ZyXEL G-570S

802.11g Wireless Access Point

User's Guide

Version 1.00
11/2005

Copyright

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Interference Statements and Certifications

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.

Caution

1. 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.
2. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

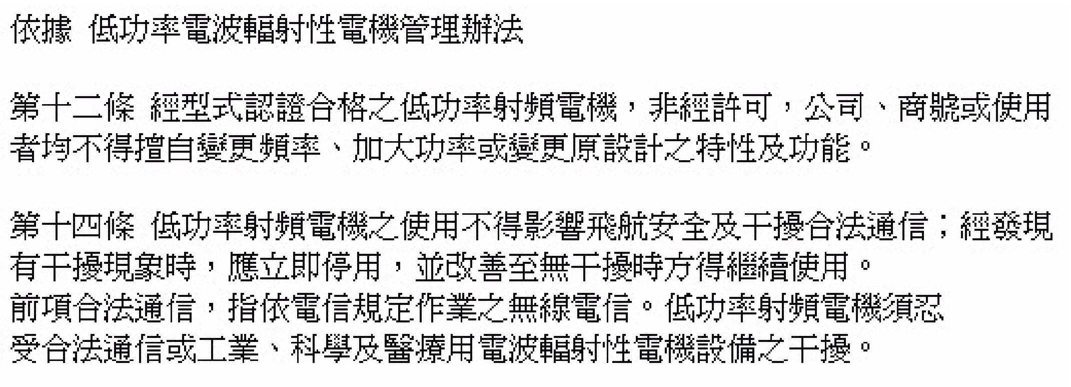
Notice 1

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

This product has been designed for the WLAN 2.4 GHz network throughout the EC region and Switzerland, with restrictions in France.

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.



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。

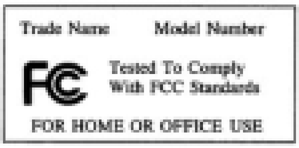
第十四條 低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。
前項合法通信，指依電信規定作業之無線電信。低功率射頻電機須忍
受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

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.



Trade Name Model Number

Tested To Comply With FCC Standards

FOR HOME OR OFFICE USE

Safety Warnings

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

- 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.
- Connect the power cord to the right supply voltage (110V AC in North America or 230V AC in Europe).
- Place connecting cables carefully so that no one will step on them or stumble over them. Do NOT allow anything to rest on the power cord and do NOT locate the product where anyone can walk on the power cord.
- If you wall mount your device, make sure that no electrical, gas or water pipes will be damaged.
- Do NOT install nor use your device during a thunderstorm. There may be a remote risk of electric shock from lightning.
- Do NOT expose your device to dampness, dust or corrosive liquids.
- Do NOT use this product near water, for example, in a wet basement or near a swimming pool.
- Make sure to connect the cables to the correct ports.
- Do NOT obstruct the device ventilation slots, as insufficient airflow may harm your device.
- Do NOT store things on the device.
- Connect ONLY suitable accessories to the device.

ZyXEL Limited Warranty

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

Note

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

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

Customer Support

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

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

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

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

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Preface

Congratulations on your purchase from the ZyXEL G-570S 802.11g Wireless Access Point.

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.

An access point (AP) acts as a bridge between the wireless and wired networks, extending your existing wired network without any additional wiring.

This User's Guide is designed to guide you through the configuration of your ZyXEL G-570S using the web configurator.

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 hardware connection and installation information.

- ZyXEL Glossary and Web Site

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

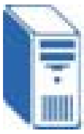
User Guide Feedback

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 choices.
- Mouse action sequences are denoted using a right arrow bracket key (>). 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 ZyXEL G-570S 802.11g Wireless Access Point may be referred to simply as the G-570S in the User's Guide.

Graphics Icons Key

G-570S 	Computer 	Notebook computer
Server 	Modem 	Wireless Signal
Telephone 	Switch 	Router

CHAPTER 1
Getting to Know Your G-570S

This chapter introduces the main features and applications of the G-570S.

1.1 Introducing the G-570S Wireless Access Point

The ZyXEL G-570S is a 4-in-1 Access Point with Super G and Turbo G wireless technology. Access Point (AP), repeater, bridge and wireless client functions allow you to use the G-570S in various network deployments. Super G and Turbo G technology boost the wireless data throughput.

The G-570S Access Point (AP) allows wireless stations to communicate and/or access a wired network. It can work as a bridge and repeater to extend your wireless network. You can also use it as a wireless client to access a wired network through another AP. The G-570S uses IEEE 802.1x, WEP data encryption, WPA (Wi-Fi Protected Access), WPA2 and MAC address filtering to give mobile users highly secured wireless connectivity. Both IEEE 802.11b and IEEE 802.11g compliant wireless devices can associate with the G-570S.

In addition to being highly flexible, the G-570S is easy to install and configure.

1.2 G-570S Features

The following sections describe the features of the G-570S.

Bridge/Repeater

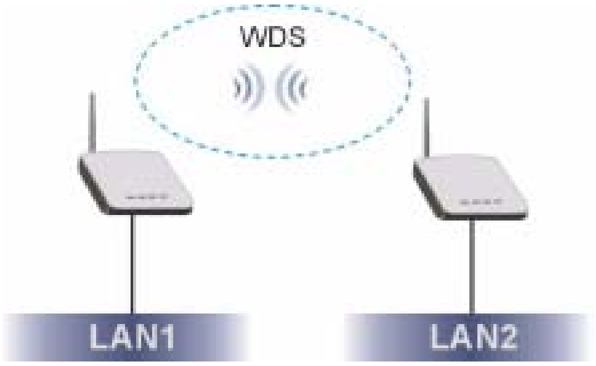
The G-570S can act as a bridge, establishing wireless links with other APs or as a repeater, establishing wireless links to APs.

WDS Functionality

A Distribution System (DS) is a wired connection between two or more APs, while a Wireless Distribution System (WDS) is a wireless connection. Your G-570S supports WDS connections to other G-570S APs.[1] This provides a cost-effective solution for wireless network expansion.

[1] The G-570S only supports WDS connections to G-570S APs, not other devices.

Figure 1 WDS Functionality Example



OTIST (One-Touch Intelligent Security Technology)

OTIST allows your G-570S to assign its SSID 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.

10/100M Auto-negotiating Ethernet/Fast Ethernet Interface

This auto-negotiating feature allows the G-570S 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.

10/100M Auto-crossover Ethernet/Fast Ethernet Interface

The LAN interface automatically adjusts to either a crossover or straight-through Ethernet cable.

Reset Button

The G-570S reset button is built into the rear panel. Use this button to restart the device or restore the factory default password.

802.11g Wireless LAN Standard

The ZyXEL wireless products containing the letter "G" in the model name, such as G-570S and G-162, comply with the IEEE 802.11g wireless standard.

IEEE 802.11g is fully compatible with the IEEE 802.11b standard. This means an IEEE 802.11b radio card can interface directly with an IEEE 802.11g access point (and vice versa) at 11 Mbps or lower depending on range.

Wi-Fi Protected Access

Wi-Fi Protected Access (WPA) is a subset of the IEEE 802.11i 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.

SSL Passthrough

The G-570S allows SSL connections to go through the G-570S. SSL (Secure Sockets Layer) uses a public key to encrypt data that's transmitted over an SSL connection. Both Netscape Navigator and Internet Explorer support SSL, and many Web sites use the protocol to obtain confidential user information, such as credit card numbers. By convention, URLs that require an SSL connection start with "https" instead of "http".

Wireless LAN MAC Address Filtering

Your G-570S checks the MAC address of the wireless station 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.

IEEE 802.1x Network Security

The G-570S supports the IEEE 802.1x standard to enhance user authentication. Use the built-in user profile database to authenticate up to 32 users using MD5 encryption. Use an EAP-compatible RADIUS (RFC2138, 2139 - Remote Authentication Dial In User Service) server to authenticate a limitless number of users using EAP (Extensible Authentication Protocol). EAP is an authentication protocol that supports multiple types of authentication.

Full Network Management

The embedded web configurator is an all-platform web-based utility that allows you to easily access the G-570S's management settings.

Logging and Tracing

Built-in message logging and packet tracing.

Wireless Association List

With the wireless association list, you can see the list of the wireless stations that are currently using the G-570S to access your wired network. When the G-570S is in client mode, the wireless association list displays a list of wireless devices and networks in the area.

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.

Limit the Number of Client Connections

You may set a maximum number of wireless stations that may connect to the G-570S. This may be necessary if for example, there is interference or difficulty with channel assignment due to a high density of APs within a coverage area.

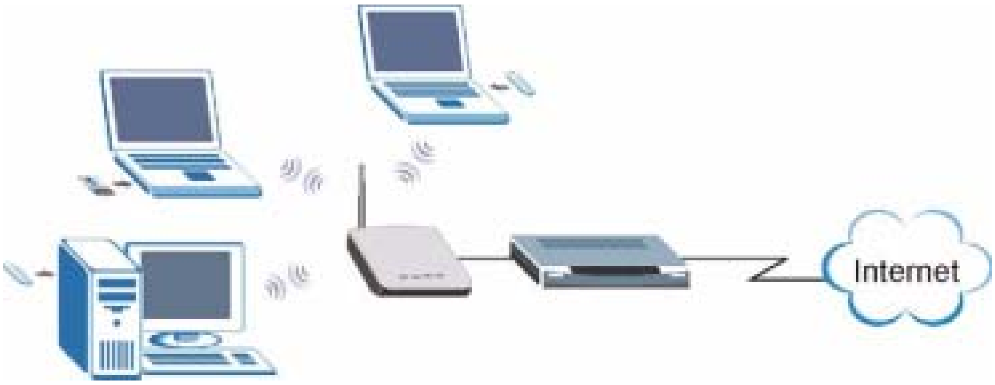
1.3 Applications for the G-570S

Here are some application examples of how you can use your G-570S.

1.3.1 Access Point for Internet Access

The G-570S is an ideal access solution for wireless Internet connection. A typical Internet access application for your G-570S is shown as follows.

Figure 2 Internet Access Application

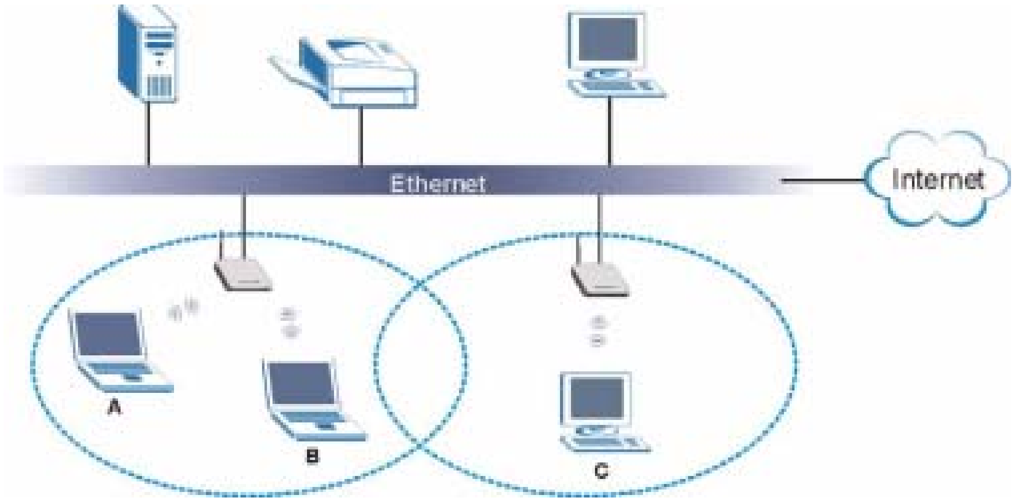


1.3.2 Corporate Network Access Application

In situations where users need to access corporate network resources and the Internet, the G-570S is an ideal solution for wireless stations to connect to the corporate network without expensive network cabling. Stations A, B and C can access the wired network through the G-570Ss.

The following figure depicts a typical application of the G-570S in an enterprise environment. The three computers with wireless adapters are allowed to access the network resource through the G-570S after account validation by the network authentication server.

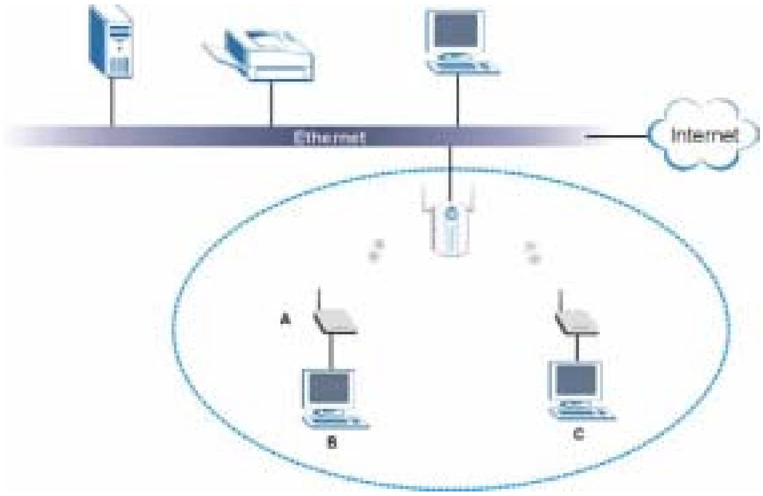
Figure 3 Corporate Network Application



1.3.3 Wireless Client Application

The G-570S can function as a wireless client to connect to a network via an Access Point (AP). The AP provides access to the wired network and the Internet.

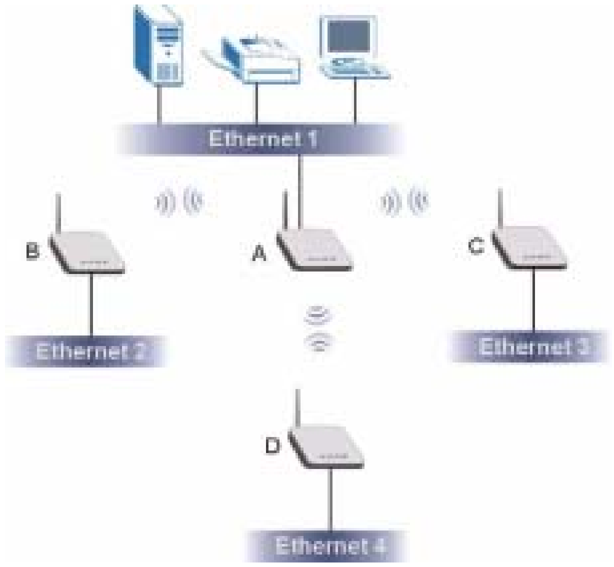
Figure 4 Wireless Client Application



1.3.4 Bridge / Repeater

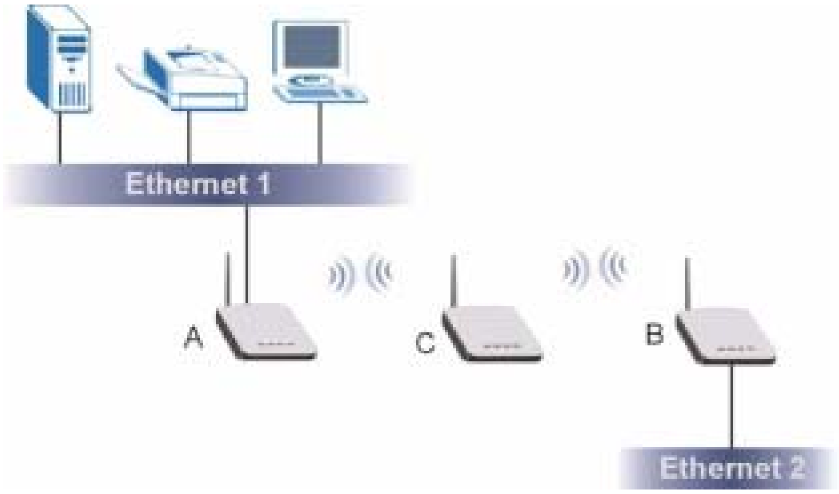
The G-570S can act as a wireless network bridge and establish wireless links with other APs. The G-570Ss in the following example are using bridge mode with a star configuration. A, B, C and D are connected to independent wired networks and have bridge connections at the same time (B, C and D can communicate with A).

Figure 5 Bridge Application



A G-570S in bridge mode without an Ethernet connection can function as a repeater. It transmits traffic from one AP to another AP without using a wired connection. C in the following graphic repeats wireless traffic between A and B.

