P-660H/HW-D Series

ADSL2+ 4-port Gateway

User's Guide

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Edition 1
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ZyXEL

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Certifications

Federal Communications Commission (FCC) Interference Statement

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

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

FCC Radiation Exposure Statement

- The device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment, under 47 CFR 2.1093 paragraph (d)(2). End users must follow the specific operating instructions for satisfying RF exposure compliance.
- This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
- To comply with FCC RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons.

注意！

依據 低功率電波輻射性電機管理辦法

第十二條 經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條 低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。
前項合法通信，指依電信規定作業之無線電信。低功率射頻電機須忍

受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

Notices

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.

Viewing Certifications

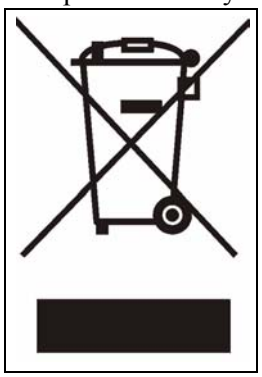
1. Go to http://www.zyxel.com.
2. Select your product from the drop-down list box on the ZyXEL home page to go to that product's page.
3. Select the certification you wish to view from this page.

Safety Warnings

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

- Do NOT use this product near water, for example, in a wet basement or near a swimming pool.
- Do NOT expose your device to dampness, dust or corrosive liquids.
- Do NOT store things on the device.
- Do NOT install, use, or service this device during a thunderstorm. There is a remote risk of electric shock from lightning.
- Connect ONLY suitable accessories to the device.
- 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 should service or disassemble this device. Please contact your vendor for further information.
- ONLY qualified service personnel should service or disassemble this device.
- Make sure to connect the cables to the correct ports.
- Place connecting cables carefully so that no one will step on them or stumble over them.
- Always disconnect all cables from this device before servicing or disassembling.
- Use ONLY an appropriate power adaptor or cord for your device.
- Connect the power adaptor or cord to the right supply voltage (for example, 110V AC in North America or 230V AC in Europe).
- Do NOT allow anything to rest on the power adaptor or cord and do NOT place the product where anyone can walk on the power adaptor or cord.
- Do NOT use the device if the power adaptor or cord is damaged as it might cause electrocution.
- If the power adaptor or cord is damaged, remove it from the power outlet.
- Do NOT attempt to repair the power adaptor or cord. Contact your local vendor to order a new one.
- Do not use the device outside, and make sure all the connections are indoors. There is a remote risk of electric shock from lightning.
- Use only No. 26 AWG (American Wire Gauge) or larger telephone wire.
- Antenna Warning! This device meets ETSI and FCC certification requirements when using the included antenna(s). Only use the included antenna(s).
- If you wall mount your device, make sure that no electrical lines, gas or water pipes will be damaged.

This product is recyclable. Dispose of it properly.



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 / 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	
COSTA RICA	soporte@zyxel.co.cr	+506-2017878	www.zyxel.co.cr	ZyXEL Costa Rica Plaza Roble Escazú Etapa El Patio, Tercer Piso San José, Costa Rica
	sales@zyxel.co.cr	+506-2015098	ftp.zyxel.co.cr	
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
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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	

METHOD / LOCATION	SUPPORT E-MAIL / SALES E-MAIL	TELEPHONE / FAX	WEB SITE / FTP SITE	REGULAR MAIL
NORWAY	support@zyxel.no sales@zyxel.no	+47-22-80-61-80 +47-22-80-61-81	www.zyxel.no	ZyXEL Communications A/S Nils Hansens vei 13 0667 Oslo Norway
POLAND	info@pl.zyxel.com	+48 (22) 333 8250 +48 (22) 333 8251	www.pl.zyxel.com	ZyXEL Communications ul. Okrzei 1A 03-715 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 Arte, 21 5ª planta 28033 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)

+" 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-660HW-D series 802.11g Wireless ADSL 2+ 4-port Gateway or P-660H-D ADSL2+ 4-port Gateway. The P-660HW comes with built-in IEEE 802.11g wireless capability allowing wireless connectivity. The P-660HW-D and P-660H-D have a 4-port switch that allows you to connect up to 4 computers to the P-660H-D or the P-660HW-D without purchasing a switch/hub.

Note: 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.

About This User's Guide

This manual is designed to guide you through the configuration of your ZyXEL Device for its various applications. The web configurator parts of this guide contain background information on features configurable by web configurator.

Note: Use the web configurator or command interpreter interface to configure your ZyXEL Device. Not all features can be configured through all interfaces.

Syntax Conventions

- "Enter" means for you to type one or more characters. "Select" or "Choose" means for you to use one predefined choice.
- Mouse action sequences are denoted using a right angle bracket (>). For example, "In Windows, click **Start > Settings > 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".
- The P-660HW-D or P-660H-D series may be referred to as the "ZyXEL Device" in this User's Guide.

Related Documentation

- Supporting Disk

  Refer to the included CD for support documents.

- Quick Start Guide

  The Quick Start Guide is designed to help you get up and running right away. It contains connection information and instructions on getting started.

- Web Configurator Online Help

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

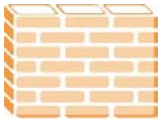
- ZyXEL Web Site

Please go to http://www.zyxel.com for product news, firmware, updated documents, and other support materials.

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.

Graphics Icons Key

ZyXEL Device 	Computer 	Notebook computer 
Server 	DSLAM 	Firewall 
Telephone 	Switch 	Router 
Wireless Signal 		

CHAPTER 1 Getting To Know Your ZyXEL DEVICE

This chapter describes the key features and applications of your ZyXEL Device.

1.1 Introducing the ZyXEL Device

The ZyXEL Device is an ADSL2+ gateway that allows super-fast, secure Internet access over analog (POTS) or digital (ISDN) telephone lines (depending on your model).

In the ZyXEL Device product name, "H" denotes an integrated 4-port switch (hub) and "W" denotes an included wireless LAN card that provides wireless connectivity.

Models ending in "1", for example P-660HW-D1, denote a device that works over the analog telephone system, POTS (Plain Old Telephone Service). Models ending in "3" denote a device that works over ISDN (Integrated Services Digital Network). Models ending in "7" denote a device that works over T-ISDN (UR-2).

Note: Only use firmware for your ZyXEL Device's specific model. Refer to the label on the bottom of your ZyXEL Device.

The DSL RJ-11 (ADSL over POTS models) or RJ-45 (ADSL over ISDN models) connects to your ADSL-enabled telephone line. The ZyXEL Device is compatible with the ADSL/ADSL2/ADSL2+ standards.

1.2 Features

High Speed Internet Access

The ZyXEL Device is ideal for high-speed Internet browsing and making LAN-to-LAN connections to remote networks. The ZyXEL Device is compatible with the ADSL/ADSL2/ ADSL2+ standards. Maximum data rates attainable for each standard are shown in the next table.

Table 1 ADSL Standards

DATA RATE STANDARD	UPSTREAM	DOWNSTREAM
ADSL	832 kbps	8Mbps
ADSL2	3.5Mbps	12Mbps
ADSL2+	3.5Mbps	24Mbps

Note: If your ZyXEL Device does not support Annex M, the maximum ADSL2/2+ upstream data rate is 1.2 Mbps. ZyXEL Devices which work over ISDN do not support Annex M.

The standard your ISP supports determines the maximum upstream and downstream speeds attainable. Actual speeds attained also depend on the distance from your ISP, line quality, etc.

Zero Configuration Internet Access

Once you connect and turn on the ZyXEL Device, it automatically detects the Internet connection settings (such as the VCI/VPI numbers and the encapsulation method) from the ISP and makes the necessary configuration changes. In cases where additional account information (such as an Internet account user name and password) is required or the ZyXEL Device cannot connect to the ISP, you will be redirected to web screen(s) for information input or troubleshooting.

Any IP

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

Firewall

The ZyXEL Device 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 ZyXEL Device firewall supports TCP/UDP inspection, DoS detection and prevention, real time alerts, reports and logs.

Content Filtering

Content filtering allows you to block access to forbidden Internet web sites, schedule when the ZyXEL Device should perform the filtering and give trusted LAN IP addresses unfiltered Internet access.

Traffic Redirect

Traffic redirect forwards WAN traffic to a backup gateway when the ZyXEL Device cannot connect to the Internet, thus acting as an auxiliary if your regular WAN connection fails.

Media Bandwidth Management

ZyXEL's Media 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.

Universal Plug and Play (UPnP)

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

PPPoE (RFC2516)

PPPoE (Point-to-Point Protocol over Ethernet) emulates a dial-up connection. It allows your ISP to use their existing network configuration with newer broadband technologies such as ADSL. The PPPoE driver on the ZyXEL Device is transparent to the computers on the LAN, which see only Ethernet and are not aware of PPPoE thus saving you from having to manage PPPoE clients on individual computers. The ZyXEL Device also includes PPPoE idle time-out (the PPPoE connection terminates after a period of no traffic that you configure) and PPPoE Dial-on-Demand (the PPPoE connection is brought up only when an Internet access request is made).

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).

Dynamic DNS Support

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

DHCP

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

IP Alias

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

TR-069 Compliance

TR-069 is a protocol that defines how your P-660H-D can be managed via a management server such as ZyXEL's Vantage CNM Access. The management server can securely manage and update configuration changes in the P-660H-Ds.

Housing

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

4-port Switch

A combination of switch and router makes your ZyXEL Device a cost-effective and viable network solution. You can connect up to four computers to the ZyXEL Device without the cost of a hub. Use a hub to add more than four computers to your LAN.

1.2.1 Wireless Features (P-660HW-D Only)

Wireless LAN

The ZyXEL Device 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 ZyXEL Device 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.

WPA2

WPA 2 (IEEE 802.11i) is a wireless security standard that defines stronger encryption, authentication and key management than WPA.

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.

Antenna

The ZyXEL Device is equipped with one 3dBi fixed antenna to provide clear radio signal between the wireless stations and the access points.

WEP Encryption

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

Output Power Management

Output power management is the ability to set the level of output power.

There may be interference or difficulty with channel assignment when there is a high density of APs within a coverage area. In this case you can lower the output power of each access point, thus enabling you to place access points closer together.

Wireless LAN MAC Address Filtering

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

1.3 Applications for the ZyXEL Device

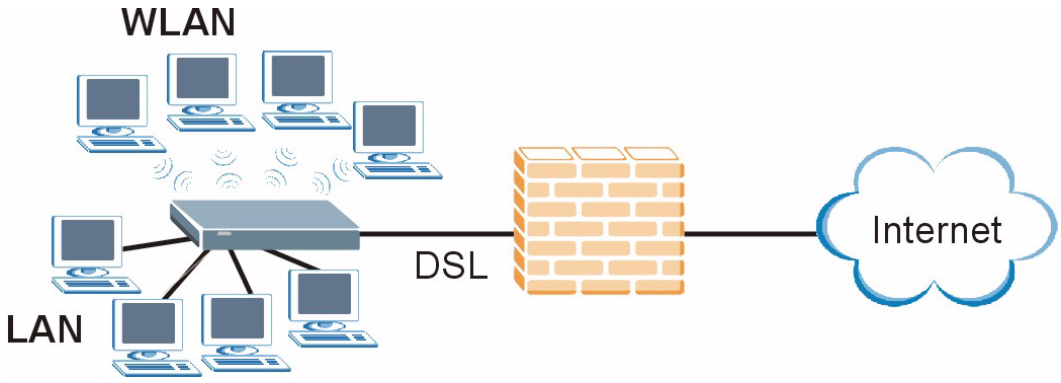
Here are some example uses for which the ZyXEL Device is well suited.

