NBG5615

Simultaneous Dual-Band Wireless N750 Media Router

Version 1.00
Edition 1, 12/2012

User's Guide

Default Login Details	
LAN IP Address	http://192.168.1.1 (Router Mode) http://192.168.1.2 (Access Point Mode)
Password	1234

IMPORTANT!

READ CAREFULLY BEFORE USE.

KEEP THIS GUIDE FOR FUTURE REFERENCE.

Screenshots and graphics in this book may differ slightly from your product due to differences in your product firmware or your computer operating system. Every effort has been made to ensure that the information in this manual is accurate.

Related Documentation

- Quick Start Guide

  The Quick Start Guide shows how to connect the NBG5615 and access the Web Configurator wizards. It contains information on setting up your network and configuring for Internet access.

Contents Overview

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PART I
User's Guide

1 Introduction

1.1 Overview

This chapter introduces the main features and applications of the NBG5615.

The NBG5615 extends the range of your existing wired network without additional wiring, providing easy network access to mobile users. You can set up a wireless network with other IEEE 802.11a/b/g/n compatible devices. The NBG5615 is able to function both 2.4GHz and 5GHz networks at the same time.

A range of services such as a firewall and content filtering are also available for secure Internet computing.

There are two USB 2.0 ports on the side panel of your NBG5615. You can connect USB (version 2.0 or lower) memory sticks, USB hard drives, or USB devices for file sharing. The NBG5615 automatically detects the USB devices.

Note: For the USB function, it is strongly recommended to use version 2.0 or lower USB storage devices (such as memory sticks, USB hard drives) and/or USB devices (such as USB printers). Other USB products are not guaranteed to function properly with the NBG5615.

Note: Be sure to install the ZyXEL NetUSB™ Share Center Utility (for NetUSB functionality) from the included disc, or download the latest version from the zyxel.com website.

1.2 Applications

Your can have the following networks using the NBG5615:

- **Wired**. You can connect network devices via the Ethernet ports of the NBG5615 so that they can communicate with each other and access the Internet.
- **Wireless**. Wireless clients can connect to the NBG5615 to access network resources. You can use WPS (Wi-Fi Protected Setup) to create an instant network connection with another WPS-compatible device.
- **WAN**. Connect to a broadband modem/router for Internet access.
- **NetUSB**. The NBG5615 allows you to connect a USB device (such as printer, or scanner) directly to the USB port and then share that device over the network using the NetUSB utility.

1.3 Ways to Manage the NBG5615

Use any of the following methods to manage the NBG5615.

- WPS (Wi-Fi Protected Setup). You can use the WPS button or the WPS section of the Web Configurator to set up a wireless network with your ZyXEL Device.
- Web Configurator. This is recommended for everyday management of the NBG5615 using a (supported) web browser.

1.4 Good Habits for Managing the NBG5615

Do the following things regularly to make the NBG5615 more secure and to manage the NBG5615 more effectively.

- Change the password. Use a password that's not easy to guess and that consists of different types of characters, such as numbers and letters.
- Write down the password and put it in a safe place.
- Back up the configuration (and make sure you know how to restore it). Restoring an earlier working configuration may be useful if the device becomes unstable or even crashes. If you forget your password, you will have to reset the NBG5615 to its factory default settings. If you backed up an earlier configuration file, you would not have to totally re-configure the NBG5615. You could simply restore your last configuration.

1.5 Resetting the NBG5615

If you forget your password or IP address, or you cannot access the Web Configurator, you will need to use the **RESET** button at the back of the NBG5615 to reload the factory-default configuration file. This means that you will lose all configurations that you had previously saved, the password will be reset to "1234" and the IP address will be reset to "192.168.1.1".

1.5.1 How to Use the RESET Button

1. Make sure the power LED is on.
2. Press the **RESET** button for one to four seconds to restart/reboot the NBG5615.
3. Press the **RESET** button for longer than five seconds to set the NBG5615 back to its factory-default configurations.

1.6 The WPS Button

Your NBG5615 supports Wi-Fi Protected Setup (WPS), which is an easy way to set up a secure wireless network. WPS is an industry standard specification, defined by the Wi-Fi Alliance.

WPS allows you to quickly set up a wireless network with strong security, without having to configure security settings manually. Each WPS connection works between two devices. Both devices must support WPS (check each device's documentation to make sure).

Depending on the devices you have, you can either press a button (on the device itself, or in its configuration utility) or enter a PIN (a unique Personal Identification Number that allows one device to authenticate the other) in each of the two devices. When WPS is activated on a device, it has two minutes to find another device that also has WPS activated. Then, the two devices connect and set up a secure network by themselves.

You can use the WPS button () on the front panel of the NBG5615 to activate WPS in order to quickly set up a wireless network with strong security.

1. Make sure the power LED is on (not blinking).
2. Press the WPS button for more than three seconds and release it. Press the WPS button on another WPS-enabled device within range of the NBG5615.

Note: You must activate WPS in the NBG5615 and in another wireless device within two minutes of each other.

For more information on using WPS, see Section 9.2 on page 73.

1.7 LEDs

Figure 1 Front Panel

The following table describes the LEDs.

Table 1 Front panel LEDs

LED	COLOR	STATUS	DESCRIPTION
Power	Green	On	The NBG5615 is receiving power and functioning properly.
		Blinking	The NBG5615 is in the process of starting up or default restoring.
	Off		The NBG5615 is not receiving power.
WAN	Green	On	The NBG5615's WAN connection is ready.
		Blinking	The NBG5615 is sending/receiving data through the WAN.
	Off		The WAN connection is not ready, or has failed.
LAN 1-4	Green	On	The NBG5615's LAN connection is ready.
		Blinking	The NBG5615 is sending/receiving data through the LAN.
	Off		The LAN connection is not ready, or has failed.

Table 1 Front panel LEDs (continued)

LED	COLOR	STATUS	DESCRIPTION
2.4G/5G WLAN	Green	On	The NBG5615 is ready and the 2.4GHz/5GHz wireless LAN is on, but is not sending/receiving data through the wireless LAN.
		Blinking	The NBG5615 is sending/receiving data through the wireless LAN.
	Off		The wireless LAN is not ready or has failed.
WPS	Green	On	WPS is enabled.
		Blinking	The NBG5615 is negotiating a WPS connection with a wireless client.
	Off		WPS is disabled.
USB 1/2	Green	On	The NBG5615 has a USB device installed.
		Blinking	The NBG5615 is transmitting and/or receiving data from routers through an installed USB device.
	Off		There is no USB device connected to the NBG5615.

1.8 Wall Mounting

You may need screw anchors if mounting on a concrete or brick wall.

Table 2 Wall Mounting Information

Distance between holes	13 cm
M4 Screws	Two
Screw anchors (optional)	Two

1 Select a position free of obstructions on a wall strong enough to hold the weight of the device.

2 Mark two holes on the wall at the appropriate distance apart for the screws.

Be careful to avoid damaging pipes or cables located inside the wall when drilling holes for the screws.

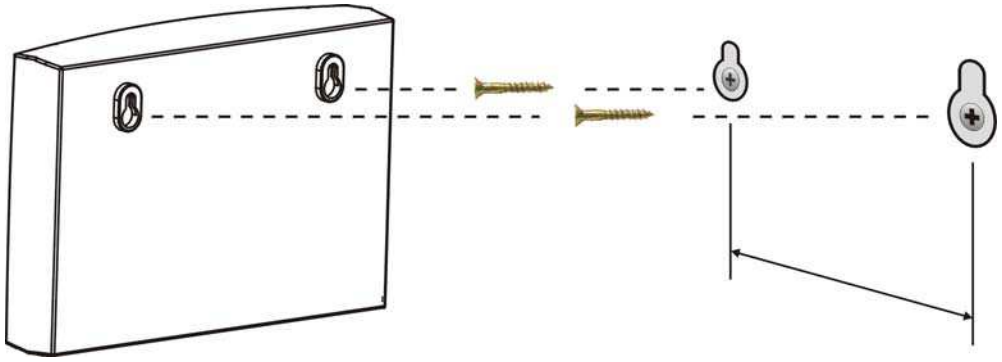
3 If using screw anchors, drill two holes for the screw anchors into the wall. Push the anchors into the full depth of the holes, then insert the screws into the anchors. Do not insert the screws all the way in - leave a small gap of about 0.5 cm.

If not using screw anchors, use a screwdriver to insert the screws into the wall. Do not insert the screws all the way in - leave a gap of about 0.5 cm.

4 Make sure the screws are fastened well enough to hold the weight of the NBG5615 with the connection cables.

5 Align the holes on the back of the NBG5615 with the screws on the wall. Hang the NBG5615 on the screws.

Figure 2 Wall Mounting Example



2

ZyXEL NetUSB Share Center Utility

2.1 Overview

The ZyXEL NetUSB Share Center Utility allows you to work with the USB devices that are connected directly to the NBG5615 as if they are connected directly to your computer. This allows you to easily share USB-based devices such as printers, scanners, MP3 players, faxes, and digital cameras (to name a few) with all the other people in your home or office as long as they are connected to the NBG5615 and have the ZyXEL NetUSB Share Center Utility installed.

Note: Be sure to install the ZyXEL NetUSB Share Center Utility (for NetUSB functionality) from the included disc, or download the latest version from the zyxel.com website.

2.1.1 Quick Setup

This section shows you how to get started using the ZyXEL NetUSB Share Center Utility.

1. Install the ZyXEL NetUSB Share Center Utility on each computer connected to the NBG5615.
2. Connect a USB device to the USB port on the NBG5615.
3. Run the ZyXEL NetUSB Share Center Utility to display a list of all connected USB devices, then use it to connect your computer to them.

2.1.2 Installing ZyXEL NetUSB Share Center Utility

Before you can access USB devices connected to the NBG5615, you must first install the ZyXEL NetUSB Share Center Utility on any computer on your LAN to which you want to allow access to these devices.

Note: In order to properly use the utility with your NBG5615, ensure that the NBG5615 firmware is version v1.00(AAGI.0) or higher. See Chapter 24 on page 196 for information on updating your device's firmware.

To install the ZyXEL NetUSB Share Center Utility:

1. Insert the disc that came with your NBG5615 into your computer's disc drive.
2. Run the **Setup** program by double-clicking it and then follow the on-screen instructions for installing it on your computer.

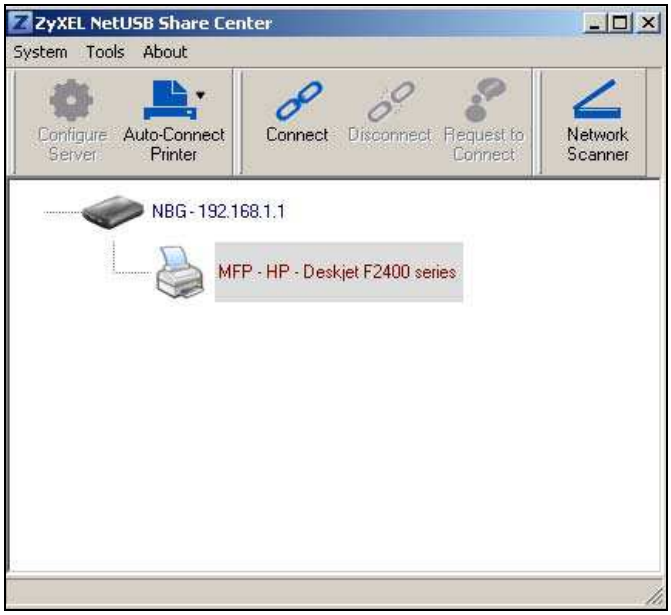
Note: The following operating systems are supported: Windows XP/Vista/7 (32 and 64-bit versions), and Mac OS X 10.6.

3 To open the ZyXEL NetUSB Share Center Utility, double-click its system tray icon.

2.2 The ZyXEL NetUSB Share Center Utility

This section describes the ZyXEL NetUSB Share Center Utility main window.

Figure 3 ZyXEL NetUSB Share Center Utility Main Window



The following table describes the icons in this window.

Table 3 ZyXEL NetUSB Share Center Utility Main Window Icons

ICON	DESCRIPTION
	Configure Server Click to open the NBG5615's built-in Web Configurator, which you can use to set up the NBG5615 (see Chapter 4 on page 39 for details).
	Auto-Connect Printer You can set the selected printer to 'auto-connect' after you have connected it to your computer during inital connection. If the printer is auto-connected to your computer, they will always be connected over the network. You do not need to configure it manually each time. Note: If the computer is connecting to the shared USB printer for the first time, you need to click **Connect** and setup the printer before you can use the **Auto-Connect Printer** function. See Chapter 9 on page 84 for more details. Note: You first must install the appropriate drivers for the printer that you intend to use.

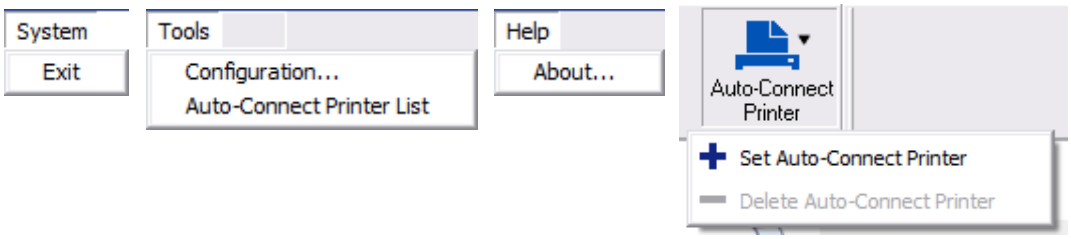
Table 3 ZyXEL NetUSB Share Center Utility Main Window Icons (continued)

ICON	DESCRIPTION
	Connect Select a USB device and then click this button to connect to it. Your computer can connect to as many USB devices as are connected to the NBG5615.
	Disconnect Select a device to which your computer is connected and then click this button to disconnect from it.
	Request to Connect Some USB devices may not allow automatic connections over the network. If so, select the device in question and click this button to issue a request to connect to it.
	Network Scanner Click this to open the scanner options on your computer for working with a scanner connected to the network.

2.2.1 The Menus

This section describes the utility's menus.

Figure 4 ZyXEL NetUSB Share Center Utility Menus



The following table describes the menus in this screen.

Table 4 ZyXEL NetUSB Share Center Utility Main Screen Menus

MENU	ITEM	DESCRIPTION
System	Exit	This closes the ZyXEL NetUSB Share Center Utility.
Tools	Configuration	This opens the ZyXEL NetUSB Share Center Utility configuration window.
	Auto-Connect Printer List	This opens the list window that displays all of the printing devices connected to the NBG5615.
Help	About	This opens the about window, which provides information of the utility software and driver versions.

Table 4 ZyXEL NetUSB Share Center Utility Main Screen Menus (continued)

MENU	ITEM	DESCRIPTION
Auto-Connect Printer	Set Auto-Connect Printer	You can set the selected printer to 'auto-connect' after you have connected it to your computer during inital connection. If the printer is auto-connected to your computer, they will always be connected over the network. You do not need to configure it manually each time. Click this to show your installed printer list and select the one you want to set as auto-connected. Note: If the computer is connecting to the shared USB printer for the first time, you need to click **Connect** and setup the printer before you can use the **Auto-Connect Printer** function. See Chapter 9 on page 84 for more details. Note: You first must install the appropriate drivers for the printer that you intend to use.
	Delete Auto-Connect Printer	This removes the auto-connect option from the selected printer.

2.2.2 The ZyXEL NetUSB Share Center Configuration Window

This section describes the utility's configuration window, which allows you to set certain options for the utility. These options do not apply to the USB devices connected to the NBG5615.

You can open it by clicking the **Tools > Configuration** menu command.

Figure 5 ZyXEL NetUSB Share Center Utility Configuration Window

The following table describes the labels in this window.

Table 5 ZyXEL NetUSB Share Center Utility Configuration Window

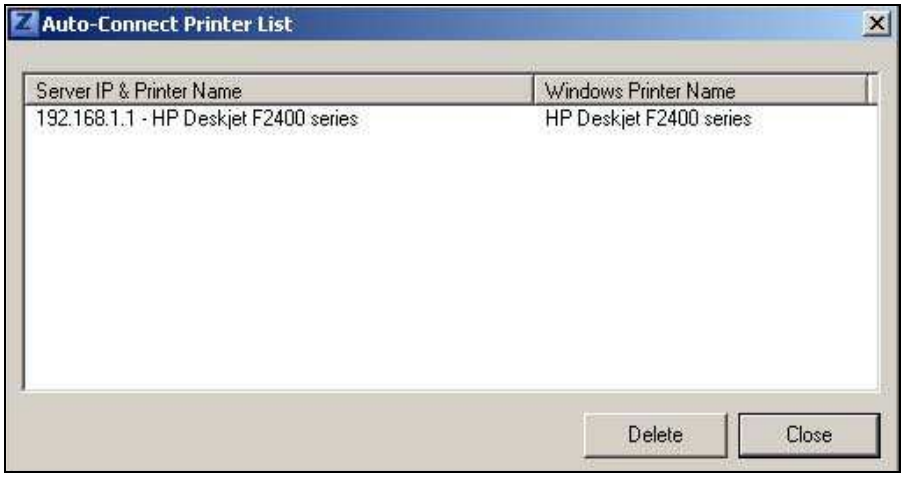
LABEL	DESCRIPTION
Basic	Select this to run the utility automatically when you log into or start up Windows.
Language	Select a language for the ZyXEL NetUSB Share Center Utility. You must restart the utility for the change to take effect.
OK	Click this to save your changes and close the window.
Cancel	Click this cancel to close the window without saving.
Apply	Click this to save your changes without closing the window.

2.2.3 The Auto-Connect Printer List Window

This section describes the utility's auto-connect printer list window. You can open it by clicking the **Tools > Auto-Connect Printer List** menu command.

Note: If the computer is connecting to the shared USB printer for the first time, you need to click **Connect** and setup the printer before you can use the **Auto-Connect Printer** function. See Chapter 9 on page 84 for more details.

Figure 6 ZyXEL NetUSB Share Center Utility Auto-Connect Printer List Window



The following table describes the labels in this screen.

Table 6 ZyXEL NetUSB Share Center Utility Auto-Connect Printer List Window

LABEL	DESCRIPTION
Server IP & Printer Name	Displays a list of print server IPs and printer names connected to this NBG5615.
Windows Printer Name	Displays a corresponding list of Windows printer names connected to this devices listed in the other list.
Delete	Select an printer from the list and click this to remove it.
Close	Click this to close the window.

2.2.4 Exit the ZyXEL NetUSB Share Center Utility

If you want to exit the ZyXEL NetUSB Share Center Utility when your computer is not connected to any USB device, follow the steps below:

1 Click **System > Exit** on the Utility screen. The Utility will automatically close.

Or you can close the Utlity screen first, then exit:

1 Click the **X** on the upper-right corner of the Utility:

2 This will close the Utility screen to an icon at the system tray of your computer. Right-click on the Utility's icon and click **Exit**.

3

Connection Wizard

3.1 Overview

This chapter provides information on the wizard setup screens in the Web Configurator.

The Web Configurator's wizard setup helps you configure your device to access the Internet. Refer to your ISP for your Internet account information. Leave a field blank if you don't have that information.

3.2 Accessing the Wizard

Launch your web browser and type "http://192.168.1.1" as the website address. Type "1234" (default) as the password and click **Login**.

Note: The Wizard appears when the NBG5615 is accessed for the first time or when you reset the NBG5615 to its default factory settings.

The Wizard screen opens. Choose your **Language** and click **Connect to Internet**.

Figure 7 Welcome

3.3 Connect to Internet

The NBG5615 offers three Internet connection types. They are **IPoE**, **PPPoE** or **PPTP**. The wizard attempts to detect which WAN connection type you are using.

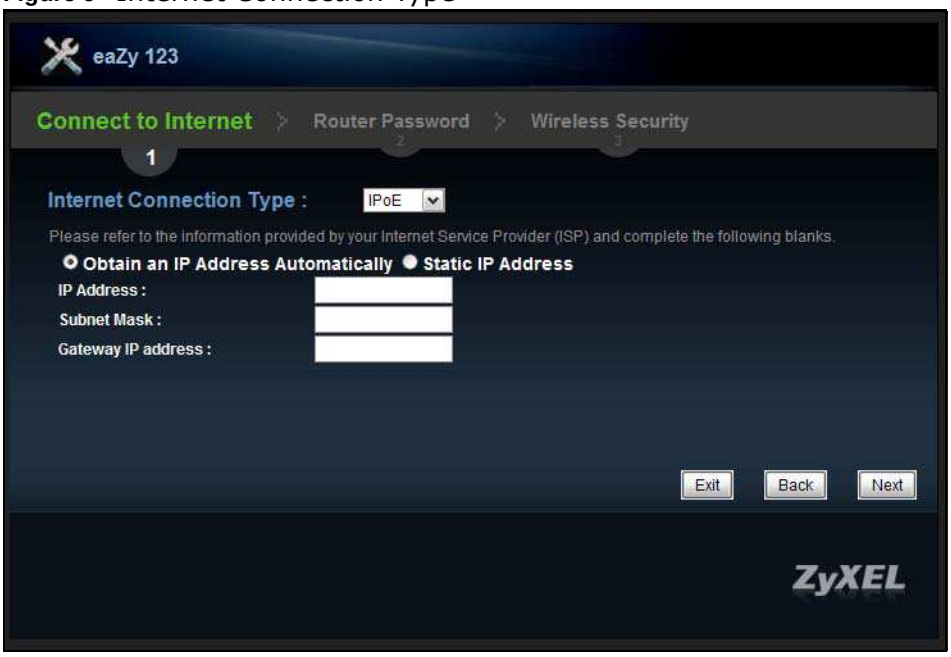
Figure 8 Detecting your Internet Connection Type

If the wizard does not detect a connection type, you must select one from the drop-down list box. Check with your ISP to make sure you use the correct type.

Note: If you get an error message, check your hardware connections. Make sure your Internet connection is up and running.

The following screen depends on your Internet connection type. Enter the details provided by your Internet Service Provider (ISP) in the fields (if any).

Figure 9 Internet Connection Type



Your NBG5615 detects the following Internet Connection type.

Table 7 Internet Connection Type

CONNECTION TYPE	DESCRIPTION
IPoE	Select the **IPoE** (IP over Ethernet) option when the WAN port is used as a regular Ethernet.
PPPoE	Select the **PPPoE** (Point-to-Point Protocol over Ethernet) option for a dial-up connection.
PPTP	Select the **PPTP** (Point-to-Point Tunneling Protocol) option for a dial-up connection, and your ISP gave you an IP address and/or subnet mask.

3.3.1 Connection Type: IPoE

Choose **IPoE** as the **Internet Connection Type** when the WAN port is used as a regular Ethernet. Click **Next**.

Figure 10 Internet Connection Type: IPoE

The following table describes the labels in this screen.

Table 8 Internet Connection Type: IPoE

LABEL	DESCRIPTION
Internet Connection Type	Select the **IPoE** option.
Obtain an IP Address Automatically	Select this radio button if your ISP did not assign you a fixed IP address.
Static IP Address	Select this radio button if your ISP assigned an IP address for your Internet connection.
IP Address	Enter the IP address provided by your ISP.
Subnet Mask	Enter the IP subnet mask in this field.
Gateway IP Address	Enter the gateway IP address in this field.
Exit	Click this to close the wizard screen without saving.
Back	Click this to return to the previous screen.
Next	Click this to continue.

Note: If you get an error screen after clicking **Next**, you might have selected the wrong Internet Connection type. Click **Back**, make sure your Internet connection is working and select the right Connection Type. Contact your ISP if you are not sure of your Internet Connection type.

3.3.2 Connection Type: PPPoE

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

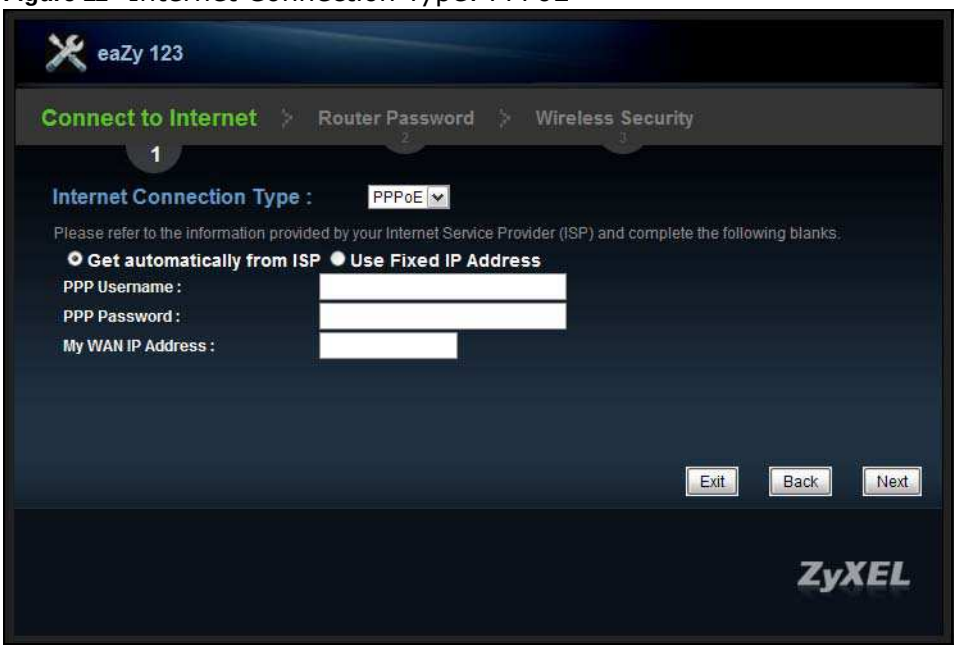
For the service provider, PPPoE offers an access and authentication method that works with existing access control systems (for instance, RADIUS).

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

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

By implementing PPPoE directly on the NBG5615 (rather than individual computers), the computers on the LAN do not need PPPoE software installed, since the NBG5615 does that part of the task. Furthermore, with NAT, all of the LAN's computers will have Internet access.

Figure 11 Internet Connection Type: PPPoE



The following table describes the labels in this screen.

Table 9 Internet Connection Type: PPPoE

LABEL	DESCRIPTION
Internet Connection Type	Select the **PPPoE** option for a dial-up connection.
Get automatically from ISP	Select this radio button if your ISP did not assign you a fixed IP address.
Use Fixed IP Address	Select this radio button, provided by your ISP to give the NBG5615 a fixed, unique IP address.
PPP Username	Type the user name given to you by your ISP.
PPP Password	Type the password associated with the user name above.
My WAN IP Address	Type the name of your service provider.
Exit	Click this to close the wizard screen without saving.
Back	Click this to return to the previous screen.
Next	Click this to continue.

3.3.3 Connection Type: PPTP

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

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

Refer to the appendix for more information on PPTP.

The NBG5615 supports one PPTP server connection at any given time.

Figure 12 Internet Connection Type: PPTP

The following table describes the fields in this screen

Table 10 Internet Connection Type: PPTP

LABEL	DESCRIPTION
Internet Connection Type	Select **PPTP** from the drop-down list box. To configure a PPTP client, you must configure the **PPTP Username** and **PPTP Password** fields for a PPP connection and the PPTP parameters for a PPTP connection.
Obtain an IP Address Automatically	Select this radio button if your ISP did not assign you a fixed IP address.
Static IP Address	Select this radio button if your ISP assigned an IP address for your Internet connection.
PPTP Username	Type the user name given to you by your ISP.
PPTP Password	Type the password associated with the User Name above.
PPTP Server IP Address	Type the server IP address of the PPTP server.
IP Address	Type the (static) IP address assigned to you by your ISP.
Subnet Mask	Type the subnet mask assigned to you by your ISP (if given).
Gateway IP Address	Type the gateway IP address of the PPTP server.

Table 10 Internet Connection Type: PPTP (continued)

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

The NBG5615 connects to the Internet.

Figure 13 Connecting to the Internet

Note: If the Wizard successfully connects to the Internet, it proceeds to the next step. If you get an error message, go back to the previous screen and make sure you have entered the correct information provided by your ISP.

3.4 Router Password

Change the login password in the following screen. Enter the new password and retype it to confirm. Click **Next** to proceed with the **Wireless Security** screen.

Figure 14 Router Password

3.5 Wireless Security

Configure Wireless Settings. Configure the wireless network settings on your NBG5615 in the following screen. The fields that show up depend on the kind of security you select.

3.5.1 Wireless Security: No Security

Choose **No Security** in the Wireless Security screen to let wireless devices within range access your wireless network.

Figure 15 Wireless Security: No Security

The following table describes the labels in this screen.

Table 11 Wireless Security: No Security

LABEL	DESCRIPTION
Wireless Radio	Choose whether you want to apply the wireless security to **2.4G Hz** or **5G Hz** wireless radio.
Wireless Network Name (SSID)	Enter a descriptive name (up to 32 printable 7-bit ASCII characters) for the wireless LAN. If you change this field on the NBG5615, make sure all wireless stations use the same SSID in order to access the network.
Security Mode	Select a security level from the drop-down list box. Choose **No Security** to have no wireless LAN security configured. If you do not enable any wireless security on your NBG5615, your network is accessible to any wireless networking device that is within range.
Exit	Click this to close the wizard screen without saving.
Back	Click this to return to the previous screen.
Next	Click this to continue.

3.5.2 Wireless Security: WPA2-PSK

Choose **WPA2-PSK** security in the Wireless Security screen to set up a password for your wireless network.

Figure 16 Wireless Security: WPA2-PSK

The following table describes the labels in this screen.

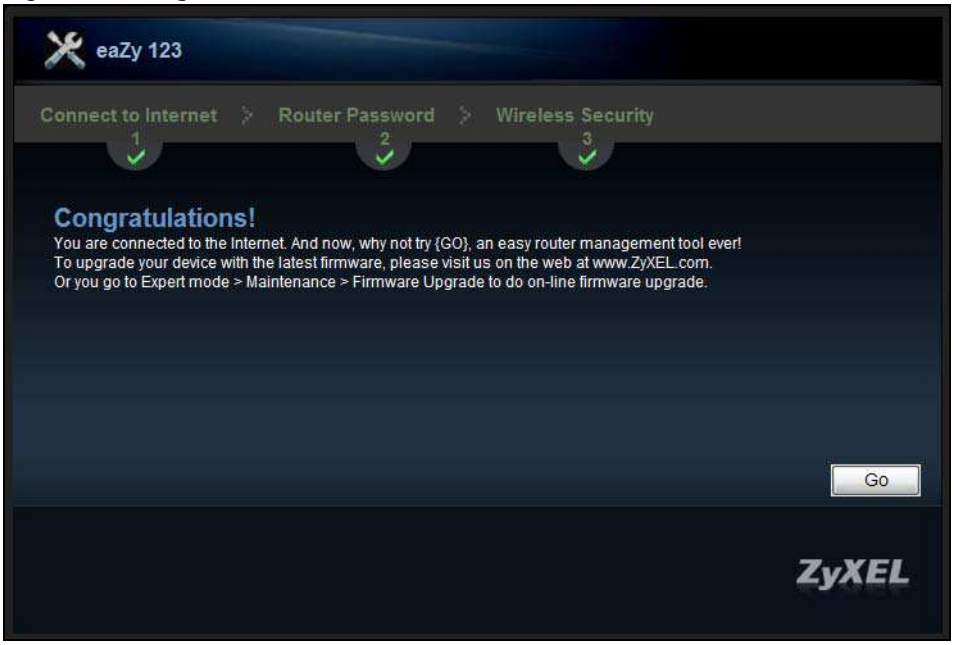
Table 12 Wireless Security: WPA2-PSK

LABEL	DESCRIPTION
Wireless Radio	Choose whether you want to apply the wireless security to **2.4G Hz** or **5G Hz** wireless radio.
Wireless Network Name (SSID)	Enter a descriptive name (up to 32 printable 7-bit ASCII characters) for the wireless LAN. If you change this field on the NBG5615, make sure all wireless stations use the same SSID in order to access the network.
Security Mode	Select a security level from the drop-down list box. Choose **WPA2-PSK** security to configure a Pre-Shared Key. Choose this option only if your wireless clients support WPA2-PSK.
Wireless password	Type from 8 to 63 case-sensitive ASCII characters. You can set up the most secure wireless connection by configuring WPA in the wireless LAN screens.
Verify Password	Retype the password to confirm.
Exit	Click this to close the wizard screen without saving.
Back	Click this to return to the previous screen.
Next	Click this to continue.

