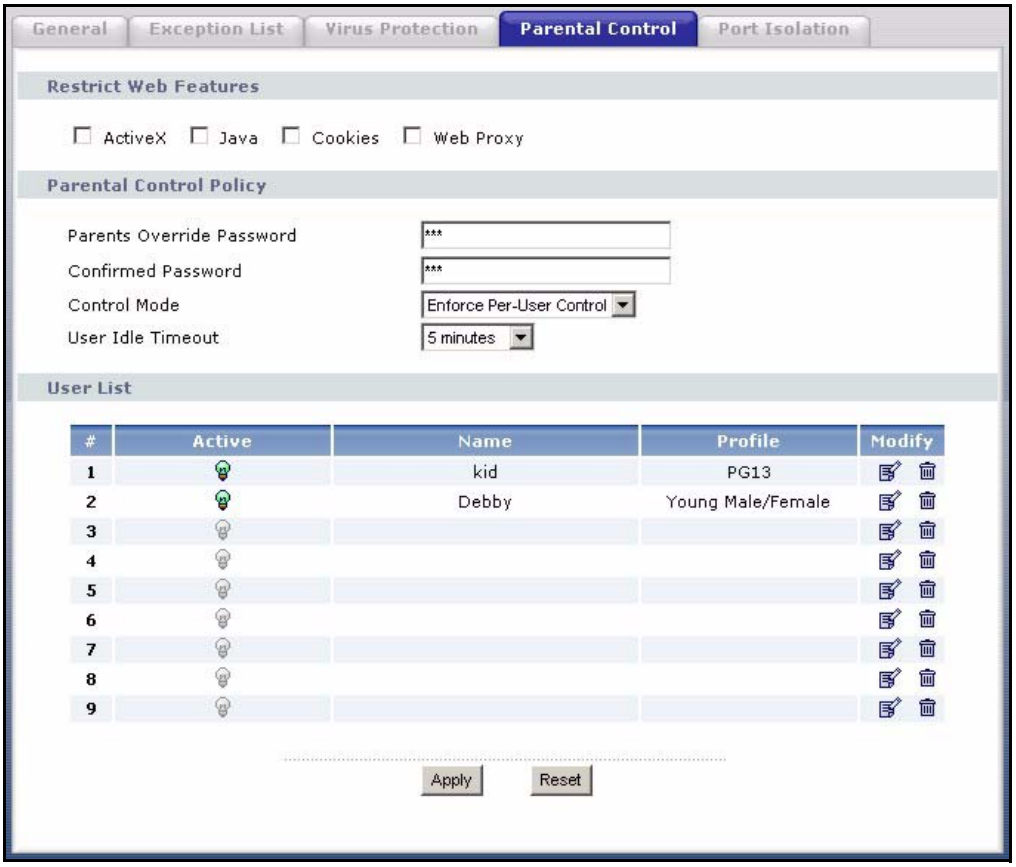


Figure 106 Parental Control Screen: Per-User Control Mode



The following table describes the labels on this screen.

Table 80 Settings: Parental Control Screen

LABEL	DESCRIPTION
Restrict Web Features Select the check boxes to restrict web features. When you download a page containing a restricted feature, that part of the web page will appear blank or grayed out.	
ActiveX	A tool for building dynamic and active web pages and distributed object applications. When you visit an ActiveX website, ActiveX controls are downloaded to your browser where they remain in case you visit the site again.
Java	A programming language and development environment for building downloadable web components or Internet and intranet business applications.
Cookies	Used by web servers to track usage and provide service based on ID.
Web Proxy	A server that acts as an intermediary between a user and the Internet to provide security, administrative control, and caching service. When a proxy server is located on the WAN, it is possible for LAN users to circumvent content filtering by pointing to this proxy server.
Parental Control Policy Parental Control prevent users of your home network from viewing inappropriate web content. For instructions on configuring Parental Controls, refer to Section 13.4.4 on page 205	

Table 80 Settings: Parental Control Screen

LABEL	DESCRIPTION
Parents Override Password	This password allows users to bypass Parental Control. Enter a password between four and 32 printable characters. Spaces are not allowed.
Confirmed Password	To change the override password, type the new password in the **Parents Override Password** field, retype it in the **Confirmed Password** field, and then click **Apply**.
Control Mode	This allows you to select either general control or per-user control mode.
Edit Category	If you select general control mode, click this button to configure the access profile that will apply to all users.
User Idle Timeout	Select a timeout setting when you use per-user control mode. If a computer is idle for the selected interval, the user is automatically logged out of Parental Controls. If a user leaves a computer unattended, this feature prevents someone else from using the computer to gain access to restricted sites.
Restrictions Exception Schedule	The following table is a list of days and times when restrictions are not enforced. It displays in the **Parental Control** screen when you use general control mode.
#	This is the number of the schedule.
Day	This is the day(s) when parent control is deactivated.
From	This is the start time when you want to disable parental control.
To	This is the end time when you want to disable parental control.
Modify	Click the Edit icon to go to the screen where you can edit the schedule. Click the Remove icon to delete an existing schedule.
User List	The User List is available only when you select per-user control mode. It shows each user's name and access profile. Active users (green light bulb) can access the websites permitted by their access profiles. Inactive users (gray light bulb) cannot log in and cannot access the Internet.
#	This is the number of the user.
Active	This displays whether the user is active or inactive.
Name	This is the name of the user.
Profile	This is the access profile applied to the user.
Modify	Click the Edit icon to go to the screen where you can configure the user information, access profile and schedule. Click the Remove icon to delete an existing user.
Apply	Click **Apply** to save the settings.
Reset	Click **Reset** to begin configuring this screen afresh.

13.4.5 Configuring an Access Profile in General Control Mode

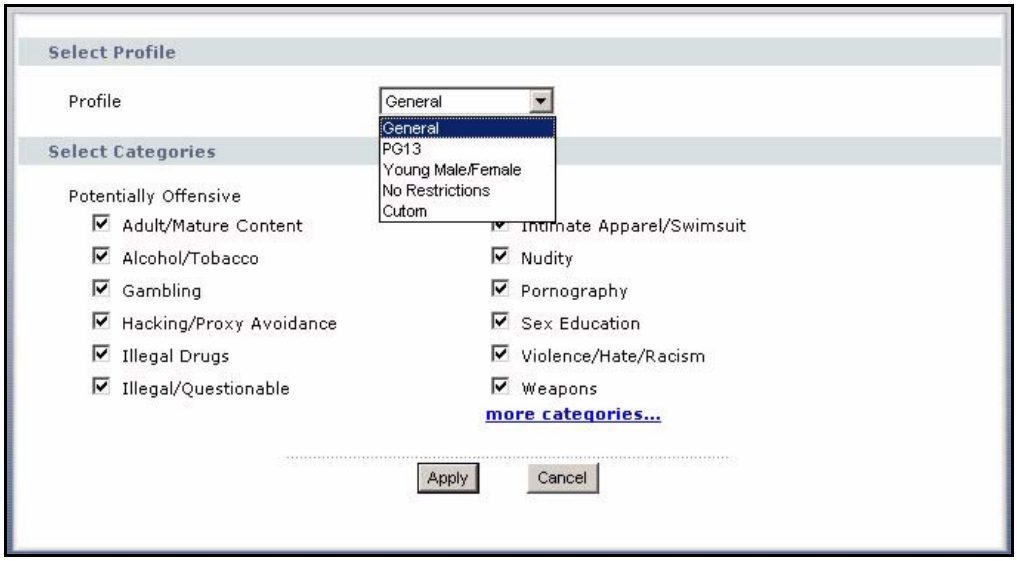
An access profile is a list of pre-selected categories to block. To configure Parental Control in General mode:

1. Start the Prestige web configurator, click **Security** > **TMSS**, and then click the **Parental Control** tab. The Parental Control screen appears.
2. In the **Control Mode** list box, select **Use General Control**.

3 Click **Edit Category**. In the **Profile** list box, choose the pre-defined access profile that will apply to all users. To create a custom profile, choose **Custom** and then select the check boxes for the categories you want to block. (For additional choices, click **more categories**).

4 Click **Apply** to save your changes. Otherwise, click **Cancel** to exit without saving.

Figure 107 General Mode: Edit Category



13.4.6 Configuring a Schedule

By default, Parental Control is always enabled. Alternatively, you can choose to disable Parental Control during certain periods.

To create an unrestricted access schedule:

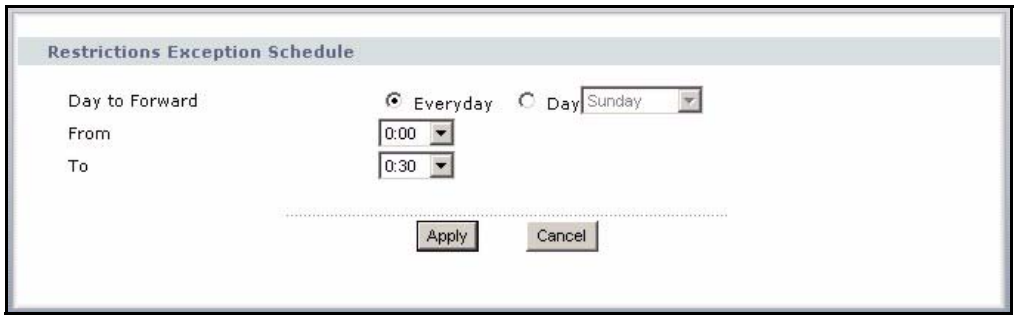
1 In the **Modify** column under **Restrictions Exception Schedule**, click the Edit icon ( ).

2 Select a specific day you want to disable Parental Controls, or select **Everyday**. Choose the start time and end time using 24-hour format (for example, "3:00pm" is "15:00").

3 Click **Apply** to save your changes. Otherwise, click **Cancel** to exit without saving.

To delete a schedule, click the Remove icon ( ).

Figure 108 General Mode: Edit Schedule



13.4.7 Configuring the User List in Per-User Mode

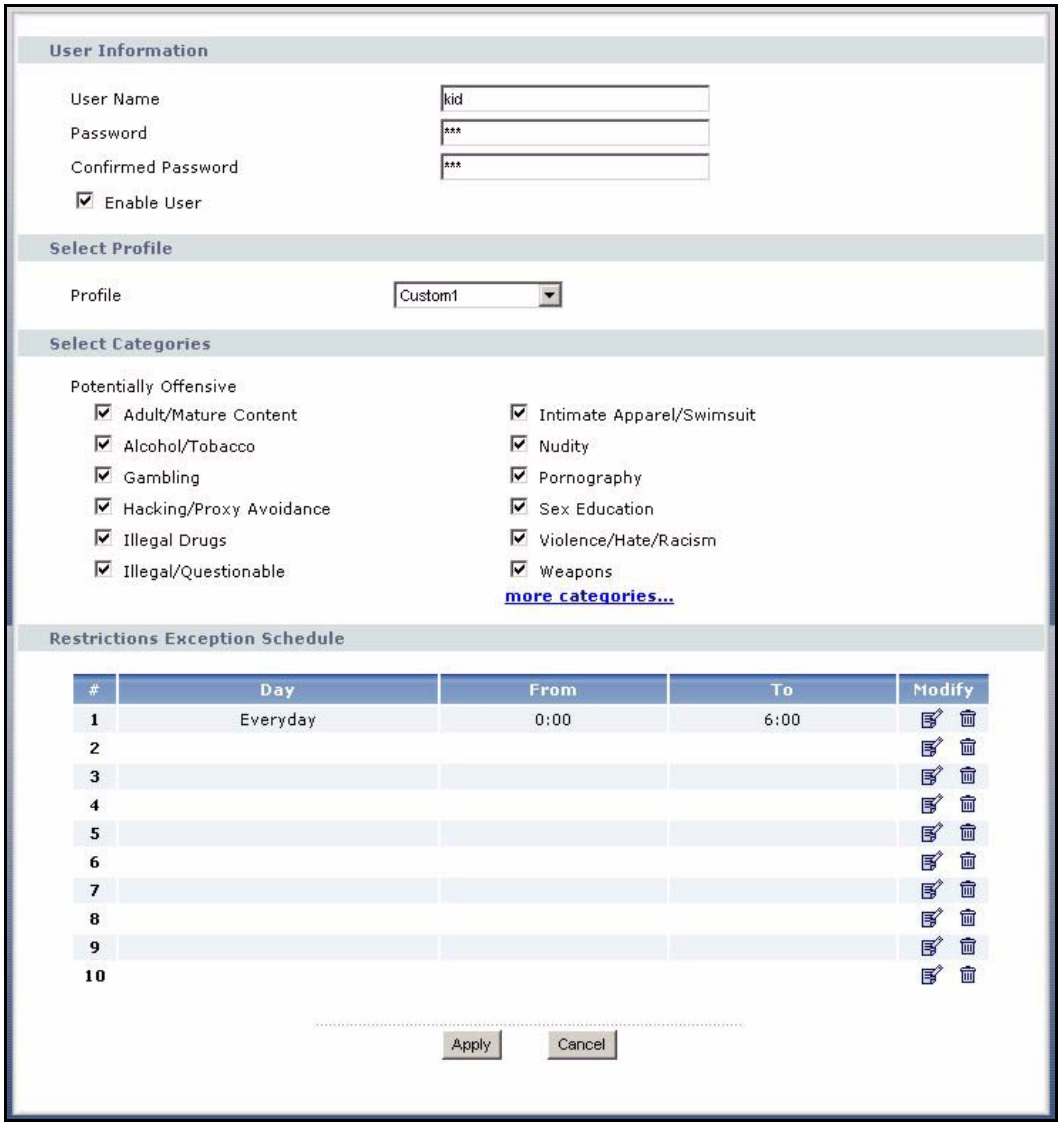
The **User List** in per-user control mode shows each user's name and access profile. Active users (green light bulb) can access the websites permitted by their access profiles. Inactive users (gray light bulb) cannot log in and cannot access the Internet.

To add a new user:

1. Click the edit icon ( ) in an unused row on the **User List**.
2. Type the new user's name (of up to 32 printable characters) and password (between four and 16 printable characters). Type the password again for confirmation.
3. Select the **Enable User** check box to allow this user to access the Internet. (Note: clearing this check box completely disables all Internet access by this user.)
4. In the **Profile** list box, choose the pre-defined access profile for this user. To create a custom profile, choose **Custom** and then select the check boxes for the categories you want to block. (For additional choices, click **more categories**.)
5. By default, Parental Control is always enabled. Alternatively, you can choose to disable Parental Control for this user during certain periods. To create an unrestricted access schedule, click the Edit icon ( ) in the **Modify** column under **Restrictions Exception Schedule** and then choose the days and times you want to disable Parental Control for this user (see Section 13.4.6 on page 209).
6. Click **Apply** to save your changes. Otherwise, click **Cancel** to exit without saving.

To edit an existing user's settings, click the Edit icon ( ) beside the user's name in the **User List**. To delete a user, click the Remove icon ( ).

Figure 109 Per-User Control Mode: Edit User List



13.4.8 Content Blocking Categories

Trend Micro has defined twelve categories of potentially offensive websites. The following table summarizes the blocking criteria for each category.

Table 81 Content Blocking Categories

CATEGORY	DESCRIPTION
Adult/Mature Content	Sites that contain material of an adult nature but without excessive violence, sexual content, or nudity. These sites may include profane or vulgar content and other content inappropriate for children.
Alcohol/Tobacco	Sites that promote or sell alcohol or tobacco products, or that provide the means to create them. Also includes sites that glamorize or otherwise encourage alcohol or tobacco consumption. Does not include sites that sell alcohol or tobacco as a subset of another business.

Table 81 Content Blocking Categories

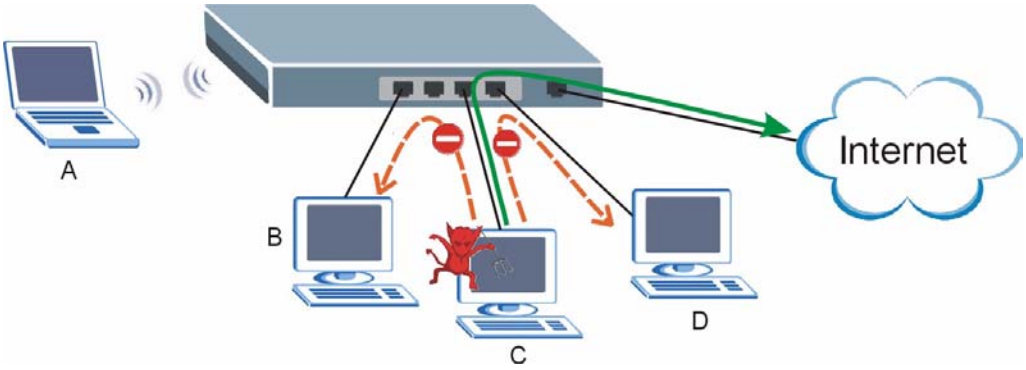
CATEGORY	DESCRIPTION
Gambling	Sites at which users can place bets or participate in betting pools (including lotteries) online. Also includes sites that provide information, assistance, recommendations, or training on placing bets or participating in games of chance. Does not include sites that sell gambling related products or machines. Also does not include off-line casino and hotel sites, unless they meet one of the foregoing criteria.
Hacking/Proxy Avoidance	Sites providing information on illegal or questionable access to, or use of, communications equipment and software, or that provide information on gaining unauthorized access to URLs.
Illegal Drugs	Sites that promote, offer, sell, supply, encourage or otherwise advocate the illegal use, cultivation, manufacture or distribution of drugs, pharmaceuticals, intoxicating plants and chemicals, and related paraphernalia.
Illegal/ Questionable	Sites that advocate or give advice on performing illegal acts such as service theft, evading law enforcement, fraud, burglary techniques, and plagiarism. Also includes sites that provide or sell questionable educational materials such as term papers.
Intimate Apparel/ Swimsuit	Sites that sell or contain images of swimsuits, intimate apparel, or other suggestive clothing. Does not include sites selling undergarments as a subset of another business.
Nudity	Sites that contain nude or seminude depictions of the human body. These depictions need not be sexual in intent or effect. May include sites containing nude paintings or photo galleries of an artistic nature. This category also includes nudist or naturist sites containing pictures of nude individuals.
Pornography	Sites that contain sexually explicit material for the purpose of arousing a sexual interest.
Sex Education	Sites that provide graphic information on reproduction, sexual development, safe sex practices, sexuality, birth control, and sexual development. Also includes sites that offer tips for better sex as well as products used for sexual enhancement.
Violence/Hate/ Racism	Sites that depict extreme physical harm to people or property, or which advocate or provide instructions on how to cause such harm. Also includes sites that advocate or depict hostility or aggression toward, or the denigration of, an individual or group on the basis of race, religion, gender, nationality, ethnic origin, and so forth.
Weapons	Sites that sell, review, or describe weapons such as guns, knives, martial arts devices, and related accessories, or that provide information on their use or modification. Does not include sites that promote weapons collecting, or groups that either support or oppose weapons ownership.

13.5 Port Isolation

When a computer is attacked by malicious programs or has security vulnerability, you can use port isolation to prevent the virus or attack from spreading through the whole network. Port isolation stops the communication between the port (connected to the infected/vulnerable computer) and other port(s).

Once the Prestige detects that the infected host, **C** in the following figure, is infected, it stops this port communicating with it's other ports. The infected host can still access the Internet to download a patch and remove the virus but cannot communicate with the devices (**A**, **B** and **D**) connected to other ports (or interfaces). The Prestige allows traffic passage between that port and other port(s) automatically once the infected computer is fixed.

Figure 110 Port Isolation Example



Click **Security > TMSS > Port Isolation** to display the screen as shown next.

Figure 111 Port Isolation

The following table describes the labels on this screen.

Table 82 Port Isolation

LABEL	DESCRIPTION
Select Categories	
Old virus pattern/scan Engine (Trend Micro Internet Security Only)	Select this category to enable port isolation on a port if the anti-virus version number on the host connected to the port is older than the current version on the Prestige.
File sharing	Select this category to enable port isolation on a port if the host connected to that port is trying to share files with others.
No Antivirus Software	Select this category to enable port isolation on a port if the host connected to that port has no anti-virus software installed.
Microsoft Vulnerability	Select this category to enable port isolation on a port if the host connected to that port has Microsoft security vulnerability.
Trojan	Select this category to enable port isolation on a port if the host connected to that port is attacked by a trojan.
Spyware	Select this category to enable port isolation on a port if the host connected to that port is attacked by spyware.

Table 82 Port Isolation

LABEL	DESCRIPTION
Bypass Port Isolation	Select the check box(es) of the interface(s) that are exempt from port isolation.
Apply	Click **Apply** to save the settings.
Reset	Click **Reset** to begin configuring this screen afresh.

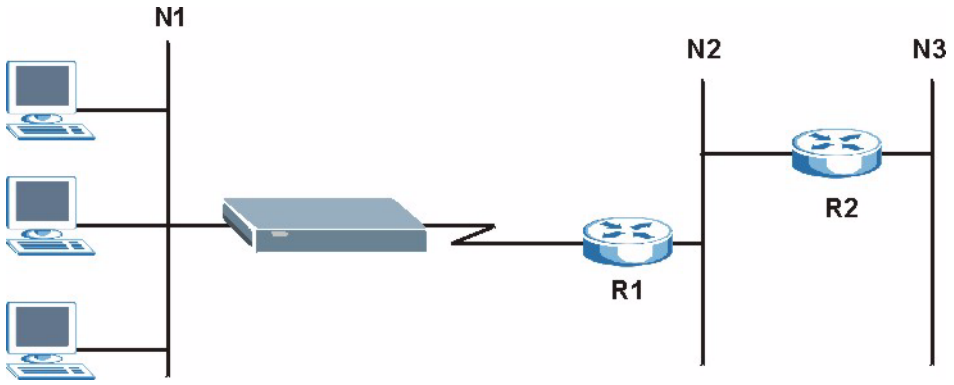
CHAPTER 14
Static Route Screens

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

14.1 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 **R1**. 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 **R1** (via gateway router **R2**). The static routes are for you to tell the Prestige about the networks beyond the remote nodes.

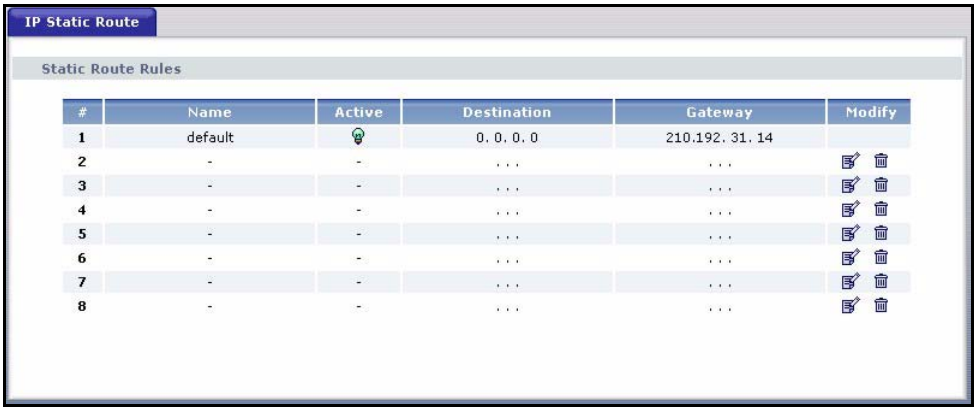
Figure 112 Example of Static Routing Topology



14.2 IP Static Route Screen

Click the **IP Static Route** link under **Management** to open the **IP Static Route** screen. The following screen displays.

Figure 113 IP Static Route



The following table describes the labels in this screen.

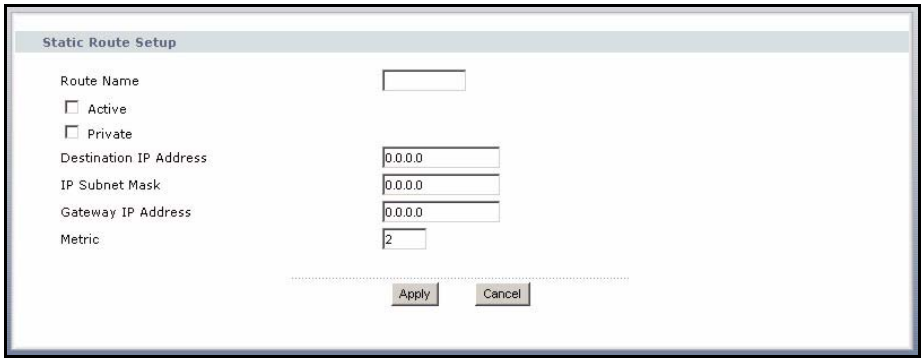
Table 83 IP Static Route

LABEL	DESCRIPTION
#	Number of an individual static route.
Name	Name that describes or identifies this route.
Active	This icon is turned on when this static route is active. Click the **Edit** icon under **Modify** and select the **Active** checkbox in the **Static Route Setup** screen to enable the static route. Clear the checkbox to disable this static route without having to delete the entry.
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 an immediate neighbor of your Prestige that will forward the packet to the destination. On the LAN, the gateway must be a router on the same segment as your Prestige; over the WAN, the gateway must be the IP address of one of the remote nodes.
Modify	Click the **Edit** icon to open the static route setup screen. Modify a static route or create a new static route in the **Static Route Setup** screen. Click the **Remove** icon to delete a static route.

14.2.1 Static Route Setup Screen

To edit a static route, click the edit icon under **Modify**. The following screen displays. Fill in the required information for each static route.

Figure 114 Static Route Setup



The following table describes the labels in this screen.

Table 84 Static Route Setup

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.
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 checkbox to propagate this route to other hosts through RIP broadcasts.
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 an immediate neighbor of your Prestige that will forward the packet to the destination. On the LAN, the gateway must be a router on the same segment as your Prestige; over the WAN, the gateway must be the IP address of one of the Remote Nodes.
Metric	Metric represents the "cost" of transmission for routing purposes. IP routing uses hop count as the measurement of cost, with a minimum of 1 for directly connected networks. Enter a number that approximates the cost for this link. The number need not be precise, but it must be between 1 and 15. In practice, 2 or 3 is usually a good number.
Apply	Click **Apply** to save your changes back to the Prestige.
Cancel	Click **Cancel** to return to the previous screen and not save your changes.

CHAPTER 15
Bandwidth Management

This chapter contains information about configuring bandwidth management, editing rules and viewing the Prestige's bandwidth management logs.

15.1 Bandwidth Management Overview

ZyXEL's Bandwidth Management allows you to specify bandwidth management rules based on an application and/or subnet. You can allocate specific amounts of bandwidth capacity (bandwidth budgets) to different bandwidth rules.

The Prestige applies bandwidth management to traffic that it forwards out through an interface. The Prestige does not control the bandwidth of traffic that comes into an interface.

Bandwidth management applies to all traffic flowing out of the router, regardless of the traffic's source.

Traffic redirect or IP alias may cause LAN-to-LAN traffic to pass through the Prestige and be managed by bandwidth management.

- The sum of the bandwidth allotments that apply to the WAN interface (LAN to WAN, WLAN to WAN, WLAN to WLAN / Prestige) must be less than or equal to the **Upstream Bandwidth** that you configure in the **Bandwidth Management Advanced** screen.
- The sum of the bandwidth allotments that apply to the LAN port (WAN to LAN, WLAN to LAN, LAN to LAN / Prestige) must be less than or equal to 100,000 kbps (you cannot configure the bandwidth budget for the LAN port).
- The sum of the bandwidth allotments that apply to the WLAN port (LAN to WLAN, WAN to WLAN, WLAN to WLAN / Prestige) must be less than or equal to 54,000 kbps (you cannot configure the bandwidth budget for the WLAN port).

15.2 Application-based Bandwidth Management

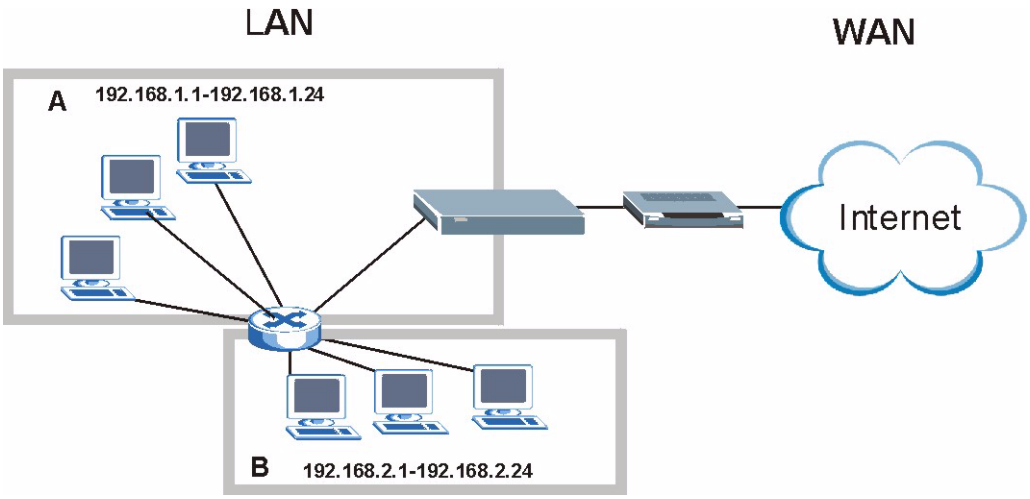
You can create bandwidth classes based on individual applications (like VoIP, Web, FTP, E-mail and Video for example).

15.3 Subnet-based Bandwidth Management

You can create bandwidth classes based on subnets.

The following figure shows LAN subnets. You could configure one bandwidth class for subnet **A** and another for subnet **B**.

Figure 115 Subnet-based Bandwidth Management Example



15.4 Application and Subnet-based Bandwidth Management

You could also create bandwidth classes based on a combination of a subnet and an application. The following example table shows bandwidth allocations for application specific traffic from separate LAN subnets.

Table 85 Application and Subnet-based Bandwidth Management Example

TRAFFIC TYPE	FROM SUBNET A	FROM SUBNET B
VoIP	64 Kbps	64 Kbps
Web	64 Kbps	64 Kbps
FTP	64 Kbps	64 Kbps
E-mail	64 Kbps	64 Kbps
Video	64 Kbps	64 Kbps

15.5 Bandwidth Management Priorities

The following table describes the priorities that you can apply to traffic that the Prestige forwards out through an interface.

Table 86 Bandwidth Management Priorities

PRIORITY LEVELS: TRAFFIC WITH A HIGHER PRIORITY GETS THROUGH FASTER WHILE TRAFFIC WITH A LOWER PRIORITY IS DROPPED IF THE NETWORK IS CONGESTED.	
High	Typically used for voice traffic or video that is especially sensitive to jitter (jitter is the variations in delay).
Mid	Typically used for "excellent effort" or better than best effort and would include important business traffic that can tolerate some delay.
Low	This is typically used for non-critical "background" traffic such as bulk transfers that are allowed but that should not affect other applications and users.

15.6 Predefined Bandwidth Management Services

The following is a description of the services that you can select and to which you can apply media bandwidth management using the wizard screens.

Table 87 Media Bandwidth Management Setup: Services

SERVICE	DESCRIPTION
Xbox Live	This is Microsoft's online gaming service that lets you play multiplayer Xbox games on the Internet via broadband technology. Xbox Live uses port 3074.
VoIP (SIP)	Sending voice signals over the Internet is called Voice over IP or VoIP. Session Initiated Protocol (SIP) is an internationally recognized standard for implementing VoIP. 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 is transported primarily over UDP but can also be transported over TCP, using the default port number 5060.
FTP	File Transfer Program enables fast transfer of files, including large files that may not be possible by e-mail. FTP uses port number 21.
E-Mail	Electronic mail consists of messages sent through a computer network to specific groups or individuals. Here are some default ports for e-mail: POP3 - port 110 IMAP - port 143 SMTP - port 25 HTTP - port 80
eMule	These programs use advanced file sharing applications relying on central servers to search for files. They use default port 4662.
BitTorrent	BitTorrent is a free P2P (peer-to-peer) sharing tool allowing you to distribute large software and media files using ports 6881 to 6889. BitTorrent requires you to search for a file with a searching engine yourself. It distributes files by corporation and trading, that is, the client downloads the file in small pieces and share the pieces with other peers to get other half of the file.

Table 87 Media Bandwidth Management Setup: Services (continued)

SERVICE	DESCRIPTION
MSN Webcam	MSN messenger allows you to chat online and send instant messages. If you use MSN messenger and also have a webcam, you can send your image/photo in real-time along with messages
WWW	The World Wide Web (WWW) is an Internet system to distribute graphical, hyper-linked information, based on Hyper Text Transfer Protocol (HTTP) - a client/server protocol for the World Wide Web. The Web is not synonymous with the Internet; rather, it is just one service on the Internet. Other services on the Internet include Internet Relay Chat and Newsgroups. The Web is accessed through use of a browser.

15.6.1 Services and Port Numbers

The commonly used services and port numbers are shown in the following table. Please refer to RFC 1700 for further information about port numbers. Next to the name of the service, two fields appear in brackets. The first field indicates the IP protocol type (TCP, UDP, or ICMP). The second field indicates the IP port number that defines the service. (Note that there may be more than one IP protocol type. For example, look at the **DNS** service. **(UDP/TCP:53)** means UDP port 53 and TCP port 53.

Table 88 Commonly Used Services

SERVICE	DESCRIPTION
AIM/New-ICQ(TCP:5190)	AOL's Internet Messenger service, used as a listening port by ICQ.
AUTH(TCP:113)	Authentication protocol used by some servers.
BGP(TCP:179)	Border Gateway Protocol.
BOOTP_CLIENT(UDP:68)	DHCP Client.
BOOTP_SERVER(UDP:67)	DHCP Server.
CU-SEEME(TCP/UDP:7648, 24032)	A popular videoconferencing solution from White Pines Software.
DNS(UDP/TCP:53)	Domain Name Server, a service that matches web names (e.g. www.zyxel.com) to IP numbers.
FINGER(TCP:79)	Finger is a UNIX or Internet related command that can be used to find out if a user is logged on.
FTP(TCP:20.21)	File Transfer Program, a program to enable fast transfer of files, including large files that may not be possible by e-mail.
H.323(TCP:1720)	NetMeeting uses this protocol.
HTTP(TCP:80)	Hyper Text Transfer Protocol - a client/server protocol for the world wide web.
HTTPS(TCP:443)	HTTPS is a secured http session often used in e-commerce.
ICQ(UDP:4000)	This is a popular Internet chat program.
IKE(UDP:500)	The Internet Key Exchange algorithm is used for key distribution and management.
IPSEC_TUNNEL(AH:0)	The IPSEC AH (Authentication Header) tunneling protocol uses this service.

Table 88 Commonly Used Services

SERVICE	DESCRIPTION
IPSEC_TUNNEL(ESP:0)	The IPSEC ESP (Encapsulation Security Protocol) tunneling protocol uses this service.
IRC(TCP/UDP:6667)	This is another popular Internet chat program.
MSN Messenger(TCP:1863)	Microsoft Networks' messenger service uses this protocol.
MULTICAST(IGMP:0)	Internet Group Multicast Protocol is used when sending packets to a specific group of hosts.
NEW-ICQ(TCP:5190)	An Internet chat program.
NEWS(TCP:144)	A protocol for news groups.
NFS(UDP:2049)	Network File System - NFS is a client/server distributed file service that provides transparent file sharing for network environments.
NNTP(TCP:119)	Network News Transport Protocol is the delivery mechanism for the USENET newsgroup service.
PING(ICMP:0)	Packet INternet Groper is a protocol that sends out ICMP echo requests to test whether or not a remote host is reachable.
POP3(TCP:110)	Post Office Protocol version 3 lets a client computer get e-mail from a POP3 server through a temporary connection (TCP/IP or other).
PPTP(TCP:1723)	Point-to-Point Tunneling Protocol enables secure transfer of data over public networks. This is the control channel.
PPTP_TUNNEL(GRE:0)	Point-to-Point Tunneling Protocol enables secure transfer of data over public networks. This is the data channel.
RCMD(TCP:512)	Remote Command Service.
REAL_AUDIO(TCP:7070)	A streaming audio service that enables real time sound over the web.
REXEC(TCP:514)	Remote Execution Daemon.
RLOGIN(TCP:513)	Remote Login.
RTELNET(TCP:107)	Remote Telnet.
RTSP(TCP/UDP:554)	The Real Time Streaming (media control) Protocol (RTSP) is a remote control for multimedia on the Internet.
SFTP(TCP:115)	Simple File Transfer Protocol.
SMTP(TCP:25)	Simple Mail Transfer Protocol is the message-exchange standard for the Internet. SMTP enables you to move messages from one e-mail server to another.
SNMP(TCP/UDP:161)	Simple Network Management Program.
SNMP-TRAPS(TCP/UDP:162)	Traps for use with the SNMP (RFC:1215).
SQL-NET(TCP:1521)	Structured Query Language is an interface to access data on many different types of database systems, including mainframes, midrange systems, UNIX systems and network servers.
SSH(TCP/UDP:22)	Secure Shell Remote Login Program.
STRM WORKS(UDP:1558)	Stream Works Protocol.
SYSLOG(UDP:514)	Syslog allows you to send system logs to a UNIX server.
TACACS(UDP:49)	Login Host Protocol used for (Terminal Access Controller Access Control System).

Table 88 Commonly Used Services

SERVICE	DESCRIPTION
TELNET(TCP:23)	Telnet is the login and terminal emulation protocol common on the Internet and in UNIX environments. It operates over TCP/IP networks. Its primary function is to allow users to log into remote host systems.
TFTP(UDP:69)	Trivial File Transfer Protocol is an Internet file transfer protocol similar to FTP, but uses the UDP (User Datagram Protocol) rather than TCP (Transmission Control Protocol).
VDOLIVE(TCP:7000)	Another videoconferencing solution.

15.7 Default Bandwidth Management Classes and Priorities

If you enable bandwidth management but do not configure a rule for critical traffic like VoIP, the voice traffic may then get delayed due to insufficient bandwidth. With the automatic traffic classifier feature activated, the Prestige automatically assigns a default bandwidth management class and priority to traffic that does not match any of the user-defined rules. The traffic is classified based on the traffic type. Real-time traffic always gets higher priority over other traffic.

The following table shows you the priorities between the three default classes (**AutoClass_H**, **AutoClass_M** and **Default Class**) and user-defined rules. 6 is the highest priority.

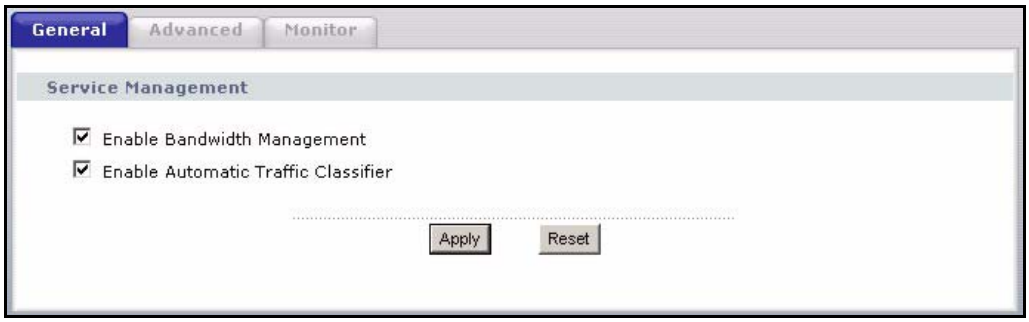
Table 89 Bandwidth Management Priority with Default Classes

CLASS TYPE	PRIORITY
User-defined with high priority	6
AutoClass_H	5
User-defined with medium priority	4
AutoClass_M	3
User-defined with low priority	2
Default Class	1

15.8 Bandwidth Management General Configuration

Click the **Bandwidth MGMT** link under **Management** to open the bandwidth management **General** screen.

Figure 116 Bandwidth Management: General



The following table describes the labels in this screen.