1.3.1 Protected Internet Access

The ZyXEL Device is the ideal high-speed Internet access solution. It is compatible with all major ADSL DSLAM (Digital Subscriber Line Access Multiplexer) providers and supports the ADSL standards as shown in Table 1 on page 35. In addition, the ZyXEL Device with the wireless features allows wireless clients access to your network resources.

The ZyXEL Device provides protection from attacks by Internet hackers. By default, the firewall blocks all incoming traffic from the WAN. The firewall supports TCP/UDP inspection and DoS (Denial of Services) detection and prevention, as well as real time alerts, reports and logs.

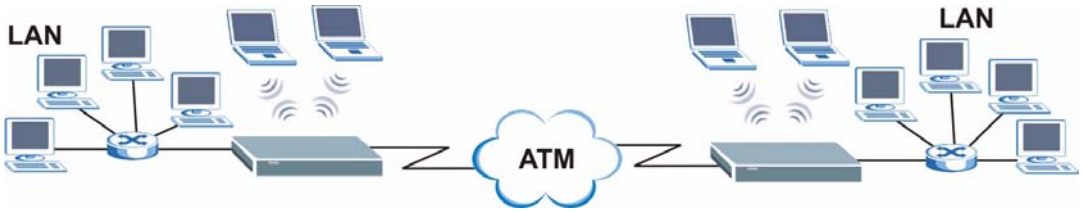
Figure 1 Protected Internet Access Applications



1.3.2 LAN to LAN Application

You can use the ZyXEL Device to connect two geographically dispersed networks over the ADSL line. A typical LAN-to-LAN application example is shown as follows.

Figure 2 LAN-to-LAN Application Example



1.4 Front Panel LEDs

The following figure shows the front panel LEDs.

Figure 3 Front Panel (P-660HW-D)

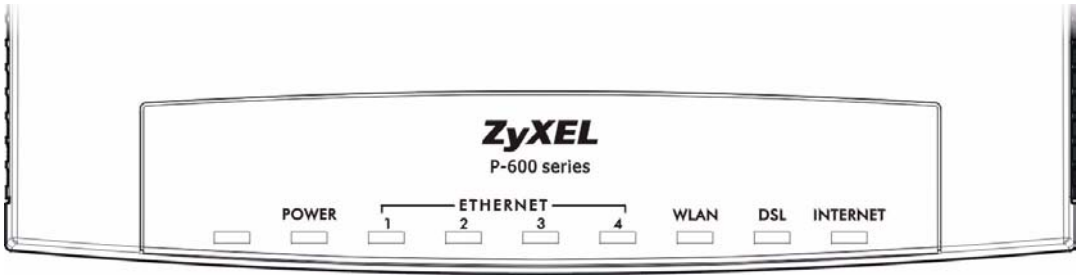
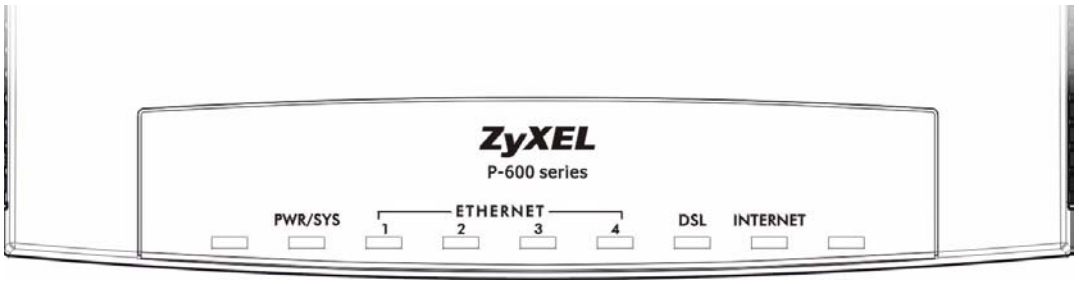


Figure 4 Front Panel (P-660H-D)



The following table describes the LEDs.

Table 2 Front Panel LEDs

LED	COLOR	STATUS	DESCRIPTION
POWER	Green	On	The ZyXEL Device is receiving power and functioning properly.
		Blinking	The ZyXEL Device is rebooting or performing diagnostics.
	Red	On	Power to the ZyXEL Device is too low.
		Off	The system is not ready or has malfunctioned.
ETHERNET	Green	On	The ZyXEL Device has a successful 10Mb Ethernet connection.
		Blinking	The ZyXEL Device is sending/receiving data.
	Amber	On	The ZyXEL Device has a successful 100Mb Ethernet connection.
		Blinking	The ZyXEL Device is sending/receiving data.
		Off	The LAN is not connected.
WLAN (P-660HW-D only)	Green	On	The ZyXEL Device is ready, but is not sending/receiving data through the wireless LAN.
		Blinking	The ZyXEL Device is sending/receiving data through the wireless LAN.
		Off	The wireless LAN is not ready or has failed.
DSL	Green	On	The DSL line is up.
		Blinking	The ZyXEL Device is initializing the DSL line.
		Off	The DSL line is down.

Table 2 Front Panel LEDs (continued)

LED	COLOR	STATUS	DESCRIPTION
INTERNET	Green	On	The Internet connection is up.
		Blinking	The ZyXEL Device is sending/receiving data.
		Off	The Internet connection is down.

1.5 Hardware Connection

Refer to the Quick Start Guide for information on hardware connection.

CHAPTER 2
Introducing the Web Configurator

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

2.1 Web Configurator Overview

The web configurator is an HTML-based management interface that allows easy ZyXEL Device 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).

See the chapter on troubleshooting if you need to make sure these functions are allowed in Internet Explorer.

2.2 Accessing the Web Configurator

Note: Even though you can connect to the ZyXEL Device wirelessly, it is recommended that you connect your computer to a LAN port for initial configuration.

1. Make sure your ZyXEL Device hardware is properly connected (refer to the Quick Start Guide).
2. Prepare your computer/computer network to connect to the ZyXEL Device (refer to the Quick Start Guide).
3. Launch your web browser.
4. Type "192.168.1.1" as the URL.
5. A window displays as shown. Enter the default admin password **1234** to configure the wizards and the advanced features or enter the default user password **user** to view the

status only. Click **Login** to proceed to a screen asking you to change your password or click **Cancel** to revert to the default password.

Figure 5 Password Screen

6 If you entered the user password, skip the next two steps and refer to Section 2.4.2 on page 47 for more information about the **Status** screen.

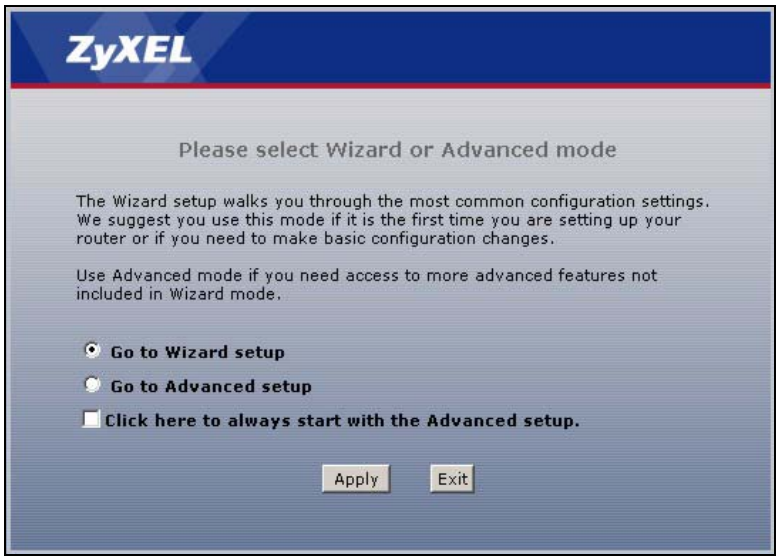
If you entered the admin password, it is highly recommended you change the default admin password! Enter a new password between 1 and 30 characters, retype it to confirm and click **Apply**; alternatively click **Ignore** to proceed to the main menu if you do not want to change the password now.

Note: If you do not change the password at least once, the following screen appears every time you log in with the admin password.

Figure 6 Change Password at Login

7 Select **Go to Wizard setup** and click **Apply** to display the wizard main screen. Otherwise, select **Go to Advanced setup** and click **Apply** to display the **Status** screen.

Figure 7 Select a Mode



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 ZyXEL Device if this happens to you.

2.3 Resetting the ZyXEL Device

If you forget your password or cannot access the web configurator, you will need to use the **RESET** button at the back of the ZyXEL Device 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 Using the Reset Button

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

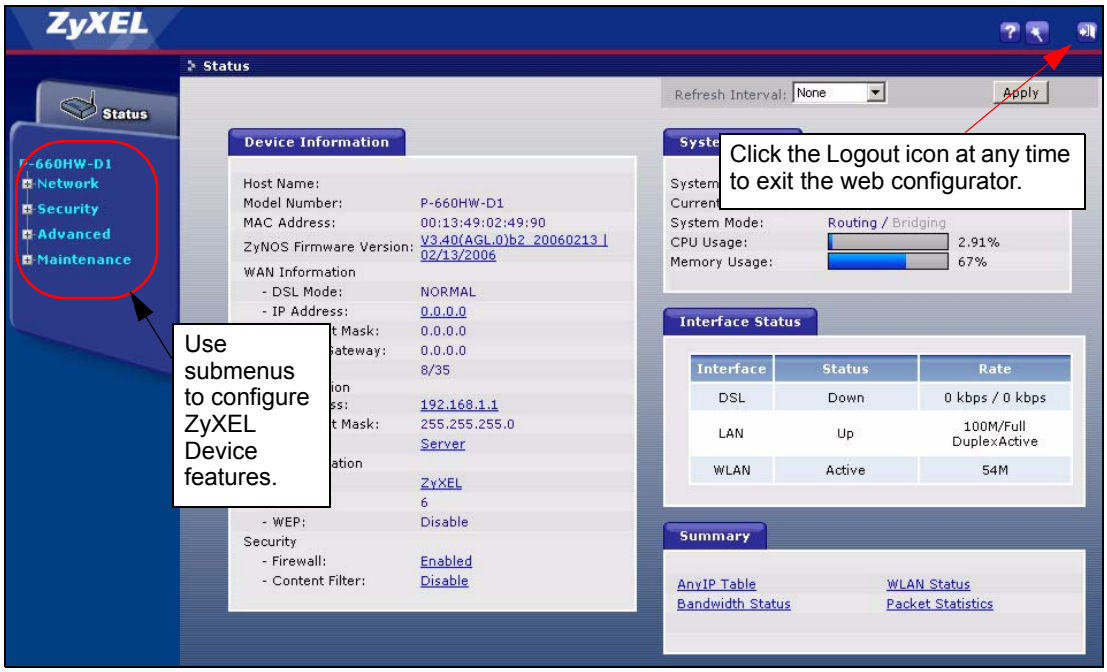
2.4 Navigating the Web Configurator

We use the P-660HW-D1 web screens in this guide as an example. Screens vary slightly for different ZyXEL Device models.