Congratulations! Open a web browser, such as Internet Explorer, to visit your favorite website.

Note: If you cannot access the Internet when your computer is connected to one of the NBG5615's LAN ports, check your connections. Then turn the NBG5615 off, wait for a few seconds then turn it back on. If that does not work, log in to the web configurator again and check you have typed all information correctly. See the User's Guide for more suggestions.

Figure 17 Congratulations



You can also click **GO** to open the **Easy Mode** Web Configurator of your NBG5615.

You have successfully set up your NBG5615 to operate on your network and access the Internet. You are now ready to connect wirelessly to your NBG5615 and access the Internet.

4

Introducing the Web Configurator

4.1 Overview

This chapter describes how to access the NBG5615 Web Configurator and provides an overview of its screens.

The Web Configurator is an HTML-based management interface that allows easy setup and management of the NBG5615 via Internet browser. Use Internet Explorer 6.0 and later versions, Mozilla Firefox 3 and later versions, or Safari 2.0 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.
- JavaScript (enabled by default).
- Java permissions (enabled by default).

Refer to the Troubleshooting chapter (Chapter 25 on page 203) to see how to make sure these functions are allowed in Internet Explorer.

4.2 Accessing the Web Configurator

1. Make sure your NBG5615 hardware is properly connected and prepare your computer or computer network to connect to the NBG5615 (refer to the Quick Start Guide).
2. Launch your web browser.
3. The NBG5615 is in router mode by default. Type "http://192.168.1.1" as the website address.

   If the NBG5615 is in access point, the IP address is 192.168.1.2. See Chapter 5 on page 43 for more information about the modes of the NBG5615.

   Your computer must be in the same subnet in order to access this website address.

4.2.1 Login Screen

Note: If this is the first time you are accessing the Web Configurator, you may be redirected to the Wizard. Refer to Chapter 3 on page 27 for the Connection Wizard screens.

The Web Configurator initially displays the following login screen.

Figure 18 Login screen

The following table describes the labels in this screen.

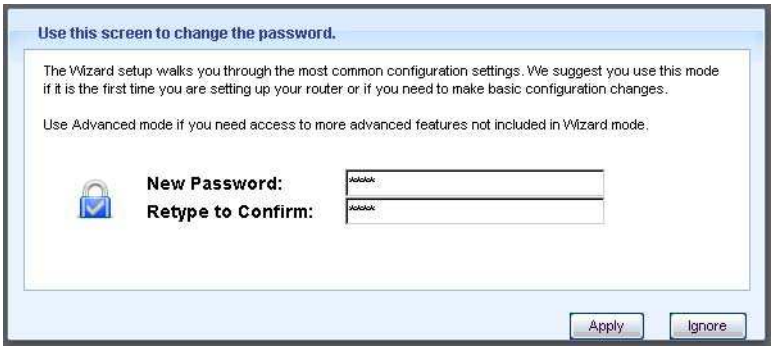
Table 13 Login screen

LABEL	DESCRIPTION
Language	Select the language you want to use to configure the Web Configurator. Click **Login**.
Password	Type "1234" (default) as the password.
	This shows the current weather, either in celsius or fahrenheit, of the city you specify in Section 4.2.2.1 on page 41.
	This shows the time (hh:mm:ss) and date (yyyy:mm:dd) of the timezone you select in Section 4.2.2.2 on page 41 or Section 24.5 on page 195. The time is in 24-hour format, for example 15:00 is 3:00 PM.

4.2.2 Password Screen

You should see a screen asking you to change your password (highly recommended) as shown next.

Figure 19 Change Password Screen



The following table describes the labels in this screen.

Table 14 Change Password Screen

LABEL	DESCRIPTION
New Password	Type a new password.
Retype to Confirm	Retype the password for confirmation.
Apply	Click **Apply** to save your changes back to the NBG5615.
Ignore	Click **Ignore** if you do not want to change the password this time.

Note: The management session automatically times out when the time period set in the **Administrator Inactivity Timer** field expires (default five minutes; go to Chapter 24 on page 193 to change this). Simply log back into the NBG5615 if this happens.

4.2.2.1 Weather Edit

You can change the temperature unit and select the location for which you want to know the weather.

Click the  icon to change the Weather display.

Figure 20 Change Weather

The following table describes the labels in this screen.

Table 15 Change Weather

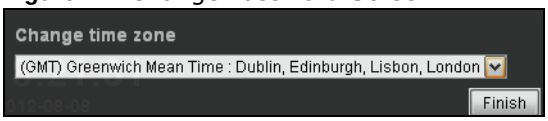
LABEL	DESCRIPTION
Change Unit	Choose which temperature unit you want the NBG5615 to display.
Change Location	Select the location for which you want to know the weather. If the city you want is not listed, choose one that is closest to it.
Finish	Click this to apply the settings and refresh the date and time display.

4.2.2.2 Time/Date Edit

One timezone can cover more than one country. You can choose a particular country in which the NBG5615 is located and have the NBG5615 display and use the current time and date for its logs.

Click the  icon to change the time and date display.

Figure 21 Change Password Screen



The following table describes the labels in this screen.

Table 16 Change Password Screen

LABEL	DESCRIPTION
Change time zone	Select the specific country whose current time and date you want the NBG5615 to display.
Finish	Click this to apply the settings and refresh the weather display.

Note: You can also edit the timezone in Section 24.5 on page 195.

5

NBG5615 Modes

5.1 Overview

This chapter introduces the different modes available on your NBG5615. First, the term "mode" refers to two things in this User's Guide.

- **Web Configurator mode**. This refers to the Web Configurator interface you want to use for editing NBG5615 features.
- **Device mode**. This is the operating mode of your NBG5615, or simply how the NBG5615 is being used in the network.

5.1.1 Web Configurator Modes

This refers to the configuration interface of the Web Configurator, which has two modes:

- **Easy**: The Web Configurator shows this mode by default. Refer to Chapter 6 on page 45 for more information on the screens in this mode. This interface may be sufficient for users who just want to use the device.
- **Expert**: Advanced users can change to this mode to customize all the functions of the NBG5615. Click **Expert Mode** after logging into the Web Configurator. The User's Guide Chapter 4 on page 39 through Chapter 24 on page 201 discusses the screens in this mode.

5.1.2 Device Modes

This refers to the operating mode of the NBG5615, which can act as a:

- **Router**: This is the default device mode of the NBG5615. Use this mode to connect the local network to another network, like the Internet. Go to Section 7.2 on page 57 to view the **Status** screen in this mode.
- **Access Point**: Use this mode if you want to extend your network by allowing network devices to connect to the NBG5615 wirelessly. Go to Section 8.4 on page 67 to view the **Status** screen in this mode.

For more information on these modes and to change the mode of your NBG5615, refer to Chapter 24 on page 201.

The menu for changing device modes is available in **Expert Mode** only.

Note: Choose your device mode carefully to avoid having to change it later.

When changing to another mode, the IP address of the NBG5615 changes. The running applications and services of the network devices connected to the NBG5615 can be interrupted.

6

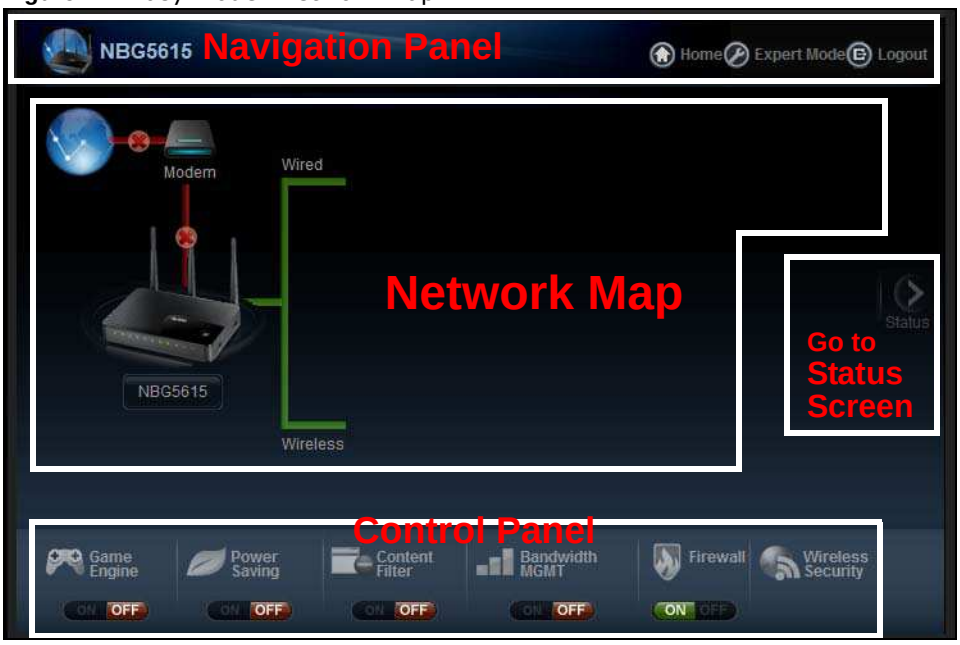
Easy Mode

6.1 Overview

The Web Configurator is set to **Easy Mode** by default. You can configure several key features of the NBG5615 in this mode. This mode is useful to users who are not fully familiar with some features that are usually intended for network administrators.

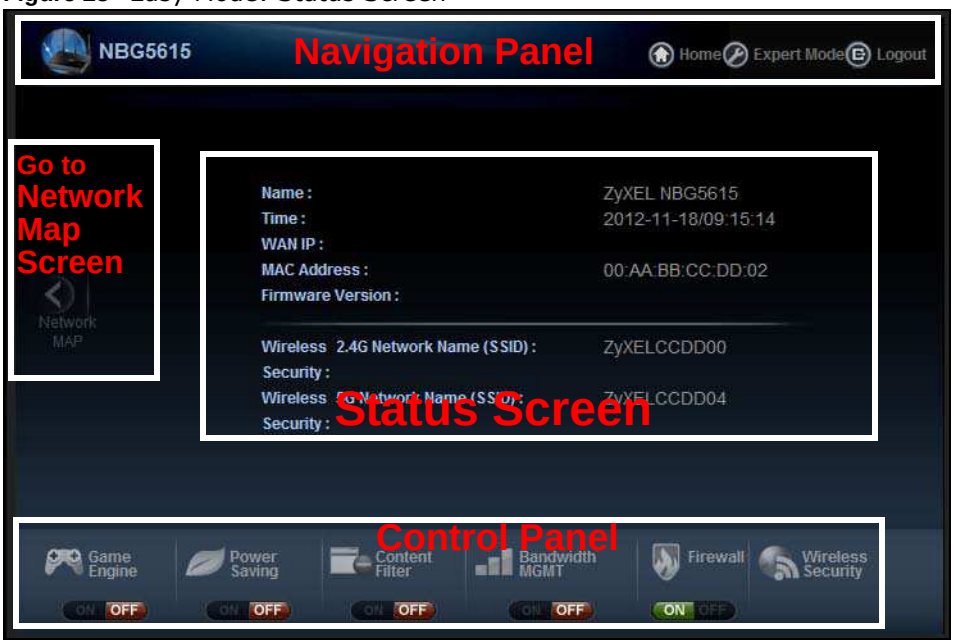
When you log in to the Web Configurator, the following screen opens.

Figure 22 Easy Mode: Network Map



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

Figure 23 Easy Mode: Status Screen



6.2 What You Can Do

You can do the following in this mode:

- Use this **Navigation Panel** to opt out of the **Easy** mode (Section 6.4 on page 46).
- Use the **Network Map** screen to check if your NBG5615 can ping the gateway and whether it is connected to the Internet (Section 6.5 on page 47).
- Use the **Control Panel** to configure and enable NBG5615 features, including wireless security, wireless scheduling and bandwidth management and so on (Section 6.6 on page 48).
- Use the **Status Screen** to view read-only information about the NBG5615, including the WAN IP, MAC address of the NBG5615 and the firmware version (Section 6.7 on page 54).

6.3 What You Need to Know

Between the different device modes, the **Control Panel** (Section 6.6 on page 48) changes depending on which features are applicable to the mode:

- **Router Mode**: All **Control Panel** features are available.
- **Access Point Mode**: Only **Power Saving** and **Wireless Security** are available.

6.4 Navigation Panel

Use this navigation panel to opt out of the **Easy** mode.

Figure 24 Control Panel

The following table describes the labels in this screen.

Table 17 Control Panel

ITEM	DESCRIPTION
Home	Click this to go to the **Login** page.
Expert Mode	Click this to change to **Expert Mode** and customize features of the NBG5615.
Logout	Click this to end the Web Configurator session.

6.5 Network Map

Note: The Network MAP is viewable by Windows XP (need to install patch), Windows Vista and Windows 7 users only. For Windows XP (Service Pack 2) users, you can see the network devices connected to the NBG5615 by downloading the LLTD (Link Layer Topology Discovery) patch from the Microsoft Website.

Note: Don't worry if the Network Map does not display in your web browser. This feature may not be supported by your system. You can still configure the Control Panel (Section 6.6 on page 48) in the Easy Mode and the NBG5615 features that you want to use in the Expert Mode.

When you log into the Web Configurator, the Network Map is shown as follows.

Figure 25 Network Map

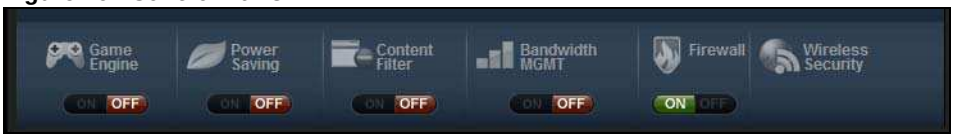
The line connecting the NBG5615 to the gateway becomes green when the NBG5615 is able to ping the gateway. It becomes red when the ping initiating from the NBG5615 does not get a response from the gateway. The same rule applies to the line connecting the gateway to the Internet.

You can also view the devices (represented by icons indicating the kind of network device) connected to the NBG5615, including those connecting wirelessly. Right-click on the NBG5615 icon to refresh the network map and go to the Wizard. Right click on the other icons to view information about the device.

6.6 Control Panel

The features configurable in **Easy Mode** are shown in the **Control Panel**.

Figure 26 Control Panel



Switch **ON** to enable the feature. Otherwise, switch **OFF**. If the feature is turned on, the green light flashes. If it is turned off, the red light flashes.

Additionally, click the feature to open a screen where you can edit its settings.

The following table describes the labels in this screen.

Table 18 Control Panel

ITEM	DESCRIPTION
Game Engine	Switch **ON** to maximize bandwidth for gaming traffic in your network. Otherwise, switch **OFF**. Refer to Section 6.6.1 on page 49 to see this screen.
Power Saving	Click this to schedule the wireless feature of the NBG5615. Disabling the wireless function helps lower the energy consumption of the NBG5615. Switch **ON** to apply wireless scheduling. Otherwise, switch **OFF**. Refer to Section 6.6.2 on page 49 to see this screen.
Content Filter	Click this to restrict access to certain websites, based on keywords contained in URLs, to which you do not want users in your network to open. Switch **ON** to apply website filtering. Otherwise, switch **OFF**. Refer to Section 6.6.3 on page 50 to see this screen.
Bandwidth MGMT	Click this to edit bandwidth management for predefined applications. Switch **ON** to have the NBG5615 management bandwidth for uplink and downlink traffic according to an application or service. Otherwise, switch **OFF**. Refer to Section 6.6.4 on page 51 to see this screen.

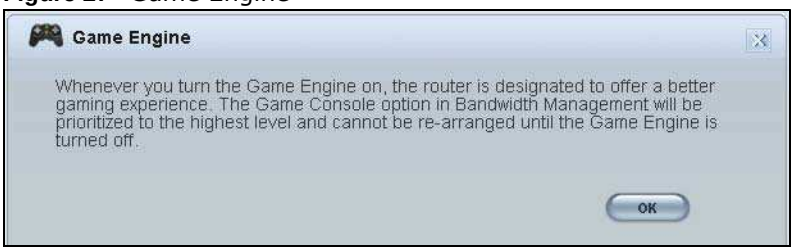
Table 18 Control Panel (continued)

ITEM	DESCRIPTION
Firewall	Switch **ON** to ensure that your network is protected from Denial of Service (DoS) attacks. Otherwise, switch **OFF**. Refer to Section 6.6.5 on page 52 to see this screen.
Wireless Security	Click this to configure the wireless security, such as SSID, security mode and WPS key on your NBG5615. Refer to Section 6.6.6 on page 52 to see this screen.

6.6.1 Game Engine

When this feature is enabled, the NBG5615 maximizes the bandwidth for gaming traffic that it forwards out through an interface.

Figure 27 Game Engine



Note: When this is switched on, the **Game Console** tab in the **Bandwidth Mgmt** screen is automatically positioned on top.

Turn this off if your network is not using gaming.

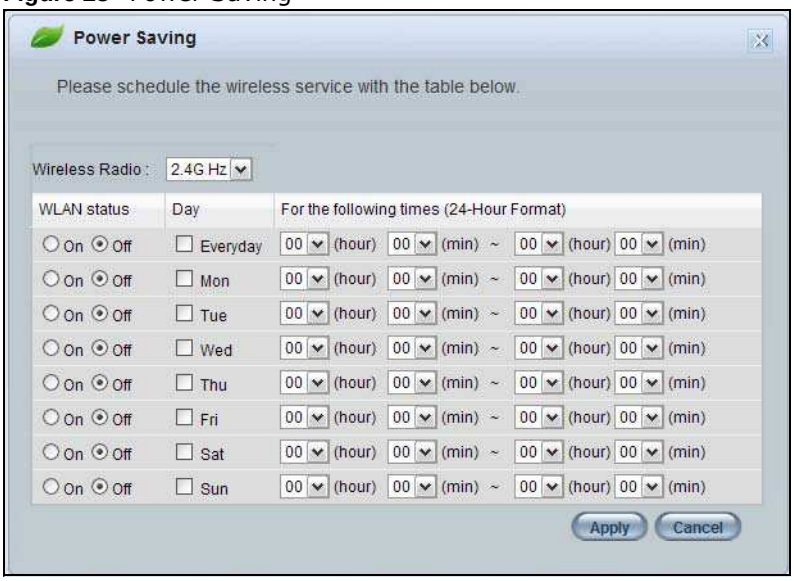
Click **OK** to close this screen.

6.6.2 Power Saving

Use this screen to set the day of the week and time of the day when your wireless LAN is turned on and off. Wireless LAN scheduling is disabled by default.

Disabling the wireless capability lowers the energy consumption of the of the NBG5615.

Figure 28 Power Saving



The following table describes the labels in this screen.

Table 19 Power Saving

LABEL	DESCRIPTION
Wireless Radio	Choose whether you want to apply the power saving schedule to **2.4G Hz** or **5G Hz** wireless radio.
WLAN Status	Select **On** or **Off** to specify whether the Wireless LAN is turned on or off (depending on what you selected in the **WLAN Status** field). This field works in conjunction with the **Day** and **For the following times** fields.
Day	Select **Everyday** or the specific days to turn the Wireless LAN on or off. If you select **Everyday** you can not select any specific days. This field works in conjunction with the **For the following times** field.
For the following times (24-Hour Format)	Select a begin time using the first set of **hour** and minute (**min**) drop down boxes and select an end time using the second set of **hour** and minute (**min**) drop down boxes. If you have chosen **On** earlier for the WLAN Status the Wireless LAN will turn on between the two times you enter in these fields. If you have chosen **Off** earlier for the WLAN Status the Wireless LAN will turn off between the two times you enter in these fields. In this time format, midnight is 00:00 and progresses up to 24:00. For example, 6:00 PM is 18:00.
Apply	Click **Apply** to save your changes back to the NBG5615.
Cancel	Click **Cancel** to close this screen without saving any changes.

6.6.3 Content Filter

Use this screen to restrict access to certain websites, based on keywords contained in URLs, to which you do not want users in your network to open.

Figure 29 Content Filter

The following table describes the labels in this screen.

Table 20 Content Filter

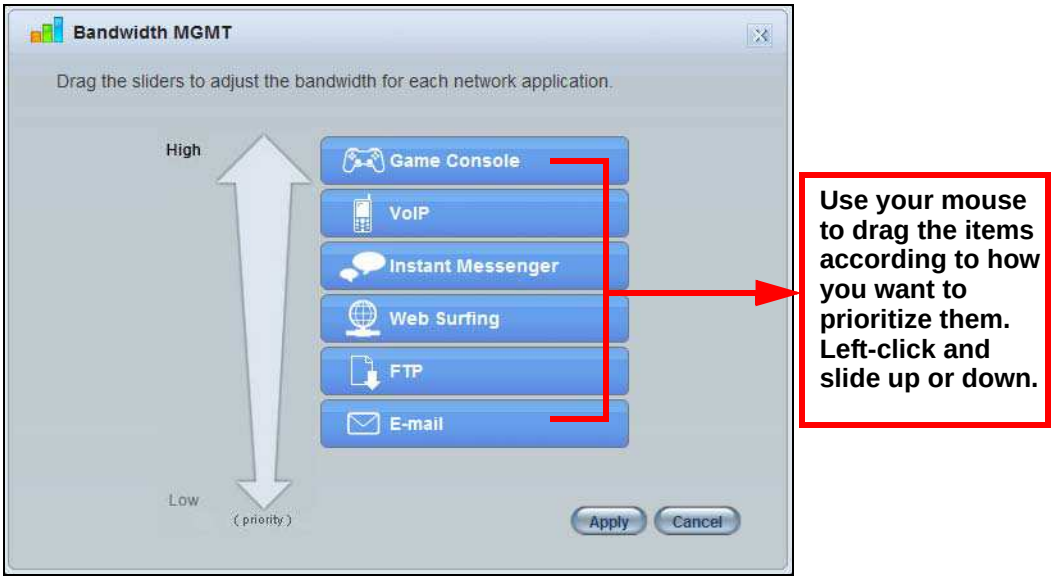
LABEL	DESCRIPTION
Add	Click **Add** after you have typed a keyword. Repeat this procedure to add other keywords. Up to 64 keywords are allowed. Note: The NBG5615 does not recognize wildcard characters as keywords. When you try to access a web page containing a keyword, you will get a message telling you that the content filter is blocking this request.
Delete	Highlight a keyword in the text box and click **Delete** to remove it. The keyword disappears from the text box after you click **Apply**.
Apply	Click **Apply** to save your changes.
Cancel	Click **Cancel** to close this screen without saving any changes.

6.6.4 Bandwidth MGMT

Use this screen to set bandwidth allocation to pre-defined services and applications for bandwidth allocation.

The NBG5615 uses bandwidth management for incoming and outgoing traffic. Rank the services and applications by dragging them accordingly from **High** to **Low** and click **Apply**. Click **Cancel** to close the screen.

Figure 30 Bandwidth MGNT



6.6.5 Firewall

Enable this feature to protect the network from Denial of Service (DoS) attacks. The NBG5615 blocks repetitive pings from the WAN that can otherwise cause systems to slow down or hang.

Figure 31 Firewall

Click **OK** to close this screen.

6.6.6 Wireless Security

Use this screen to configure security for your the wireless LAN. You can enter the SSID and select the wireless security mode in the following screen.

Note: You can enable the wireless function of your NBG5615 by first turning on the switch in the back panel.

Figure 32 Wireless Security

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

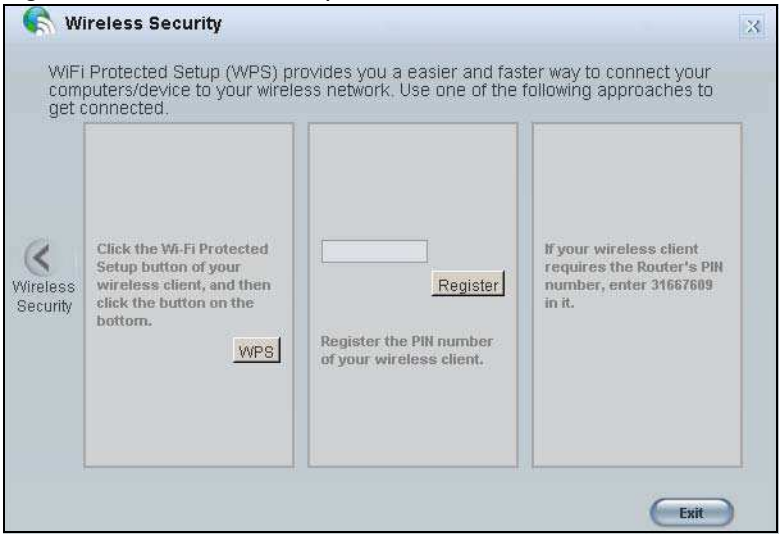
Table 21 Wireless Security

LABEL	DESCRIPTION
Wireless Radio	Choose whether you want to apply the wireless security to **2.4G Hz** or **5G Hz** wireless radio.
Wireless Network Name (SSID)	(Service Set IDentity) The SSID identifies the Service Set with which a wireless station is associated. Wireless stations associating to the access point (AP) must have the same SSID. Enter a descriptive name (up to 32 keyboard characters) for the wireless LAN.
Security mode	Select **WPA2-PSK** to add security on this wireless network. The wireless clients which want to associate to this network must have same wireless security settings as this device. After you select to use a security, additional options appears in this screen. Select **No Security** to allow any client to connect to this network without authentication.
Wireless password	This field appears when you choose wither **WPA2-PSK** as the security mode. Type a pre-shared key from 8 to 63 case-sensitive keyboard characters.
Verify password	Type the password again to confirm.
Apply	Click **Apply** to save your changes back to the NBG5615.
Cancel	Click **Cancel** to close this screen.
WPS	Click this to configure the WPS screen. You can transfer the wireless settings configured here (**Wireless Security** screen) to another wireless device that supports WPS.

6.6.7 WPS

Use this screen to add a wireless station to the network using WPS. Click **WPS** in the **Wireless Security** to open the following screen.

Figure 33 Wireless Security: WPS



The following table describes the labels in this screen.

Table 22 Wireless Security: WPS

LABEL	DESCRIPTION
Wireless Security	Click this to go back to the **Wireless Security** screen.
WPS	Create a secure wireless network simply by pressing a button. The NBG5615 scans for a WPS-enabled device within the range and performs wireless security information synchronization. Note: After you click the **WPS** button on this screen, you have to press a similar button in the wireless station utility within 2 minutes. To add the second wireless station, you have to press these buttons on both device and the wireless station again after the first 2 minutes.
Register	Create a secure wireless network simply by entering a wireless client's PIN (Personal Identification Number) in the NBG5615's interface and pushing this button. Type the same PIN number generated in the wireless station's utility. Then click **Register** to associate to each other and perform the wireless security information synchronization.
Exit	Click **Exit** to close this screen.

6.7 Status Screen in Easy Mode

In the Network Map screen, click **Status** to view read-only information about the NBG5615.

Figure 34 Status Screen in Easy Mode

The following table describes the labels in this screen.

Table 23 Status Screen in Easy Mode

ITEM	DESCRIPTION
Name	This is the name of the NBG5615 in the network. You can change this in the **Maintenance > General** screen in Section 24.3 on page 193.
Time	This is the current system date and time. The date is in YYYY:MM:DD (Year-Month-Day) format. The time is in HH:MM:SS (Hour:Minutes:Seconds) format.
WAN IP	This is the IP address of the WAN port.
MAC Address	This is the MAC address of the NBG5615.
Firmware Version	This shows the firmware version of the NBG5615. The firmware version format shows the trunk version, model code and release number.
Wireless 2.4G Network Name (SSID) Wireless 5G Network Name (SSID)	This shows the SSID of the wireless network. You can configure this in the Wireless Security screen (Section 6.6.6 on page 52; Section 12.2 on page 110).
Security	This shows the wireless security used by the NBG5615.

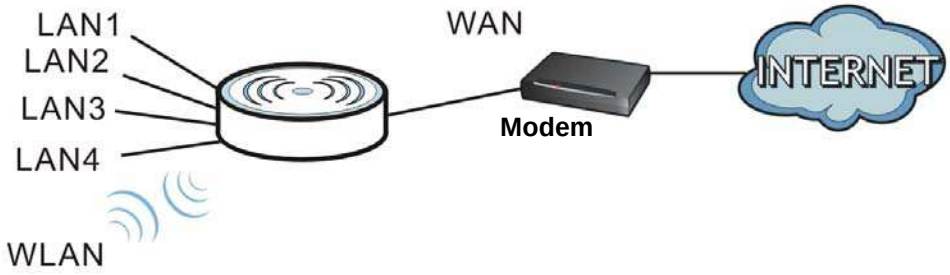
7

Router Mode

7.1 Overview

The NBG5615 is set to router mode by default. Routers are used to connect the local network to another network (for example, the Internet). In the figure below, the NBG5615 connects the local network (**LAN1** ~ **LAN4**) to the Internet.

Figure 35 NBG5615 Network



Note: The **Status** screen is shown after changing to the **Expert Mode** of the Web Configurator. It varies depending on the device mode of your NBG5615.

7.2 Router Mode Status Screen

Click  to open the status screen.

Figure 36 Status Screen: Router Mode

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

Table 24 Status Screen Icon Key

ICON	DESCRIPTION
Logout	Click this at any time to exit the Web Configurator.
About	Click this icon to view copyright and a link for related product information.
Easy Mode	Click this icon to go to Easy Mode. See Chapter 6 on page 45.
Refresh Interval: None	Select a number of seconds or **None** from the drop-down list box to refresh all screen statistics automatically at the end of every time interval or to not refresh the screen statistics.
Refresh Now	Click this button to refresh the status screen statistics.

Table 24 Status Screen Icon Key (continued)

ICON	DESCRIPTION
	Click this icon to see the **Status** page. The information in this screen depends on the device mode you select.
	Click this icon to see the **Monitor** navigation menu.
	Click this icon to see the **Configuration** navigation menu.
	Click this icon to see the **Maintenance** navigation menu.