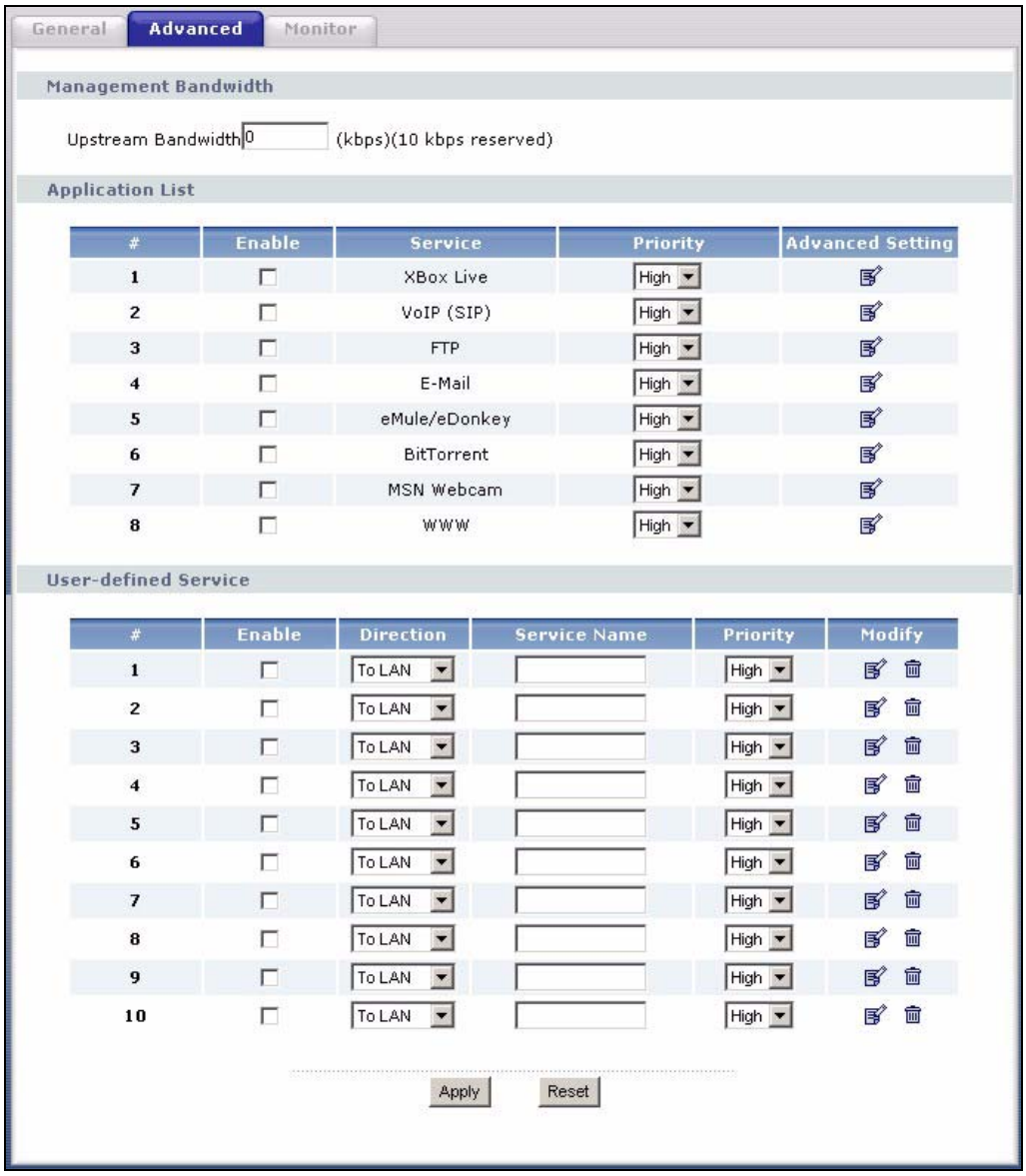
Table 90 Bandwidth Management: General

LABEL	DESCRIPTION
Enable Bandwidth Management	Select this check box to have the Prestige apply bandwidth management. Enable bandwidth management to give traffic that matches a bandwidth rule priority over traffic that does not match a bandwidth rule. Enabling bandwidth management also allows you to control the maximum or minimum amounts of bandwidth that can be used by traffic that matches a bandwidth rule.
Enable Automatic Traffic Classifier	This field is only applicable when you select the **Enable Bandwidth Management** check box. Select this check box to have the Prestige base on the default bandwidth classes to apply bandwidth management. Real-time packets, such as VoIP traffic always get higher priority.
Apply	Click **Apply** to save your customized settings.
Reset	Click **Reset** to begin configuring this screen afresh.

15.9 Bandwidth Management Advanced Configuration

Click the **Bandwidth MGMT** link under **Management** and the **Advanced** tab to open the bandwidth management **Advanced** screen.

Figure 117 Bandwidth Management: Advanced



The following table describes the labels in this screen.

Table 91 Bandwidth Management: Advanced

LABEL	DESCRIPTION
Upstream Bandwidth (kbps)	Enter the amount of bandwidth in kbps (2 to 100,000) that you want to allocate for traffic. 20 kbps to 20,000 kbps is recommended. The recommendation is to set this speed to be equal to or less than the speed of the broadband device connected to the WAN port. For example, set the speed to 1000 Kbps (or less) if the broadband device connected to the WAN port has an upstream speed of 1000 Kbps.
Application List	Use this table to allocate specific amounts of bandwidth based on the pre-defined service.
#	This is the number of an individual bandwidth management rule.

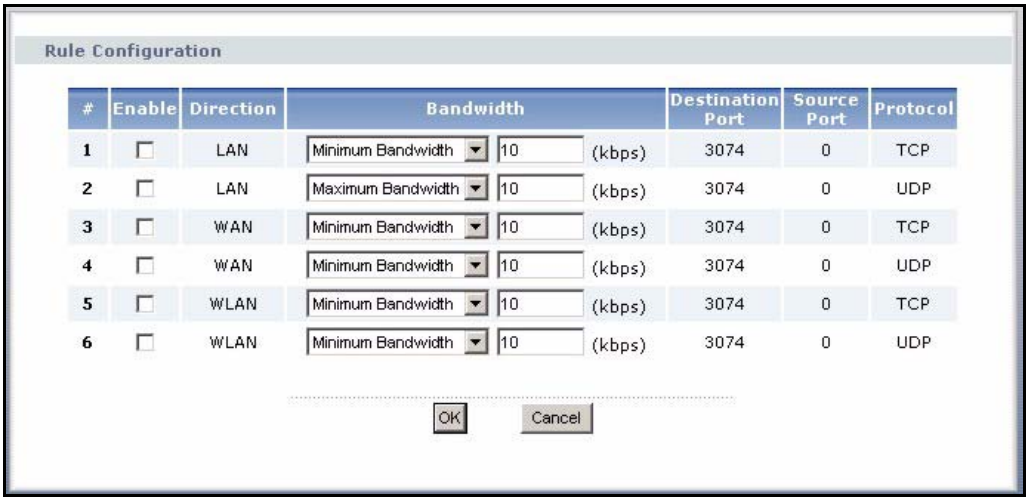
Table 91 Bandwidth Management: Advanced (continued)

LABEL	DESCRIPTION
Enable	Select this check box to have the Prestige apply this bandwidth management rule.
Service	This is the name of the service.
Priority	Select a priority from the drop down list box. Choose **High**, **Mid** or **Low**.
Advanced Setting	Click the **Edit** icon to open the **Rule Configuration** screen where you can modify the rule.
User-defined Service	Use this table to allocate specific amounts of bandwidth to specific applications and/or subnets.
#	This is the number of an individual bandwidth management rule.
Enable	Select this check box to have the Prestige apply this bandwidth management rule.
Direction	Select **To LAN** to apply bandwidth management to traffic that the Prestige forwards to the LAN. Select **To WAN** to apply bandwidth management to traffic that the Prestige forwards to the WAN. Select **To WLAN** to apply bandwidth management to traffic that the Prestige forwards to the WLAN.
Service Name	Enter a descriptive name of up to 19 alphanumeric characters, including spaces.
Priority	Select a priority from the drop down list box. Choose **High**, **Mid** or **Low**.
Modify	Click the **Edit** icon to open the **Rule Configuration** screen. Modify an existing rule or create a new rule in the **Rule Configuration** screen. See Section 15.9.2 on page 228 for more information. Click the **Remove** icon to delete a rule.
Apply	Click **Apply** to save your customized settings.
Reset	Click **Reset** to begin configuring this screen afresh.

15.9.1 Rule Configuration with the Pre-defined Service

To edit a bandwidth management rule for the pre-defined service in the Prestige, click the **Edit** icon in the **Application List** table of the **Advanced** screen. The following screen displays.

Figure 118 Bandwidth Management Rule Configuration: Pre-defined Service



The following table describes the labels in this screen.

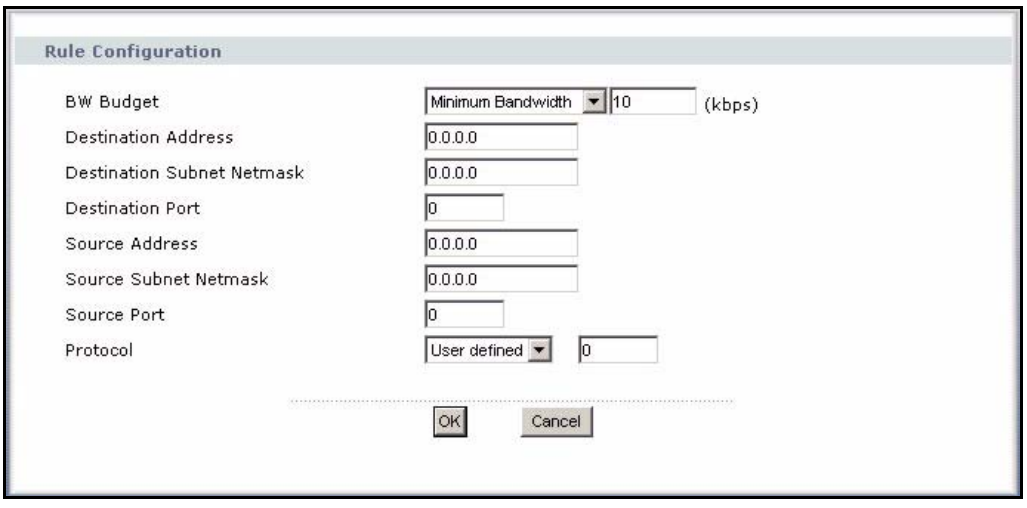
Table 92 Bandwidth Management Rule Configuration: Pre-defined Service

LABEL	DESCRIPTION
#	This is the number of an individual bandwidth management rule.
Enable	Select an interface's check box to enable bandwidth management on that interface.
Direction	These read-only labels represent the physical interfaces. Bandwidth management applies to all traffic flowing out of the router through the interface, regardless of the traffic's source. Traffic redirect or IP alias may cause LAN-to-LAN traffic to pass through the Prestige and be managed by bandwidth management.
Bandwidth	Select **Maximum Bandwidth** or **Minimum Bandwidth** and specify the maximum or minimum bandwidth allowed for the rule in kilobits per second.
Destination Port	This is the port number of the destination. See Table 88 on page 222 for some common services and port numbers.
Source Port	This is the port number of the source. See Table 88 on page 222 for some common services and port numbers.
Protocol	This is the protocol (**TCP** or **UDP**) used for the service.
OK	Click **OK** to save your customized settings.
Cancel	Click **Cancel** to exit this screen without saving.

15.9.2 Rule Configuration with the User-defined Service

In addition to the pre-defined services, if you want to edit a bandwidth management rule for other applications and/or subnets, click the **Edit** icon in the **User-defined Service** table of the **Advanced** screen. The following screen displays.

Figure 119 Bandwidth Management Rule Configuration: User-defined Service



The following table describes the labels in this screen.

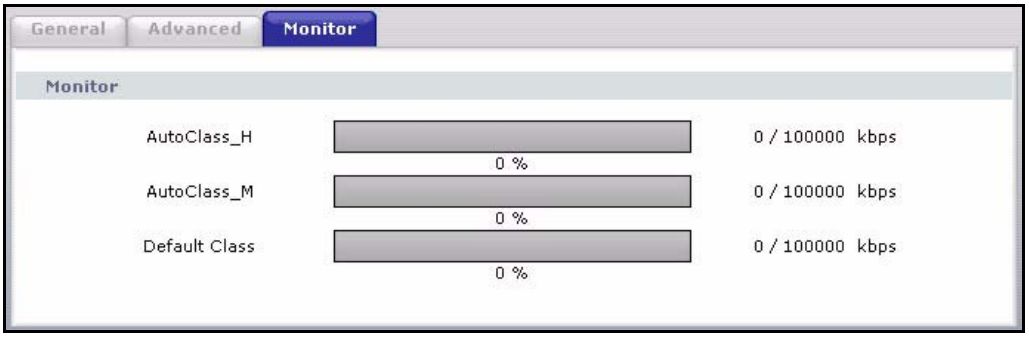
Table 93 Bandwidth Management Rule Configuration: User-defined Service

LABEL	DESCRIPTION
BW Budget	Select **Maximum Bandwidth** or **Minimum Bandwidth** and specify the maximum or minimum bandwidth allowed for the rule in kilobits per second.
Destination Address	Enter the destination IP address in dotted decimal notation.
Destination Subnet Netmask	Enter the destination subnet mask. This field is N/A if you do not specify a **Destination Address**. Refer to the appendices for more information on IP subnetting.
Destination Port	Enter the port number of the destination. See Table 88 on page 222 for some common services and port numbers.
Source Address	Enter the source IP address in dotted decimal notation.
Source Subnet Netmask	Enter the destination subnet mask. This field is N/A if you do not specify a **Source Address**. Refer to the appendices for more information on IP subnetting.
Source Port	Enter the port number of the source. See Table 88 on page 222 for some common services and port numbers.
Protocol	Select the protocol (**TCP** or **UDP**) or select **User defined** and enter the protocol (service type) number.
OK	Click **OK** to save your customized settings.
Cancel	Click **Cancel** to exit this screen without saving.

15.10 Bandwidth Management Monitor

Click the **Bandwidth MGMT** link under **Management** and the **Monitor** tab to open the bandwidth management **Monitor** screen. View the bandwidth usage of the WAN configured bandwidth rules. This is also shown as bandwidth usage over the bandwidth budget for each rule. The gray section of the bar represents the percentage of unused bandwidth and the orange color represents the percentage of bandwidth in use.

Figure 120 Bandwidth Management: Monitor



CHAPTER 16
Remote Management Screens

This chapter provides information on the Remote Management screens.

16.1 Remote Management Overview

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

Note: When you configure remote management to allow management from the WAN, you still need to configure a firewall rule to allow access. See the firewall chapters for details on configuring firewall rules.

You may manage your Prestige from a remote location via:

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

Note: When you choose **WAN** or **LAN & WAN**, you still need to configure a firewall rule to allow access.

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

16.1.1 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 Address** 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.

5 There is a firewall rule that blocks it.

16.1.2 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.

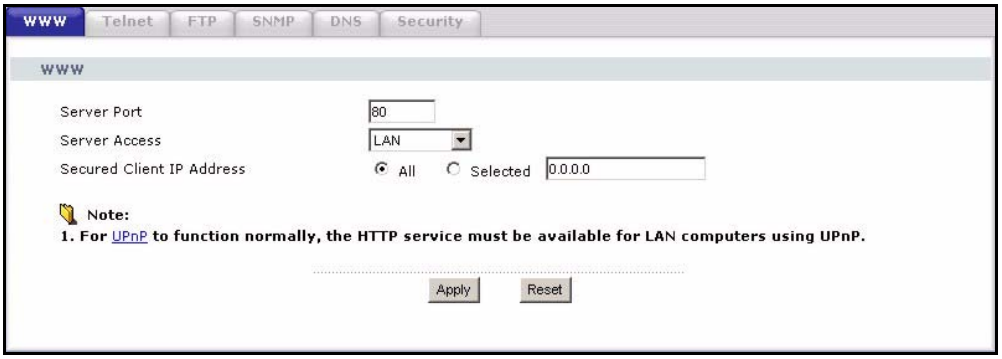
16.1.3 System Timeout

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** screen

16.2 WWW Screen

To change your Prestige's World Wide Web settings, click the **Remote MGMT** link under **Management** to display the **WWW** screen.

Figure 121 WWW Remote Management



The following table describes the labels in this screen.

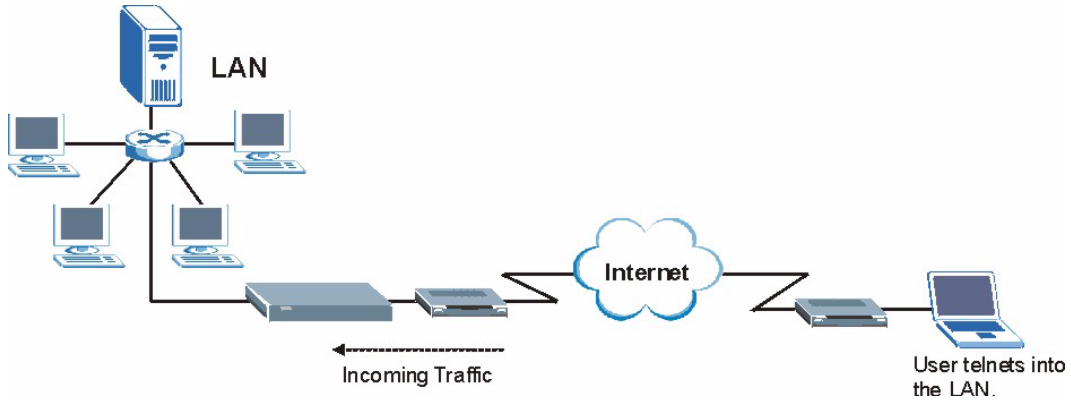
Table 94 WWW Remote Management

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 **All** to allow any computer to access the Prestige using this service. Choose **Selected** to just allow the computer with the IP address that you specify to access the Prestige using this service.
Apply	Click **Apply** to save your customized settings and exit this screen.
Reset	Click **Reset** to begin configuring this screen afresh.

16.3 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.

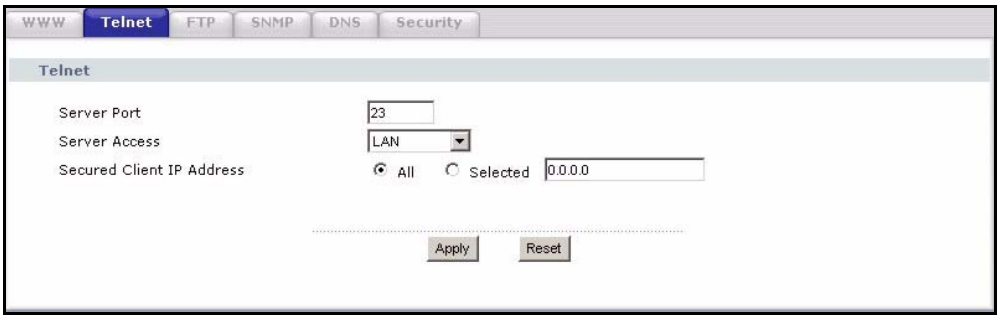
Figure 122 Telnet Configuration on a TCP/IP Network



16.4 Telnet Screen

To change your Prestige's Telnet settings, click the **Remote MGMT** link under **Management** and the **Telnet** tab. The following screen displays.

Figure 123 Telnet Remote Management



The following table describes the labels in this screen.

Table 95 Telnet Remote Management

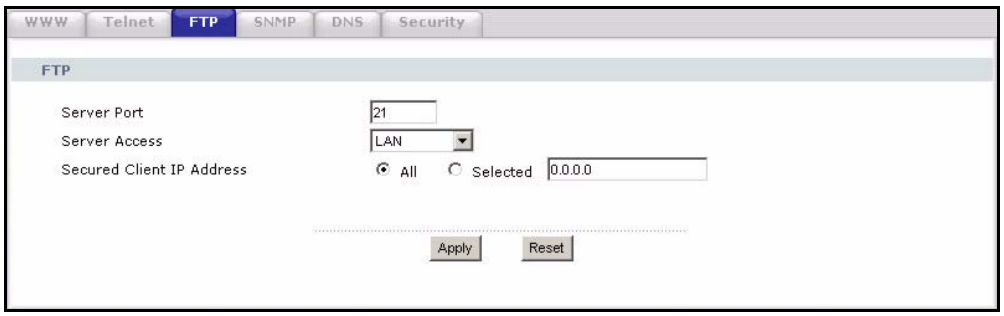
LABEL	DESCRIPTION
Server Port	You may change the server port number for a service if needed, however you must use the same port number in order to use that service for remote management.
Server Access	Select the interface(s) through which a computer may access the Prestige using this service.
Secured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

16.5 FTP Screen

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 the **Remote MGMT** link under **Management**, and the **FTP** tab. The screen appears as shown.

Figure 124 FTP Remote Management



The following table describes the labels in this screen.

Table 96 FTP Remote Management

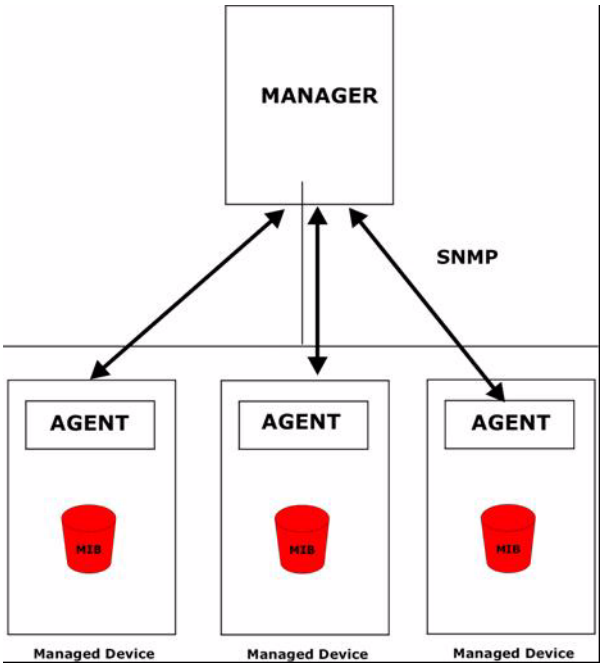
LABEL	DESCRIPTION
Server Port	You may change the server port number for a service if needed, however you must use the same port number in order to use that service for remote management.
Server Access	Select the interface(s) through which a computer may access the Prestige using this service.
Secured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

16.6 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.

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

Figure 125 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.

16.6.1 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.

16.6.2 SNMP Traps

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

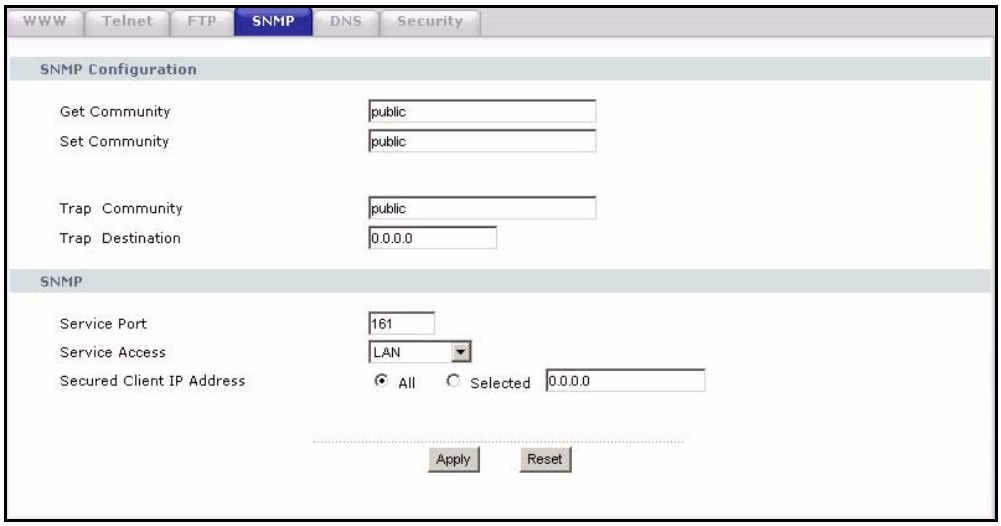
Table 97 SNMP Traps

TRAP #	TRAP NAME	DESCRIPTION
0	coldStart (defined in *RFC-1215*)	A trap is sent after booting (power on).
1	warmStart (defined in *RFC-1215*)	A trap is sent after booting (software reboot).
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.).
6b	For fatal error :	A trap is sent with the message of the fatal code if the system reboots because of fatal errors.

16.7 SNMP Screen

To change your Prestige's SNMP settings, click the **Remote MGMT** link under **Management**, and the **SNMP** tab. The screen appears as shown.

Figure 126 SNMP Remote Management



The following table describes the labels in this screen.

Table 98 SNMP Remote Management

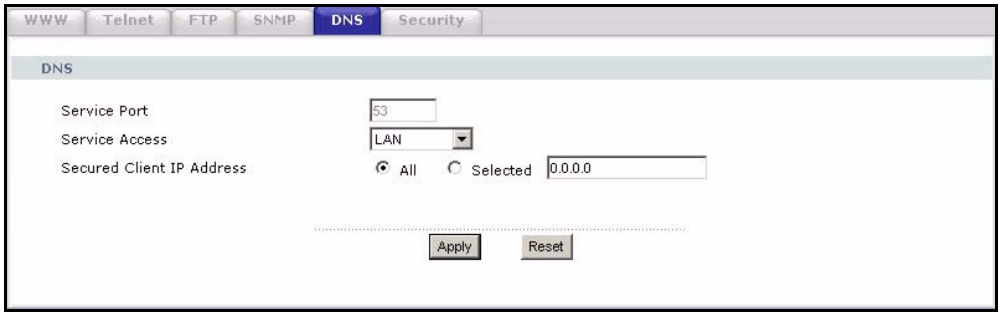
LABEL	DESCRIPTION
SNMP Configuration	
Get Community	Enter the **Get Community**, which is the password for the incoming Get and GetNext requests from the management station. The default is public and allows all requests.
Set Community	Enter the **Set community**, which is the password for incoming Set 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.
Trap 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.
Secured Client IP Address	A secured client is a "trusted" computer that is allowed to communicate with the Prestige using this service. Select **All** to allow any computer to access the Prestige using this service. Choose **Selected** to just allow the computer with the IP address that you specify to access the Prestige using this service.
Apply	Click **Apply** to save your customized settings and exit this screen.
Reset	Click **Reset** to begin configuring this screen afresh.

16.8 DNS Screen

Use DNS (Domain Name System) to map a domain name to its corresponding IP address and vice versa. Refer to the chapter on Wizard Setup for background information.

To change your Prestige's DNS settings, click the **Remote MGMT** link under **Management** and the **DNS** tab. The screen appears as shown.

Figure 127 DNS Remote Management



The following table describes the labels in this screen.

Table 99 DNS Remote Management

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

16.9 Security Screen

To change your Prestige's security settings, click the **Remote MGMT** link under **Management** and 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 128 Security Remote Management

The following table describes the labels in this screen.

Table 100 Security Remote Management

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 **Disable** is selected. Select **LAN** to reply to incoming LAN Ping requests. Select **WAN** to reply to incoming WAN Ping requests. Otherwise select **LAN & WAN** 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. Note that the probing packets must first traverse the Prestige's firewall mechanism before reaching this anti-probing mechanism. Therefore if the firewall mechanism blocks a probing packet, the Prestige reacts based on the firewall policy, which by default, is to send a TCP reset packet for a blocked TCP packet. You can use the command "sys firewall tcprst rst [on|off]" to change this policy. When the firewall mechanism blocks a UDP packet, it drops the packet without sending a response packet.
Apply	Click **Apply** to save your customized settings and exit this screen.
Reset	Click **Reset** to begin configuring this screen afresh.

CHAPTER 17
UPNP

This chapter introduces the Universal Plug and Play feature.

17.1 Universal Plug and Play Overview

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

17.1.1 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.

17.1.2 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:

1. Dynamic port mapping
2. Learning public IP addresses
3. Assigning lease times to mappings

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

See the chapter on SUA/NAT for further information about NAT.

17.1.3 Cautions with UPnP

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

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

17.2 UPnP and ZyXEL

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

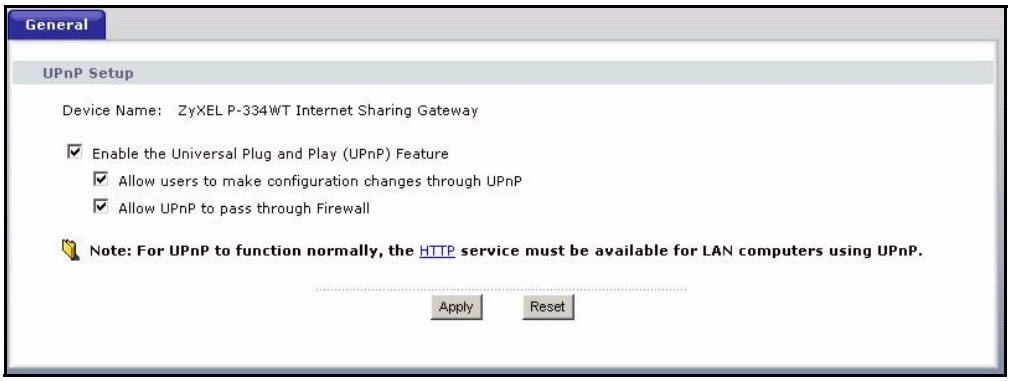
UPnP broadcasts are only allowed on the LAN.

Please see later in this User's Guide for examples of installing UPnP in Windows XP and Windows Me as well as an example of using UPnP in Windows.

17.3 UPnP Screen

Click the **UPnP** link under **Management** to display the UPnP screen.

Figure 129 Configuring UPnP



The following table describes the labels in this screen.

Table 101 Configuring UPnP

LABEL	DESCRIPTION
Enable the Universal Plug and Play (UPnP) feature	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.

Table 101 Configuring UPnP

LABEL	DESCRIPTION
Allow UPnP to pass through Firewall	UPnP broadcasts are only allowed on the LAN. If you block LAN-to-LAN/ Prestige traffic using the firewall, then you need to select this check box to allow UPnP-enabled traffic to pass through the firewall. This setting remains active until you disable UPnP. Clear this check box if you do not want to create a hole in the firewall for UPnP application packets (for example, MSN packets).
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to begin configuring this screen afresh.

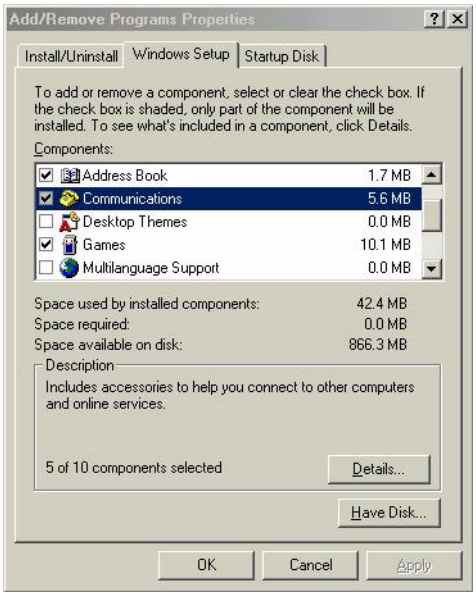
17.4 Installing UPnP in Windows Example

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

17.4.1 Installing UPnP in Windows Me

Follow the steps below to install UPnP in Windows Me.

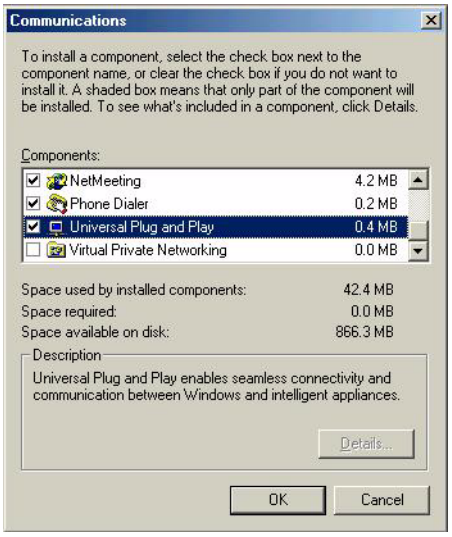
1. Click **Start** and **Control Panel**. Double-click **Add/Remove Programs**.
2. Click on the **Windows Setup** tab and select **Communication** in the **Components** selection box. Click **Details**.



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

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

5 Restart the computer when prompted.



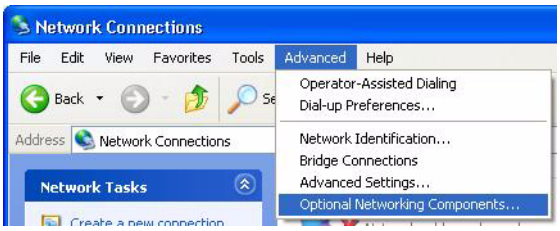
17.4.2 Installing UPnP in Windows XP

Follow the steps below to install UPnP in Windows XP.

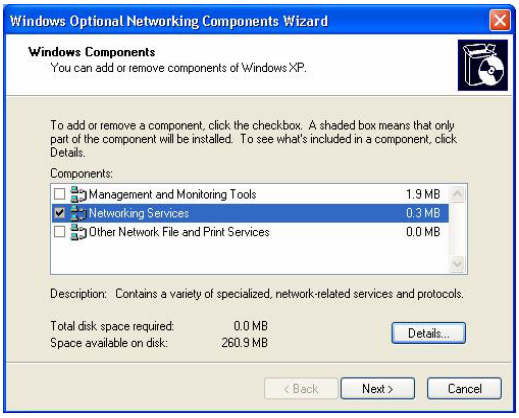
1 Click **Start** and **Control Panel**.

2 Double-click **Network Connections**.

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

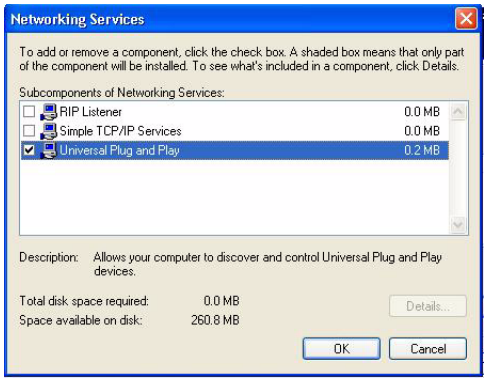


4 Select **Networking Service** in the **Components** selection box and click **Details**.



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

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



17.5 Using UPnP in Windows XP Example

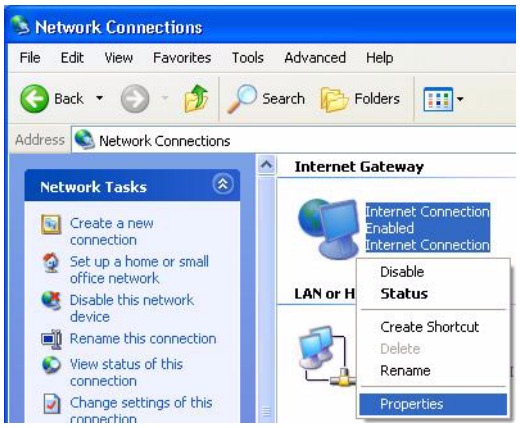
This section shows you how to use the UPnP feature in Windows XP. You must already have UPnP installed in Windows XP and UPnP activated on the ZyXEL device.

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

17.5.1 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**.



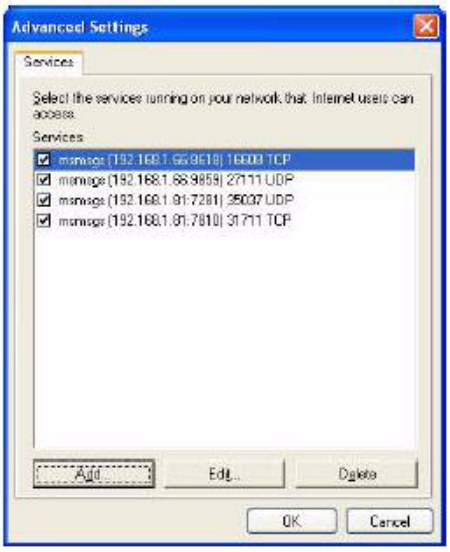
3 In the **Internet Connection Properties** window, click **Settings** to see the port mappings that were automatically created.

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

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

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

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



17.5.2 Web Configurator Easy Access

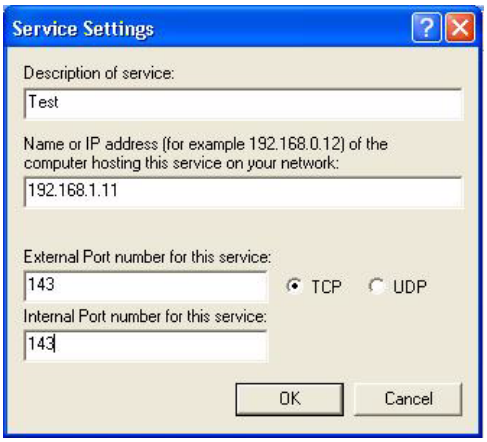
With UPnP, you can access the web-based configurator on the ZyXEL device without finding out the IP address of the ZyXEL device first. This is helpful if you do not know the IP address of the ZyXEL device.

Follow the steps below to access the web configurator.

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

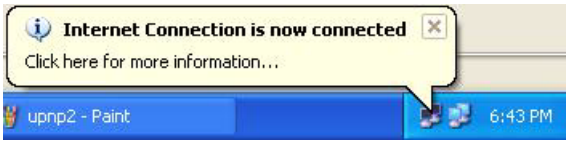
2 Double-click **Network Connections**.

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



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

5 Right-click the icon for your ZyXEL device and select **Invoke**. The web configurator login screen displays.



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

17.5.3 Web Configurator Easy Access

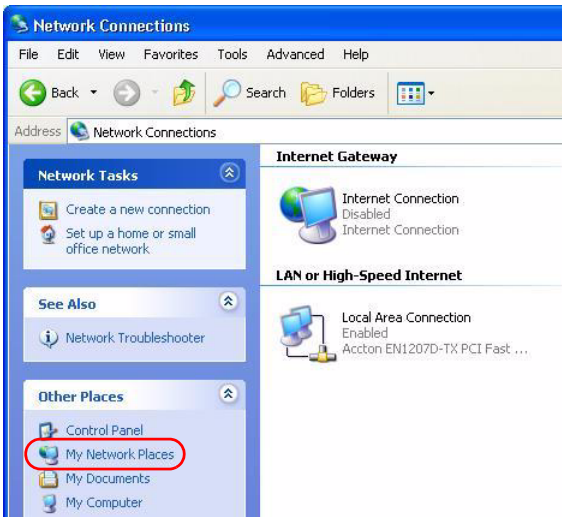
With UPnP, you can access the web-based configurator on the ZyXEL device without finding out the IP address of the ZyXEL device first. This is helpful if you do not know the IP address of the ZyXEL device.

Follow the steps below to access the web configurator.

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

2 Double-click **Network Connections**.

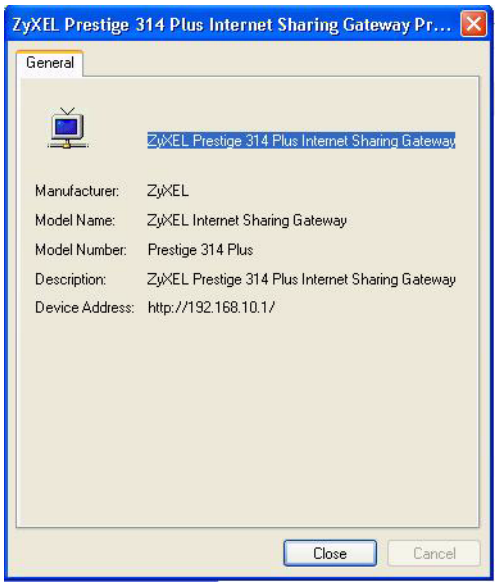
3 Select **My Network Places** under **Other Places**.



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

5 Right-click the icon for your ZyXEL device and select **Invoke**. The web configurator login screen displays.

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



CHAPTER 18
System

This chapter provides information on the System screens.

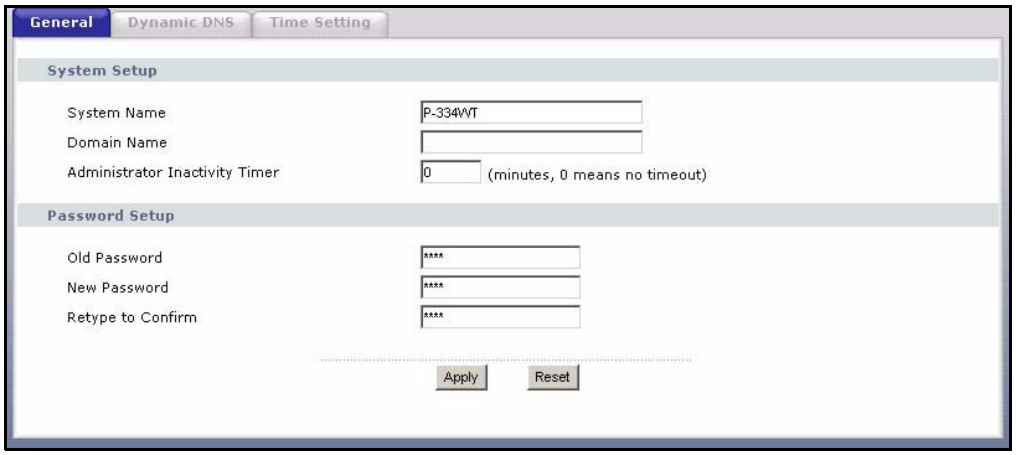
18.1 System Overview

See the chapter about wizard setup for more information on the next few screens.

18.2 System General Screen

Click the **System** link under **Maintenance** and the **General** tab. The following screen displays.

Figure 130 System General



The following table describes the labels in this screen.

Table 102 System General

LABEL	DESCRIPTION
System Name	System Name is a unique name to identify the Prestige in an Ethernet network. It is recommended you enter your computer's "Computer name" in this field (see the chapter about wizard setup for how to find your computer's name). 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. The domain name entered by you is given priority over the ISP assigned domain name.

Table 102 System General

LABEL	DESCRIPTION
Administrator Inactivity Timer	Type how many minutes a management session (either via the web configurator or SMT) 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).
Password Setup	Change your Prestige's password (recommended) using the fields as shown.
Old Password	Type the default password or the existing password you use to access the system in this field.
New Password	Type your new system password (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.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to begin configuring this screen afresh.

18.3 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.dhs.org, where myhost is a name of your choice) that will never change instead of using an IP address that changes each time you reconnect. Your friends or relatives will always be able to call you even if they don't know your IP address.

First of all, you need to have registered a dynamic DNS account with www.dyndns.org. This is for people with a dynamic IP from their ISP or DHCP server that would still like to have a domain name. The Dynamic DNS service provider will give you a password or key.