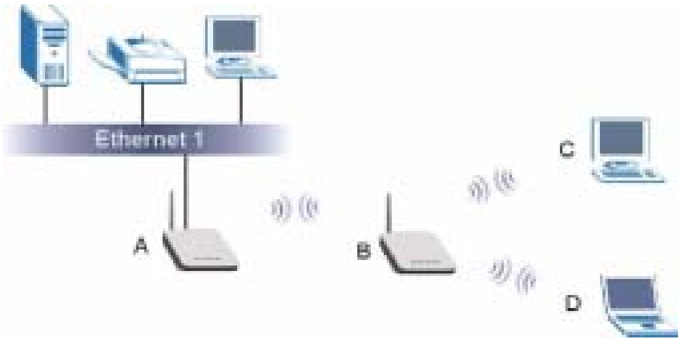
Figure 6 Bridge Repeater Application



1.3.5 Access Point and Repeater

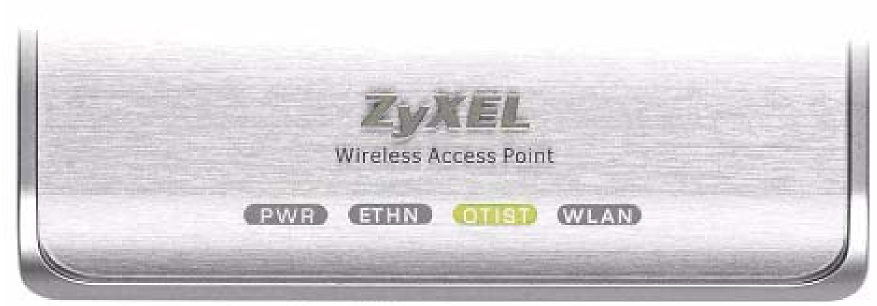
Set the G-570S to **AP+Repeater** mode to have it simultaneously provide access for wireless clients and use the repeater function. This allows you to extend the coverage of your wireless network without installing Ethernet cable to connect the G-570S. In the following figure, B is in **AP+Repeater** mode. B functions as an AP for wireless clients C and D. B also repeats traffic between the wireless clients and AP A which is connected to the wired network. You could also set AP A to **AP+Repeater** mode so that wireless clients could connect to A as well.

Figure 7 AP+Repeater Application



1.4 The LED Display

Figure 8 Front Panel



The following table describes the LEDs on the G-570S.

Table 1 Front Panel LED Description

LED	COLOR	STATUS	DESCRIPTION
PWR	Green	Blinking	The G-570S is not ready or rebooting.
		On	The G-570S has a successful reboot and is receiving power.
		Off	The G-570S is not receiving power.

Table 1 Front Panel LED Description

LED	COLOR	STATUS	DESCRIPTION
ETHN	Green	Blinking	The G-570S is sending/receiving data.
		On	The G-570S has a successful 10Mbps Ethernet connection.
	Amber	Blinking	The G-570S is sending/receiving data.
		On	The G-570S has a successful 100Mbps Ethernet connection.
		Off	The G-570S does not have an Ethernet connection.
OTIST	Green	Blinking	The OTIST automatic wireless configuration is in progress.
		On	The OTIST feature is activated on the G-570S.
		Off	The OTIST feature is not activated or activated but the wireless settings have been changed.
WLAN	Green	Blinking	The G-570S is sending or receiving data through the wireless LAN.
		On	The G-570S is ready, but is not sending/receiving data.

CHAPTER 2
Management Computer Setup

This chapter describes how to prepare your computer to access the G-570S web configurator.

2.1 Introduction

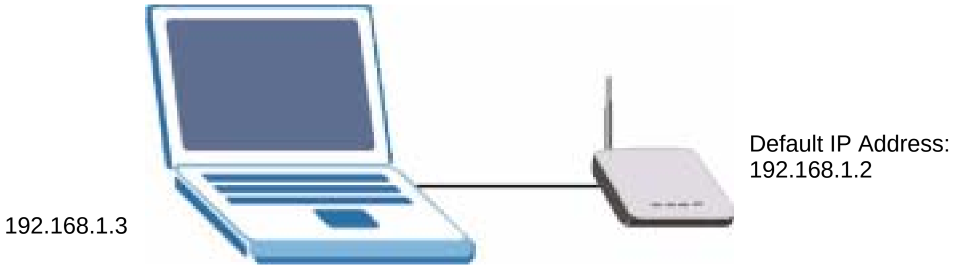
You can connect a computer to the G-570S for management purposes either using an Ethernet connection (recommended for a first time management session) or wirelessly.

2.2 Wired Connection

You must prepare your computer/computer network to connect to the G-570S if you are using a wired connection. Your computer's IP address and subnet mask must be on the same subnet as the G-570S. This can be done by setting up your computer's IP address.

The following figure shows you an example of accessing your G-570S via a wired connection with an Ethernet cable.

Figure 9 Wired Connection



2.2.1 Setting Up Your Computer's IP Address

Note: Skip this section if your computer's IP address is already between 192.168.1.3 and 192.168.1.254 with subnet mask 255.255.255.0.

Your computer must have a network card and TCP/IP installed. TCP/IP should already be installed on computers using Windows NT/2000/XP, Macintosh OS 7 and later operating systems. Refer to the appendix about setting up your computer's IP address for other operating systems.

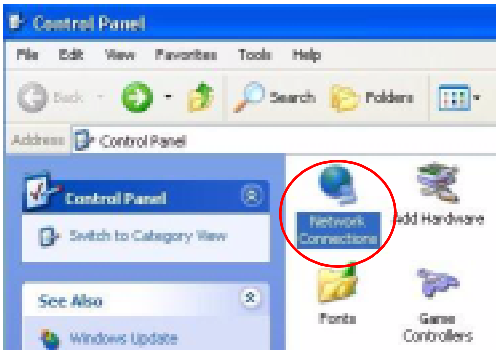
2.2.1.1 Windows 2000/NT/XP

The following example figures use the default Windows XP GUI theme.

1 Click **start** (**Start** in Windows 2000/NT) > **Settings** > **Control Panel**.

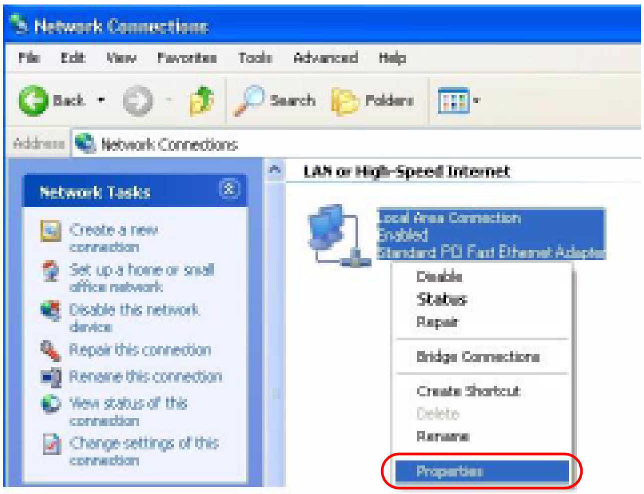
2 In the **Control Panel**, double-click **Network Connections** (**Network and Dial-up Connections** in Windows 2000/NT).

Figure 10 Control Panel



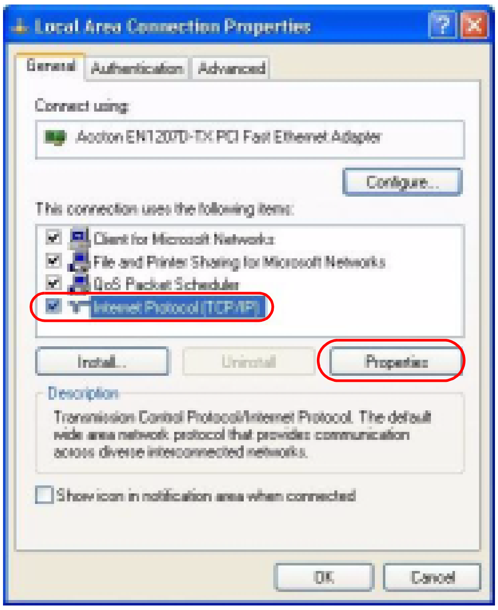
3 Right-click **Local Area Connection** and then **Properties**.

Figure 11 Network Connection


Network Connections
File Edit View Favorites Tools Advanced Help
Back Search Folders
Address Network Connections
Network Tasks
Create a new connection
Set up a home or small office network
Disable this network device
Repair this connection
Rename this connection
View status of this connection
Change settings of this connection
LAN or High-Speed Internet
Local Area Connection
Enabled
Standard PCI Fast Ethernet Adapter
Disable
Status
Repair
Bridge Connections
Create Shortcut
Delete
Rename
Properties

4 Select **Internet Protocol (TCP/IP)** and then click **Properties**.

Figure 12 Local Area Connection Properties



Local Area Connection Properties

General | Authentication | Advanced

Connect using:

Accton EN1207D-TX PCI Fast Ethernet Adapter

Configure...

This connection uses the following items:

☑ Client for Microsoft Networks
☑ File and Printer Sharing for Microsoft Networks
☑ QoS Packet Scheduler
☑ Internet Protocol (TCP/IP)

Install... | Uninstall | Properties

Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

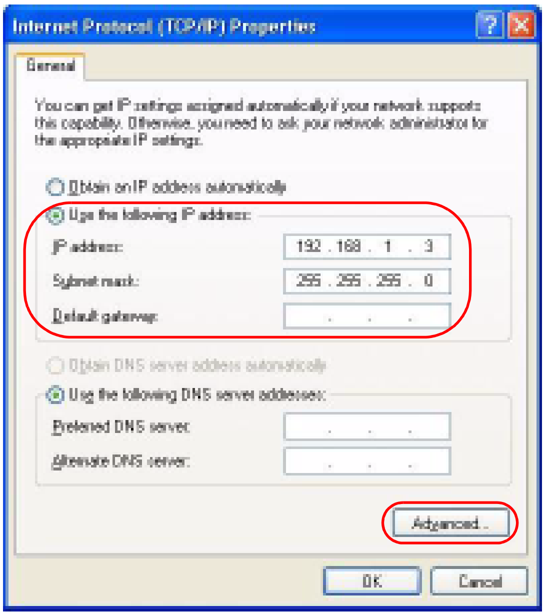
□ Show icon in notification area when connected

OK | Cancel

5 Select **Use the following IP Address** and fill in an **IP address** (between 192.168.1.3 and 192.168.1.254).

- Type 255.255.255.0 as the **Subnet mask**.
- Click **Advanced**[1].

Figure 13 Internet Protocol Properties



Internet Protocol (TCP/IP) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically
● Use the following IP address:

IP address: 192 . 168 . 1 . 3
Subnet mask: 255 . 255 . 255 . 0
Default gateway: . . .

○ Obtain DNS server address automatically
● Use the following DNS server addresses:

Preferred DNS server: . . .
Alternate DNS server: . . .

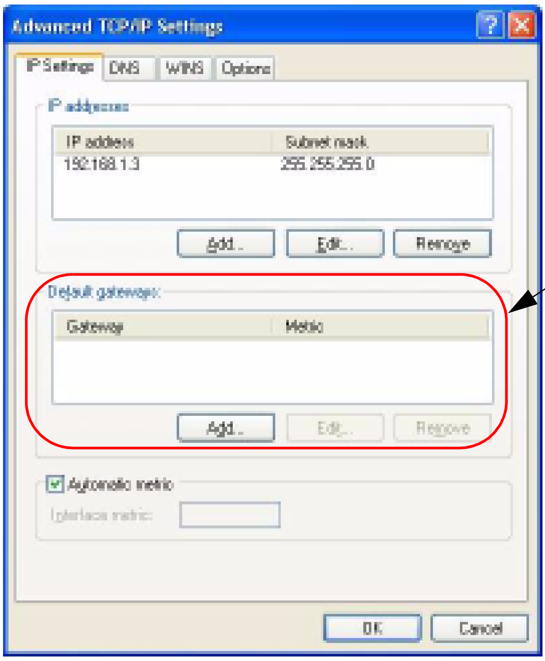
Advanced...

OK | Cancel

6 Remove any previously installed gateways in the **IP Settings** tab and click **OK** to go back to the **Internet Protocol TCP/IP Properties** screen.

[1] See the appendices for information on configuring DNS server addresses.

Figure 14 Advanced TCP/IP Settings



Advanced TCP/IP Settings

IP Settings | DNS | WINS | Options

IP addresses

IP address	Subnet mask
192.168.1.3	255.255.255.0

Add... Edit... Remove

Default gateways:

Gateway	Metric

Add... Edit... Remove

☑ Automatic metric

Interface metric:

OK Cancel

No gateways configured.

7 Click **OK** to close the **Internet Protocol (TCP/IP) Properties** window.

8 Click **Close** (**OK** in Windows 2000/NT) to close the **Local Area Connection Properties** window.

9 Close the **Network Connections** window (**Network and Dial-up Connections** in Windows 2000/NT).

2.3 Wireless Connection

Ensure that the wireless stations have a compatible wireless card/adapter with the same wireless settings as the G-570S. The following figure shows how you can access your G-570S wirelessly.

Figure 15 Wireless Connection

SSID: ZyXEL G-570S

Channel: 6

Note: The wireless stations and G-570S must use the same SSID, channel and wireless security settings for wireless communication.

If you do not enable any wireless security on your G-570S, your network traffic is visible to any wireless networking device that is within range.

2.4 Restarting the G-570S

Press and immediately release the **RESET** button to restart the G-570S.

Note: Holding the RESET button in for five seconds or longer resets the device to the factory-default settings.

2.5 Resetting the G-570S

If you forget the G-570S's IP address or your password, to access the G-570S, you will need to reload the factory-default using the **RESET** button. Resetting the G-570S replaces the current configuration file with the factory-default configuration file. This means that you will lose all configurations that you had previously. The following parameters will be reset to the default values.

Table 2 Factory Defaults

PARAMETER	DEFAULT VALUE
IP Address	192.168.1.2
Password	1234
Wireless Security	Disabled
SSID	ZyXEL G-570S

2.5.1 Methods of Restoring Factory-Defaults

You can erase the current configuration and restore factory defaults in two ways:

1. Use the **RESET** button on the G-570S to upload the default configuration file (hold this button in for at least five seconds).
2. Use the web configurator to restore defaults. Click **SYSTEM** > **Management** > **Configuration File**. From here you can restore the G-570S to factory defaults.

CHAPTER 3 Introducing the Web Configurator

This chapter describes how to configure the G-570S using the Wizard.

3.1 Web Configurator Overview

The web configurator is an HTML-based management interface that allows easy G-570S 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).

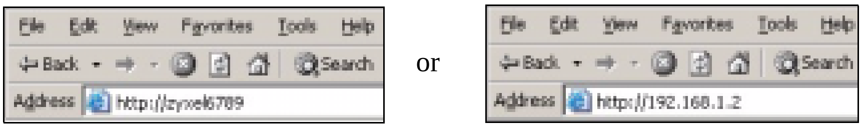
See the **Troubleshooting** chapter if you want to make sure these functions are allowed in Internet Explorer or Netscape Navigator.

3.2 Accessing the G-570S Web Configurator

Follow the steps below to access the web configurator, select a language, change your login password and choose a configuration method from the status screen.

1. Make sure your G-570S hardware is properly connected (refer to the Quick Start Guide).
2. Prepare your computer/computer network to connect to the G-570S (refer to Section 2.2.1 on page 29 for instructions on how to do this).
3. Launch your web browser.
4. Type the device name of your G-570S as the URL. ZyXELXXXX is the default where “XXXX” is the last four digits of the MAC address. The MAC address is on the bottom of the device). You could also use the IP address of the G-570S (192.168.1.2 is the default). Press **Enter**.

Figure 16 Web Configurator Address



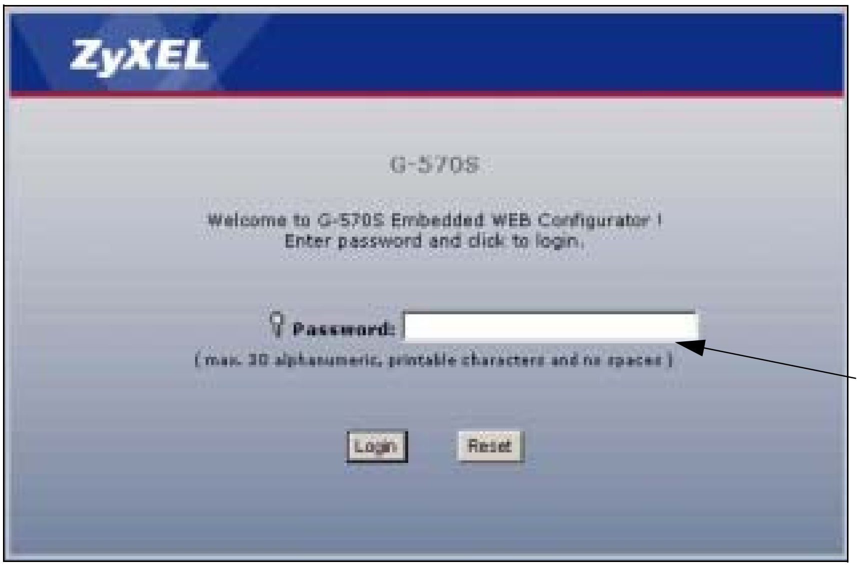
Address: http://zyxel6789

or

Address: http://192.168.1.2

5 Type "1234" (default) as the password and click **Login**.

Figure 17 Login Screen



G-570S

Welcome to G-570S Embedded WEB Configurator !
Enter password and click to login.