2.4.1 Navigation Panel

After you enter the admin password, use the sub-menus on the navigation panel to configure ZyXEL Device features. The following table describes the sub-menus.

Figure 8 Web Configurator: Main Screen



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

Table 3 Web Configurator Screens Summary

LINK/ICON	SUB-LINK	FUNCTION
Wizard	INTERNET/ WIRELESS SETUP	Use these screens for initial configuration including general setup, ISP parameters for Internet Access and WAN IP/DNS Server/MAC address assignment.
	BANDWIDTH MANAGEMENT SETUP	Use these screens to limit bandwidth usage by application or packet type.
Logout		Click this icon to exit the web configurator.
Status		This screen shows the ZyXEL Device's general device, system and interface status information. Use this screen to access the summary statistics tables.
Network		
WAN	Internet Connection	This screen allows you to configure ISP parameters, WAN IP address assignment, DNS servers and other advanced properties.
	More Connections	Use this screen to view and configure other connections for placing calls to another remote gateway.
	WAN Backup Setup	Use this screen to configure your traffic redirect properties and WAN backup settings.

Table 3 Web Configurator Screens Summary (continued)

LINK/ICON	SUB-LINK	FUNCTION
LAN	IP	Use this screen to configure LAN TCP/IP settings, enable Any IP and other advanced properties.
	DHCP Setup	Use this screen to configure LAN DHCP settings.
	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).
	IP Alias	Use this screen to partition your LAN interface into subnets.
Wireless LAN (Wireless devices only)	General	Use this screen to configure the wireless LAN settings and WLAN authentication/security settings.
	OTIST	This screen allows you to assign wireless clients the ZyXEL Device's wireless security settings.
	MAC Filter	Use this screen to configure the ZyXEL Device to block access to devices or block the devices from accessing the ZyXEL Device.
	QoS	WMM QoS allows you to prioritize wireless traffic according to the delivery requirements of the individual and applications.
NAT	General	Use this screen to enable NAT.
	Port Forwarding	Use this screen to configure servers behind the ZyXEL Device.
	Address Mapping	Use this screen to configure network address translation mapping rules.
Security		
Firewall	General	Use this screen to activate/deactivate the firewall and the direction of network traffic to which to apply the rule.
	Rules	This screen shows a summary of the firewall rules, and allows you to edit/add a firewall rule.
	Anti Probing	Use this screen to change your anti-probing settings.
	Threshold	Use this screen to configure the threshold for DoS attacks.
Content Filter	Keyword	Use this screen to block sites containing certain keywords in the URL.
	Schedule	Use this screen to set the days and times for the ZyXEL Device to perform content filtering.
	Trusted	Use this screen to exclude a range of users on the LAN from content filtering on your ZyXEL Device.
Advanced		
Static Route		Use this screen to configure IP static routes.
Bandwidth MGMT	Summary	Use this screen to enable bandwidth management on an interface.
	Rule Setup	Use this screen to define a bandwidth rule.
	Monitor	Use this screen to view the ZyXEL Device's bandwidth usage and allotments.
Dynamic DNS		Use this screen to set up dynamic DNS.

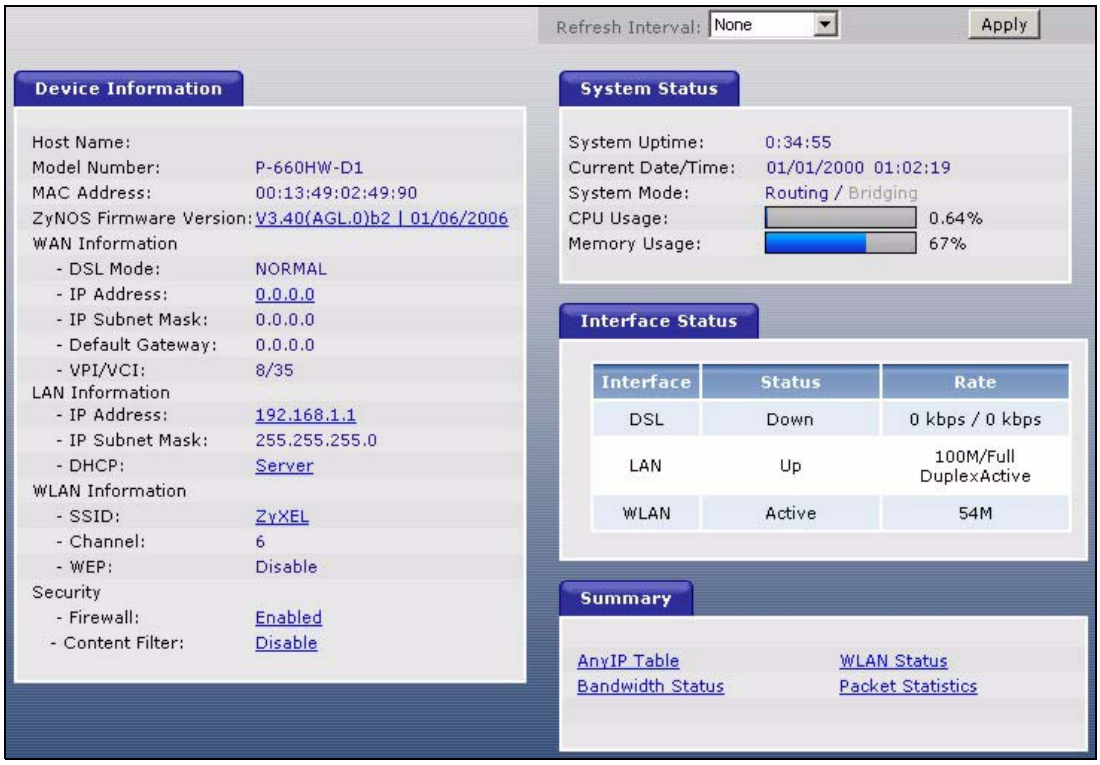
Table 3 Web Configurator Screens Summary (continued)

LINK/ICON	SUB-LINK	FUNCTION
Remote MGMT	WWW	Use this screen to configure through which interface(s) and from which IP address(es) users can use HTTPS or HTTP to manage the ZyXEL Device.
	Telnet	Use this screen to configure through which interface(s) and from which IP address(es) users can use Telnet to manage the ZyXEL Device.
	FTP	Use this screen to configure through which interface(s) and from which IP address(es) users can use FTP to access the ZyXEL Device.
	SNMP	Use this screen to configure your ZyXEL Device'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 ZyXEL Device.
	ICMP	Use this screen to change your anti-probing settings.
UPnP		Use this screen to enable UPnP on the ZyXEL Device.
Maintenance		
System	General	This screen contains administrative and system-related information and also allows you to change your password.
	Time Setting	Use this screen to change your ZyXEL Device'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 ZyXEL Device's log settings.
Tools	Firmware	Use this screen to upload firmware to your ZyXEL Device.
	Configuration	Use this screen to backup and restore the configuration or reset the factory defaults to your ZyXEL Device.
	Restart	This screen allows you to reboot the ZyXEL Device without turning the power off.
Diagnostic	General	These screens display information to help you identify problems with the ZyXEL Device general connection.
	DSL Line	These screens display information to help you identify problems with the DSL line.

2.4.2 Status Screen

The following summarizes how to navigate the web configurator from the **Status** screen. Some fields or links are not available if you entered the user password in the login password screen (see Figure 5 on page 43). Not all fields are available on all models.

Figure 9 Status Screen



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

Table 4 Status Screen

LABEL	DESCRIPTION
Refresh Interval	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.
Apply	Click this button to refresh the status screen statistics.
Device Information	
Host Name	This is the **System Name** you enter in the **Maintenance** > **System** > **General** screen. It is for identification purposes.
Model Number	This is your ZyXEL Device's model name.
MAC Address	This is the MAC (Media Access Control) or Ethernet address unique to your ZyXEL Device.
ZyNOS Firmware Version	This is the ZyNOS Firmware version and the date created. ZyNOS is ZyXEL's proprietary Network Operating System design.
WAN Information	
DSL Mode	This is the standard that your ZyXEL Device is using.
IP Address	This is the WAN port IP address.
IP Subnet Mask	This is the WAN port IP subnet mask.
Default Gateway	This is the IP address of the default gateway, if applicable.
VPI/VCI	This is the Virtual Path Identifier and Virtual Channel Identifier that you entered in the wizard or **WAN** screen.

Table 4 Status Screen

LABEL	DESCRIPTION
LAN Information	
IP Address	This is the LAN port IP address.
IP Subnet Mask	This is the LAN port IP subnet mask.
DHCP	This is the LAN port DHCP role - **Server**, **Relay** or **None**.
WLAN Information (Wireless devices only)	
SSID	This is the descriptive name used to identify the ZyXEL Device in the wireless LAN.
Channel	This is the channel number used by the ZyXEL Device now.
WEP	This displays the status of WEP data encryption.
Security	
Firewall	This displays whether or not the ZyXEL Device's firewall is activated.
Content Filter	This displays whether or not the ZyXEL Device's content filtering is activated.
System Status	
System Uptime	This is the total time the ZyXEL Device has been on.
Current Date/Time	This field displays your ZyXEL Device's present date and time.
System Mode	This displays whether the ZyXEL Device is functioning as a router or a bridge.
CPU Usage	This number shows how many kilobytes of the heap memory the ZyXEL Device 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 ZyXEL Device'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 ZyXEL Device's total heap memory (in kilobytes). The bar displays what percent of the ZyXEL Device's heap memory is in use. The bar turns from green to red when the maximum is being approached.
Interface Status	
Interface	This displays the ZyXEL Device port types.
Status	This field displays **Down** (line is down), **Up** (line is up or connected) if you're using Ethernet encapsulation and **Down** (line is down), **Up** (line is up or connected), **Idle** (line (ppp) idle), **Dial** (starting to trigger a call) and **Drop** (dropping a call) if you're using PPPoE encapsulation. For the WLAN port, it displays **Active** when WLAN is enabled or **Inactive** when WLAN is disabled.
Rate	For the LAN ports, this displays the port speed and duplex setting. For the WAN port, it displays the downstream and upstream transmission rate. For the WLAN port, it displays the transmission rate when WLAN is enabled or **N/A** when 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 ZyXEL Device.
WLAN Status (Wireless devices only)	This screen displays the MAC address(es) of the wireless stations that are currently associating with the ZyXEL Device.

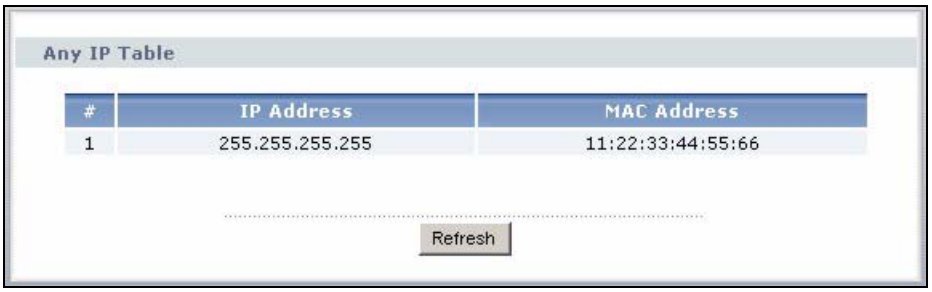
Table 4 Status Screen

LABEL	DESCRIPTION
Bandwidth Status	Use this screen to view the ZyXEL Device's bandwidth usage and allotments.
Packet Statistics	Use this screen to view port status and packet specific statistics.