18.3.1 DynDNS Wildcard

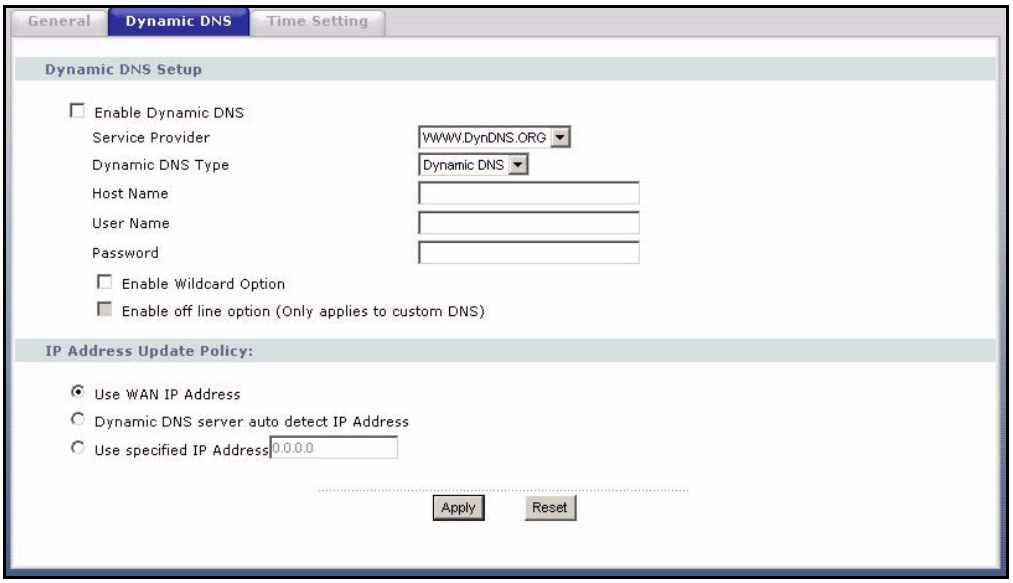
Enabling the wildcard feature for your host causes *.yourhost.dyndns.org to be aliased to the same IP address as yourhost.dyndns.org. This feature is useful if you want to be able to use, for example, www.yourhost.dyndns.org and still reach your hostname.

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

18.4 Dynamic DNS Screen

To change your Prestige's DDNS, click the **System** link under **Maintenance** and the **Dynamic DNS** tab. The screen appears as shown.

Figure 131 Dynamic DNS



The following table describes the labels in this screen.

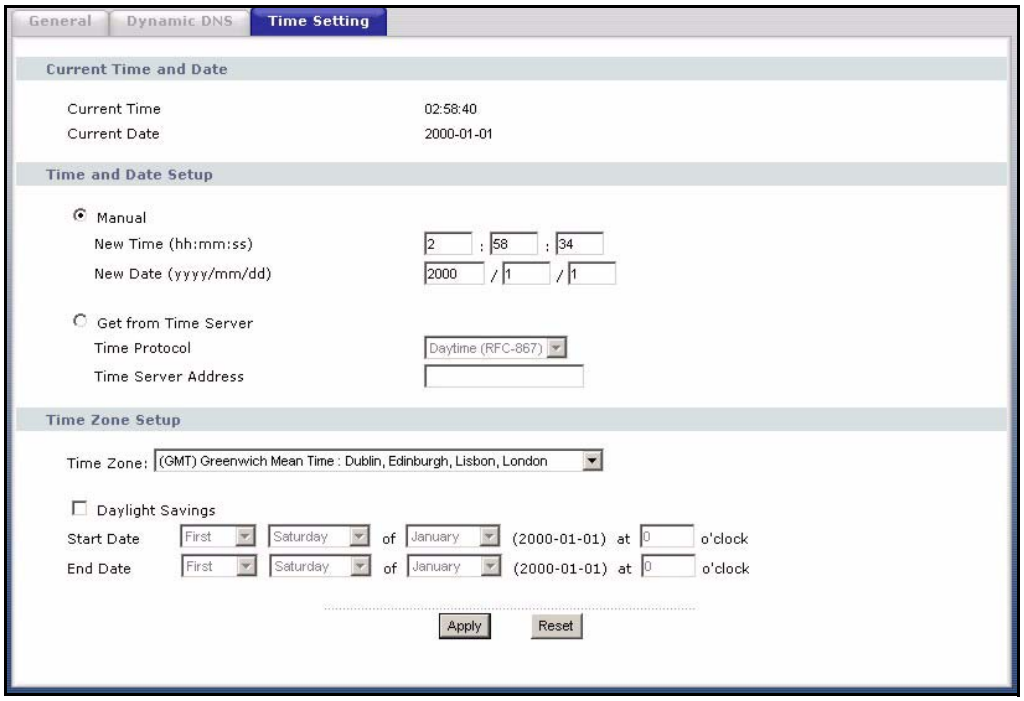
Table 103 Dynamic DNS

LABEL	DESCRIPTION
Enable Dynamic DNS	Select this check box to use dynamic DNS.
Service Provider	Select the name of your Dynamic DNS service provider.
Dynamic DNS Type	Select the type of service that you are registered for from your Dynamic DNS service provider.
Host Name	Enter a host names in the field provided. You can specify up to two host names in the 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	This option is available when **CustomDNS** is selected in the **DDNS Type** 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 update the IP address of the host name(s) to the WAN IP address.
Dynamic DNS 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.
Use specified IP Address	Type the IP address of the host name(s). Use this if you have a static IP address.
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to begin configuring this screen afresh.

18.5 Time Setting Screen

To change your Prestige's time and date, click the **System** link under **Maintenance** and 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 132 Time Setting



The following table describes the labels in this screen.

Table 104 Time Setting

LABEL	DESCRIPTION
Current Time and Date	
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.
Current Date	This field displays the date of your Prestige. Each time you reload this page, the Prestige synchronizes the date with the time server.
Time and Date Setup	
Manual	Select this radio button to enter the time and date manually. If you configure a new time and date, Time Zone and Daylight Saving at the same time, the new time and date you entered has priority and the Time Zone and Daylight Saving settings do not affect it.

Table 104 Time Setting

LABEL	DESCRIPTION
New Time (hh:mm:ss)	This field displays the last updated time from the time server or the last time configured manually. When you set **Time and Date Setup** to **Manual**, enter the new time in this field and then click **Apply**.
New Date (yyyy-mm-dd)	This field displays the last updated date from the time server or the last date configured manually. When you set **Time and Date Setup** to **Manual**, enter the new date in this field and then click **Apply**.
Get from Time Server	Select this radio button to have the Prestige get the time and date from the time server you specified below.
Time Protocol	Select the time service protocol that your time server uses. Not all time servers support all protocols, so you may have to check with your ISP/network administrator or use trial and error to find a protocol that works. The main difference between them is the format. **Daytime (RFC 867)** format is day/month/year/time zone of the server. **Time (RFC 868)** format displays a 4-byte integer giving the total number of seconds since 1970/1/1 at 0:0:0. The default, **NTP (RFC 1305)**, is similar to Time (RFC 868). Select **None** to enter the time and date manually.
Time Server Address	Enter the IP address or URL (up to 20 extended ASCII characters in length) of your time server. Check with your ISP/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 **None** in the **Time Protocol** field, enter the new time in this field and then click **Apply**.
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.
New Date	This field displays the last updated date from the time server. When you select **None** in the **Time Protocol** field, enter the new date in this field and then click **Apply**.
Time Zone Setup	
Enable Daylight Saving	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. Select this option if you use Daylight Saving Time.

Table 104 Time Setting

LABEL	DESCRIPTION
Start Date	Configure the day and time when Daylight Saving Time starts if you selected **Daylight Saving**. The **o'clock** field uses the 24 hour format. Here are a couple of examples: Daylight Saving Time starts in most parts of the United States on the first Sunday of April. Each time zone in the United States starts using Daylight Saving Time at 2 A.M. local time. So in the United States you would select **First**, **Sunday**, **April** and type 2 in the **o'clock** field. Daylight Saving Time starts in the European Union on the last Sunday of March. All of the time zones in the European Union start using Daylight Saving Time at the same moment (1 A.M. GMT or UTC). So in the European Union you would select **Last**, **Sunday**, **March**. The time you type in the **o'clock** field depends on your time zone. In Germany for instance, you would type 2 because Germany's time zone is one hour ahead of GMT or UTC (GMT+1).
End Date	Configure the day and time when Daylight Saving Time ends if you selected **Daylight Saving**. The **o'clock** field uses the 24 hour format. Here are a couple of examples: Daylight Saving Time ends in the United States on the last Sunday of October. Each time zone in the United States stops using Daylight Saving Time at 2 A.M. local time. So in the United States you would select **Last**, **Sunday**, **October** and type 2 in the **o'clock** field. Daylight Saving Time ends in the European Union on the last Sunday of October. All of the time zones in the European Union stop using Daylight Saving Time at the same moment (1 A.M. GMT or UTC). So in the European Union you would select **Last**, **Sunday**, **October**. The time you type in the **o'clock** field depends on your time zone. In Germany for instance, you would type 2 because Germany's time zone is one hour ahead of GMT or UTC (GMT+1).
Apply	Click **Apply** to save your changes back to the Prestige.
Reset	Click **Reset** to begin configuring this screen afresh.

CHAPTER 19
Logs

This chapter contains information about configuring general log settings and viewing the Prestige's logs. Refer to the appendices for example log message explanations.

19.1 View Log

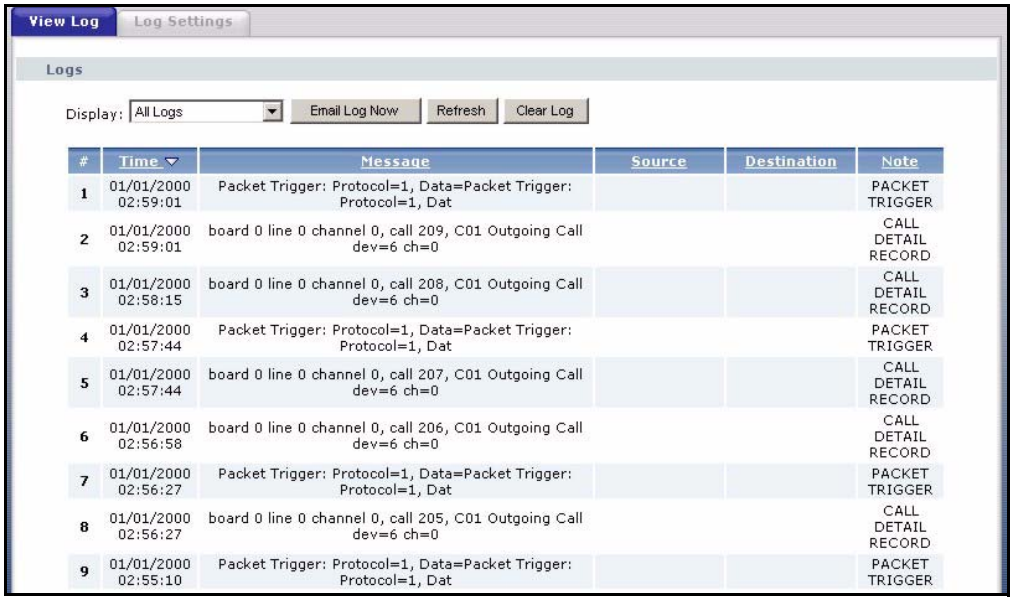
The web configurator allows you to look at all of the Prestige's logs in one location.

Click the **Logs** link under **Maintenance** to open the **View Log** screen.

Use the **View Log** screen to see the logs for the categories that you selected in the **Log Settings** screen (see Section 19.2 on page 258). Options include logs about system maintenance, system errors, access control, allowed or blocked web sites, blocked web features (such as ActiveX controls, Java and cookies), attacks (such as DoS) and IPSec.

Log entries in red indicate system error logs. The log wraps around and deletes the old entries after it fills. Click a column heading to sort the entries. A triangle indicates ascending or descending sort order.

Figure 133 View Log



The following table describes the labels in this screen.

Table 105 View Logs

LABEL	DESCRIPTION
Display	The categories that you select in the **Log Settings** page (see Section 19.2 on page 258) display in the drop-down list box. Select a category of logs to view; select **All Logs** to view logs from all of the log categories that you selected in the **Log Settings** page.
Time	This field displays the time the log was recorded. See the chapter on system maintenance and information to configure the Prestige's time and date.
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.
Email Log Now	Click **Email Log Now** to send the log screen to the e-mail address specified in the **Log Settings** page (make sure that you have first filled in the **Address Info** fields in **Log Settings**).
Refresh	Click **Refresh** to renew the log screen.
Clear Log	Click **Clear Log** to delete all the logs.

19.2 Log Settings

You can configure the Prestige's general log settings in one location.

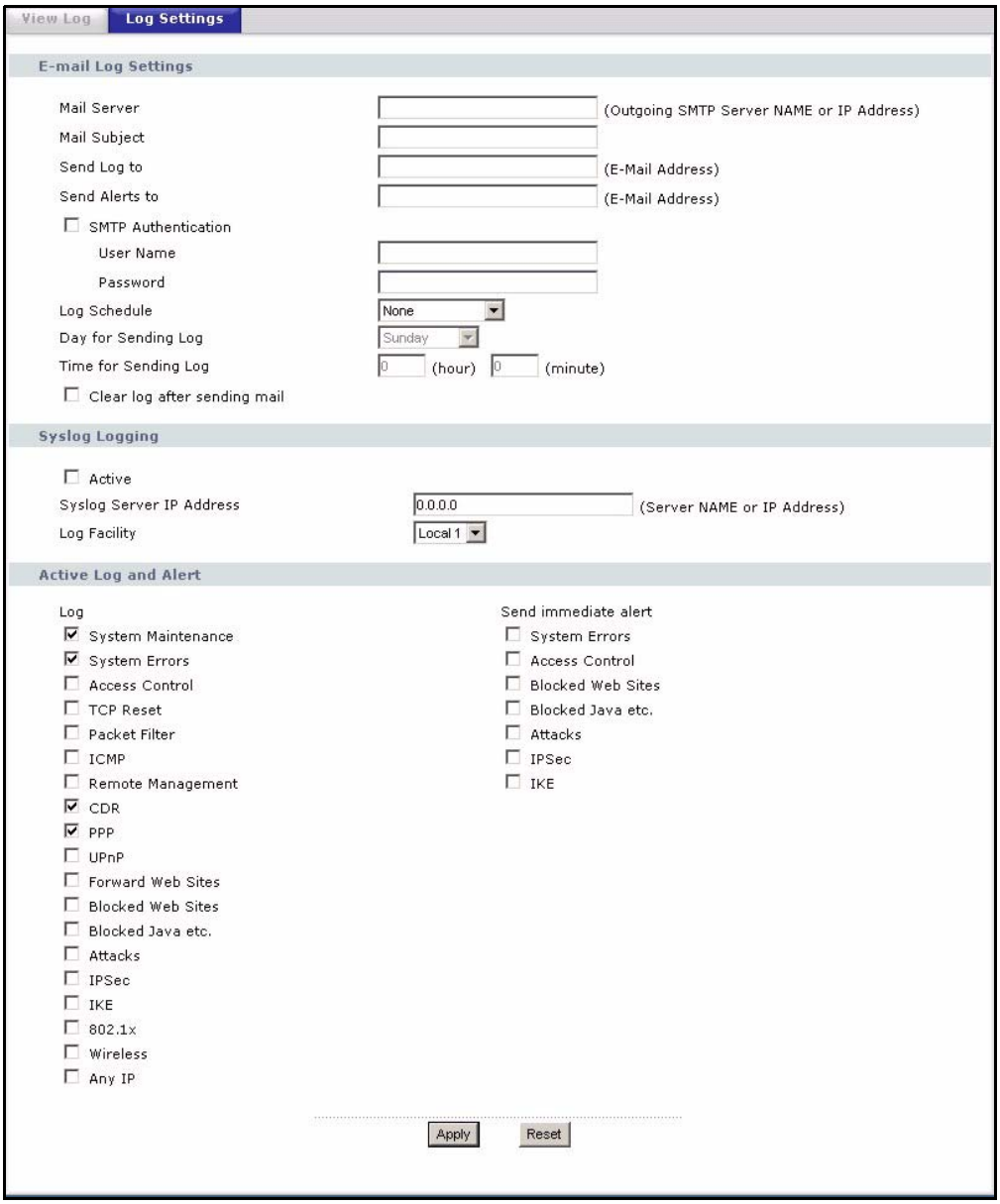
Click the **Logs** link under **Maintenance** in the navigation panel and the **Log Settings** tab to open the **Log Settings** screen.

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

An alert is a type of log that warrants more serious attention. They include system errors, attacks (access control) and attempted access to blocked web sites or web sites with restricted web features such as cookies, active X and so on. 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 display in red and logs display in black.

Alerts are e-mailed as soon as they happen. Logs may be e-mailed as soon as the log is full (see **Log Schedule**). Selecting many alert and/or log categories (especially **Access Control**) may result in many e-mails being sent

Figure 134 Log Settings



The following table describes the labels in this screen.

Table 106 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. Not all Prestige models have this field.
Send Log To	The Prestige sends logs to the e-mail address specified in this field. If this field is left blank, the Prestige does not send logs via e-mail.

Table 106 Log Settings

LABEL	DESCRIPTION
Send Alerts To	Alerts are real-time notifications that are sent as soon as an event, such as a DoS attack, system error, or forbidden web access attempt occurs. Enter the E-mail address where the alert messages will be sent. Alerts include system errors, attacks and attempted access to blocked web sites. If this field is left blank, alert messages will not be sent via E-mail.
SMTP Authentication	SMTP (Simple Mail Transfer Protocol) is the message-exchange standard for the Internet. SMTP enables you to move messages from one e-mail server to another. Select the check box to activate SMTP authentication. If mail server authentication is needed but this feature is disabled, you will not receive the e-mail logs.
User Name	Enter the user name (up to 31 characters) (usually the user name of a mail account).
Password	Enter the password associated with the user name above.
Log Schedule	This drop-down menu is used to configure the frequency of log messages being sent as E-mail: • **Daily** • **Weekly** • **Hourly** • **When Log is Full** • **None**. If you select **Weekly** or **Daily**, specify a time of day when the E-mail should be sent. If you select **Weekly**, then also specify which day of the week the E-mail should be sent. If you select **When Log is Full**, an alert is sent when the log fills up. If you select **None**, no log messages are sent.
Day for Sending Log	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 checkbox to delete all the logs after the Prestige sends an E-mail of the logs.
Syslog Logging	The Prestige sends a log to an external syslog server.
Active	Click **Active** 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 syslog server manual for more information.
Log	Select the categories of logs that you want to record.
Send Immediate Alert	Select log categories for which you want the Prestige to send E-mail alerts immediately.
Apply	Click **Apply** to save your changes.
Reset	Click **Reset** to begin configuring this screen afresh.

CHAPTER 20
Tools

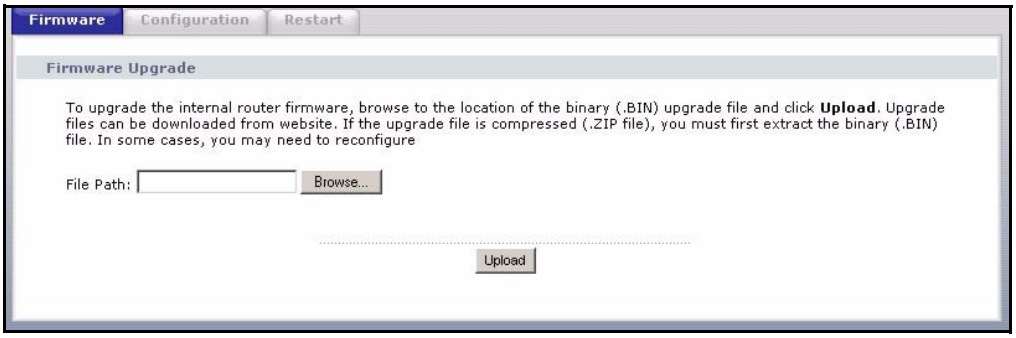
This chapter shows you how to upload a new firmware, upload or save backup configuration files and restart the Prestige.

20.1 Firmware Upload Screen

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

Click **MAINTENANCE**, and then the **F/W Upload** tab. Follow the instructions in this screen to upload firmware to your Prestige.

Figure 135 Maintenance Firmware Upload



The following table describes the labels in this screen.

Table 107 Maintenance Firmware Upload

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

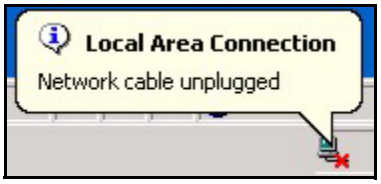
Note: Do not turn off the Prestige while firmware upload is in progress!

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

Figure 136 Upload Warning

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

Figure 137 Network Temporarily Disconnected



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

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

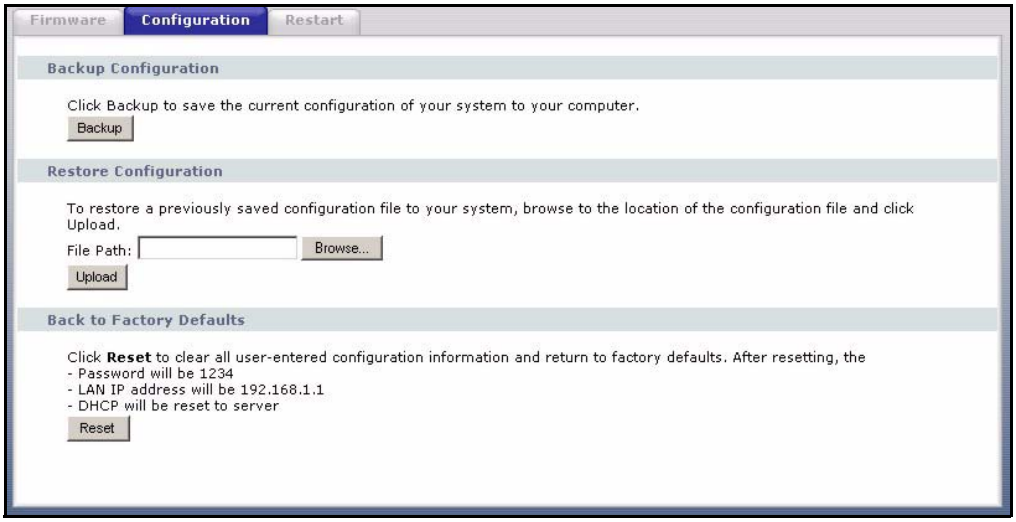
Figure 138 Upload Error Message

20.2 Configuration Screen

See the Firmware and Configuration File Maintenance chapter for transferring configuration files using FTP/TFTP commands.

Click the **Tools** link under **Maintenance**, and the **Configuration** tab. Information related to factory defaults, backup configuration, and restoring configuration appears as shown next.

Figure 139 Configuration



20.2.1 Backup Configuration

Backup configuration allows you to back up (save) the Prestige's current configuration to a file on your computer. Once your Prestige 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 Prestige's current configuration to your computer

20.2.2 Restore Configuration

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

Table 108 Maintenance Restore Configuration

LABEL	DESCRIPTION
File Path	Type in the location of the file you want to upload in this field or click **Browse...** to find it.
Browse...	Click **Browse...** to find the file you want to upload. Remember that you must decompress compressed (.ZIP) files before you can upload them.
Upload	Click **Upload** to begin the upload process.

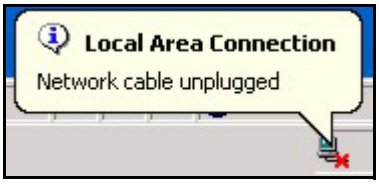
Note: Do not turn off the Prestige while configuration file upload is in progress

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

Figure 140 Configuration Restore Successful

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

Figure 141 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 Prestige IP address (192.168.1.1). See your Quick Start Guide for details on how to set up your computer's IP address.

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

Figure 142 Configuration Restore Error

20.2.3 Back to Factory Defaults

Pressing the **Reset** button in this section clears all user-entered configuration information and returns the Prestige to its factory defaults.

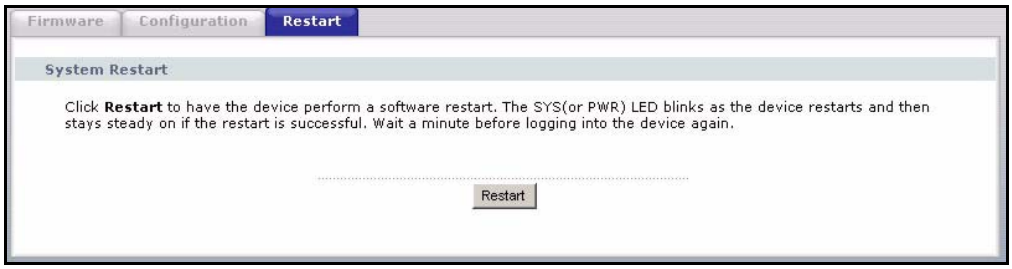
You can also press the **RESET** button on the rear panel to reset the factory defaults of your Prestige. Refer to the chapter about introducing the web configurator for more information on the **RESET** button.

20.3 Restart Screen

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

Click the Tools link under **Maintenance**, and the **Restart** tab. Click **Restart** to have the Prestige reboot. This does not affect the Prestige's configuration.

Figure 143 System Restart



CHAPTER 21
Introducing the SMT

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

21.1 SMT Introduction

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

21.1.1 Procedure for SMT Configuration 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. Enter "1234" in the **Password** field.
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.

21.1.2 Entering Password

The login screen appears after you press [ENTER], prompting you to enter the password, as shown next.

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

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

Figure 144 Login Screen

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

21.1.3 Prestige SMT Menu Overview

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

Table 109 SMT Menus 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	
	3.5 Wireless LAN Setup	3.5.1 WLAN MAC Address Filter	
		3.5.2 Roaming Configuration	
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 IP Static Route		
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 Sets		
21 Filter and Firewall Rule Setup	21.1 Filter Setup	21.1 Filter Rules Summary	21.1.x.1 Generic Filter Rule
			21.1.x.1 TCP/IP Filter Rule
	21.1 Firewall Setup		
22 SNMP Configuration			
23 System Security	23.1 Change Password		
	23.2 RADIUS Server		
	23.4 IEEE 802.1X		

Table 109 SMT Menus Overview (continued)

MENUS	SUB MENUS		
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		
26 Schedule Setup	26.1 Schedule Set Setup		
27 VPN/IPSec Setup	27.1 IPSec Summary	27.1.1 IPSec Setup	27.1.1.1 IKE Setup
			27.1.1.2 Manual Setup
	27.2 SA Monitor		

21.2 Navigating the SMT Interface

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

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

Table 110 Main Menu Commands

OPERATION	KEYSTROKE	DESCRIPTION
Move down to another menu	[ENTER]	To move forward to a submenu, type in the number of the desired submenu and press [ENTER].
Move up to a previous menu	[ESC]	Press [ESC] to move back to the previous menu.
Move to a "hidden" menu	Press [SPACE BAR] to change **No** to **Yes** then press [ENTER].	Fields beginning with "Edit" lead to hidden menus and have a default setting of **No**. Press [SPACE BAR] once to change **No** to **Yes**, and then press [ENTER] to go to the "hidden" menu.

Table 110 Main Menu Commands

OPERATION	KEYSTROKE	DESCRIPTION
Move the cursor	[ENTER] or [UP]/[DOWN] arrow keys.	Within a menu, press [ENTER] to move to the next field. You can also use the [UP]/[DOWN] arrow keys to move to the previous and the next field, respectively.
Entering information	Type in or press [SPACE BAR], then press [ENTER].	You need to fill in two types of fields. The first requires you to type in the appropriate information. The second allows you to cycle through the available choices by pressing [SPACE BAR].
Required fields	<? > or **ChangeMe**	All fields with the symbol <?> must be filled in order to be able to save the new configuration. All fields with **ChangeMe** must not be left blank in order to be able to save the new configuration.
N/A fields	<N/A>	Some of the fields in the SMT will show a <N/A>. This symbol refers to an option that is Not Applicable.
Save your configuration	[ENTER]	Save your configuration by pressing [ENTER] at the message "Press ENTER to confirm or ESC to cancel". Saving the data on the screen will take you, in most cases to the previous menu.
Exit the SMT	Type 99, then press [ENTER].	Type 99 at the main menu prompt and press [ENTER] to exit the SMT interface.

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

Figure 145 SMT Main Menu

```
          Copyright (c) 1994 - 2005 ZyXEL Communications Corp.

                            P-334WT Main Menu

    Getting Started                     Advanced Management
      1. General Setup                    21. Filter and Firewall Setup
      2. WAN Setup                        22. SNMP Configuration
      3. LAN Setup                        23. System Password
      4. Internet Access Setup            24. System Maintenance
                                          26. Schedule Setup
                                          27. VPN/IPSec Setup
    Advanced Applications
      11. Remote Node Setup
      12. Static Routing Setup
      15. NAT Setup

                                          99. Exit

                          Enter Menu Selection Number:
```

21.2.1 System Management Terminal Interface Summary

The following table describes the fields in the previous screen.

Table 111 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 and Firewall Setup	Use this menu to configure filters, activate/deactivate the firewall and view the firewall log.
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.
27	VPN/ IPSec Setup	Use this menu to configure VPN connections.
99	Exit	Use this to exit from SMT and return to a blank screen.

21.3 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 146 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 type

CHAPTER 22
Menu 1 General Setup

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

22.1 General Setup

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

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

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

In Windows XP, click **start**, **My Computer**, **View system information** and then click the **Computer Name** tab. Note the entry in the **Full computer name** field and enter it as the Prestige **System Name**.

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

22.2 Procedure To Configure Menu 1

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

Figure 147 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:
```

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

Table 112 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. 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].
First System DNS Server Second System DNS Server Third System DNS Server	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 VPN, DDNS and the time server. Press [SPACE BAR] and then [ENTER] to select an option. Select **From ISP** if your ISP dynamically assigns DNS server information (and the Prestige's WAN IP address). The **IP Address** field below displays the (read-only) DNS server IP address that the ISP assigns. Select **User-Defined** if you have the IP address of a DNS server. Enter the DNS server's IP address in the **IP Address** field. If you select **User-Defined**, but leave the IP address set to 0.0.0.0, **User-Defined** changes to **None** after you save your changes. If you set a second choice to **User-Defined**, and enter the same IP address, the second **User-Defined** changes to **None** after you save your changes. Select **None** 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 VPN, DDNS and the time server.
Edit Dynamic DNS	Press [SPACE BAR] and then [ENTER] to select **Yes** or **No** (default). Select **Yes** to configure **Menu 1.1: Configure Dynamic DNS** 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.	

22.2.1 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 148 Menu 1.1 Configure Dynamic DNS

```
            Menu 1.1 - Configure Dynamic DNS

            Service Provider= WWW.DynDNS.ORG
            Active= No
            DDNS Type= DynamicDNS
            Host Name 1=
            Host Name 2=
            Host Name 3=
            Username=
            Password= ********
            Enable Wildcard Option= No
            Enable Off Line Option= N/A
            IP Address Update Policy:
              DDNS Server Auto Detect IP Address= No
              Use Specified IP Address= No
              Use 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 113 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 **Yes** and then press [ENTER] to make dynamic DNS active.
DDNS Type	Press [SPACE BAR] and then [ENTER] to select **DynamicDNS** if you have a dynamic IP address(es). Select **StaticDNS** if you have a static IP address(s). Select **CustomDNS** to have dyns.org provide DNS service for a domain name that you already have from a source other than dyndns.org.
Host Name 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.
Username	Enter your user name.
Password	Enter the password assigned to you.
Enable Wildcard Option	Your Prestige supports DYNDNS Wildcard. Press [SPACE BAR] and then [ENTER] to select **Yes** or **No** This field is **N/A** when you choose DDNS client as your service provider.

Table 113 Menu 1.1 Configure Dynamic DNS

FIELD	DESCRIPTION
Enable Off Line Option	This field is only available when **CustomDNS** is selected in the **DDNS Type** field. Press [SPACE BAR] and then [ENTER] to select **Yes**. When **Yes** is selected, http://www.dyndns.org/ traffic is redirected to a URL that you have previously specified (see www.dyndns.org for details).
Edit Update IP Address: You can select **Yes** in either the **DDNS Server Auto Detect IP Address** field (recommended) or the **Use Specified IP Address** field, but not both. With the **DDNS Server Auto Detect IP Address** and **Use Specified IP Address** fields both set to **No**, 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 **No**, the Prestige must have a public WAN IP address in order for DDNS to work.	
DDNS Server Auto Detect IP Address	Press [SPACE BAR] to select **Yes** 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 **Yes** whether the IP address is public or private, static or dynamic.
Use Specified IP Address	Press [SPACE BAR] to select **Yes** and then press [ENTER] to update the IP address of the host name(s) to the IP address specified below. Only select **Yes** if the Prestige uses or is behind a static public IP address.
Use IP Address	Enter the static public IP address if you select **Yes** in the **Use Specified IP Address** 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 23
Menu 2 WAN Setup

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

23.1 WAN Setup

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

Figure 149 Menu 2 WAN Setu

```
                        Menu 2 - WAN Setup

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

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

The following table describes the fields in this menu.

Table 114 Menu 2 WAN Setup

FIELD	DESCRIPTION
MAC Address	
Assigned By	Press [SPACE BAR] and then [ENTER] to choose one of three methods to assign a MAC Address. Choose **Factory default** to select the factory assigned default MAC Address. Choose **IP address attached on LAN** to use the MAC Address of that computer whose IP you give in the **IP Address** field. Choose **Assign MAC address** to use the MAC Address you configure in the **WAN MAC Address** field.
WAN MAC Address	This field is applicable only if you choose the **Assign MAC address** method in the **Assigned By** field. Enter the MAC address you want to use.
IP Address	This field is applicable only if you choose the **IP address attached on LAN** method in the **Assigned By** 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 24
Menu 3 LAN Setup

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

24.1 LAN Setup

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

Figure 150 Menu 3 LAN Setup

```
                        Menu 3 - LAN Setup

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

              5. Wireless LAN Setup

            Enter Menu Selection Number:
```

24.1.1 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 151 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 the Filter Set Configuration chapter first, then return to this menu to define the filter sets.

24.2 Protocol Dependent Ethernet Setup

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

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

24.3 TCP/IP Ethernet Setup and DHCP

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

To edit menu 3.2, enter 3 from the main menu to display **Menu 3 — 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 152 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:
  Starting Address= 192.168.1.33      IP Address= 192.168.1.1
  Size of Client IP Pool= 32          IP Subnet Mask= 255.255.255.0
First DNS Server= From ISP            RIP Direction= Both
  IP Address= N/A                       Version= RIP-1
Second DNS Server= From ISP           Multicast= None
  IP Address= N/A                     Edit IP Alias= No
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 115 DHCP Ethernet Setup Fields

FIELD	DESCRIPTION
DHCP	This field enables/disables the DHCP server. If set to **Server**, your Prestige will act as a DHCP server. If set to **None**, the DHCP server will be disabled. If set to **Relay** the Prestige acts as a surrogate DHCP server and relays requests and responses between the remote server and the clients. When set to **Server**, 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.

Table 115 DHCP Ethernet Setup Fields

FIELD	DESCRIPTION
Size of Client IP Pool	This field specifies the size, or count of the IP address pool.
First DNS Server Second DNS Server Third DNS Server	The Prestige passes a DNS (Domain Name System) server IP address (in the order you specify here) to the DHCP clients. Select **From ISP** if your ISP dynamically assigns DNS server information (and the Prestige's WAN IP address). The **IP Address** field below displays the (read-only) DNS server IP address that the ISP assigns. Select **User-Defined** if you have the IP address of a DNS server. Enter the DNS server's IP address in the **IP Address** field below. If you chose **User-Defined**, but leave the IP address set to 0.0.0.0, **User-Defined** changes to **None** after you save your changes. If you set a second choice to **User-Defined**, and enter the same IP address, the second **User-Defined** changes to **None** after you save your changes. Select **DNS Relay** to have the Prestige act as a DNS proxy. The Prestige's LAN IP address displays in the **IP Address** 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 **DNS Relay** for one of the three servers; if you select DNS Relay for a second or third DNS server, that choice changes to **None** after you save your changes. Select **None** 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.
DHCP Server Address	If **Relay** is selected in the **DHCP** 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.

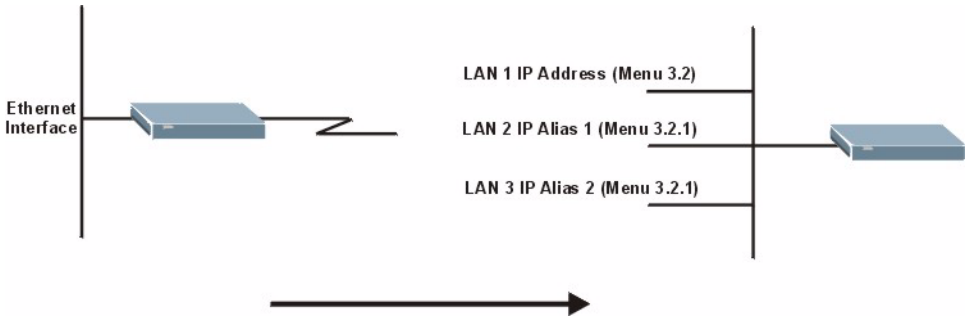
Table 116 Menu 3.2: LAN TCP/IP Setup Fields

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: **Both**, **In Only**, **Out Only** or **None**.
Version	Press [SPACE BAR] and then [ENTER] to select the RIP version. Options are: **RIP-1**, **RIP-2B** or **RIP-2M**.
Multicast	IGMP (Internet Group Multicast Protocol) is a session-layer protocol used to establish membership in a Multicast group. The Prestige supports both IGMP version 1 (**IGMP-v1**) and version 2 (**IGMP-v2**). Press [SPACE BAR] and then [ENTER] to enable IP Multicasting or select **None** (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 **Yes** 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.	

24.3.1 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.

Figure 153 Physical Network & Partitioned Logical Networks



You must 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 network.

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

Figure 154 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 117 Menu 3.2.1: IP Alias Setup

FIELD	DESCRIPTION
IP Alias 1, 2	Choose **Yes** to configure the LAN network for the Prestige.
IP Address	Enter the IP address of your Prestige in dotted decimal notation.

Table 117 Menu 3.2.1: IP Alias Setup

FIELD	DESCRIPTION
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 **Both**, **In Only**, **Out Only** or **None**.
Version	Press [SPACE BAR] and then [ENTER] to select the RIP version. Options are **RIP-1**, **RIP-2B** or **RIP-2M**.
Incoming Protocol Filters	Enter the filter set(s) you wish to apply to the incoming traffic between this node and the Prestige.
Outgoing Protocol Filters	Enter the filter set(s) you wish to apply to the outgoing traffic between this node and the Prestige.
When you have completed this menu, press [ENTER] at the prompt [Press ENTER to Confirm…] to save your configuration, or press [ESC] at any time to cancel.	

24.4 Wireless LAN Setup

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

Figure 155 Menu 3.5: Wireless LAN Setup

```
                    Menu 3.5 - Wireless LAN Setup

ESSID= ZyXEL
Hide ESSID= No
Channel ID= CH06 2437MHz                  Edit MAC Address Filter= Yes
RTS Threshold= 4096                     Edit Roaming Configuration= Yes
Frag. Threshold= 4096
WEP Encryption= Disable                   Preamble= Long
  Default Key= N/A                        802.11 Mode= Mixed
  Key1= N/A
  Key2= N/A
  Key3= N/A
  Key4= N/A
  Authen. Method= N/A


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

The following table describes the fields in this menu.

Table 118 Menu 3.5: Wireless LAN Setup

FIELD	DESCRIPTION
ESSID	The ESSID (Extended Service Set IDentity) identifies the AP to which the wireless stations associate. Wireless stations associating to the AP must have the same ESSID. Enter a descriptive name of up to 32 printable 7-bit ASCII characters.
Hide ESSID	Press [SPACE BAR] and select **Yes** to hide the ESSID in the outgoing data frame so an intruder cannot obtain the ESSID through passive scanning.
Channel ID	Press [SPACE BAR] to select a channel. This allows you to set the operating frequency/channel depending on your particular region.
RTS Threshold	Setting this attribute to zero turns on the RTS/CTS handshake. Enter a value between 0 and 2432. You must enter **4096** if you enable G+.
Frag. Threshold	This is the maximum data fragment size that can be sent. Enter a value between 256 and 2432. You must enter **4096** if you enable G+.
WEP Encryption	Select **Disable** to allow wireless stations to communicate with the access points without any data encryption. Select **64-bit WEP**, **128-bit WEP** or **256-bit WEP** to enable data encryption.
Default Key	Enter the key number (1 to 4) in this field. Only one key can be enabled at any one time. This key must be the same on the Prestige and the wireless stations to communicate.
Key 1 to Key 4	The WEP keys are used to encrypt data. Both the Prestige and the wireless stations must use the same WEP key for data transmission. If you chose **64-bit WEP** in the **WEP Encryption** field, then enter any 5 ASCII characters or 10 hexadecimal characters ("0-9", "A-F"). If you chose **128-bit WEP** in the **WEP Encryption** field, then enter 13 ASCII characters or 26 hexadecimal characters ("0-9", "A-F"). If you chose **256-bit WEP** in the **WEP Encryption** field, then enter 29 ASCII characters or 58 hexadecimal characters ("0-9", "A-F"). **Note:** Enter "0x" before the key to denote a hexadecimal key. Don't enter "0x" before the key to denote a ASCII key.
Authen. Method	Press [SPACE BAR] to select **Auto**, **Open System Only** or **Shared Key Only** and press [ENTER]. This field is **N/A** if WEP is not activated. If WEP encryption is activated, the default setting is **Auto**.
Edit MAC Address Filter	Press [SPACE BAR] to select **Yes** and press [ENTER] to display **Menu 3.5.1 - WLAN MAC Address Filter**.
Edit Roaming Configuration	Use [SPACE BAR] to choose **Yes** and press [ENTER] to go to **Menu 3.5.2 - Roaming Configuration**.
Preamble	Press [SPACE BAR] to select a preamble type. Choices are **Long**, **Short** and **Dynamic**. See the section on preamble for more information.
802.11 Mode	Select **B Only** to allow only IEEE 802.11b compliant WLAN devices to associate with the Prestige. Select **G Only** to allow only IEEE 802.11g compliant WLAN devices to associate with the Prestige. Select **Mixed** to allow either IEEE802.11b or IEEE802.11g compliant WLAN devices to associate with the Prestige. The transmission rate of your Prestige might be reduced.
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.	