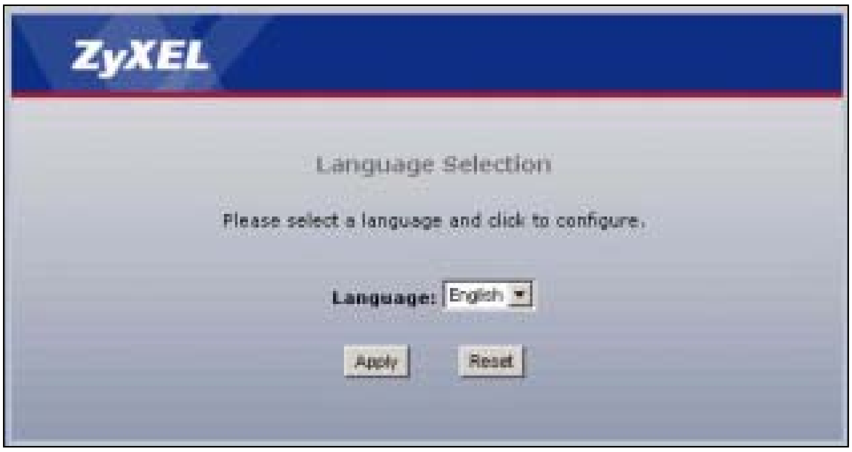
Password:

(max. 30 alphanumeric, printable characters and no spaces)

Default password is 1234.

6 Select your language and click **Apply**.

Figure 18 Language Screen



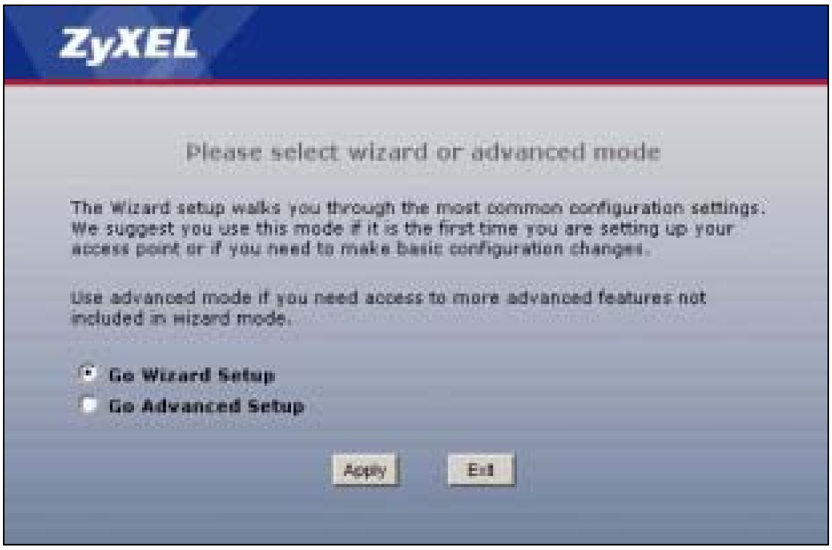
Language Selection

Please select a language and click to configure.

Language: English

7 The following screen displays. Select **Go Wizard Setup** and click **Apply** to use the wizard setup screens for initial configuration (see Section 3.3 on page 37). Select **Go Advanced Setup** and click **Apply** to go directly to the advanced screens (see Section 3.4 on page 43).

Figure 19 Select Wizard or Advanced Setup Screen



Please select wizard or advanced mode

The Wizard setup walks you through the most common configuration settings. We suggest you use this mode if it is the first time you are setting up your access point or if you need to make basic configuration changes.

Use advanced mode if you need access to more advanced features not included in wizard mode.

● Go Wizard Setup
○ Go Advanced Setup

3.3 Configuring the G-570S Using the Wizard

The wizard consists of a series of screens to help you configure your G-570S for wireless stations to access your wired LAN.

Use the following buttons to navigate the Wizard:

Back	Click **Back** to return to the previous screen.
Next	Click **Next** to continue to the next screen.

No configuration changes will be saved to the G-570S until you click **Finish**.

3.3.1 Wizard: Basic Settings

Click **SETUP WIZARD** to display the first wizard screen shown next. Refer to the **System Screens** chapter for more background information.

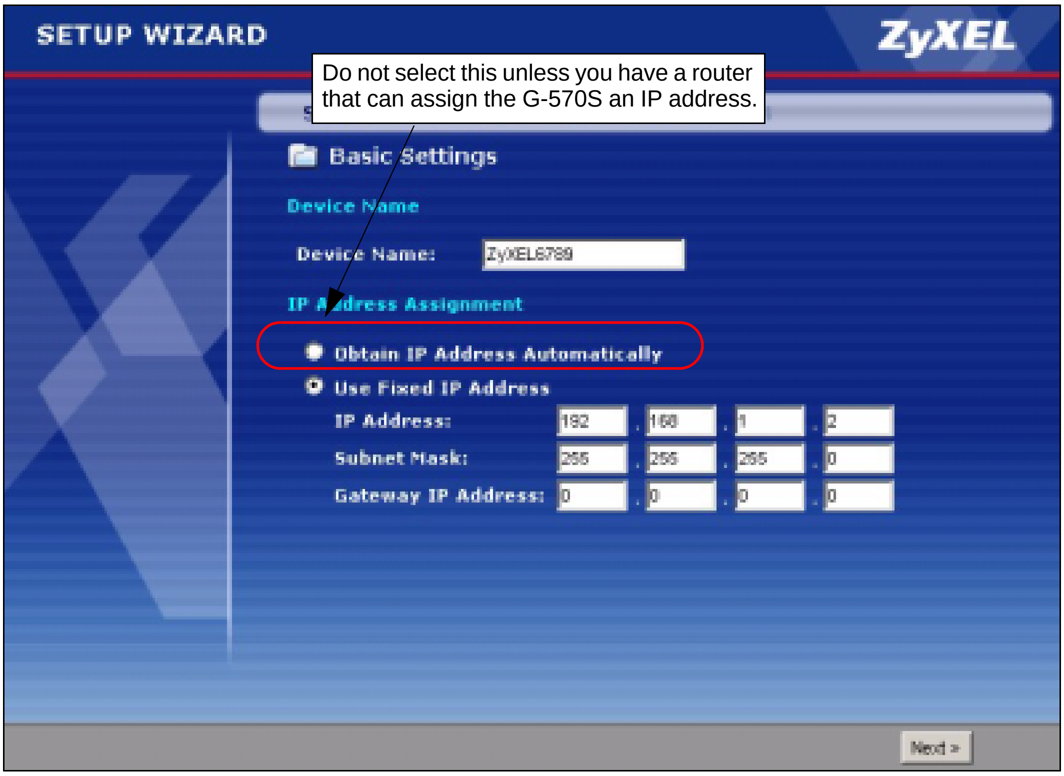
1 Enter a descriptive name to identify the device in the Ethernet network.

2 Select **Obtain IP Address Automatically** if you want to put the device behind a router that assigns an IP address. If you select this by mistake, use the **RESET** button to restore the factory default IP address.

3 Select **Use fixed IP Address** to give the device a static IP address. The IP address you configure here is used for management of the device (accessing the web configurator).

4 Enter a **Subnet Mask** appropriate to your network and the **Gateway IP Address** of the neighboring device, if you know it. If you do not, leave the **Gateway IP Address** field as **0.0.0.0**.

Figure 20 Wizard: Basic Settings



Do not select this unless you have a router that can assign the G-570S an IP address.

Basic Settings

Device Name

Device Name: ZyXEL6789

IP Address Assignment

○ Obtain IP Address Automatically

● Use Fixed IP Address

IP Address: 192 . 168 . 1 . 2

Subnet Mask: 255 . 255 . 255 . 0

Gateway IP Address: 0 . 0 . 0 . 0

3.3.2 Wizard: Wireless Settings

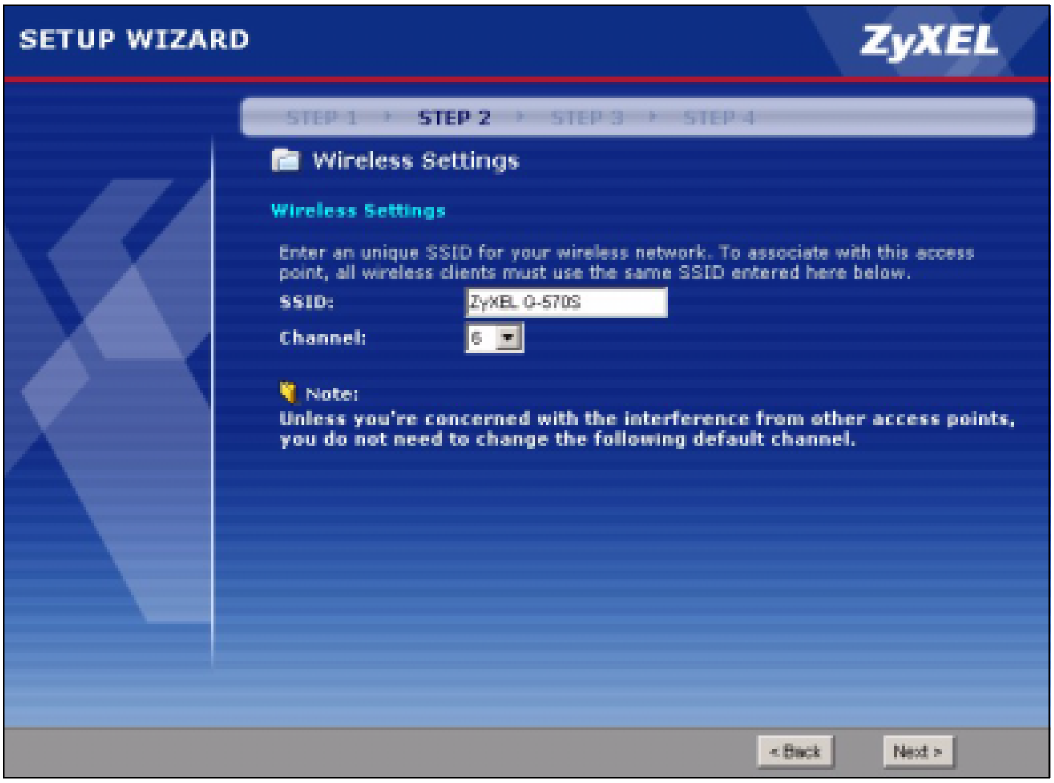
Use this wizard screen to set up the wireless LAN. See the chapter on the wireless screens for background information.

1 The SSID is a unique name to identify the device in a wireless network. Enter up to 32 printable characters. Spaces are allowed. If you change this field on the device, make sure all wireless stations use the same SSID in order to access the network.

2 A wireless device uses a channel to communicate in a wireless network. Select a channel that is not already in use by a neighboring wireless device.

Note: The wireless stations and this device must use the same SSID, channel and wireless security settings for wireless communication.

Figure 21 Wizard: Wireless Settings



Wireless Settings

Wireless Settings

Enter an unique SSID for your wireless network. To associate with this access point, all wireless clients must use the same SSID entered here below.

SSID: ZyXEL G-570S

Channel: 6

Note:
Unless you're concerned with the interference from other access points, you do not need to change the following default channel.

3.3.3 Wizard: Security Settings

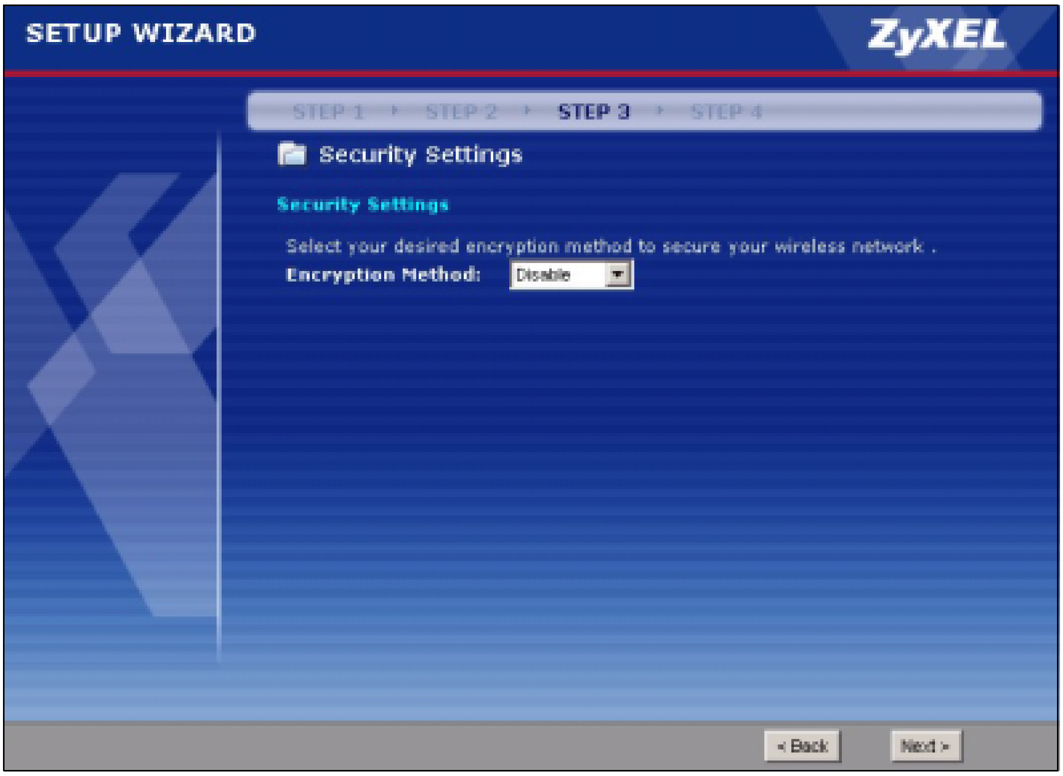
Use this screen to configure security for your wireless LAN. The screen varies depending on what you select in the **Encryption Method** field. Select **Disable** to have no wireless security configured, select **WEP**, or select **WPA-PSK** if your wireless clients support WPA-PSK. Select **WPA2-PSK** if your wireless clients support WPA2-PSK Go to **SETTINGS** > **WIRELESS** > **Security** if you want WPA2, WPA or 802.1x. See Chapter 6 on page 57 for background information.

3.3.3.1 Disable

Select **Disable** to have no wireless LAN security configured. If you do not enable any wireless security on your device, your network is accessible to any wireless networking device that is within range.

Note: With no wireless security a neighbor can access and see traffic in your network.

Figure 22 Setup Wizard 3: Disable



Security Settings

Select your desired encryption method to secure your wireless network .

Encryption Method: Disable

3.3.3.2 WEP

1 WEP (Wired Equivalent Privacy) encrypts data frames before transmitting over the wireless network. Select **64-bit**, **128-bit** or **152-bit** from the **WEP Encryption** drop-down list box and then follow the on-screen instructions to set up the WEP keys.

2 Choose an encryption level from the drop-down list. The higher the WEP encryption, the higher the security but the slower the throughput.