2.4.3 Status: Any IP Table

Click the **Any IP Table** 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 ZyXEL Device.

Figure 10 Status: Any IP Table



The following table describes the labels in this screen.

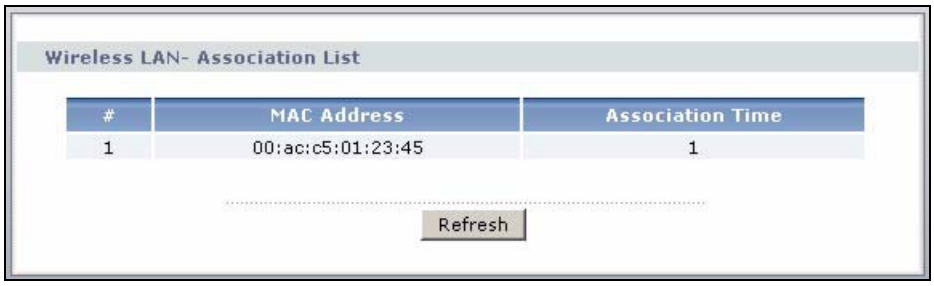
Table 5 Status: Any IP Table

LABEL	DESCRIPTION
#	This is the index number of the host computer.
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.

2.4.4 Status: WLAN Status

Click the **WLAN Status** hyperlink in the **Status** screen to view the wireless stations that are currently associated to the ZyXEL Device.

Figure 11 Status: WLAN Status



The following table describes the labels in this screen.

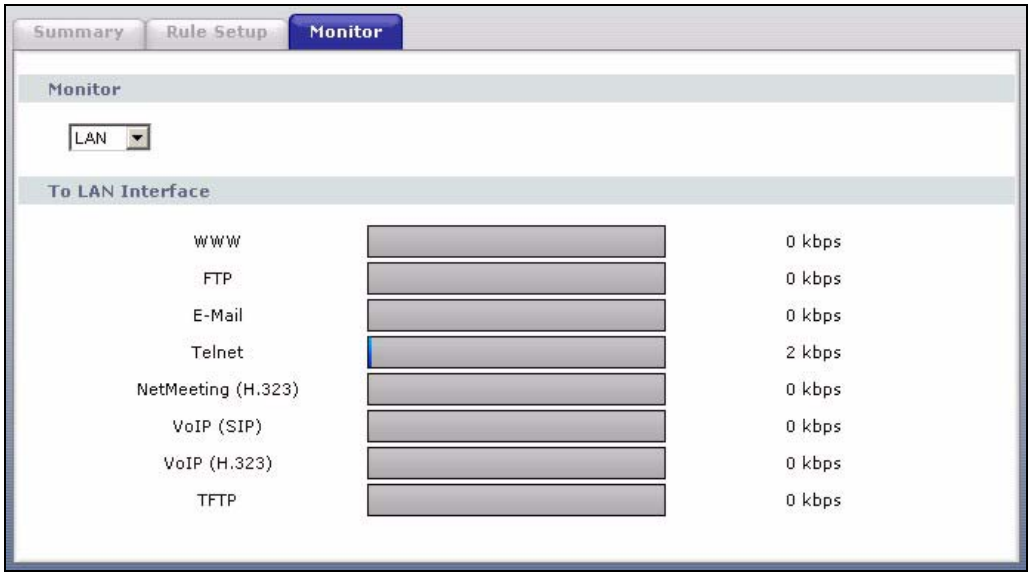
Table 6 Status: WLAN Status

LABEL	DESCRIPTION
#	This is the index number of an associated wireless station.
MAC Address	This field displays the MAC (Media Access Control) address of an associated wireless station.
Association TIme	This field displays the time a wireless station first associated with the ZyXEL Device.
Refresh	Click **Refresh** to reload this screen.

2.4.5 Status: Bandwidth Status

Click the **Bandwidth Status** hyperlink in the **Status** screen. Select an interface from the drop-down list box to view the bandwidth usage of its bandwidth rules. The gray section of the bar represents the percentage of unused bandwidth and the blue color represents the percentage of bandwidth in use.

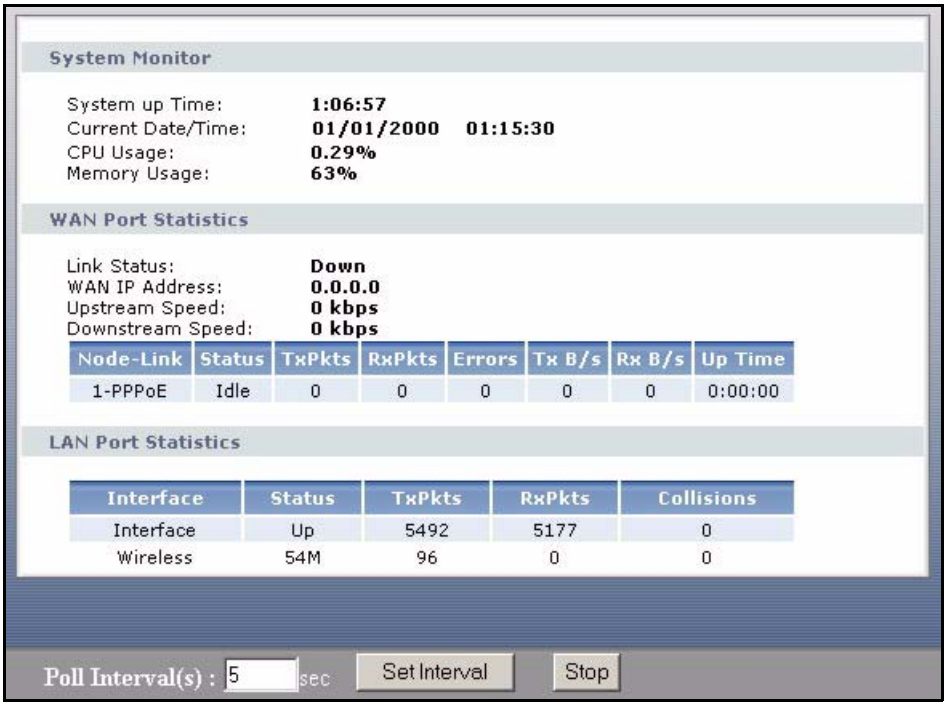
Figure 12 Status: Bandwidth Status



2.4.6 Status: Packet Statistics

Click the **Packet Statistics** 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. Not all fields are available on all models

Figure 13 Status: Packet Statistics



The following table describes the fields in this screen.

Table 7 Status: Packet Statistics

LABEL	DESCRIPTION
System Monitor	
System up Time	This is the elapsed time the system has been up.
Current Date/Time	This field displays your ZyXEL Device's present date and time.
CPU Usage	This field specifies the percentage of CPU utilization.
Memory Usage	This field specifies the percentage of memory utilization.
LAN or WAN Port Statistics	This is the WAN or LAN port.
Link Status	This is the status of your WAN link.
Upstream Speed	This is the upstream speed of your ZyXEL Device.
Downstream Speed	This is the downstream speed of your ZyXEL Device.
Node-Link	This field displays the remote node index number and link type. Link types are PPPoA, ENET, RFC 1483 and PPPoE.
Interface	This field displays the type of port.

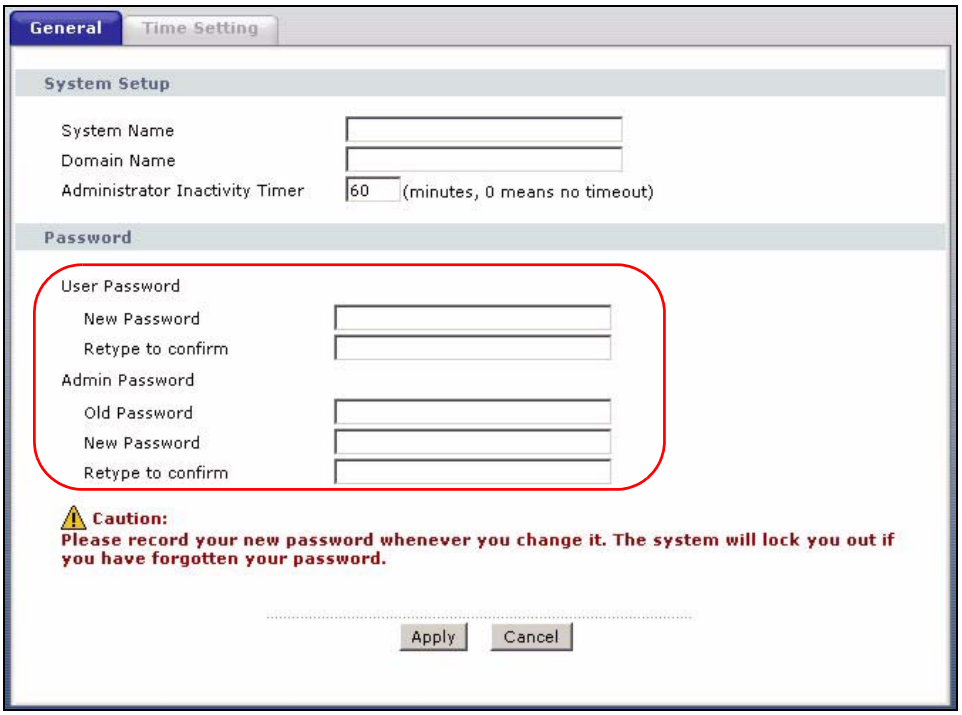
Table 7 Status: Packet Statistics (continued)

LABEL	DESCRIPTION
Status	This field displays **Down** (line is down), **Up** (line is up or connected) if you're using Ethernet encapsulation and **Down** (line is down), **Up** (line is up or connected), **Idle** (line (ppp) idle), **Dial** (starting to trigger a call) and **Drop** (dropping a call) if you're using PPPoE encapsulation. For the WLAN port, it displays the transmission rate when WLAN is enabled or **N/A** when WLAN is disabled.
TxPkts	This field displays the number of packets transmitted on this port.
RxPkts	This field displays the number of packets received on this port.
Errors	This field displays the number of error packets on this port.
Tx B/s	This field displays the number of bytes transmitted in the last second.
Rx B/s	This field displays the number of bytes received in the last second.
Up Time	This field displays the elapsed time this port has been up.
Collisions	This is the number of collisions on this port.
Poll Interval(s)	Type the time interval for the browser to refresh system statistics.
Set Interval	Click this button to apply the new poll interval you entered in the **Poll Interval** field above.
Stop	Click this button to halt the refreshing of the system statistics.

2.4.7 Changing Login Password

It is highly recommended that you periodically change the password for accessing the ZyXEL Device. If you didn't change the default one after you logged in or you want to change to a new password again, then click **Maintenance > System** to display the screen as shown next. See Table 89 on page 227 for detailed field descriptions.