24.4.1 Configuring MAC Address Filter

Your Prestige checks the MAC address of the wireless station device against a list of allowed or denied MAC addresses. However, intruders could fake allowed MAC addresses so MAC-based authentication is less secure than EAP authentication.

Follow the steps below to create the MAC address table on your Prestige.

1. From the main menu, enter 3 to open **Menu 3 - LAN Setup**.
2. Enter 5 to display **Menu 3.5 - Wireless LAN Setup**.
3. In the **Edit MAC Address Filtering** field, press [SPACE BAR] to select **Yes** and press [ENTER]. **Menu 3.5.1 - WLAN MAC Address Filter** displays as shown next

Figure 156 Menu 3.5.1: WLAN MAC Address Filter

```
                  Menu 3.5.1 - WLAN MAC Address Filter

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

The following table describes the fields in this menu.

Table 119 Menu 3.5.1: WLAN MAC Address Filter

FIELD	DESCRIPTION
Active	To enable MAC address filtering, press [SPACE BAR] to select **Yes** and press [ENTER].
Filter Action	Define the filter action for the list of MAC addresses in the MAC address filter table. To deny access to the Prestige, press [SPACE BAR] to select **Deny Association** and press [ENTER]. MAC addresses not listed will be allowed to access the router. The default action, **Allowed Association**, permits association with the Prestige. MAC addresses not listed will be denied access to the router.
MAC Address Filter	

Table 119 Menu 3.5.1: WLAN MAC Address Filter

FIELD	DESCRIPTION
1..32	Enter the MAC addresses (in XX:XX:XX:XX:XX:XX format) of the client computers that are allowed or denied access to the Prestige in these address fields.
When you have completed this menu, press [ENTER] at the prompt "Press ENTER to Confirm…" to save your configuration, or press [ESC] at any time to cancel.	

24.4.2 Configuring Roaming on the Prestige

Enable the roaming feature if you have two or more Prestiges on the same subnet. Follow the steps below to allow roaming on your Prestige.

1. From the main menu, enter 3 to display **Menu 3 - LAN Setup**.
2. Enter 5 to display **Menu 3.5 - Wireless LAN Setup**.
3. Move the cursor to the **Edit Roaming Configuration** field. Press [SPACE BAR] to select Yes and then press [ENTER]. **Menu 3.5.2 - Roaming Configuration** displays as shown next.

Figure 157 Menu 3.5.2: Roaming Configuration

```
                Menu 3.5.2 - Roaming Configuration

            Active= Yes
            Port #= 3517

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

The following table describes the fields in this menu.

Table 120 Menu 3.5.2: Roaming Configuration

FIELD	DESCRIPTION
Active	Press [SPACE BAR] and then [ENTER] to select **Yes** to enable roaming on the Prestige if you have two or more Prestiges on the same subnet.
Port#	Enter the port number to communicate roaming information between access points. The port number must be the same on all access points. The default is 3517. Make sure this port is not used by other services.
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 25
Internet Access

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

25.1 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.

25.2 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 158 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
          Relogin Every (min)=  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 121 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 **Ethernet**. The encapsulation method influences your choices for the **IP Address** field.
Service Type	Press [SPACE BAR] and then [ENTER] to select **Standard**, **RR-Toshiba** (RoadRunner Toshiba authentication method), **RR-Manager** (RoadRunner Manager authentication method), **RR-Telstra** or **Telia Login**. Choose a RoadRunner flavor if your ISP is Time Warner's RoadRunner; otherwise choose **Standard**.
Note: DSL users must choose the **Standard** option only. The **My Login**, **My Password** and **Login Server** 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.
Relogin Every (min)	This field is available when you select **Telia Login** in the **Service Type** field. The Telia server logs the Prestige out if the Prestige does not log in periodically. Type the number of minutes from 1 to 59 (30 recommended) for the Prestige to wait between logins.
IP Address Assignment	If your ISP did not assign you a fixed IP address, press [SPACE BAR] and then [ENTER] to select **Dynamic**, otherwise select **Static** 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	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 **None** to disable NAT. Choose **SUA Only** if you have a single public IP address. SUA (Single User Account) is a subset of NAT that supports two types of mapping: **Many-to-One** and **Server**. Choose **Full Feature** if you have multiple public IP addresses. **Full Feature** mapping types include: **One-to-One**, **Many-to-One** (SUA/PAT), **Many-to-Many Overload**, **Many- One-to-One** and **Server**. When you select **Full Feature** you must configure at least one address mapping set! Please see the NAT chapter for a more detailed discussion on the Network Address Translation feature.
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.	

25.3 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 159 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 122 New Fields in Menu 4 (PPTP) Screen

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

25.4 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 160 Internet Access Setup (PPPoE)

```
                  Menu 4 - Internet Access Setup

          ISP's Name= MyISP
          Encapsulation= PPPoE
            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 **PPPoE** in the **Encapsulation** field in menu 4.

Table 123 New Fields in Menu 4 (PPPoE) screen

FIELD	DESCRIPTION
Encapsulation	Press [SPACE BAR] and then press [ENTER] to choose **PPPoE**. The encapsulation method influences your choices in the **IP Address** 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.

25.5 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.

Note: When the firewall is activated, the default policy allows all communications to the Internet that originate from the LAN, and blocks all traffic to the LAN that originates from the Internet.

You may deactivate the firewall in menu 21.2 or via the Prestige embedded web configurator. You may also define additional firewall rules or modify existing ones but please exercise extreme caution in doing so. See the chapters on firewall for more information on the firewall.

CHAPTER 26
Remote Node Configuration

This chapter covers remote node configuration.

26.1 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**.

26.2 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.

26.2.1 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 161 Menu 11.1 Remote Node Profile for Ethernet Encapsulation

```
                    Menu 11.1 - Remote Node Profile

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

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

The following table describes the fields in this menu.

Table 124 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 **Yes** (activate remote node) or **No** (deactivate remote node).
Encapsulation	**Ethernet** is the default encapsulation. Press [SPACE BAR] and then [ENTER] to change to **PPPoE** or **PPTP** encapsulation.
Service Type	Press [SPACE BAR] and then [ENTER] to select from **Standard**, **RR-Toshiba** (RoadRunner Toshiba authentication method), **RR-Manager** (RoadRunner Manager authentication method), **RR-Telstra** or **Telia Login**. Choose one of the RoadRunner methods if your ISP is Time Warner's RoadRunner; otherwise choose **Standard**.
Outgoing	
My Login	This field is applicable for **PPPoE** encapsulation only. Enter the login name assigned by your ISP when the Prestige calls this remote node. Some ISPs append this field to the **Service Name** field above (e.g., jim@poellc) to access the PPPoE server.
My Password	Enter the password assigned by your ISP when the Prestige calls this remote node. Valid for **PPPoE** 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 **RoadRunner** is selected in the **Service Type** 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.
Relogin Every (min)	This field is available when you select **Telia Login** in the **Service Type** field. The Telia server logs the Prestige out if the Prestige does not log in periodically. Type the number of minutes from 1 to 59 (30 recommended) for the Prestige to wait between logins.
Route	This field refers to the protocol that will be routed by your Prestige – IP is the only option for the Prestige.

Table 124 Menu 11.1 Remote Node Profile for Ethernet Encapsulation

FIELD	DESCRIPTION
Edit IP	This field leads to a "hidden" menu. Press [SPACE BAR] to select **Yes** and press [ENTER] to go to **Menu 11.3 - Remote Node Network Layer Options**.
Session Options	
Edit Filter Sets	This field leads to another "hidden" menu. Use [SPACE BAR] to select **Yes** and press [ENTER] to open menu 11.5 to edit the filter sets. See the Remote Node Filter section for more details.
Edit Traffic Redirect	Press [SPACE BAR] to select **Yes** or **No**. Select **Yes** and press [ENTER] to configure **Menu 11.6 Traffic Redirect Setup**. Select **No** (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.	

26.2.2 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 162 Menu 11.1 Remote Node Profile for PPPoE Encapsulation

```
                    Menu 11.1 - Remote Node Profile

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

26.2.2.1 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.

26.2.2.2 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 124 on page 292.

Table 125 Fields in Menu 11.1 (PPPoE Encapsulation Specific)

FIELD	DESCRIPTION
Service Name	If you are using **PPPoE** encapsulation, then type the name of your PPPoE service here. Only valid with **PPPoE** encapsulation.
Authen	This field sets the authentication protocol used for outgoing calls. Options for this field are: • **CHAP**/**PAP** - Your Prestige will accept either **CHAP** or **PAP** when requested by this remote node. • **CHAP** - accept CHAP only. • **PAP** - accept PAP only.
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 **Allocated Budget** is (10 minutes) and the **Period(hr)** is 1 (hour).
Schedules	You can apply up to four schedule sets here. For more details please refer to the Call Schedule Setup 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.

26.2.3 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 163 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                   Edit IP= No
  Service Type= Standard                Telco Option:
  Service Name= N/A                       Allocated Budget(min)= 0
  Outgoing:                               Period(hr)= 0
    My Login=                             Schedules=
    My Password= ********                 Nailed-Up Connection= No
    Retype to Confirm= ********
    Authen= CHAP/PAP
  PPTP:                                 Session Options:
    My IP Addr=                           Edit Filter Sets= No
    My IP Mask=                           Idle Timeout(sec)= 100
    Server IP Addr=
    Connection ID/Name=                 Edit Traffic Redirect= No

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

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

Table 126 Menu 11.1 Remote Node Profile for PPTP Encapsulation

FIELD	DESCRIPTION
Encapsulation	Press [SPACE BAR] and then [ENTER] to select **PPTP**. You must also go to menu 11.3 to check the IP Address setting once you have selected the encapsulation method.
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.

26.3 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 164 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 127 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 **Dynamic**; otherwise select **Static** 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 **Ethernet** 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 **PPPoE** and **PPTP** 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 **None** to disable NAT**.** Choose **SUA Only** if you have a single public IP address. SUA (Single User Account) is a subset of NAT that supports two types of mapping: **Many-to-One** and **Server**. Choose **Full Feature** if you have multiple public IP addresses. **Full Feature** mapping types include: **One-to-One**, **Many-to-One** (SUA/PAT), **Many-to-Many Overload**, **Many- One-to-One** and **Server**. When you select **Full Feature** you must configure at least one address mapping set! See the *NAT chapter* for a full discussion on this feature.

Table 127 Remote Node Network Layer Options

FIELD	DESCRIPTION
Metric	Enter a number from 1 to 15 to set this route's priority among the Prestige's routes (see the *Metric* section in the *WAN and Dial Backup Setup* chapter) 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 **Yes**, this route is kept private and not included in RIP broadcast. If **No**, the route to this remote node will be propagated to other hosts through RIP broadcasts.
RIP Direction	Press [SPACE BAR] and then [ENTER] to select the RIP direction from **Both**/ **None**/ **In Only**/**Out Only**. See the *LAN Setup* chapter for more information on RIP. The default for RIP on the WAN side is **None**. It is recommended that you do not change this setting.
Version	Press [SPACE BAR] and then [ENTER] to select the RIP version from **RIP-1**/**RIP-2B**/ **RIP-2M** or **None**.
Multicast	IGMP (Internet Group Multicast Protocol) is a network-layer protocol used to establish membership in a Multicast group. The Prestige supports both IGMP version 1 (**IGMP-v1**) and version 2 (**IGMP-v2)**. Press [SPACE BAR] to enable IP Multicasting or select **None** to disable it. See the *LAN Setup* chapter for more information on this feature.
Once you have completed filling in **Menu 11.3 Remote Node Network Layer Options**, 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.	

26.4 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 165 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 166 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:
```

26.4.1 Traffic Redirect Setup

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

Figure 167 Menu 11.6: Traffic Redirect Setup

```
                  Menu 11.6 - Traffic Redirect Setup

            Active= Yes
            Configuration:
              Backup Gateway IP Address= 0.0.0.0

              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 128 Menu 11.6 Traffic Redirect Setup

FIELD	DESCRIPTION
Active	Press [SPACE BAR] and select **Yes** (to enable) or **No** (to disable) traffic redirect setup. The default is **No**.
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.

Table 128 Menu 11.6 Traffic Redirect Setup

FIELD	DESCRIPTION
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 **Check WAN IP Address** field before it times out. The number in this field should be less than the number in the **Period** 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 **Fail Tolerance** 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 27
Static Route Setup

This chapter shows how to setup IP static routes.

27.1 IP Static Route Setup

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

Figure 168 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 169 Menu12.1 Edit IP Static Route

```
Menu 12.1 - Edit IP Static Route

          Route #: 2
          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 129 Menu12.1 Edit IP Static Route

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

CHAPTER 28
Network Address Translation (NAT)

This chapter discusses how to configure NAT on the Prestige.

28.1 Using NAT

Note: You must create a firewall rule in addition to setting up SUA/NAT, to allow traffic from the WAN to be forwarded through the Prestige.

28.1.1 SUA (Single User Account) Versus NAT

SUA (Single User Account) is a ZyNOS implementation of a subset of NAT that supports two types of mapping, **Many-to-One** and **Server**. See Section 28.3.1 on page 305 for a detailed description of the NAT set for SUA. The Prestige also supports **Full Feature** NAT to map multiple global IP addresses to multiple private LAN IP addresses of clients or servers using mapping types.

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

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

28.2 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 170 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
            Relogin Every (min)=  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 171 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 130 Applying NAT in Menus 4 & 11.3

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

28.3 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 172 Menu 15 NAT Setup

```
            Menu 15 - NAT Setup
                      1. Address Mapping Sets
                      2. Port Forwarding Setup
                      3. Trigger Port Setup
            Enter Menu Selection Number:
```

28.3.1 Address Mapping Sets

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

Figure 173 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 28.1.1 on page 303). The fields in this menu cannot be changed.

Figure 174 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 131 Menu 15.1.255 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	**Local Start IP** is the starting local IP address (ILA).
Local End IP	**Local End IP** is the ending local IP address (ILA). If the rule is for all local IPs, then the Start IP is 0.0.0.0 and the End IP is 255.255.255.255.
Global Start IP	This is the starting global IP address (IGA). If you have a dynamic IP, enter 0.0.0.0 as the **Global Start IP**.
Global End IP	This is the ending global IP address (IGA).
Type	These are the mapping types. **Server** allows us to specify multiple servers of different types behind NAT to this machine. See later for some examples.
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.

28.3.1.1 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 175 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.

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

28.3.1.2 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 132 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 **Edit**. **Edit** means you want to edit a selected rule (see the following field). **Insert Before** means to insert a rule before the rule selected. The rules after the selected rule will then be moved down by one rule. **Delete** means to delete the selected rule and then all the rules after the selected one will be advanced one rule. **None** disables the **Select Rule** item.
Select Rule	When you choose **Edit**, **Insert Before** or **Delete** in the previous field the cursor jumps to this field to allow you to select the rule to apply the action in question.

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 176 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 133 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. **Server** allows you to specify multiple servers of different types behind NAT to this computer. See *section* for an example.
Local IP	Only local IP fields are **N/A** for server; Global IP fields MUST be set for **Server**.
Start	This is the starting local IP address (ILA).
End	This is the ending local IP address (ILA). If the rule is for all local IPs, then put the Start IP as 0.0.0.0 and the End IP as 255.255.255.255. This field is **N/A** for One-to-One and Server types.
Global IP	
Start	This is the starting inside global IP address (IGA). If you have a dynamic IP, enter 0.0.0.0 as the **Global IP Start**. Note that **Global IP Start** can be set to 0.0.0.0 only if the types are **Many-to-One** or **Server**.
End	This is the ending inside global IP address (IGA). This field is **N/A** for **One-to-One**, **Many-to-One** and **Server types**.
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.	

28.4 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.

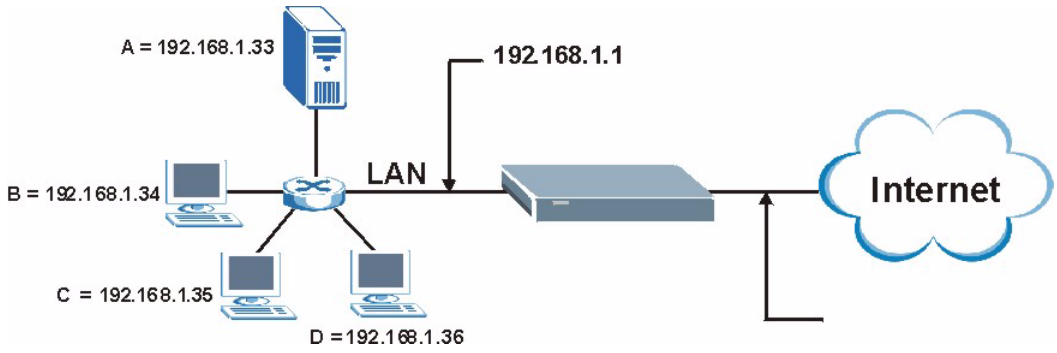
Figure 177 Menu 15.2.1 NAT Server Setup

```
            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.       0                0            0.0.0.0

         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 178 Multiple Servers Behind NAT Example



28.5 General NAT Examples

The following are some examples of NAT configuration.

28.5.1 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 179 NAT Example 1

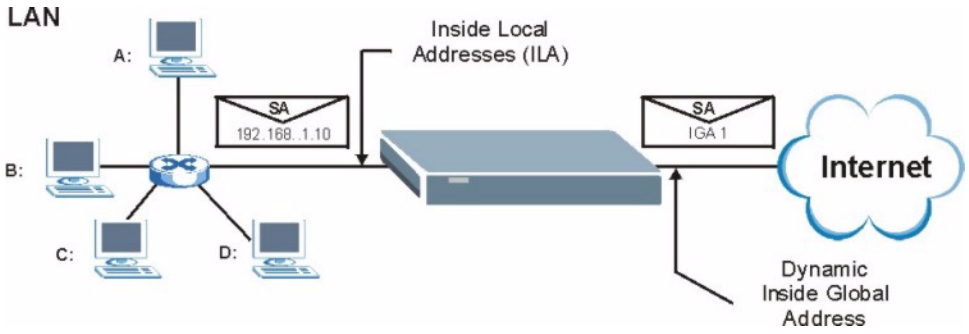


Figure 180 Menu 4 Internet Access & NAT Example

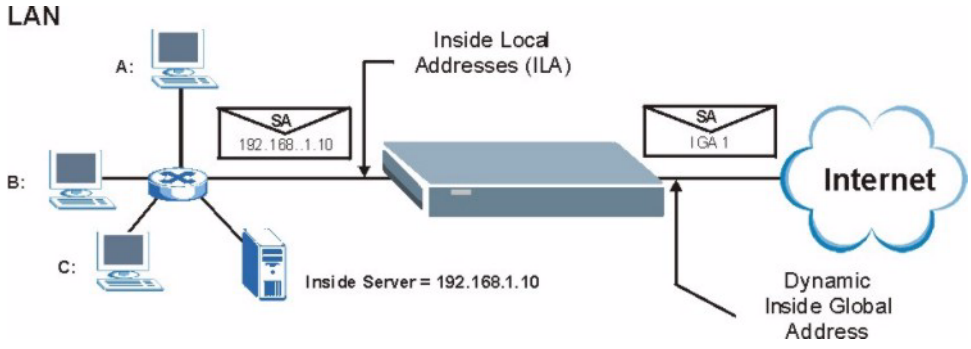
```
                Menu 4 - Internet Access Setup

          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
            Relogin Every (min)=  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 General NAT Examples.* 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.

28.5.2 Example 2: Internet Access with an Inside Server

The dynamic Inside Global Address is assigned by the ISP.

Figure 181 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 182 Menu 15.2.1 Specifying an Inside Server

```
                Menu 15.2.1 - NAT Server Setup

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

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

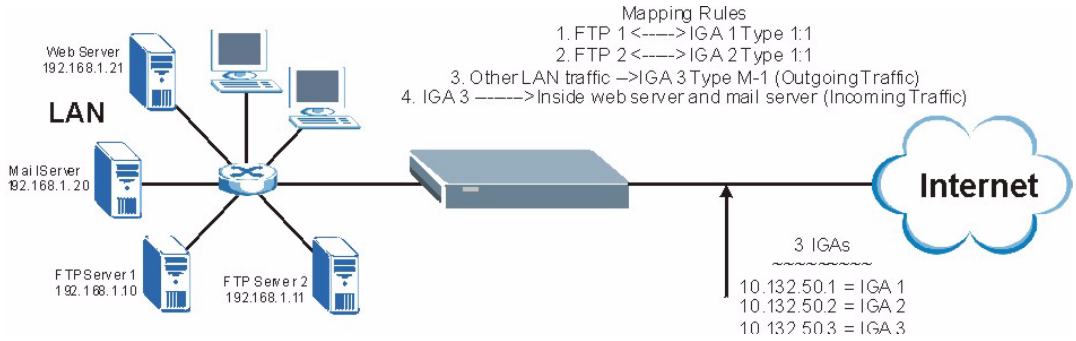
28.5.3 Example 3: Multiple Public IP Addresses With Inside Servers

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 183 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) Figure 164 on page 296.

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) Figure 185 on page 314.

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 186 on page 314.

Figure 184 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 185 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 186 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.

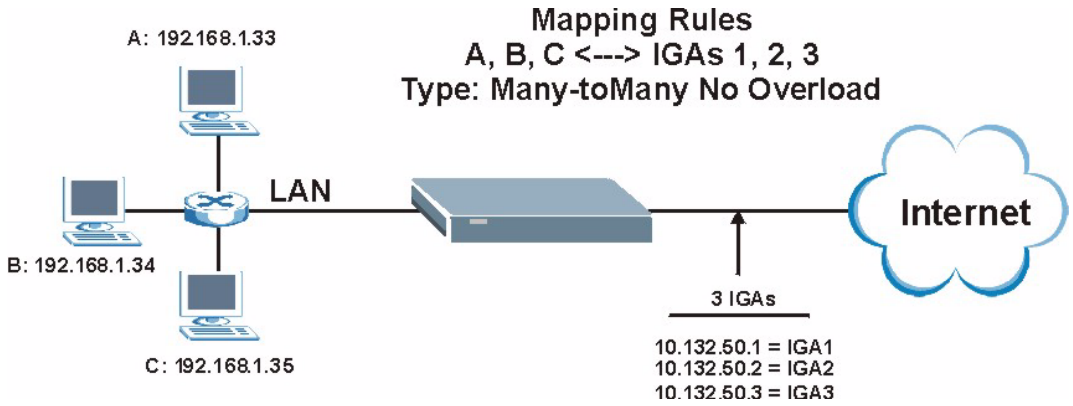
Figure 187 Example 3: Menu 15.2

```
            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.       0                0            0.0.0.0

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

28.5.4 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 188 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 189 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 190 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:
```

28.6 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 191 Menu 15.3 Trigger Port Setup

```
     Menu 15.3 - Trigger Port Setup

                                Incoming                Trigger
  Rule       Name          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 134 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 29
Enabling the Firewall

This chapter shows you how to get started with the Prestige firewall.

29.1 Remote Management and the Firewall

When SMT menu 24.11 is configured to allow management (see the Remote Management chapter) and the firewall is enabled:

- The firewall blocks remote management from the WAN unless you configure a firewall rule to allow it.
- The firewall allows remote management from the LAN.

29.2 Access Methods

The web configurator is, by far, the most comprehensive firewall configuration tool your Prestige has to offer. For this reason, it is recommended that you configure your firewall using the web configurator, see the following chapters for instructions. SMT screens allow you to activate the firewall and view firewall logs.

29.3 Enabling the Firewall

From the main menu enter 21 to go to **Menu 21 - Filter and Firewall Setup** to display the screen shown next**.**

Enter option 2 in this menu to bring up the following screen. Press [SPACE BAR] and then [ENTER] to select **Yes** in the **Active** field to activate the firewall. The firewall must be active to protect against Denial of Service (DoS) attacks. Additional rules may be configured using the web configurator.

Figure 192 Menu 21.2 Firewall Setup

```
                Menu 21.2 - Firewall Setup

    The firewall protects against Denial of Service (DoS) attacks when
    it is active.

    Your network is vulnerable to attacks when the firewall is turned off.
    Refer to the User's Guide for details about the firewall default
    policies.

    You may define additional Policy rules or modify existing ones but
    please exercise extreme caution in doing so.

        Active: No

         You can use the Web Configurator to configure the firewall.

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

Note: Use the web configurator or the command interpreter to configure the firewall rules.

CHAPTER 30
Filter Configuration

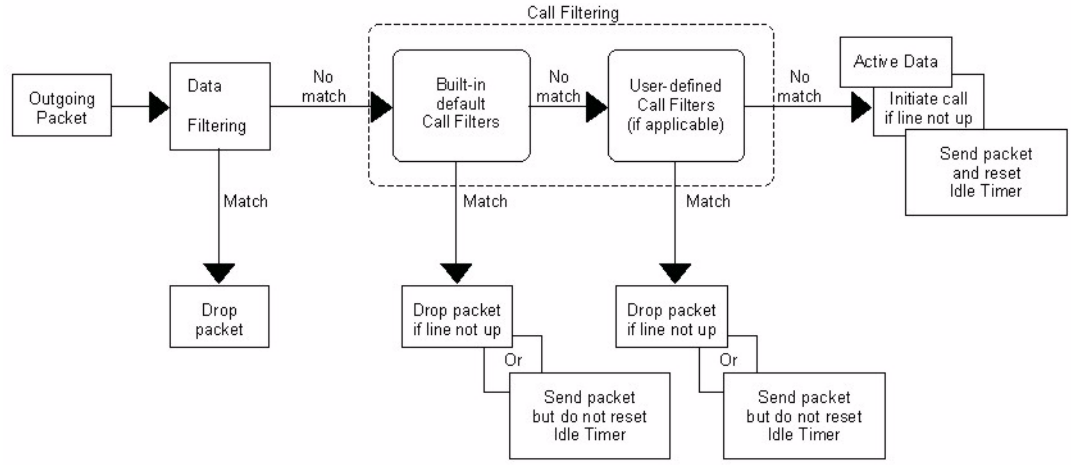
This chapter shows you how to create and apply filters.

30.1 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 193 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.

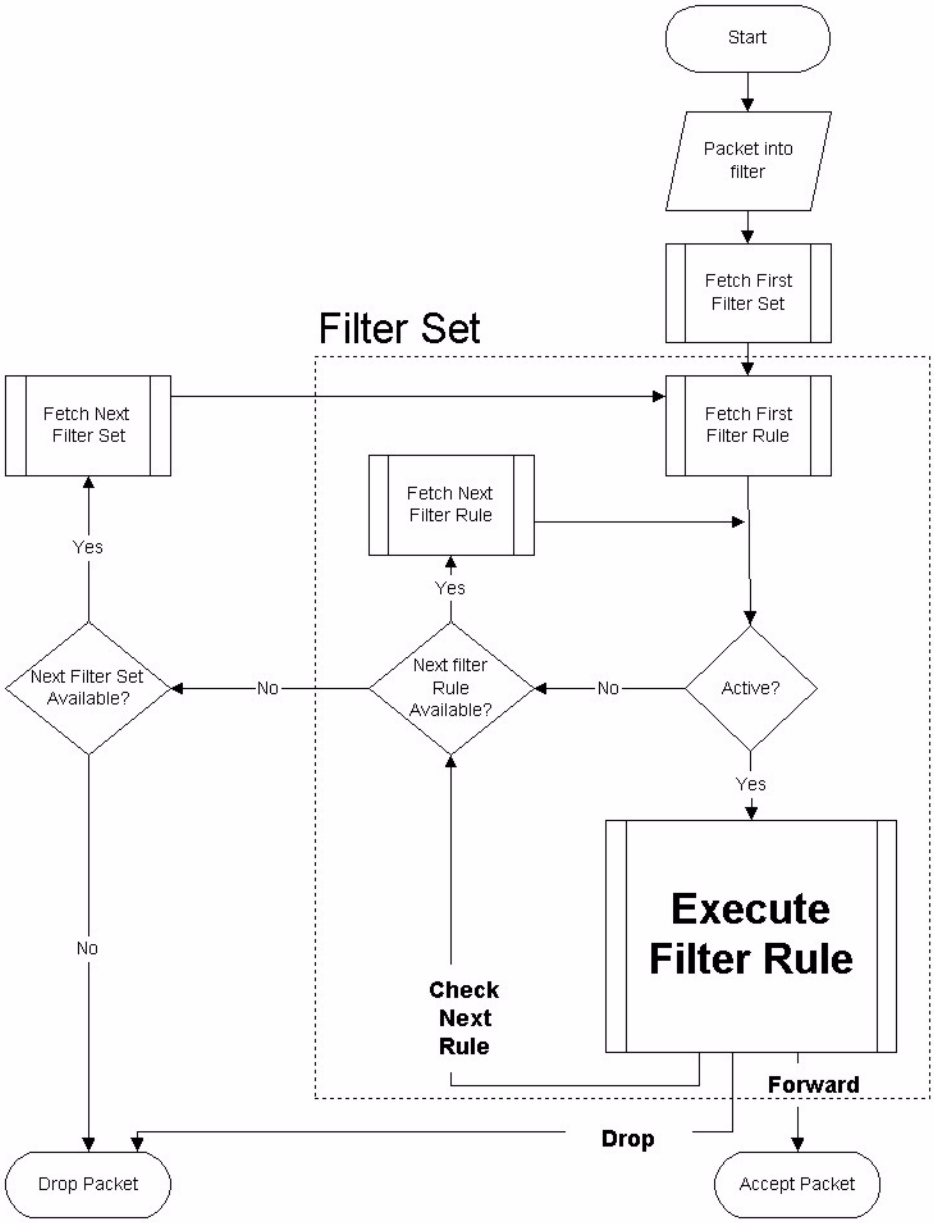
30.1.1 The Filter Structure of the Prestige

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 198 for the logic flow when executing an IP filter.

Figure 194 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.

30.2 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 195 Menu 21: Filter and Firewall Setup

```
            Menu 21 - Filter and Firewall Setup

                      1. Filter Setup
                      2. Firewall Setup

            Enter Menu Selection Number:
```

2 Enter 1 to bring up the following menu.

Figure 196 Menu 21.1: Filter Set Configuration

```
                Menu 21.1 - Filter Set Configuration

  Filter                                Filter
  Set #        Comments                 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:
```

3 Select the filter set you wish to configure (1-12) and press [ENTER].

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

5 Press [ENTER] at the message [Press ENTER to confirm] to open **Menu 21.1.1 - 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 135 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.

Table 135 Abbreviations Used in the Filter Rules Summary Menu

FIELD	DESCRIPTION
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 136 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.

30.2.1 Configuring a Filter Rule

To configure a filter rule, type its number in **Menu 21.1.x - Filter Rules Summary** and press [ENTER] to open menu 21.1.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.

30.2.2 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 21.1.x.x - TCP/IP Filter Rule**, as shown next

Figure 197 Menu 21.1.1.1 TCP/IP Filter Rule.

```
                Menu 21.1.1.1 - 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 137 Menu 21.1.x.x TCP/IP Filter Rule

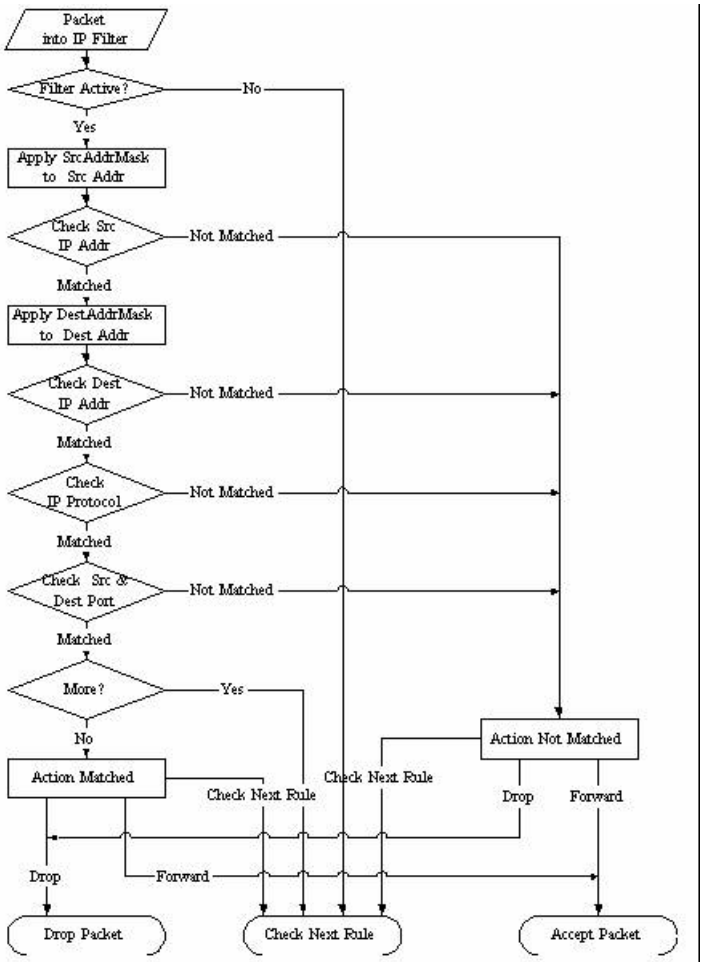
FIELD	DESCRIPTION	OPTIONS
Active	Press [SPACE BAR] and then [ENTER] to select **Yes** to activate the filter rule or **No** to deactivate it.	Yes No
IP Protocol	Protocol refers to the upper layer protocol, e.g., TCP is 6, UDP is 17 and ICMP is 1. Type a value between 0 and 255. A value of 0 matches ANY protocol.	0-255
IP Source Route	Press [SPACE BAR] and then [ENTER] to select **Yes** 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.	Yes No
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.	0.0.0.0
IP Mask	Enter the IP mask to apply to the **Destination: IP Addr**.	0.0.0.0
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.	0-65535
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 Destination: Port #**.	None Less Greater Equal Not Equal

Table 137 Menu 21.1.x.x TCP/IP Filter Rule

FIELD	DESCRIPTION	OPTIONS
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.	0.0.0.0
IP Mask	Enter the IP mask to apply to the **Source: IP Addr**.	0.0.0.0
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.	0-65535
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 **Source: Port #**.	None Less Greater Equal Not Equal
TCP Estab	This field is applicable only when the IP Protocol field is 6, TCP. Press [SPACE BAR] and then [ENTER] to select **Yes**, to have the rule match packets that want to establish a TCP connection (SYN=1 and ACK=0); if **No**, it is ignored.	Yes No
More	Press [SPACE BAR] and then [ENTER] to select **Yes** or **No**. If **Yes**, a matching packet is passed to the next filter rule before an action is taken; if **No**, the packet is disposed of according to the action fields. If **More** is **Yes**, then **Action Matched** and **Action Not Matched** will be **N/A**.	Yes No
Log	Press [SPACE BAR] and then [ENTER] to select a logging option from the following: **None** – No packets will be logged. **Action Matched** - Only packets that match the rule parameters will be logged. **Action Not Matched** - Only packets that do not match the rule parameters will be logged. **Both** – All packets will be logged.	None Action Matched Action Not Matched **Both**
Action Matched	Press [SPACE BAR] and then [ENTER] to select the action for a matching packet.	Check Next Rule Forward Drop
Action Not Matched	Press [SPACE BAR] and then [ENTER] to select the action for a packet not matching the rule.	Check Next Rule Forward Drop
When you have **Menu 21.1.1.1 - TCP/IP Filter Rule** 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 **Menu 21.1.1 - Filter Rules Summary**.		

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

Figure 198 Executing an IP Filter



30.2.3 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 21.1.x.x and press [ENTER] to open Generic Filter Rule, as shown below.

Figure 199 Menu 21.1.4.1 Generic Filter Rule

```
                Menu 21.1.4.1 - Generic Filter Rule

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

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

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

Table 138 Menu 21.1.x.x Generic Filter Rule Menu Fields

FIELD	DESCRIPTION	OPTIONS
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.	**Generic Filter Rule** **TCP/IP Filter Rule**
Active	Select **Yes** to turn on the filter rule or **No** to turn it off.	Yes / No
Offset	Enter the starting byte of the data portion in the packet that you wish to compare. The range for this field is from 0 to 255.	0-255
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.	0-8
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 **Yes**, a matching packet is passed to the next filter rule before an action is taken; else the packet is disposed of according to the action fields. If **More** is **Yes**, then Action Matched and Action Not Matched will be **No**.	Yes No
Log	Select the logging option from the following: **None** - No packets will be logged. **Action Matched** - Only packets that match the rule parameters will be logged. **Action Not Matched** - Only packets that do not match the rule parameters will be logged. **Both** – All packets will be logged.	None Action Matched Action Not Matched Both

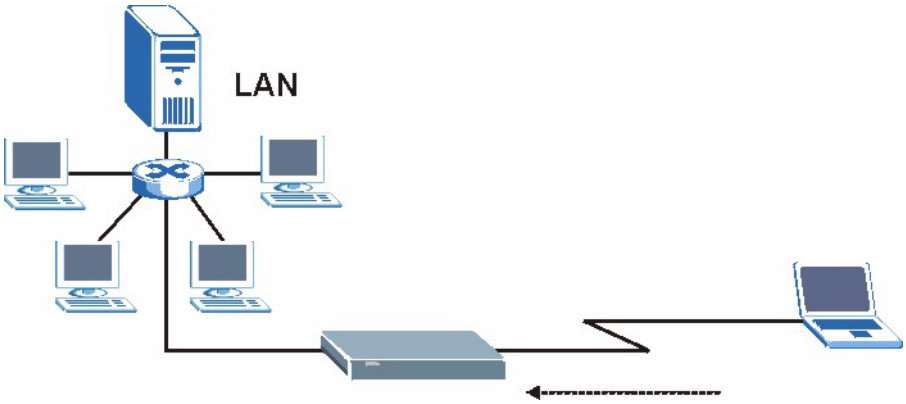
Table 138 Menu 21.1.x.x Generic Filter Rule Menu Fields

FIELD	DESCRIPTION	OPTIONS
Action Matched	Select the action for a packet matching the rule.	Check Next Rule Forward Drop
Action Not Matched	Select the action for a packet not matching the rule.	Check Next Rule Forward Drop
Once you have completed filling in **Menu 21.4.1.1 - Generic Filter Rule**, press [ENTER] at the message "Press ENTER to Confirm" to save your configuration, or press [ESC] to cancel. This data will now be displayed on **Menu 21.1.1 - Filter Rules Summary**.		

30.3 Example Filter

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

Figure 200 Telnet Filter Example



1. Enter 21 from the main menu to open **Menu 21 - Filter and Firewall Setup**.
2. Enter 1 to open **Menu 21.1 - Filter Set Configuration**.
3. Enter the index of the filter set you wish to configure (say 3) and press [ENTER].
4. Enter a descriptive name or comment in the **Edit Comments** field and press [ENTER].
5. Press [ENTER] at the message [Press ENTER to confirm] to open **Menu 21.1.3 - Filter Rules Summary**
6. 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 201 Example Filter: Menu 21.1.3.1

```
            Menu 21.1.3.1 - 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 202 Example Filter Rules Summary: Menu 21.1.3

```
                        Menu 21.1.3 - Filter Rules Summary
# A Type                        Filter Rules                          M m n
- - ---- ------------------------------------------------------------ - - -
1 Y IP   Pr=6, SA=0.0.0.0, DA=0.0.0.0, DP=23                          N D F
2 N
3 N
4 N
5 N
6 N
                  Enter Filter Rule Number (1-6) to Configure:
```

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).

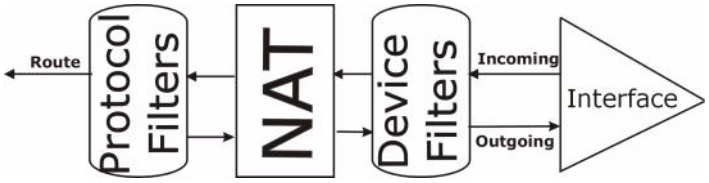
After you've created the filter set, you must apply it.

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.

30.4 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 203 Protocol and Device Filter Sets



30.5 Firewall Versus Filters

Firewall configuration is discussed in the firewall chapters of this manual. Further comparisons are also made between filtering, NAT and the firewall.

30.6 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.

Note: If you do not activate the firewall, it is advisable to apply filters.