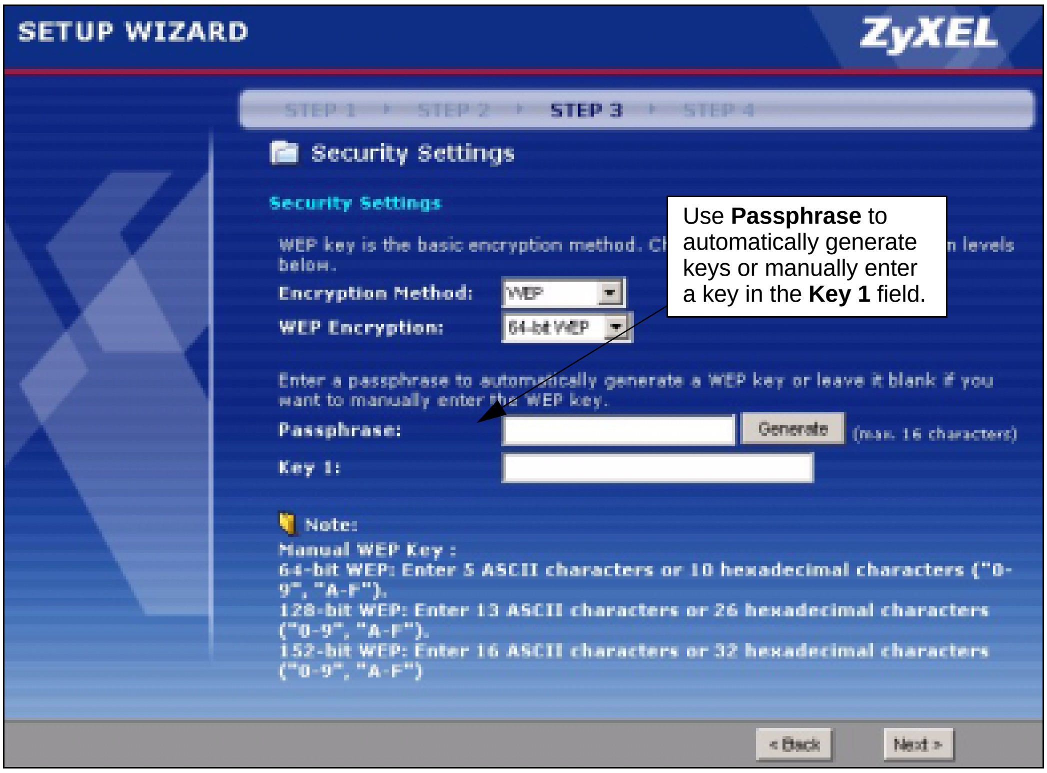
3 You can generate or manually enter a WEP key.

- If you selected 64-bit or 128-bit WEP, you can enter a **Passphrase** (up to 32 printable characters) and click **Generate**. The device automatically generates WEP keys. One key displays in the **Key 1** field. Go to **SETTINGS** > **WIRELESS** > **Security** if you want to see the other WEP keys.

  or

- Enter a manual key in the **Key 1** field.

Figure 23 Wizard 3: WEP



Security Settings

Security Settings

WEP key is the basic encryption method. Ch n levels below.

Encryption Method: WEP

WEP Encryption: 64-bit WEP

Enter a passphrase to automatically generate a WEP key or leave it blank if you want to manually enter the WEP key.

Passphrase: Generate (max. 16 characters)

Key 1:

Note:
Manual WEP Key :
64-bit WEP: Enter 5 ASCII characters or 10 hexadecimal characters ("0-9", "A-F").
128-bit WEP: Enter 13 ASCII characters or 26 hexadecimal characters ("0-9", "A-F").
152-bit WEP: Enter 16 ASCII characters or 32 hexadecimal characters ("0-9", "A-F")

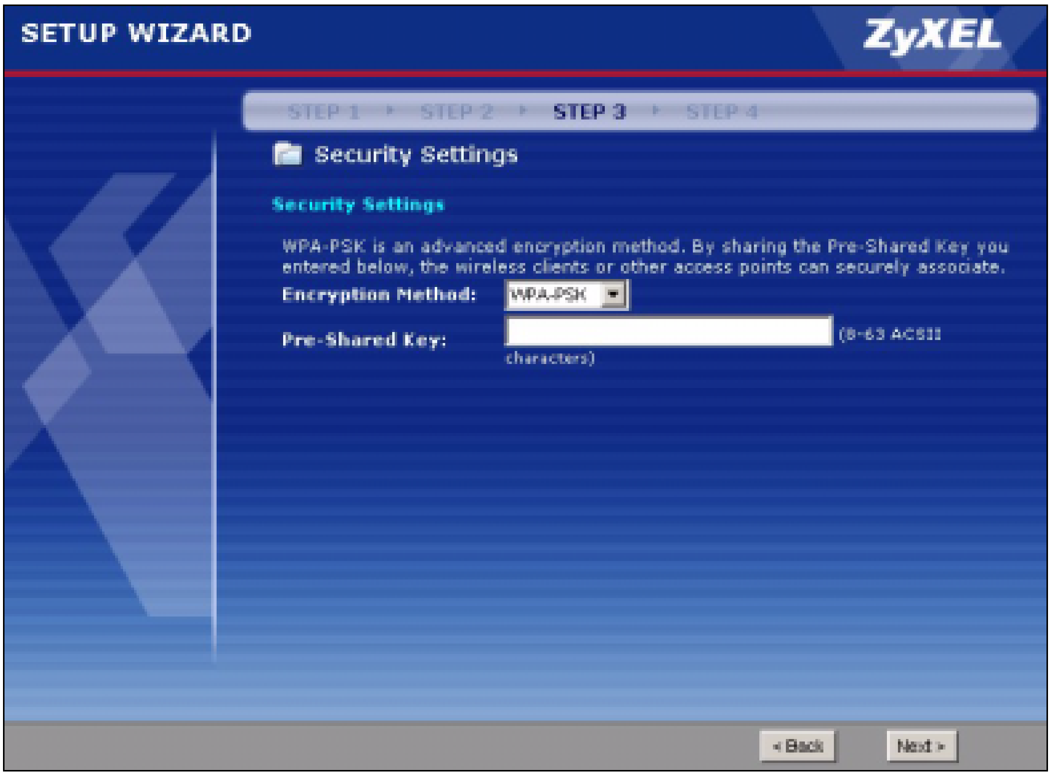
Use **Passphrase** to automatically generate keys or manually enter a key in the **Key 1** field.

3.3.3.3 WPA(2)-PSK

Only select **WPA-PSK** or **WPA2-PSK** if your wireless clients support it.

Type a pre-shared key from 8 to 63 ASCII characters (including spaces and symbols). This field is case-sensitive.

Figure 24 Wizard 3: WPA(2)-PSK



Security Settings

Security Settings

WPA-PSK is an advanced encryption method. By sharing the Pre-Shared Key you entered below, the wireless clients or other access points can securely associate.

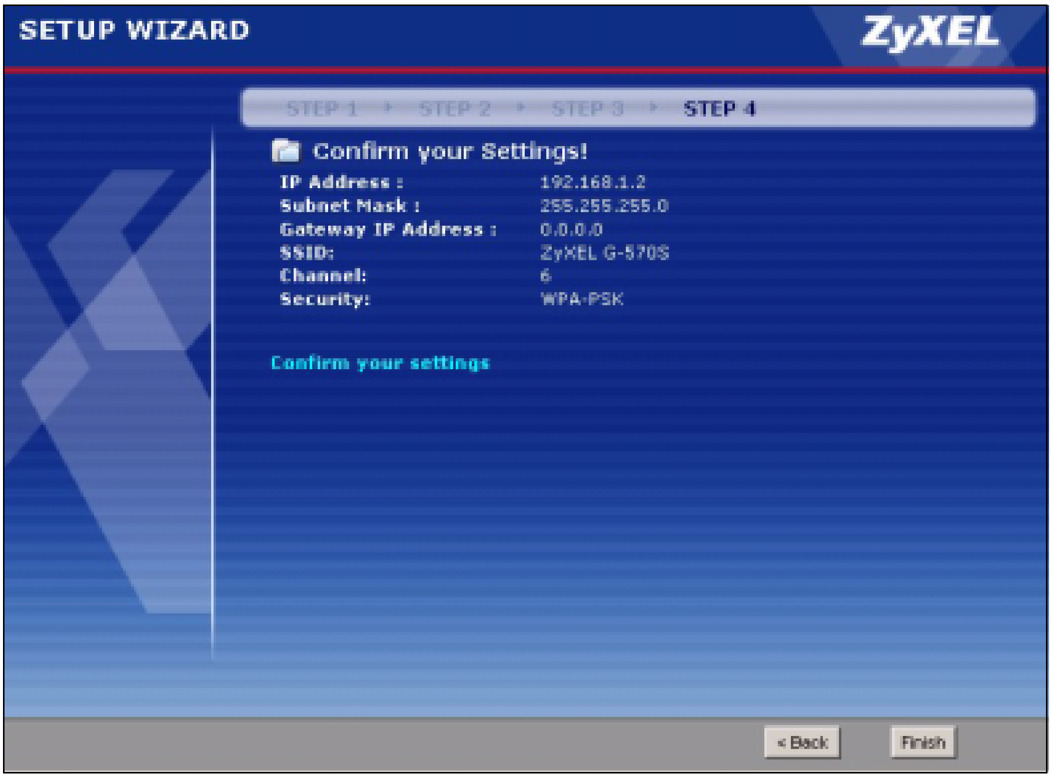
Encryption Method: WPA-PSK

Pre-Shared Key: (8-63 ACSII characters)

3.3.4 Wizard: Confirm Your Settings

This read-only screen shows the status of the current settings. Use the summary table to check whether what you have configured is correct. Click **Finish** to complete the wizard configuration and save your settings.

Figure 25 Wizard: Confirm Your Settings



Confirm your Settings!

IP Address : 192.168.1.2
Subnet Mask : 255.255.255.0
Gateway IP Address : 0.0.0.0
SSID: ZyXEL G-570S
Channel: 6
Security: WPA-PSK

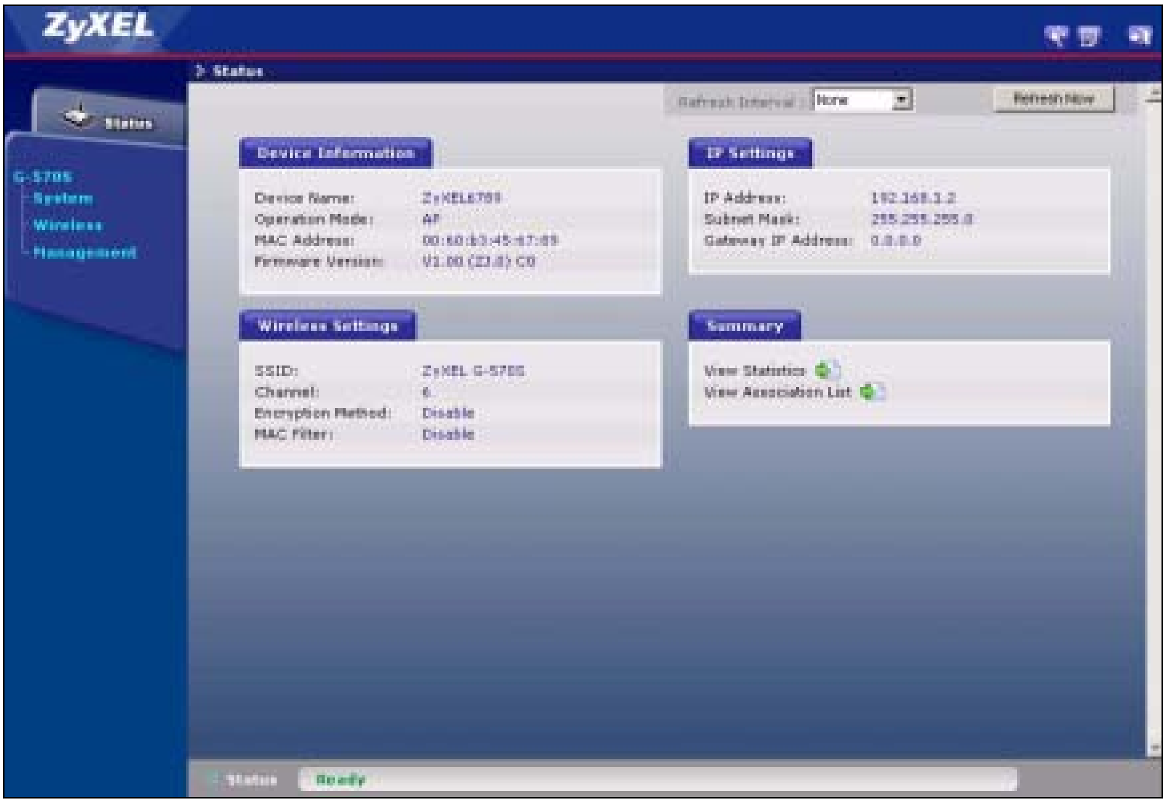
Confirm your settings

For more detailed background information, see the rest of this User's Guide.

3.4 Navigating the Advanced Screens

The **STATUS** screen is the first advanced screen that displays. This section explains how to navigate the advanced configuration screens. See the chapter on the **Status** screen for details about the individual screen.

Figure 26 Status Screen



Refresh Interval : None

Device Information

Device Name: ZyXEL6789
Operation Mode: AP
MAC Address: 00:60:b3:45:67:89
Firmware Version: V1.00 (ZJ.0) C0

IP Settings

IP Address: 192.168.1.2
Subnet Mask: 255.255.255.0
Gateway IP Address: 0.0.0.0

Wireless Settings

SSID: ZyXEL G-570S
Channel: 6
Encryption Method: Disable
MAC Filter: Disable

Summary

View Statistics
View Association List

The following table describes the global web configurator icons (in the upper left corner of most screens).

Table 3 Global Icon Key

ICON	DESCRIPTION
	Click the **Wizard** icon to open the setup wizard.
	Click the **About** icon to view copyright information.
	Click the **Logout** icon at any time to exit the web configurator. Make sure you save any changes before you log out.

3.4.1 Navigation Panel

After you enter the password, use the links on the navigation panel to go to the various advanced screens.

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.
System		Use this screen to configure the device name and IP address assignment settings.
Wireless	Wireless Settings	Use this screen to configure wireless LAN.
	Security	Use this screen to configure wireless LAN 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.
	OTIST	This screen allows you to assign wireless clients the Prestige’s wireless security settings.
Management		
	Password	Use this screen to configure the administrator password.
	Logs	Use this screen to view logs and alert messages.
	Configuration	Use this screen to backup and restore the configuration or reset the factory defaults to your Prestige.
	F/W Upload	Use this screen to upload firmware to your Prestige.

Note: See the rest of this User's Guide for configuration details and background information on all G-570S features using the web configurator.

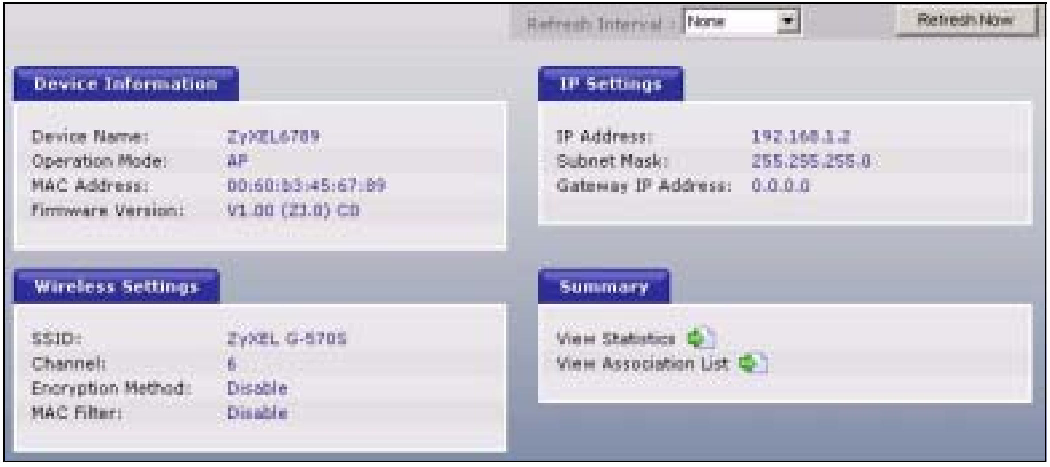
CHAPTER 4
Status Screens

This chapter describes the Status screens.

4.1 System Status

Click **Status** to open the following screen. The Status screen display a snapshot of your device's settings. You can also view network statistics and a list of wireless stations currently associated with your device. Note that these labels are READ-ONLY and are meant to be used for diagnostic purposes.

Figure 27 Status



Refresh Interval : None

Device Name: ZyXEL6789
Operation Mode: AP
MAC Address: 00:60:b3:45:67:89
Firmware Version: V1.00 (23.0) C0

IP Address: 192.168.1.2
Subnet Mask: 255.255.255.0
Gateway IP Address: 0.0.0.0

SSID: ZyXEL G-570S
Channel: 6
Encryption Method: Disable
MAC Filter: Disable

The following table describes the labels in this screen.