Figure 14 System General



CHAPTER 3
Wizard Setup for Internet Access

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

3.1 Introduction

Use the wizard setup screens to configure your system for Internet access with the information given to you by your ISP.

Note: See the advanced menu chapters for background information on these fields.

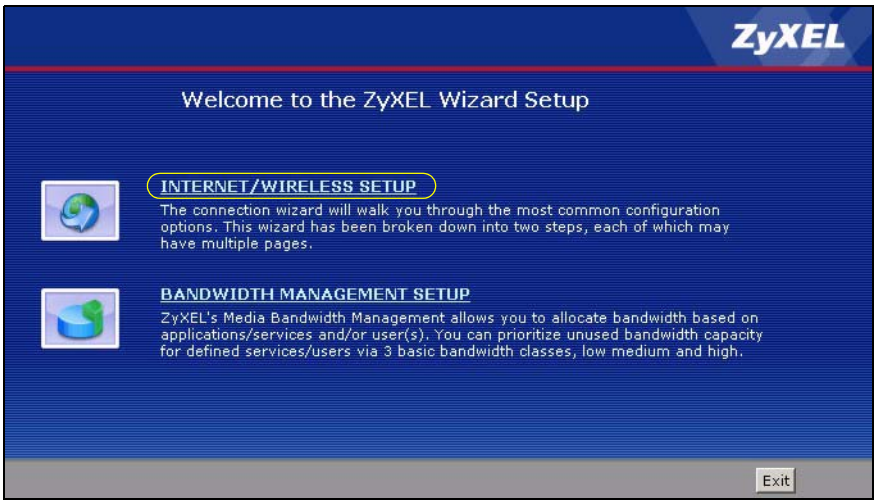
3.2 Internet Access Wizard Setup

1 After you enter the admin password to access the web configurator, select **Go to Wizard setup** and click **Apply**. Otherwise, click the wizard icon ( ) in the top right corner of the web configurator to display the wizard main screen.

Figure 15 Select a Mode

2 Click **INTERNET/WIRELESS SETUP** to configure the system for Internet access and wireless connection.

Figure 16 Wizard: Welcome

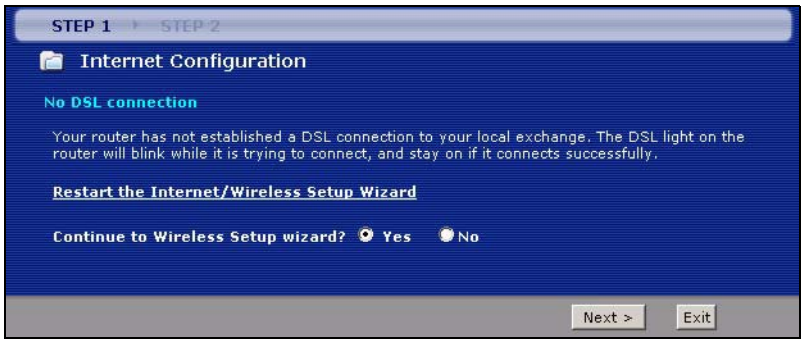


3 The wizard attempts to detect which WAN connection type you are using.

If the wizard detects your connection type and your ISP uses PPPoE or PPPoA, go to Section 3.2.1 on page 58. The screen varies depending on the connection type you use.

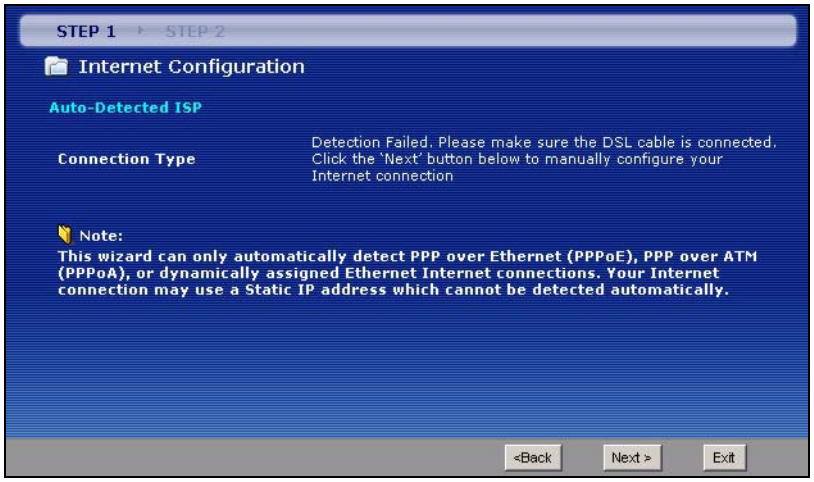
If the wizard does not detect a connection type and the following screen appears (see Figure 17 on page 57), check your hardware connections and click **Restart the Internet/ Wireless Setup Wizard** to have the ZyXEL Device detect your connection again.

Figure 17 Auto Detection: No DSL Connection



If the wizard still cannot detect a connection type and the following screen appears (see Figure 18 on page 58), click **Next** and refer to Section 3.2.2 on page 58 on how to configure the ZyXEL Device for Internet access manually.

Figure 18 Auto Detection: Failed

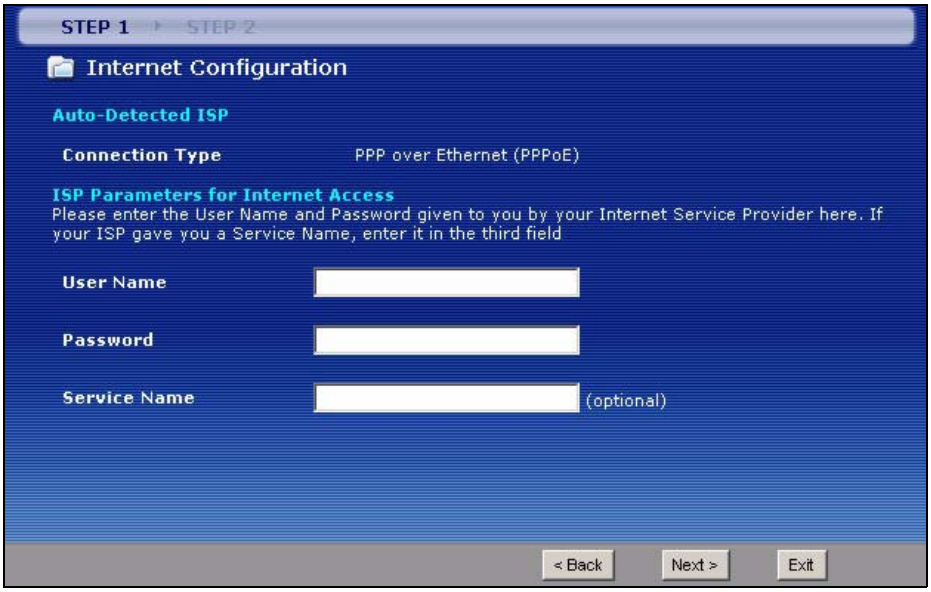


3.2.1 Automatic Detection

1 If you have a PPPoE or PPPoA connection, a screen displays prompting you to enter your Internet account information. Enter the username, password and/or service name exactly as provided.

2 Click **Next** and see Section 3.3 on page 63 for wireless connection wizard setup.

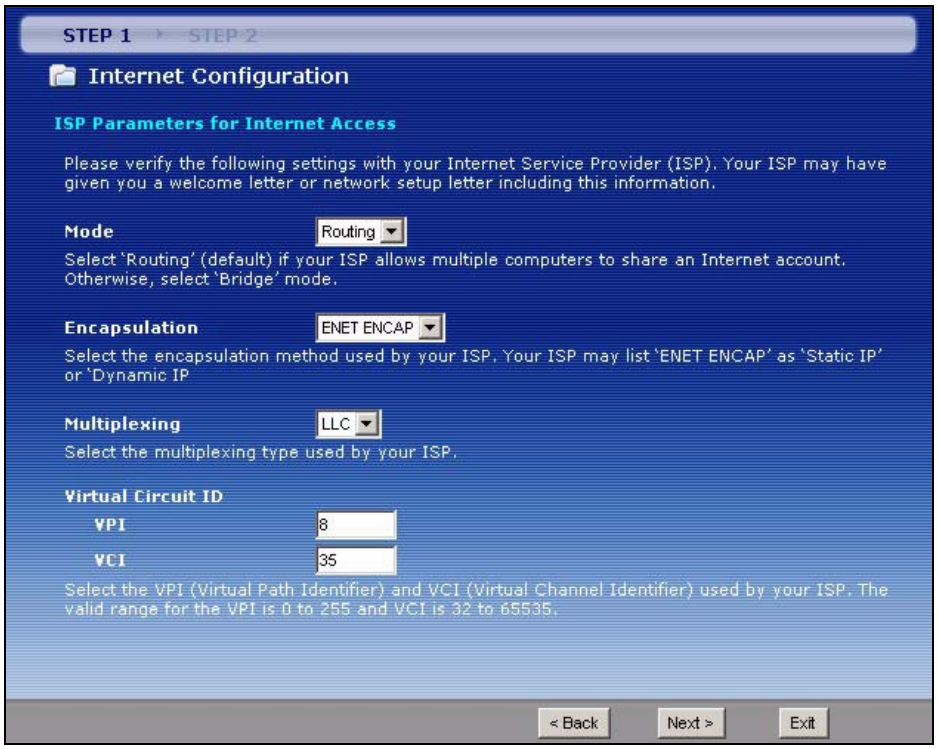
Figure 19 Auto-Detection: PPPoE



3.2.2 Manual Configuration

1 If the ZyXEL Device fails to detect your DSL connection type, enter the Internet access information given to you by your ISP exactly in the wizard screen. If not given, leave the fields set to the default.

Figure 20 Internet Access Wizard Setup: ISP Parameters



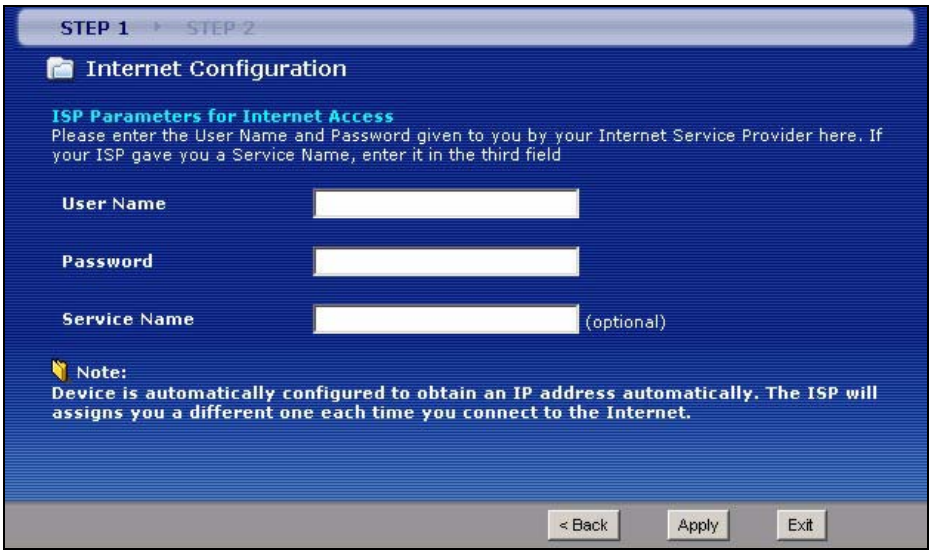
The following table describes the fields in this screen.