30.6.1 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 204 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:
```

30.6.2 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 205 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:
```

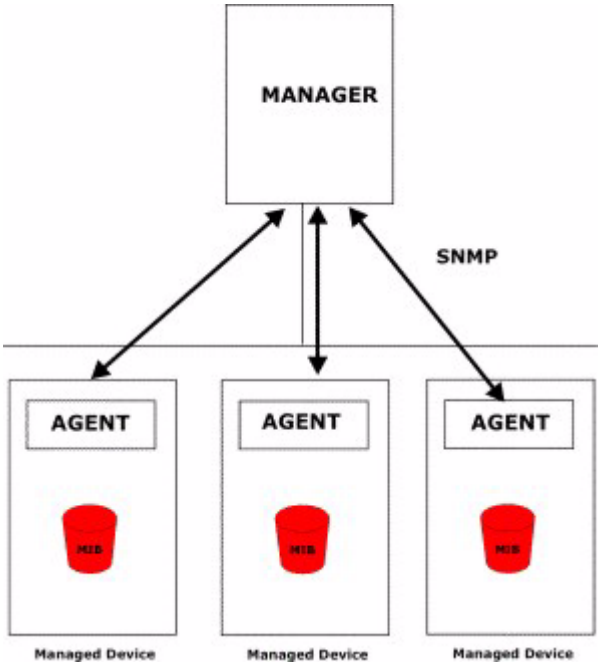
CHAPTER 31
SNMP Configuration

This chapter explains SNMP Configuration menu 22.

31.1 About 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 c (SNMPv2c). The next figure illustrates an SNMP management operation. SNMP is only available if TCP/IP is configured.

Figure 206 SNMP Management Model



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

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

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

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

1. Get - Allows the manager to retrieve an object variable from the agent.
2. 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.
3. Set - Allows the manager to set values for object variables within an agent.
4. Trap - Used by the agent to inform the manager of some events.

31.2 Supported MIBs

The Prestige supports RFC-1215 and MIB II as defined in RFC-1213 as well as ZyXEL private MIBs. The focus of the MIBs is to let administrators collect statistic data and monitor status and performance.

31.3 SNMP Configuration

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

Figure 207 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 139 Menu 22 SNMP Configuration

FIELD	DESCRIPTION
SNMP:	
Get Community	Type the **Get Community**, which is the password for the incoming Get- and GetNext requests from the management station.
Set Community	Type the **Set 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.
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.	

31.4 SNMP Traps

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

Table 140 SNMP Traps

TRAP #	TRAP NAME	DESCRIPTION
1	coldStart (*defined in RFC-1215*)	A trap is sent after booting (power on).
2	warmStart (*defined in RFC-1215*)	A trap is sent after booting (software reboot).
3	linkDown (*defined in RFC-1215*)	A trap is sent with the port number when any of the links are down. See the following table.
4	linkUp (*defined in RFC-1215*)	A trap is sent with the port number.
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 141 Ports and Permanent Virtual Circuits

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

CHAPTER 32
System Security

This chapter describes how to configure the system security on the Prestige.

32.1 System Security

You can configure the system password, an external RADIUS server and 802.1x in this menu.

32.2 System Password

Figure 208 Menu 23 System Security

```
                    Menu 23 - System Security

              1. Change Password
              2. RADIUS Server

              4. IEEE802.1x

                   Enter Menu Selection Number:
```

You should change the default password. If you forget your password you have to restore the default configuration file. Refer to the section on changing the system password in the Introducing the SMT chapter and the section on resetting the Prestige in the chapter about introducing the web configurator .

32.3 Configuring External RADIUS Server

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

From Menu 23- System Security, enter 2 to display **Menu 23.2 - System Security-RADIUS Server** as shown next.

Figure 209 Menu 23.2 System Security : RADIUS Server

```
                  Menu 23.2 - System Security - RADIUS Server

                   Authentication Server:
                     Active= No
                     Server Address= 0.0.0.0
                     Port #= 1812
                     Shared Secret= ********

                   Accounting Server:
                     Active= No
                     Server Address= 0.0.0.0
                     Port #= 1813
                     Shared Secret= ********


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

The following table describes the fields in this screen.

Table 142 Menu 23.2 System Security : RADIUS Server

FIELD	DESCRIPTION
Authentication Server	
Active	Press [SPACE BAR] to select **Yes** and press [ENTER] to enable user authentication through an external authentication server.
Server Address	Enter the IP address of the external authentication server in dotted decimal notation.
Port	The default port of the RADIUS server for authentication is 1812. You need not change this value unless your network administrator instructs you to do so with additional information.
Shared Secret	Specify a password (up to 31 alphanumeric characters) as the key to be shared between the external authentication server and the access points. The key is not sent over the network. This key must be the same on the external authentication server and Prestige.
Accounting Server	
Active	Press [SPACE BAR] to select **Yes** and press [ENTER] to enable user authentication through an external accounting server.
Server Address	Enter the IP address of the external accounting server in dotted decimal notation.
Port	The default port of the RADIUS server for accounting is 1813. You need not change this value unless your network administrator instructs you to do so with additional information.
Shared Secret	Specify a password (up to 31 alphanumeric characters) as the key to be shared between the external accounting server and the access points. The key is not sent over the network. This key must be the same on the external accounting server and Prestige.
When you have completed this menu, press [ENTER] at the prompt "Press ENTER to confirm or ESC to cancel" to save your configuration or press [ESC] to cancel and go back to the previous screen.	

32.4 IEEE 802.1x

The IEEE802.1x standards outline enhanced security methods for both the authentication of wireless stations and encryption key management.

Follow the steps below to enable EAP authentication on your Prestige.

1. From the main menu, enter 23 to display **Menu23 - System Security**.
2. Enter 4 to display **Menu 23.4 - System Security - IEEE802.1x**.

Figure 210 Menu 23.4 System Security : IEEE802.1x

```
               Menu 23.4 - System Security - IEEE802.1x

             Wireless Port Control= Authentication Required
             ReAuthentication Timer (in second)= 1800
             Idle Timeout (in second)= 3600


             Key Management Protocol= WPA-PSK
             Dynamic WEP Key Exchange= N/A
             PSK = ********
             WPA Compatible= N/A

             WPA Broadcast/Multicast Key Update Timer= 1800

             Authentication Databases= N/A

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

The following table describes the fields in this screen.

Table 143 Menu 23.4 System Security : IEEE802.1x

FIELD	DESCRIPTION
Wireless Port Control	Press [SPACE BAR] and select a security mode for the wireless LAN access. Select **No Authentication Required** to allow any wireless stations access to your wired network without entering usernames and passwords. This is the default setting. Selecting **Authentication Required** means wireless stations have to enter usernames and passwords before access to the wired network is allowed. Select **No Access Allowed** to block all wireless stations access to the wired network. The following fields are not available when you select **No Authentication Required** or **No Access Allowed**.
ReAuthentication Timer (in second)	Specify how often a client has to re-enter username and password to stay connected to the wired network. This field is activated only when you select **Authentication Required** in the **Wireless Port Control** field. Enter a time interval between 10 and 9999 (in seconds). The default time interval is 1800 seconds (or 30 minutes).

Table 143 Menu 23.4 System Security : IEEE802.1x

FIELD	DESCRIPTION
Idle Timeout (in second)	The ZyAIR automatically disconnects a client from the wired network after a period of inactivity. The client needs to enter the username and password again before access to the wired network is allowed. This field is activated only when you select **Authentication Required** in the **Wireless Port Control** field. The default time interval is 3600 seconds (or 1 hour).
Key Management Protocol	Press [SPACE BAR] to select **802.1x**, **WPA**, **WPA2**, **WPA-PSK** or **WPA2-PSK** and press [ENTER].
Dynamic WEP Key Exchange	This field is activated only when you select **Authentication Required** in the **Wireless Port Control** field. Also set the **Key Management Protocol** field to **802.1x**. Select **Disable** to allow wireless stations to communicate with the access points without using **Dynamic WEP Key Exchange**. Select **64-bit WEP** or **128-bit WEP** to enable data encryption. Up to 32 stations can access the Prestige when you configure **Dynamic WEP Key Exchange**.
PSK	Type a pre-shared key from 8 to 63 case-sensitive ASCII characters (including spaces and symbols) when you select **WPA-PSK** or **WPA2-PSK** in the **Key Management Protocol** field.
WPA Compatible	Select **Enable** to have both WPA2 and WPA wireless clients be able to communicate with the Prestige even when the Prestige is using WPA2-PSK or WPA2. Otherwise, select **Disable**.
WPA Broadcast/ Multicast Key Update Timer	The **WPA Broadcast/Multicast Key Update Timer** is the rate at which the AP (if using **WPA-PSK**/**WPA2-PSK key** management) or RADIUS server (if using **WPA**/**WPA2** key management) sends a new group key out to all clients. The re-keying process is the WPA equivalent of automatically changing the WEP key for an AP and all stations in a WLAN on a periodic basis. Setting of the **WPA Broadcast/Multicast Key Update Timer** is also supported in **WPA-PSK**/**WPA2-PSK** mode. The default is 1800 seconds (30 minutes).
Authentication Databases	The authentication database contains wireless station login information. The RADIUS is an external server. When you configure **Key Management Protocol** to **WPA**, **WPA2** or **802.1x**, the **Authentication Databases** is **RADIUS Only**. Before you enable wireless LAN and use WPA, WPA2 or IEEE 802.1x authentication, make sure you have set up an external server correctly first. The Prestige checks the user database on the specified RADIUS server for a wireless station's username and password. When the user name is not found or password does not match in the RADIUS server, the authentication will fail.
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 33
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 211 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
```

33.1 System Status

The first selection, System Status gives you information on the status and statistics of the ports, as shown next (see Figure 212 on page 344). 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 212 Menu 24.1 System Maintenance : Status

```
                  Menu 24.1 - System Maintenance - Status          01:04:32
                                                          Sun. Jan. 02, 2000

Port   Status       TxPkts      RxPkts    Cols    Tx B/s    Rx B/s     Up Time
 WAN   100M/Full       2440       21360       0         0       572     1:02:03
 LAN   100M/Full       2563        1348       0       346       224     1:02:13
WLAN   G+              278           0       0        96         0     1:02:13
Port   Ethernet Address         IP Address           IP Mask        DHCP
 WAN  00:A0:C5:F3:86:5C      172.23.23.49     255.255.255.0     Client
 LAN  00:A0:C5:F3:86:5B       192.168.1.1     255.255.255.0     Server
WLAN  00:A0:C5:F3:86:5B
     System up Time:     1:02:19

     Name: P-334WT.zyxel.com
     Routing: IP
     ZyNOS F/W Version: V3.60(JN.9)b1 | 11/04/2005

                                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 144 System Maintenance: Status Menu Fields

FIELD	DESCRIPTION
Port	Identifies a port (WAN, LAN, WLAN) on the Prestige.
Status	For the LAN ports, it displays the port speed and duplex setting. For the WAN port, it displays the port speed and duplex setting if you're using Ethernet encapsulation and **Idle** (line (ppp) idle), **Dial** (starting to trigger a call) and **Drop** (dropping a call) if you're using PPPoE or PPTP encapsulation. For the WLAN, it displays the transmission rate when the WLAN is enabled. This displays **Down** when the WLAN is disabled or the line is disconnected.
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.

Table 144 System Maintenance: Status Menu Fields

FIELD	DESCRIPTION
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.
ZyNOS F/W Version	The ZyNOS Firmware 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.	

33.2 System Information

To get to the System Information:

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

Figure 213 Menu 24.2 System Information and Console Port Speed

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

                  1. System Information
                  2. Console Port Speed
           Please enter selection:
```

33.2.1 System Information

Enter 1 in menu 24.2 to display the screen shown next

Figure 214 Menu 24.2.1 System Maintenance : Information

```
                Menu 24.2.1 - System Maintenance - Information

    Name: P-334WT.zyxel.com
    Routing: IP
    ZyNOS F/W Version: V3.60(JN.9)b1 | 11/04/2005
    Country Code: 255

    LAN
      Ethernet Address: 00:A0:C5:F3:86:5B
      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 145 Menu 24.2.1 System Maintenance : Information

FIELD	DESCRIPTION
Name	Displays the system name of your Prestige. This information can be changed in **Menu 1 – General Setup**.
Routing	Refers to the routing protocol used.
ZyNOS F/W Version	Refers to the ZyNOS (ZyXEL Network Operating System) system firmware version. ZyNOS is a registered trademark of ZyXEL Communications Corporation.
Country Code	Refers to the country code of the firmware.
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.

33.2.2 Console Port Speed

You can set up different port speeds for the console port through **Menu 24.2.2 – System Maintenance – Change 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 215 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:
```

33.3 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.

33.3.1 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 216 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 146 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:

33.3.1.1 CDR

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

33.3.1.2 Packet triggered

```
Packet triggered Message Format
SdcmdSyslogSend( SYSLOG_PKTTRI, SYSLOG_NOTICE, String );
Sring = Packet trigger: Protocol=xx Data=xxxxxxxxxx…..x
Protocol: (1:IP 2:IPX 3:IPXHC 4:BPDU 5:ATALK 6:IPNG)
Data: We will send forty-eight Hex characters to the server
Jul 19 11:28:39 192.168.102.2 ZyXEL: Packet Trigger: Protocol=1,
Data=4500003c100100001f010004c0a86614ca849a7b08004a5c0200010061626364656667686 96a6b6c
6d6e6f7071727374
Jul 19 11:28:56 192.168.102.2 ZyXEL: Packet Trigger: Protocol=1,
Data=4500002c1b0140001f06b50ec0a86614ca849a7b0427001700195b3e0000000060022000 8cd40000
020405b4
Jul 19 11:29:06 192.168.102.2 ZyXEL: Packet Trigger: Protocol=1,
Data=45000028240140001f06ac12c0a86614ca849a7b0427001700195b451d1430135004000 0077600000
```

33.3.1.3 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[ffffffffffnordff0080] }S05>R01mF
Mar 03 10:41:29 202.132.155.97 ZyXEL:
GEN[00a0c5f502fnord010080] }S05>R01mF
Mar 03 10:41:34 202.132.155.97 ZyXEL:
IP[Src=192.168.2.33 Dst=202.132.155.93 ICMP]}S04>R01mF
Mar 03 11:59:20 202.132.155.97 ZyXEL:
GEN[00a0c5f502fnord010080] }S05>R01mF
Mar 03 12:00:52 202.132.155.97 ZyXEL:
GEN[ffffffffffff0080] }S05>R01mF
Mar 03 12:00:57 202.132.155.97 ZyXEL:
GEN[00a0c5f502010080] }S05>R01mF
Mar 03 12:01:06 202.132.155.97 ZyXEL:
IP[Src=192.168.2.33 Dst=202.132.155.93 TCP spo=01170  dpo=00021]}S04>R01mF
```

33.3.1.4 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
```

33.3.1.5 Firewall log

```
Firewall Log Message Format
SdcmdSyslogSend(SYSLOG_FIREWALL, SYSLOG_NOTICE, buf);
buf = IP[Src=xx.xx.xx.xx : spo=xxxx Dst=xx.xx.xx.xx : dpo=xxxx | prot | rule | action]
Src: Source Address
spo: Source port (empty means no source port information)
Dst: Destination Address
dpo: Destination port (empty means no destination port information)
prot: Protocol ("TCP","UDP","ICMP", "IGMP", "GRE", "ESP")
rule: <a,b> where a means "set" number; b means "rule" number.
Action: nothing(N) block (B) forward (F)
08-01-2000
11:48:41
Local1.Notice
192.168.10.10
RAS: FW 172.21.1.80     :137  ->172.21.1.80     :137  |UDP|default permit:<2,0>|B
08-01-2000
11:48:41
Local1.Notice
192.168.10.10
RAS: FW 192.168.77.88   :520  ->192.168.77.88   :520  |UDP|default permit:<2,0>|B
08-01-2000
11:48:39
Local1.Notice
192.168.10.10
RAS: FW 172.21.1.50     ->172.21.1.50     |IGMP<2>|default permit:<2,0>|B
08-01-2000
11:48:39
Local1.Notice
192.168.10.10
RAS: FW 172.21.1.25     ->172.21.1.25     |IGMP<2>|default permit:<2,0>|B
```

33.3.2 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 217 Call-Triggering Packet Example

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

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

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

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

33.4 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**.

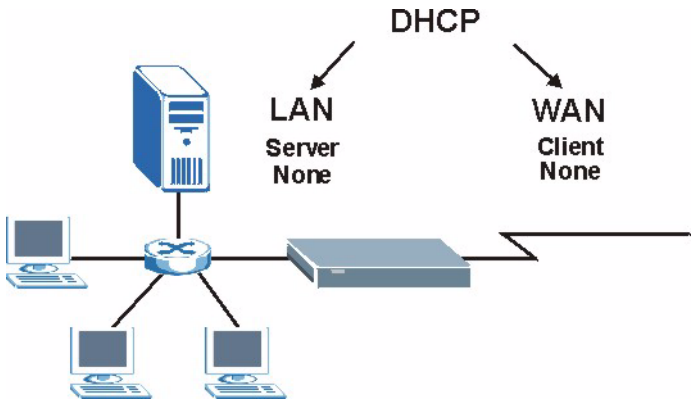
Figure 218 Menu 24.4 System Maintenance : Diagnostic

```
            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
```

33.4.1 WAN DHCP

DHCP functionality can be enabled on the LAN or WAN as shown in LAN & WAN DHCP. 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 219 LAN & WAN DHCP



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

Table 147 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 **Host IP Address** field below.
WAN DHCP Release	Enter 2 to release your WAN DHCP settings.
WAN DHCP Renewal	Enter 3 to renew your WAN DHCP settings.

Table 147 System Maintenance Menu Diagnostic

FIELD	DESCRIPTION
Internet Setup Test	Enter 4 to test the Internet setup. You can also test the Internet setup in **Menu 4 - Internet Access**. Please refer to the Internet Access 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 **Ping Host**, 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 34
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.

34.1 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 148 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

34.2 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.

34.2.1 Backup Configuration

Follow the instructions as shown in the next screen.

Figure 220 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:
```

34.2.2 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.

34.2.3 Example of FTP Commands from the Command Line

Figure 221 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
```

34.2.4 GUI-based FTP Clients

The following table describes some of the commands that you may see in GUI-based FTP clients.

Table 149 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).

34.2.5 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.
- You have an SMT console session running.

34.2.6 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.

34.2.7 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.

34.2.8 GUI-based TFTP Clients

The following table describes some of the fields that you may see in GUI-based TFTP clients.

Table 150 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.

34.3 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.

34.3.1 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 222 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.

34.3.2 Restore Using FTP Session Example

Figure 223 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
```

34.4 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 section about restoring configuration 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.

34.4.1 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 224 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:
```

34.4.2 Configuration File Upload

You see the following screen when you telnet into menu 24.7.2

Figure 225 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

34.4.3 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.

34.4.4 FTP Session Example of Firmware File Upload

Figure 226 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.

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

34.4.6 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 35
System Maintenance

This chapter leads you through SMT menus 24.8 to 24.10.

35.1 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 web site for more detailed information on CI commands. Enter 8 from **Menu 24 — System Maintenance**. A list of valid commands can be found by typing `help` or `?` at the command prompt. Type "exit" to return to the SMT main menu when finished.

Figure 227 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:
```

35.1.1 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.

35.1.2 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 228 Valid Commands

```
Copyright (c) 1994 - 2004 ZyXEL Communications Corp.
P-334WT> ?
Valid commands are:
sys             exit            device          ether
poe             pptp            config          ip
ipsec           ppp             bm
P-334WT>
```

35.2 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 229 Menu 24.9 System Maintenance : Call Control

```
                Menu 24.9 - System Maintenance - Call Control

                     1. Budget Management
                     2. Call History

                   Enter Menu Selection Number:
```

35.2.1 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 230 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 151 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.	

35.2.2 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 231 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 152 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.	

35.3 Time and Date Setting

The Real Time Chip (RTC) keeps track of the time and date (not available on all models). There is also a software mechanism to set the time manually or get the current time and date from an external server when you turn on your Prestige. Menu 24.10 allows you to update the time and date settings of your Prestige. The real time is then displayed in the Prestige error logs and firewall logs.

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

Figure 232 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 233 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-nth-week-hr):       Jan. - 1st  - Sat.(01)  - 00
    End Date (mm-nth-week-hr):         Jan. - 1st  - Sat.(01)  - 00

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

The following table describes the fields in this screen.

Table 153 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. **Daytime (RFC 867)** format is day/month/year/time zone of the server. **Time (RFC-868)** format displays a 4-byte integer giving the total number of seconds since 1970/1/1 at 0:0:0. **NTP (RFC-1305)** the default, is similar to **Time (RFC-868)**. **None** 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 savings time, then choose **Yes**.
Start Date	Enter the day and time that your daylight-savings time starts on if you selected **Yes** in the **Daylight Saving** field.
End Date	Enter the day and time that your daylight-savings time ends on if you selected **Yes** in the **Daylight Saving** 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.	

35.3.1 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 36
Remote Management

This chapter covers remote management (SMT menu 24.11).

36.1 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).

Note: When you choose **WAN only** or **ALL** (LAN & WAN), you still need to configure a firewall rule to allow access.

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 234 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 154 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: **LAN only**, **WAN only**, **ALL** or **Disable**.
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.	

36.1.1 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 an SMT console session running.
5. 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.
6. There is a firewall rule that blocks it.

CHAPTER 37
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.

37.1 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 235 Menu 26 Schedule Setup

```
Menu 26 - Schedule Setup

Schedule                          Schedule
  Set #       Name                  Set #      Name
------   -------------------      ------  ----------------

1          ________________           7      ________________
2          ________________           8      ________________
3          ________________           9      ________________
4          ________________          10      ________________
5          ________________          11      ________________
6          ________________          12      ________________

Enter Schedule Set Number to Configure= 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 236 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(yyyyy-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 155 Menu 26.1 Schedule Set Setup

FIELD	DESCRIPTION
Active	Press [SPACE BAR] to select **Yes** or **No**. Choose **Yes** 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-December-31.
How Often	Should this schedule set recur weekly or be used just once only? Press the [SPACE BAR] and then [ENTER] to select **Once** or **Weekly**. Both these options are mutually exclusive. If **Once** is selected, then all weekday settings are **N/A**. When **Once** is selected, the schedule rule deletes automatically after the scheduled time elapses.
Once: Date	If you selected **Once** in the **How Often** field above, then enter the date the set should activate here in year-month-date format.
Weekdays: Day	If you selected **Weekly** in the **How Often** field above, then select the day(s) when the set should activate (and recur) by going to that day(s) and pressing [SPACE BAR] to select **Yes**, then press [ENTER].
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 155 Menu 26.1 Schedule Set Setup

FIELD	DESCRIPTION
Action	**Forced On** means that the connection is maintained whether or not there is a demand call on the line and will persist for the time period specified in the **Duration** field. **Forced Down** means that the connection is blocked whether or not there is a demand call on the line. **Enable Dial-On-Demand** means that this schedule permits a demand call on the line. **Disable Dial-On-Demand** means that this schedule prevents a demand call on the line.
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 237 Applying Schedule Set(s) to a Remote Node (PPPoE)

```
     Menu 11.1 - Remote Node Profile

  Rem Node Name= MyISP                 Route= IP
  Active= Yes
  Encapsulation= PPPoE                 Edit IP= No
  Service Type= Standard               Telco Option:
  Service Name=                          Allocated Budget(min)= 0
  Outgoing:                              Period(hr)= 0
    My Login=                            Schedules= 1,2,3,4
    My Password= ********                Nailed-Up Connection= No
    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 38
VPN/IPSec Setup

This chapter introduces the VPN SMT menus.

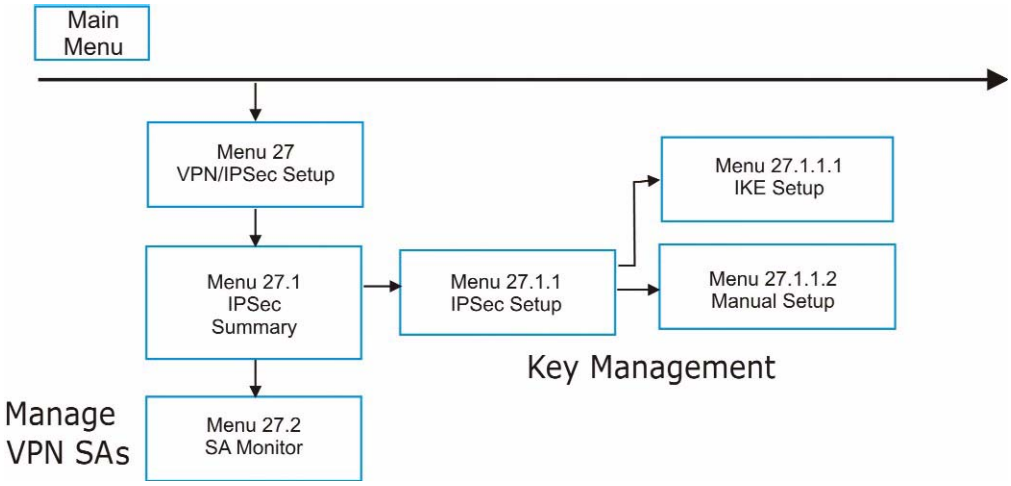
38.1 VPN/IPSec Overview

The VPN/IPSec main SMT menu has these main submenus:

1. Define VPN policies in menu 27.1 submenus, including security policies, endpoint IP addresses, peer IPSec router IP address and key management.
2. **Menu 27.2 - SA Monitor** allows you to manage (refresh or disconnect) your SA connections.

This is an overview of the VPN menu tree.

Figure 238 VPN SMT Menu Tree



From the main menu, enter 27 to display the first VPN menu (shown next).

Figure 239 Menu 27 VPN/IPSec Setup

```
              Menu 27 - VPN/IPSec Setup

               1. IPSec Summary
               2. SA Monitor

              Enter Menu Selection Number:
```

38.2 IPSec Summary Screen

Type 1 in menu 27 and then press [ENTER] to display **Menu 27.1 - IPSec Summary**. This is a summary read-only menu of your IPSec rules (tunnels). Edit or create an IPSec rule by selecting an index number and then configuring the associated submenus.

Figure 240 Menu 27

```
                        Menu 27.1 - IPSec Summary

#      Name    A Local  Addr                          Encap  IPSec Algorithm
     Key Mgt     Remote Addr Start - Addr End / Mask          Secure Gw Addr
--- ---------- - -----------------   ----------------- ------ -------------
001 Taiwan     Y  192.168.1.35                         Tunnel ESP DES-MD5
    IKE           172.16.2.40         172.16.2.46             193.81.13.2
002




            Select Command=  None          Select Rule=  N/A

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

The following table describes the fields in this menu.

Table 156 Menu 27.1 IPSec Summary

FIELD	DESCRIPTION
#	This is the VPN policy index number.
Name	This field displays the unique identification name for this VPN rule. The name may be up to 32 characters long but only 10 characters will be displayed here.
A	**Y** signifies that this VPN rule is active.
Local Addr Start	This is a static IP address on the LAN behind your Prestige.
Encap	This field displays **Tunnel** mode or **Transport** mode. See earlier for a discussion of these. You need to finish configuring the VPN policy in menu 27.1.1.1 or 27.1.1.2 if **???** is displayed.
IPSec Algorithm	This field displays the security protocols used for an SA. **ESP** provides confidentiality and integrity of data by encrypting the data and encapsulating it into IP packets. Encryption methods include 56-bit **DES** and 168-bit **3DES**. **NULL** denotes a tunnel without encryption. **AH** (Authentication Header) provides strong integrity and authentication by adding authentication information to IP packets. This authentication information is calculated using header and payload data in the IP packet. This provides an additional level of security. **AH** choices are **MD5** (default - 128 bits) and **SHA -1**(160 bits)**.** Both **AH** and **ESP** increase the Prestige's processing requirements and communications latency (delay). You need to finish configuring the VPN policy in menu 27.1.1.1 or 27.1.1.2 if **???** is displayed.

Table 156 Menu 27.1 IPSec Summary

FIELD	DESCRIPTION
Key Mgt	This field displays the SA's type of key management, (**IKE** or **Manual**).
Remote Addr Start	When the **Addr Type** field in **Menu 27.1.1 IPSec Setup** is configured to **Single**, this is a static IP address on the network behind the remote IPSec router. When the **Addr Type** field in **Menu 27.1.1 IPSec Setup** is configured to **Range**, this is the beginning (static) IP address, in a range of computers on the network behind the remote IPSec router. When the **Addr Type** field in **Menu 27.1.1 IPSec Setup** is configured to **SUBNET**, this is a static IP address on the network behind the remote IPSec router. This field displays **N/A** when you configure the **Secure Gateway Addr** field in SMT 27.1.1 to 0.0.0.0.
Remote Addr End/Mask	When the **Addr Type** field in **Menu 27.1.1 IPSec Setup** is configured to **Single**, this is the same (static) IP address as in the **Remote Addr Start** field. When the **Addr Type** field in **Menu 27.1.1 IPSec Setup** is configured to **Range**, this is the end (static) IP address, in a range of computers on the network behind the remote IPSec router. When the **Addr Type** field in **Menu 27.1.1 IPSec Setup** is configured to **SUBNET**, this is a subnet mask on the network behind the remote IPSec router. This field displays **N/A** when you configure the **Secure Gateway Address** field in SMT 27.1.1 to 0.0.0.0.
Secure GW Addr	This is the WAN IP address or the domain name (up to the first 15 characters are displayed) of the IPSec router with which you are making the VPN connection. This field displays **0.0.0.0** when you configure the **Secure Gateway Address** field in SMT 27.1.1 to 0.0.0.0.
Select Command	Press [SPACE BAR] to choose from **None**, **Edit**, **Delete**, **Go To Rule**, **Next Page** or **Previous Page** and then press [ENTER]. You must select a rule in the next field when you choose the **Edit**, Delete or **Go To** commands. Select **None** and then press [ENTER] to go to the "Press ENTER to Confirm…" prompt. Use **Edit** to create or edit a rule. Use **Delete** to remove a rule. To edit or delete a rule, first make sure you are on the correct page. When a VPN rule is deleted, subsequent rules do not move up in the page list. Use **Go To Rule** to view the page where your desired rule is listed. Select **Next Page** or **Previous Page** to view the next or previous page of rules (respectively).
Select Rule	Type the VPN rule index number you wish to edit or delete and then press [ENTER].
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.	

Figure 241 Menu 27.1.1 IPSec Setup

```
                    Menu 27.1.1 - IPSec Setup

Index #= 2          Name= example
Active= Yes         Keep Alive= No     Nat Traversal= No
Local ID type= IP          Content=
My IP Addr= 0.0.0.0
Peer ID type= IP           Content=
Secure Gateway Address= zwtest.zyxel.com.tw
Protocol= 0         DNS Server= 0.0.0.0
Local:  Addr Type= SINGLE
    Local IP Addr= 1.1.1.1
       Port Start= 0                End= N/A
Remote: Addr Type= SUBNET
    IP Addr Start= 4.4.4.4          End/Subnet Mask= 255.255.0.0
       Port Start= 0                End= N/A
Enable Replay Detection= No
Key Management= IKE
Edit Key Management Setup= No

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

The following table describes the fields in this menu.

Table 157 Menu 27.1.1 IPSec Setup

FIELD	DESCRIPTION
Index	This is the VPN rule index number you selected in the previous menu.
Name	Enter a unique identification name for this VPN rule. The name may be up to 32 characters long but only 10 characters will be displayed in **Menu 27.1 - IPSec Summary**.
Active	Press [SPACE BAR] to choose either **Yes** or **No**. Choose **Yes** and press [ENTER] to activate the VPN tunnel. This field determines whether a VPN rule is applied before a packet leaves the firewall.
Keep Alive	Press [SPACE BAR] to choose either **Yes** or **No**. Choose **Yes** and press [ENTER] to have the Prestige automatically re-initiate the SA after the SA lifetime times out, even if there is no traffic. The remote IPSec router must also have keep alive enabled in order for this feature to work.
Nat Traversal	Select this check box to enable NAT traversal. NAT traversal allows you to set up a VPN connection when there are NAT routers between the two IPSec routers. The remote IPSec router must also have NAT traversal enabled. You can use NAT traversal with **ESP** protocol using **Transport** or **Tunnel** mode, but not with **AH** protocol nor with **Manual** key management. In order for an IPSec router behind a NAT router to receive an initiating IPSec packet, set the NAT router to forward UDP port 500 to the IPSec router behind the NAT router.
Local ID type	Press [SPACE BAR] to choose **IP**, **DNS**, or **E-mail** and press [ENTER]. Select **IP** to identify this Prestige by its IP address. Select **DNS** to identify this Prestige by a domain name. Select **E-mail** to identify this Prestige by an e-mail address.

Table 157 Menu 27.1.1 IPSec Setup

FIELD	DESCRIPTION
Content	When you select **IP** in the **Local ID Type** field, type the IP address of your computer or leave the field blank to have the Prestige automatically use its own IP address. When you select **DNS** in the **Local ID Type** field, type a domain name (up to 31 characters) by which to identify this Prestige. When you select **E-mail** in the **Local ID Type** field, type an e-mail address (up to 31 characters) by which to identify this Prestige. The domain name or e-mail address that you use in the **Content** field is used for identification purposes only and does not need to be a real domain name or e-mail address.
My IP Addr	Enter the IP address of your Prestige. The Prestige uses its current WAN IP address (static or dynamic) in setting up the VPN tunnel if you leave this field as 0.0.0.0. The VPN tunnel has to be rebuilt if this IP address changes.
Peer ID type	Press [SPACE BAR] to choose **IP**, **DNS**, or **E-mail** and press [ENTER]. Select **IP** to identify the remote IPSec router by its IP address. Select **DNS** to identify the remote IPSec router by a domain name. Select **E-mail** to identify the remote IPSec router by an e-mail address.
Content	When you select **IP** in the **Peer ID Type** field, type the IP address of the computer with which you will make the VPN connection or leave the field blank to have the Prestige automatically use the address in the **Secure Gateway Address** field. When you select **DNS** in the **Peer ID Type** field, type a domain name (up to 31 characters) by which to identify the remote IPSec router. When you select **E-mail** in the **Peer ID Type** field, type an e-mail address (up to 31 characters) by which to identify the remote IPSec router. The domain name or e-mail address that you use in the **Content** field is used for identification purposes only and does not need to be a real domain name or e-mail address. The domain name also does not have to match the remote router's IP address or what you configure in the **Secure Gateway Address** field below.
Secure Gateway Address	Type the IP address or the domain name (up to 31 characters) of the IPSec router with which you're making the VPN connection. Set this field to 0.0.0.0 if the remote IPSec router has a dynamic WAN IP address (the **Key Management** field must be set to **IKE**, see later).
Protocol	Enter 1 for ICMP, 6 for TCP, 17 for UDP, etc. 0 is the default and signifies any protocol.
DNS Server	If there is a private DNS server that services the VPN, type its IP address here. The Prestige assigns this additional DNS server to the Prestige's DHCP clients that have IP addresses in this IPSec rule's range of local addresses. A DNS server allows clients on the VPN to find other computers and servers on the VPN by their (private) domain names.
Local	Local IP addresses must be static and correspond to the remote IPSec router's configured remote IP addresses. Two active SAs cannot have the local and remote IP address(es) both the same. Two active SAs can have the same local or remote IP address, but not both. You can configure multiple SAs between the same local and remote IP addresses, as long as only one is active at any time.
Addr Type	This field displays **SINGLE** for a single IP address.
Local IP Addr	Enter a static IP address on the LAN behind your Prestige.
Port Start	0 is the default and signifies any port. Type a port number from 0 to 65535. You cannot create a VPN tunnel if you try to connect using a port number that does not match this port number or range of port numbers. Some of the most common IP ports are: 21, FTP; 53, DNS; 23, Telnet; 80, HTTP; 25, SMTP; 110, POP3

Table 157 Menu 27.1.1 IPSec Setup

FIELD	DESCRIPTION
End	Enter a port number in this field to define a port range. This port number must be greater than that specified in the previous field. This field is **N/A** when 0 is configured in the **Port Start** field.
Remote	Remote IP addresses must be static and correspond to the remote IPSec router's configured local IP addresses. The remote fields are **N/A** when the **Secure Gateway Address** field is configured to 0.0.0.0. Two active SAs cannot have the local and remote IP address(es) both the same. Two active SAs can have the same local or remote IP address, but not both. You can configure multiple SAs between the same local and remote IP addresses, as long as only one is active at any time.
Addr Type	Press [SPACE BAR] to choose **SINGLE**, **RANGE**, or **SUBNET** and press [ENTER]. Select **SINGLE** with a single IP address. Use **RANGE** for a specific range of IP addresses. Use **SUBNET** to specify IP addresses on a network by their subnet mask.
IP Addr Start	When the **Addr Type** field is configured to **Single**, enter a static IP address on the network behind the remote IPSec router. When the **Addr Type** field is configured to **Range**, enter the beginning (static) IP address, in a range of computers on the network behind the remote IPSec router. When the **Addr Type** field is configured to **SUBNET**, enter a static IP address on the network behind the remote IPSec router. This field displays **N/A** when you configure the **Secure Gateway Address** field to 0.0.0.0.
End/Subnet Mask	When the **Addr Type** field is configured to **Single**, this field is **N/A**. When the **Addr Type** field is configured to **Range**, enter the end (static) IP address, in a range of computers on the network behind the remote IPSec router. When the **Addr Type** field is configured to **SUBNET**, enter a subnet mask on the network behind the remote IPSec router. This field displays **N/A** when you configure the **Secure Gateway Address** field to 0.0.0.0.
Port Start	0 is the default and signifies any port. Type a port number from 0 to 65535. Someone behind the remote IPSec router cannot create a VPN tunnel when attempting to connect using a port number that does not match this port number or range of port numbers. Some of the most common IP ports are: 21, FTP; 53, DNS; 23, Telnet; 80, HTTP; 25, SMTP; 110, POP3.
End	Enter a port number in this field to define a port range. This port number must be greater than that specified in the previous field. This field is **N/A** when 0 is configured in the **Port Start** field.
Enable Replay Detection	As a VPN setup is processing intensive, the system is vulnerable to Denial of Service (DoS) attacks The IPSec receiver can detect and reject old or duplicate packets to protect against replay attacks. Enable replay detection by setting this field to **Yes**. Press [SPACE BAR] to select **Yes** or **No**. Choose **Yes** and press [ENTER] to enable replay detection.
Key Management	Press [SPACE BAR] to choose either **IKE** or **Manual** and then press [ENTER]. **Manual** is useful for troubleshooting if you have problems using **IKE** key management.
Edit Key Management Setup	Press [SPACE BAR] to change the default **No** to **Yes** and then press [ENTER] to go to a key management menu for configuring your key management setup (described later). If you set the **Key Management** field to **IKE**, this will take you to **Menu 27.1.1.1 – IKE Setup**. If you set the **Key Management** field to **Manual**, this will take you to **Menu 27.1.1.2 – Manual Setup**.
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.	

38.3 IKE Setup

To edit this menu, the **Key Management** field in **Menu 27.1.1 – IPSec Setup** must be set to **IKE**. Move the cursor to the **Edit Key Management Setup** field in **Menu 27.1.1 – IPSec Setup**; press [SPACE BAR] to select **Yes** and then press [ENTER] to display **Menu 27.1.1.1 – IKE Setup**.

Figure 242 Menu 27.1.1.1 IKE Setup

```
                Menu 27.1.1.1 - IKE Setup

                  Phase 1
                    Negotiation Mode= Main
                    Pre-Shared Key= ?
                    Encryption Algorithm= DES
                    Authentication Algorithm= MD5
                    SA Life Time (Seconds)= 28800
                    Key Group= DH1

                  Phase 2
                    Active Protocol= ESP
                    Encryption Algorithm= DES
                    Authentication Algorithm= SHA1
                    SA Life Time (Seconds)= 28800
                    Encapsulation= Tunnel
                    Perfect Forward Secrecy (PFS)= None

                                Press ENTER to Confirm or ESC to Cancel:

            Press Space Bar to Toggle.
```

The following table describes the fields in this menu.

Table 158 Menu 27.1.1.1 IKE Setup

FIELD	DESCRIPTION
Phase 1	
Negotiation Mode	Press [SPACE BAR] to choose from **Main** or **Aggressive** and then press [ENTER]. See earlier for a discussion of these modes. Multiple SAs connecting through a secure gateway must have the same negotiation mode.
PSK	Prestige gateways authenticate an IKE VPN session by matching pre-shared keys. Pre-shared keys are best for small networks with fewer than ten nodes. Enter your pre-shared key here. Enter up to 31 characters. Any character may be used, including spaces, but trailing spaces are truncated. Both ends of the VPN tunnel must use the same pre-shared key. You will receive a "PYLD_MALFORMED" (payload malformed) packet if the same pre-shared key is not used on both ends.