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

Table 25 Status Screen: Router Mode

LABEL	DESCRIPTION
Device Information	
Host Name	This is the **System Name** you enter in the **Maintenance** > **General** screen. It is for identification purposes.
Model Number	This is the model name of your device.
Firmware Version	This is the firmware version and the date created.
Sys OP Mode	This is the device mode (Section 5.1.2 on page 43) to which the NBG5615 is set - **Router Mode**.
WAN Information	
MAC Address	This shows the WAN Ethernet adapter MAC Address of your device.
IP Address	This shows the WAN port's IP address.
IP Subnet Mask	This shows the WAN port's subnet mask.
Default Gateway	This shows the WAN port's gateway IP address.
LAN Information	
MAC Address	This shows the LAN Ethernet adapter MAC Address of your device.
IP Address	This shows the LAN port's IP address.
IP Subnet Mask	This shows the LAN port's subnet mask.
DHCP	This shows the LAN port's DHCP role - **Server** or **Disable**.
WLAN 2.4G Information	
WLAN OP Mode	This is the device mode (Section 5.1.2 on page 43) to which the NBG5615's wireless LAN is set - **Access Point Mode**.
MAC Address	This shows the 2.4GHz wireless adapter MAC Address of your device.
SSID	This shows a descriptive name used to identify the NBG5615 in the 2.4GHz wireless LAN.
Channel	This shows the channel number which you select manually.
Security	This shows the level of wireless security the NBG5615 is using.
WLAN 5G Information	
MAC Address	This shows the 5GHz wireless adapter MAC Address of your device.
SSID	This shows a descriptive name used to identify the NBG5615 in the 5GHz wireless LAN.
Channel	This shows the channel number which you select manually.
Security	This shows the level of wireless security the NBG5615 is using.
Firewall	This shows whether the firewall is enabled or not.
Summary	

Table 25 Status Screen: Router Mode (continued)

LABEL	DESCRIPTION
Packet Statistics	Click **Details...** to go to the **Monitor > Packet Statistics** screen (Section 10.5 on page 91). Use this screen to view port status and packet specific statistics.
WLAN 2.4G Station Status	Click **Details...** to go to the **Monitor > WLAN 2.4G Station Status** screen (Section 10.6 on page 92). Use this screen to view the wireless stations that are currently associated to the NBG5615's 2.4GHz wireless LAN.
WLAN 5G Station Status	Click **Details...** to go to the **Monitor > WLAN 5G Station Status** screen (Section 10.6 on page 92). Use this screen to view the wireless stations that are currently associated to the NBG5615's 5GHz wireless LAN.
System Status	
Item	This column shows the type of data the NBG5615 is recording.
Data	This column shows the actual data recorded by the NBG5615.
System Up Time	This is the total time the NBG5615 has been on.
Current Date/Time	This field displays your NBG5615's present date and time.
System Resource	
- CPU Usage	This displays what percentage of the NBG5615's processing ability is currently used. When this percentage is close to 100%, the NBG5615 is running at full load, and the throughput is not going to improve anymore. If you want some applications to have more throughput, you should turn off other applications (for example, using bandwidth management.)
- Memory Usage	This shows what percentage of the heap memory the NBG5615 is using.
Interface Status	
Interface	This displays the NBG5615 port types. The port types are: **WAN**, **LAN** and **WLAN**.
Status	For the LAN and WAN ports, this field displays **Down** (line is down) or **Up** (line is up or connected). For the 2.4GHz/5GHz WLAN, it displays **Up** when the 2.4GHz/5GHz WLAN is enabled or **Down** when the 2.4G/5G WLAN is disabled.
Rate	For the LAN ports, this displays the port speed and duplex setting or **N/A** when the line is disconnected. For the WAN port, it displays the port speed and duplex setting if you're using Ethernet encapsulation. This field displays **N/A** when the line is disconnected. For the 2.4GHz/5GHz WLAN, it displays the maximum transmission rate when the 2.4GHz/5GHz WLAN is enabled and **N/A** when the WLAN is disabled.

7.2.1 Navigation Panel

Use the sub-menus on the navigation panel to configure NBG5615 features.

Figure 37 Navigation Panel: Router Mode

The following table describes the sub-menus.

Table 26 Navigation Panel: Router Mode

LINK	TAB	FUNCTION
Status		This screen shows the NBG5615's general device, system and interface status information. Use this screen to access the wizard, and summary statistics tables.
MONITOR		
Log		Use this screen to view the list of activities recorded by your NBG5615.
DHCP Table		Use this screen to view current DHCP client information.
Packet Statistics		Use this screen to view port status and packet specific statistics.
WLAN 2.4G Station Status		Use this screen to view the wireless stations that are currently associated to the NBG5615's 2.4GHz wireless LAN.
WLAN 5G Station Status		Use this screen to view the wireless stations that are currently associated to the NBG5615's 5GHz wireless LAN.
CONFIGURATION		
Network		
WAN	Internet Connection	This screen allows you to configure ISP parameters, WAN IP address assignment, DNS servers and the WAN MAC address.
	Advanced	Use this screen to configure other advanced properties.

Table 26 Navigation Panel: Router Mode (continued)

LINK	TAB	FUNCTION
Wireless LAN 2.4G/5G	General	Use this screen to enable the wireless LAN and configure wireless LAN and wireless security settings.
	More AP	Use this screen to configure multiple BSSs on the NBG5615.
	MAC Filter	Use the MAC filter screen to configure the NBG5615 to block access to devices or block the devices from accessing the NBG5615.
	Advanced	This screen allows you to configure advanced wireless settings.
	QoS	Use this screen to configure Wi-Fi Multimedia Quality of Service (WMM QoS). WMM QoS allows you to prioritize wireless traffic according to the delivery requirements of individual services.
	WPS	Use this screen to configure WPS.
	WPS Station	Use this screen to add a wireless station using WPS.
	Scheduling	Use this screen to schedule the times the Wireless LAN is enabled.
LAN	IP	Use this screen to configure LAN IP address and subnet mask.
	IP Alias	Use this screen to have the NBG5615 apply IP alias to create LAN subnets.
DHCP Server	General	Use this screen to enable the NBG5615's DHCP server.
	Advanced	Use this screen to assign IP addresses to specific individual computers based on their MAC addresses and to have DNS servers assigned by the DHCP server.
	Client List	Use this screen to view information related to your DHCP status.
NAT	General	Use this screen to enable NAT.
	Port Forwarding	Use this screen to configure servers behind the NBG5615 and forward incoming service requests to the server(s) on your local network.
	Port Trigger	Use this screen to change your NBG5615's port triggering settings.
Dynamic DNS	Dynamic DNS	Use this screen to set up dynamic DNS.
Static Route	Static Route	Use this screen to configure IP static routes.
Security		
Firewall	General	Use this screen to activate/deactivate the firewall.
	Services	This screen shows a summary of the firewall rules, and allows you to edit/ add a firewall rule.
Content Filter	Content Filter	Use this screen to block certain web features and sites containing certain keywords in the URL.
Management		
Bandwidth Management	General	Use this screen to enable bandwidth management.
	Advanced	Use this screen to set the upstream bandwidth and edit a bandwidth management rule.
Remote Management	WWW	Use this screen to configure through which interface(s) and from which IP address(es) users can use HTTP to manage the NBG5615.
	Telnet	Use this screen to configure through which interface(s) and from which IP address(es) users can use Telnet to manage the NBG5615.
	Wake On LAN	Use this screen to enable Wake on LAN to remotely turn on a device on the local network.
UPnP	General	Use this screen to enable UPnP on the NBG5615.

Table 26 Navigation Panel: Router Mode (continued)

LINK	TAB	FUNCTION
USB Media Sharing	DLNA	Use this screen to have the NBG5615 function as a DLNA-compliant media server, that lets DLNA-compliant media clients play video, audio, and photo content files stored on the connected USB storage device.
	SAMBA	Use this screen to enable file sharing through the NBG5615.
	FTP	Use this screen to have the NBG5615 act as a FTP server.
MAINTENANCE		
General	General	Use this screen to view and change administrative settings such as system and domain names.
Password	Password Setup	Use this screen to change the password of your NBG5615.
Time	Time Setting	Use this screen to change your NBG5615's time and date.
Firmware Upgrade	Firmware Upgrade	Use this screen to upload firmware to your NBG5615.
Backup/ Restore	Backup/ Restore	Use this screen to backup and restore the configuration or reset the factory defaults to your NBG5615.
Restart	System Restart	This screen allows you to reboot the NBG5615 without turning the power off.
Language	Language	This screen allows you to select the language you prefer.
Sys OP Mode	Sys OP Mode	This screen allows you to select whether your device acts as a router, or an access point.

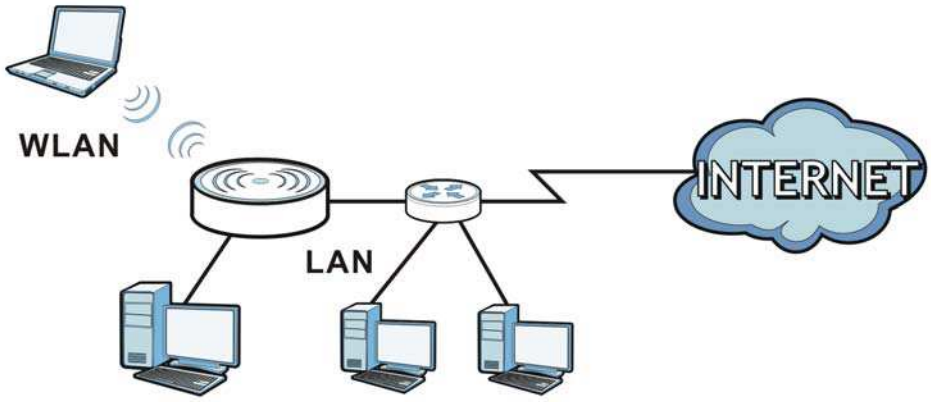
8

Access Point Mode

8.1 Overview

Use your NBG5615 as an access point (AP) if you already have a router or gateway on your network. In this mode your NBG5615 bridges a wired network (LAN) and wireless LAN (WLAN) in the same subnet. See the figure below for an example.

Figure 38 Wireless Internet Access in Access Point Mode



Many screens that are available in **Router Mode** are not available in **Access Point Mode**, such as bandwidth management and firewall.

Note: See Chapter 9 on page 73 for an example of setting up a wireless network in Access Point mode.

8.2 What You Can Do

- Use the **Status** screen to view read-only information about your NBG5615 (Section 8.4 on page 67).
- Use the **LAN** screen to set the IP address for your NBG5615 acting as an access point (Section 8.5 on page 69).

8.3 What You Need to Know

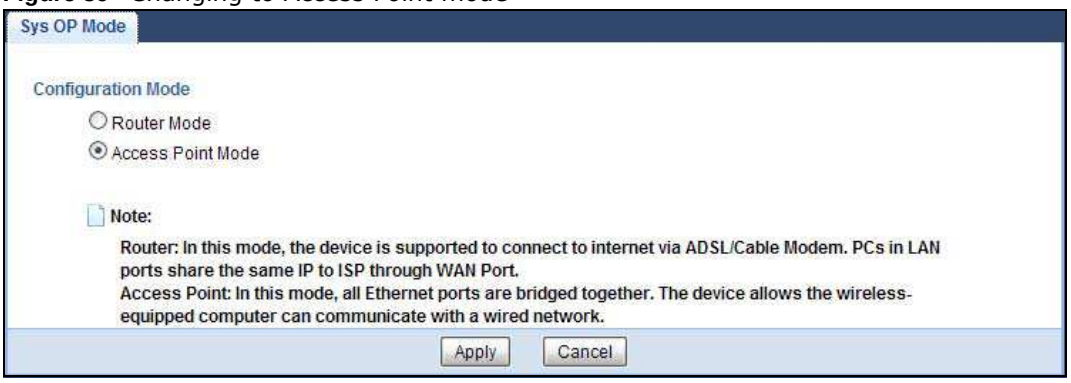
See Chapter 9 on page 73 for a tutorial on setting up a network with the NBG5615 as an access point.

8.3.1 Setting your NBG5615 to AP Mode

1 Log into the Web Configurator if you haven't already. See the Quick start Guide for instructions on how to do this.

2 To use your NBG5615 as an access point, go to **Maintenance > Sys OP Mode** and select **Access Point Mode**.

Figure 39 Changing to Access Point mode



Note: You have to log in to the Web Configurator again when you change modes. As soon as you do, your NBG5615 is already in Access Point mode.

3 When you select **Access Point Mode**, the following pop-up message window appears.

Figure 40 Pop up for Access Point mode

Click **OK**. Then click **Apply**. The Web Configurator refreshes once the change to Access Point mode is successful.

8.3.2 Accessing the Web Configurator in Access Point Mode

Log in to the Web Configurator in Access Point mode, do the following:

1 Connect your computer to the LAN port of the NBG5615.

2 The default IP address of the NBG5615 is "192.168.1.2". In this case, your computer must have an IP address in the range between "192.168.1.3" and "192.168.1.254".

3 Click **Start > Run** on your computer in Windows. Type "cmd" in the dialog box. Enter "ipconfig" to show your computer's IP address. If your computer's IP address is not in the correct range then see Appendix B on page 221 for information on changing your computer's IP address.

4 After you've set your computer's IP address, open a web browser such as Internet Explorer and type "192.168.1.2" as the web address in your web browser.

Note: After clicking **Login**, the **Easy Mode** appears. Refer to Section on page 45 for the **Easy Mode** screens. Change to **Expert Mode** to see the screens described in the sections following this.

8.3.3 Configuring your WLAN and Maintenance Settings

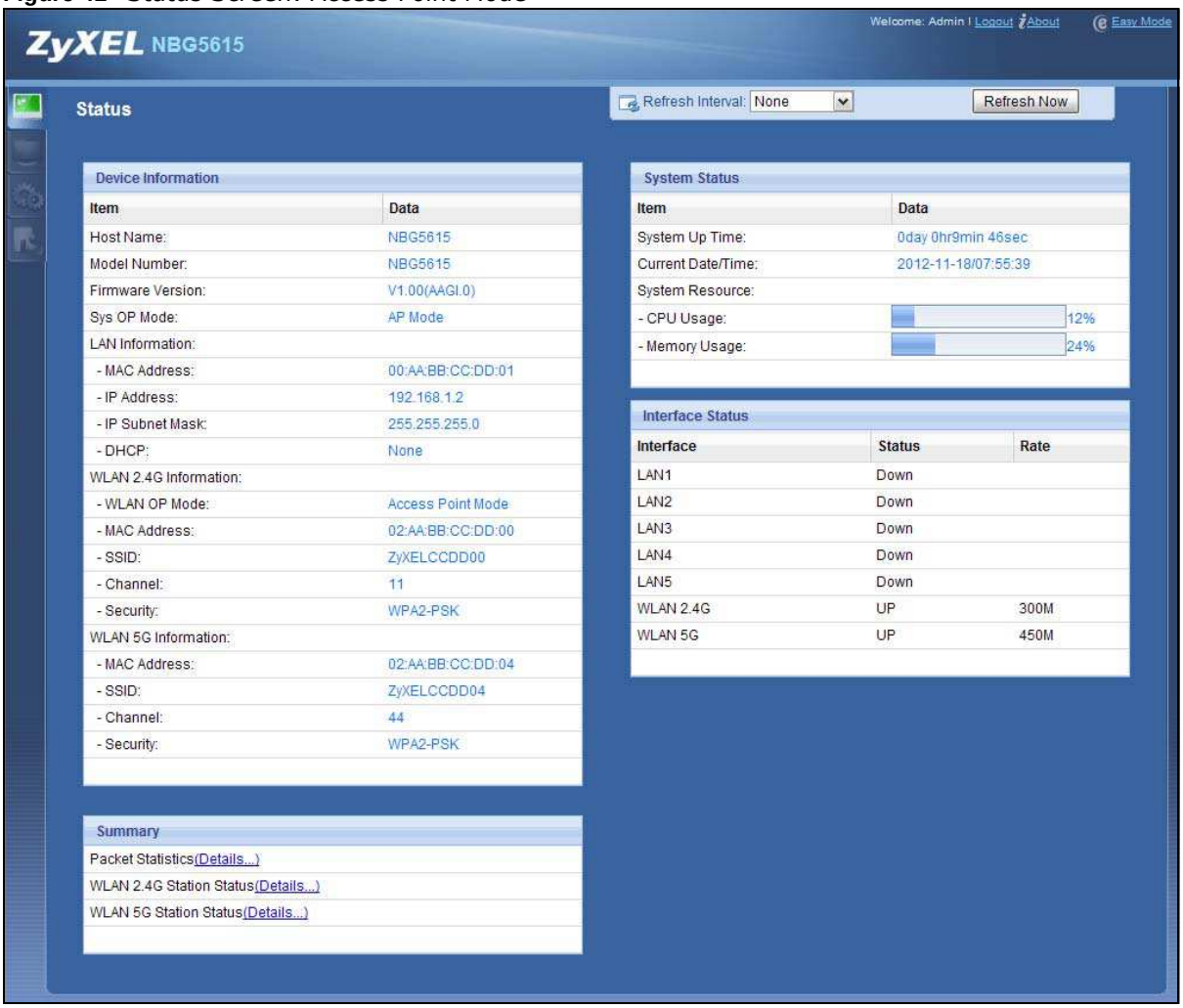
The configuration of wireless and maintenance settings in **Access Point Mode** is the same as for **Router Mode**.

- See Chapter 12 on page 105 for information on the configuring your wireless network.
- See Chapter 24 on page 193 for information on configuring your Maintenance settings.

8.4 AP Mode Status Screen

Click  to open the **Status** screen.

Figure 41 Status Screen: Access Point Mode



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

Table 27 Status Screen: Access Point Mode

LABEL	DESCRIPTION
Device Information	
Host Name	This is the **System Name** you enter in the **Maintenance** > **General** screen. It is for identification purposes.
Model Number	This is the model name of your device.
Firmware Version	This is the firmware version and the date created.
Sys OP Mode	This is the device mode (Section 5.1.2 on page 43) to which the NBG5615 is set - **AP Mode**.
LAN Information	
MAC Address	This shows the LAN Ethernet adapter MAC Address of your device.
IP Address	This shows the LAN port's IP address.
IP Subnet Mask	This shows the LAN port's subnet mask.
DHCP	This shows the LAN port's DHCP role - **Client** or **None**.
WLAN 2.4G Information	
WLAN OP Mode	This is the device mode (Section 5.1.2 on page 43) to which the NBG5615's wireless LAN is set - **Access Point Mode**.
MAC Address	This shows the 2.4GHz wireless adapter MAC Address of your device.
SSID	This shows a descriptive name used to identify the NBG5615 in the 2.4GHz wireless LAN.
Channel	This shows the channel number which you select manually.
Security	This shows the level of wireless security the NBG5615 is using.
WLAN 5G Information	
MAC Address	This shows the 5GHz wireless adapter MAC Address of your device.
SSID	This shows a descriptive name used to identify the NBG5615 in the 5GHz wireless LAN.
Channel	This shows the channel number which you select manually.
Security	This shows the level of wireless security the NBG5615 is using.
Summary	
Packet Statistics	Click **Details...** to go to the **Monitor > Packet Statistics** screen (Section 10.5 on page 91). Use this screen to view port status and packet specific statistics.
WLAN 2.4G Station Status	Click **Details...** to go to the **Monitor > WLAN 2.4G Station Status** screen (Section 10.6 on page 92). Use this screen to view the wireless stations that are currently associated to the NBG5615's 2.4GHz wireless LAN.
WLAN 5G Station Status	Click **Details...** to go to the **Monitor > WLAN 5G Station Status** screen (Section 10.6 on page 92). Use this screen to view the wireless stations that are currently associated to the NBG5615's 5GHz wireless LAN.
System Status	
Item	This column shows the type of data the NBG5615 is recording.
Data	This column shows the actual data recorded by the NBG5615.
System Up Time	This is the total time the NBG5615 has been on.
Current Date/Time	This field displays your NBG5615's present date and time.
System Resource	
- CPU Usage	This displays what percentage of the NBG5615's processing ability is currently used. When this percentage is close to 100%, the NBG5615 is running at full load, and the throughput is not going to improve anymore. If you want some applications to have more throughput, you should turn off other applications (for example, using bandwidth management.)
- Memory Usage	This shows what percentage of the heap memory the NBG5615 is using.

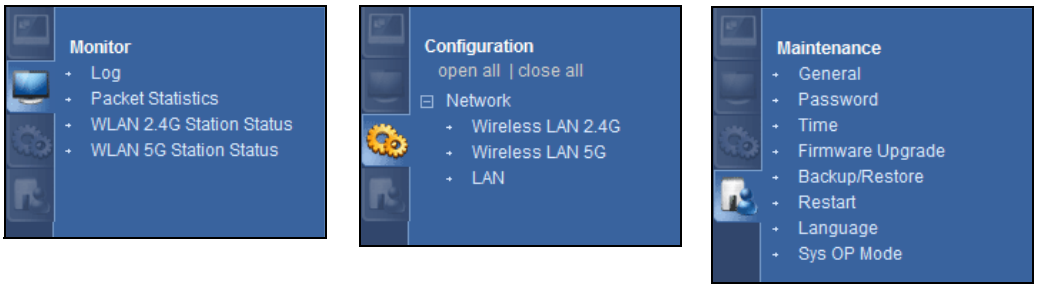
Table 27 Status Screen: Access Point Mode (continued)

LABEL	DESCRIPTION
Interface Status	
Interface	This displays the NBG5615 port types. The port types are: **LAN** and **WLAN**.
Status	For the LAN ports, this field displays **Down** (line is down) or **Up** (line is up or connected). For the 2.4GHz/5GHz WLAN, it displays **Up** when the 2.4GHz/5GHz WLAN is enabled or **Down** when the 2.4G/5G WLAN is disabled.
Rate	For the LAN ports, this displays the port speed and duplex setting or **N/A** when the line is disconnected. For the 2.4GHz/5GHz WLAN, it displays the maximum transmission rate when the 2.4GHz/5GHz WLAN is enabled and **N/A** when the WLAN is disabled.

8.4.1 Navigation Panel

Use the menu in the navigation panel to configure NBG5615 features in **Access Point Mode**.

Figure 42 Menu: Access Point Mode



Refer to Table 26 on page 61 for descriptions of the labels shown in the navigation panel.

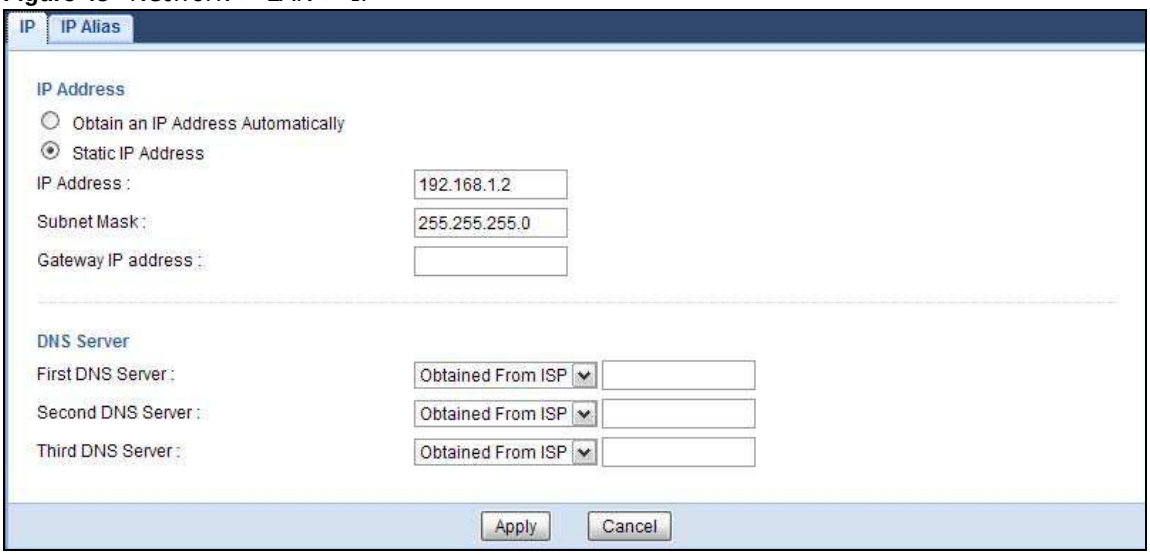
8.5 LAN Screen

Use this section to configure your LAN settings while in **Access Point Mode**.

Click **Network > LAN** to see the screen below.

Note: If you change the IP address of the NBG5615 in the screen below, you will need to log into the NBG5615 again using the new IP address.

Figure 43 Network > LAN > IP



The table below describes the labels in the screen.

Table 28 Network > LAN > IP

LABEL	DESCRIPTION
Obtain an IP Address Automatically	When you enable this, the NBG5615 gets its IP address from the network's DHCP server (for example, your ISP). Users connected to the NBG5615 can now access the network (i.e., the Internet if the IP address is given by the ISP). The Web Configurator may no longer be accessible unless you know the IP address assigned by the DHCP server to the NBG5615. You need to reset the NBG5615 to be able to access the Web Configurator again (see Section 24.7 on page 198 for details on how to reset the NBG5615). Also when you select this, you cannot enter an IP address for your NBG5615 in the field below.
Static IP Address	Click this if you want to specify the IP address of your NBG5615. Or if your ISP or network administrator gave you a static IP address to access the network or the Internet.
IP Address	Type the IP address in dotted decimal notation. The default setting is 192.168.1.2. If you change the IP address you will have to log in again with the new IP address.
Subnet Mask	The subnet mask specifies the network number portion of an IP address. Your NBG5615 will automatically calculate the subnet mask based on the IP address that you assign. Unless you are implementing subnetting, use the subnet mask computed by the NBG5615.
Gateway IP Address	Enter a **Gateway IP Address** (if your ISP or network administrator gave you one) in this field.
DNS Assignment	
First DNS Server Second DNS Server Third DNS Server	Select **Obtained From ISP** if your ISP dynamically assigns DNS server information (and the NBG5615's WAN IP address). The field to the right displays the (read-only) DNS server IP address that the ISP assigns. Select **User-Defined** if you have the IP address of a DNS server. Enter the DNS server's IP address in the field to the right. If you chose **User-Defined**, but leave the IP address set to 0.0.0.0, **User-Defined** changes to **None** after you click **Apply**. If you set a second choice to **User-Defined**, and enter the same IP address, the second **User-Defined** changes to **None** after you click **Apply**. Select **None** if you do not want to configure DNS servers. If you do not configure a DNS server, you must know the IP address of a computer in order to access it.

Table 28 Network > LAN > IP (continued)

LABEL	DESCRIPTION
Apply	Click **Apply** to save your changes to the NBG5615.
Cancel	Click **Cancel** to reload the previous configuration for this screen.

9

Tutorials

9.1 Overview

This chapter provides tutorials for setting up your NBG5615.

- Set Up a Wireless Network with WPS
- Configure Wireless Security without WPS
- Using Multiple SSIDs on the NBG5615
- Automatically Connecting to a USB Printer

9.2 Set Up a Wireless Network with WPS

This section gives you an example of how to set up wireless network using WPS. This example uses the NBG5615 as the AP and NWD210N as the wireless client which connects to a notebook.

Note: The wireless client must be a WPS-aware device (for example, a WPS USB adapter or PCI card).

There are two WPS methods for creating a secure connection. This tutorial shows you how to do both.

- **Push Button Configuration (PBC)** - create a secure wireless network simply by pressing a button. See Section 9.2.1 on page 73.This is the easier method.
- **PIN Configuration** - create a secure wireless network simply by entering a wireless client's PIN (Personal Identification Number) in the NBG5615's interface. See Section 9.2.2 on page 74. This is the more secure method, since one device can authenticate the other.

9.2.1 Push Button Configuration (PBC)

1. Make sure that your NBG5615 is turned on. Make sure the **WIFI** button (at the back panel of the NBG5615) is pushed in, and that the device is placed within range of your notebook.
2. Make sure that you have installed the wireless client (this example uses the NWD210N) driver and utility in your notebook.
3. In the wireless client utility, find the WPS settings. Enable WPS and press the WPS button (**Start** or **WPS** button)
4. Log into NBG5615's Web Configurator and press the **Push Button** in the **Configuration > Network > Wireless LAN 2.4G > WPS Station** screen.

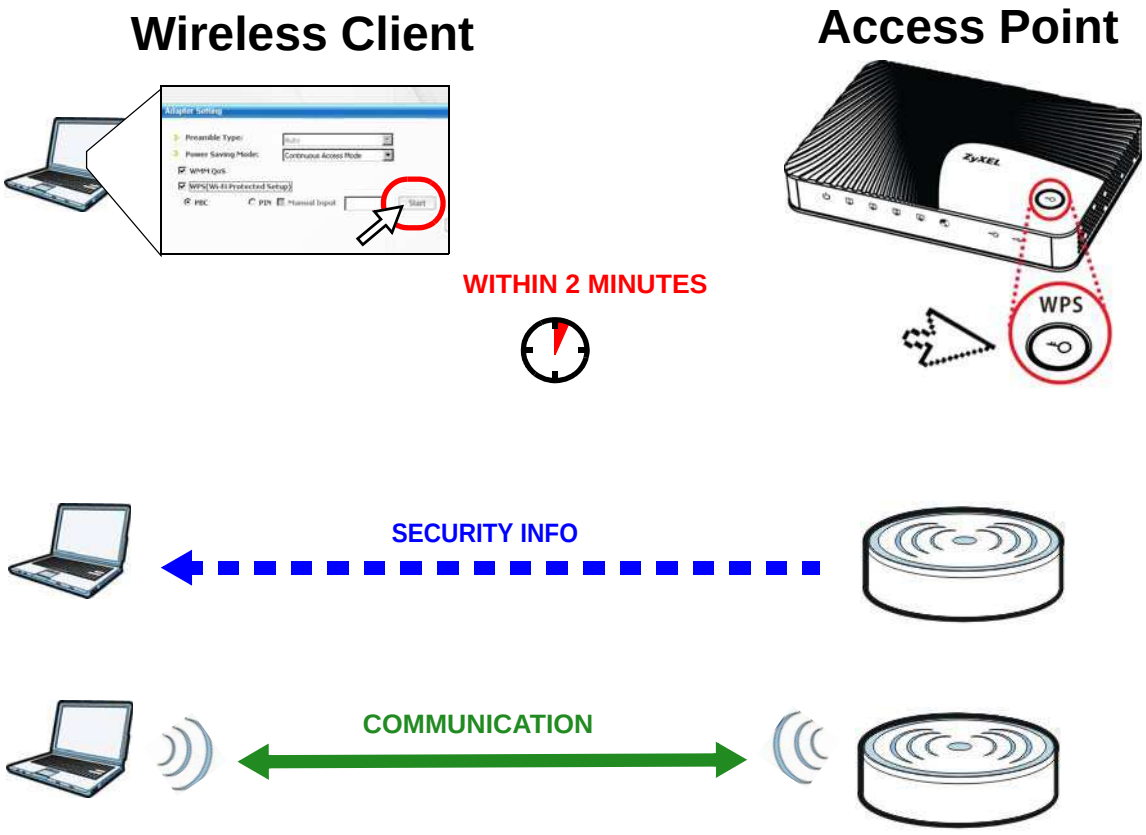
Note: Your NBG5615 has a WPS button located on its panel, as well as a WPS button in its configuration utility. Both buttons have exactly the same function; you can use one or the other.