Table 8 Internet Access Wizard Setup: ISP Parameters

LABEL	DESCRIPTION
Mode	From the **Mode** drop-down list box, select **Routing** (default) if your ISP allows multiple computers to share an Internet account. Otherwise select **Bridge**.
Encapsulation	Select the encapsulation type your ISP uses from the **Encapsulation** drop-down list box. Choices vary depending on what you select in the **Mode** field. If you select **Bridge** in the **Mode** field, select either **PPPoA** or **RFC 1483**. If you select **Routing** in the **Mode** field, select **PPPoA**, **RFC 1483**, **ENET ENCAP** or **PPPoE**.
Multiplexing	Select the multiplexing method used by your ISP from the **Multiplex** drop-down list box either VC-based or LLC-based.
Virtual Circuit ID	VPI (Virtual Path Identifier) and VCI (Virtual Channel Identifier) define a virtual circuit. Refer to the appendix for more information.
VPI	Enter the VPI assigned to you. This field may already be configured.
VCI	Enter the VCI assigned to you. This field may already be configured.
Back	Click **Back** to go back to the previous screen.
Next	Click **Next** to continue to the next wizard screen. The next wizard screen you see depends on what protocol you chose above.
Exit	Click **Exit** to close the wizard screen without saving your changes.

2 The next wizard screen varies depending on what mode and encapsulation type you use. All screens shown are with routing mode. Configure the fields and click **Next** to continue. See Section 3.3 on page 63 for wireless connection wizard setup

Figure 21 Internet Connection with PPPoE

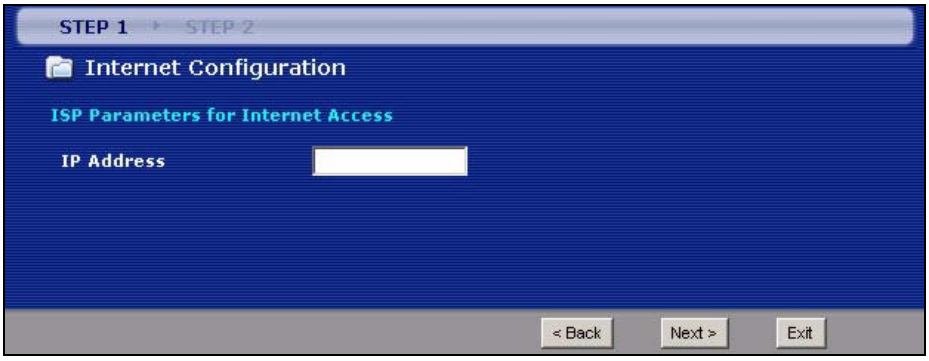


The following table describes the fields in this screen.

Table 9 Internet Connection with PPPoE

LABEL	DESCRIPTION
User Name	Enter the user name exactly as your ISP assigned. If assigned a name in the form user@domain where domain identifies a service name, then enter both components exactly as given.
Password	Enter the password associated with the user name above.
Service Name	Type the name of your PPPoE service here.
Back	Click **Back** to go back to the previous wizard screen.
Apply	Click **Apply** to save your changes back to the ZyXEL Device.
Exit	Click **Exit** to close the wizard screen without saving your changes.

Figure 22 Internet Connection with RFC 1483

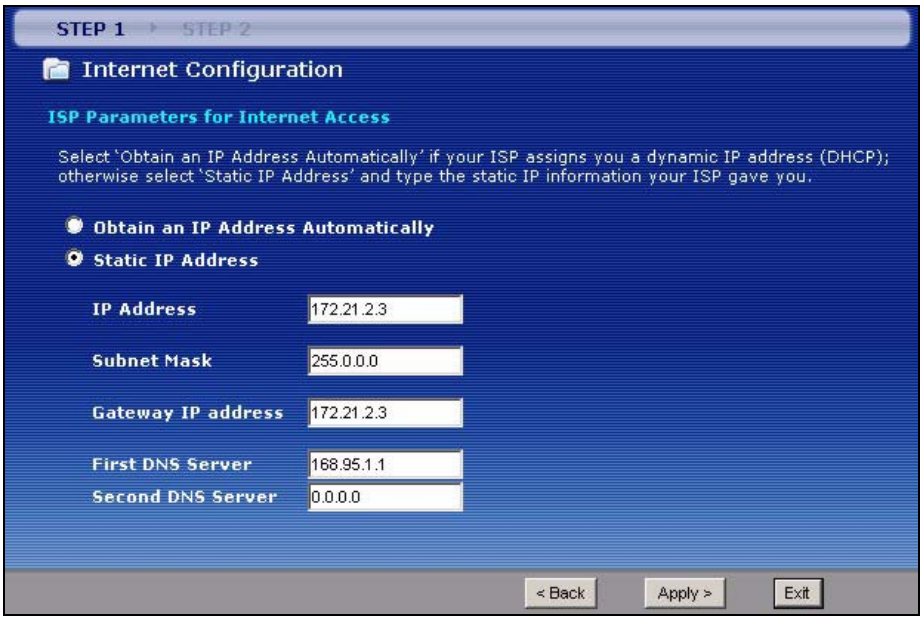


The following table describes the fields in this screen.

Table 10 Internet Connection with RFC 1483

LABEL	DESCRIPTION
IP Address	This field is available if you select **Routing** in the **Mode** field. Type your ISP assigned IP address in this field.
Back	Click **Back** to go back to the previous wizard screen.
Next	Click **Next** to continue to the next wizard screen.
Exit	Click **Exit** to close the wizard screen without saving your changes.

Figure 23 Internet Connection with ENET ENCAP



The following table describes the fields in this screen.

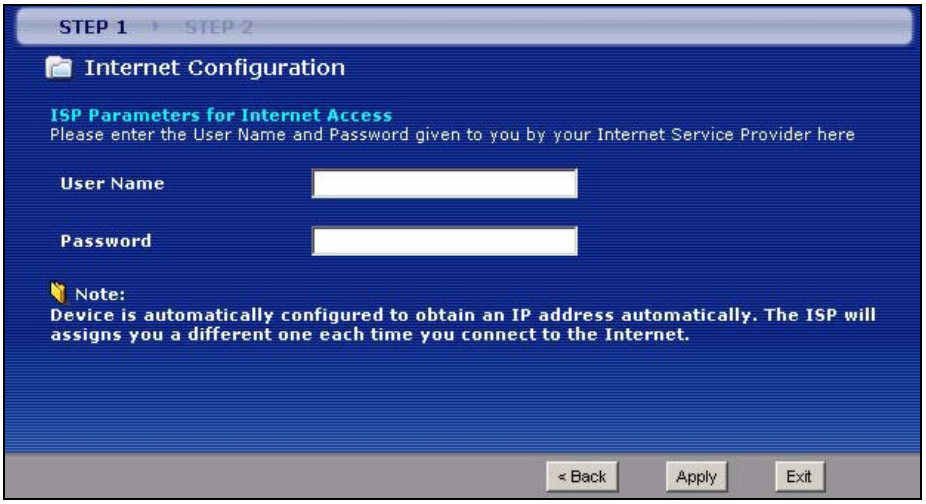
Table 11 Internet Connection with ENET ENCAP

LABEL	DESCRIPTION
Obtain an IP Address Automatically	A static IP address is a fixed IP that your ISP gives you. A dynamic IP address is not fixed; the ISP assigns you a different one each time you connect to the Internet. Select **Obtain an IP Address Automatically** if you have a dynamic IP address.
Static IP Address	Select **Static IP Address** if your ISP gives you a fixed IP address.
IP Address	Enter your ISP assigned IP address.
Subnet Mask	Enter a subnet mask in dotted decimal notation. Refer to the appendices to calculate a subnet mask If you are implementing subnetting.
Gateway IP address	You must specify a gateway IP address (supplied by your ISP) when you use **ENET ENCAP** in the **Encapsulation** field in the previous screen.
First DNS Server	Enter the IP addresses of the DNS servers. The DNS servers are passed to the DHCP clients along with the IP address and the subnet mask.

Table 11 Internet Connection with ENET ENCAP (continued)

LABEL	DESCRIPTION
Second DNS Server	As above.
Back	Click **Back** to go back to the previous wizard screen.
Apply	Click **Apply** to save your changes back to the ZyXEL Device.
Exit	Click **Exit** to close the wizard screen without saving your changes.

Figure 24 Internet Connection with PPPoA



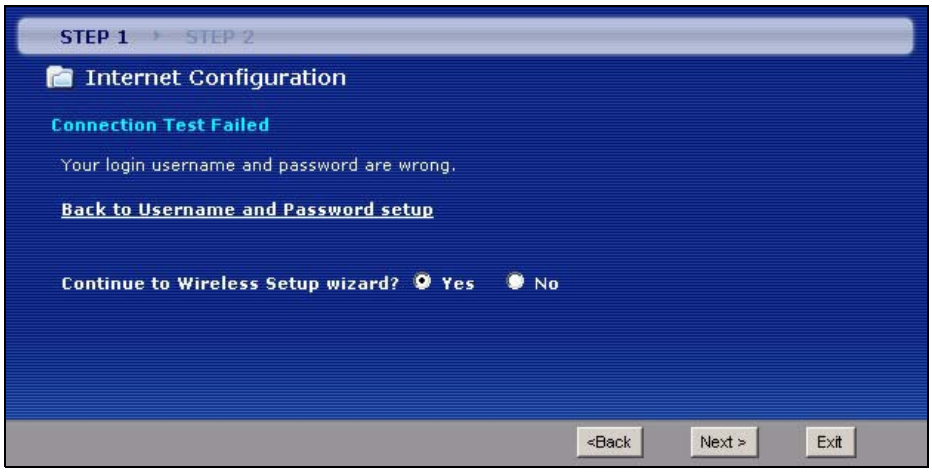
The following table describes the fields in this screen.

Table 12 Internet Connection with PPPoA

LABEL	DESCRIPTION
User Name	Enter the login name that your ISP gives you.
Password	Enter the password associated with the user name above.
Back	Click **Back** to go back to the previous wizard screen.
Apply	Click **Apply** to save your changes back to the ZyXEL Device.
Exit	Click **Exit** to close the wizard screen without saving your changes.

- If the user name and/or password you entered for PPPoE or PPPoA connection are not correct, the screen displays as shown next. Click **Back to Username and Password setup** to go back to the screen where you can modify them.

Figure 25 Connection Test Failed-1



- If the following screen displays, check if your account is activated or click **Restart the Internet/Wireless Setup Wizard** to verify your Internet access settings.