Table 158 Menu 27.1.1.1 IKE Setup

FIELD	DESCRIPTION
Encryption Algorithm	When **DES** is used for data communications, both sender and receiver must know the same secret key, which can be used to encrypt and decrypt the message or to generate and verify a message authentication code. Prestige **DES** encryption algorithm uses a 56-bit key. Triple DES (**3DES**), is a variation on DES that uses a 168-bit key. As a result, **3DES** is more secure than **DES**. It also requires more processing power, resulting in slightly increased latency and decreased throughput. Press [SPACE BAR] to choose from **3DES** or **DES** and then press [ENTER].
Authentication Algorithm	**MD5** (Message Digest 5) and **SHA1** (Secure Hash Algorithm) are hash algorithms used to authenticate packet data. The **SHA1** algorithm is generally considered stronger than **MD5**, but is slightly slower. Press [SPACE BAR] to choose from **SHA1** or **MD5** and then press [ENTER].
SA Life Time (Seconds)	Define the length of time before an IKE Security automatically renegotiates in this field. It may range from 60 to 3,000,000 seconds (almost 35 days). A short **SA Life Time** increases security by forcing the two VPN gateways to update the encryption and authentication keys. However, every time the VPN tunnel renegotiates, all users accessing remote resources are temporarily disconnected.
Key Group	You must choose a key group for phase 1 IKE setup. **DH1** (default) refers to Diffie-Hellman Group 1 a 768 bit random number. **DH2** refers to Diffie-Hellman Group 2 a 1024 bit (1Kb) random number.
Phase 2	
Active Protocol	Press [SPACE BAR] to choose from **ESP** or **AH** and then press [ENTER]. See earlier for a discussion of these protocols.
Encryption Algorithm	Press [SPACE BAR] to choose from **NULL**, **3DES** or **DES** and then press [ENTER]. Select **NULL** to set up a tunnel without encryption.
Authentication Algorithm	Press [SPACE BAR] to choose from **SHA1** or **MD5** and then press [ENTER].
SA Life Time (Seconds)	Define the length of time before an IPSec Security automatically renegotiates in this field. It may range from 60 to 3,000,000 seconds (almost 35 days).
Encapsulation	Press [SPACE BAR] to choose from **Tunnel** mode or **Transport** mode and then press [ENTER]. See earlier for a discussion of these.
Perfect Forward Secrecy (PFS)	Perfect Forward Secrecy (PFS) is disabled (**None**) by default in phase 2 IPSec SA setup. This allows faster IPSec setup, but is not so secure. Press [SPACE BAR] and choose from **DH1** or **DH2** to enable PFS. **DH1** refers to Diffie-Hellman Group 1 a 768 bit random number. **DH2** refers to Diffie-Hellman Group 2 a 1024 bit (1Kb) random number (more secure, yet slower).
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.	

38.4 Manual Setup

You only configure **Menu 27.1.1.2 – Manual Setup** when you select **Manual** in the **Key Management** field in **Menu 27.1.1 – IPSec Setup**. Manual key management is useful if you have problems with **IKE** key management.

38.4.1 Active Protocol

This field is a combination of mode and security protocols used for the VPN. See the Web Configurator part on VPN for more information on these parameters.

Table 159 Active Protocol: Encapsulation and Security Protocol

MODE	SECURITY PROTOCOL
Tunnel	ESP
Transport	AH

38.4.2 Security Parameter Index (SPI)

To edit this menu, move the cursor to the **Edit Manual Setup** field in **Menu 27.1.1 – IPSec Setup** press [SPACE BAR] to select **Yes** and then press [ENTER] to go to **Menu 27.1.1.2 – Manual Setup**.

Figure 243 Menu 27.1.1.2 Manual Setup

```
            Menu 27.1.1.2 - Manual Setup
Active Protocol= ESP Tunnel
ESP Setup
  SPI (Decimal)=
  Encryption Algorithm= DES
    Key1=
    Key2= N/A
    Key3= N/A
  Authentication Algorithm= MD5
    Key= N/A

AH Setup
  SPI (Decimal)= N/A
  Authentication Algorithm= N/A
    Key=
      Press ENTER to Confirm or ESC to Cancel:
```

The following table describes the fields in this menu.

Table 160 Menu 27.1.1.2 Manual Setup

FIELD	DESCRIPTION
Active Protocol	Press [SPACE BAR] to choose from **ESP Tunnel**, **ESP Transport**, **AH Tunnel** or **AH Transport** and then press [ENTER]. Choosing an **ESP** combination causes the **AH Setup** fields to be non-applicable (**N/A**)
ESP Setup	The **ESP Setup** fields are **N/A** if you chose an **AH Active Protocol**.
SPI (Decimal)	The **SPI** must be unique and from one to four integers ("0" to "9").

Table 160 Menu 27.1.1.2 Manual Setup

FIELD	DESCRIPTION
Encryption Algorithm	Press [SPACE BAR] to choose from **NULL**, **3DES** or **DES** and then press [ENTER]. Fill in the **Key1** field below when you choose **DES** and fill in fields **Key1** to **Key3** when you choose **3DES**. Select **NULL** to set up a tunnel without encryption. When you select **NULL**, you do not enter any encryption keys.
Key1	Enter a unique eight-character key. Any character may be used, including spaces, but trailing spaces are truncated. Fill in the **Key1** field when you choose **DES** and fill in fields **Key1** to **Key3** when you choose **3DES**.
Key2	Enter a unique eight-character key. It can be comprised of any character including spaces (but trailing spaces are truncated).
Key3	Enter a unique eight-character key. It can be comprised of any character including spaces (but trailing spaces are truncated).
Authentication Algorithm	Press [SPACE BAR] to choose from **MD5** or **SHA1** and then press [ENTER].
Key	Enter the authentication key to be used by IPSec if applicable. The key must be unique. Enter 16 characters for **MD5** authentication and 20 characters for **SHA-1** authentication. Any character may be used, including spaces, but trailing spaces are truncated.
AH Setup	The **AH Setup** fields are **N/A** if you chose an **ESP Active Protocol**.
SPI (Decimal)	The **SPI** must be from one to four unique decimal characters ("0" to "9") long.
Authentication Algorithm	Press [SPACE BAR] to choose from **MD5** or **SHA1** and then press [ENTER].
Key	Enter the authentication key to be used by IPSec if applicable. The key must be unique. Enter 16 characters for **MD5** authentication and 20 characters for **SHA-1** authentication. Any character may be used, including spaces, but trailing spaces are truncated.
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 39
SA Monitor

This chapter teaches you how to manage your SAs by using the SA Monitor in SMT menu 27.2.

39.1 SA Monitor Overview

A Security (SA) is the group of security settings related to a specific VPN tunnel. This menu (shown next) displays active VPN connections.

Note: When there is outbound traffic but no inbound traffic, the SA times out automatically after two minutes. A tunnel with no outbound or inbound traffic is "idle" and does not timeout until the SA lifetime period expires. See the Web configurator part on keep alive to have the Prestige renegotiate an IPSec SA when the SA lifetime expires, even if there is no traffic.

39.2 Using SA Monitor

1. Use the **Refresh** function to display active VPN connections.
2. Use the **Disconnect** function to cut off active connections.
3. Type 2 in **Menu 27 - VPN/IPSec Setup**, and then press [ENTER] to go to **Menu 27.2 - SA Monitor**.

Figure 244 Menu 27.2 SA Monitor

```
                        Menu 27.2 - SA Monitor
#                  Name                        Encap.     IPSec ALgorithm
---    --------------------------------    ---------    ----------------
1      Taiwan : 3.3.3.1 - 3.3.3.100        Tunnel       ESP DES MD5
2




                                  Select Command= Refresh
                                  Select Connection= N/A
       Press ENTER to Confirm or ESC to Cancel:
```

The following table describes the fields in this menu.

Table 161 Menu 27.2 SA Monitor

FIELD	DESCRIPTION
#	This is the security index number.
Name	This field displays the identification name for this VPN policy. This name is unique for each connection where the secure gateway IP address is a public static IP address. When the secure gateway IP address is 0.0.0.0 (as discussed in the last chapter), there may be different connections using this same VPN rule. In this case, the name is followed by the remote IP address as configured in **Menu 27.1.1. – IPSec Setup**. Individual connections using the same VPN rule may be terminated without affecting other connections using the same rule.
Encap.	This field displays **Tunnel** mode or **Transport** mode. See previous for discussion.
IPSec ALgorithm	This field displays the security protocols used for an SA. **ESP** provides confidentiality and integrity of data by encrypting the data and encapsulating it into IP packets. Encryption methods include 56-bit **DES** and 168-bit **3DES**. **NULL** denotes a tunnel without encryption. An incoming SA may have an **AH** in addition to **ESP**. The Authentication Header provides strong integrity and authentication by adding authentication information to IP packets. This authentication information is calculated using header and payload data in the IP packet. This provides an additional level of security. **AH** choices are **MD5** (default - 128 bits) and **SHA -1**(160 bits). Both **AH** and **ESP** increase Prestige processing requirements and communications latency (delay).
Select Command	Press [SPACE BAR] to choose from **Refresh**, **Disconnect**, **None**, **Next Page**, or **Previous Page** and then press [ENTER]. You must select a connection in the next field when you choose the **Disconnect** command. **Refresh** displays current active VPN connections. **None** allows you to jump to the "Press ENTER to Confirm…" prompt. Select **Next Page** or **Previous Page** to view the next or previous page of rules (respectively).
Select Connection	Type the VPN connection index number that you want to disconnect and then press [ENTER].
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 40
Troubleshooting

This chapter covers potential problems and the corresponding remedies.

40.1 Problems Starting Up the Prestige

Table 162 Troubleshooting Starting Up 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 plugged in to an appropriate power source. Make sure that the Prestige and the power source are both turned on. Turn the Prestige off and on. If the error persists, you may have a hardware problem. In this case, you should contact your vendor.

40.2 Problems with the LAN

Table 163 Troubleshooting the LAN

PROBLEM	CORRECTIVE ACTION
The LAN LEDs do not turn on.	Check your Ethernet cable connections (refer to the Quick Start Guide for details). Check for faulty Ethernet cables.
	Make sure your computer's Ethernet Card is working properly.
I cannot access the Prestige from the LAN.	If **Any IP** is disabled, make sure that the IP address and the subnet mask of the Prestige and your computer(s) are on the same subnet.

40.3 Problems with the WAN

Table 164 Troubleshooting the WAN

PROBLEM	CORRECTIVE ACTION
The WAN LED is off.	Check the connections between the Prestige WAN port and the cable/DSL modem or ethernet jack.
	Check whether your cable/DSL device requires a crossover or straight-through cable.
I cannot get a WAN IP address from the ISP.	Click WAN to verify your settings. The username and password apply to PPPoE and PPPoA encapsulation only. Make sure that you have entered the correct **Service Type**, **User Name** and **Password** (be sure to use the correct casing). Refer to the WAN Setup chapter (web configurator or SMT).
I cannot access the Internet.	Make sure the Prestige is turned on and connected to the network. Verify your WAN settings. Refer to the chapter on WAN setup (web configurator) or the section on Internet Access (SMT). Make sure you entered the correct user name and password. If you use PPPoE pass through, make sure that bridge mode is turned on.
The Internet connection disconnects.	Check the schedule rules. Refer to Chapter 39 on page 387 (SMT). If you use PPPoE encapsulation, check the idle time-out setting. Refer to the Chapter 5 on page 111 (web configurator) or Chapter 27 on page 301 (SMT). Contact your ISP.

40.4 Problems Accessing the Prestige

Table 165 Troubleshooting Accessing the Prestige

PROBLEM	CORRECTIVE ACTION
I cannot access the Prestige.	The username is "admin". The default password is "1234". The **Password** and **Username** fields are case-sensitive. Make sure that you enter the correct password and username using the proper casing. If you have changed the password and have now forgotten it, you will need to upload the default configuration file. This restores all of the factory defaults including the password.
I cannot access the web configurator.	Make sure that there is not an SMT console session running. Use the Prestige's WAN IP address when configuring from the WAN. Refer to the instructions on checking your WAN connection. Use the Prestige's LAN IP address when configuring from the LAN. Refer to for instructions on checking your LAN connection. Check that you have enabled web service access. If you have configured a secured client IP address, your computer's IP address must match it. Refer to the chapter on remote management for details. Your computer's and the Prestige's IP addresses must be on the same subnet for LAN access. If you changed the Prestige's LAN IP address, then enter the new one as the URL. Remove any filters in SMT menu 3.1 (LAN) or menu 11.5 (WAN) that block web service. See the following section to check that pop-up windows, JavaScripts and Java permissions are allowed.

40.5 Problems with Restricted Web Pages and Keyword Blocking

Table 166 Troubleshooting Restricted Web Pages and Keyword Blocking

PROBLEM	CORRECTIVE ACTION
Access to a restricted web page is not blocked.	Make sure that the Enable Parental Control check box is selected in the Parental Control screen.
	Make sure that you select a category in the Parental Control screen to restrict access to web pages relevant to that category. For example, select the Gambling check box to prevent access to www.onlinegambling.com.
Access to a web page with a URL containing a forbidden keyword is not blocked.	Make sure that you select the Keyword Blocking check box in the Content Filtering screen. Make sure that the keywords that you type are listed in the Keyword List.
	If a keyword that is listed in the Keyword List is not blocked when it is found in a URL, customize the keyword blocking using commands. See the Customizing Keyword Blocking URL Checking section in the Content Filter chapter.

Table 166 Troubleshooting Restricted Web Pages and Keyword Blocking

PROBLEM	CORRECTIVE ACTION
Parental Control is configured correctly, but I can still access restricted web pages.	Restart the device to clear the cache.
	The content filter server may be unavailable. The **View Logs** screen can display content filtering log messages. See the Log Descriptions appendix for a list of possible log messages. In the **View Logs** screen copy and paste the log messages and e-mail them to customer support with an explanation of the problem.
	If you still have problems, contact your vendor or customer support for further advice.

Problems with the Password

Table 167 Troubleshooting the Password

PROBLEM	CORRECTIVE ACTION
Cannot access the Prestige.	The password field is case sensitive. Make sure that you enter the correct password using the proper casing.
	Use the Reset button to restore the factory default configuration file. This will restore all of the factory defaults including the password; see section 2.3 for details.

Problems with Remote Management

Table 168 Troubleshooting Telnet

PROBLEM	CORRECTIVE ACTION
Cannot access the Prestige from the LAN or WAN.	Refer to Chapter 16 on page 231 for scenarios when remote management may not be possible.
	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.

40.5.1 Pop-up Windows, JavaScripts and Java Permissions

In order to use the web configurator you need to allow:

- Web browser pop-up windows from your device.
- JavaScripts (enabled by default).

- Java permissions (enabled by default).

Note: Internet Explorer 6 screens are used here. Screens for other Internet Explorer versions may vary.

40.5.1.1 Internet Explorer Pop-up Blockers

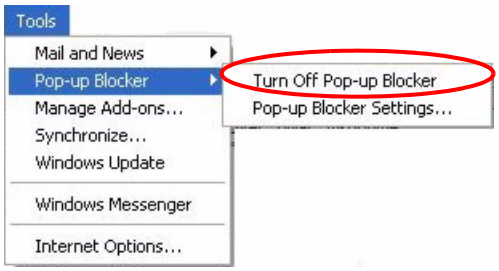
You may have to disable pop-up blocking to log into your device.

Either disable pop-up blocking (enabled by default in Windows XP SP (Service Pack) 2) or allow pop-up blocking and create an exception for your device's IP address.

40.5.1.1.1 Disable pop-up Blockers

1 In Internet Explorer, select **Tools**, **Pop-up Blocker** and then select **Turn Off Pop-up Blocker**.

Figure 245 Pop-up Blocker

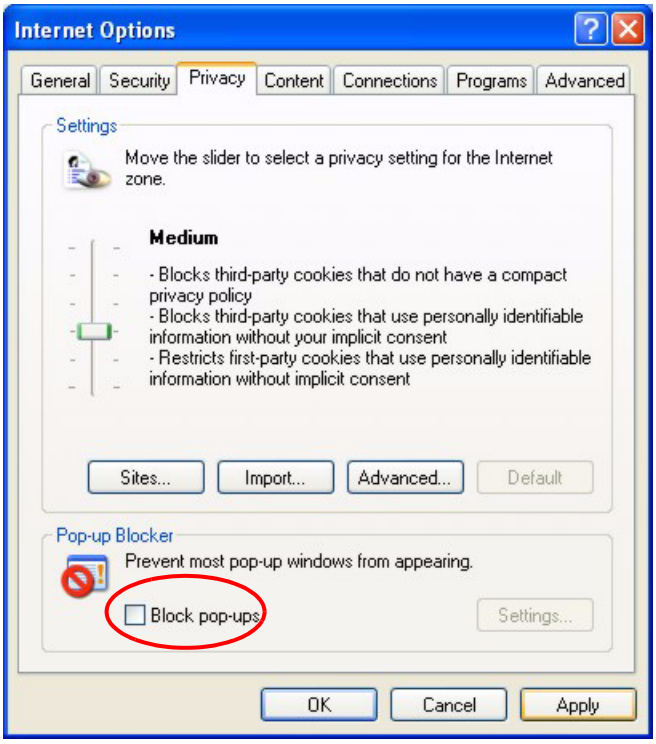


You can also check if pop-up blocking is disabled in the **Pop-up Blocker** section in the **Privacy** tab.

1 In Internet Explorer, select **Tools**, **Internet Options**, **Privacy**.

2 Clear the **Block pop-ups** check box in the **Pop-up Blocker** section of the screen. This disables any web pop-up blockers you may have enabled.

Figure 246 Internet Options



3 Click **Apply** to save this setting.

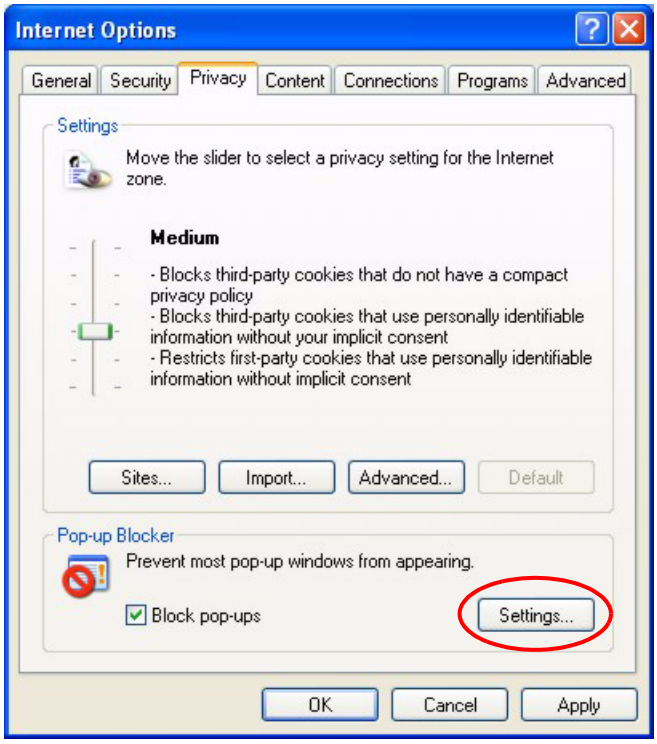
40.5.1.1.2 Enable pop-up Blockers with Exceptions

Alternatively, if you only want to allow pop-up windows from your device, see the following steps.

1 In Internet Explorer, select **Tools**, **Internet Options** and then the **Privacy** tab.

2 Select **Settings…**to open the **Pop-up Blocker Settings** screen.

Figure 247 Internet Options

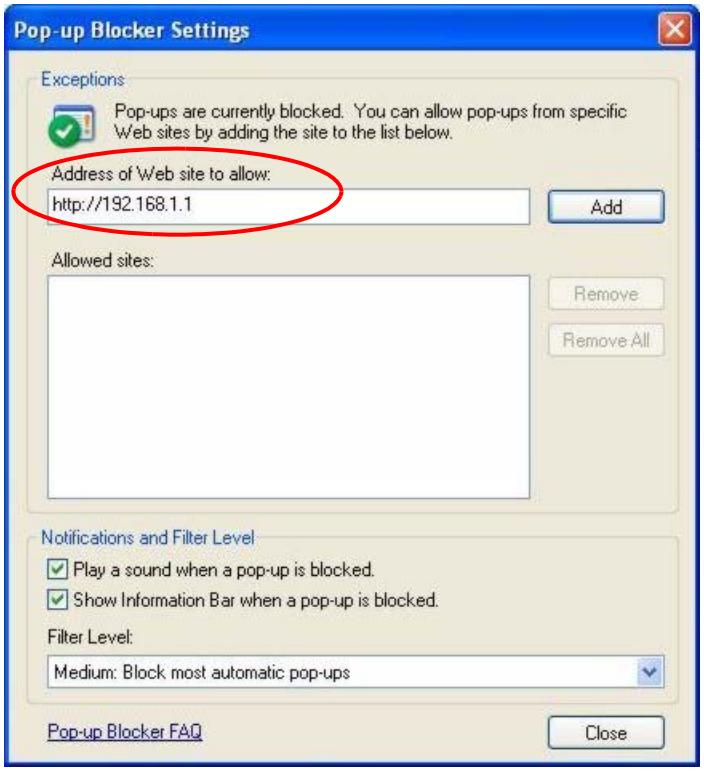


3 Type the IP address of your device (the web page that you do not want to have blocked) with the prefix "http://". For example, http://192.168.1.1.

4 Click **Add** to move the IP address to the list of **Allowed sites**.

Note: If you change the IP address of your device, make sure that the new address matches the address you type in the **Pop-up Blocker Settings** screen.

Figure 248 Pop-up Blocker Settings



5 Click **Close** to return to the **Privacy** screen.

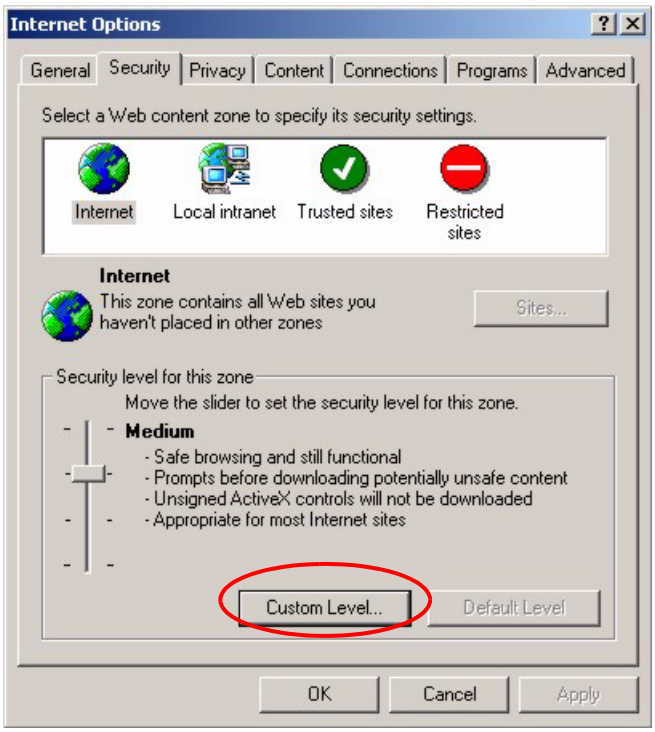
6 Click **Apply** to save this setting.

40.5.1.2 JavaScripts

If pages of the web configurator do not display properly in Internet Explorer, check that JavaScripts are allowed.

1 In Internet Explorer, click **Tools**, **Internet Options** and then the **Security** tab.

Figure 249 Internet Options



2 Click the **Custom Level...** button.

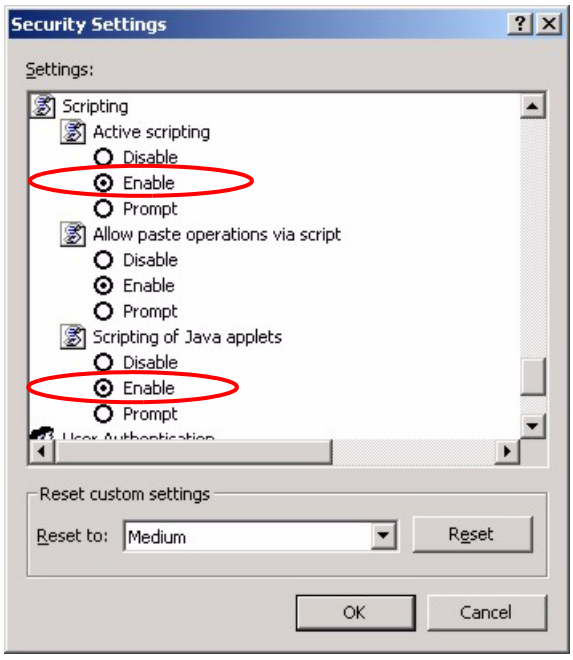
3 Scroll down to **Scripting**.

4 Under **Active scripting** make sure that **Enable** is selected (the default).

5 Under **Scripting of Java applets** make sure that **Enable** is selected (the default).

6 Click **OK** to close the window.

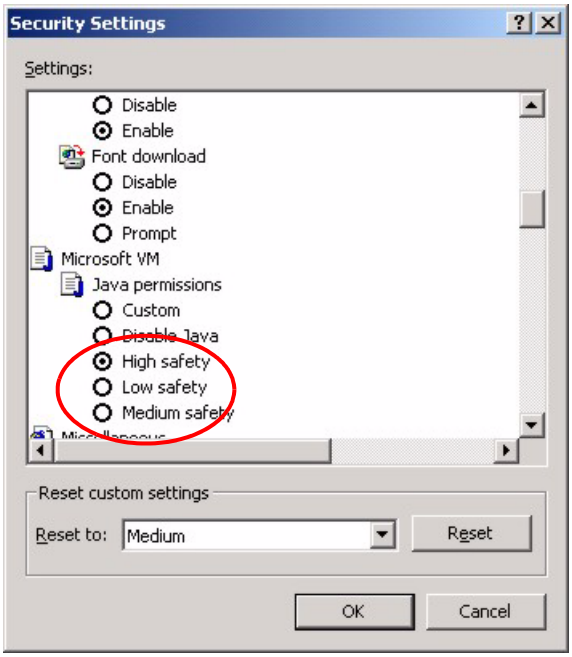
Figure 250 Security Settings - Java Scripting



40.5.1.3 Java Permissions

1. From Internet Explorer, click **Tools**, **Internet Options** and then the **Security** tab.
2. Click the **Custom Level...** button.
3. Scroll down to **Microsoft VM**.
4. Under **Java permissions** make sure that a safety level is selected.
5. Click **OK** to close the window.

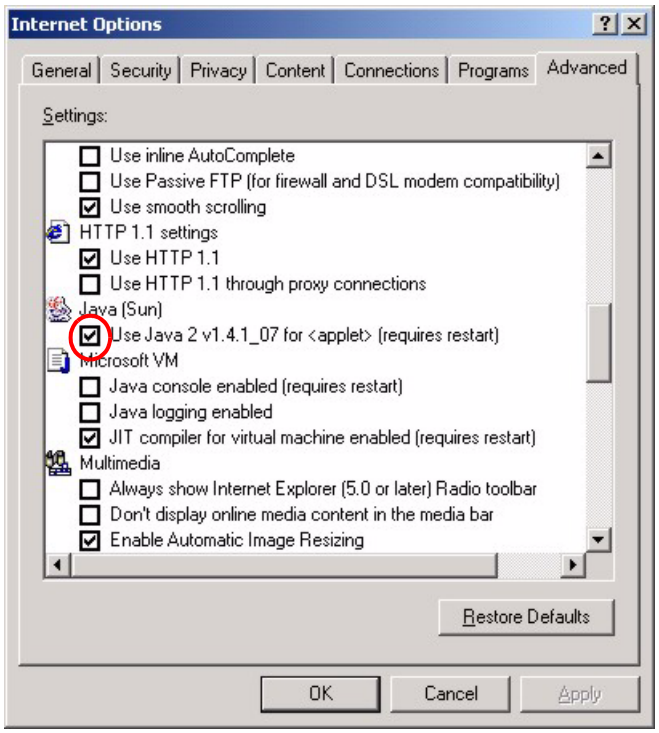
Figure 251 Security Settings - Java



40.5.1.3.1 JAVA (Sun)

1. From Internet Explorer, click **Tools**, **Internet Options** and then the **Advanced** tab.
2. Make sure that **Use Java 2 for <applet>** under **Java (Sun)** is selected.
3. Click **OK** to close the window.

Figure 252 Java (Sun)



40.5.2 ActiveX Controls in Internet Explorer

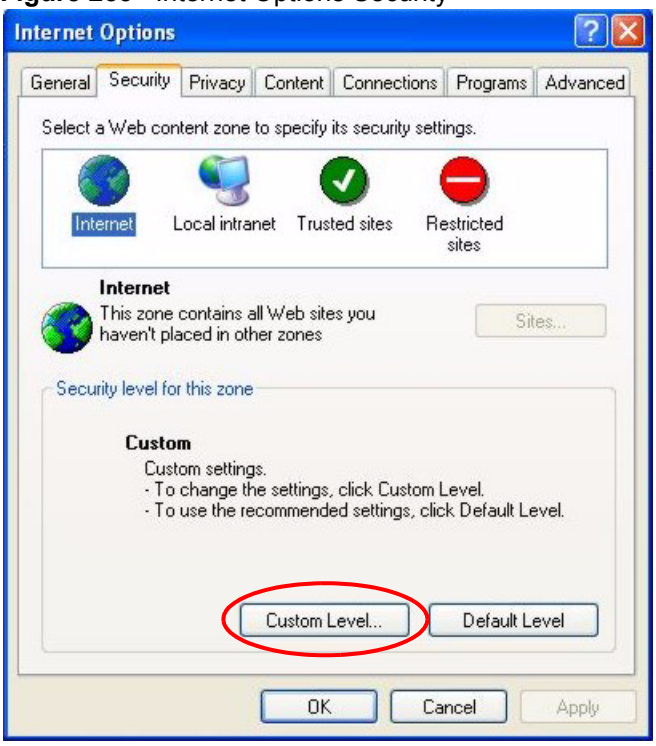
If ActiveX is disabled, you will not be able to download ActiveX controls or to use Trend Micro Security Serivces. Make sure that ActiveX controls are allowed in Internet Explorer.

Screen shots for Internet Explorer 6 are shown. Steps may vary depending on your version of Internet Explorer.

1 In Internet Explorer, click **Tools**, **Internet Options** and then the **Security** tab.

2 In the **Internet Options** window, click **Custom Level**.

Figure 253 Internet Options Security



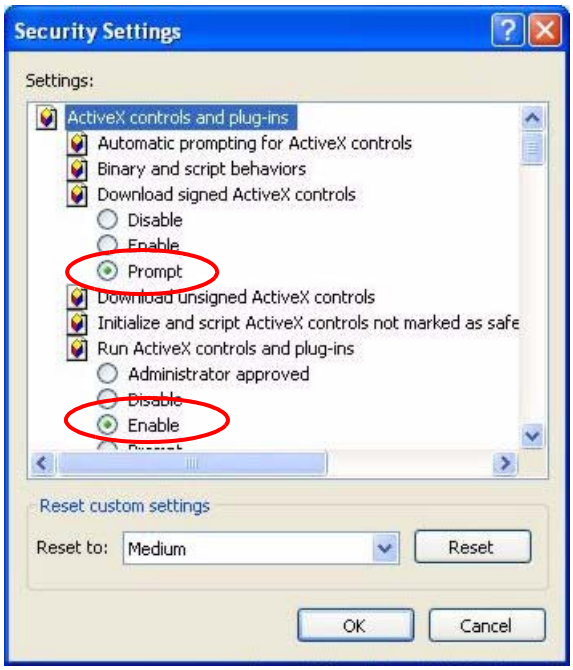
3 Scroll down to **ActiveX controls and plug-ins**.

4 Under **Download signed ActiveX controls** select the **Prompt** radio button.

5 Under **Run ActiveX controls and plug-ins** make sure the **Enable** radio button is selected.

6 Then click the **OK** button.

Figure 254 Security Setting ActiveX Controls



APPENDIX A
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.

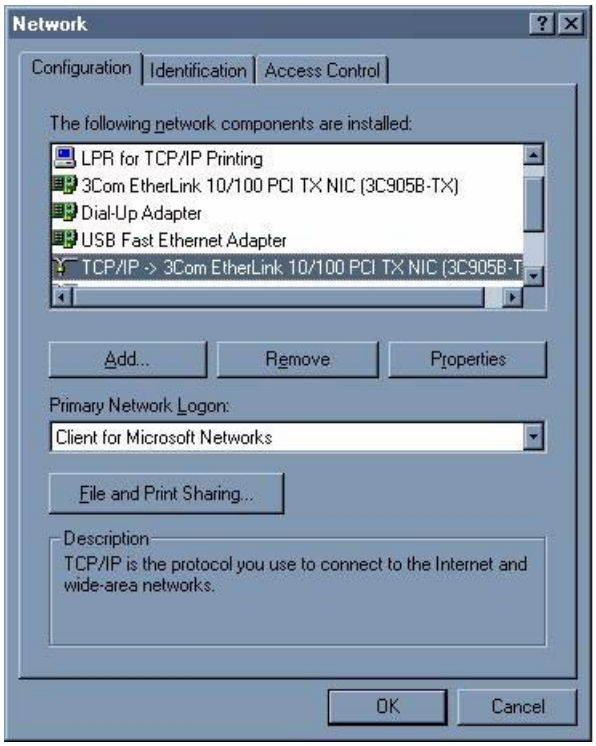
After the appropriate TCP/IP components are installed, configure the TCP/IP settings in order to "communicate" with your network.

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 255 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.

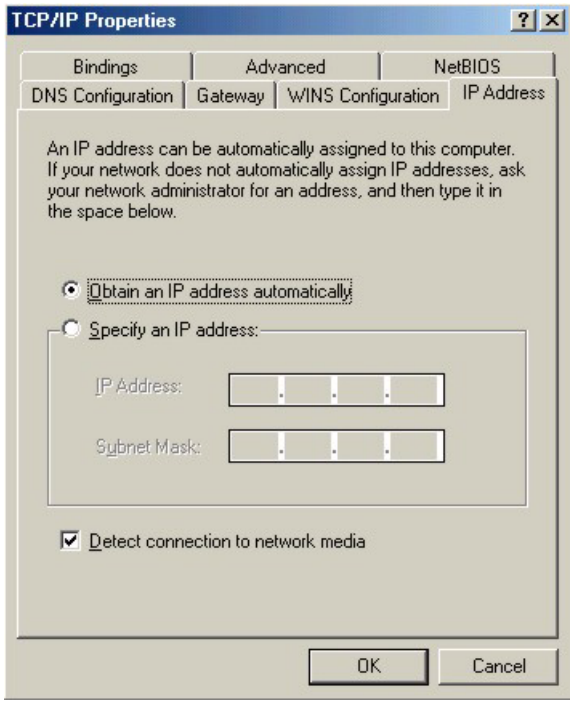
Configuring

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.

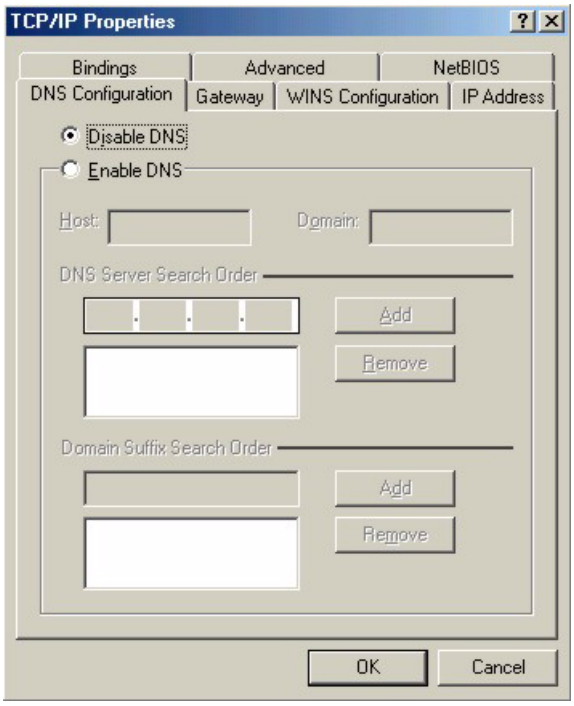
Figure 256 Windows 95/98/Me: TCP/IP Properties: IP Address



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 257 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.

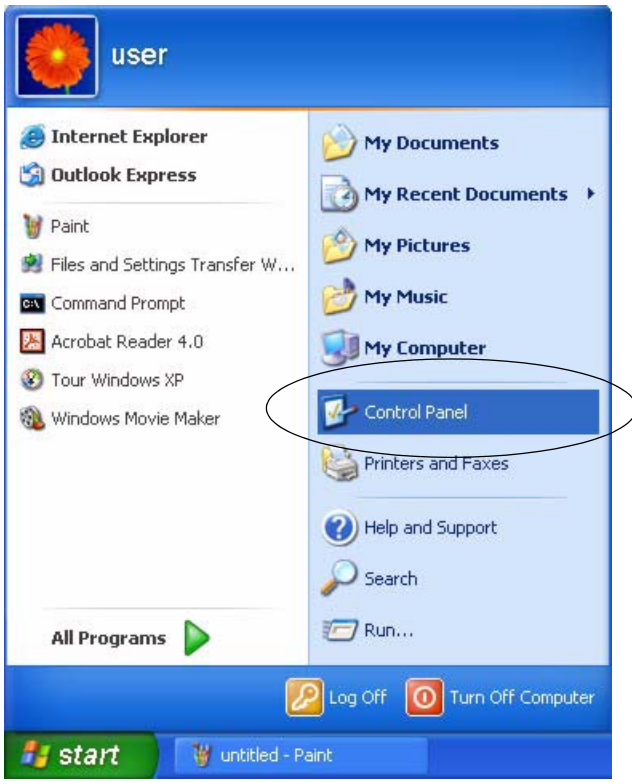
3 Select your network adapter. You should see your computer's IP address, subnet mask and default gateway.

Windows 2000/NT/XP

The following example figures use the default Windows XP GUI theme.

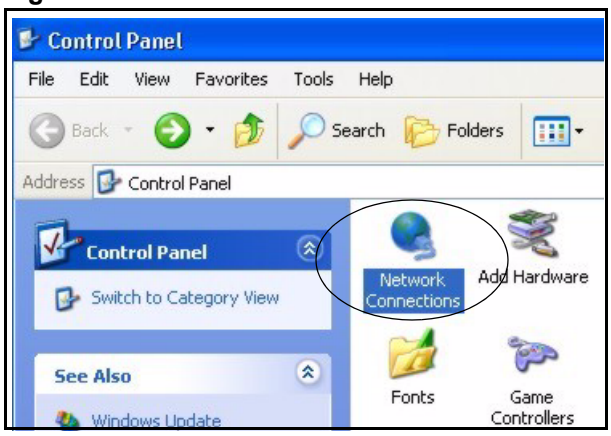
1 Click **start** (**Start** in Windows 2000/NT), **Settings**, **Control Panel**.

Figure 258 Windows XP: Start Menu



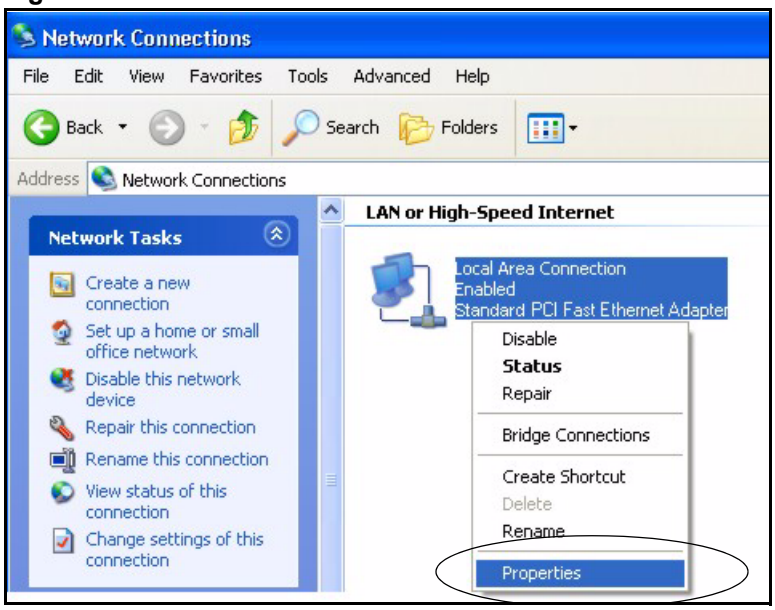
2 In the **Control Panel**, double-click **Network Connections** (**Network and Dial-up Connections** in Windows 2000/NT).

Figure 259 Windows XP: Control Panel



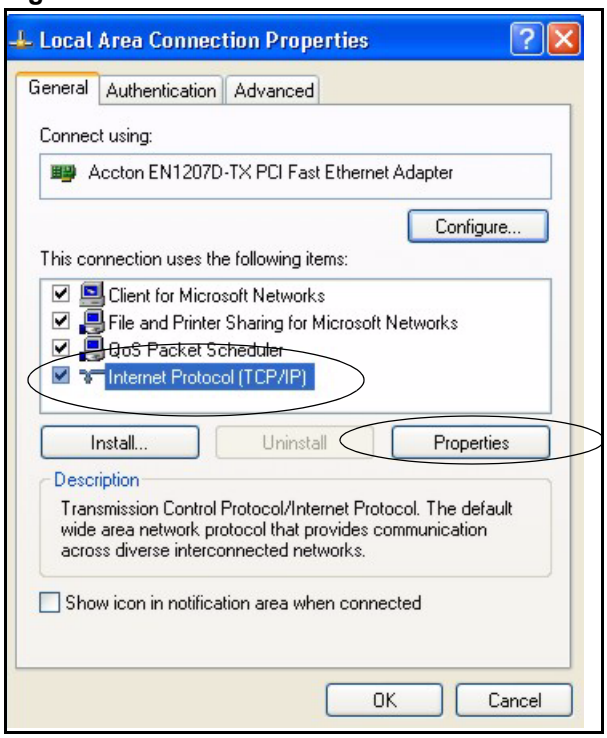
3 Right-click **Local Area Connection** and then click **Properties**.