Note: It doesn't matter which button is pressed first. You must press the second button within two minutes of pressing the first one.

The NBG5615 sends the proper configuration settings to the wireless client. This may take up to two minutes. Then the wireless client is able to communicate with the NBG5615 securely.

The following figure shows you an example to set up wireless network and security by pressing a button on both NBG5615 and wireless client (the NWD210N in this example).

Figure 44 Example WPS Process: PBC Method



9.2.2 PIN Configuration

When you use the PIN configuration method, you need to use both NBG5615's configuration interface and the client's utilities.

1 Launch your wireless client's configuration utility. Go to the WPS settings and select the PIN method to get a PIN number.

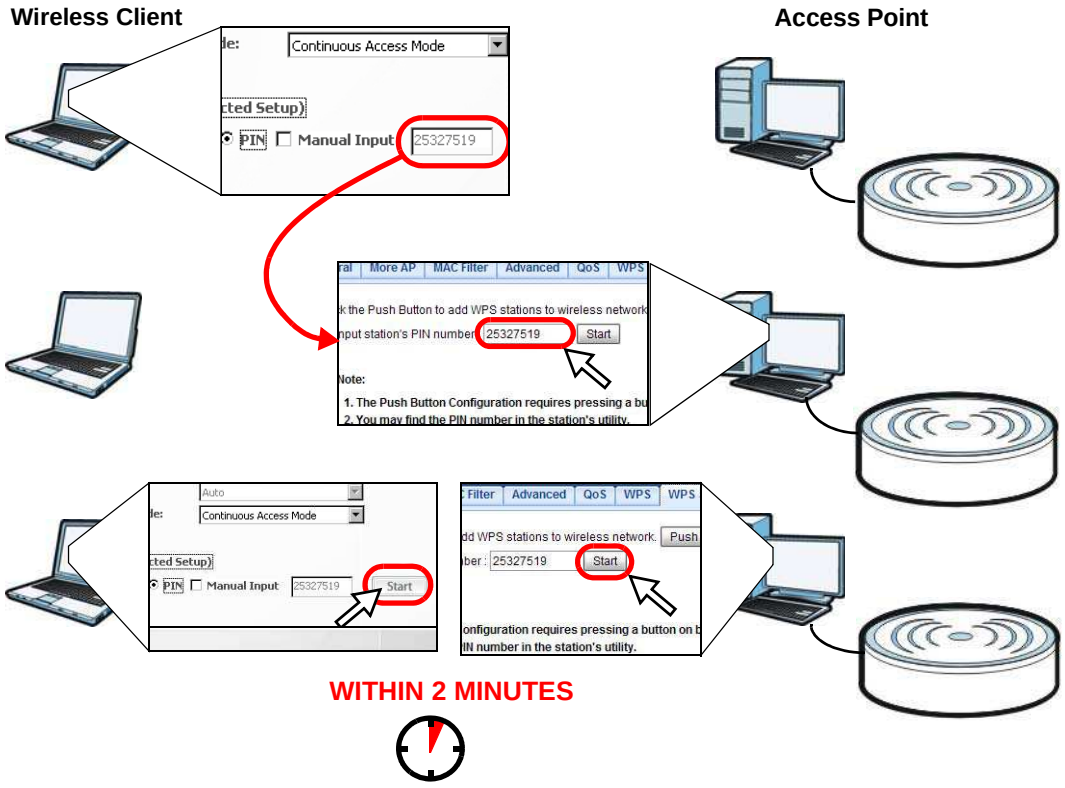
2 Enter the PIN number to the **PIN** field in the **Configuration > Network > Wireless LAN 2.4G > WPS Station** screen on the NBG5615.

3 Click **Start** buttons (or button next to the PIN field) on both the wireless client utility screen and the NBG5615's **WPS Station** screen within two minutes.

The NBG5615 authenticates the wireless client and sends the proper configuration settings to the wireless client. This may take up to two minutes. Then the wireless client is able to communicate with the NBG5615 securely.

The following figure shows you the example to set up wireless network and security on NBG5615 and wireless client (ex. NWD210N in this example) by using PIN method.

Figure 45 Example WPS Process: PIN Method



9.3 Configure Wireless Security without WPS

This example shows you how to configure wireless security settings with the following parameters on your NBG5615.

SSID	SSID_Example3
Channel	6
Security	WPA2-PSK (Pre-Shared Key: ThisismyWPA-PSKpre-sharedkey)

Follow the steps below to configure the wireless settings on your NBG5615.

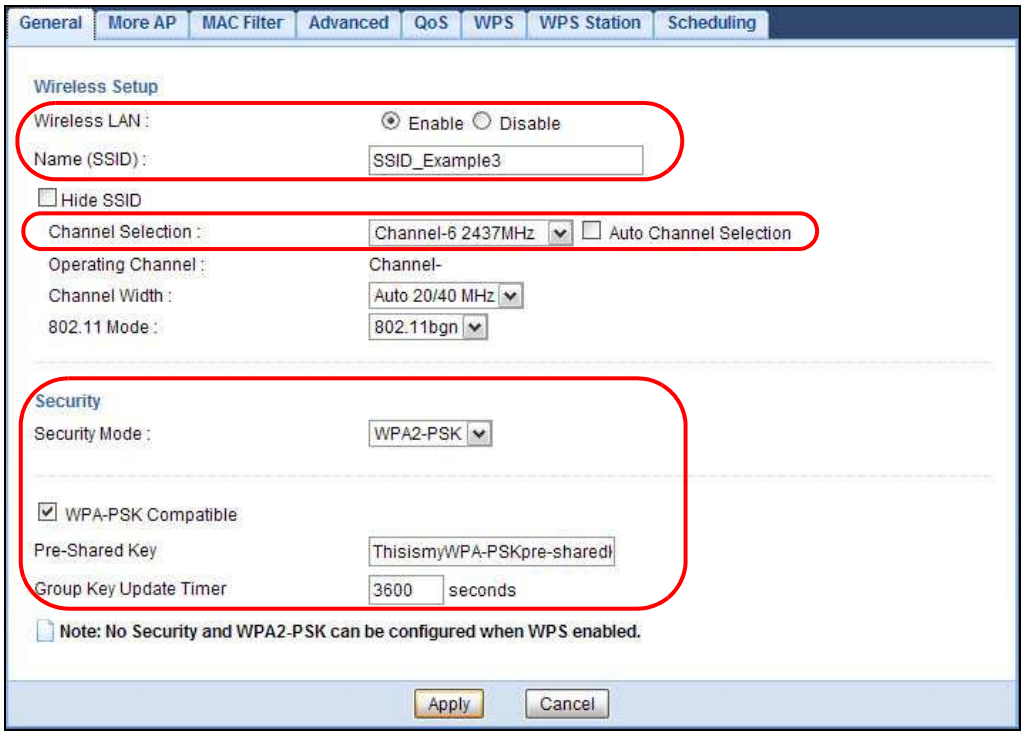
The instructions require that your hardware is connected (see the Quick Start Guide) and you are logged into the Web Configurator through your LAN connection (see Section 4.2 on page 39).

1 Make sure the **WIFI** switch (at the back panel of the NBG5615) is set to **ON**.

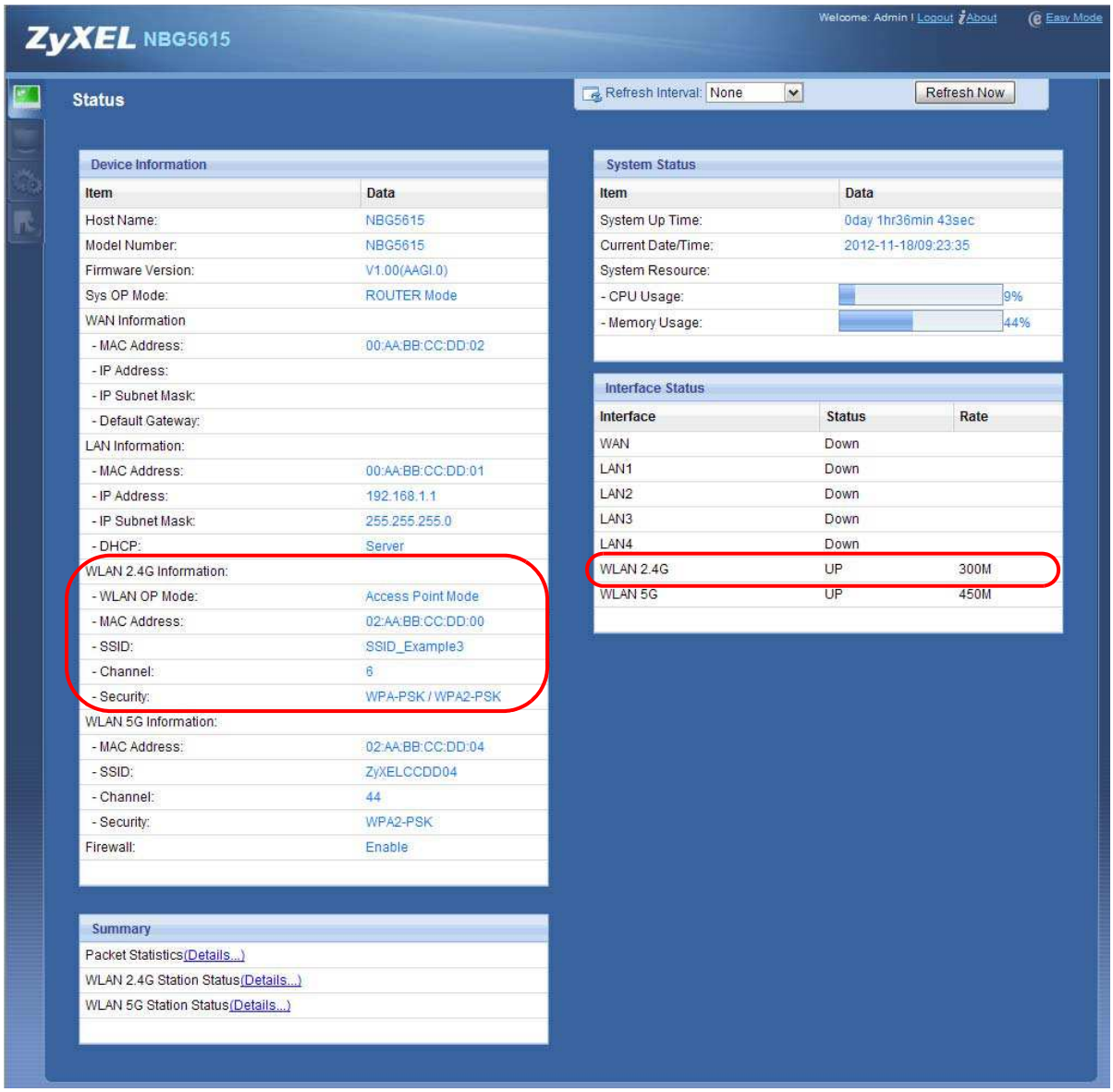
2 Open the **Configuration > Network** > **Wireless LAN 2.4G > General** screen in the AP's Web Configurator.

3 Confirm that the wireless LAN is enabled on the NBG5615.

4 Enter **SSID_Example3** as the SSID and select **Channel-06** as the channel. Set security mode to **WPA2-PSK** and enter **ThisismyWPA-PSKpre-sharedkey** in the **Pre-Shared Key** field. Click **Apply**.



5 Open the **Status** screen. Verify your wireless and wireless security settings under **Device Information** and check if the WLAN connection is up under **Interface Status**.



9.3.1 Configure Your Notebook

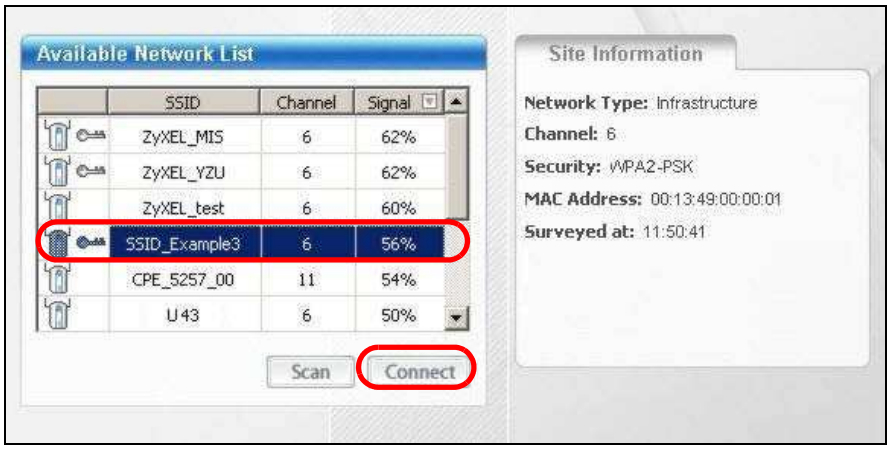
Note: We use the ZyXEL NWD2205 wireless adapter utility screens as an example for the wireless client. The screens may vary for different models.

1 The NBG5615 supports IEEE 802.11a, IEEE 802.11b, IEEE 802.11g and IEEE 802.11n wireless clients. Make sure that your notebook or computer's wireless adapter supports one of these standards.

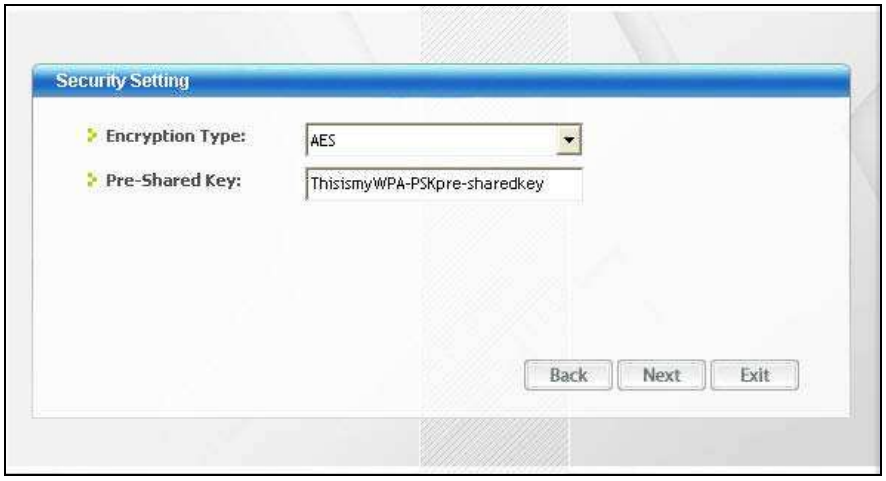
2 Wireless adapters come with software sometimes called a "utility" that you install on your computer. See your wireless adapter's User's Guide for information on how to do that.

3 After you've installed the utility, open it. If you cannot see your utility's icon on your screen, go to **Start > Programs** and click on your utility in the list of programs that appears. The utility displays a list of APs within range, as shown in the example screen below.

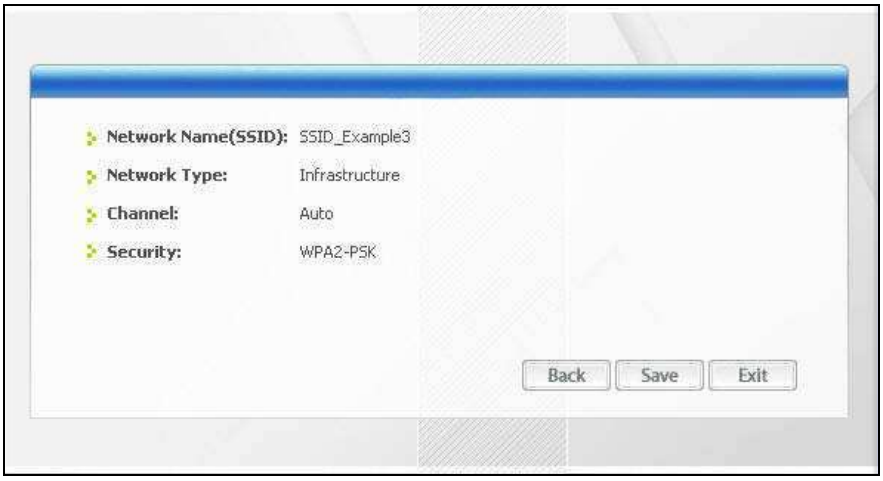
4 Select SSID_Example3 and click **Connect**.



5 Select **AES** and type the security key in the following screen. Click **Next**.



6 The **Confirm Save** window appears. Check your settings and click **Save** to continue.



7 Check the status of your wireless connection in the screen below. If your wireless connection is weak or you have no connection, see the Troubleshooting section of this User's Guide.

If your connection is successful, open your Internet browser and enter http://www.zyxel.com or the URL of any other web site in the address bar. If you are able to access the web site, your wireless connection is successfully configured.

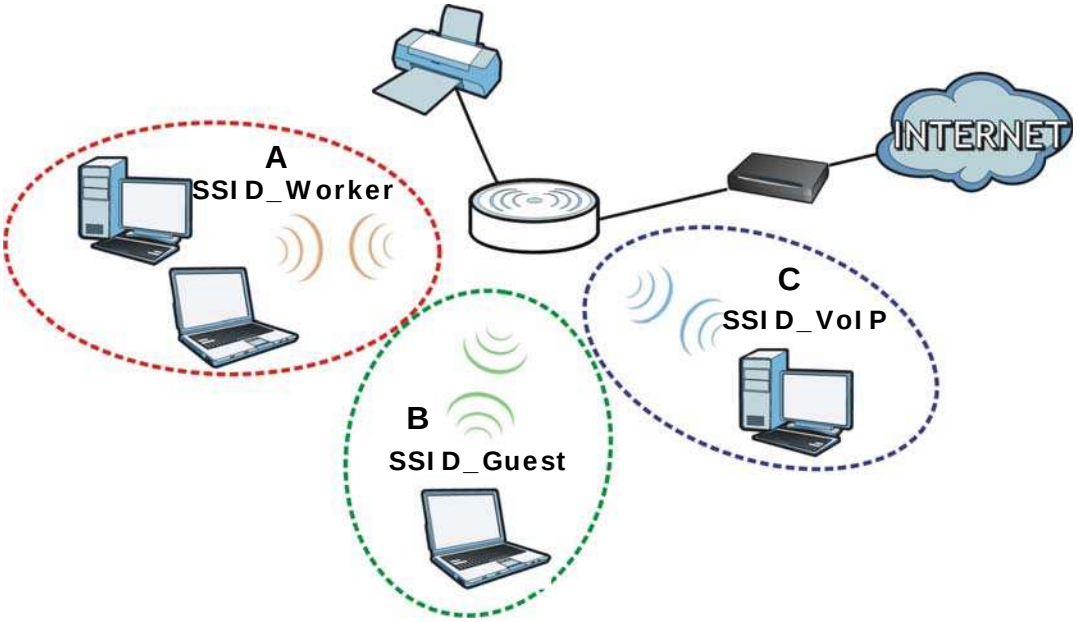
9.4 Using Multiple SSIDs on the NBG5615

You can configure more than one SSID on a NBG5615. See Section 12.4 on page 118.

This allows you to configure multiple independent wireless networks on the NBG5615 as if there were multiple APs (virtual APs). Each virtual AP has its own SSID, wireless security type and MAC filtering settings. That is, each SSID on the NBG5615 represents a different access point/wireless network to wireless clients in the network.

Clients can associate only with the SSIDs for which they have the correct security settings. Clients using different SSIDs can access the Internet and the wired network behind the NBG5615 (such as a printer).

For example, you may set up three wireless networks (**A**, **B** and **C**) in your office. **A** is for workers, **B** is for guests and **C** is specific to a VoIP device in the meeting room.



9.4.1 Configuring Security Settings of Multiple SSIDs

The NBG5615 is in router mode by default.

This example shows you how to configure the SSIDs with the following parameters on your NBG5615 (in router mode).

SSID	SECURITY TYPE	KEY	MAC FILTERING
SSID_Worker	WPA2-PSK WPA Compatible	DoNotStealMyWirelessNetwork	Disable
SSID_VoIP	WPA-PSK	VoIPOnly12345678	Allow 00:A0:C5:01:23:45
SSID_Guest	WPA-PSK	keyexample123	Disable

1 Connect your computer to the LAN port of the NBG5615 using an Ethernet cable.

2 The default IP address of the NBG5615 in router mode is "192.168.1.1". In this case, your computer must have an IP address in the range between "192.168.1.2" and "192.168.1.254".

3 Click **Start > Run** on your computer in Windows. Type "cmd" in the dialog box. Enter "ipconfig" to show your computer's IP address. If your computer's IP address is not in the correct range then see Appendix B on page 221 for information on changing your computer's IP address.

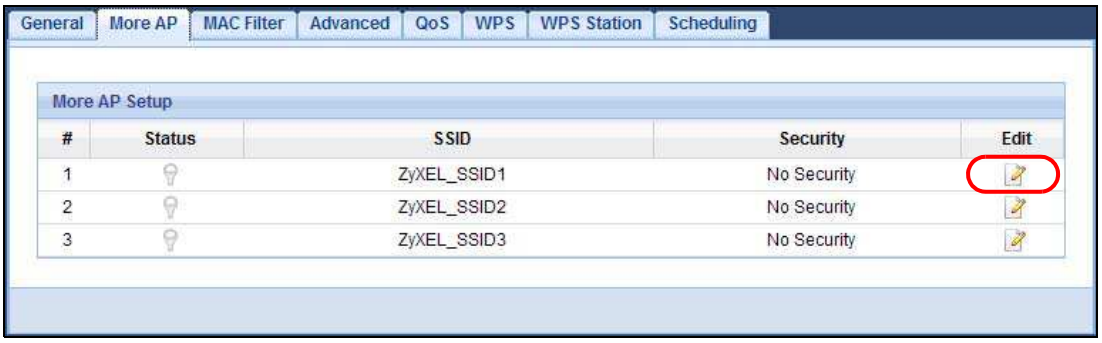
4 After you've set your computer's IP address, open a web browser such as Internet Explorer and type "http://192.168.1.1" as the web address in your web browser.

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

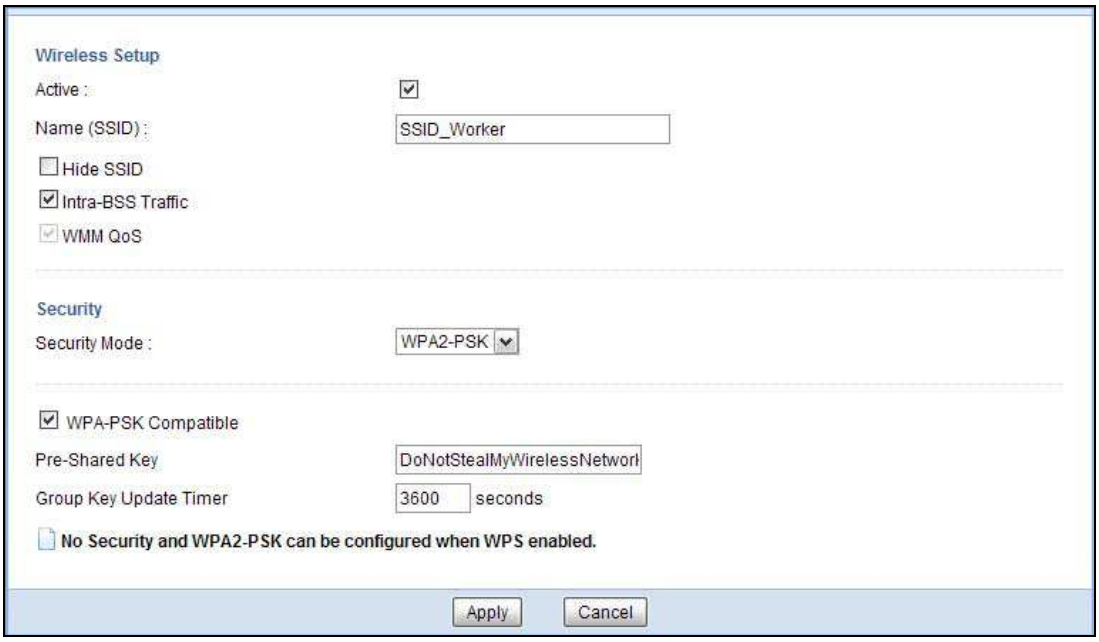
6 Type a new password and retype it to confirm, then click **Apply**. Otherwise, click **Ignore**.

7 The **Easy Mode** appears. Click **Expert Mode** in the navigation panel.

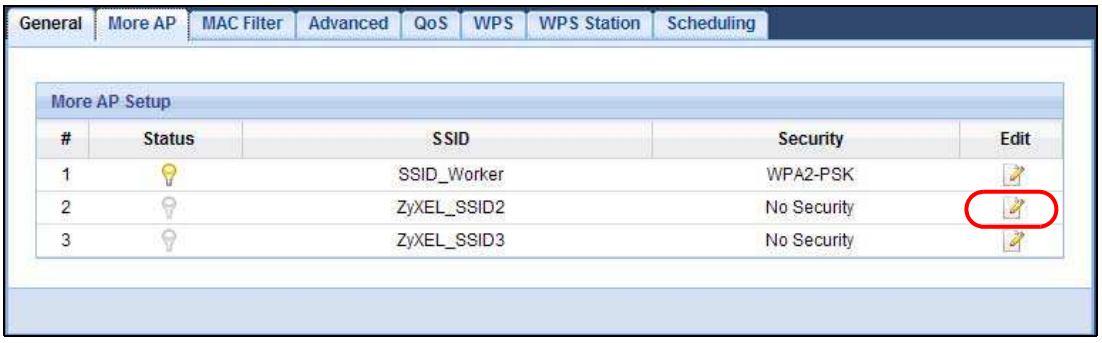
8 Go to **Configuration > Network > Wireless LAN 2.4G > More AP**. Click the **Edit** icon of the first entry to configure wireless and security settings for **SSID_Worker**.



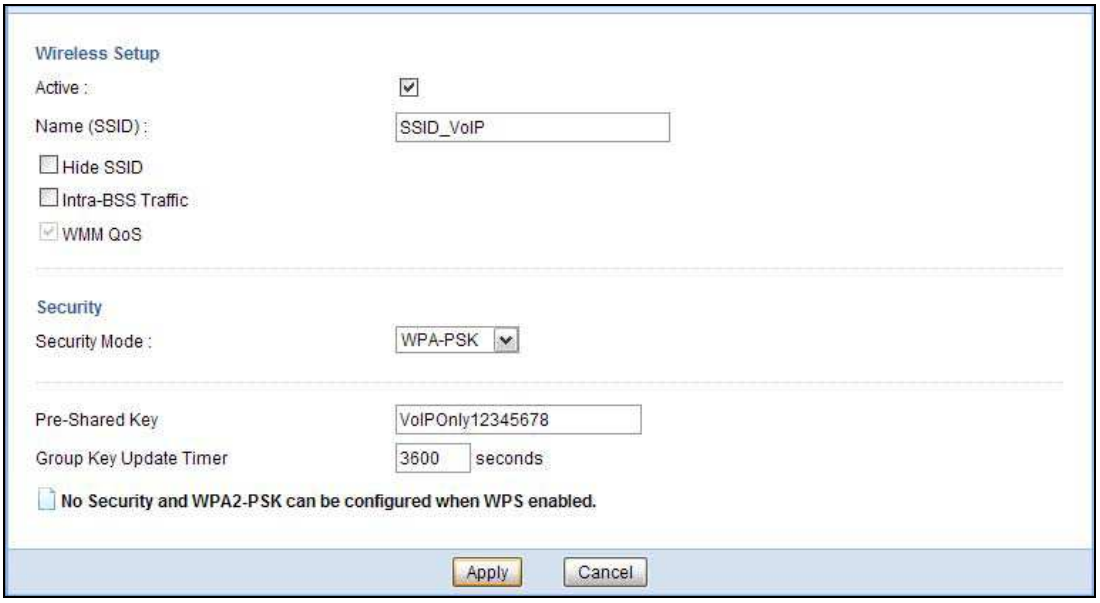
9 Configure the screen as follows. In this example, you enable **Intra-BSS Traffic** for **SSID_Worker** to allow wireless clients in the same wireless network to communicate with each other. Click **Apply**.



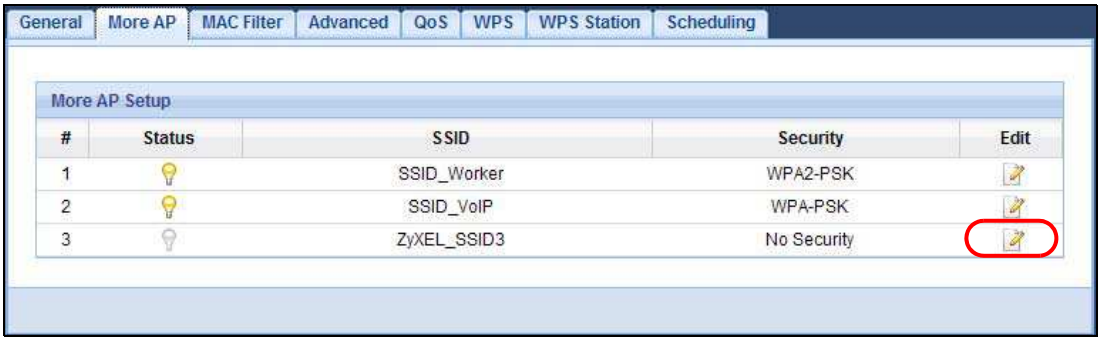
10 Click the **Edit** icon of the second entry to configure wireless and security settings for **SSID_VoIP**.