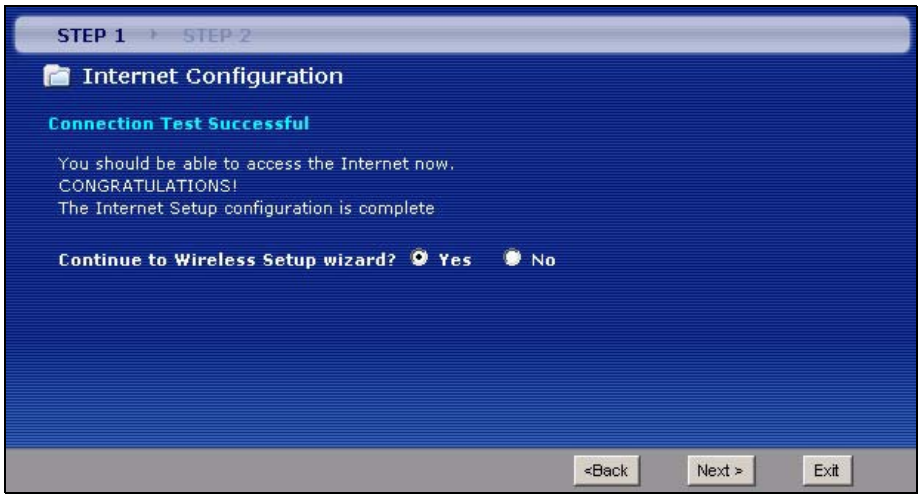
Figure 26 Connection Test Failed-2.

3.3 Wireless Connection Wizard Setup

After you configure the Internet access information, use the following screens to set up your wireless LAN. This section is available on the wireless devices only.

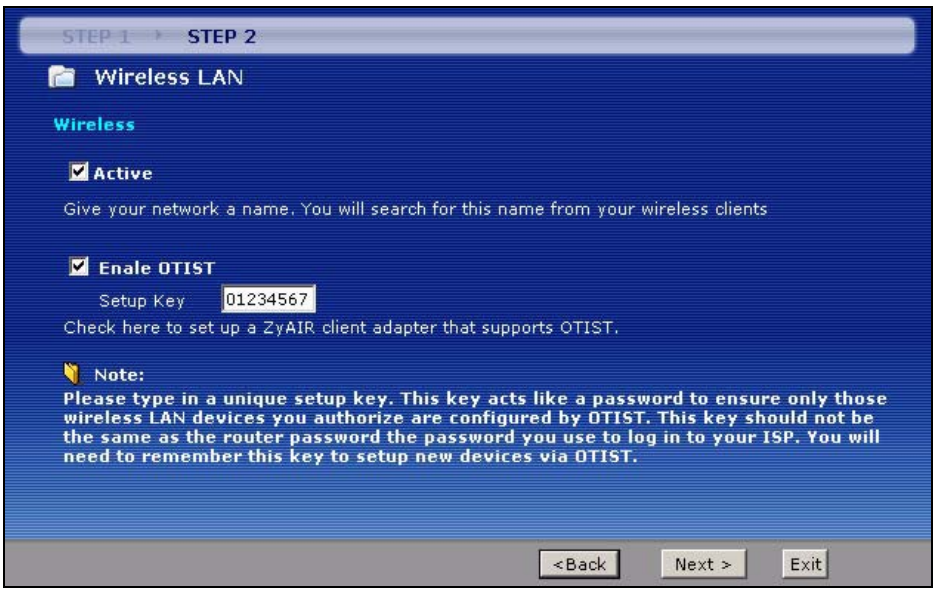
1 Select **Yes** and click **Next** to configure wireless settings. Otherwise, select **No** and skip to Step 6.

Figure 27 Connection Test Successful



2 Use this screen to activate the wireless LAN and OTIST. Click **Next** to continue.

Figure 28 Wireless LAN Setup Wizard 1



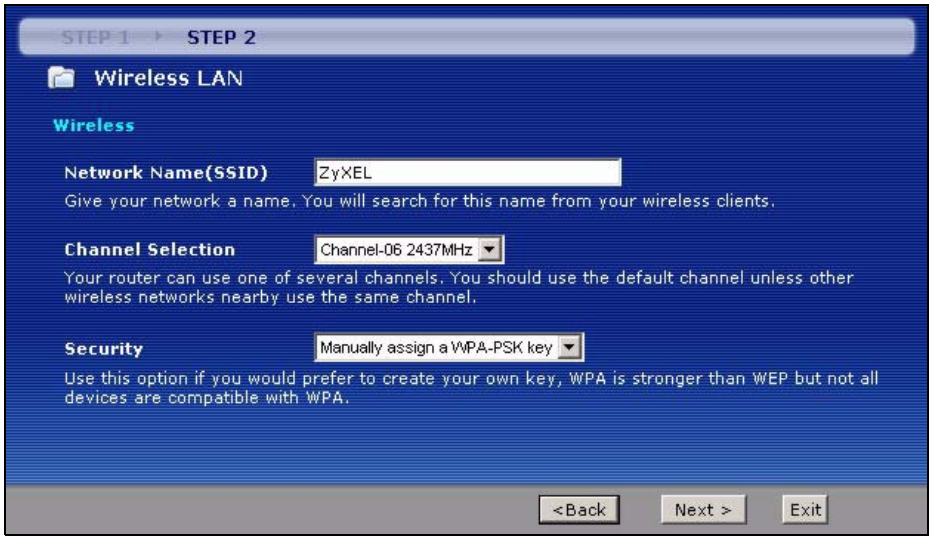
The following table describes the labels in this screen.

Table 13 Wireless LAN Setup Wizard 1

LABEL	DESCRIPTION
Active	Select the check box to turn on the wireless LAN.
Enable OTIST	Select the check box to enable OTIST if you want to transfer your ZyXEL Device's SSID and WPA-PSK security settings to wireless clients that support OTIST and are within transmission range. You must also activate and start OTIST on the wireless client at the same time. The process takes three minutes to complete. **Note:** Enable OTIST only if your wireless clients support WPA and OTIST.
Setup Key	Type an OTIST **Setup Key** of up to eight ASCII characters in length. Be sure to use the same OTIST **Setup Key** on the ZyXEL Device 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.

3 Configure your wireless settings in this screen. Click **Next**.

Figure 29 Wireless LAN Setup Wizard 2



The following table describes the labels in this screen.

Table 14 Wireless LAN Setup Wizard 2

LABEL	DESCRIPTION
Network 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 ZyXEL Device, 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 **Automatically assign a WPA key (Recommended)** to have the ZyXEL Device create a pre-shared key (WPA-PSK) automatically only if your wireless clients support WPA and OTIST. This option is availeble only when you enable OTIST in the previous wizard screen. Select **Manually assign a WPA-PSK key** to configure a pre-shared key (WPA-PSK). Choose this option only if your wireless clients support WPA. See Section 3.3.1 on page 66 for more information. Select **Manually assign a WEP key** to configure a WEP Key. See Section 3.3.2 on page 67 for more information. Select **Disable wireless security** to have no wireless LAN security configured and your network is accessible to any wireless networking device that is within range. **Note:** If you enable OTIST in the previous wizard screen but select **Disable wireless security** here, the ZyXEL Device still creates a pre-shared key (WPA-PSK) automatically. If you enable OTIST and select **Manually assign a WEP key**, the ZyXEL Device will replace the WEP key with a WPA-PSK.
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.

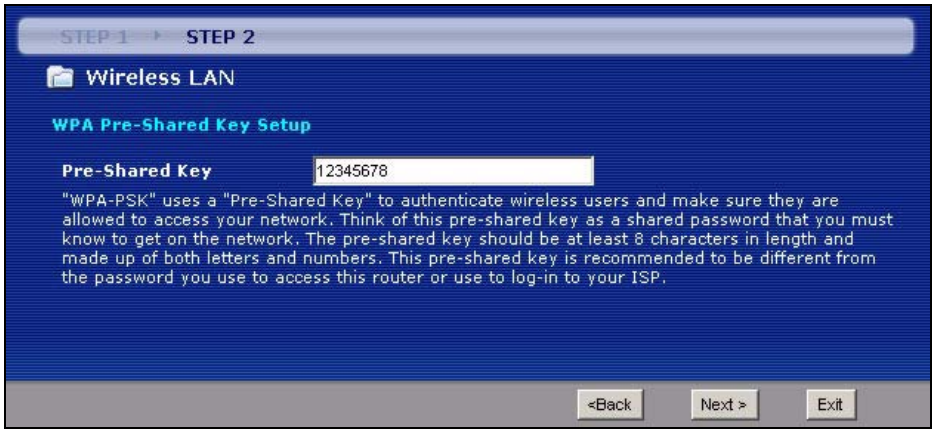
Note: The wireless stations and ZyXEL Device must use the same SSID, channel ID and WEP encryption key (if WEP is enabled), WPA-PSK (if WPA-PSK is enabled) for wireless communication.

4 This screen varies depending on the security mode you selected in the previous screen. Fill in the field (if available) and click **Next**.

3.3.1 Manually assign a WPA-PSK key

Choose **Manually assign a WPA-PSK key** in the Wireless LAN setup screen to set up a **Pre-Shared Key**.

Figure 30 Manually assign a WPA key



The following table describes the labels in this screen.

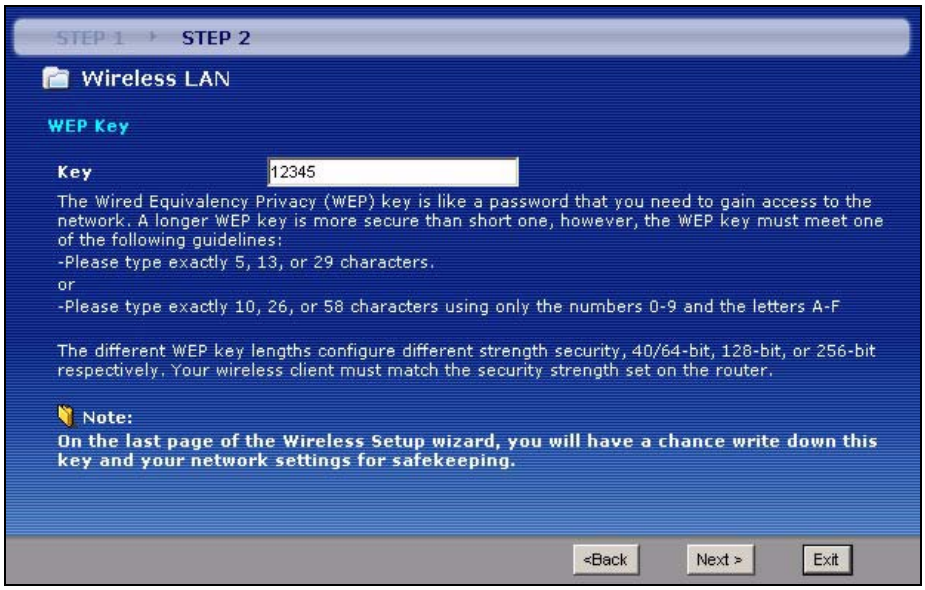
Table 15 Manually assign a WPA key

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.

3.3.2 Manually assign a WEP key

Choose **Manually assign a WEP key** to setup WEP Encryption parameters.

Figure 31 Manually assign a WEP key



The following table describes the labels in this screen.