Figure 260 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 261 Windows XP: Local Area Connection Properties

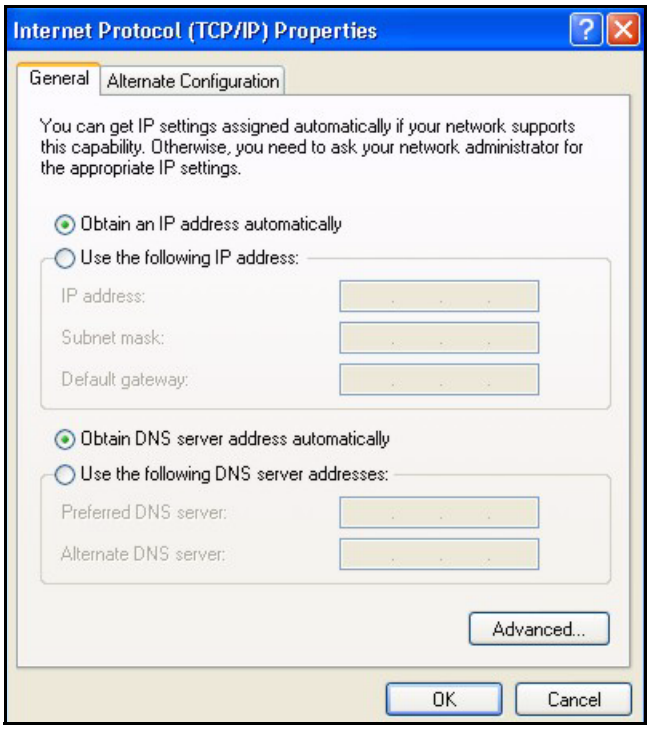


5 The **Internet Protocol TCP/IP Properties** window opens (the **General tab** in Windows XP).

- 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 262 Windows XP: Internet Protocol (TCP/IP) Properties

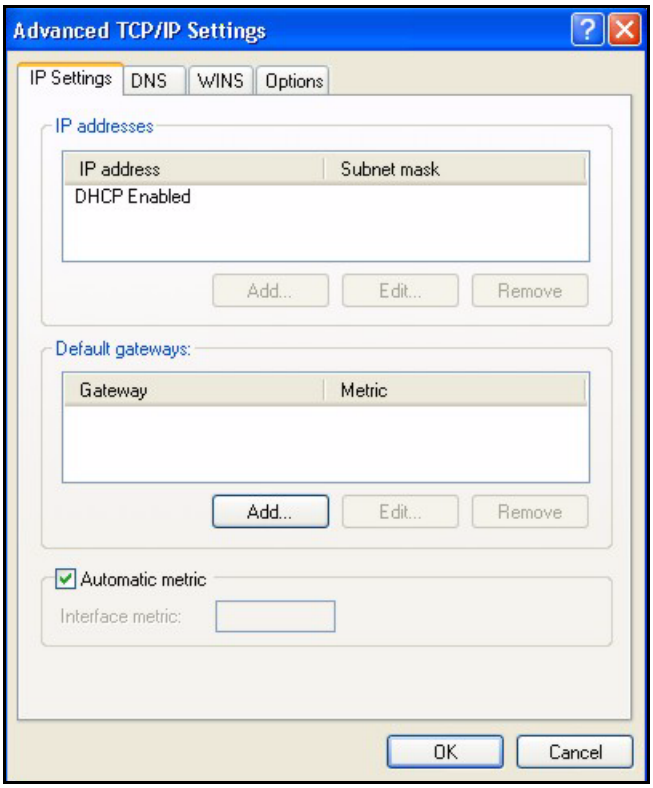


6 If you do not know your gateway's IP address, remove any previously installed gateways in the **IP Settings** tab and click **OK**.

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 263 Windows XP: Advanced TCP/IP Properties

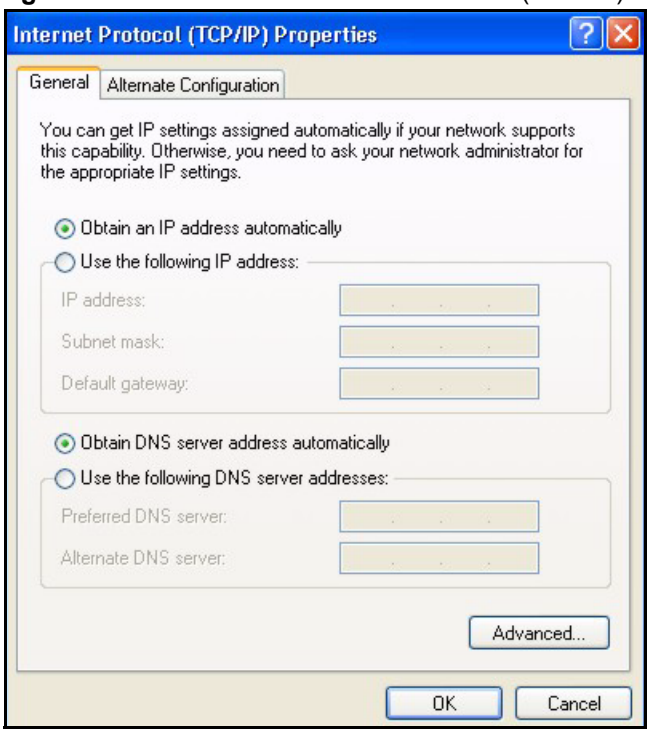


7 In the **Internet Protocol TCP/IP Properties** window (the **General tab** in Windows XP):

- 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 264 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

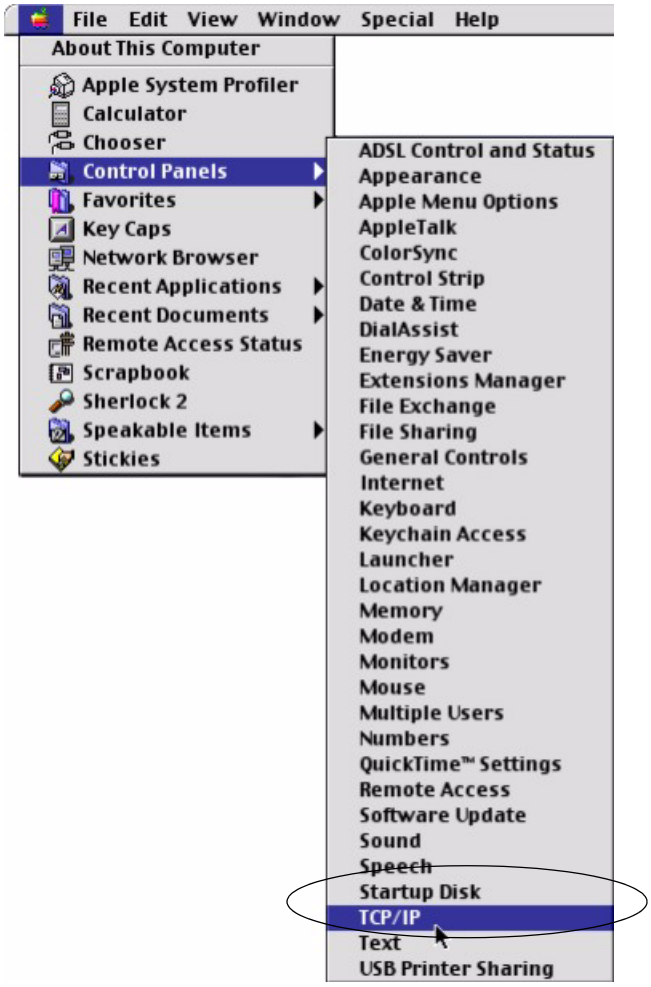
1 Click **Start**, **All Programs**, **Accessories** and then **Command Prompt**.

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

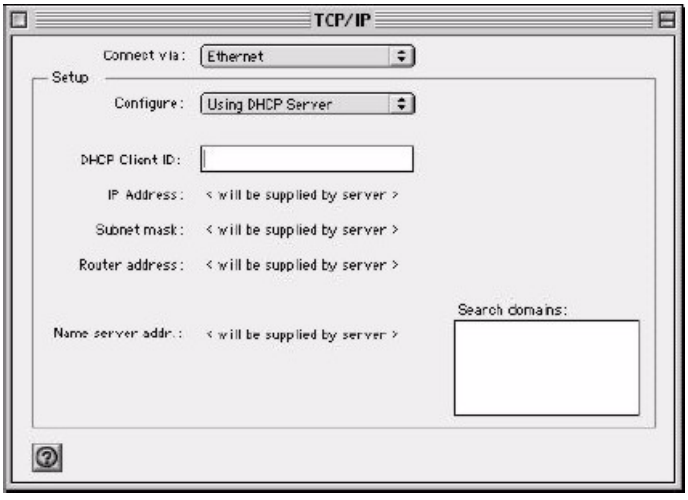
1 Click the **Apple** menu, **Control Panel** and double-click **TCP/IP** to open the **TCP/IP Control Panel**.

Figure 265 Macintosh OS 8/9: Apple Menu



2 Select **Ethernet built-in** from the **Connect via** list.

Figure 266 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).

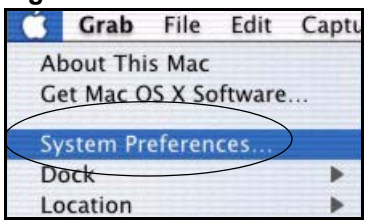
Verifying Settings

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 267 Macintosh OS X: Apple Menu

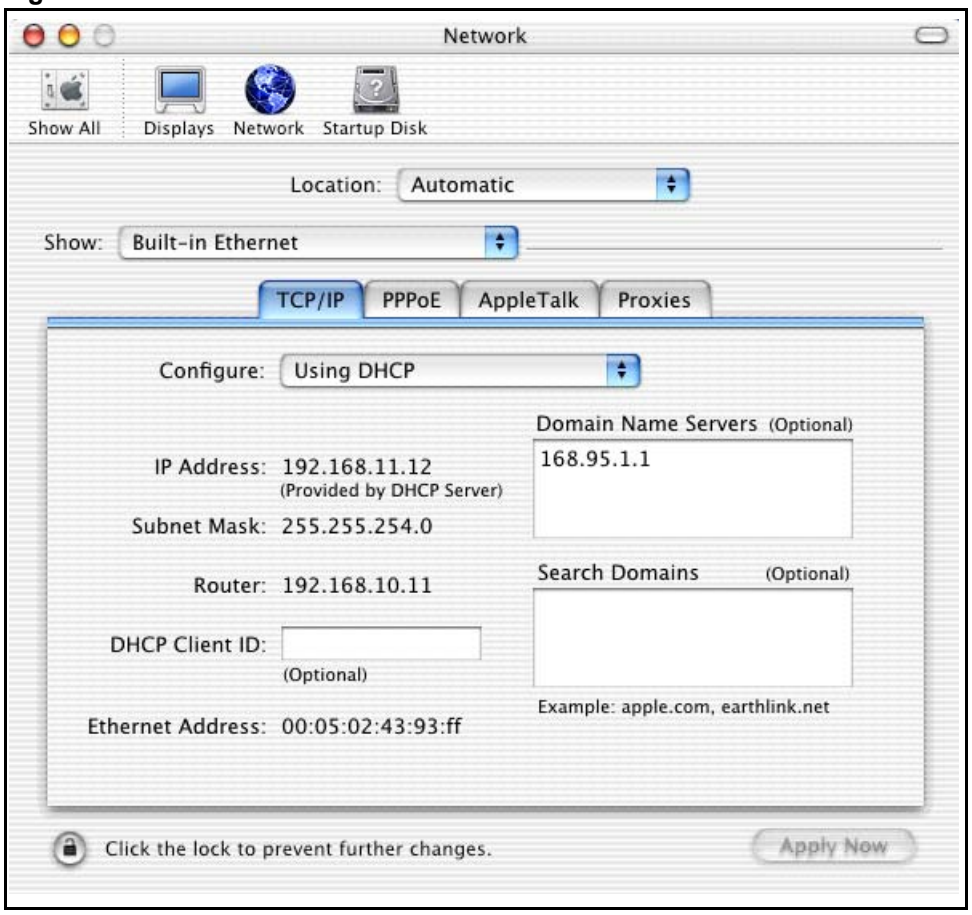


2 Click **Network** in the icon bar.

- 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 268 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.

Linux

This section shows you how to configure your computer's TCP/IP settings in Red Hat Linux 9.0. Procedure, screens and file location may vary depending on your Linux distribution and release version.

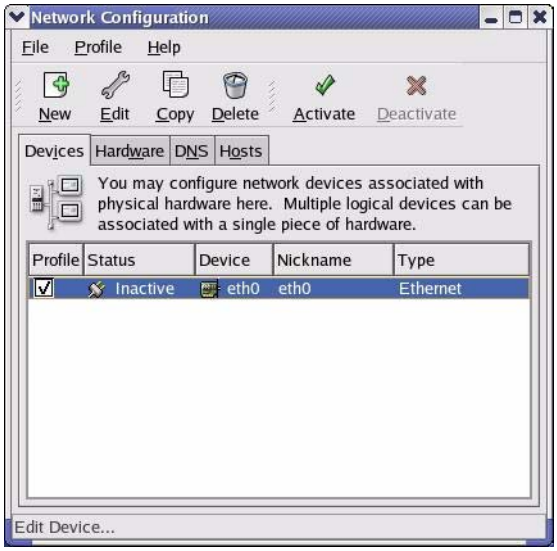
Note: Make sure you are logged in as the root administrator.

Using the K Desktop Environment (KDE)

Follow the steps below to configure your computer IP address using the KDE.

1 Click the Red Hat button (located on the bottom left corner), select **System Setting** and click **Network**.

Figure 269 Red Hat 9.0: KDE: Network Configuration: Devices



2 Double-click on the profile of the network card you wish to configure. The **Ethernet Device General** screen displays as shown.

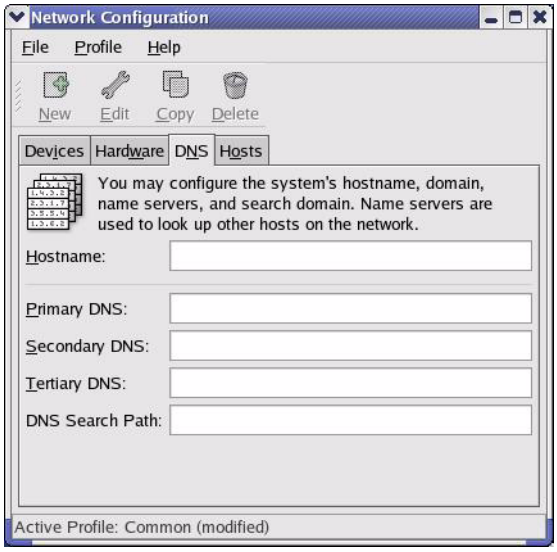
Figure 270 Red Hat 9.0: KDE: Ethernet Device: General

- If you have a dynamic IP address click **Automatically obtain IP address settings with** and select **dhcp** from the drop down list.
- If you have a static IP address click **Statically set IP Addresses** and fill in the **Address**, **Subnet mask**, and **Default Gateway Address** fields.

3 Click **OK** to save the changes and close the **Ethernet Device General** screen.

4 If you know your DNS server IP address(es), click the **DNS** tab in the **Network Configuration** screen. Enter the DNS server information in the fields provided.

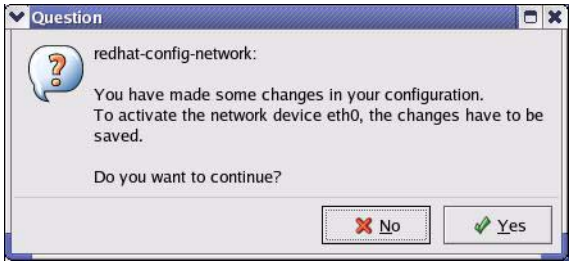
Figure 271 Red Hat 9.0: KDE: Network Configuration: DNS



5 Click the **Devices** tab.

6 Click the **Activate** button to apply the changes. The following screen displays. Click **Yes** to save the changes in all screens.

Figure 272 Red Hat 9.0: KDE: Network Configuration: Activate



7 After the network card restart process is complete, make sure the **Status** is **Active** in the **Network Configuration** screen.

Using Configuration Files

Follow the steps below to edit the network configuration files and set your computer IP address.

1 Assuming that you have only one network card on the computer, locate the `ifconfig-eth0` configuration file (where `eth0` is the name of the Ethernet card). Open the configuration file with any plain text editor.

- If you have a dynamic IP address, enter **`dhcp`** in the `BOOTPROTO=` field. The following figure shows an example.

Figure 273 Red Hat 9.0: Dynamic IP Address Setting in ifconfig-eth0

```
DEVICE=eth0
ONBOOT=yes
BOOTPROTO=dhcp
USERCTL=no
PEERDNS=yes
TYPE=Ethernet
```

- If you have a static IP address, enter **`static`** in the `BOOTPROTO=` field. Type `IPADDR=` followed by the IP address (in dotted decimal notation) and type `NETMASK=` followed by the subnet mask. The following example shows an example where the static IP address is 192.168.1.10 and the subnet mask is 255.255.255.0.

Figure 274 Red Hat 9.0: Static IP Address Setting in ifconfig-eth0

```
DEVICE=eth0
ONBOOT=yes
BOOTPROTO=static
IPADDR=192.168.1.10
NETMASK=255.255.255.0
USERCTL=no
PEERDNS=yes
TYPE=Ethernet
```

2 If you know your DNS server IP address(es), enter the DNS server information in the `resolv.conf` file in the `/etc` directory. The following figure shows an example where two DNS server IP addresses are specified.

Figure 275 Red Hat 9.0: DNS Settings in resolv.conf

```
nameserver 172.23.5.1
nameserver 172.23.5.2
```

3 After you edit and save the configuration files, you must restart the network card. Enter `./network restart` in the `/etc/rc.d/init.d` directory. The following figure shows an example.

Figure 276 Red Hat 9.0: Restart Ethernet Card

```
[root@localhost init.d]# network restart

Shutting down interface eth0:                [OK]
Shutting down loopback interface:            [OK]
Setting network parameters:                  [OK]
Bringing up loopback interface:              [OK]
Bringing up interface eth0:                  [OK]
```

40.5.3 Verifying Settings

Enter `ifconfig` in a terminal screen to check your TCP/IP properties.

Figure 277 Red Hat 9.0: Checking TCP/IP Properties

```
[root@localhost]# ifconfig
eth0      Link encap:Ethernet  HWaddr 00:50:BA:72:5B:44
          inet addr:172.23.19.129  Bcast:172.23.19.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:717 errors:0 dropped:0 overruns:0 frame:0
          TX packets:13 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:100
          RX bytes:730412 (713.2 Kb)  TX bytes:1570 (1.5 Kb)
          Interrupt:10 Base address:0x1000
[root@localhost]#
```

APPENDIX B
IP Subnetting

IP Addressing

Routers "route" based on the network number. The router that delivers the data packet to the correct destination host uses the host ID.

IP Classes

An IP address is made up of four octets (eight bits), written in dotted decimal notation, for example, 192.168.1.1. IP addresses are categorized into different classes. The class of an address depends on the value of its first octet.

- Class "A" addresses have a 0 in the left most bit. In a class "A" address the first octet is the network number and the remaining three octets make up the host ID.
- Class "B" addresses have a 1 in the left most bit and a 0 in the next left most bit. In a class "B" address the first two octets make up the network number and the two remaining octets make up the host ID.
- Class "C" addresses begin (starting from the left) with 1 1 0. In a class "C" address the first three octets make up the network number and the last octet is the host ID.
- Class "D" addresses begin with 1 1 1 0. Class "D" addresses are used for multicasting. (There is also a class "E" address. It is reserved for future use.)

Table 169 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 170 Allowed IP Address Range By Class

CLASS	ALLOWED RANGE OF FIRST OCTET (BINARY)	ALLOWED RANGE OF FIRST OCTET (DECIMAL)
Class A	**0**0000000 to **0**1111111	0 to 127
Class B	**10**000000 to **10**111111	128 to 191
Class C	**110**00000 to **110**11111	192 to 223
Class D	**1110**0000 to **1110**1111	224 to 239

Subnet Masks

A subnet mask is used to determine which bits are part of the network number, and which bits are part of the host ID (using a logical AND operation). A subnet mask has 32 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 171 "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 172 Alternative Subnet Mask Notation

SUBNET MASK	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 173 Two Subnets Example

IP/SUBNET MASK	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 174 Subnet 1

IP/SUBNET MASK	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address	192.168.1.	0
IP Address (Binary)	11000000.10101000.00000001.	**0**0000000
Subnet Mask	255.255.255.	128
Subnet Mask (Binary)	11111111.11111111.11111111.	**1**0000000
Subnet Address: 192.168.1.0	Lowest Host ID: 192.168.1.1	
Broadcast Address: 192.168.1.127	Highest Host ID: 192.168.1.126	

Table 175 Subnet 2

IP/SUBNET MASK	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address	192.168.1.	128
IP Address (Binary)	11000000.10101000.00000001.	**1**0000000
Subnet Mask	255.255.255.	128
Subnet Mask (Binary)	11111111.11111111.11111111.	**1**0000000
Subnet Address: 192.168.1.128	Lowest Host ID: 192.168.1.129	
Broadcast Address: 192.168.1.255	Highest Host ID: 192.168.1.254	

The remaining 7 bits determine the number of hosts each subnet can have. Host IDs of all zeros represent the subnet itself and host IDs of all ones are the broadcast address for that subnet, so the actual number of hosts available on each subnet in the example above is $2^7 - 2$ or 126 hosts for each subnet.

192.168.1.0 with mask 255.255.255.128 is the subnet itself, and 192.168.1.127 with mask 255.255.255.128 is the directed broadcast address for the first subnet. Therefore, the lowest IP address that can be assigned to an actual host for the first subnet is 192.168.1.1 and the highest is 192.168.1.126. Similarly the host ID range for the second subnet is 192.168.1.129 to 192.168.1.254.

Example: Four Subnets

The above example illustrated using a 25-bit subnet mask to divide a class "C" address space into two subnets. Similarly to divide a class "C" address into four subnets, you need to "borrow" two host ID bits to give four possible combinations of 00, 01, 10 and 11. The subnet mask is 26 bits (11111111.11111111.11111111.**11**000000) or 255.255.255.192. Each subnet contains 6 host ID bits, giving 2^6-2 or 62 hosts for each subnet (all 0's is the subnet itself, all 1's is the broadcast address on the subnet).

Table 176 Subnet 1

IP/SUBNET MASK	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address	192.168.1.	0
IP Address (Binary)	11000000.10101000.00000001.	**00**000000
Subnet Mask (Binary)	11111111.11111111.11111111.	**11**000000
Subnet Address: 192.168.1.0	Lowest Host ID: 192.168.1.1	
Broadcast Address: 192.168.1.63	Highest Host ID: 192.168.1.62	

Table 177 Subnet 2

IP/SUBNET MASK	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address	192.168.1.	64
IP Address (Binary)	11000000.10101000.00000001.	**01**000000
Subnet Mask (Binary)	11111111.11111111.11111111.	**11**000000
Subnet Address: 192.168.1.64	Lowest Host ID: 192.168.1.65	
Broadcast Address: 192.168.1.127	Highest Host ID: 192.168.1.126	

Table 178 Subnet 3

IP/SUBNET MASK	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address	192.168.1.	128
IP Address (Binary)	11000000.10101000.00000001.	**10**000000
Subnet Mask (Binary)	11111111.11111111.11111111.	**11**000000
Subnet Address: 192.168.1.128	Lowest Host ID: 192.168.1.129	
Broadcast Address: 192.168.1.191	Highest Host ID: 192.168.1.190	

Table 179 Subnet 4

IP/SUBNET MASK	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address	192.168.1.	192
IP Address (Binary)	11000000.10101000.00000001.	**11**000000
Subnet Mask (Binary)	11111111.11111111.11111111.	**11**000000
Subnet Address: 192.168.1.192	Lowest Host ID: 192.168.1.193	
Broadcast Address: 192.168.1.255	Highest Host ID: 192.168.1.254	

Example Eight Subnets

Similarly use a 27-bit mask to create 8 subnets (001, 010, 011, 100, 101, 110).

The following table shows class C IP address last octet values for each subnet.

Table 180 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	225	254	255

The following table is a summary for class "C" subnet planning.

Table 181 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 169 on page 419) available for subnetting.

The following table is a summary for class "B" subnet planning.

Table 182 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 C
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 278 on page 428). 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.

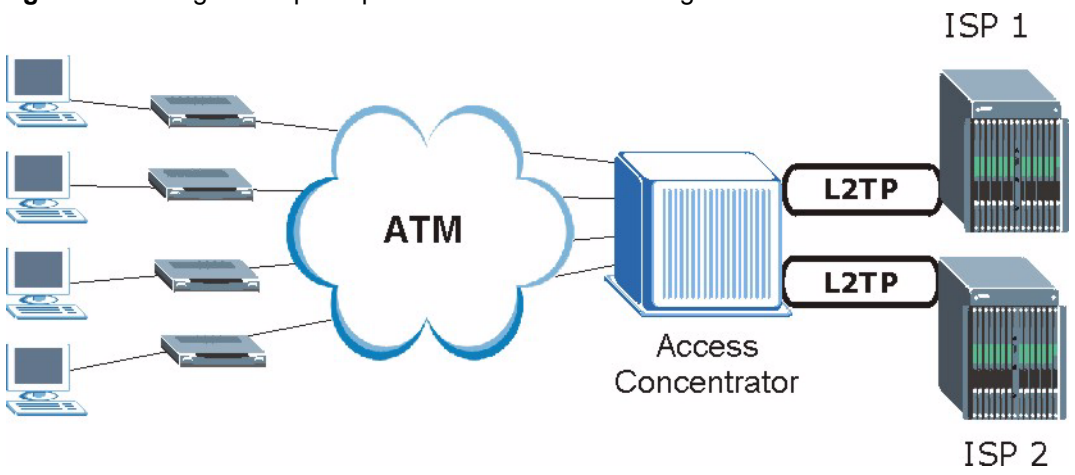
It lessens the burden on the carriers of provisioning virtual circuits all the way to the ISP on multiple switches for thousands of users. For GSTN (PSTN and ISDN), the switching fabric is already in place.

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 278 Single-Computer per Router Hardware Configuration



How PPPoE Works

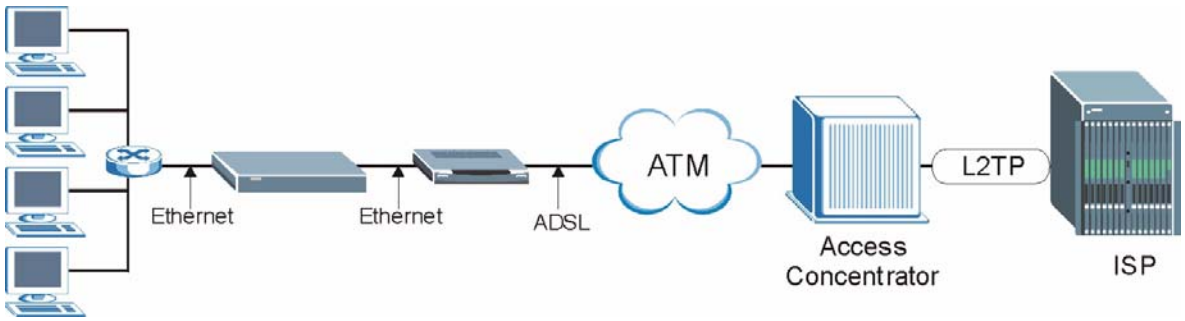
The PPPoE driver makes the Ethernet appear as a serial link to the computer and the computer runs PPP over it, while the modem bridges the Ethernet frames to the Access Concentrator (AC). Between the AC and an ISP, the AC is acting as a L2TP (Layer 2 Tunneling Protocol) LAC (L2TP Access Concentrator) 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 279 Prestige as a PPPoE Client



APPENDIX D
PPTP

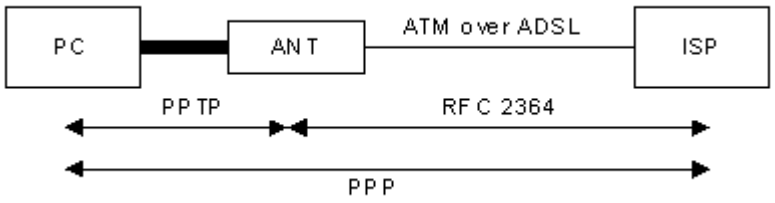
What is PPTP?

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

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

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

Figure 280 Transport PPP frames over Ethernet



PPTP and the Prestige

When the Prestige is deployed in such a setup, it appears as a computer to the ANT.

In Windows VPN or PPTP Pass-Through feature, the PPTP tunneling is created from Windows 95, 98 and NT clients to an NT server in a remote location. The pass-through feature allows users on the network to access a different remote server using the Prestige's Internet connection. In SUA/NAT mode, the Prestige is able to pass the PPTP packets to the internal PPTP server (i.e. NT server) behind the NAT. You need to configure port forwarding for port 1723 to have the Prestige forward PPTP packets to the server. In the case above as the remote PPTP Client initializes the PPTP connection, the user must configure the PPTP clients. The Prestige initializes the PPTP connection hence; there is no need to configure the remote PPTP clients.

PPTP Protocol Overview

PPTP is very similar to L2TP, since L2TP is based on both PPTP and L2F (Cisco's Layer 2 Forwarding). Conceptually, there are three parties in PPTP, namely the PNS (PPTP Network Server), the PAC (PPTP Access Concentrator) and the PPTP user. The PNS is the box that hosts both the PPP and the PPTP stacks and forms one end of the PPTP tunnel. The PAC is the box that dials/answers the phone calls and relays the PPP frames to the PNS. The PPTP user is not necessarily a PPP client (can be a PPP server too). Both the PNS and the PAC must have IP connectivity; however, the PAC must in addition have dial-up capability. The phone call is between the user and the PAC and the PAC tunnels the PPP frames to the PNS. The PPTP user is unaware of the tunnel between the PAC and the PNS.

Figure 281 PPTP Protocol Overview

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

Control & PPP Connections

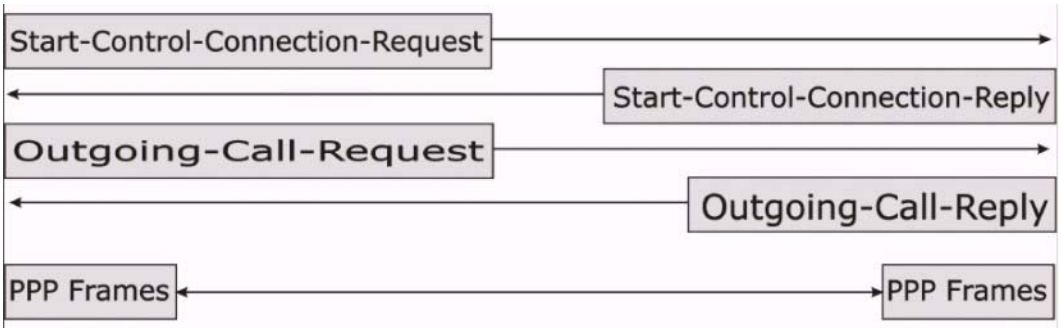
Each PPTP session has distinct control connection and PPP data connection.

Call Connection

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

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

Figure 282 Example Message Exchange between Computer and an ANT



PPP Data Connection

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

APPENDIX E
Wireless LANs

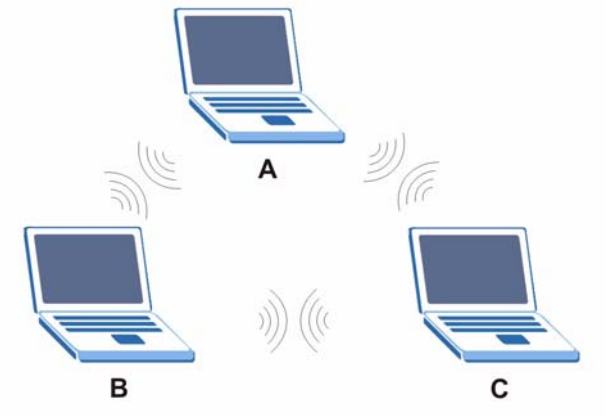
Wireless LAN Topologies

This section discusses ad-hoc and infrastructure wireless LAN topologies.

Ad-hoc Wireless LAN Configuration

The simplest WLAN configuration is an independent (Ad-hoc) WLAN that connects a set of computers with wireless stations (A, B, C). Any time two or more wireless adapters are within range of each other, they can set up an independent network, which is commonly referred to as an Ad-hoc network or Independent Basic Service Set (IBSS). The following diagram shows an example of notebook computers using wireless adapters to form an Ad-hoc wireless LAN.

Figure 283 Peer-to-Peer Communication in an Ad-hoc Network

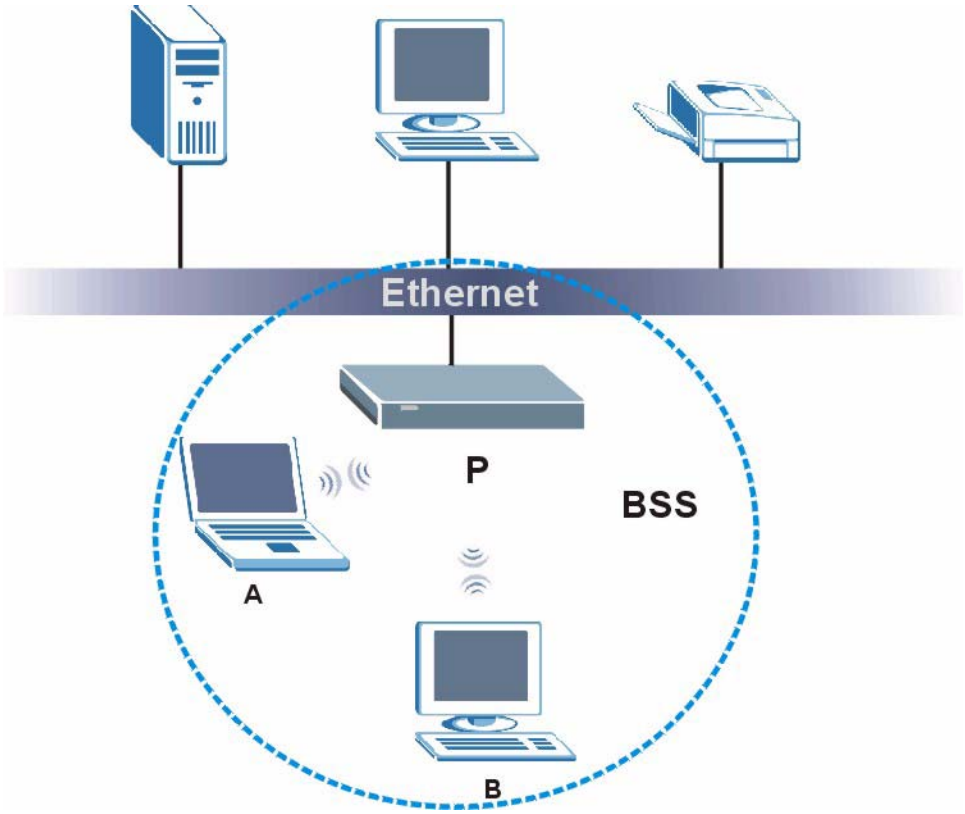


BSS

A Basic Service Set (BSS) exists when all communications between wireless stations or between a wireless station and a wired network client go through one access point (AP).

Intra-BSS traffic is traffic between wireless stations in the BSS. When Intra-BSS is enabled, wireless station A and B can access the wired network and communicate with each other. When Intra-BSS is disabled, wireless station A and B can still access the wired network but cannot communicate with each other.

Figure 284 Basic Service Set



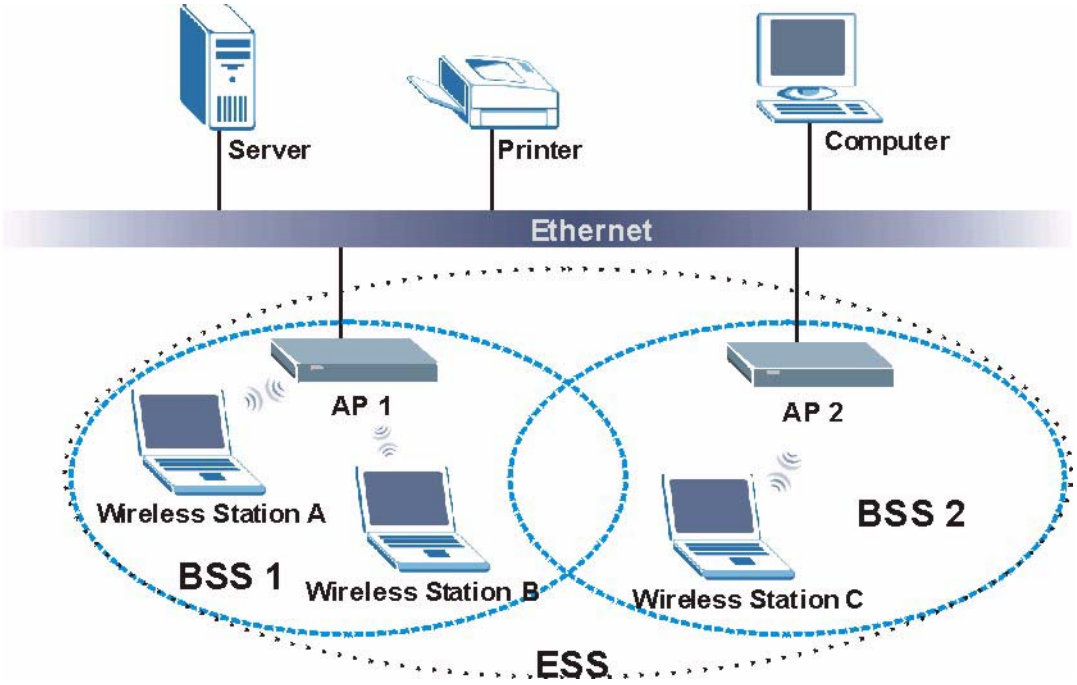
ESS

An Extended Service Set (ESS) consists of a series of overlapping BSSs, each containing an access point, with each access point connected together by a wired network. This wired connection between APs is called a Distribution System (DS).

This type of wireless LAN topology is called an Infrastructure WLAN. The Access Points not only provide communication with the wired network but also mediate wireless network traffic in the immediate neighborhood.

An ESSID (ESS IDentification) uniquely identifies each ESS. All access points and their associated wireless stations within the same ESS must have the same ESSID in order to communicate.

Figure 285 Infrastructure WLAN



Channel

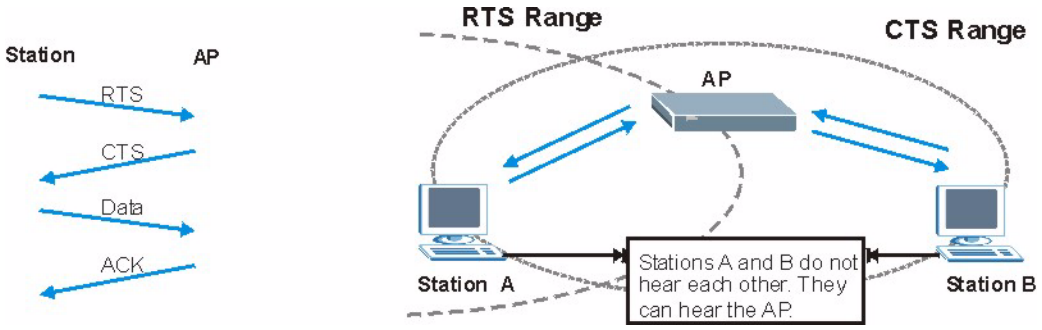
A channel is the radio frequency(ies) used by IEEE 802.11a/b/g wireless devices. Channels available depend on your geographical area. You may have a choice of channels (for your region) so you should use a different channel than an adjacent AP (access point) to reduce interference. Interference occurs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

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

RTS/CTS

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

Figure 286 RTS/CTS



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

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

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

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

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

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

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

Fragmentation Threshold

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

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

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

Preamble Type

A preamble is used to synchronize the transmission timing in your wireless network. There are two preamble modes: **Long** and **Short**.

Short preamble takes less time to process and minimizes overhead, so it should be used in a good wireless network environment when all wireless stations support it.

Select **Long** if you have a 'noisy' network or are unsure of what preamble mode your wireless stations support as all IEEE 802.11b compliant wireless adapters must support long preamble. However, not all wireless adapters support short preamble. Use long preamble if you are unsure what preamble mode the wireless adapters support, to ensure interpretability between the AP and the wireless stations and to provide more reliable communication in 'noisy' networks.

Select **Dynamic** to have the AP automatically use short preamble when all wireless stations support it, otherwise the AP uses long preamble.

Note: The AP and the wireless stations MUST use the same preamble mode in order to communicate.