Table 5 Status

LABEL	DESCRIPTION
Refresh Interval	Use the drop-down list box to select how often you want the device to renew the information on this screen.
Refresh Now	Click this button to have the device renew the information on this screen.
Device Information	
Device Name	This is the same as the device name you entered in the first wizard screen if you entered one there. It is for identification purposes.
Operation Mode	This field shows whether the device is functioning as an access point, a wireless client, a bridge or an access point and repeater.

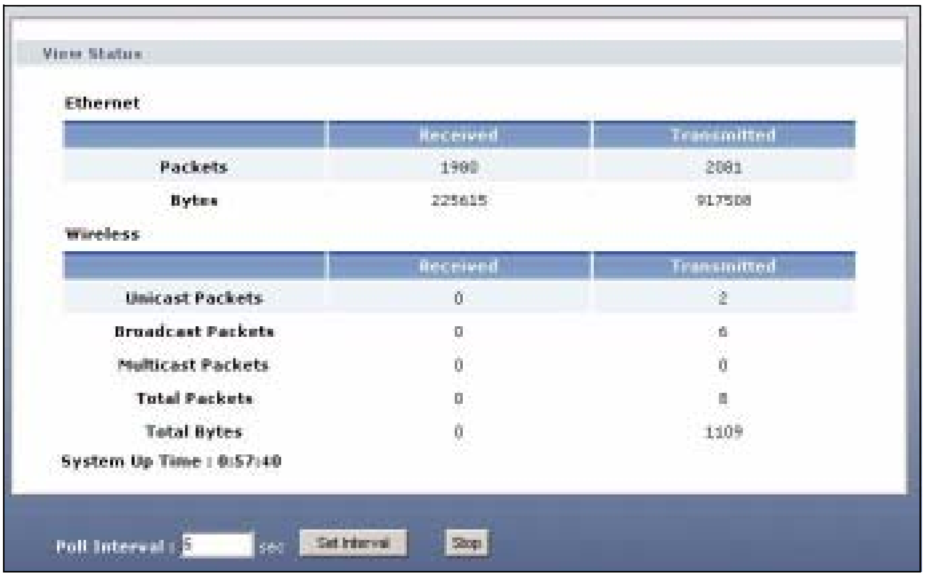
Table 5 Status

LABEL	DESCRIPTION
MAC Address	This field displays the MAC address of the device. The MAC (Media Access Control) or Ethernet address on a LAN (Local Area Network) is unique to your computer. 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.
Firmware Version	This is the firmware version and the date the firmware was created.
IP Settings	
IP Address	This is the Ethernet port IP address.
Subnet Mask	This is the Ethernet port subnet mask.
Gateway IP Address	This is the IP address of a gateway. Leave this field as **0.0.0.0** if you do not know it.
Wireless Settings	
SSID	This is the descriptive name used to identify the device in a wireless network.
Channel	This field displays the radio channel the device is currently using.
Encryption Method	This field shows whether data encryption is activated (**WEP**, **WPA-PSK**, **WPA**, **WPA2-PSK**, **WPA2** or **802.1X**) or inactive (**Disable**).
MAC Filter	This field shows whether MAC filter is enabled or not. With MAC filtering, you can allow or deny access to the device based on the MAC addresses of the wireless stations.
View Statistics	Click **View Statistics** to see performance statistics such as number of packets sent and number of packets received.
View Association List	Click **View Association List** to show the wireless stations that are currently associated to the device.

4.1.1 Statistics

Click **View Statistics** in the **STATUS** screen. This screen displays read-only information including port status and packet specific statistics. Also provided are "system up time" and "poll interval(s)". The **Poll Interval(s)** field is configurable.

Figure 28 Status: View Statistics



View Status

Ethernet

	Received	Transmitted
Packets	1980	2081
Bytes	225615	917508

Wireless

	Received	Transmitted
Unicast Packets	0	2
Broadcast Packets	0	6
Multicast Packets	0	0
Total Packets	0	8
Total Bytes	0	1109

System Up Time : 0:57:40

Poll Interval : 5 sec

The following table describes the labels in this screen.

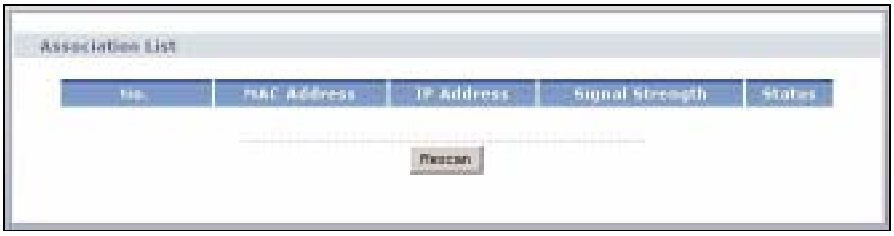
Table 6 Status: View Statistics

LABEL	DESCRIPTION
Ethernet	
Packets	This row displays the numbers of packets received and transmitted by the Ethernet port.
Bytes	This row displays the numbers of bytes received and transmitted by the Ethernet port.
Wireless	
Unicast Packets	This row displays the numbers of unicast packets received and transmitted by the wireless adapter.
Broadcast Packets	This row displays the numbers of broadcast packets received and transmitted by the wireless adapter.
Multicast Packets	This row displays the numbers of multicast packets received and transmitted by the wireless adapter.
Total Packets	This row displays the numbers of all types of packets received and transmitted by the wireless adapter.
Total Bytes	This row displays the numbers of bytes received and transmitted by the wireless adapter.
System Up Time	This is the total time the device has been on.
Poll Interval(s)	Enter the time interval for refreshing statistics.
Set Interval	Click this button to apply the new poll interval you entered above.
Stop	Click this button to stop refreshing statistics.

4.1.2 Association List

Click **STATUS** and then the **View Association List** button to display the **Association List** screen. When the device is not in wireless client mode, this screen displays which wireless stations are currently associated to the device in the **Association List** screen.

Figure 29 Status: View Association List



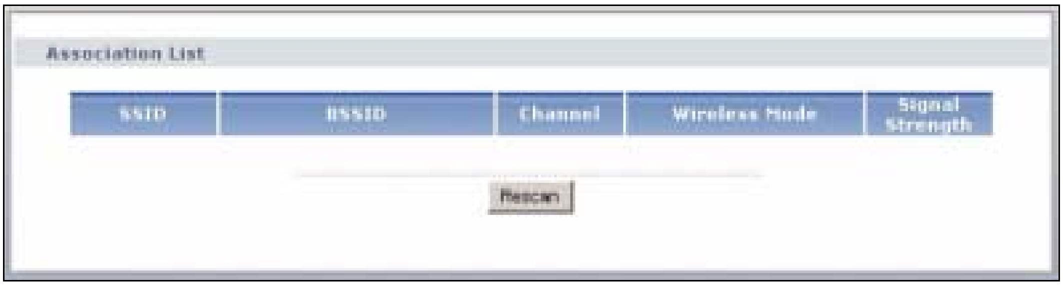
The following table describes the labels in this screen.

Table 7 Status: View Association List

LABEL	DESCRIPTION
No.	This is the index number of an associated wireless station.
MAC Address	This field displays the MAC address of an associated wireless station.
IP Address	This field displays the IP address of an associated wireless station.
Signal Strength	This field displays the signal strength of each associated wireless station.
Status	This field displays **Associated** for associated wireless stations.
Rescan	Click **Rescan** to check for associated wireless stations.

When the device is in client mode, this screen displays a list of wireless devices and networks in the area.

Figure 30 Status: View Association List: Wireless Client Mode



The following table describes the labels in this screen.

Table 8 Status: View Association List: Wireless Client Mode

LABEL	DESCRIPTION
SSID	This field displays the SSID (Service Set IDentifier) of each wireless device that the device detected.
BSSID	This field displays the BSSID (Basic Service Set IDentifier) of each wireless network that the device detected.
Channel	This field displays the channel number used by each wireless device.
Wireless Mode	This field shows whether the network is using IEEE 802.11b or IEEE 802.11g.
Signal Strength	This field displays the signal strength of each wireless device that the device detected.
Rescan	Click **Rescan** to check for associated wireless stations.

CHAPTER 5 System Screen

This chapter provides information on the **System** screen.

5.1 TCP/IP Parameters

5.1.1 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 9 Private IP Address Ranges

10.0.0.0	-	10.255.255.255
172.16.0.0	-	172.31.255.255
192.168.0.0	-	192.168.255.255

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

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

5.1.2 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.

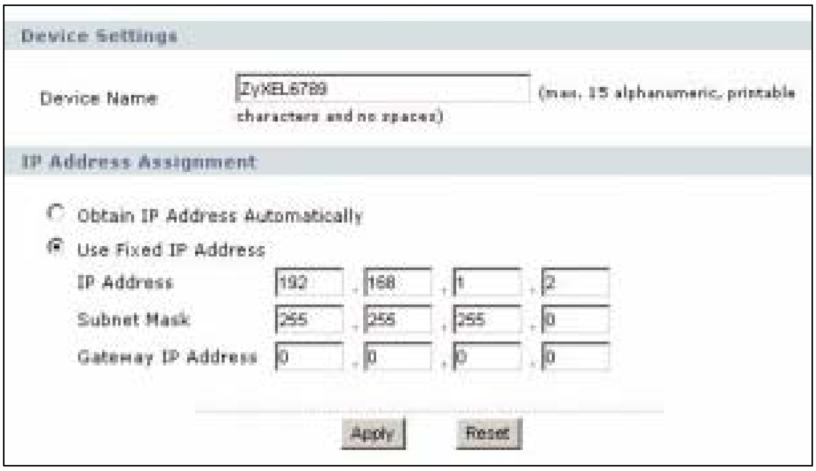
Once you have decided on the network number, pick an IP address that is easy to remember, for instance, 192.168.1.2, for your device, but make sure that no other device on your network is using that IP address.

The subnet mask specifies the network number portion of an IP address. Your device 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 device unless you are instructed to do otherwise.

5.2 System Settings

Click **SETTINGS > SYSTEM** to open the **System Settings** screen.

Figure 31 System Settings



Device Settings

Device Name: ZyXEL6789 (max. 15 alphanumeric, printable characters and no spaces)

IP Address Assignment

○ Obtain IP Address Automatically

● Use Fixed IP Address

IP Address: 192 . 168 . 1 . 2

Subnet Mask: 255 . 255 . 255 . 0

Gateway IP Address: 0 . 0 . 0 . 0

The following table describes the labels in this screen.

Table 10 System Settings

LABEL	DESCRIPTION
Device Name	This name can be up to 30 printable characters long. Spaces are allowed.
IP Address Assignment	
Obtain IP Address Automatically	Select this option to have your device use a dynamically assigned IP address from a router each time.

Table 10 System Settings

LABEL	DESCRIPTION
Use fixed IP address	Select this option to have your device use a static IP address. When you select this option, fill in the fields below.
IP Address	Enter the IP address of your device in dotted decimal notation.
Subnet Mask	Enter the subnet mask.
Gateway IP Address	Type the IP address of the gateway. The gateway is a router or switch on the same network segment as the device. The gateway helps forward packets to their destinations. Leave this field as **0.0.0.0** if you do not know it.
Apply	Click **Apply** to save your changes back to the device.
Reset	Click **Reset** to reload the previous configuration for this screen.

CHAPTER 6 Wireless Screens

This chapter discusses how to configure wireless settings and wireless security on your G-570S.

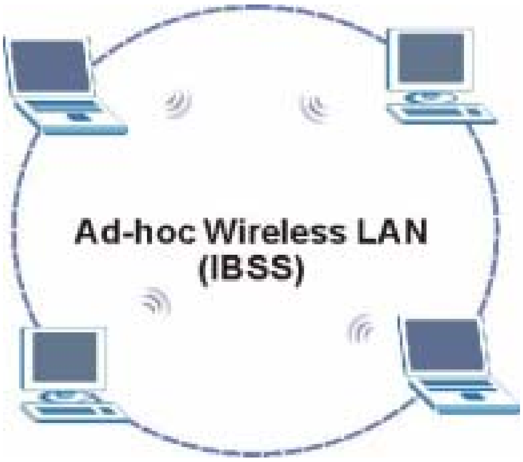
6.1 Wireless LAN Overview

This section introduces the wireless LAN (WLAN) and some basic scenarios.

6.1.1 IBSS

An Independent Basic Service Set (IBSS), also called an Ad-hoc network, is the simplest WLAN configuration. An IBSS is defined as two or more computers with wireless adapters within range of each other that from an independent (wireless) network without the need of an access point (AP).

Figure 32 IBSS (Ad-hoc) Wireless LAN

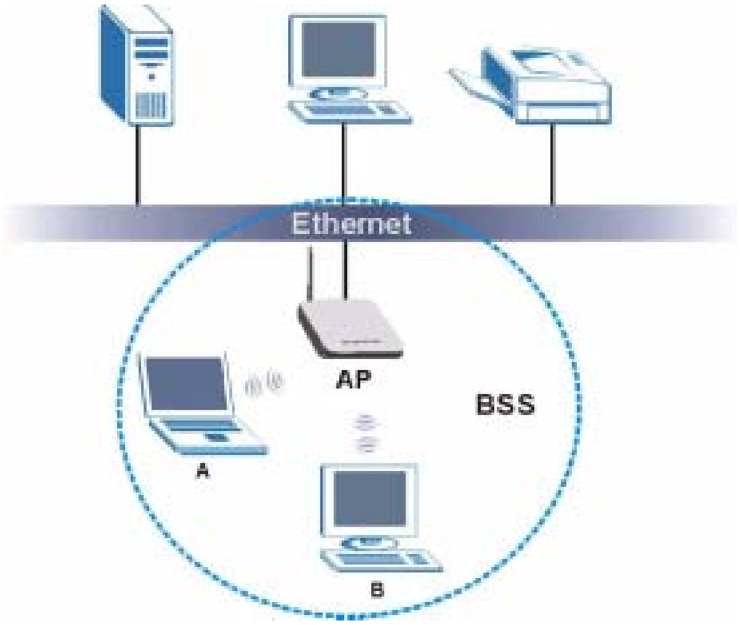


6.1.2 BSS

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.

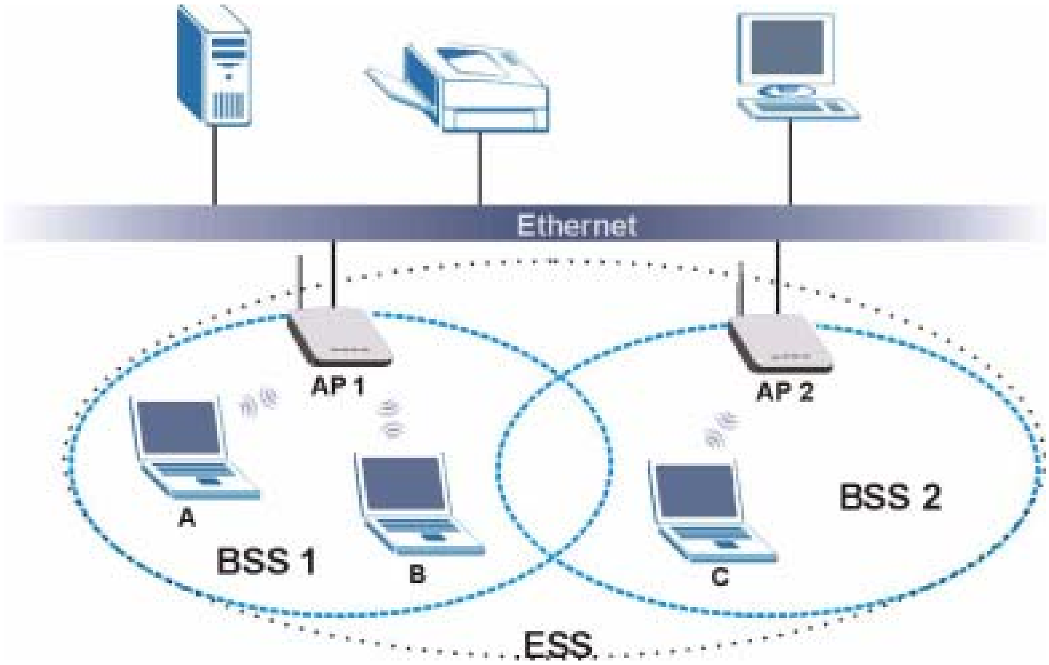
Figure 33 Basic Service set



6.1.3 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). 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 34 Extended Service Set



6.2 Wireless LAN Basics

This section describes the wireless LAN network terms.

6.2.1 Channel

A channel is the radio frequency(ies) used by IEEE 802.11b 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.