Table 16 Manually assign a WEP key

LABEL	DESCRIPTION
Key	The WEP keys are used to encrypt data. Both the ZyXEL Device and the wireless stations must use the same WEP key for data transmission. Enter any 5, 13 or 29 ASCII characters or 10, 26 or 58 hexadecimal characters ("0-9", "A-F") for a 64-bit, 128-bit or 256-bit WEP key respectively.
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.

5 Click **Apply** to save your wireless LAN settings.

Figure 32 Wireless LAN Setup 3

6 Use the read-only summary table to check whether what you have configured is correct. Click **Finish** to complete and save the wizard setup.

Figure 33 Internet Access and WLAN Wizard Setup Complete

7 Launch your web browser and navigate to www.zyxel.com. Internet access is just the beginning. Refer to the rest of this guide for more detailed information on the complete range of ZyXEL Device features. If you cannot access the Internet, open the web configurator again to confirm that the Internet settings you configured in the wizard setup are correct.

CHAPTER 4
Bandwidth Management Wizard

This chapter shows you how to configure basic bandwidth management using the wizard screens.

4.1 Introduction

Bandwidth management allows you to control the amount of bandwidth going out through the ZyXEL Device's WAN port and prioritize the distribution of the bandwidth according to service bandwidth requirements. This helps keep one service from using all of the available bandwidth and shutting out other users.

4.2 Predefined Media 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 17 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

Table 17 Media Bandwidth Management Setup: Services (continued)

SERVICE	DESCRIPTION
eMule	These programs use advanced file sharing applications relying on central servers to search for files. They use default port 4662.
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.

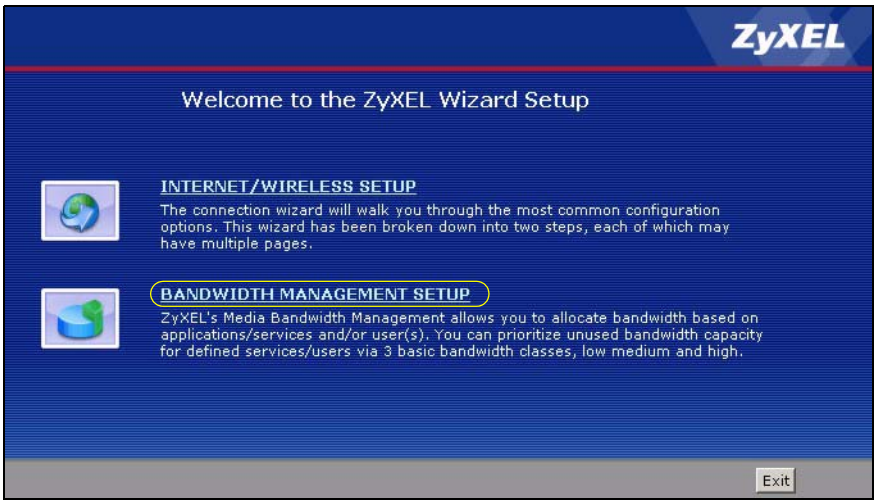
4.3 Bandwidth Management Wizard Setup

1 After you enter the admin password to access the web configurator, select **Go to Wizard setup** and click **Apply**. Otherwise, click the wizard icon () in the top right corner of the web configurator to display the wizard main screen.

Figure 34 Select a Mode

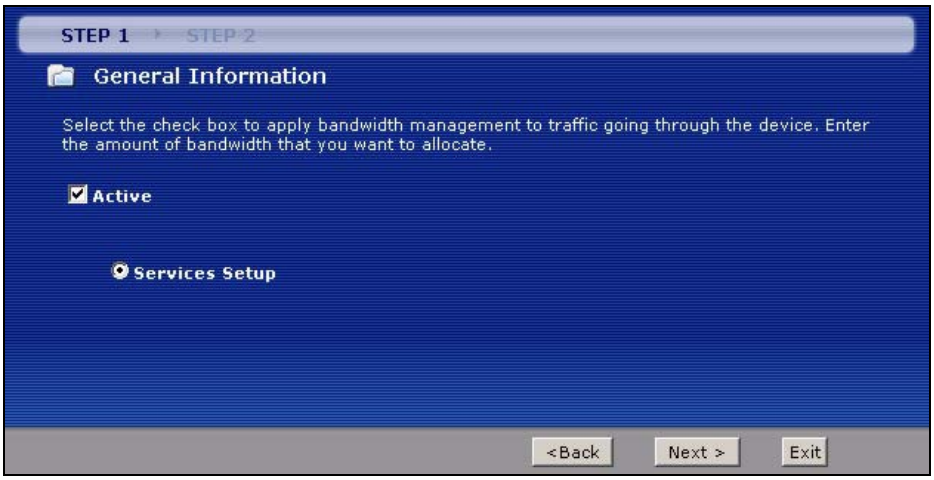
2 Click **BANDWIDTH MANAGEMENT SETUP** to configure the system for Internet access and wireless connection.

Figure 35 Wizard: Welcome



3 Activate bandwidth management and select to allocate bandwidth to packets based on the service requirements.

Figure 36 Bandwidth Management Wizard: General Information



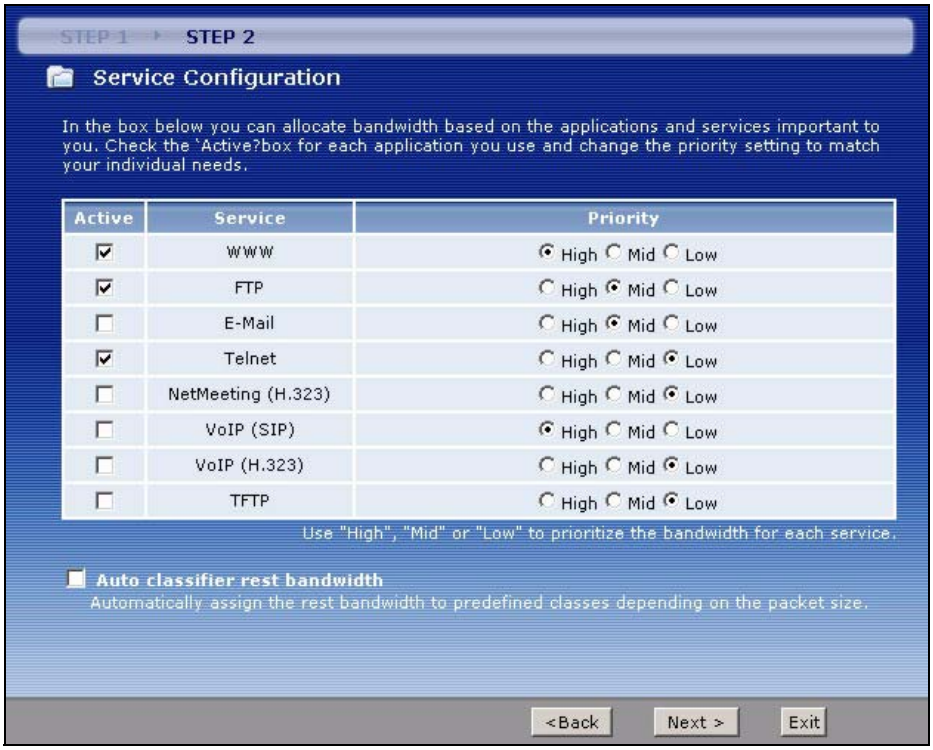
The following fields describe the label in this screen.

Table 18 Bandwidth Management Wizard: General Information

LABEL	DESCRIPTION
Active	Select the **Active** check box to have the ZyXEL Device apply bandwidth management to traffic going out through the ZyXEL Device's port(s). Select **Services Setup** to allocate bandwidth based on the service requirements.
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.

4 Use the second wizard screen to select the services that you want to apply bandwidth management and select the priorities that you want to apply to the services listed.

Figure 37 Bandwidth Management Wizard: Configuration



The following table describes the labels in this screen.

Table 19 Bandwidth Management Wizard: Configuration

LABEL	DESCRIPTION
Active	Select an entry's **Active** check box to turn on bandwidth management for the service/ application.
Service	These fields display the services names.
Priority	Select **High**, **Mid** or **Low** priority for each service to have your ZyXEL Device use a priority for traffic that matches that service. A service with **High** priority is given as much bandwidth as it needs. If you select services as having the same priority, then bandwidth is divided equally amongst those services. Services not specified in bandwidth management are allocated bandwidth after all specified services receive their bandwidth requirements. If the rules set up in this wizard are changed in **Advanced** > **Bandwidth MGMT** > **Rule Setup**, then the service priority radio button will be set to **User Configured**. The **Advanced** > **Bandwidth MGMT** > **Rule Setup** screen allows you to edit these rule configurations.
Auto classifier rest bandwidth	Select **Auto classifier rest bandwidth** to automatically allocate unbudgeted or unused bandwidth to services based on the packet type.
Back	Click **Back** to go back to the previous wizard screen.
Apply	Click **Apply** to save your changes back to the ZyXEL Device.
Exit	Click **Exit** to close the wizard screen without saving your changes.

5 Follow the on-screen instructions and click **Finish** to complete the wizard setup and save your configuration.

Figure 38 Bandwidth Management Wizard: Complete

CHAPTER 5
WAN Setup

This chapter describes how to configure WAN settings.

5.1 WAN Overview

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

5.1.1 Encapsulation

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

5.1.1.1 ENET ENCAP

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

5.1.1.2 PPP over Ethernet

PPPoE (Point-to-Point Protocol over Ethernet) provides access control and billing functionality in a manner similar to dial-up services using PPP. PPPoE is an IETF standard (RFC 2516) specifying how a personal computer (PC) interacts with a broadband modem (DSL, cable, wireless, etc.) connection.

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

5.1.1.3 PPPoA

PPPoA stands for Point to Point Protocol over ATM Adaptation Layer 5 (AAL5). A PPPoA connection functions like a dial-up Internet connection. The ZyXEL Device encapsulates the PPP session based on RFC1483 and sends it through an ATM PVC (Permanent Virtual Circuit) to the Internet Service Provider's (ISP) DSLAM (digital access multiplexer). Please refer to RFC 2364 for more information on PPPoA. Refer to RFC 1661 for more information on PPP.

5.1.1.4 RFC 1483

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

5.1.2 Multiplexing

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

5.1.2.1 VC-based Multiplexing

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

5.1.2.2 LLC-based Multiplexing

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

5.1.3 Encapsulation and Multiplexing Scenarios

For Internet access you should use the encapsulation and multiplexing methods used by your ISP. Consult your telephone company for information on encapsulation and multiplexing methods for LAN-to-LAN applications, for example between a branch office and corporate headquarters. There must be prior agreement on encapsulation and multiplexing methods

because they cannot be automatically determined. What method(s) you use also depends on how many VCs you have and how many different network protocols you need. The extra overhead that ENET ENCAP encapsulation entails makes it a poor choice in a LAN-to-LAN application. Here are some examples of more suitable combinations in such an application.

5.1.3.1 Scenario 1: One VC, Multiple Protocols

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

5.1.3.2 Scenario 2: One VC, One Protocol (IP)

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

5.1.3.3 Scenario 3: Multiple VCs

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

5.1.4 VPI and VCI

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

5.1.5 IP Address Assignment

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

5.1.5.1 IP Assignment with PPPoA or PPPoE Encapsulation

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

5.1.5.2 IP Assignment with RFC 1483 Encapsulation

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