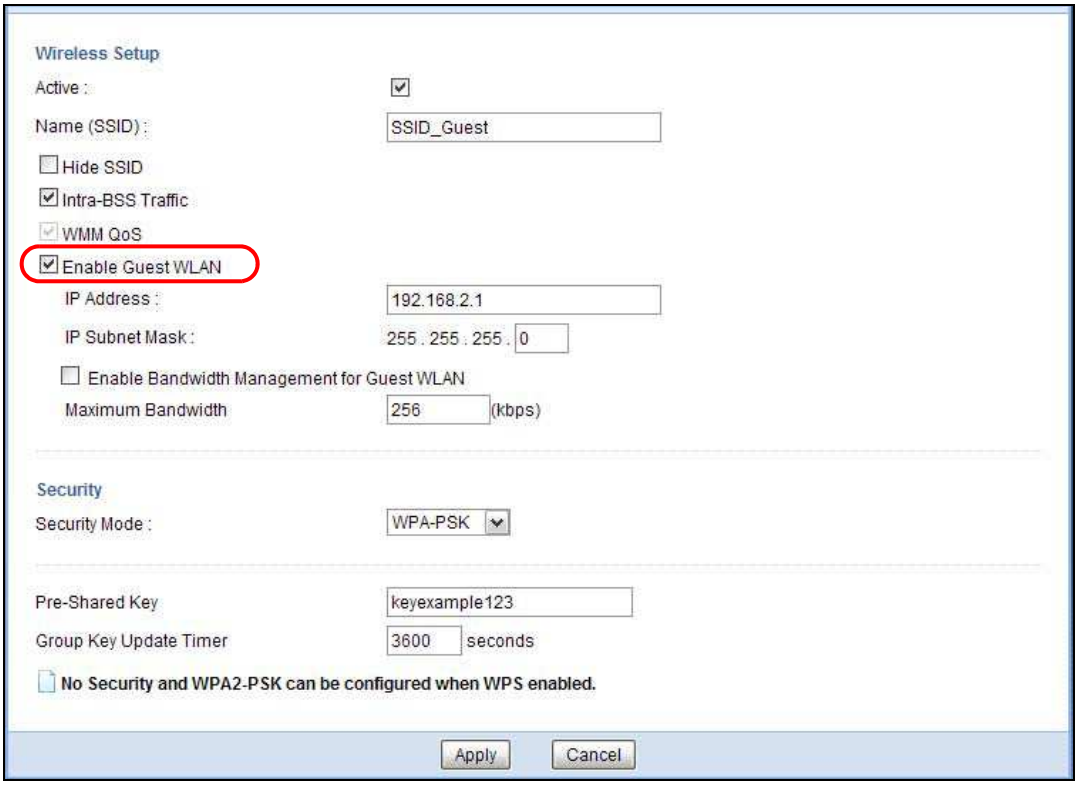
11 Configure the screen as follows. You do not enable **Intra-BSS Traffic** for **SSID_VoIP**. Click **Apply**.



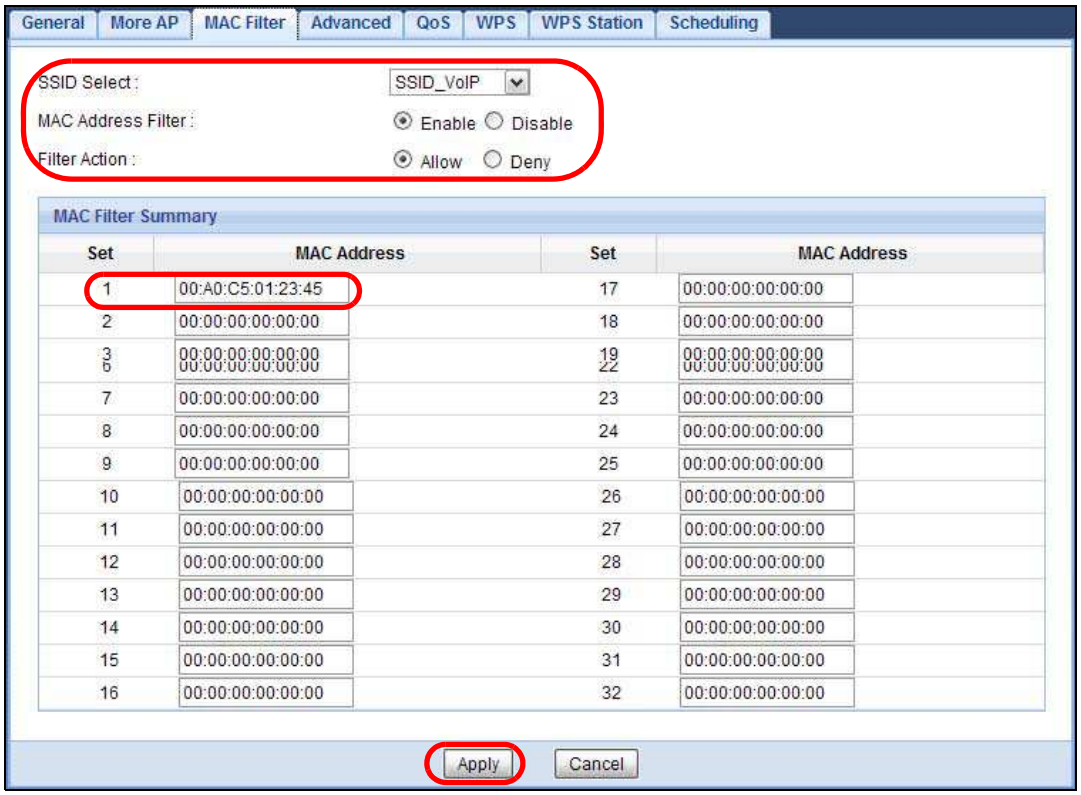
12 Click the **Edit** icon of the third entry to configure wireless and security settings for **SSID_Guest**.



13 Configure the screen as follows. In this example, you enable **Intra-BSS Traffic** for **SSID_Guest** to allow wireless clients in the same wireless network to communicate with each other. Select **Enable Guest WLAN** to allow clients to access the Internet only. Click **Apply**.



14 Click the **MAC Filter** tab to configure MAC filtering for the **SSID_VoIP** wireless network. Select **SSID_VoIP** from the **SSID Select** drop-down list, enable MAC address filtering and set the **Filter Action** to **Allow**. Enter the VoIP device's MAC address in the **Mac Address** field and click **Apply** to allow only the VoIP device to associate with the NBG5615 using this SSID.



9.5 Automatically Connecting to a USB Printer

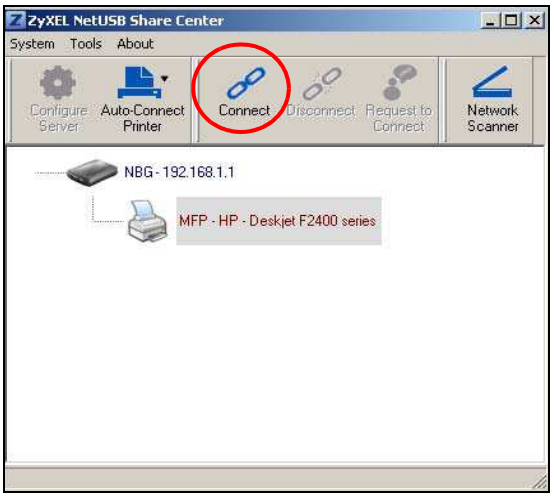
Your computer can connect to a shared USB printer by using the ZyXEL NetUSB Share Center Utility. This tutorial shows you how to set your computer to automatically connect to a shared USB printer over your NBG5615 network each time you log into your computer.

1 Install the ZyXEL NetUSB Share Center Utility to your computer which should be connected to the NBG5615's network. See Chapter 2 on page 22 for details on the installation.

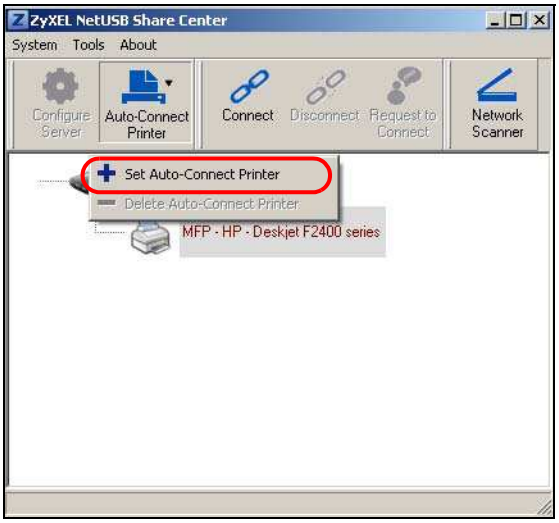
2 Connect a USB printer to one of the USB ports of the NBG5615.

3 Open the **ZyXEL NetUSB Sharing Center Utility** on your computer. The name of the USB printer automatically shows in the Utility screen.

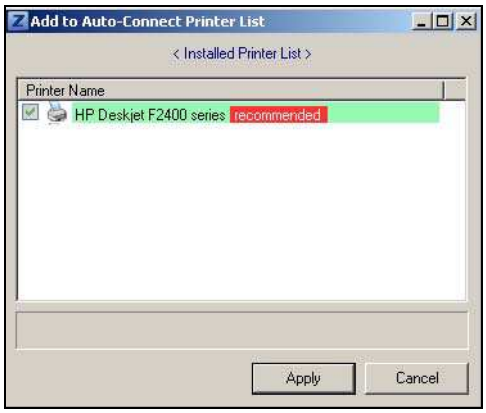
4 Click on the printer name. Then click **Connect**. Your computer will search for the printer driver. You may be prompted to install the driver. Follow the driver's installation steps to finish installing.



5 Click the **Auto-Connect Printer** menu and select **Set Auto-Connect Printer** from the menu.



6 Select the USB printer you want to connect to and click **Apply**.



7 Now your computer can automatically connect to this shared USB printer over your NBG5615 network each time you log into your computer. The printer will be automatically added to your printer list.

8 The Utility supports one connection to the NBG5615's USB device at a time. If more than one computer is using the printer and are all auto-connected to the USB device, the second computer automatically starts printing after the first computer finishes its printing task.

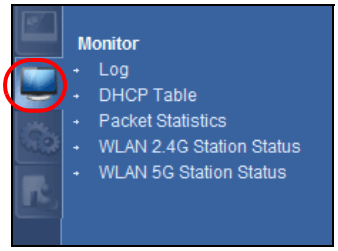
PART II
Technical Reference

10 Monitor

10.1 Overview

This chapter discusses read-only information related to the device state of the NBG5615.

To access the Monitor screens, go to **Expert Mode** after login, then click  .



You can also click the links in the **Summary** table of the **Status** screen to view the packets sent/ received as well as the status of clients connected to the NBG5615.

10.2 What You Can Do

- Use the **Log** screen to see the logs for the activity on the NBG5615 (Section 10.3 on page 89).
- Use the **DHCP Table** screen to view information related to your DHCP status (Section 10.4 on page 90).
- use the **Packet Statistics** screen to view port status, packet specific statistics, the "system up time" and so on (Section 10.5 on page 91).
- Use the **WLAN 2.4G/ 5G Station Status** screen to view the wireless stations that are currently associated to the NBG5615 (Section 10.6 on page 92).

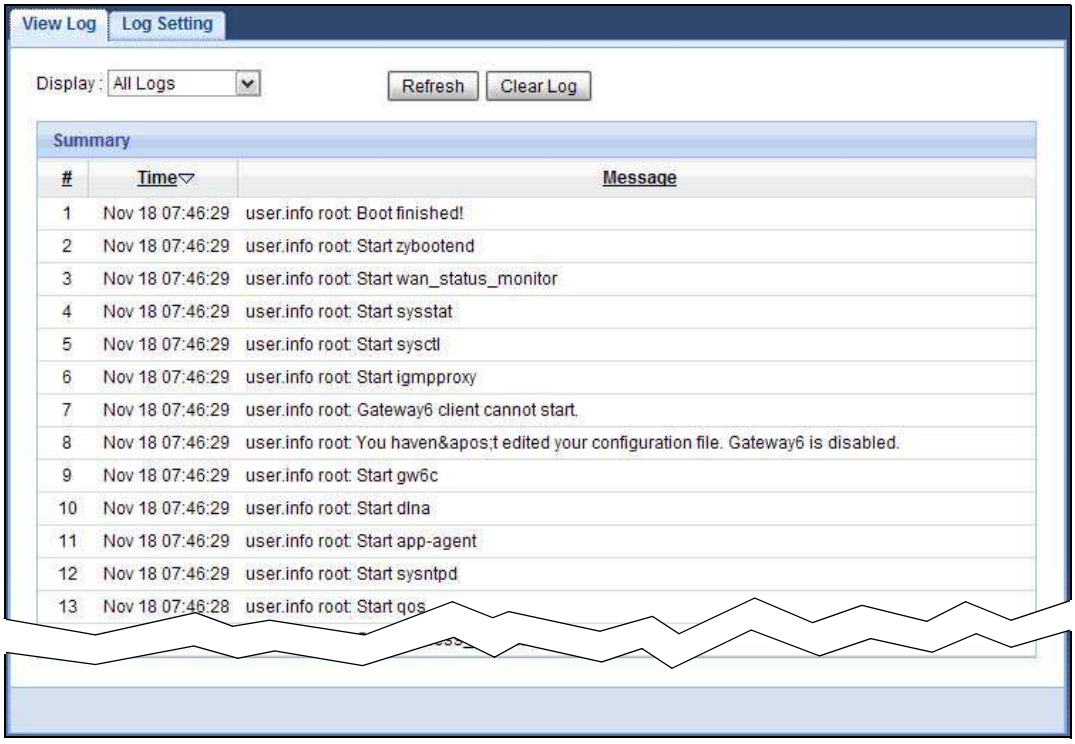
10.3 The Log Screen

The Web Configurator allows you to look at all of the NBG5615's logs in one location.

10.3.1 View Log

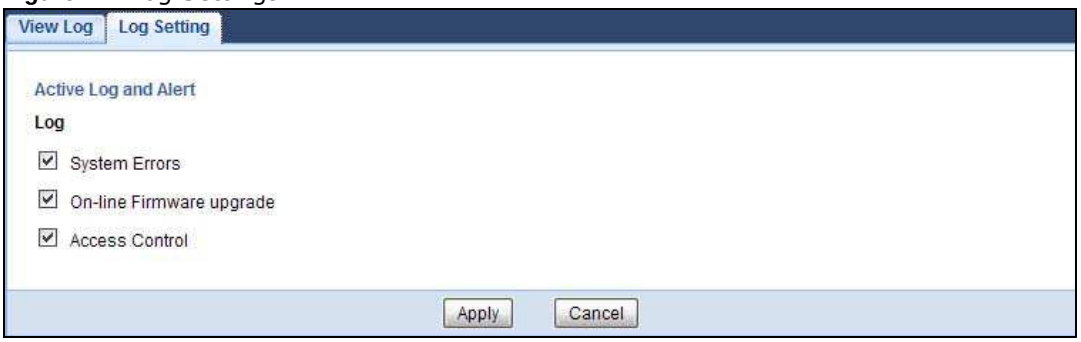
Use the **View Log** screen to see the logged messages for the NBG5615. The log wraps around and deletes the old entries after it fills. Select what logs you want to see from the **Display** drop list. The log choices depend on your settings in the **Log Setting** screen. Click **Refresh** to renew the log screen. Click **Clear Log** to delete all the logs.

Figure 46 View Log



You can configure which logs to display in the **View Log** screen. Go to the **Log Setting** screen and select the logs you wish to display. Click **Apply** to save your settings. Click **Cancel** to start the screen afresh.

Figure 47 Log Settings



10.4 DHCP Table

DHCP (Dynamic Host Configuration Protocol, RFC 2131 and RFC 2132) allows individual clients to obtain TCP/IP configuration at start-up from a server. You can configure the NBG5615's LAN as a DHCP server or disable it. When configured as a server, the NBG5615 provides the TCP/IP configuration for the clients. If DHCP service is disabled, you must have another DHCP server on that network, or else the computer must be manually configured.

Click **Monitor > DHCP Table** or **Configuration > Network > DHCP Server > Client List**. Read-only information here relates to your DHCP status. The DHCP table shows current DHCP client

information (including **MAC Address**, and **IP Address**) of all network clients using the NBG5615's DHCP server.

Figure 48 Monitor > DHCP Table

The following table describes the labels in this screen.

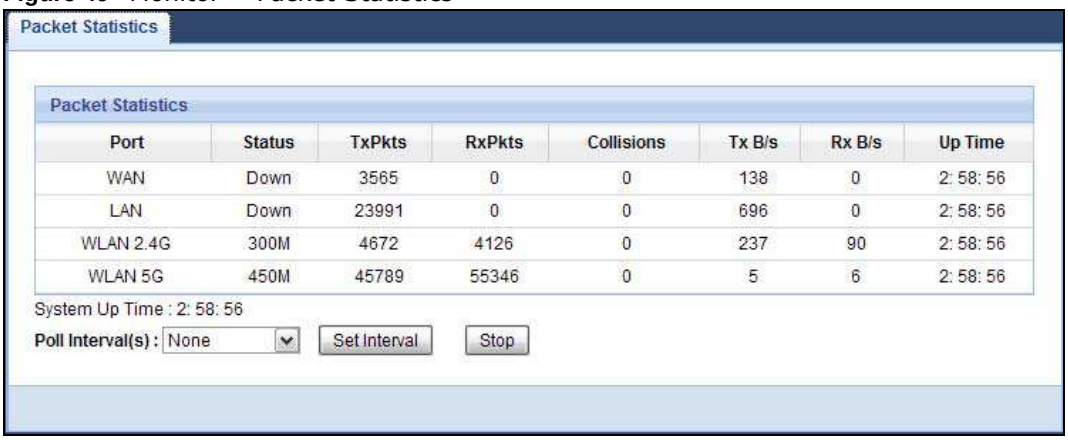
Table 29 Monitor > DHCP Table

LABEL	DESCRIPTION
#	This is the index number of the host computer.
Status	This field displays whether the connection to the host computer is up (a yellow bulb) or down (a gray bulb).
Host Name	This field displays the computer host name.
IP Address	This field displays the IP address relative to the # field listed above.
MAC Address	This field shows the MAC address of the computer with the name in the **Host Name** field. Every Ethernet device has a unique MAC (Media Access Control) address which uniquely identifies a device. The MAC address is assigned at the factory and consists of six pairs of hexadecimal characters, for example, 00:A0:C5:00:00:02.
Reserve	Select this if you want to reserve the IP address for this specific MAC address.
Apply	Click **Apply** to save your changes back to the NBG5615.
Cancel	Click **Cancel** to reload the previous configuration for this screen.

10.5 Packet Statistics

Click **Monitor > Packet Statistics** or the **Packet Statistics (Details...)** hyperlink in the **Status** screen. Read-only information here includes port status, packet specific statistics and the "system up time". The **Poll Interval(s)** field is configurable and is used for refreshing the screen.

Figure 49 Monitor > Packet Statistics



The following table describes the labels in this screen.

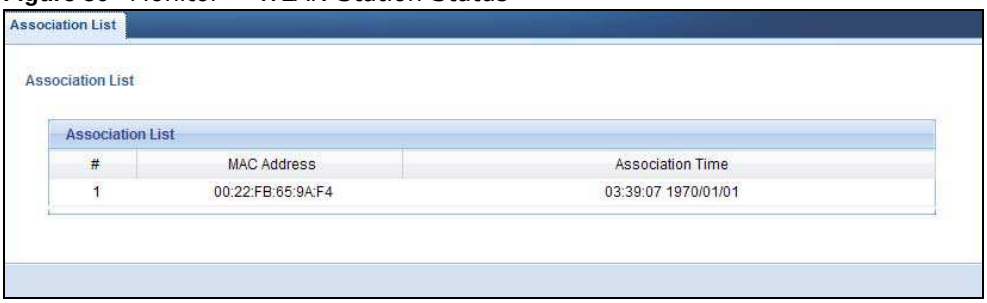
Table 30 Monitor > Packet Statistics

LABEL	DESCRIPTION
Port	This is the NBG5615's interface type.
Status	For the LAN ports, this displays the port speed and duplex setting or **Down** when the line is disconnected. For the WAN port, it displays the port speed and duplex setting if you're using Ethernet encapsulation and **Idle** (line (ppp) idle), **Dial** (starting to trigger a call) and **Drop** (dropping a call) if you're using PPPoE or PPTP encapsulation. This field displays **Down** when the line is disconnected. For the 2.4GHz or 5GHz WLAN, it displays the maximum transmission rate when the WLAN is enabled and **Down** when the WLAN is disabled.
TxPkts	This is the number of transmitted packets on this port.
RxPkts	This is the number of received packets on this port.
Collisions	This is the number of collisions on this port.
Tx B/s	This displays the transmission speed in bytes per second on this port.
Rx B/s	This displays the reception speed in bytes per second on this port.
Up Time	This is the total time the NBG5615 has been for each session.
System Up Time	This is the total time the NBG5615 has been on.
Poll Interval(s)	Enter the time interval in seconds for refreshing statistics in this field.
Set Interval	Click this button to apply the new poll interval you entered in the **Poll Interval(s)** field.
Stop	Click **Stop** to stop refreshing statistics.

10.6 WLAN Station Status

Click **Monitor > WLAN 2.4G/ 5G Station Status** or the **WLAN 2.4G/ 5G Station Status (Details...)** hyperlink in the **Status** screen. View the wireless stations that are currently associated to the NBG5615's 2.4GHz or 5GHz wireless network in the **Association List**. Association means that a wireless client (for example, your network or computer with a wireless network card) has connected successfully to the AP (or wireless router) using the same SSID, channel and security settings.

Figure 50 Monitor > WLAN Station Status



The following table describes the labels in this screen.

Table 31 Monitor > WLAN Station Status

LABEL	DESCRIPTION
#	This is the index number of an associated wireless station.
MAC Address	This field displays the MAC address of an associated wireless station.
Association Time	This field displays the time a wireless station first associated with the NBG5615's WLAN.

11

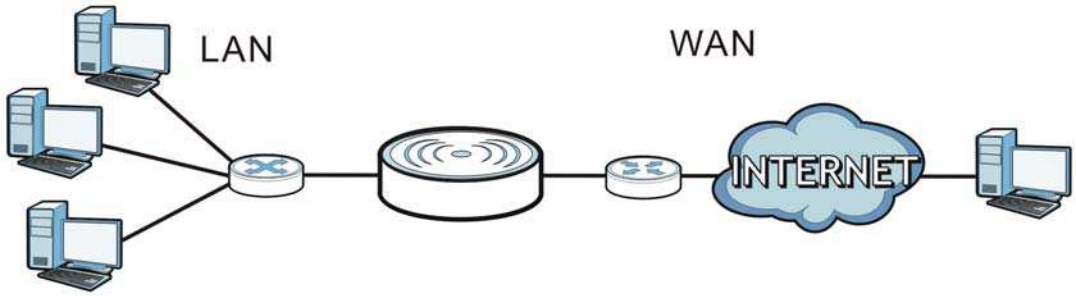
WAN

11.1 Overview

This chapter discusses the NBG5615's **WAN** screens. Use these screens to configure your NBG5615 for Internet access.

A WAN (Wide Area Network) connection is an outside connection to another network or the Internet. It connects your private networks such as a LAN (Local Area Network) and other networks, so that a computer in one location can communicate with computers in other locations.

Figure 51 LAN and WAN



11.2 What You Can Do

- Use the **Internet Connection** screen to enter your ISP information and set how the computer acquires its IP, DNS and WAN MAC addresses (Section 11.4 on page 97).
- Use the **Advanced** screen to enable multicasting, configure Windows networking and bridge (Section 11.5 on page 104).

11.3 What You Need To Know

The information in this section can help you configure the screens for your WAN connection, as well as enable/disable some advanced features of your NBG5615.

11.3.1 Configuring Your Internet Connection

Encapsulation Method

Encapsulation is used to include data from an upper layer protocol into a lower layer protocol. To set up a WAN connection to the Internet, you need to use the same encapsulation method used by your ISP (Internet Service Provider). If your ISP offers a dial-up Internet connection using PPPoE (PPP over Ethernet) or PPTP (Point-to-Point Tunneling Protocol), they should also provide a username and password (and service name) for user authentication.

WAN IP Address

The WAN IP address is an IP address for the NBG5615, which makes it accessible from an outside network. It is used by the NBG5615 to communicate with other devices in other networks. It can be static (fixed) or dynamically assigned by the ISP each time the NBG5615 tries to access the Internet.

If your ISP assigns you a static WAN IP address, they should also assign you the subnet mask and DNS server IP address(es) (and a gateway IP address if you use the Ethernet or ENET ENCAP encapsulation method).

DNS Server Address Assignment

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

The NBG5615 can get the DNS server addresses in the following ways.

1. The ISP tells you the DNS server addresses, usually in the form of an information sheet, when you sign up. If your ISP gives you DNS server addresses, manually enter them in the DNS server fields.
2. If your ISP dynamically assigns the DNS server IP addresses (along with the NBG5615's WAN IP address), set the DNS server fields to get the DNS server address from the ISP.

WAN MAC Address

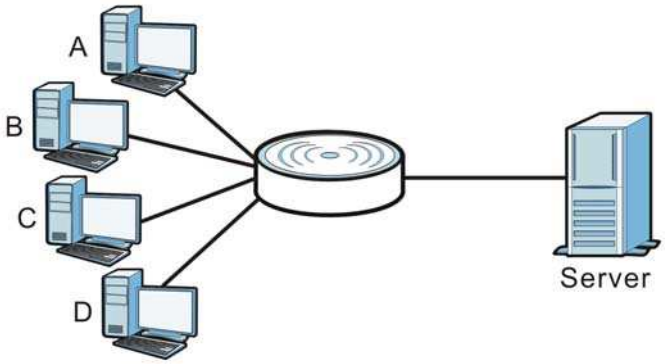
The MAC address screen allows users to configure the WAN port's MAC address by either using the factory default or cloning the MAC address from a computer on your LAN. Choose **Factory Default** to select the factory assigned default MAC Address.

Otherwise, click **Clone the computer's MAC address - IP Address** and enter the IP address of the computer on the LAN whose MAC you are cloning. Once it is successfully configured, the address will be copied to configuration file. It is recommended that you clone the MAC address prior to hooking up the WAN Port.

Multicast

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

Figure 52 Multicast Example



In the multicast example above, systems A and D comprise one multicast group. In multicasting, the server only needs to send one data stream and this is delivered to systems A and D.

IGMP (Internet Group Multicast Protocol) is a network-layer protocol used to establish membership in a multicast group - it is not used to carry user data. The NBG5615 supports both IGMP version 1 (**IGMP-v1**) and IGMP version 2 (**IGMP-v2**).

At start up, the NBG5615 queries all directly connected networks to gather group membership. After that, the NBG5615 periodically updates this information. IP multicasting can be enabled/ disabled on the NBG5615 WAN interface in the Web Configurator (**WAN**). Select **None** to disable IP multicasting on these interfaces.

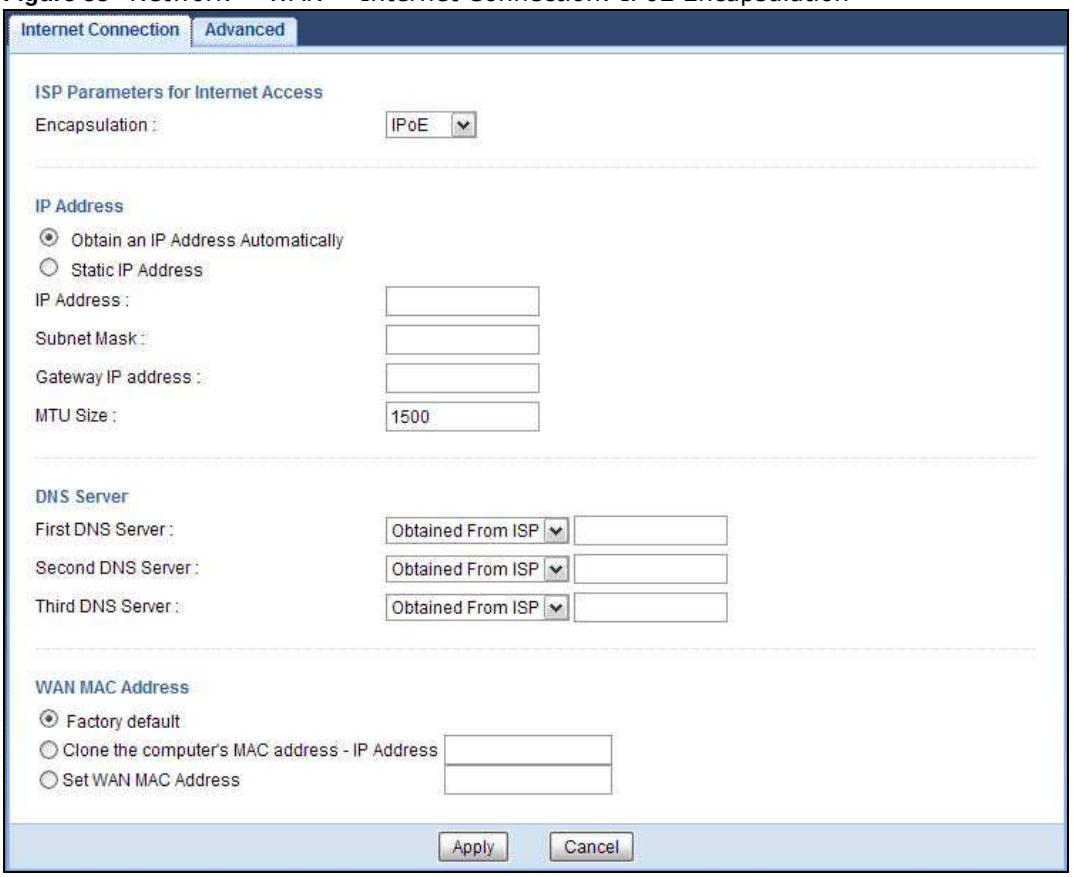
11.4 Internet Connection

Use this screen to change your NBG5615's Internet access settings. Click **Network** > **WAN** from the **Configuration** menu. The screen differs according to the encapsulation you choose.

11.4.1 IPoE Encapsulation

This screen displays when you select **IPoE** encapsulation.

Figure 53 Network > WAN > Internet Connection: IPoE Encapsulation



The following table describes the labels in this screen.

Table 32 Network > WAN > Internet Connection: IPoE Encapsulation

LABEL	DESCRIPTION
ISP Parameters for Internet Access	
Encapsulation	You must choose the **IPoE** option when the WAN port is used as a regular Ethernet.
IP Address	
Obtain an IP Address Automatically	Select this option If your ISP did not assign you a fixed IP address. This is the default selection.
Static IP Address	Select this option If the ISP assigned a fixed IP address.
IP Address	Enter your WAN IP address in this field if you selected **Static IP Address**.
Subnet Mask	Enter the **Subnet Mask** in this field.
Gateway IP Address	Enter a **Gateway IP Address** (if your ISP gave you one) in this field.
MTU Size	Enter the MTU (Maximum Transmission Unit) size for each packet. If a larger packet arrives, the NBG5615 divides it into smaller fragments.
DNS Server	

Table 32 Network > WAN > Internet Connection: IPoE Encapsulation (continued)

LABEL	DESCRIPTION
First DNS Server Second DNS Server Third DNS Server	Select **Obtained From ISP** if your ISP dynamically assigns DNS server information (and the NBG5615's WAN IP address). The field to the right displays the (read-only) DNS server IP address that the ISP assigns. Select **User-Defined** if you have the IP address of a DNS server. Enter the DNS server's IP address in the field to the right. If you chose **User-Defined**, but leave the IP address set to 0.0.0.0, **User-Defined** changes to **None** after you click **Apply**. If you set a second choice to **User-Defined**, and enter the same IP address, the second **User-Defined** changes to **None** after you click **Apply**. Select **None** if you do not want to configure DNS servers. If you do not configure a DNS server, you must know the IP address of a computer in order to access it.
WAN MAC Address	The MAC address section allows users to configure the WAN port's MAC address by either using the NBG5615's MAC address, copying the MAC address from a computer on your LAN or manually entering a MAC address.
Factory default	Select **Factory default** to use the factory assigned default MAC Address.
Clone the computer's MAC address - IP Address	Select **Clone the computer's MAC address - IP Address** and enter the IP address of the computer on the LAN whose MAC you are cloning.
Set WAN MAC Address	Select this option and enter the MAC address you want to use.
Apply	Click **Apply** to save your changes back to the NBG5615.
Cancel	Click **Cancel** to begin configuring this screen afresh.