IEEE 802.11g Wireless LAN

IEEE 802.11g is fully compatible with the IEEE 802.11b standard. This means an IEEE 802.11b adapter can interface directly with an IEEE 802.11g access point (and vice versa) at 11 Mbps or lower depending on range. IEEE 802.11g has several intermediate rate steps between the maximum and minimum data rates. The IEEE 802.11g data rate and modulation are as follows:

Table 183 IEEE 802.11g

DATA RATE (MBPS)	MODULATION
1	DBPSK (Differential Binary Phase Shift Keyed)
2	DQPSK (Differential Quadrature Phase Shift Keying)
5.5 / 11	CCK (Complementary Code Keying)
6/9/12/18/24/36/48/54	OFDM (Orthogonal Frequency Division Multiplexing)

IEEE 802.1x

In June 2001, the IEEE 802.1x standard was designed to extend the features of IEEE 802.11 to support extended authentication as well as providing additional accounting and control features. It is supported by Windows XP and a number of network devices. Some advantages of IEEE 802.1x are:

- User based identification that allows for roaming.
- Support for RADIUS (Remote Authentication Dial In User Service, RFC 2138, 2139) for centralized user profile and accounting management on a network RADIUS server.
- Support for EAP (Extensible Authentication Protocol, RFC 2486) that allows additional authentication methods to be deployed with no changes to the access point or the wireless stations.

RADIUS

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

- Authentication

  Determines the identity of the users.

- Authorization

  Determines the network services available to authenticated users once they are connected to the network.

- Accounting

  Keeps track of the client's network activity.

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

Types of RADIUS Messages

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

- Access-Request

  Sent by an access point requesting authentication.

- Access-Reject

  Sent by a RADIUS server rejecting access.

- Access-Accept

  Sent by a RADIUS server allowing access.

- Access-Challenge

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

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

- Accounting-Request

  Sent by the access point requesting accounting.

- Accounting-Response

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

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

Types of Authentication

This appendix discusses some popular authentication types: **EAP-MD5**, **EAP-TLS**, **EAP-TTLS**, **PEAP** and **LEAP**.

The type of authentication you use depends on the RADIUS server or the AP. Consult your network administrator for more information.

EAP-MD5 (Message-Digest Algorithm 5)

MD5 authentication is the simplest one-way authentication method. The authentication server sends a challenge to the wireless station. The wireless station 'proves' that it knows the password by encrypting the password with the challenge and sends back the information. Password is not sent in plain text.

However, MD5 authentication has some weaknesses. Since the authentication server needs to get the plaintext passwords, the passwords must be stored. Thus someone other than the authentication server may access the password file. In addition, it is possible to impersonate an authentication server as MD5 authentication method does not perform mutual authentication. Finally, MD5 authentication method does not support data encryption with dynamic session key. You must configure WEP encryption keys for data encryption.

EAP-TLS (Transport Layer Security)

With EAP-TLS, digital certifications are needed by both the server and the wireless stations for mutual authentication. The server presents a certificate to the client. After validating the identity of the server, the client sends a different certificate to the server. The exchange of certificates is done in the open before a secured tunnel is created. This makes user identity vulnerable to passive attacks. A digital certificate is an electronic ID card that authenticates the sender's identity. However, to implement EAP-TLS, you need a Certificate Authority (CA) to handle certificates, which imposes a management overhead.

EAP-TTLS (Tunneled Transport Layer Service)

EAP-TTLS is an extension of the EAP-TLS authentication that uses certificates for only the server-side authentications to establish a secure connection. Client authentication is then done by sending username and password through the secure connection, thus client identity is protected. For client authentication, EAP-TTLS supports EAP methods and legacy authentication methods such as PAP, CHAP, MS-CHAP and MS-CHAP v2.

PEAP (Protected EAP)

Like EAP-TTLS, server-side certificate authentication is used to establish a secure connection, then use simple username and password methods through the secured connection to authenticate the clients, thus hiding client identity. However, PEAP only supports EAP methods, such as EAP-MD5, EAP-MSCHAPv2 and EAP-GTC (EAP-Generic Token Card), for client authentication. EAP-GTC is implemented only by Cisco.

LEAP

LEAP (Lightweight Extensible Authentication Protocol) is a Cisco implementation of IEEE 802.1x.

Dynamic WEP Key Exchange

The AP maps a unique key that is generated with the RADIUS server. This key expires when the wireless connection times out, disconnects or reauthentication times out. A new WEP key is generated each time reauthentication is performed.

If this feature is enabled, it is not necessary to configure a default encryption key in the Wireless screen. You may still configure and store keys here, but they will not be used while Dynamic WEP is enabled.

Note: EAP-MD5 cannot be used with Dynamic WEP Key Exchange

For added security, certificate-based authentications (EAP-TLS, EAP-TTLS and PEAP) use dynamic keys for data encryption. They are often deployed in corporate environments, but for public deployment, a simple user name and password pair is more practical. The following table is a comparison of the features of authentication types.

Table 184 Comparison of EAP Authentication Types

	EAP-MD5	EAP-TLS	EAP-TTLS	PEAP	LEAP
Mutual Authentication	No	Yes	Yes	Yes	Yes
Certificate – Client	No	Yes	Optional	Optional	No
Certificate – Server	No	Yes	Yes	Yes	No
Dynamic Key Exchange	No	Yes	Yes	Yes	Yes
Credential Integrity	None	Strong	Strong	Strong	Moderate
Deployment Difficulty	Easy	Hard	Moderate	Moderate	Moderate
Client Identity Protection	No	No	Yes	Yes	No

WPA(2)

User Authentication

WPA or WPA2 applies IEEE 802.1x and Extensible Authentication Protocol (EAP) to authenticate wireless stations using an external RADIUS database.

Encryption

Both WPA and WPA2 improve data encryption by using Temporal Key Integrity Protocol (TKIP), Message Integrity Check (MIC) and IEEE 802.1x. In addition to TKIP, WPA2 also uses Advanced Encryption Standard (AES) in the Counter mode with Cipher block chaining Message authentication code Protocol (CCMP) to offer stronger encryption.

TKIP uses 128-bit keys that are dynamically generated and distributed by the authentication server. It includes a per-packet key mixing function, a Message Integrity Check (MIC) named Michael, an extended initialization vector (IV) with sequencing rules, and a re-keying mechanism.

TKIP regularly changes and rotates the encryption keys so that the same encryption key is never used twice.

The RADIUS server distributes a Pairwise Master Key (PMK) key to the AP that then sets up a key hierarchy and management system, using the PMK to dynamically generate unique data encryption keys to encrypt every data packet that is wirelessly communicated between the AP and the wireless stations. This all happens in the background automatically.

WPA2 AES (Advanced Encryption Standard) is a block cipher that uses a 256-bit mathematical algorithm called Rijndael.

The Message Integrity Check (MIC) is designed to prevent an attacker from capturing data packets, altering them and resending them. The MIC provides a strong mathematical function in which the receiver and the transmitter each compute and then compare the MIC. If they do not match, it is assumed that the data has been tampered with and the packet is dropped.

By generating unique data encryption keys for every data packet and by creating an integrity checking mechanism (MIC), TKIP makes it much more difficult to decrypt data on a Wi-Fi network than WEP, making it difficult for an intruder to break into the network.

The encryption mechanisms used for WPA(2) and WPA(2)-PSK are the same. The only difference between the two is that WPA(2)-PSK uses a simple common password, instead of user-specific credentials. The common-password approach makes WPA(2)-PSK susceptible to brute-force password-guessing attacks but it's still an improvement over WEP as it employs an easier-to-use, consistent, single, alphanumeric password.

Security Parameters Summary

Refer to this table to see what other security parameters you should configure for each Authentication Method/ key management protocol type. MAC address filters are not dependent on how you configure these security features.

Table 185 Wireless Security Relational Matrix

AUTHENTICATION METHOD/ KEY MANAGEMENT PROTOCOL	ENCRYPTION METHOD	ENTER MANUAL KEY	IEEE 802.1X
Open	None	No	Disable
			Enable without Dynamic WEP Key
Open	WEP	No	Enable with Dynamic WEP Key
		Yes	Enable without Dynamic WEP Key
		Yes	Disable
Shared	WEP	No	Enable with Dynamic WEP Key
		Yes	Enable without Dynamic WEP Key
		Yes	Disable
WPA	TKIP	No	Enable
WPA-PSK	TKIP	Yes	Enable
WPA2	AES	No	Enable
WPA2-PSK	AES	Yes	Enable

APPENDIX F
Log Descriptions

This appendix provides descriptions of example log messages.

Table 186 System Maintenance Logs

LOG MESSAGE	DESCRIPTION
`Time calibration is successful`	The router has adjusted its time based on information from the time server.
`Time calibration failed`	The router failed to get information from the time server.
`WAN interface gets IP:%s`	A WAN interface got a new IP address from the DHCP, PPPoE, PPTP or dial-up 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.
`Successful SMT login`	Someone has logged on to the router's SMT interface.
`SMT login failed`	Someone has failed to log on to the router's SMT interface.
`Successful WEB login`	Someone has logged on to the router's web configurator interface.
`WEB login failed`	Someone has failed to log on to the router's web configurator interface.
`Successful TELNET login`	Someone has logged on to the router via telnet.
`TELNET login failed`	Someone has failed to log on to the router via telnet.
`Successful FTP login`	Someone has logged on to the router via ftp.
`FTP login failed`	Someone has failed to log on to the router via ftp.
`NAT Session Table is Full!`	The maximum number of NAT session table entries has been exceeded and the table is full.
`Starting Connectivity Monitor`	Starting Connectivity Monitor.
`Time initialized by Daytime Server`	The router got the time and date from the Daytime server.
`Time initialized by Time server`	The router got the time and date from the time server.
`Time initialized by NTP server`	The router got the time and date from the NTP server.
`Connect to Daytime server fail`	The router was not able to connect to the Daytime server.
`Connect to Time server fail`	The router was not able to connect to the Time server.
`Connect to NTP server fail`	The router was not able to connect to the NTP server.
`Too large ICMP packet has been dropped`	The router dropped an ICMP packet that was too large.
`SMT Session Begin`	An SMT management session has started.
`SMT Session End`	An SMT management session has ended.

Table 186 System Maintenance Logs (continued)

LOG MESSAGE	DESCRIPTION
`Configuration Change: PC = 0x%x, Task ID = 0x%x`	The router is saving configuration changes.
`Successful SSH login`	Someone has logged on to the router's SSH server.
`SSH login failed`	Someone has failed to log on to the router's SSH server.
`Successful HTTPS login`	Someone has logged on to the router's web configurator interface using HTTPS protocol.
`HTTPS login failed`	Someone has failed to log on to the router's web configurator interface using HTTPS protocol.

Table 187 System Error Logs

LOG MESSAGE	DESCRIPTION
`%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.
`setNetBIOSFilter: calloc error`	The router failed to allocate memory for the NetBIOS filter settings.
`readNetBIOSFilter: calloc error`	The router failed to allocate memory for the NetBIOS filter settings.
`WAN connection is down.`	A WAN connection is down. You cannot access the network through this interface.

Table 188 Access Control Logs

LOG MESSAGE	DESCRIPTION
`Firewall default policy: [TCP | UDP | IGMP | ESP | GRE | OSPF] <Packet Direction>`	Attempted TCP/UDP/IGMP/ESP/GRE/OSPF access matched the default policy and was blocked or forwarded according to the default policy's setting.
`Firewall rule [NOT] match:[TCP | UDP | IGMP | ESP | GRE | OSPF] <Packet Direction>, <rule:%d>`	Attempted TCP/UDP/IGMP/ESP/GRE/OSPF access matched (or did not match) a configured firewall rule (denoted by its number) and was blocked or forwarded according to the rule.
`Triangle route packet forwarded: [TCP | UDP | IGMP | ESP | GRE | OSPF]`	The firewall allowed a triangle route session to pass through.
`Packet without a NAT table entry blocked: [TCP | UDP | IGMP | ESP | GRE | OSPF]`	The router blocked a packet that didn't have a corresponding NAT table entry.
`Router sent blocked web site message: TCP`	The router sent a message to notify a user that the router blocked access to a web site that the user requested.

Table 189 TCP Reset Logs

LOG MESSAGE	DESCRIPTION
`Under SYN flood attack, sent TCP RST`	The router sent a TCP reset packet when a host was under a SYN flood attack (the TCP incomplete count is per destination host.)
`Exceed TCP MAX incomplete, sent TCP RST`	The router sent a TCP reset packet when the number of TCP incomplete connections exceeded the user configured threshold. (the TCP incomplete count is per destination host.) Note: Refer to **TCP Maximum Incomplete** in the **Firewall Attack Alerts** screen.
`Peer TCP state out of order, sent TCP RST`	The router sent a TCP reset packet when a TCP connection state was out of order.Note: The firewall refers to RFC793 Figure 6 to check the TCP state.
`Firewall session time out, sent TCP RST`	The router sent a TCP reset packet when a dynamic firewall session timed out. The default timeout values are as follows: ICMP idle timeout: 3 minutes UDP idle timeout: 3 minutes TCP connection (three way handshaking) timeout: 270 seconds TCP FIN-wait timeout: 2 MSL (Maximum Segment Lifetime set in the TCP header). TCP idle (established) timeout (s): 150 minutes TCP reset timeout: 10 seconds
`Exceed MAX incomplete, sent TCP RST`	The router sent a TCP reset packet when the number of incomplete connections (TCP and UDP) exceeded the user-configured threshold. (Incomplete count is for all TCP and UDP connections through the firewall.)Note: When the number of incomplete connections (TCP + UDP) > "Maximum Incomplete High", the router sends TCP RST packets for TCP connections and destroys TOS (firewall dynamic sessions) until incomplete connections < "Maximum Incomplete Low".
`Access block, sent TCP RST`	The router sends a TCP RST packet and generates this log if you turn on the firewall TCP reset mechanism (via CI command: "sys firewall tcprst").

Table 190 Packet Filter Logs

LOG MESSAGE	DESCRIPTION
`[TCP | UDP | ICMP | IGMP | Generic] packet filter matched (set:%d, rule:%d)`	Attempted access matched a configured filter rule (denoted by its set and rule number) and was blocked or forwarded according to the rule.

Table 191 ICMP Logs

LOG MESSAGE	DESCRIPTION
`Firewall default policy: ICMP <Packet Direction>, <type:%d>, <code:%d>`	ICMP access matched the default policy and was blocked or forwarded according to the user's setting. For type and code details, see Table 203 on page 455.
`Firewall rule [NOT] match: ICMP <Packet Direction>, <rule:%d>, <type:%d>, <code:%d>`	ICMP access matched (or didn't match) a firewall rule (denoted by its number) and was blocked or forwarded according to the rule. For type and code details, see Table 203 on page 455.
`Triangle route packet forwarded: ICMP`	The firewall allowed a triangle route session to pass through.
`Packet without a NAT table entry blocked: ICMP`	The router blocked a packet that didn't have a corresponding NAT table entry.
`Unsupported/out-of-order ICMP: ICMP`	The firewall does not support this kind of ICMP packets or the ICMP packets are out of order.
`Router reply ICMP packet: ICMP`	The router sent an ICMP reply packet to the sender.

Table 192 CDR Logs

LOG MESSAGE	DESCRIPTION
`board%d line%d channel%d, call%d,%s C01 Outgoing Call dev=%x ch=%x%s`	The router received the setup requirements for a call. "call" is the reference (count) number of the call. "dev" is the device type (3 is for dial-up, 6 is for PPPoE, 10 is for PPTP). "channel" or "ch" is the call channel ID.For example,"board 0 line 0 channel 0, call 3, C01 Outgoing Call dev=6 ch=0 "Means the router has dialed to the PPPoE server 3 times.
`board%d line%d channel%d, call%d,%s C02 OutCall Connected%d%s`	The PPPoE, PPTP or dial-up call is connected.
`board%d line%d channel%d, call%d,%s C02 Call Terminated`	The PPPoE, PPTP or dial-up call was disconnected.

Table 193 PPP Logs

LOG MESSAGE	DESCRIPTION
`ppp:LCP Starting`	The PPP connection's Link Control Protocol stage has started.
`ppp:LCP Opening`	The PPP connection's Link Control Protocol stage is opening.
`ppp:CHAP Opening`	The PPP connection's Challenge Handshake Authentication Protocol stage is opening.
`ppp:IPCP Starting`	The PPP connection's Internet Protocol Control Protocol stage is starting.
`ppp:IPCP Opening`	The PPP connection's Internet Protocol Control Protocol stage is opening.

Table 193 PPP Logs (continued)

LOG MESSAGE	DESCRIPTION
ppp:LCP Closing	The PPP connection's Link Control Protocol stage is closing.
ppp:IPCP Closing	The PPP connection's Internet Protocol Control Protocol stage is closing.

Table 194 UPnP Logs

LOG MESSAGE	DESCRIPTION
UPnP pass through Firewall	UPnP packets can pass through the firewall.

Table 195 Content Filtering Logs

LOG MESSAGE	DESCRIPTION
%s: Keyword blocking	The content of a requested web page matched a user defined keyword.
%s: Not in trusted web list	The web site is not in a trusted domain, and the router blocks all traffic except trusted domain sites.
%s: Forbidden Web site	The web site is in the forbidden web site list.
%s: Contains ActiveX	The web site contains ActiveX.
%s: Contains Java applet	The web site contains a Java applet.
%s: Contains cookie	The web site contains a cookie.
%s: Proxy mode detected	The router detected proxy mode in the packet.
%s	The content filter server responded that the web site is in the blocked category list, but it did not return the category type.
%s:%s	The content filter server responded that the web site is in the blocked category list, and returned the category type.
%s(cache hit)	The system detected that the web site is in the blocked list from the local cache, but does not know the category type.
%s:%s(cache hit)	The system detected that the web site is in blocked list from the local cache, and knows the category type.
%s: Trusted Web site	The web site is in a trusted domain.
%s	When the content filter is not on according to the time schedule or you didn't select the "Block Matched Web Site" check box, the system forwards the web content.
Waiting content filter server timeout	The external content filtering server did not respond within the timeout period.
DNS resolving failed	The Prestige cannot get the IP address of the external content filtering via DNS query.
Creating socket failed	The Prestige cannot issue a query because TCP/IP socket creation failed, port:port number.

Table 195 Content Filtering Logs (continued)

LOG MESSAGE	DESCRIPTION
Connecting to content filter server fail	The connection to the external content filtering server failed.
License key is invalid	The external content filtering license key is invalid.

Table 196 Attack Logs

LOG MESSAGE	DESCRIPTION
attack [TCP | UDP | IGMP | ESP | GRE | OSPF]	The firewall detected a TCP/UDP/IGMP/ESP/GRE/OSPF attack.
attack ICMP (type:%d, code:%d)	The firewall detected an ICMP attack. For type and code details, see Table 203 on page 455.
land [TCP | UDP | IGMP | ESP | GRE | OSPF]	The firewall detected a TCP/UDP/IGMP/ESP/GRE/OSPF land attack.
land ICMP (type:%d, code:%d)	The firewall detected an ICMP land attack. For type and code details, see Table 203 on page 455.
ip spoofing - WAN [TCP | UDP | IGMP | ESP | GRE | OSPF]	The firewall detected an IP spoofing attack on the WAN port.
ip spoofing - WAN ICMP (type:%d, code:%d)	The firewall detected an ICMP IP spoofing attack on the WAN port. For type and code details, see Table 203 on page 455.
icmp echo: ICMP (type:%d, code:%d)	The firewall detected an ICMP echo attack. For type and code details, see Table 203 on page 455.
syn flood TCP	The firewall detected a TCP syn flood attack.
ports scan TCP	The firewall detected a TCP port scan attack.
teardrop TCP	The firewall detected a TCP teardrop attack.
teardrop UDP	The firewall detected an UDP teardrop attack.
teardrop ICMP (type:%d, code:%d)	The firewall detected an ICMP teardrop attack. For type and code details, see Table 203 on page 455.
illegal command TCP	The firewall detected a TCP illegal command attack.
NetBIOS TCP	The firewall detected a TCP NetBIOS attack.
ip spoofing - no routing entry [TCP | UDP | IGMP | ESP | GRE | OSPF]	The firewall classified a packet with no source routing entry as an IP spoofing attack.
ip spoofing - no routing entry ICMP (type:%d, code:%d)	The firewall classified an ICMP packet with no source routing entry as an IP spoofing attack.
vulnerability ICMP (type:%d, code:%d)	The firewall detected an ICMP vulnerability attack. For type and code details, see Table 203 on page 455.
traceroute ICMP (type:%d, code:%d)	The firewall detected an ICMP traceroute attack. For type and code details, see Table 203 on page 455.

Table 197 IPSec Logs

LOG MESSAGE	DESCRIPTION
Discard REPLAY packet	The router received and discarded a packet with an incorrect sequence number.
Inbound packet authentication failed	The router received a packet that has been altered. A third party may have altered or tampered with the packet.
Receive IPSec packet, but no corresponding tunnel exists	The router dropped an inbound packet for which SPI could not find a corresponding phase 2 SA.
Rule <%d> idle time out, disconnect	The router dropped a connection that had outbound traffic and no inbound traffic for a certain time period. You can use the "ipsec timer chk_conn" CI command to set the time period. The default value is 2 minutes.
WAN IP changed to <IP>	The router dropped all connections with the "MyIP" configured as "0.0.0.0" when the WAN IP address changed.

Table 198 IKE Logs

LOG MESSAGE	DESCRIPTION
Active connection allowed exceeded	The IKE process for a new connection failed because the limit of simultaneous phase 2 SAs has been reached.
Start Phase 2: Quick Mode	Phase 2 Quick Mode has started.
Verifying Remote ID failed:	The connection failed during IKE phase 2 because the router and the peer's Local/Remote Addresses don't match.
Verifying Local ID failed:	The connection failed during IKE phase 2 because the router and the peer's Local/Remote Addresses don't match.
IKE Packet Retransmit	The router retransmitted the last packet sent because there was no response from the peer.
Failed to send IKE Packet	An Ethernet error stopped the router from sending IKE packets.
Too many errors! Deleting SA	An SA was deleted because there were too many errors.
Phase 1 IKE SA process done	The phase 1 IKE SA process has been completed.
Duplicate requests with the same cookie	The router received multiple requests from the same peer while still processing the first IKE packet from the peer.
IKE Negotiation is in process	The router has already started negotiating with the peer for the connection, but the IKE process has not finished yet.
No proposal chosen	Phase 1 or phase 2 parameters don't match. Please check all protocols / settings. Ex. One device being configured for 3DES and the other being configured for DES causes the connection to fail.
Local / remote IPs of incoming request conflict with rule <%d>	The security gateway is set to "0.0.0.0" and the router used the peer's "Local Address" as the router's "Remote Address". This information conflicted with static rule #d; thus the connection is not allowed.

Table 198 IKE Logs (continued)

LOG MESSAGE	DESCRIPTION
Cannot resolve Secure Gateway Addr for rule <%d>	The router couldn't resolve the IP address from the domain name that was used for the secure gateway address.
Peer ID: <peer id> <My remote type> -<My local type>	The displayed ID information did not match between the two ends of the connection.
vs. My Remote <My remote> - <My remote>	The displayed ID information did not match between the two ends of the connection.
vs. My Local <My local>-<My local>	The displayed ID information did not match between the two ends of the connection.
Send <packet>	A packet was sent.
Recv <packet>	IKE uses ISAKMP to transmit data. Each ISAKMP packet contains many different types of payloads. All of them show in the LOG. Refer to RFC2408 – ISAKMP for a list of all ISAKMP payload types.
Recv <Main or Aggressive> Mode request from <IP>	The router received an IKE negotiation request from the peer address specified.
Send <Main or Aggressive> Mode request to <IP>	The router started negotiation with the peer.
Invalid IP <Peer local> / <Peer local>	The peer's "Local IP Address" is invalid.
Remote IP <Remote IP> / <Remote IP> conflicts	The security gateway is set to "0.0.0.0" and the router used the peer's "Local Address" as the router's "Remote Address". This information conflicted with static rule #d; thus the connection is not allowed.
Phase 1 ID type mismatch	This router's "Peer ID Type" is different from the peer IPSec router's "Local ID Type".
Phase 1 ID content mismatch	This router's "Peer ID Content" is different from the peer IPSec router's "Local ID Content".
No known phase 1 ID type found	The router could not find a known phase 1 ID in the connection attempt.
ID type mismatch. Local / Peer: <Local ID type/Peer ID type>	The phase 1 ID types do not match.
ID content mismatch	The phase 1 ID contents do not match.
Configured Peer ID Content: <Configured Peer ID Content>	The phase 1 ID contents do not match and the configured "Peer ID Content" is displayed.
Incoming ID Content: <Incoming Peer ID Content>	The phase 1 ID contents do not match and the incoming packet's ID content is displayed.
Unsupported local ID Type: <%d>	The phase 1 ID type is not supported by the router.
Build Phase 1 ID	The router has started to build the phase 1 ID.
Adjust TCP MSS to%d	The router automatically changed the TCP Maximum Segment Size value after establishing a tunnel.
Rule <%d> input idle time out, disconnect	The tunnel for the listed rule was dropped because there was no inbound traffic within the idle timeout period.
XAUTH succeed! Username: <Username>	The router used extended authentication to authenticate the listed username.

Table 198 IKE Logs (continued)

LOG MESSAGE	DESCRIPTION
XAUTH fail! Username: <Username>	The router was not able to use extended authentication to authenticate the listed username.
Rule[%d] Phase 1 negotiation mode mismatch	The listed rule's IKE phase 1 negotiation mode did not match between the router and the peer.
Rule [%d] Phase 1 encryption algorithm mismatch	The listed rule's IKE phase 1 encryption algorithm did not match between the router and the peer.
Rule [%d] Phase 1 authentication algorithm mismatch	The listed rule's IKE phase 1 authentication algorithm did not match between the router and the peer.
Rule [%d] Phase 1 authentication method mismatch	The listed rule's IKE phase 1 authentication method did not match between the router and the peer.
Rule [%d] Phase 1 key group mismatch	The listed rule's IKE phase 1 key group did not match between the router and the peer.
Rule [%d] Phase 2 protocol mismatch	The listed rule's IKE phase 2 protocol did not match between the router and the peer.
Rule [%d] Phase 2 encryption algorithm mismatch	The listed rule's IKE phase 2 encryption algorithm did not match between the router and the peer.
Rule [%d] Phase 2 authentication algorithm mismatch	The listed rule's IKE phase 2 authentication algorithm did not match between the router and the peer.
Rule [%d] Phase 2 encapsulation mismatch	The listed rule's IKE phase 2 encapsulation did not match between the router and the peer.
Rule [%d]> Phase 2 pfs mismatch	The listed rule's IKE phase 2 perfect forward secret (pfs) setting did not match between the router and the peer.
Rule [%d] Phase 1 ID mismatch	The listed rule's IKE phase 1 ID did not match between the router and the peer.
Rule [%d] Phase 1 hash mismatch	The listed rule's IKE phase 1 hash did not match between the router and the peer.
Rule [%d] Phase 1 preshared key mismatch	The listed rule's IKE phase 1 pre-shared key did not match between the router and the peer.
Rule [%d] Tunnel built successfully	The listed rule's IPSec tunnel has been built successfully.
Rule [%d] Peer's public key not found	The listed rule's IKE phase 1 peer's public key was not found.
Rule [%d] Verify peer's signature failed	The listed rule's IKE phase 1verification of the peer's signature failed.
Rule [%d] Sending IKE request	IKE sent an IKE request for the listed rule.
Rule [%d] Receiving IKE request	IKE received an IKE request for the listed rule.
Swap rule to rule [%d]	The router changed to using the listed rule.
Rule [%d] Phase 1 key length mismatch	The listed rule's IKE phase 1 key length (with the AES encryption algorithm) did not match between the router and the peer.
Rule [%d] phase 1 mismatch	The listed rule's IKE phase 1 did not match between the router and the peer.

Table 198 IKE Logs (continued)

LOG MESSAGE	DESCRIPTION
`Rule [%d] phase 2 mismatch`	The listed rule's IKE phase 2 did not match between the router and the peer.
`Rule [%d] Phase 2 key length mismatch`	The listed rule's IKE phase 2 key lengths (with the AES encryption algorithm) did not match between the router and the peer.

Table 199 PKI Logs

LOG MESSAGE	DESCRIPTION
`Enrollment successful`	The SCEP online certificate enrollment was successful. The Destination field records the certification authority server IP address and port.
`Enrollment failed`	The SCEP online certificate enrollment failed. The Destination field records the certification authority server's IP address and port.
`Failed to resolve <SCEP CA server url>`	The SCEP online certificate enrollment failed because the certification authority server's address cannot be resolved.
`Enrollment successful`	The CMP online certificate enrollment was successful. The Destination field records the certification authority server's IP address and port.
`Enrollment failed`	The CMP online certificate enrollment failed. The Destination field records the certification authority server's IP address and port.
`Failed to resolve <CMP CA server url>`	The CMP online certificate enrollment failed because the certification authority server's IP address cannot be resolved.
`Rcvd ca cert: <subject name>`	The router received a certification authority certificate, with subject name as recorded, from the LDAP server whose IP address and port are recorded in the Source field.
`Rcvd user cert: <subject name>`	The router received a user certificate, with subject name as recorded, from the LDAP server whose IP address and port are recorded in the Source field.
`Rcvd CRL <size>: <issuer name>`	The router received a CRL (Certificate Revocation List), with size and issuer name as recorded, from the LDAP server whose IP address and port are recorded in the Source field.
`Rcvd ARL <size>: <issuer name>`	The router received an ARL (Authority Revocation List), with size and issuer name as recorded, from the LDAP server whose address and port are recorded in the Source field.
`Failed to decode the received ca cert`	The router received a corrupted certification authority certificate from the LDAP server whose address and port are recorded in the Source field.
`Failed to decode the received user cert`	The router received a corrupted user certificate from the LDAP server whose address and port are recorded in the Source field.
`Failed to decode the received CRL`	The router received a corrupted CRL (Certificate Revocation List) from the LDAP server whose address and port are recorded in the Source field.
`Failed to decode the received ARL`	The router received a corrupted ARL (Authority Revocation List) from the LDAP server whose address and port are recorded in the Source field.

Table 199 PKI Logs (continued)

LOG MESSAGE	DESCRIPTION
`Rcvd data <size> too large! Max size allowed: <max size>`	The router received directory data that was too large (the size is listed) from the LDAP server whose address and port are recorded in the Source field. The maximum size of directory data that the router allows is also recorded.
`Cert trusted: <subject name>`	The router has verified the path of the certificate with the listed subject name.
`Due to <reason codes>, cert not trusted: <subject name>`	Due to the reasons listed, the certificate with the listed subject name has not passed the path verification. The recorded reason codes are only approximate reasons for not trusting the certificate. Please see Table 200 on page 453 for the corresponding descriptions of the codes.

Table 200 Certificate Path Verification Failure Reason Codes

CODE	DESCRIPTION
1	Algorithm mismatch between the certificate and the search constraints.
2	Key usage mismatch between the certificate and the search constraints.
3	Certificate was not valid in the time interval.
4	(Not used)
5	Certificate is not valid.
6	Certificate signature was not verified correctly.
7	Certificate was revoked by a CRL.
8	Certificate was not added to the cache.
9	Certificate decoding failed.
10	Certificate was not found (anywhere).
11	Certificate chain looped (did not find trusted root).
12	Certificate contains critical extension that was not handled.
13	Certificate issuer was not valid (CA specific information missing).
14	(Not used)
15	CRL is too old.
16	CRL is not valid.
17	CRL signature was not verified correctly.
18	CRL was not found (anywhere).
19	CRL was not added to the cache.
20	CRL decoding failed.
21	CRL is not currently valid, but in the future.
22	CRL contains duplicate serial numbers.
23	Time interval is not continuous.
24	Time information not available.
25	Database method failed due to timeout.

Table 200 Certificate Path Verification Failure Reason Codes (continued)

CODE	DESCRIPTION
26	Database method failed.
27	Path was not verified.
28	Maximum path length reached.

Table 201 802.1X Logs

LOG MESSAGE	DESCRIPTION
Local User Database accepts user.	A user was authenticated by the local user database.
Local User Database reports user credential error.	A user was not authenticated by the local user database because of an incorrect user password.
Local User Database does not find user`s credential.	A user was not authenticated by the local user database because the user is not listed in the local user database.
RADIUS accepts user.	A user was authenticated by the RADIUS Server.
RADIUS rejects user. Pls check RADIUS Server.	A user was not authenticated by the RADIUS Server. Please check the RADIUS Server.
Local User Database does not support authentication method.	The local user database only supports the EAP-MD5 method. A user tried to use another authentication method and was not authenticated.
User logout because of session timeout expired.	The router logged out a user whose session expired.
User logout because of user deassociation.	The router logged out a user who ended the session.
User logout because of no authentication response from user.	The router logged out a user from which there was no authentication response.
User logout because of idle timeout expired.	The router logged out a user whose idle timeout period expired.
User logout because of user request.	A user logged out.
Local User Database does not support authentication mothed.	A user tried to use an authentication method that the local user database does not support (it only supports EAP-MD5).
No response from RADIUS. Pls check RADIUS Server.	There is no response message from the RADIUS server, please check the RADIUS server.
Use Local User Database to authenticate user.	The local user database is operating as the authentication server.
Use RADIUS to authenticate user.	The RADIUS server is operating as the authentication server.
No Server to authenticate user.	There is no authentication server to authenticate a user.
Local User Database does not find user`s credential.	A user was not authenticated by the local user database because the user is not listed in the local user database.

Table 202 ACL Setting Notes

PACKET DIRECTION	DIRECTION	DESCRIPTION
(L to W)	LAN to WAN	ACL set for packets traveling from the LAN to the WAN.
(W to L)	WAN to LAN	ACL set for packets traveling from the WAN to the LAN.
(D to L)	DMZ to LAN	ACL set for packets traveling from the DMZ to the LAN.
(D to W)	DMZ to WAN	ACL set for packets traveling from the DMZ to the WAN.
(W to D)	WAN to DMZ	ACL set for packets traveling from the WAN to the DMZ.
(L to D)	LAN to DMZ	ACL set for packets traveling from the LAN to the DMZ.
(L to L/ZW)	LAN to LAN/ Prestige	ACL set for packets traveling from the LAN to the LAN or the Prestige.
(W to W/ZW)	WAN to WAN/ Prestige	ACL set for packets traveling from the WAN to the WAN or the Prestige.
(D to D/ZW)	DMZ to DMZ/ Prestige	ACL set for packets traveling from the DMZ to the DM or the Prestige.

Table 203 ICMP Notes

TYPE	CODE	DESCRIPTION
0		Echo Reply
	0	Echo reply message
3		Destination Unreachable
	0	Net unreachable
	1	Host unreachable
	2	Protocol unreachable
	3	Port unreachable
	4	A packet that needed fragmentation was dropped because it was set to Don't Fragment (DF)
	5	Source route failed
4		Source Quench
	0	A gateway may discard internet datagrams if it does not have the buffer space needed to queue the datagrams for output to the next network on the route to the destination network.
5		Redirect
	0	Redirect datagrams for the Network
	1	Redirect datagrams for the Host
	2	Redirect datagrams for the Type of Service and Network
	3	Redirect datagrams for the Type of Service and Host
8		Echo
	0	Echo message

Table 203 ICMP Notes (continued)

TYPE	CODE	DESCRIPTION
11		Time Exceeded
	0	Time to live exceeded in transit
	1	Fragment reassembly time exceeded
12		Parameter Problem
	0	Pointer indicates the error
13		Timestamp
	0	Timestamp request message
14		Timestamp Reply
	0	Timestamp reply message
15		Information Request
	0	Information request message
16		Information Reply
	0	Information reply message

Table 204 Syslog Logs

LOG MESSAGE	DESCRIPTION
<Facility*8 + Severity>Mon dd hr:mm:ss hostname src="<srcIP:srcPort>" dst="<dstIP:dstPort>" msg="<msg>" note="<note>" devID="<mac address last three numbers>" cat="<category>	"This message is sent by the system ("RAS" displays as the system name if you haven't configured one) when the router generates a syslog. The facility is defined in the web MAIN MENU->LOGS->Log Settings page. The severity is the log's syslog class. The definition of messages and notes are defined in the various log charts throughout this appendix. The "devID" is the last three characters of the MAC address of the router's LAN port. The "cat" is the same as the category in the router's logs.

The following table shows RFC-2408 ISAKMP payload types that the log displays. Please refer to the RFC for detailed information on each type.

Table 205 RFC-2408 ISAKMP Payload Types

LOG DISPLAY	PAYLOAD TYPE
SA	Security Association
PROP	Proposal
TRANS	Transform
KE	Key Exchange
ID	Identification
CER	Certificate
CER_REQ	Certificate Request
HASH	Hash

Table 205 RFC-2408 ISAKMP Payload Types (continued)

LOG DISPLAY	PAYLOAD TYPE
SIG	Signature
NONCE	Nonce
NOTFY	Notification
DEL	Delete
VID	Vendor ID

Log Commands

Go to the command interpreter interface.

Configuring What You Want the Prestige to Log

1. Use the sys logs load command to load the log setting buffer that allows you to configure which logs the Prestige is to record.
2. Use sys logs category to view a list of the log categories.

Figure 287 Displaying Log Categories Example

```
Copyright (c) 1994 - 2004 ZyXEL Communications Corp.
ras>?
Valid commands are:
sys             exit            ether           aux
ip              ipsec           bridge          bm
certificates    cnm             8021x           radius
ras>
```

3. Use sys logs category followed by a log category to display the parameters that are available for the category.

Figure 288 Displaying Log Parameters Example

```
ras> sys logs category access
Usage: [0:none/1:log/2:alert/3:both] [0:don't show debug type/
1:show debug type]
```

4. Use sys logs category followed by a log category and a parameter to decide what to record.

Use 0 to not record logs for that category, 1 to record only logs for that category, 2 to record only alerts for that category, and 3 to record both logs and alerts for that category. Not every parameter is available with every category.

5 Step 5.Use the sys logs save command to store the settings in the Prestige (you must do this in order to record logs).

Displaying Logs

- Use the sys logs display command to show all of the logs in the Prestige's log.
- Use the sys logs category display command to show the log settings for all of the log categories.
- Use the sys logs display [log category] command to show the logs in an individual Prestige log category.
- Use the sys logs clear command to erase all of the Prestige's logs.

Log Command Example

This example shows how to set the Prestige to record the access logs and alerts and then view the results.

```
ras> sys logs load
ras> sys logs category access 3
ras> sys logs save
ras> sys logs display access

#.time                  source                  destination            notes

    message
 0|06/08/2004 05:58:21 |172.21.4.154          |224.0.1.24            |ACCESS
BLOCK
    Firewall default policy: IGMP (W to W/ZW)
 1|06/08/2004 05:58:20 |172.21.3.56           |239.255.255.250       |ACCESS
BLOCK
    Firewall default policy: IGMP (W to W/ZW)
 2|06/08/2004 05:58:20 |172.21.0.2            |239.255.255.254       |ACCESS
BLOCK
    Firewall default policy: IGMP (W to W/ZW)
 3|06/08/2004 05:58:20 |172.21.3.191          |224.0.1.22            |ACCESS
BLOCK
    Firewall default policy: IGMP (W to W/ZW)
 4|06/08/2004 05:58:20 |172.21.0.254          |224.0.0.1             |ACCESS
BLOCK
    Firewall default policy: IGMP (W to W/ZW)
 5|06/08/2004 05:58:20 |172.21.4.187:137      |172.21.255.255:137    |ACCESS
BLOCK
    Firewall default policy: UDP (W to W/ZW)
```

APPENDIX G
Wall-mounting Instructions

Do the following to hang your Prestige on a wall.

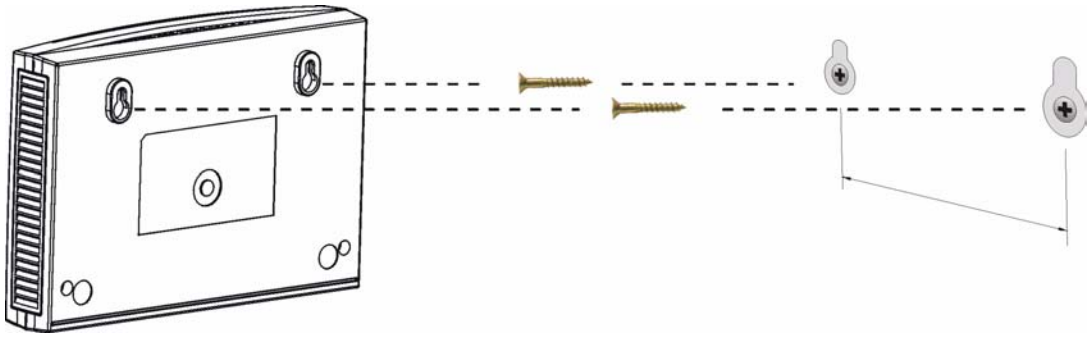
Note: See the product specifications appendix for the size of screws to use and how far apart to place them.

1. Locate a high position on wall that is free of obstructions. Use a sturdy wall.
2. Drill two holes for the screws. Make sure the distance between the centers of the holes matches what is listed in the product specifications appendix.

Note: Be careful to avoid damaging pipes or cables located inside the wall when drilling holes for the screws.

3. Do not screw the screws all the way into the wall. Leave a small gap of about 0.5 cm between the heads of the screws and the wall.
4. Make sure the screws are snugly fastened to the wall. They need to hold the weight of the Prestige with the connection cables.
5. Align the holes on the back of the Prestige with the screws on the wall. Hang the Prestige on the screws.

Figure 289 Wall-mounting Example



Index

Numerics

A

B

C

D

E

F

G

H

I

J

L

M

N

O

P

Q

R

S

T

U

V

W

Z