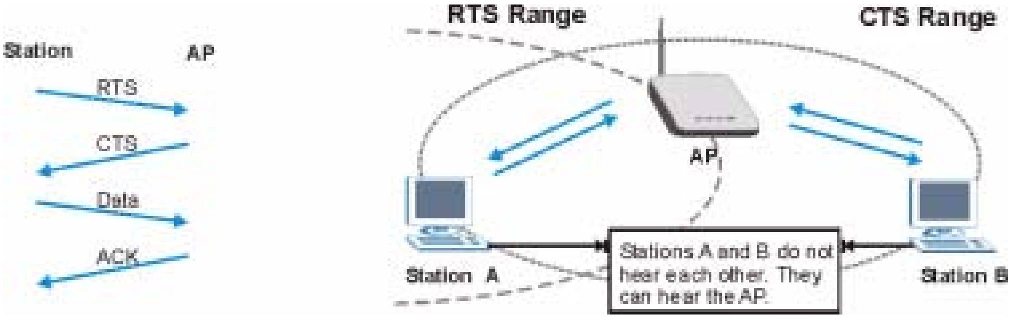
6.2.2 SSID

The SSID (Service Set Identity) is a unique name shared among all wireless devices in a wireless network. Wireless devices must have the same SSID to communicate with each other.

6.2.3 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 35 RTS/CTS


Station
AP
RTS
CTS
Data
ACK
RTS Range
CTS Range
AP
Station A
Station B
Stations A and B do not hear each other. They can hear the AP.

When station A sends data to the G-570S, 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.

6.2.4 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 G-570S 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.

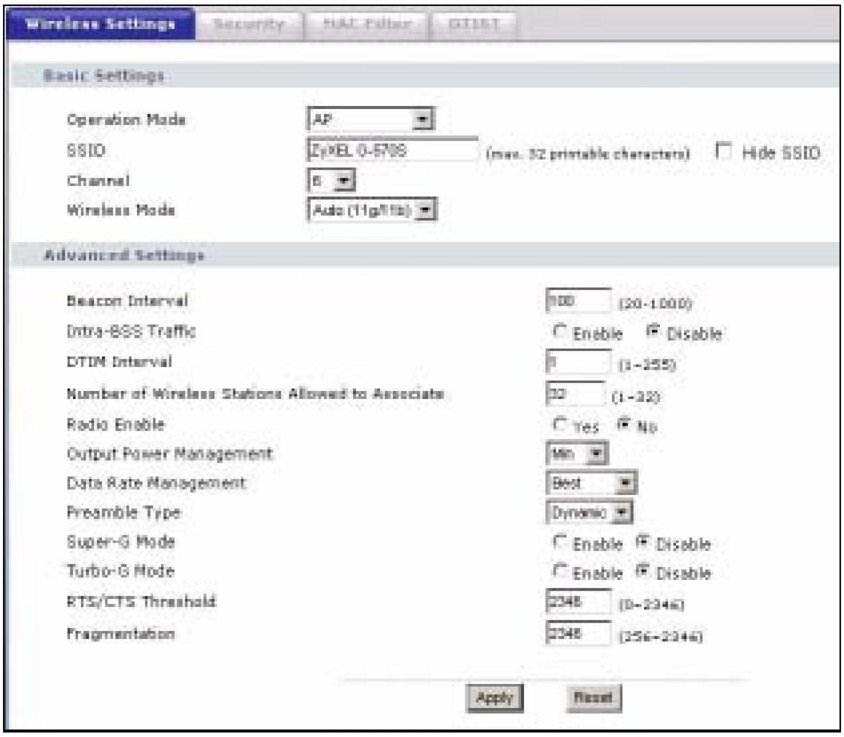
6.3 Configuring Wireless

Click **SETTINGS** > **WIRELESS** to display the **Wireless Settings** screen.The screen varies depending upon the operation mode you select.

6.3.1 Access Point Mode

Select **Access Point** in the **Operation Mode** field to display the screen as shown next. This mode has the device act as an access point (AP) through which wireless stations can communicate and/or access a wired network.

Figure 36 Wireless Settings: Access Point



Basic Settings

Operation Mode: AP
SSID: ZyXEL G-570S (max. 32 printable characters) □ Hide SSID
Channel: 6
Wireless Mode: Auto (11g/11b)

Advanced Settings

Beacon Interval: 100 (20-1000)
Intra-BSS Traffic: ○ Enable ● Disable
DTIM Interval: 1 (1-255)
Number of Wireless Stations Allowed to Associate: 32 (1-32)
Radio Enable: ○ Yes ● No
Output Power Management: Min
Data Rate Management: Best
Preamble Type: Dynamic
Super-G Mode: ○ Enable ● Disable
Turbo-G Mode: ○ Enable ● Disable
RTS/CTS Threshold: 2346 (0-2346)
Fragmentation: 2346 (256-2346)

The following table describes the labels in this screen.

Table 11 Wireless Settings: Access Point

LABEL	DESCRIPTION
Operation Mode	Select the operating mode from the drop-down list. The options are **Access Point**, **Wireless Client**, **Bridge** and **AP+Repeater**.
SSID	Wireless stations associating to the access point (AP) must have the same SSID. Enter a descriptive name (up to 32 printable characters) for the wireless LAN. Spaces are allowed. **Note:** If you are configuring the device from a computer connected to the wireless LAN and you change the device'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 device's new settings.
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	Set the operating frequency/channel depending on your particular region. Select a channel from the drop-down list box. Refer to the chapter on wizard setup for more information about channels.

Table 11 Wireless Settings: Access Point (continued)

LABEL	DESCRIPTION
Wireless Mode	Select **802.11b only** to allow only IEEE 802.11b compliant WLAN devices to associate with the device. Select **802.11g only** to allow only IEEE 802.11g compliant WLAN devices to associate with the device. Select **Auto (11g/11b)** to allow either IEEE 802.11b or IEEE 802.11g compliant WLAN devices to associate with the device. The transmission rate of your device might be reduced.
Advanced Settings	
Beacon Interval	Set the number of milliseconds that should pass between the sending out of beacons.
Intra-BSS Traffic	Intra-BSS traffic is traffic between wireless stations in the same BSS. Enable Intra-BSS traffic to allow wireless stations connected to the device to communicate with each other. Disable Intra-BSS traffic to only allow wireless stations to communicate with the wired network, not with each other.
DTIM Interval	Set the interval for wireless clients in sleep mode to wake up and check for multicast or broadcast traffic. The AP includes a Delivery Traffic Indication Message (DTIM) in the beacon to notify wireless clients in sleep mode that there is a multicast or broadcast packet awaiting delivery. The interval is a multiple of the beacon interval. For example, if the beacon interval is 100 milliseconds and the DTIM interval is 2, the AP includes a DTIM with every second beacon (or every 200 milliseconds).
Number of Wireless Stations Allowed to Associate:	Use this field to set a maximum number of wireless stations that may connect to the device. Enter the number (from 1 to 32) of wireless stations allowed.
Radio Enable	Turn on the wireless adapter to allow wireless communications between the device and other IEEE 802.11b and IEEE 802.11g compliant wireless devices. Turn off the wireless adapter to stop wireless communications between the device and other IEEE 802.11b and IEEE 802.11g compliant wireless devices.
Output Power Management	Set the output power of the device in this field. If there is a high density of APs within an area, decrease the output power of the device to reduce interference with other APs. The options are **Full**, **50%**, **25%**, **12%** and **Min**.
Data Rate Management	Use this field to select a maximum data rate for the wireless connection(s). Please note that this is a total rate to be shared by all of the device’s wireless connections.
Preamble Type	Preamble is used to signal that data is coming to the receiver. Short preamble increases performance as less time sending preamble means more time for sending data. All IEEE 802.11b compliant wireless adapters support long preamble, but not all support short preamble. Select **Long** preamble if you are unsure what preamble mode the wireless adapters support, and to provide more reliable communications in busy wireless networks. Select **Short** preamble if you are sure the wireless adapters support it, and to provide more efficient communications. Select **Auto** to have the device automatically use short preamble when all wireless clients support it, otherwise the device uses long preamble. **Note:** The device and the wireless stations MUST use the same preamble mode in order to communicate.

Table 11 Wireless Settings: Access Point (continued)

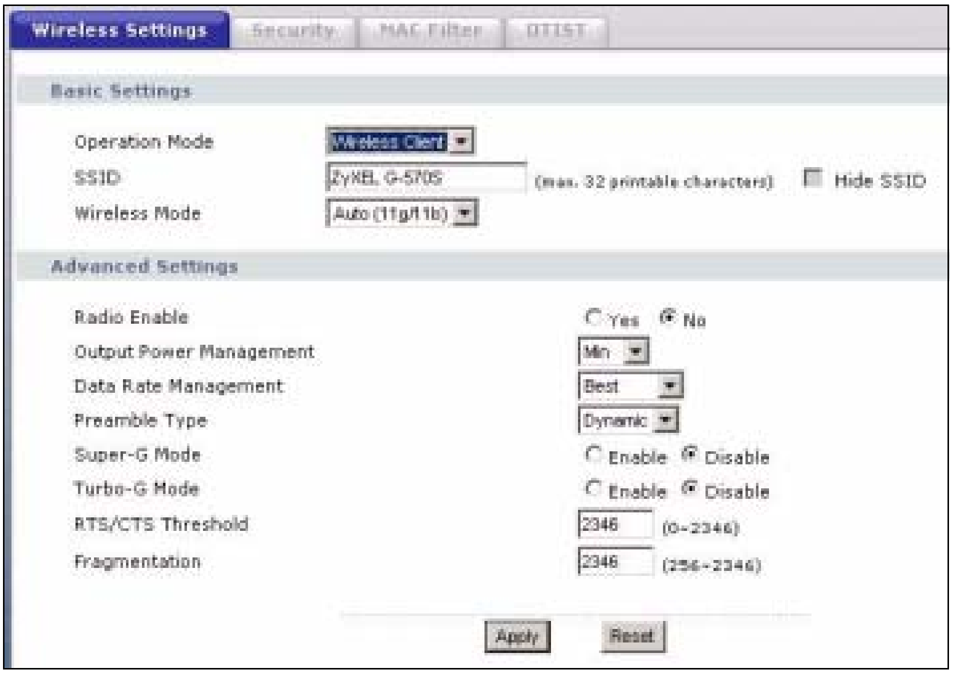
LABEL	DESCRIPTION
Super-G Mode	Super-G mode provides higher speed transmissions than regular IEEE 802.11g. The other device must also support super-G mode in order for the device to use it for the wireless connection. This is available when you select a **Wireless Mode** that includes IEEE 802.11g.
Turbo-G Mode	Turbo-G mode provides higher speed transmissions than regular IEEE 802.11g or super-G mode. The other device must also support turbo-G mode in order for the device to use it for the wireless connection. This is available when you select a **Wireless Mode** that includes IEEE 802.11g. Turbo-G uses two channels bonded together in order to achieve its higher transmission rates. This may cause interference with other APs in the area. The **Channel** field is automatically fixed at 6 when you use turbo-G mode.
RTS/CTS Threshold	Enter a value between 0 and 2432. The default is **2432**.
Fragmentation	Enter a value between 256 and 2432. The default is **2432**. It is the maximum data fragment size that can be sent.
Apply	Click **Apply** to save your changes back to the device.
Reset	Click **Reset** to begin configuring this screen afresh.

6.3.2 Wireless Client Mode

Select **Wireless Client** in the **Operation Mode** field to display the screen as shown next. This mode has the device act as wireless client to connect to a wireless network.

Note: WPA, WPA2 and IEEE 802.1x wireless security are not available when you use Wireless Client, Bridge or AP+Repeater mode.

Figure 37 Wireless Settings: Wireless Client



Basic Settings

Operation Mode	Wireless Client
SSID	ZyXEL G-570S (max. 32 printable characters) □ Hide SSID
Wireless Mode	Auto (11g/11b)

Advanced Settings

Radio Enable	○ Yes ● No
Output Power Management	Min
Data Rate Management	Best
Preamble Type	Dynamic
Super-G Mode	○ Enable ● Disable
Turbo-G Mode	○ Enable ● Disable
RTS/CTS Threshold	2346 (0~2346)
Fragmentation	2346 (256~2346)

The following table describes the labels in this screen.

Table 12 Wireless Settings: Wireless Client

LABEL	DESCRIPTION
Operation Mode	Select the operating mode from the drop-down list. The options are **Access Point**, **Wireless Client**, **Bridge** and **AP+Repeater**.
SSID	Wireless stations associating to the access point (AP) must have the same SSID. Enter a descriptive name (up to 32 printable characters) for the wireless LAN. Spaces are allowed. **Note:** If you are configuring the device from a computer connected to the wireless LAN and you change the device's SSID, channel or security settings, you will lose your wireless connection when you click **Apply** to save your settings. You must then change the wireless settings of your computer to match the device's new settings.
Wireless Mode	Select **802.11b only** to allow only IEEE 802.11b compliant WLAN devices to associate with the device. Select **802.11g only** to allow only IEEE 802.11g compliant WLAN devices to associate with the device. Select **Auto (11g/11b)** to allow either IEEE 802.11b or IEEE 802.11g compliant WLAN devices to associate with the device. The transmission rate of your device might be reduced.
Advanced Settings	
Radio Enable	Turn on the wireless adapter to allow wireless communications between the device and other IEEE 802.11b and IEEE 802.11g compliant wireless devices. Turn off the wireless adapter to stop wireless communications between the device and other IEEE 802.11b and IEEE 802.11g compliant wireless devices.
Output Power Management	Set the output power of the device in this field. If there is a high density of APs within an area, decrease the output power of the device to reduce interference with other APs. The options are **Full**, **50%**, **25%**, **12%** and **Min**.
Data Rate Management	Use this field to select a maximum data rate for the wireless connection(s). Please note that this is a total rate to be shared by all of the device’s wireless connections.
Preamble Type	Preamble is used to signal that data is coming to the receiver. Short preamble increases performance as less time sending preamble means more time for sending data. All IEEE 802.11b compliant wireless adapters support long preamble, but not all support short preamble. Select **Long** preamble if you are unsure what preamble mode the wireless adapters support, and to provide more reliable communications in busy wireless networks. Select **Short** preamble if you are sure the wireless adapters support it, and to provide more efficient communications. Select **Auto** to have the device automatically use short preamble when all wireless clients support it, otherwise the device uses long preamble. **Note:** The device and the wireless stations MUST use the same preamble mode in order to communicate.
Super-G Mode	Super-G mode provides higher speed transmissions than regular IEEE 802.11g. The other device must also support super-G mode in order for the device to use it for the wireless connection. This is available when you select a **Wireless Mode** that includes IEEE 802.11g.

Table 12 Wireless Settings: Wireless Client (continued)

LABEL	DESCRIPTION
Turbo-G Mode	Turbo-G mode provides higher speed transmissions than regular IEEE 802.11g or super-G mode. The other device must also support turbo-G mode in order for the device to use it for the wireless connection. This is available when you select a **Wireless Mode** that includes IEEE 802.11g. Turbo-G uses two channels bonded together in order to achieve its higher transmission rates. This may cause interference with other APs in the area. The **Channel** field is automatically fixed at 6 when you use turbo-G mode.
RTS/CTS Threshold	Enter a value between 0 and 2432. The default is **2432**.
Fragmentation	Enter a value between 256 and 2432. The default is **2432**. It is the maximum data fragment size that can be sent.
Apply	Click **Apply** to save your changes back to the device.
Reset	Click **Reset** to begin configuring this screen afresh.

6.3.3 Bridge Mode

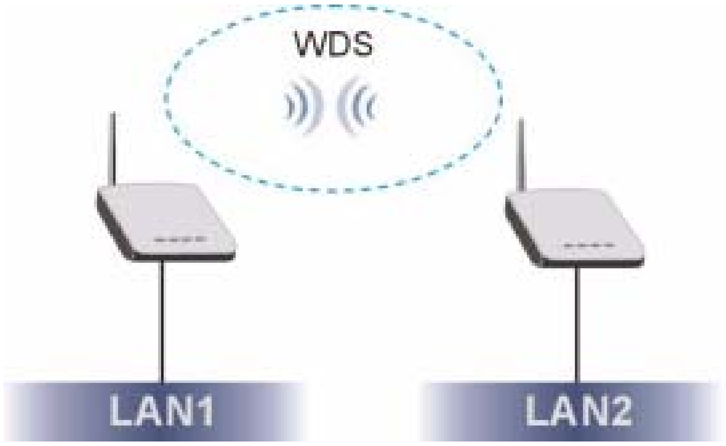
The device can act as a wireless network bridge and establish wireless links with other APs. You need to know the MAC address of the peer device, which also must be in bridge mode.