11.4.2 PPPoE Encapsulation

The NBG5615 supports PPPoE (Point-to-Point Protocol over Ethernet). PPPoE is an IETF standard (RFC 2516) specifying how a personal computer (PC) interacts with a broadband modem (DSL, cable, wireless, etc.) connection. The **PPP over Ethernet** option is for a dial-up connection using PPPoE.

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

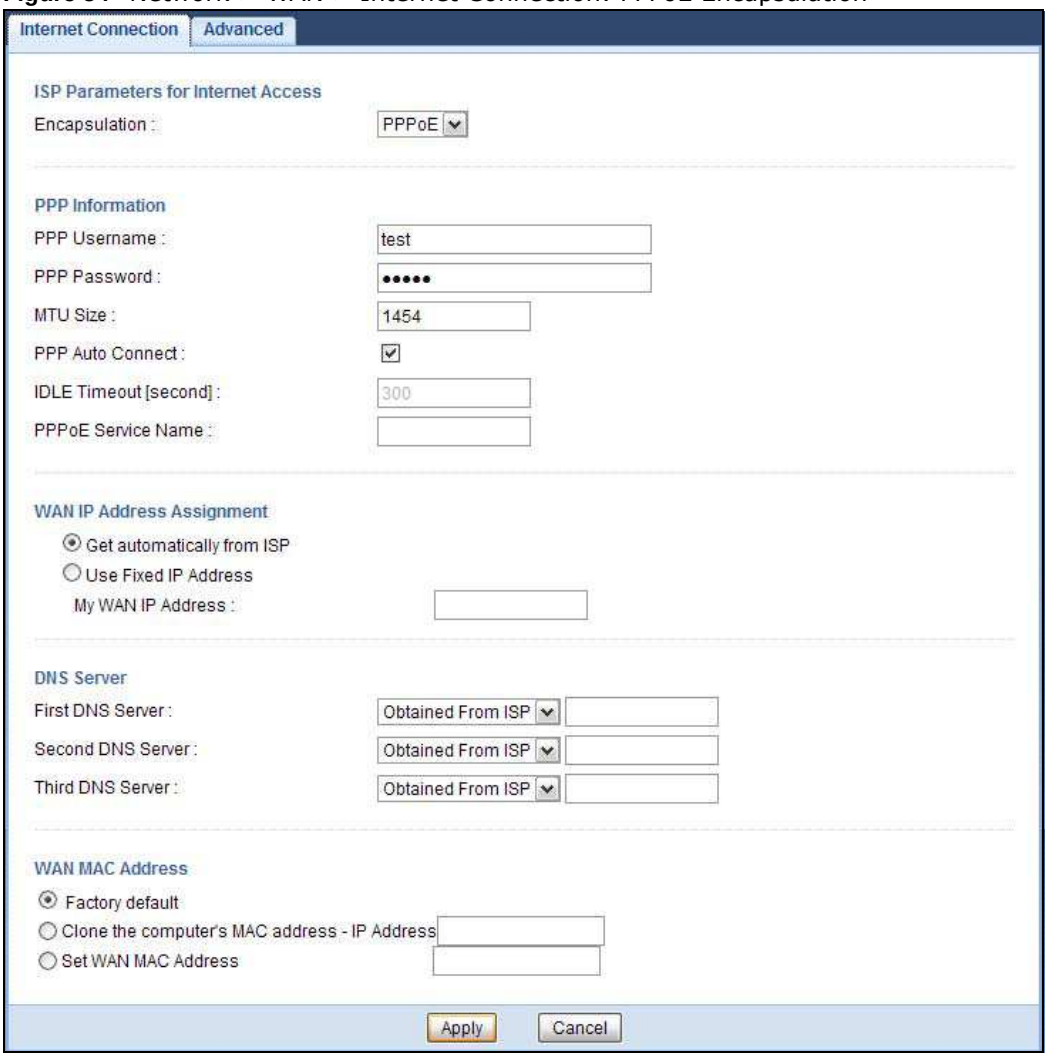
One of the benefits of PPPoE is the ability to let you access one of multiple network services, a function known as dynamic service selection. This enables the service provider to easily create and offer new IP services for individuals.

Operationally, PPPoE saves significant effort for both you and the ISP or carrier, as it requires no specific configuration of the broadband modem at the customer site.

By implementing PPPoE directly on the NBG5615 (rather than individual computers), the computers on the LAN do not need PPPoE software installed, since the NBG5615 does that part of the task. Furthermore, with NAT, all of the LANs' computers will have access.

This screen displays when you select **PPPoE** encapsulation.

Figure 54 Network > WAN > Internet Connection: PPPoE Encapsulation



The following table describes the labels in this screen.

Table 33 Network > WAN > Internet Connection: PPPoE Encapsulation

LABEL	DESCRIPTION
ISP Parameters for Internet Access	
Encapsulation	Select **PPPoE** if you connect to your Internet via dial-up.
PPP Information	
PPP Username	Type the user name given to you by your ISP.
PPP Password	Type the password associated with the user name above.
MTU Size	Enter the Maximum Transmission Unit (MTU) or the largest packet size per frame that your NBG5615 can receive and process.
PPP Auto Connect	Select this option if you do not want the connection to time out.
Idle Timeout (second)	This value specifies the time in minutes that elapses before the router automatically disconnects from the PPPoE server.

Table 33 Network > WAN > Internet Connection: PPPoE Encapsulation (continued)

LABEL	DESCRIPTION
PPPoE Service Name	Enter the PPPoE service name specified in the ISP account.
WAN IP Address Assignment	
Get automatically from ISP	Select this option If your ISP did not assign you a fixed IP address. This is the default selection.
Use Fixed IP Address	Select this option If the ISP assigned a fixed IP address.
My WAN IP Address	Enter your WAN IP address in this field if you selected **Use Fixed IP Address**.
DNS Server	
First DNS Server Second DNS Server Third DNS Server	Select **Obtained From ISP** if your ISP dynamically assigns DNS server information (and the NBG5615's WAN IP address). The field to the right displays the (read-only) DNS server IP address that the ISP assigns. Select **User-Defined** if you have the IP address of a DNS server. Enter the DNS server's IP address in the field to the right. If you chose **User-Defined**, but leave the IP address set to 0.0.0.0, **User-Defined** changes to **None** after you click **Apply**. If you set a second choice to **User-Defined**, and enter the same IP address, the second **User-Defined** changes to **None** after you click **Apply**. Select **None** if you do not want to configure DNS servers. If you do not configure a DNS server, you must know the IP address of a computer in order to access it.
WAN MAC Address	The MAC address section allows users to configure the WAN port's MAC address by using the NBG5615's MAC address, copying the MAC address from a computer on your LAN or manually entering a MAC address.
Factory default	Select **Factory default** to use the factory assigned default MAC Address.
Clone the computer's MAC address - IP Address	Select **Clone the computer's MAC address - IP Address** and enter the IP address of the computer on the LAN whose MAC you are cloning.
Set WAN MAC Address	Select this option and enter the MAC address you want to use.
Apply	Click **Apply** to save your changes back to the NBG5615.
Cancel	Click **Cancel** to begin configuring this screen afresh.

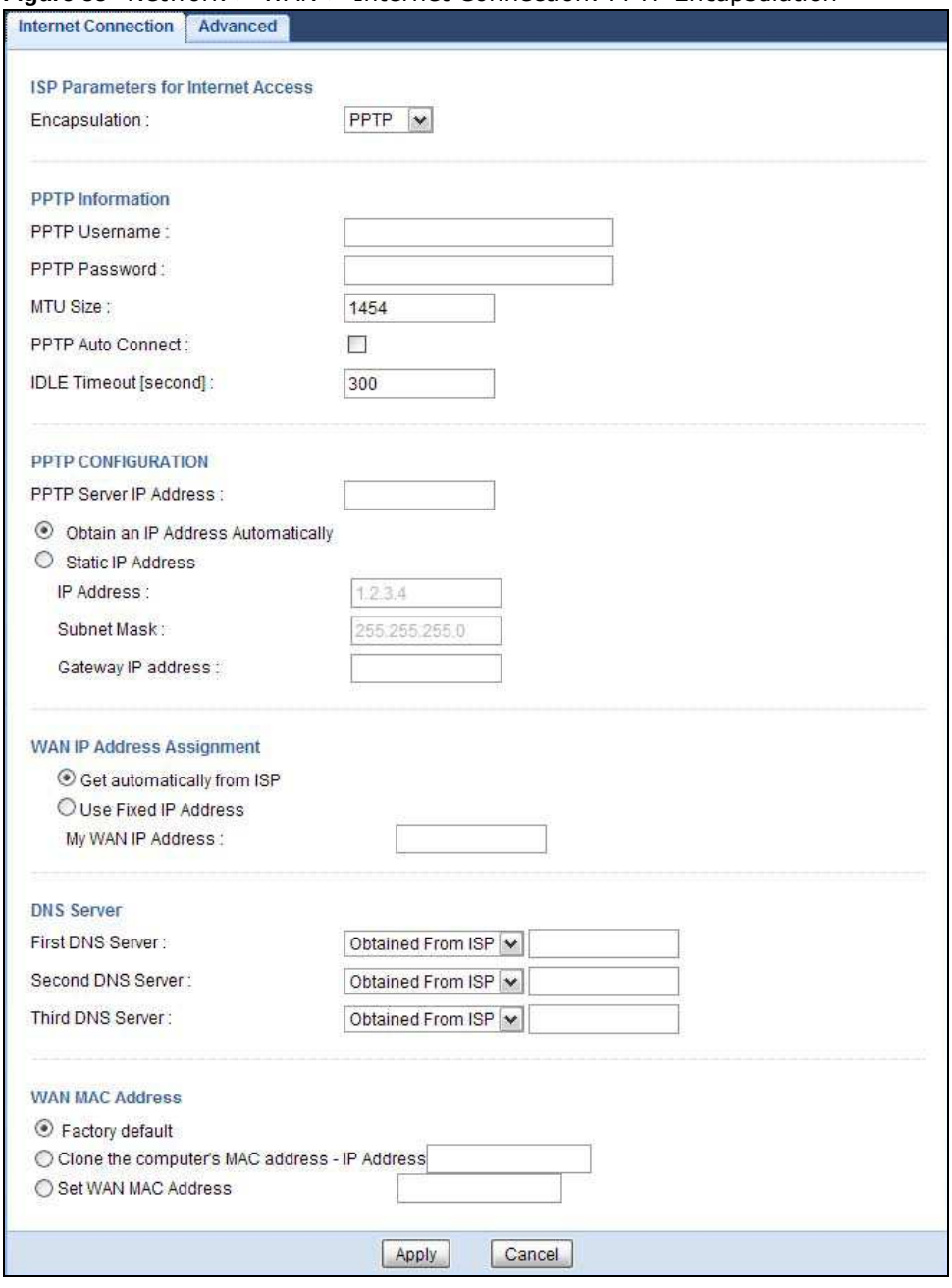
11.4.3 PPTP Encapsulation

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

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

This screen displays when you select **PPTP** encapsulation.

Figure 55 Network > WAN > Internet Connection: PPTP Encapsulation



The following table describes the labels in this screen.

Table 34 Network > WAN > Internet Connection: PPTP Encapsulation

LABEL	DESCRIPTION
ISP Parameters for Internet Access	
Encapsulation	To configure a PPTP client, you must configure the **User Name** and **Password** fields for a PPP connection and the PPTP parameters for a PPTP connection.
PPTP Information	
PPTP Username	Type the user name given to you by your ISP.

Table 34 Network > WAN > Internet Connection: PPTP Encapsulation (continued)

LABEL	DESCRIPTION
PPTP Password	Type the password associated with the User Name above.
MTU Size	Enter the Maximum Transmission Unit (MTU) or the largest packet size per frame that your NBG5615 can receive and process.
PPPTP Auto Connect	Select this option if you do not want the connection to time out.
Idle Timeout	This value specifies the time in minutes that elapses before the NBG5615 automatically disconnects from the PPTP server.
PPTP Configuration	
PPTP Server IP Address	Type the IP address of the PPTP server.
Obtain an IP Address Automatically	Select this option If your ISP did not assign you a fixed IP address. This is the default selection.
Static IP Address	Select this option If the ISP assigned a fixed IP address.
IP Address	Enter your WAN IP address in this field if you selected **Use Fixed IP Address**.
Subnet Mask	Your NBG5615 will automatically calculate the subnet mask based on the IP address that you assign. Unless you are implementing subnetting, use the subnet mask computed by the NBG5615.
Gateway IP Address	Enter a **Gateway IP Address** (if your ISP gave you one) in this field.
WAN IP Address Assignment	
Get automatically from ISP	Select this to get your WAN IP address from your ISP.
Use Fixed IP Address	Select this option If the ISP assigned a fixed IP address.
My WAN IP Address	Enter your WAN IP address in this field if you selected **Use Fixed IP Address**.
DNS Server	
First DNS Server Second DNS Server Third DNS Server	Select **Obtained From ISP** if your ISP dynamically assigns DNS server information (and the NBG5615's WAN IP address). The field to the right displays the (read-only) DNS server IP address that the ISP assigns. Select **User-Defined** if you have the IP address of a DNS server. Enter the DNS server's IP address in the field to the right. If you chose **User-Defined**, but leave the IP address set to 0.0.0.0, **User-Defined** changes to **None** after you click **Apply**. If you set a second choice to **User-Defined**, and enter the same IP address, the second **User-Defined** changes to **None** after you click **Apply**. Select **None** if you do not want to configure DNS servers. If you do not configure a DNS server, you must know the IP address of a computer in order to access it.
WAN MAC Address	The MAC address section allows users to configure the WAN port's MAC address by either using the NBG5615's MAC address, copying the MAC address from a computer on your LAN or manually entering a MAC address.
Factory default	Select **Factory default** to use the factory assigned default MAC Address.
Clone the computer's MAC address - IP Address	Select **Clone the computer's MAC address - IP Address** and enter the IP address of the computer on the LAN whose MAC you are cloning.
Set WAN MAC Address	Select this option and enter the MAC address you want to use.
Apply	Click **Apply** to save your changes back to the NBG5615.
Cancel	Click **Cancel** to begin configuring this screen afresh.

11.5 Advanced WAN Screen

To change your NBG5615's advanced WAN settings, click **Network** > **WAN** > **Advanced**. The screen appears as shown.

Figure 56 Network > WAN > Advanced

The following table describes the labels in this screen.

Table 35 Network > WAN > Advanced

LABEL	DESCRIPTION
Multicast Setup	
Multicast	Select **IGMPv1/ v2** to enable multicasting. This applies to traffic routed from the WAN to the LAN. Select **None** to disable this feature. This may cause incoming traffic to be dropped or sent to all connected network devices.
Auto-Subnet Configuration	
Enable Auto-IP-Change mode	Select this option to have the NBG5615 change its LAN IP address to 10.0.0.1 or 192.168.1.1 accordingly when the NBG5615 gets a dynamic WAN IP address in the same subnet as the LAN IP address 192.168.1.1 or 10.0.0.1. The NAT, DHCP server and firewall functions on the NBG5615 are still available in this mode.
Apply	Click **Apply** to save your changes back to the NBG5615.
Cancel	Click **Cancel** to begin configuring this screen afresh.

12

Wireless LAN

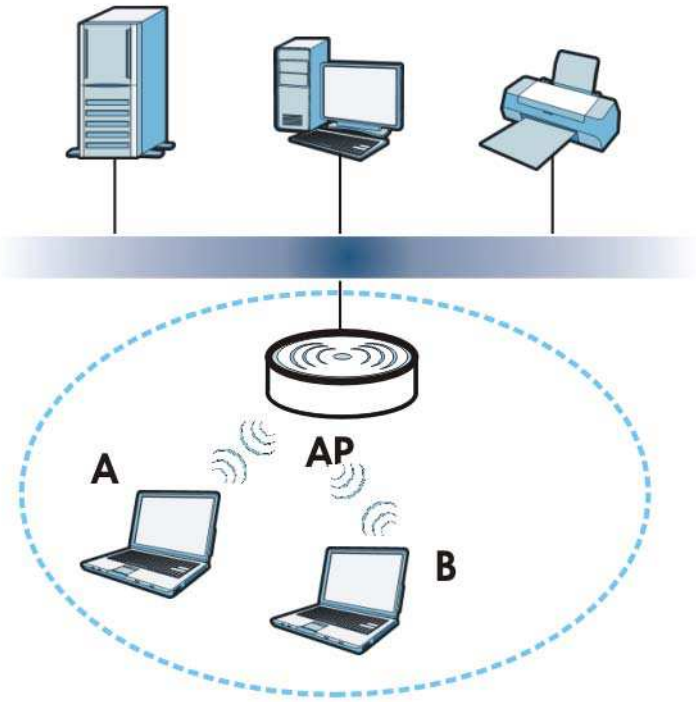
12.1 Overview

This chapter discusses how to configure the wireless network settings in your NBG5615. The NBG5615 is able to function both 2.4GHz and 5GHz network at the same time. You can have different wireless and wireless security settings for 2.4GHz and 5GHz wireless LANs. Click **Configuration > Network > Wireless LAN 2.4G** or **Wireless LAN 5G** to configure to do so.

See the appendices for more detailed information about wireless networks.

The following figure provides an example of a wireless network.

Figure 57 Example of a Wireless Network



The wireless network is the part in the blue circle. In this wireless network, devices **A** and **B** are called wireless clients. The wireless clients use the access point (AP) to interact with other devices (such as the printer) or with the Internet. Your NBG5615 is the AP.

12.1.1 What You Can Do

- Use the **General** screen to turn the wireless connection on or off, set up wireless security between the NBG5615 and the wireless clients, and make other basic configuration changes (Section 12.2 on page 110).
- Use the **More AP** screen to set up multiple wireless networks on your NBG5615 (Section 12.4 on page 118).
- Use the **MAC Filter** screen to allow or deny wireless stations based on their MAC addresses from connecting to the NBG5615 (Section 12.5 on page 121).
- Use the **Advanced** screen to allow intra-BSS networking and set the RTS/CTS Threshold (Section 12.6 on page 123).
- Use the **QoS** screen to ensure Quality of Service (QoS) in your wireless network (Section 12.7 on page 123).
- Use the **WPS** screen to quickly set up a wireless network with strong security, without having to configure security settings manually (Section 12.8 on page 124).
- Use the **WPS Station** screen to add a wireless station using WPS (Section 12.9 on page 126).
- Use the **Scheduling** screen to set the times your wireless LAN is turned on and off (Section 12.10 on page 126).

12.1.2 What You Should Know

Every wireless network must follow these basic guidelines.

- Every wireless client in the same wireless network must use the same SSID.

  The SSID is the name of the wireless network. It stands for Service Set IDentity.
- If two wireless networks overlap, they should use different channels.

  Like radio stations or television channels, each wireless network uses a specific channel, or frequency, to send and receive information.
- Every wireless client in the same wireless network must use security compatible with the AP.

  Security stops unauthorized devices from using the wireless network. It can also protect the information that is sent in the wireless network.

Wireless Security Overview

The following sections introduce different types of wireless security you can set up in the wireless network.

SSID

Normally, the AP acts like a beacon and regularly broadcasts the SSID in the area. You can hide the SSID instead, in which case the AP does not broadcast the SSID. In addition, you should change the default SSID to something that is difficult to guess.

This type of security is fairly weak, however, because there are ways for unauthorized devices to get the SSID. In addition, unauthorized devices can still see the information that is sent in the wireless network.

MAC Address Filter

Every wireless client has a unique identification number, called a MAC address.[1] A MAC address is usually written using twelve hexadecimal characters[2]; for example, 00A0C5000002 or 00:A0:C5:00:00:02. To get the MAC address for each wireless client, see the appropriate User's Guide or other documentation.

You can use the MAC address filter to tell the AP which wireless clients are allowed or not allowed to use the wireless network. If a wireless client is allowed to use the wireless network, it still has to have the correct settings (SSID, channel, and security). If a wireless client is not allowed to use the wireless network, it does not matter if it has the correct settings.

This type of security does not protect the information that is sent in the wireless network. Furthermore, there are ways for unauthorized devices to get the MAC address of an authorized wireless client. Then, they can use that MAC address to use the wireless network.

User Authentication

You can make every user log in to the wireless network before they can use it. This is called user authentication. However, every wireless client in the wireless network has to support IEEE 802.1x to do this.

For wireless networks, there are two typical places to store the user names and passwords for each user.

- In the AP: this feature is called a local user database or a local database.
- In a RADIUS server: this is a server used in businesses more than in homes.

If your AP does not provide a local user database and if you do not have a RADIUS server, you cannot set up user names and passwords for your users.

Unauthorized devices can still see the information that is sent in the wireless network, even if they cannot use the wireless network. Furthermore, there are ways for unauthorized wireless users to get a valid user name and password. Then, they can use that user name and password to use the wireless network.

Local user databases also have an additional limitation that is explained in the next section.

Encryption

Wireless networks can use encryption to protect the information that is sent in the wireless network. Encryption is like a secret code. If you do not know the secret code, you cannot understand the message.

1. Some wireless devices, such as scanners, can detect wireless networks but cannot use wireless networks. These kinds of wireless devices might not have MAC addresses.
2. Hexadecimal characters are 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, and F.

The types of encryption you can choose depend on the type of user authentication. (See page 107 for information about this.)

Table 36 Types of Encryption for Each Type of Authentication

	NO AUTHENTICATION	RADIUS SERVER
Weakest	No Security	WPA
↕	Static WEP	
	WPA-PSK	
Strongest	WPA2-PSK	WPA2

For example, if the wireless network has a RADIUS server, you can choose **WPA** or **WPA2**. If users do not log in to the wireless network, you can choose no encryption, **Static WEP**, **WPA-PSK**, or **WPA2-PSK**.

Usually, you should set up the strongest encryption that every wireless client in the wireless network supports. For example, suppose the AP does not have a local user database, and you do not have a RADIUS server. Therefore, there is no user authentication. Suppose the wireless network has two wireless clients. Device A only supports WEP, and device B supports WEP and WPA. Therefore, you should set up **Static WEP** in the wireless network.

Note: It is recommended that wireless networks use **WPA-PSK**, **WPA**, or stronger encryption. IEEE 802.1x and WEP encryption are better than none at all, but it is still possible for unauthorized devices to figure out the original information pretty quickly.

Note: It is not possible to use **WPA-PSK**, **WPA** or stronger encryption with a local user database. In this case, it is better to set up stronger encryption with no authentication than to set up weaker encryption with the local user database.

When you select **WPA2** or **WPA2-PSK** in your NBG5615, you can also select an option (**WPA**/**WPA-PSK Compatible**) to support WPA/WPA-PSK as well. In this case, if some wireless clients support WPA and some support WPA2, you should set up **WPA2-PSK** or **WPA2** (depending on the type of wireless network login) and select the **WPA**/**WPA-PSK Compatible** option in the NBG5615.

Many types of encryption use a key to protect the information in the wireless network. The longer the key, the stronger the encryption. Every wireless client in the wireless network must have the same key.

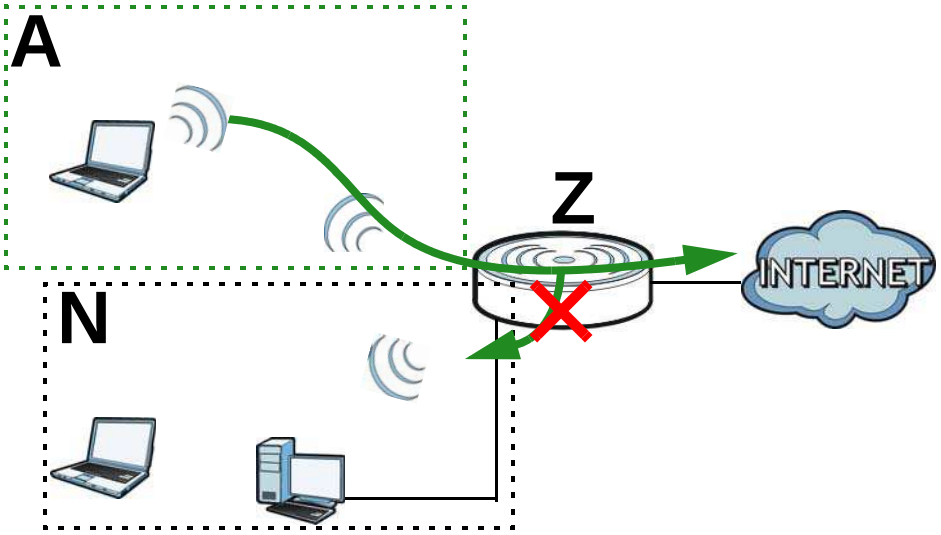
Guest WLAN

Guest WLAN allows you to set up a wireless network where users can access to Internet via the NBG5615 (**Z**), but not other networks connected to the **Z**. In the following figure, a guest user can access the Internet from the guest wireless network **A** via **Z** but not the home or company network **N**.

Note: The home or company network **N** and Guest WLAN network are independent networks.

Note: Only Router mode supports guest WLAN.

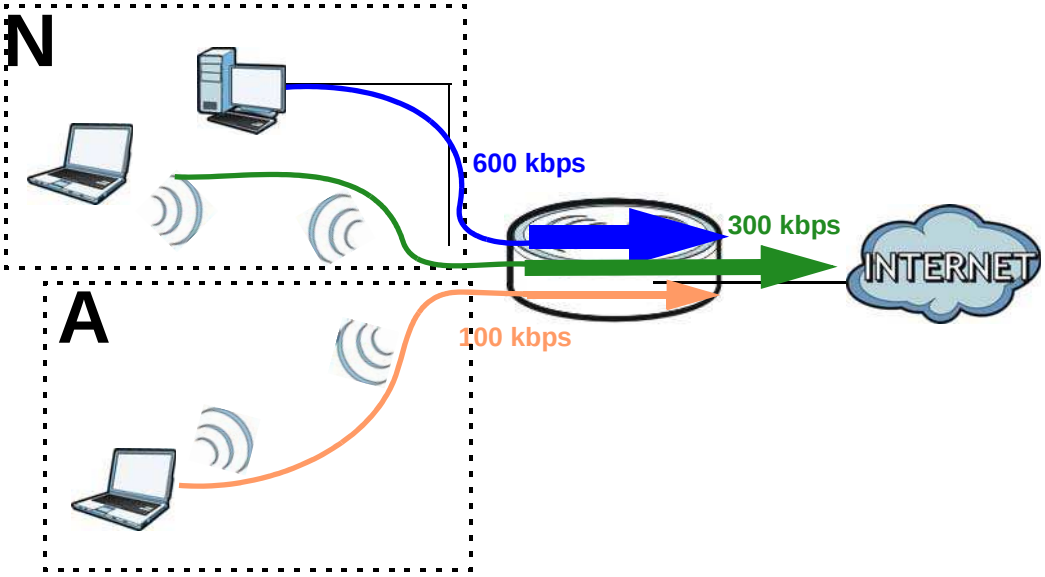
Figure 58 Guest Wireless LAN Network



Guest WLAN Bandwidth

The Guest WLAN Bandwidth function allows you to restrict the maximum bandwidth for the guest wireless network. Additionally, you can also define bandwidth for your home or office network. An example is shown next to define maximum bandwidth for your networks (**A** is Guest WLAN and **N** is home or company network.)

Figure 59 Example: Bandwidth for Different Networks



WPS

WiFi Protected Setup (WPS) is an industry standard specification, defined by the WiFi Alliance. WPS allows you to quickly set up a wireless network with strong security, without having to configure security settings manually. Depending on the devices in your network, you can either press a button (on the device itself, or in its configuration utility) or enter a PIN (Personal Identification

Number) in the devices. Then, they connect and set up a secure network by themselves. See how to set up a secure wireless network using WPS in the Section 9.2 on page 73.

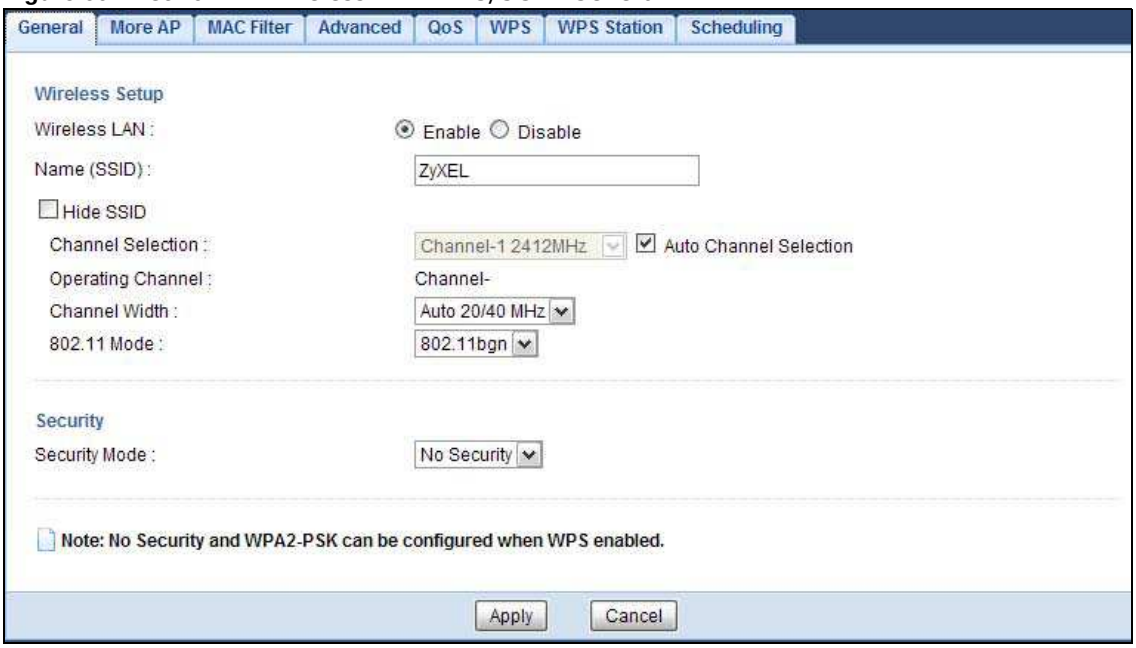
12.2 General Wireless LAN Screen

Use this screen to configure the SSID and wireless security of the wireless LAN.

Note: If you are configuring the NBG5615 from a computer connected to the wireless LAN and you change the NBG5615'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 NBG5615's new settings.

Click **Network** > **Wireless LAN 2.4G/ 5G** to open the **General** screen.

Figure 60 Network > Wireless LAN 2.4G/5G > General



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

Table 37 Network > Wireless LAN 2.4G/5G > General

LABEL	DESCRIPTION
Wireless LAN	Select **Enable** to activate the 2.4GHz and/or 5GHz wireless LAN. Select **Disable** to turn it off. You can enable or disable both 2.4GHz and 5GHz wireless LANs by using the **WIFI** button located on the back panel of the NBG5615.
Name (SSID)	The SSID (Service Set IDentity) identifies the Service Set with which a wireless client is associated. Enter a descriptive name (up to 32 printable characters found on a typical English language keyboard) for the wireless LAN.
Hide SSID	Select this check box to hide the SSID in the outgoing beacon frame so a station cannot obtain the SSID through scanning using a site survey tool.

Table 37 Network > Wireless LAN 2.4G/5G > General (continued)

LABEL	DESCRIPTION
Channel Selection	Set the operating frequency/channel depending on your particular region. Select a channel from the drop-down list box. The options vary depending on the frequency band and the country you are in. Refer to the Connection Wizard chapter for more information on channels. This option is only available if **Auto Channel Selection** is disabled.
Auto Channel Selection	Select this check box for the NBG5615 to automatically choose the channel with the least interference. Deselect this check box if you wish to manually select the channel using the **Channel Selection** field.
Operating Channel	This displays the channel the NBG5615 is currently using.
Channel Width	Select the wireless channel width used by NBG5615. A standard 20MHz channel offers transfer speeds of up to 144Mbps (2.4GHz) or 217Mbps (5GHZ) whereas a 40MHz channel uses two standard channels and offers speeds of up to 300Mbps (2.4GHz) or 450Mbps (5GHZ). Because not all devices support 40 MHz channels, select **Auto 20/ 40MHz** to allow the NBG5615 to adjust the channel bandwidth automatically. 40MHz (channel bonding or dual channel) bonds two adjacent radio channels to increase throughput. The wireless clients must also support 40 MHz. It is often better to use the 20 MHz setting in a location where the environment hinders the wireless signal. Select **20MHz** if you want to lessen radio interference with other wireless devices in your neighborhood or the wireless clients do not support channel bonding.
802.11 Mode	If you are in the **Wireless LAN 2.4G > General** screen, you can select from the following: • **802.11b**: allows either IEEE 802.11b or IEEE 802.11g compliant WLAN devices to associate with the NBG5615. In this mode, all wireless devices can only transmit at the data rates supported by IEEE 802.11b. • **802.11g**: allows IEEE 802.11g compliant WLAN devices to associate with the Device. IEEE 802.11b compliant WLAN devices can associate with the NBG5615 only when they use the short preamble type. • **802.11bg**: allows either IEEE 802.11b or IEEE 802.11g compliant WLAN devices to associate with the NBG5615. The NBG5615 adjusts the transmission rate automatically according to the wireless standard supported by the wireless devices. • **802.11n**: allows IEEE 802.11n compliant WLAN devices to associate with the NBG5615. This can increase transmission rates, although IEEE 802.11b or IEEE 802.11g clients will not be able to connect to the NBG5615. I • **802.11gn**: allows either IEEE 802.11g or IEEE 802.11n compliant WLAN devices to associate with the NBG5615. The transmission rate of your NBG5615 might be reduced. • **802.11 bgn**: allows IEEE802.11b, IEEE802.11g and IEEE802.11n compliant WLAN devices to associate with the NBG5615. The transmission rate of your NBG5615 might be reduced. If you are in the **Wireless LAN 5G > General** screen, you can select from the following: • **802.11a**: allows only IEEE 802.11a compliant WLAN devices to associate with the NBG5615. • **802.11an**: allows both IEEE802.11n and IEEE802.11a compliant WLAN devices to associate with the NBG5615. The transmission rate of your NBG5615 might be reduced.

Table 37 Network > Wireless LAN 2.4G/5G > General (continued)

LABEL	DESCRIPTION
Security Mode	Select **Static WEP**, **WPA-PSK**, **WPA**, **WPA2-PSK** or **WPA2** to add security on this wireless network. The wireless clients which want to associate to this network must have same wireless security settings as this device. After you select to use a security, additional options appears in this screen. See Section 12.3 on page 112 for detailed information on different security modes. Or you can select **No Security** to allow any client to associate this network without authentication. Note: If the WPS function is enabled (default), only **No Security** and **WPA2-PSK** are available in this field.
Apply	Click **Apply** to save your changes back to the NBG5615.
Cancel	Click **Cancel** to reload the previous configuration for this screen.

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

12.3 Wireless Security

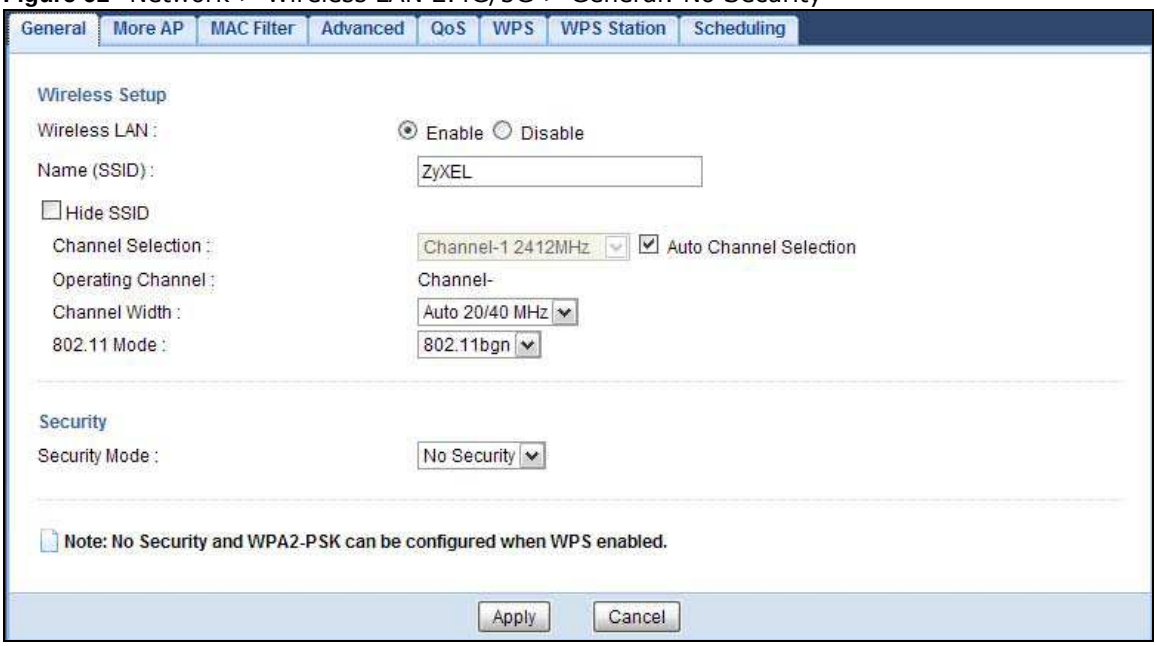
The screen varies depending on what you select in the **Security Mode** field.

12.3.1 No Security

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

Note: If you do not enable any wireless security on your NBG5615, your network is accessible to any wireless networking device that is within range.

Figure 61 Network > Wireless LAN 2.4G/5G > General: No Security



The following table describes the labels in this screen.

Table 38 Network > Wireless LAN 2.4G/5G > General: No Security

LABEL	DESCRIPTION
Security Mode	Choose **No Security** from the drop-down list box.
Apply	Click **Apply** to save your changes back to the NBG5615.
Cancel	Click **Cancel** to reload the previous configuration for this screen.

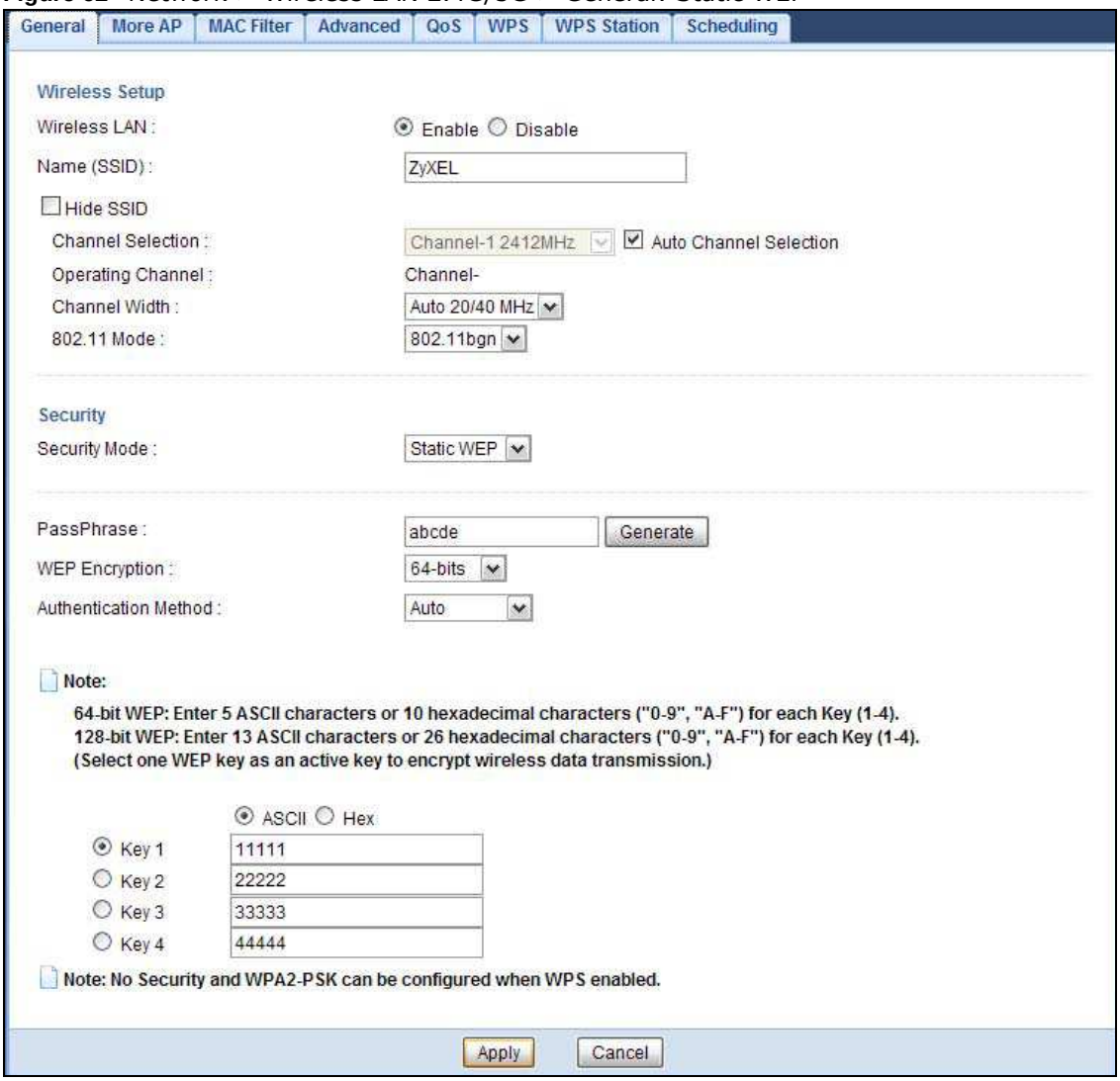
12.3.2 WEP Encryption

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

Your NBG5615 allows you to configure up to four 64-bit or 128-bit WEP keys but only one key can be enabled at any one time.

Select **Static WEP** from the **Security Mode** list.

Figure 62 Network > Wireless LAN 2.4G/5G > General: Static WEP



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

Table 39 Network > Wireless LAN 2.4G/5G > General: Static WEP

LABEL	DESCRIPTION
Security Mode	Select **Static WEP** to enable data encryption.
PassPhrase	Enter a Passphrase (up to 26 printable characters) and click **Generate**. A passphrase functions like a password. In WEP security mode, it is further converted by the NBG5615 into a complicated string that is referred to as the "key". This key is requested from all devices wishing to connect to a wireless network.
WEP Encryption	Select **64-bits** or **128-bits**. This dictates the length of the security key that the network is going to use.
Authentication Method	Select **Auto** or **Shared Key** from the drop-down list box. This field specifies whether the wireless clients have to provide the WEP key to login to the wireless client. Keep this setting at **Auto** unless you want to force a key verification before communication between the wireless client and the NBG5615 occurs. Select **Shared Key** to force the clients to provide the WEP key prior to communication.

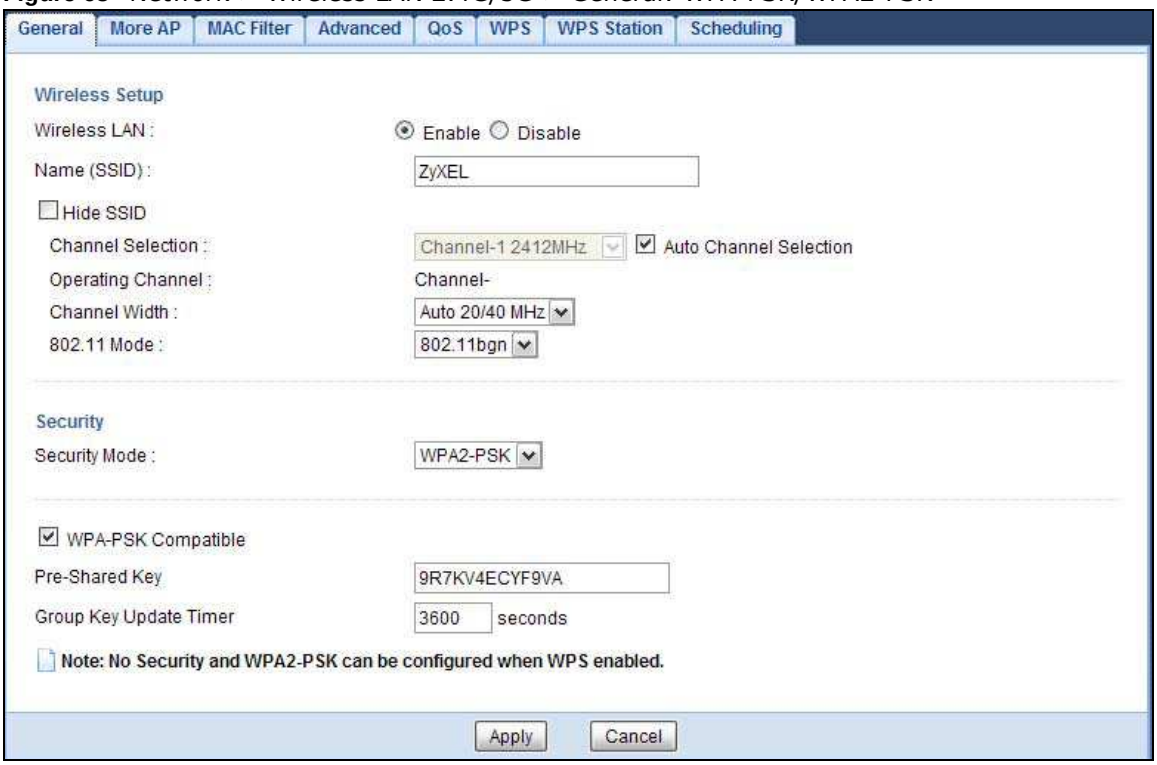
Table 39 Network > Wireless LAN 2.4G/5G > General: Static WEP (continued)

LABEL	DESCRIPTION
ASCII	Select this option in order to enter ASCII characters as WEP key.
Hex	Select this option in order to enter hexadecimal characters as a WEP key. The preceding "0x", that identifies a hexadecimal key, is entered automatically.
Key 1 to Key 4	The WEP keys are used to encrypt data. Both the NBG5615 and the wireless stations must use the same WEP key for data transmission. If you chose **64-bits**, then enter any 5 ASCII characters or 10 hexadecimal characters ("0-9", "A-F"). If you chose **128-bits**, then enter 13 ASCII characters or 26 hexadecimal characters ("0-9", "A-F"). You must configure at least one key, only one key can be activated at any one time. The default key is key 1.
Apply	Click **Apply** to save your changes back to the NBG5615.
Cancel	Click **Cancel** to reload the previous configuration for this screen.

12.3.3 WPA-PSK/WPA2-PSK

Select **WPA-PSK** or **WPA2-PSK** from the **Security Mode** list.

Figure 63 Network > Wireless LAN 2.4G/5G > General: WPA-PSK/WPA2-PSK



The following table describes the labels in this screen.

Table 40 Network > Wireless LAN 2.4G/5G > General: WPA-PSK/WPA2-PSK

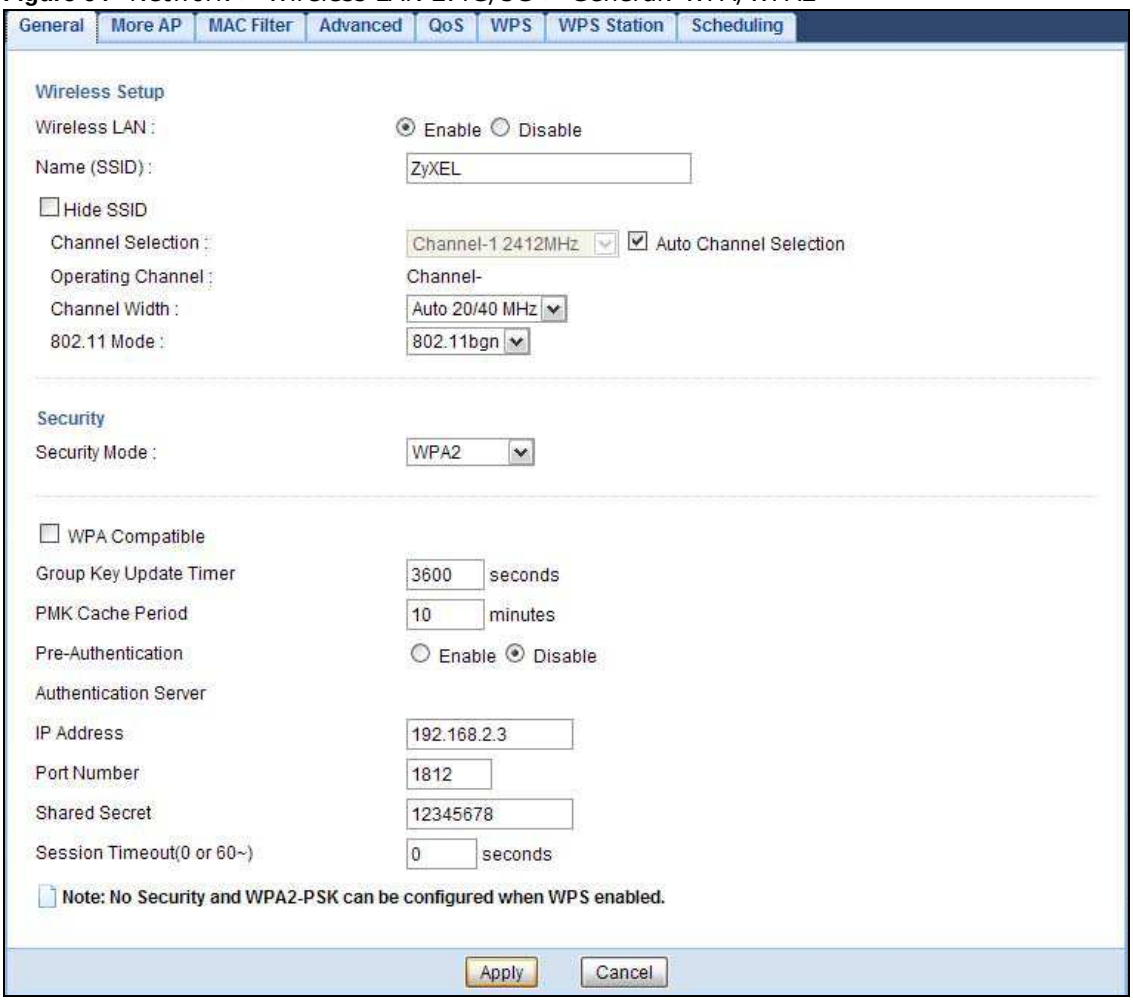
LABEL	DESCRIPTION
Security Mode	Select **WPA-PSK** or **WPA2-PSK** to enable data encryption.
WPA-PSK Compatible	This field appears when you choose **WPA2-PSK** as the **Security Mode**. Check this field to allow wireless devices using **WPA-PSK** security mode to connect to your NBG5615.
Pre-Shared Key	**WPA-PSK/ WPA2-PSK** uses a simple common password for authentication. Type a pre-shared key from 8 to 63 case-sensitive keyboard characters.
Group Key Update Timer	The **Group Key Update Timer** is the rate at which the AP sends a new group key out to all clients. The default is **3600** seconds (60 minutes).
Apply	Click **Apply** to save your changes back to the NBG5615.
Cancel	Click **Cancel** to reload the previous configuration for this screen.

12.3.4 WPA/WPA2

Select **WPA** or **WPA2** from the **Security Mode** list.

Note: WPA or WPA2 is not available if you enable WPS before you configure WPA or WPA2 in the **Wireless LAN 2.4G/ 5G > General** screen.

Figure 64 Network > Wireless LAN 2.4G/5G > General: WPA/WPA2



The following table describes the labels in this screen.

Table 41 Network > Wireless LAN 2.4G/5G > General: WPA/WPA2

LABEL	DESCRIPTION
Security Mode	Select **WPA** or **WPA2** to enable data encryption.
WPA Compatible	This check box is available only when you select **WPA2-PSK** or **WPA2** in the **Security Mode** field. Select the check box to have both WPA2 and WPA wireless clients be able to communicate with the NBG5615 even when the NBG5615 is using WPA2-PSK or WPA2.
Group Key Update Timer	The **Group Key Update Timer** is the rate at which the AP (if using **WPA-PSK/ WPA2-PSK** key management) or RADIUS server (if using **WPA/ WPA2** key management) sends a new group key out to all clients. The re-keying process is the WPA/WPA2 equivalent of automatically changing the WEP key for an AP and all stations in a WLAN on a periodic basis. Setting of the **Group Key Update Timer** is also supported in **WPA-PSK/ WPA2-PSK** mode.
PMK Cache Period	This field is available only when you select **WPA2**. Specify how often wireless clients have to resend usernames and passwords in order to stay connected. Enter a time interval between 10 and 999999 minutes. Note: If wireless client authentication is done using a RADIUS server, the reauthentication timer on the RADIUS server has priority.

Table 41 Network > Wireless LAN 2.4G/5G > General: WPA/WPA2 (continued)

LABEL	DESCRIPTION
Pre-Authentication	This field is available only when you select **WPA2**. Pre-authentication enables fast roaming by allowing the wireless client (already connecting to an AP) to perform IEEE 802.1x authentication with another AP before connecting to it. Select **Enable** to turn on preauthentication in WAP2. Otherwise, select **Disable**.
Authentication Server	
IP Address	Enter the IP address of the external authentication server in dotted decimal notation.
Port Number	Enter the port number of the external authentication server. You need not change this value unless your network administrator instructs you to do so with additional information.
Shared Secret	Enter a password (up to 127 alphanumeric characters) as the key to be shared between the external authentication server and the NBG5615. The key must be the same on the external authentication server and your NBG5615. The key is not sent over the network.
Session Timeout	The NBG5615 automatically disconnects a wireless client from the wireless and wired networks after a period of inactivity. The wireless client needs to send the username and password again before it can use the wireless and wired networks again. Some wireless clients may prompt users for a username and password; other clients may use saved login credentials. In either case, there is usually a short delay while the wireless client logs in to the wireless network again. Enter the time in seconds from 0 to 999999.
Apply	Click **Apply** to save your changes back to the NBG5615.
Cancel	Click **Cancel** to reload the previous configuration for this screen.

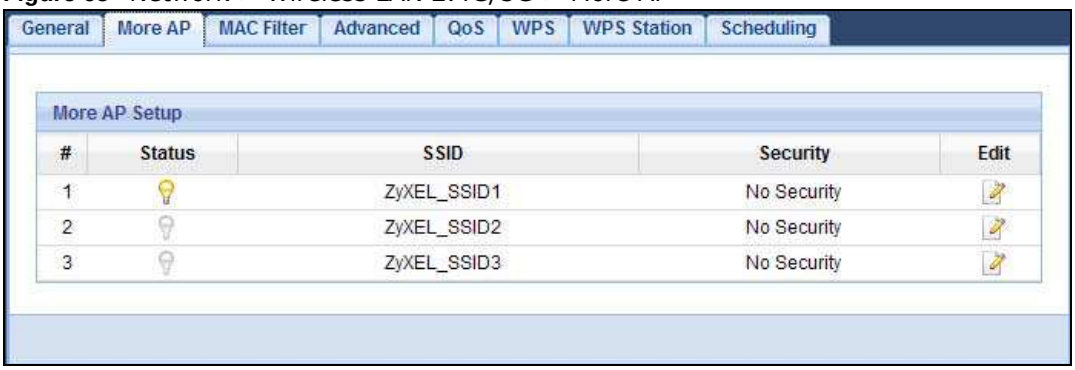
12.4 More AP Screen

This screen allows you to enable and configure multiple wireless networks and guest wireless network settings on the NBG5615.

You can configure up to four SSIDs to enable multiple BSSs (Basic Service Sets) on the NBG5615. This allows you to use one access point to provide several BSSs simultaneously. You can then assign varying security types to different SSIDs. Wireless clients can use different SSIDs to associate with the same access point.

Click **Network > Wireless LAN 2.4G/ 5G > More AP**. The following screen displays.

Figure 65 Network > Wireless LAN 2.4G/5G > More AP



The following table describes the labels in this screen.

Table 42 Network > Wireless LAN 2.4G/5G > More AP

LABEL	DESCRIPTION
#	This is the index number of each SSID profile.
Status	This shows whether the SSID profile is active (a yellow bulb) or not (a gray bulb).
SSID	An SSID profile is the set of parameters relating to one of the NBG5615's BSSs. The SSID (Service Set IDentifier) identifies the Service Set with which a wireless device is associated. This field displays the name of the wireless profile on the network. When a wireless client scans for an AP to associate with, this is the name that is broadcast and seen in the wireless client utility.
Security	This field indicates the security mode of the SSID profile.
Edit	Click the **Edit** icon to configure the SSID profile.

12.4.1 More AP Edit

Use this screen to edit an SSID profile. Click the **Edit** icon next to an SSID in the **More AP** screen. The following screen displays.

Figure 66 Network > Wireless LAN 2.4G/5G > More AP: Edit

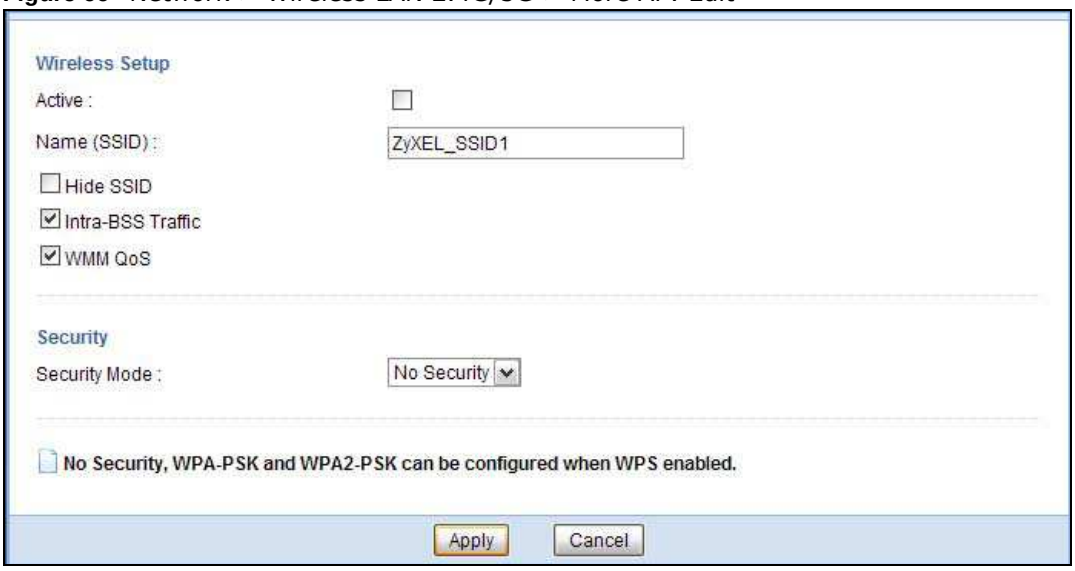
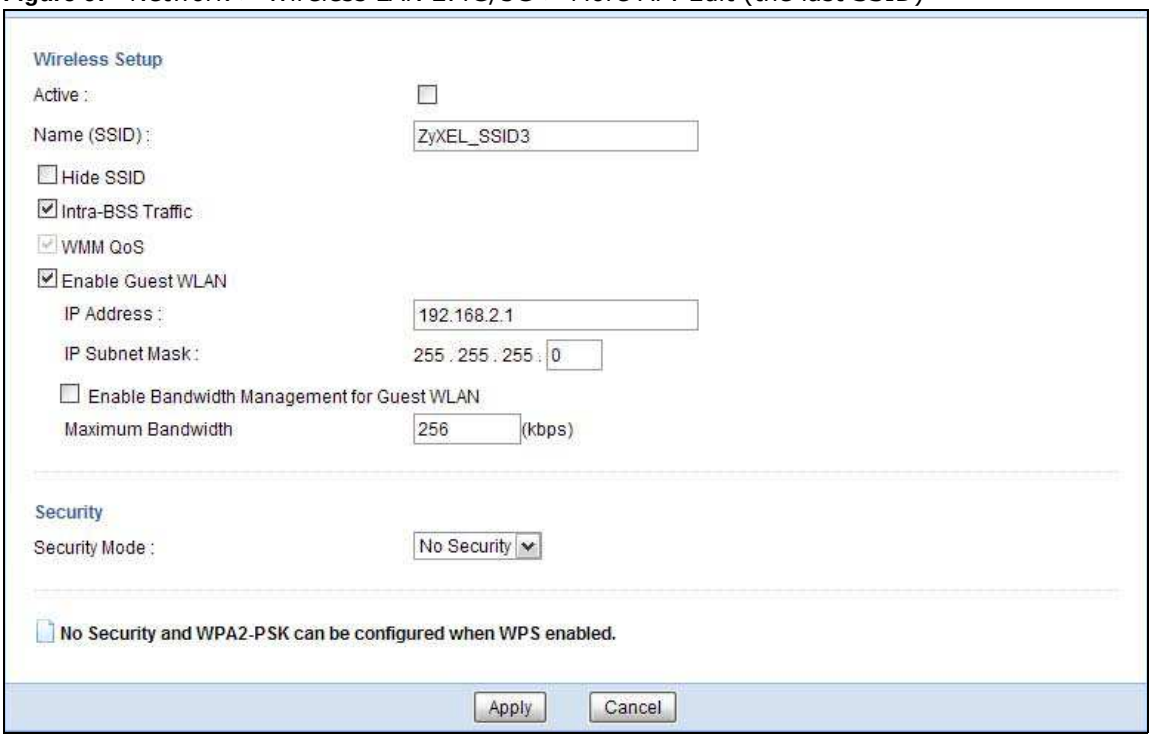


Figure 67 Network > Wireless LAN 2.4G/5G > More AP: Edit (the last SSID)



The following table describes the labels in this screen.