When two devices connect in **Bridge** mode, they form a WDS (Wireless Distribution System) allowing the computers in one LAN to connect to the computers in another LAN. See the following example.

Note: WPA, WPA2 and IEEE 802.1x wireless security are not available when you use Wireless Client, Bridge or AP+Repeater mode.

You can only use WEP keys to encrypt traffic between APs.

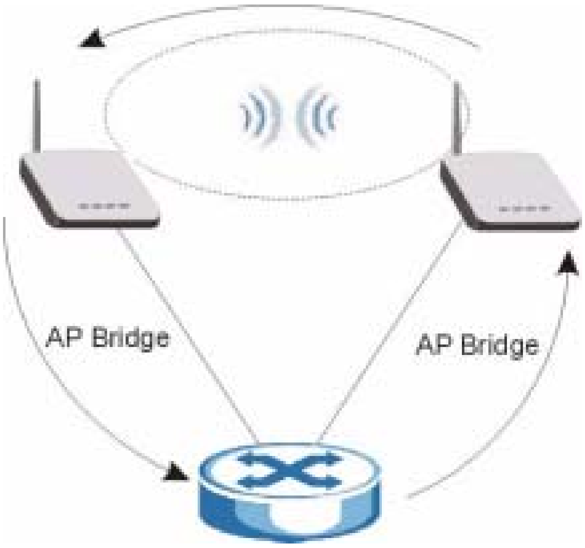
Figure 38 Bridging Example



Be careful to avoid bridge loops when you enable bridging in the G-570S. Bridge loops cause broadcast traffic to circle the network endlessly, resulting in possible throughput degradation and disruption of communications. The following examples show two network topologies that can lead to this problem:

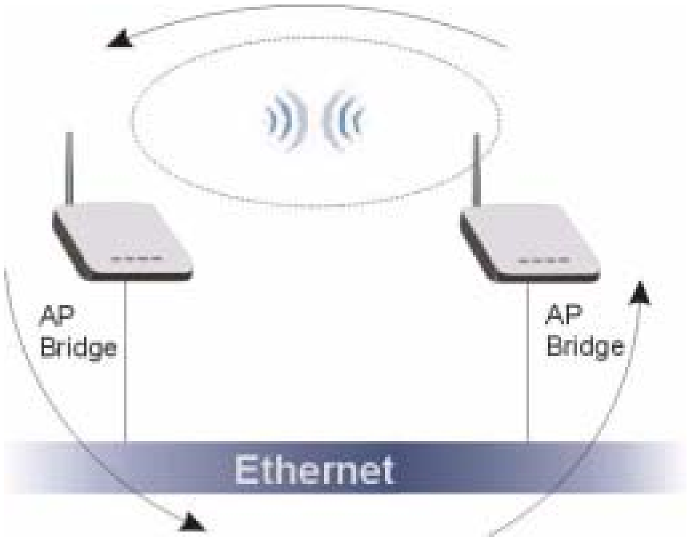
If two or more G-570Ss (in bridge mode) are connected to the same hub as shown next.

Figure 39 Bridge Loop: Two Bridges Connected to Hub



If your G-570S (in bridge mode) is connected to a wired LAN while communicating with another wireless bridge that is also connected to the same wired LAN as shown next.

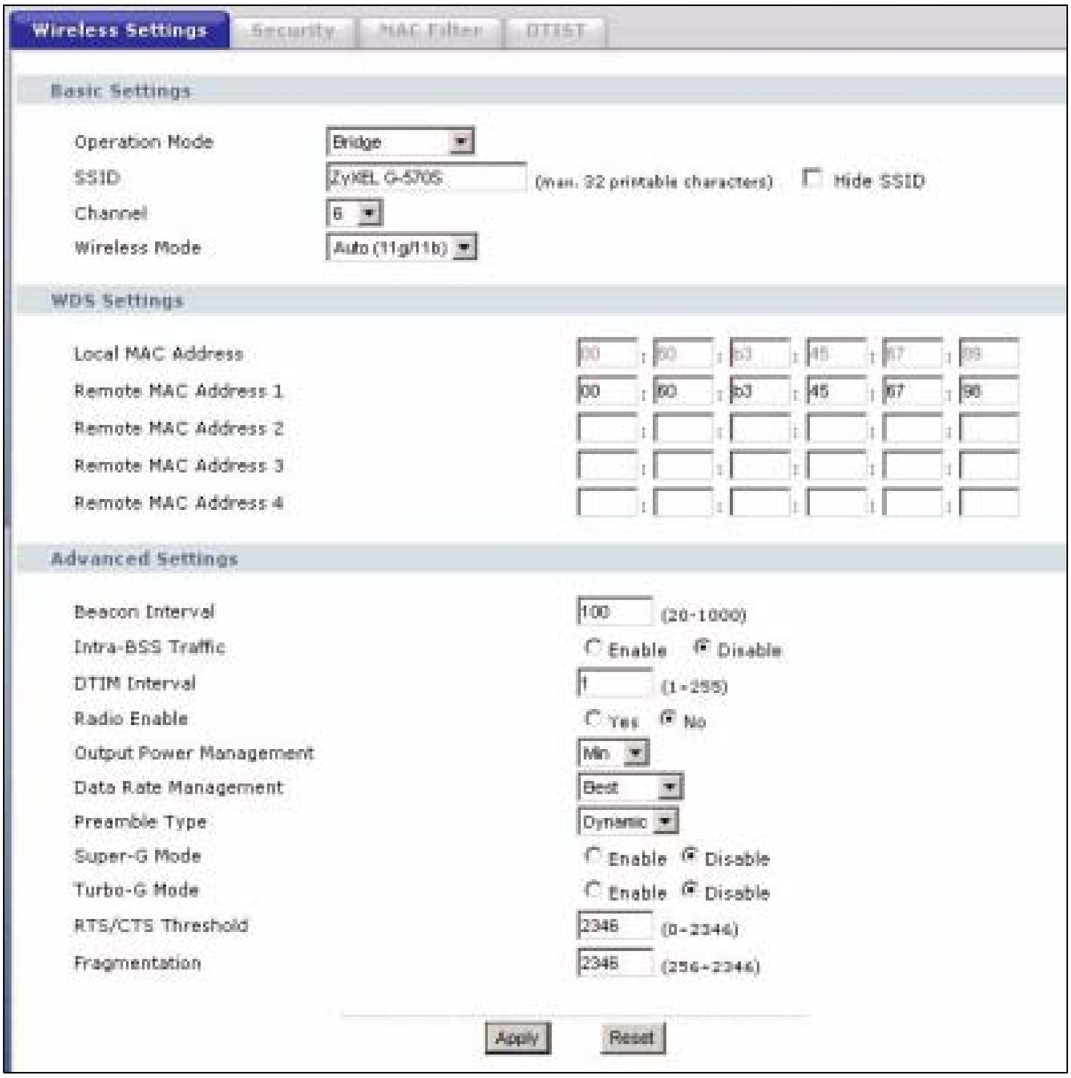
Figure 40 Bridge Loop: Bridge Connected to Wired LAN



To prevent bridge loops, ensure that your G-570S is not set to bridge mode while connected to both wired and wireless segments of the same LAN.

Select **Bridge** as the **Operation Mode** to have the device act as a wireless bridge only.

Figure 41 Wireless Settings: Bridge



Basic Settings

Operation Mode	Bridge
SSID	ZyXEL G-570S (max. 32 printable characters) □ Hide SSID
Channel	6
Wireless Mode	Auto (11g/11b)

WDS Settings

Local MAC Address	00 : 60 : b3 : 45 : 67 : 89
Remote MAC Address 1	00 : 60 : b3 : 45 : 67 : 98
Remote MAC Address 2	: : : : :
Remote MAC Address 3	: : : : :
Remote MAC Address 4	: : : : :

Advanced Settings

Beacon Interval	100 (20-1000)
Intra-BSS Traffic	○ Enable ● Disable
DTIM Interval	1 (1-255)
Radio Enable	○ Yes ● No
Output Power Management	Min
Data Rate Management	Best
Preamble Type	Dynamic
Super-G Mode	○ Enable ● Disable
Turbo-G Mode	○ Enable ● Disable
RTS/CTS Threshold	2346 (0-2346)
Fragmentation	2346 (256-2346)

The following table describes the labels in this screen.

Table 13 Wireless Settings: Bridge

LABEL	DESCRIPTION
Operation Mode	Select the operating mode from the drop-down list. The options are **Access Point**, **Wireless Client**, **Bridge** and **AP+Repeater**. **Note:** If you are configuring the device from a computer connected to the wireless LAN and you change the device to use bridge mode, you will lose your wireless connection when you click **Apply** to save your settings. You must then connect to the device through the wired network.
SSID	The device does not use the SSID with bridge mode. You do not need to configure it.
Hide SSID	The device does not use the SSID with bridge mode. You do not need to configure this field.
Channel	Set the operating frequency/channel depending on your particular region. Select a channel from the drop-down list box. Refer to the chapter on wizard setup for more information about channels.
Wireless Mode	Select **802.11b only** to allow only IEEE 802.11b compliant WLAN devices to associate with the device. Select **802.11g only** to allow only IEEE 802.11g compliant WLAN devices to associate with the device. Select **Auto (11g/11b)** to allow either IEEE 802.11b or IEEE 802.11g compliant WLAN devices to associate with the device. The transmission rate of your device might be reduced.
Local MAC Address	This is the MAC address of the device.
Remote MAC Address 1~4	Type the MAC address of the peer device in a valid MAC address format, that is, six hexadecimal character pairs, for example, 12:34:56:78:9a:bc.
Advanced Settings	
Beacon Interval	Set the number of milliseconds that should pass between the sending out of beacons.
Intra-BSS Traffic	Intra-BSS traffic is traffic between wireless stations in the same BSS. Enable Intra-BSS traffic to allow wireless stations connected to the device to communicate with each other. Disable Intra-BSS traffic to only allow wireless stations to communicate with the wired network, not with each other.
DTIM Interval	Set the interval for wireless clients in sleep mode to wake up and check for multicast or broadcast traffic. The AP includes a Delivery Traffic Indication Message (DTIM) in the beacon to notify wireless clients in sleep mode that there is a multicast or broadcast packet awaiting delivery. The interval is a multiple of the beacon interval. For example, if the beacon interval is 100 milliseconds and the DTIM interval is 2, the AP includes a DTIM with every second beacon (or every 200 milliseconds).
Radio Enable	Turn on the wireless adapter to allow wireless communications between the device and other IEEE 802.11b and IEEE 802.11g compliant wireless devices. Turn off the wireless adapter to stop wireless communications between the device and other IEEE 802.11b and IEEE 802.11g compliant wireless devices.

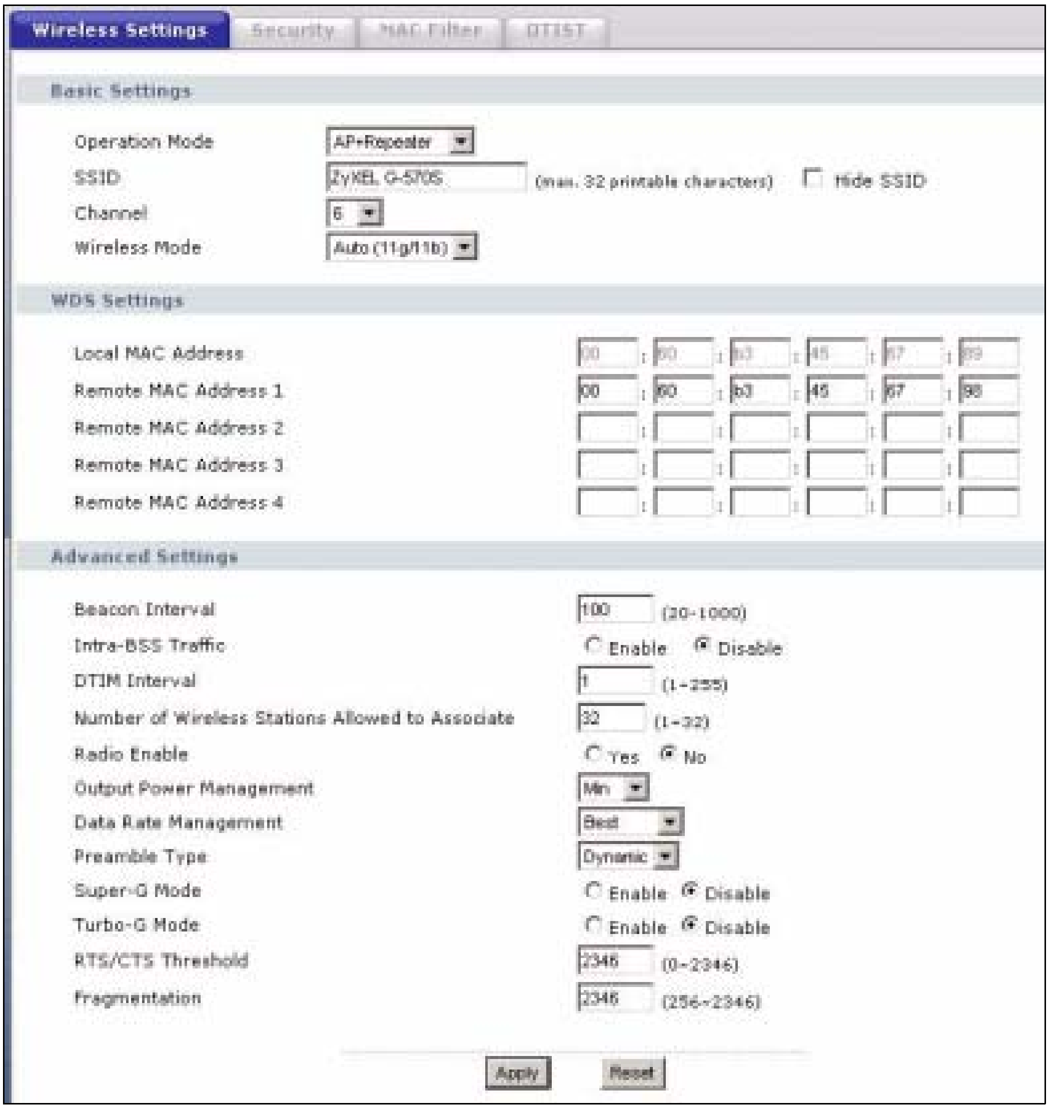
Table 13 Wireless Settings: Bridge (continued)

LABEL	DESCRIPTION
Output Power Management	Set the output power of the device in this field. If there is a high density of APs within an area, decrease the output power of the device to reduce interference with other APs. The options are **Full**, **50%**, **25%**, **12%** and **Min**.
Data Rate Management	Use this field to select a maximum data rate for the wireless connection(s). Please note that this is a total rate to be shared by all of the device's wireless connections.
Preamble Type	Preamble is used to signal that data is coming to the receiver. Short preamble increases performance as less time sending preamble means more time for sending data. All IEEE 802.11b compliant wireless adapters support long preamble, but not all support short preamble. Select **Long** preamble if you are unsure what preamble mode the wireless adapters support, and to provide more reliable communications in busy wireless networks. Select **Short** preamble if you are sure the wireless adapters support it, and to provide more efficient communications. Select **Auto** to have the device automatically use short preamble when all wireless clients support it, otherwise the device uses long preamble. **Note:** The device and the wireless stations MUST use the same preamble mode in order to communicate.
Super-G Mode	Super-G mode provides higher speed transmissions than regular IEEE 802.11g. The other device must also support super-G mode in order for the device to use it for the wireless connection. This is available when you select a **Wireless Mode** that includes IEEE 802.11g.
Turbo-G Mode	Turbo-G mode provides higher speed transmissions than regular IEEE 802.11g or super-G mode. The other device must also support turbo-G mode in order to use it for the wireless connection. This is available when you select a **Wireless Mode** that includes IEEE 802.11g. Turbo-G uses two channels bonded together in order to achieve its higher transmission rates. This may cause interference with other APs in the area. The **Channel** field is automatically fixed at 6 when you use turbo-G mode.
RTS/CTS Threshold	Enter a value between 0 and 2432. The default is **2432**.
Fragmentation	Enter a value between 256 and 2432. The default is **2432**. It is the maximum data fragment size that can be sent.
Apply	Click **Apply** to save your changes back to the device.
Reset	Click **Reset** to begin configuring this screen afresh.

6.3.4 AP+Repeater Mode

Select **AP+Repeater** as the **Operation Mode** to have the device act as an access point and a wireless bridge.

Figure 42   Wireless Settings: AP+Repeater



Basic Settings

Operation Mode	AP+Repeater
SSID	ZyXEL G-570S (max. 32 printable characters) □ Hide SSID
Channel	6
Wireless Mode	Auto (11g/11b)

WDS Settings

Local MAC Address	00 : 60 : b3 : 45 : 67 : 89
Remote MAC Address 1	00 : 60 : b3 : 45 : 67 : 98
Remote MAC Address 2	: : : : :
Remote MAC Address 3	: : : : :
Remote MAC Address 4	: : : : :

Advanced Settings

Beacon Interval	100 (20-1000)
Intra-BSS Traffic	○ Enable ● Disable
DTIM Interval	1 (1~255)
Number of Wireless Stations Allowed to Associate	32 (1~32)
Radio Enable	○ Yes ● No
Output Power Management	Min
Data Rate Management	Best
Preamble Type	Dynamic
Super-G Mode	○ Enable ● Disable
Turbo-G Mode	○ Enable ● Disable
RTS/CTS Threshold	2346 (0~2346)
Fragmentation	2346 (256~2346)

The following table describes the labels in this screen.

Table 14 Wireless Settings: AP + Repeater

LABEL	DESCRIPTION
Operation Mode	Select the operating mode from the drop-down list. The options are **Access Point**, **Wireless Client**, **Bridge** and **AP+Repeater**.
SSID	Wireless stations associating to the access point (AP) must have the same SSID. Enter a descriptive name (up to 32 printable characters) for the wireless LAN. Spaces are allowed. **Note:** If you are configuring the device from a computer connected to the wireless LAN and you change the device's SSID, channel or security settings, you will lose your wireless connection when you click **Apply** to save your settings. You must then change the wireless settings of your computer to match the device's new settings.
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	Set the operating frequency/channel depending on your particular region. Select a channel from the drop-down list box. Refer to the chapter on wizard setup for more information about channels.
Wireless Mode	Select **802.11b only** to allow only IEEE 802.11b compliant WLAN devices to associate with the device. Select **802.11g only** to allow only IEEE 802.11g compliant WLAN devices to associate with the device. Select **Auto (11g/11b)** to allow either IEEE 802.11b or IEEE 802.11g compliant WLAN devices to associate with the device. The transmission rate of your device might be reduced.
Local MAC Address	This is the MAC address of the device.
Remote MAC Address 1~4	Type the MAC address of the peer device in a valid MAC address format, that is, six hexadecimal character pairs, for example, 12:34:56:78:9a:bc.
Advanced Settings	
Beacon Interval	Set the number of milliseconds that should pass between the sending out of beacons.
Intra-BSS Traffic	Intra-BSS traffic is traffic between wireless stations in the same BSS. Enable Intra-BSS traffic to allow wireless stations connected to the device to communicate with each other. Disable Intra-BSS traffic to only allow wireless stations to communicate with the wired network, not with each other.
DTIM Interval	Set the interval for wireless clients in sleep mode to wake up and check for multicast or broadcast traffic. The AP includes a Delivery Traffic Indication Message (DTIM) in the beacon to notify wireless clients in sleep mode that there is a multicast or broadcast packet awaiting delivery. The interval is a multiple of the beacon interval. For example, if the beacon interval is 100 milliseconds and the DTIM interval is 2, the AP includes a DTIM with every second beacon (or every 200 milliseconds).
Radio Enable	Turn on the wireless adapter to allow wireless communications between the device and other IEEE 802.11b and IEEE 802.11g compliant wireless devices. Turn off the wireless adapter to stop wireless communications between the device and other IEEE 802.11b and IEEE 802.11g compliant wireless devices.

Table 14 Wireless Settings: AP + Repeater (continued)

LABEL	DESCRIPTION
Output Power Management	Set the output power of the device in this field. If there is a high density of APs within an area, decrease the device's output power to reduce interference with other APs. The options are **Full**, **50%**, **25%**, **12%** and **Min**.
Data Rate Management	Use this field to select a maximum data rate for the wireless connection(s). Please note that this is a total rate to be shared by all of the device's wireless connections.
Preamble Type	Preamble is used to signal that data is coming to the receiver. Short preamble increases performance as less time sending preamble means more time for sending data. All IEEE 802.11b compliant wireless adapters support long preamble, but not all support short preamble. Select **Long** preamble if you are unsure what preamble mode the wireless adapters support, and to provide more reliable communications in busy wireless networks. Select **Short** preamble if you are sure the wireless adapters support it, and to provide more efficient communications. Select **Auto** to have the device automatically use short preamble when all wireless clients support it, otherwise the device uses long preamble. **Note:** The device and the wireless stations MUST use the same preamble mode in order to communicate.
Super-G Mode	Super-G mode provides higher speed transmissions than regular IEEE 802.11g. The other device must also support super-G mode in order to use it for the wireless connection. This is available when you select a **Wireless Mode** that includes IEEE 802.11g.
Turbo-G Mode	Turbo-G mode provides higher speed transmissions than regular IEEE 802.11g or super-G mode. The other device must also support turbo-G mode in order to use it for the wireless connection. This is available when you select a **Wireless Mode** that includes IEEE 802.11g. Turbo-G uses two channels bonded together in order to achieve its higher transmission rates. This may cause interference with other APs in the area. The **Channel** field is automatically fixed at 6 when you use turbo-G mode.
RTS/CTS Threshold	Enter a value between 0 and 2432. The default is **2432**.
Fragmentation	Enter a value between 256 and 2432. The default is **2432**. It is the maximum data fragment size that can be sent.
Apply	Click **Apply** to save your changes back to the device.
Reset	Click **Reset** to begin configuring this screen afresh.

6.4 Wireless Security Overview

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

The figure below shows the possible wireless security levels on your G-570S. EAP (Extensible Authentication Protocol) is used for authentication and utilizes dynamic WEP key exchange. It requires interaction with a RADIUS (Remote Authentication Dial-In User Service) server either on the WAN or your LAN to provide authentication service for wireless stations.

Table 15 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

If you do not enable any wireless security on your G-570S, your network is accessible to any wireless networking device that is within range.

6.4.1 Encryption

- Use WPA(2) security if you have WP(2)A-aware wireless clients and a RADIUS server. WPA(2) 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 the passphrase feature to automatically generate WEP keys or manually enter WEP keys.

6.4.2 Authentication

Use a RADIUS server with WPA or IEEE 802.1x key management protocol.

See the appendix for information on protocols used when a client authenticates with a RADIUS server via the G-570S.

6.4.3 Restricted Access

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

6.4.4 Hide G-570S Identity

If you hide the ESSID, then the G-570S cannot be seen when a wireless client scans for local APs. The trade-off for the extra security of "hiding" the G-570S may be inconvenience for some valid WLAN clients.

6.5 WEP Overview

WEP (Wired Equivalent Privacy) as specified in the IEEE 802.11 standard provides methods for both data encryption and wireless station authentication.

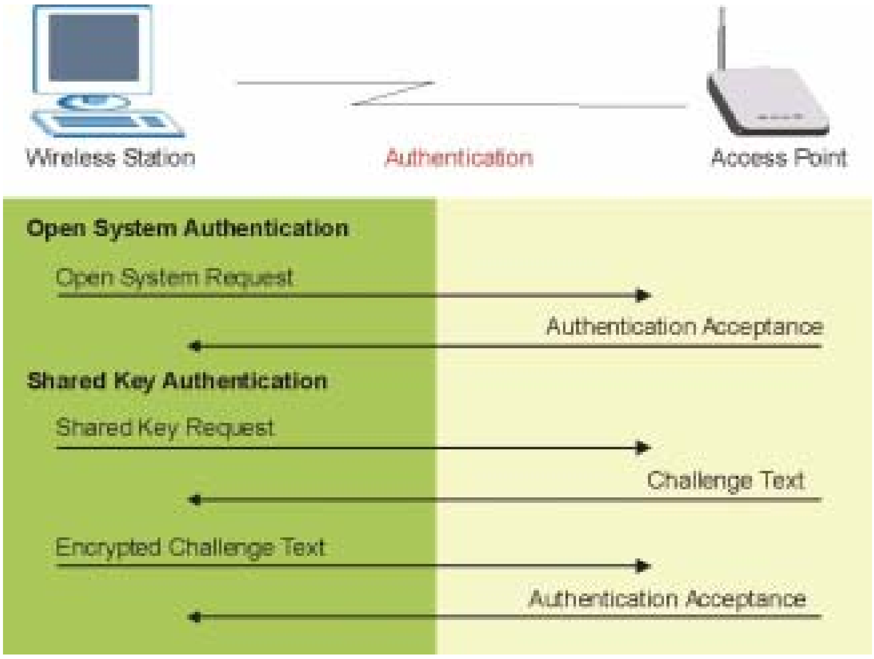
6.5.1 Data Encryption

WEP provides a mechanism for encrypting data using encryption keys. Both the AP and the wireless stations must use the same WEP key to encrypt and decrypt data. Your G-570S allows you to configure up to four 64-bit, 128-bit or 152-bit WEP keys, but only one key can be enabled at any one time.

6.5.2 Authentication

Three different methods can be used to authenticate wireless stations to the network: **Open System**, **Shared** and **Auto**. The following figure illustrates the steps involved.

Figure 43   WEP Authentication Steps



Open system authentication involves an unencrypted two-message procedure. A wireless station sends an open system authentication request to the AP, which will then automatically accept and connect the wireless station to the network. In effect, open system is not authentication at all as any station can gain access to the network.

Shared key authentication involves a four-message procedure. A wireless station sends a shared key authentication request to the AP, which will then reply with a challenge text message. The wireless station must then use the AP’s default WEP key to encrypt the challenge text and return it to the AP, which attempts to decrypt the message using the AP’s default WEP key. If the decrypted message matches the challenge text, the wireless station is authenticated.

When your G-570S's authentication method is set to open system, it will only accept open system authentication requests. The same is true for shared key authentication. However, when it is set to auto authentication, the G-570S will accept either type of authentication request and the G-570S will fall back to use open authentication if the shared key does not match.

6.6 802.1x Overview

The IEEE 802.1x standard outlines enhanced security methods for both the authentication of wireless stations and encryption key management. Authentication can be done using the local user database internal to the G-570S (authenticate up to 32 users) or an external RADIUS server for an unlimited number of users.

6.7 Introduction to RADIUS

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

- Authentication

  Determines the identity of the users.

- Accounting

  Keeps track of the client’s network activity.

RADIUS user is a simple package exchange in which your G-570S acts as a message relay between the wireless station and the network RADIUS server.

6.7.1 Types of RADIUS Messages

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

- Access-Request

  Sent by an access point, requesting authentication.
- Access-Reject

  Sent by a RADIUS server rejecting access.
- Access-Accept

  Sent by a RADIUS server allowing access.
- Access-Challenge

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

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

- Accounting-Request

  Sent by the access point requesting accounting.
- Accounting-Response

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

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

6.8 EAP Authentication Overview

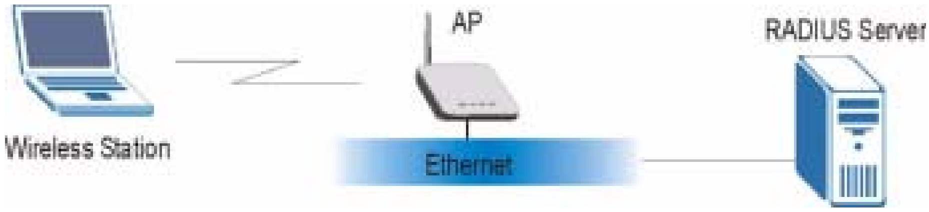
EAP (Extensible Authentication Protocol) is an authentication protocol that runs on top of the IEEE802.1x transport mechanism in order to support multiple types of user authentication. By using EAP to interact with an EAP-compatible RADIUS server, the access point helps a wireless station and a RADIUS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

The type of authentication you use depends on the RADIUS server or the AP. The G-570S supports EAP-TLS, EAP-TTLS, EAP-MD5 and PEAP with RADIUS. Refer to the appendix about the types of EAP authentication for descriptions on the common types.

Your G-570S supports EAP-MD5 (Message-Digest Algorithm 5) and PEAP (Protected EAP) with the built-in RADIUS server.

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

Figure 44 EAP Authentication



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

1. The wireless station sends a "start" message to the G-570S.
2. The G-570S sends a "request identity" message to the wireless station for identity information.
3. The wireless station replies with identity information, including user name and password.
4. The RADIUS server checks the user information against its user profile database and determines whether or not to authenticate the wireless station.

6.9 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 WEP 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.

To use Dynamic WEP, enable and configure the RADIUS server and enable Dynamic WEP Key Exchange in the **WIRELESS Security 802.1x** screen. Ensure that the wireless station's EAP type is configured to one of the following:

- EAP-TLS
- EAP-TTLS
- PEAP

Note: EAP-MD5 cannot be used with Dynamic WEP Key Exchange.

6.10 Introduction to WPA and WPA2

Wi-Fi Protected Access (WPA) is a subset of the IEEE 802.11i standard. WPA2 (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.

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.

If the AP or the wireless clients do not support WPA2, just use WPA or WPA-PSK depending on whether you have an external RADIUS server or not.

Select WEP only when the AP and/or wireless clients do not support WPA or WPA2. WEP is less secure than WPA or WPA2.

6.10.1 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.

The encryption mechanisms used for WPA(2) and WPA(2)-PSK are the same. The only difference between the two is that WPA-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.

6.10.2 User Authentication

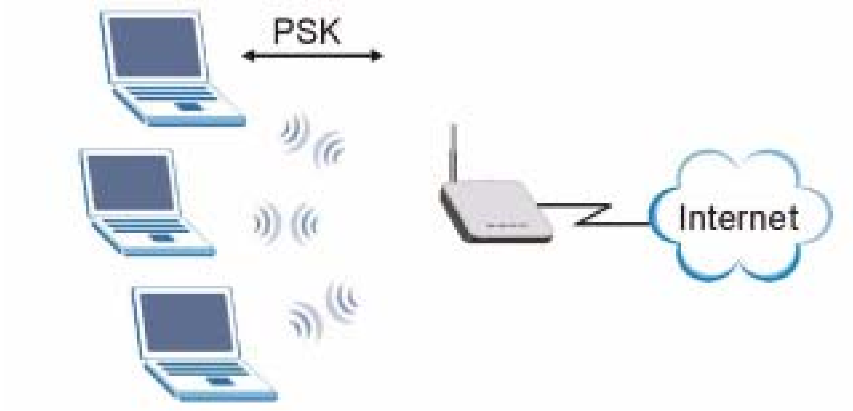
WPA or WPA2 applies IEEE 802.1x and Extensible Authentication Protocol (EAP) to authenticate wireless clients using an external RADIUS database.

6.11 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 client’s password and (only) allows it to join the network if it matches its password.
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 45   WPA(2)-PSK Authentication

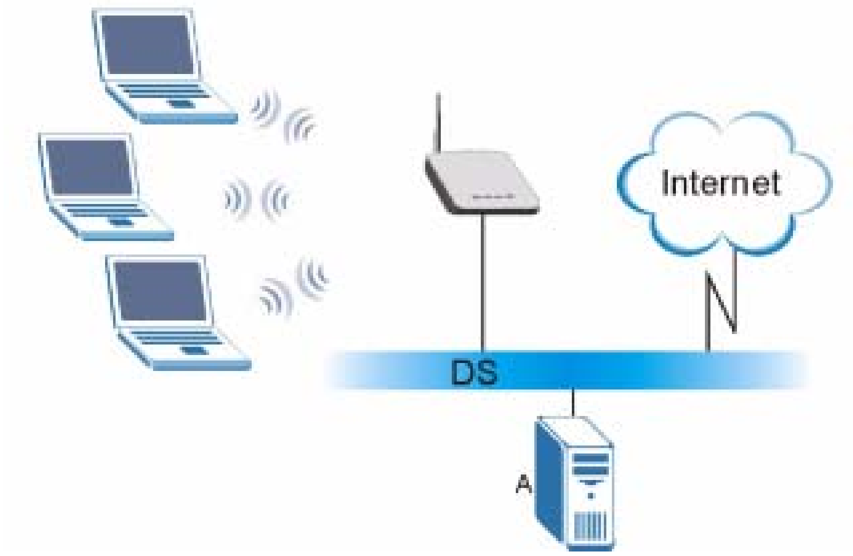


6.12 WPA(2) with RADIUS Application Example

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 46   WPA with RADIUS Application Example


Internet
DS
A