Table 43 Network > Wireless LAN 2.4G/5G > More AP: Edit

LABEL	DESCRIPTION
Active	Select this to activate the SSID profile.
Name (SSID)	The SSID (Service Set IDentity) identifies the Service Set with which a wireless client is associated. Enter a descriptive name (up to 32 printable characters found on a typical English language keyboard) for the wireless LAN.
Hide SSID	Select this check box to hide the SSID in the outgoing beacon frame so a station cannot obtain the SSID through scanning using a site survey tool.
Intra-BSS Traffic	A Basic Service Set (BSS) exists when all communications between wireless clients or between a wireless client and a wired network client go through one access point (AP). Intra-BSS traffic is traffic between wireless clients in the BSS. When Intra-BSS is enabled, wireless clients can access the wired network and communicate with each other. When Intra-BSS is disabled, wireless clients can still access the wired network but cannot communicate with each other.
WMM QoS	Check this to have the NBG5615 automatically give a service a priority level according to the ToS value in the IP header of packets it sends. WMM QoS (Wifi MultiMedia Quality of Service) gives high priority to voice and video, which makes them run more smoothly.
Enable Guest WLAN	Select the check box to activate guest wireless LAN. This is available only for the last SSID on the NBG5615. Note: Only Router mode supports guest WLAN. AP mode, Universal Repeater mode, WISP mode and WISP + Universal Repeater mode don't support guest WLAN.
IP Address	Type an IP address for the devices on the Guest WLAN using this as the gateway IP address.
IP Subnet Mask	Type the subnet mask for the guest wireless LAN.

Table 43 Network > Wireless LAN 2.4G/5G > More AP: Edit (continued)

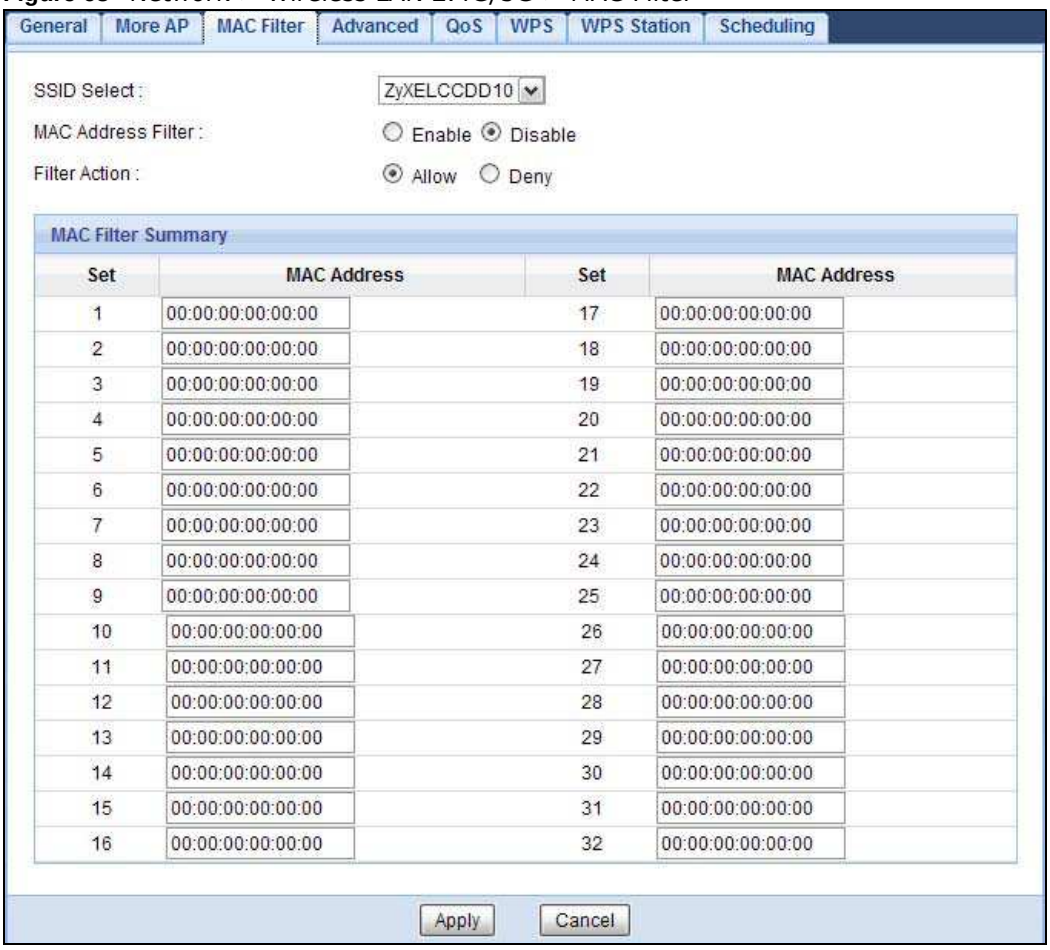
LABEL	DESCRIPTION
Enable Bandwidth Management for Guest WLAN	Select this to turn on bandwidth management for the Guest WLAN network.
Maximum Bandwidth	Enter a number to specify maximum bandwidth the Guest WLAN network can use.
Security Mode	Select **Static WEP**, **WPA-PSK**, **WPA**, **WPA2-PSK** or **WPA2** to add security on this wireless network. The wireless clients which want to associate to this network must have same wireless security settings as this device. After you select to use a security, additional options appears in this screen. See Section 12.3 on page 112 for detailed information on different security modes. Or you can select **No Security** to allow any client to associate this network without authentication. Note: If the WPS function is enabled (default), only **No Security** and **WPA2-PSK** are available in this field.
Apply	Click **Apply** to save your changes back to the NBG5615.
Cancel	Click **Cancel** to reload the previous configuration for this screen.

12.5 MAC Filter Screen

The MAC filter screen allows you to configure the NBG5615 to give exclusive access to devices (**Allow**) or exclude devices from accessing the NBG5615 (**Deny**). Every Ethernet device has a unique MAC (Media Access Control) address. The MAC address is assigned at the factory and consists of six pairs of hexadecimal characters, for example, 00:A0:C5:00:00:02. You need to know the MAC address of the devices to configure this screen.

To change your NBG5615's MAC filter settings, click **Network** > **Wireless LAN 2.4G/ 5G** > **MAC Filter**. The screen appears as shown.

Figure 68 Network > Wireless LAN 2.4G/5G > MAC Filter



The following table describes the labels in this menu.

Table 44 Network > Wireless LAN 2.4G/5G > MAC Filter

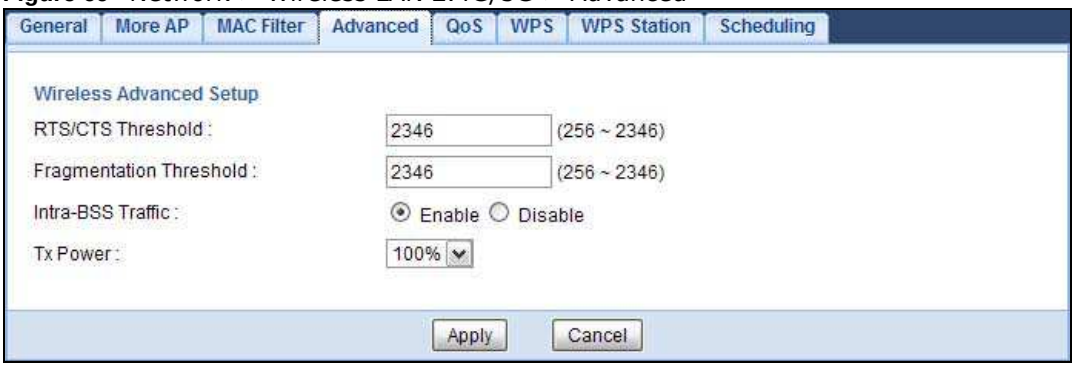
LABEL	DESCRIPTION
SSID Select	Select the SSID for which you want to configure MAC filtering.
MAC Address Filter	Select to turn on (**Enable**) or off (**Disable**) MAC address filtering.
Filter Action	Define the filter action for the list of MAC addresses in the MAC Filter Summary table. Select **Allow** to permit access to the NBG5615, MAC addresses not listed will be denied access to the NBG5615. Select **Deny** to block access to the NBG5615, MAC addresses not listed will be allowed to access the NBG5615.
MAC Filter Summary	
Set	This is the index number of the MAC address.
MAC Address	Enter the MAC address of the wireless station that are allowed or denied access to the NBG5615.
Apply	Click **Apply** to save your changes back to the NBG5615.
Cancel	Click **Cancel** to reload the previous configuration for this screen.

12.6 Wireless LAN Advanced Screen

Use this screen to allow wireless advanced features, such as the output power, RTS/CTS Threshold settings.

Click **Network** > **Wireless LAN 2.4G/ 5G** > **Advanced**. The screen appears as shown.

Figure 69 Network > Wireless LAN 2.4G/5G > Advanced



The following table describes the labels in this screen.

Table 45 Network > Wireless LAN 2.4G/5G > Advanced

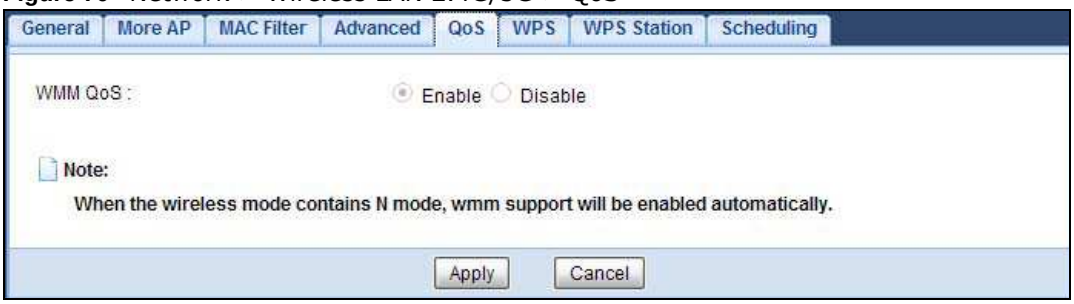
LABEL	DESCRIPTION
RTS/CTS Threshold	Data with its frame size larger than this value will perform the RTS (Request To Send)/ CTS (Clear To Send) handshake. This field is not configurable and the NBG5615 automatically changes to use the maximum value if you select **802.11n**, **802.11an**, **802.11gn** or **802.11bgn** in the **Wireless LAN 2.4G/ 5G > General** screen.
Fragmentation Threshold	The threshold (number of bytes) for the fragmentation boundary for directed messages. It is the maximum data fragment size that can be sent. This field is not configurable and the NBG5615 automatically changes to use the maximum value if you select **802.11n**, **802.11an**, **802.11gn** or **802.11bgn** in the **Wireless LAN 2.4G/ 5G > General** screen.
Intra-BSS Traffic	A Basic Service Set (BSS) exists when all communications between wireless clients or between a wireless client and a wired network client go through one access point (AP). Intra-BSS traffic is traffic between wireless clients in the BSS. When Intra-BSS is enabled, wireless clients can access the wired network and communicate with each other. When Intra-BSS is disabled, wireless clients can still access the wired network but cannot communicate with each other.
Tx Power	Set the output power of the NBG5615 in this field. If there is a high density of APs in an area, decrease the output power of the NBG5615 to reduce interference with other APs. Select one of the following **100%** , **90%** , **75%** , **50%** , **25%** or **10%** .
Apply	Click **Apply** to save your changes back to the NBG5615.
Cancel	Click **Cancel** to reload the previous configuration for this screen.

12.7 Quality of Service (QoS) Screen

The QoS screen allows you to automatically give a service (such as VoIP and video) a priority level.

Click **Network** > **Wireless LAN 2.4G/ 5G** > **QoS**. The following screen appears.

Figure 70 Network > Wireless LAN 2.4G/5G > QoS



The following table describes the labels in this screen.

Table 46 Network > Wireless LAN 2.4G/5G > QoS

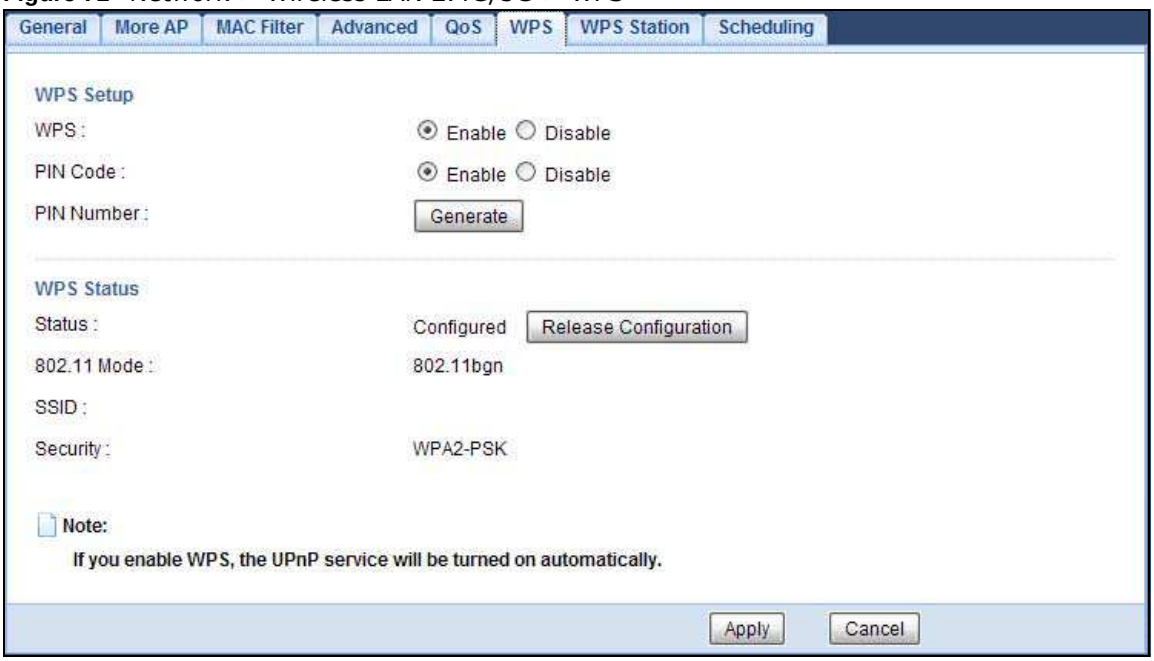
LABEL	DESCRIPTION
WMM QoS	Select **Enable** to have the NBG5615 automatically give a service a priority level according to the ToS value in the IP header of packets it sends. WMM QoS (Wifi MultiMedia Quality of Service) gives high priority to voice and video, which makes them run more smoothly. This field is not configurable and the NBG5615 automatically enables WMM QoS if you select **802.11n**, **802.11an**, **802.11gn** or **802.11bgn** in the **Wireless LAN 24G/ 5G > General** screen.
Apply	Click **Apply** to save your changes to the NBG5615.
Cancel	Click **Cancel** to reload the previous configuration for this screen.

12.8 WPS Screen

Use this screen to enable/disable WPS, view or generate a new PIN number and check current WPS status. To open this screen, click **Network** > **Wireless LAN 2.4G/ 5G** > **WPS**.

Note: With WPS, wireless clients can only connect to the wireless network using the first SSID on the NBG5615.

Figure 71 Network > Wireless LAN 2.4G/5G > WPS



The following table describes the labels in this screen.

Table 47 Network > Wireless LAN 2.4G/5G > WPS

LABEL	DESCRIPTION
WPS Setup	
WPS	Select **Enable** to turn on the WPS feature. Otherwise, select **Disable**.
PIN Code	Select **Enable** and click **Apply** to allow the PIN Configuration method. If you select **Disable**, you cannot create a new PIN number.
PIN Number	This is the WPS PIN (Personal Identification Number) of the NBG5615. Enter this PIN in the configuration utility of the device you want to connect to the NBG5615 using WPS. The PIN is not necessary when you use WPS push-button method. Click **Generate** to generate a new PIN number.
WPS Status	
Status	This displays **Configured** when the NBG5615 has connected to a wireless network using WPS or when **WPS Enable** is selected and wireless or wireless security settings have been changed. The current wireless and wireless security settings also appear in the screen. This displays **Unconfigured** if WPS is disabled and there are no wireless or wireless security changes on the NBG5615 or you click **Release Configuration** to remove the configured wireless and wireless security settings.
Release Configuration	This button is only available when the WPS status displays **Configured**. Click this button to remove all configured wireless and wireless security settings for WPS connections on the NBG5615.
802.11 Mode	This is the 802.11 mode used. Only compliant WLAN devices can associate with the NBG5615.
SSID	This is the name of the wireless network (the NBG5615's first SSID).
Security	This is the type of wireless security employed by the network.

Table 47 Network > Wireless LAN 2.4G/5G > WPS (continued)

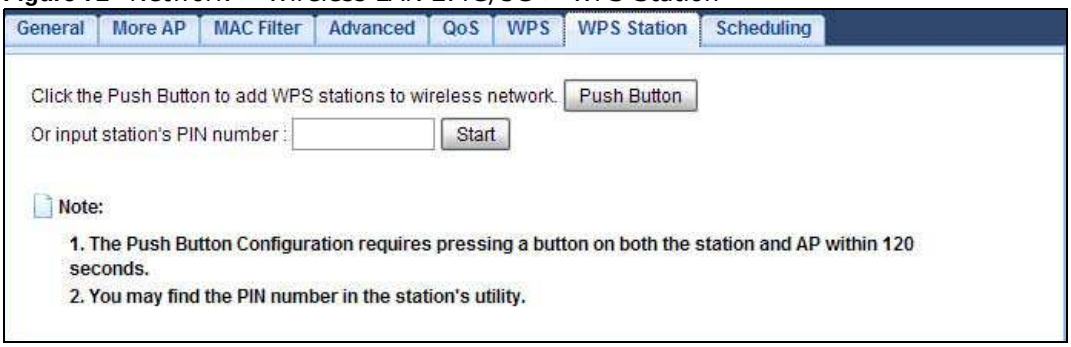
LABEL	DESCRIPTION
Apply	Click **Apply** to save your changes back to the NBG5615.
Cancel	Click **Cancel** to reload the previous configuration for this screen.

12.9 WPS Station Screen

Use this screen when you want to add a wireless station using WPS. To open this screen, click **Network** > **Wireless LAN 2.4G/ 5G** > **WPS Station** tab.

Note: After you click **Push Button** on this screen, you have to press a similar button in the wireless station utility within 2 minutes. To add the second wireless station, you have to press these buttons on both device and the wireless station again after the first 2 minutes.

Figure 72 Network > Wireless LAN 2.4G/5G > WPS Station



The following table describes the labels in this screen.

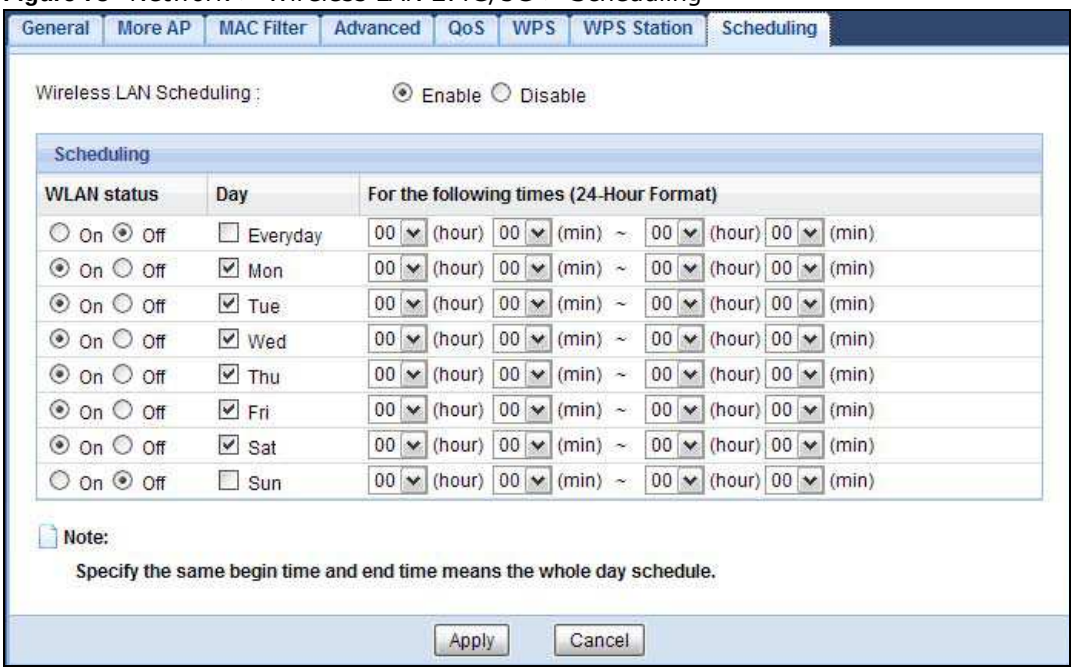
Table 48 Network > Wireless LAN 2.4G/5G > WPS Station

LABEL	DESCRIPTION
Push Button	Use this button when you use the PBC (Push Button Configuration) method to configure wireless stations's wireless settings. Click this to start WPS-aware wireless station scanning and the wireless security information synchronization.
Or input station's PIN number	Use this button when you use the PIN Configuration method to configure wireless station's wireless settings. Type the same PIN number generated in the wireless station's utility. Then click **Start** to associate to each other and perform the wireless security information synchronization.

12.10 Scheduling Screen

Use this screen to set the times your wireless LAN is turned on and off. Wireless LAN scheduling is disabled by default. The wireless LAN can be scheduled to turn on or off on certain days and at certain times. To open this screen, click **Network** > **Wireless LAN 2.4G/ 5G** > **Scheduling** tab.

Figure 73 Network > Wireless LAN 2.4G/5G > Scheduling



The following table describes the labels in this screen.

Table 49 Network > Wireless LAN 2.4G/5G > Scheduling

LABEL	DESCRIPTION
Wireless LAN Scheduling	
Wireless LAN Scheduling	Select **Enable** to activate the wireless LAN scheduling feature. Select **Disable** to turn it off.
Scheduling	
WLAN Status	Select **On** or **Off** to specify whether the Wireless LAN is turned on or off. This field works in conjunction with the **Day** and **For the following times** fields.
Day	Select **Everyday** or the specific days to turn the Wireless LAN on or off. If you select **Everyday** you can not select any specific days. This field works in conjunction with the **For the following times** field.
For the following times (24-Hour Format)	Select a begin time using the first set of **hour** and minute (**min**) drop down boxes and select an end time using the second set of **hour** and minute (**min**) drop down boxes. If you have chosen **On** earlier for the WLAN Status the Wireless LAN will turn on between the two times you enter in these fields. If you have chosen **Off** earlier for the WLAN Status the Wireless LAN will turn off between the two times you enter in these fields.
Apply	Click **Apply** to save your changes back to the NBG5615.
Cancel	Click **Cancel** to reload the previous configuration for this screen.

13

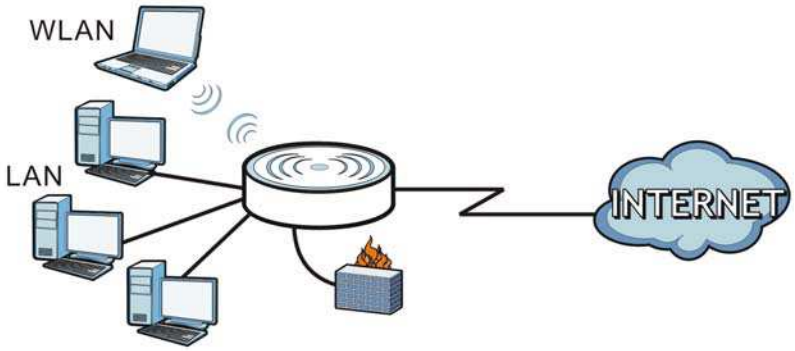
LAN

13.1 Overview

This chapter describes how to configure LAN settings.

A Local Area Network (LAN) is a shared communication system to which many computers are attached. A LAN is a computer network limited to the immediate area, usually the same building or floor of a building.

Figure 74 LAN Example



The LAN screens can help you configure a manage IP address, and partition your physical network into logical networks.

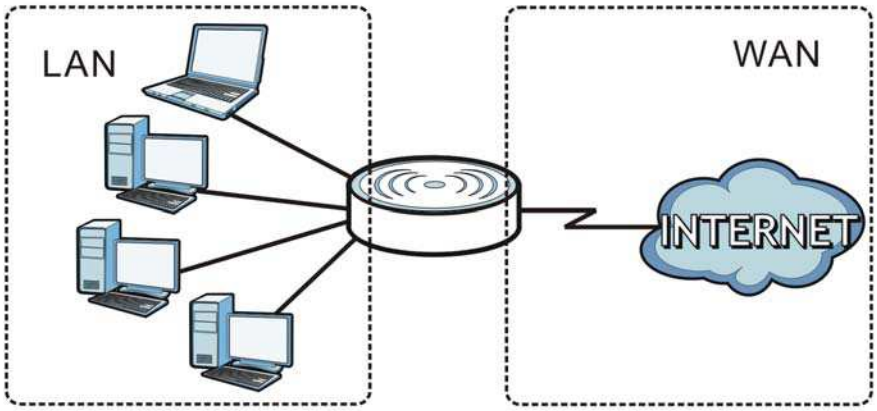
13.2 What You Can Do

- Use the **IP** screen to change the IP address for your NBG5615 (Section 13.4 on page 130).
- Use the **IP Alias** screen to have the NBG5615 apply IP alias to create LAN subnets (Section 13.5 on page 131).

13.3 What You Need To Know

The actual physical connection determines whether the NBG5615 ports are LAN or WAN ports. There are two separate IP networks, one inside the LAN network and the other outside the WAN network as shown next.

Figure 75 LAN and WAN IP Addresses



The LAN parameters of the NBG5615 are preset in the factory with the following values:

- IP address of 192.168.1.1 with subnet mask of 255.255.255.0 (24 bits)
- DHCP server enabled with 32 client IP addresses starting from 192.168.1.33.

These parameters should work for the majority of installations. If your ISP gives you explicit DNS server address(es), read the embedded Web Configurator help regarding what fields need to be configured.

13.3.1 IP Pool Setup

The NBG5615 is pre-configured with a pool of 32 IP addresses starting from 192.168.1.33 to 192.168.1.64. This configuration leaves 31 IP addresses (excluding the NBG5615 itself) in the lower range (192.168.1.2 to 192.168.1.32) for other server computers, for instance, servers for mail, FTP, TFTP, web, etc., that you may have.

13.3.2 LAN TCP/IP

The NBG5615 has built-in DHCP server capability that assigns IP addresses and DNS servers to systems that support DHCP client capability.

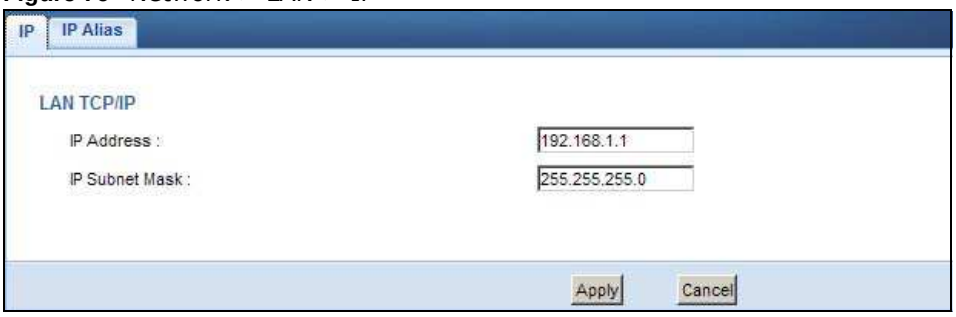
13.3.3 IP Alias

IP alias allows you to partition a physical network into different logical networks over the same Ethernet interface. The NBG5615 supports three logical LAN interfaces via its single physical Ethernet interface with the NBG5615 itself as the gateway for each LAN network.

13.4 LAN IP Screen

Use this screen to change the IP address for your NBG5615. Click **Network > LAN > IP**.

Figure 76 Network > LAN > IP



The following table describes the labels in this screen.

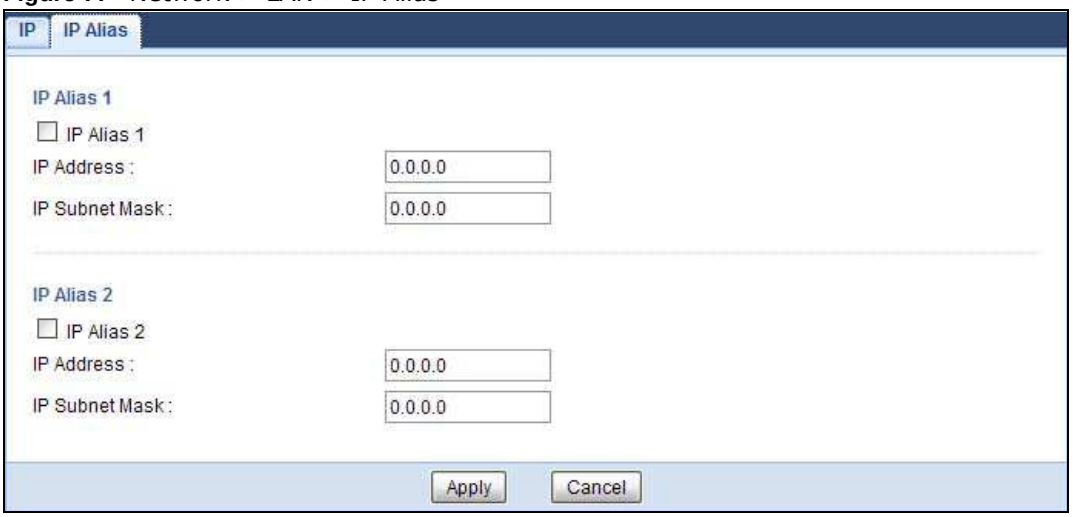
Table 50 Network > LAN > IP

LABEL	DESCRIPTION
IP Address	Type the IP address of your NBG5615 in dotted decimal notation.
IP Subnet Mask	The subnet mask specifies the network number portion of an IP address. Your NBG5615 will automatically calculate the subnet mask based on the IP address that you assign. Unless you are implementing subnetting, use the subnet mask computed by the NBG5615.
Apply	Click **Apply** to save your changes back to the NBG5615.
Cancel	Click **Cancel** to begin configuring this screen afresh.

13.5 IP Alias Screen

Use this screen to have the NBG5615 apply IP alias to create LAN subnets. Click **LAN** > **IP Alias**.

Figure 77 Network > LAN > IP Alias



The following table describes the labels in this screen.

Table 51 Network > LAN > IP Alias

LABEL	DESCRIPTION
IP Alias 1, 2	Check this to enable IP alias to configure another LAN network for the NBG5615.
IP Address	Type the IP alias address of your NBG5615 in dotted decimal notation.
IP Subnet Mask	The subnet mask specifies the network number portion of an IP address. Your NBG5615 will automatically calculate the subnet mask based on the IP address that you assign. Unless you are implementing subnetting, use the subnet mask computed by the NBG5615.
Apply	Click **Apply** to save your changes back to the NBG5615.
Cancel	Click **Cancel** to begin configuring this screen afresh.