NBG4615

Wireless N Gigabit NetUSB Router

User's Guide

Default Login Details

IP Address	http://192.168.1.1
Password	1234

Firmware Version 1.0
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ZyXEL

www.zyxel.com

About This User's Guide

Intended Audience

This manual is intended for people who want to configure the NBG4615 using the Web Configurator. You should have at least a basic knowledge of TCP/IP networking concepts and topology.

Tips for Reading User's Guides On-Screen

When reading a ZyXEL User's Guide On-Screen, keep the following in mind:

- If you don't already have the latest version of Adobe Reader, you can download it from http://www.adobe.com.

- Use the PDF's bookmarks to quickly navigate to the areas that interest you. Adobe Reader's bookmarks pane opens by default in all ZyXEL User's Guide PDFs.

- If you know the page number or know vaguely which page-range you want to view, you can enter a number in the toolbar in Reader, then press [ENTER] to jump directly to that page.

- Type [CTRL]+[F] to open the Adobe Reader search utility and enter a word or phrase. This can help you quickly pinpoint the information you require. You can also enter text directly into the toolbar in Reader.

- To quickly move around within a page, press the [SPACE] bar. This turns your cursor into a "hand" with which you can grab the page and move it around freely on your screen.

- Embedded hyperlinks are actually cross-references to related text. Click them to jump to the corresponding section of the User's Guide PDF.

Related Documentation

- Quick Start Guide

  The Quick Start Guide is designed to help you get your NBG4615 up and running right away. It contains information on setting up your network and configuring for Internet access.

- Supporting Disc

  The embedded Web Help contains descriptions of individual screens and supplementary information.

- Support Disc

  Refer to the included CD for support documents.

Documentation Feedback

Send your comments, questions or suggestions to: techwriters@zyxel.com.tw

Thank you!

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Need More Help?

More help is available at www.zyxel.com.

• Download Library

   Search for the latest product updates and documentation from this link. Read the Tech Doc Overview to find out how to efficiently use the User Guide, Quick Start Guide and Command Line Interface Reference Guide in order to better understand how to use your product.

• Knowledge Base

   If you have a specific question about your product, the answer may be here. This is a collection of answers to previously asked questions about ZyXEL products.

• Forum

   This contains discussions on ZyXEL products. Learn from others who use ZyXEL products and share your experiences as well.

Customer Support

Should problems arise that cannot be solved by the methods listed above, you should contact your vendor. If you cannot contact your vendor, then contact a ZyXEL office for the region in which you bought the device.

See http://www.zyxel.com/web/contact_us.php for contact information. Please have the following information ready when you contact an office.

• Product model and serial number.

• Warranty Information.

• Date that you received your device.

Document Conventions

Warnings and Notes

These are how warnings and notes are shown in this User's Guide.

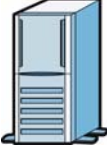**Warnings tell you about things that could harm you or your device.**
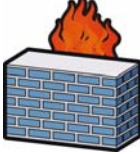
Note: Notes tell you other important information (for example, other things you may need to configure or helpful tips) or recommendations.

Syntax Conventions

* The NBG4615 may be referred to as the "NBG4615", the "device", the "product" or the "system" in this User's Guide.

* Product labels, screen names, field labels and field choices are all in **bold** font.

* A key stroke is denoted by square brackets and uppercase text, for example, [ENTER] means the "enter" or "return" key on your keyboard.

* "Enter" means for you to type one or more characters and then press the [ENTER] key. "Select" or "choose" means for you to use one of the predefined choices.

* A right angle bracket (>) within a screen name denotes a mouse click. For example, **Maintenance > Log > Log Setting** means you first click **Maintenance** in the navigation panel, then the **Log** sub menu and finally the **Log Setting** tab to get to that screen.

* Units of measurement may denote the "metric" value or the "scientific" value. For example, "k" for kilo may denote "1000" or "1024", "M" for mega may denote "1000000" or "1048576" and so on.

* "e.g.," is a shorthand for "for instance", and "i.e.," means "that is" or "in other words".

Icons Used in Figures

Figures in this User's Guide may use the following generic icons. The NBG4615 icon is not an exact representation of your device.

NBG4615	Computer	Notebook computer
Server	DSLAM	Firewall
Telephone	Switch	Router
Modem		

Safety Warnings

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

Your product is marked with this symbol, which is known as the WEEE mark. WEEE stands for Waste Electronics and Electrical Equipment. It means that used electrical and electronic products should not be mixed with general waste. Used electrical and electronic equipment should be treated separately.

Contents Overview

Table of Contents

16

PART I
User's Guide

Introduction

1.1 Overview

This chapter introduces the main features and applications of the NBG4615.

The NBG4615 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 802.11b/g/n compatible devices.

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

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 create the following networks using the NBG4615:

• **Wired**. You can connect network devices via the Ethernet ports of the NBG4615 so that they can communicate with each other and access the Internet.

• **Wireless**. Wireless clients can connect to the NBG4615 to access network resources.

• **WAN**. Connect to a broadband modem/router for Internet access.

• **WPS**. Create an instant network connection with another WPS-compatible device, sharing your network connection with it.

• **NetUSB**. The NBG4615 allows you to connect a USB device (such as printer, scanner, or portable hard disk) directly to the USB port and then share that device over the Internet. You can also connect a USB to the NBG4615, which can then share up to 3 additional USB devices with the rest of your personal home network.

1.3 Ways to Manage the NBG4615

Use any of the following methods to manage the NBG4615.

*   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 NBG4615 using a (supported) web browser.

1.4 Good Habits for Managing the NBG4615

Do the following things regularly to make the NBG4615 more secure and to manage the NBG4615 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 NBG4615 to its factory default settings. If you backed up an earlier configuration file, you would not have to totally re-configure the NBG4615. You could simply restore your last configuration.

1.5 LEDs

Figure 1   Front Panel
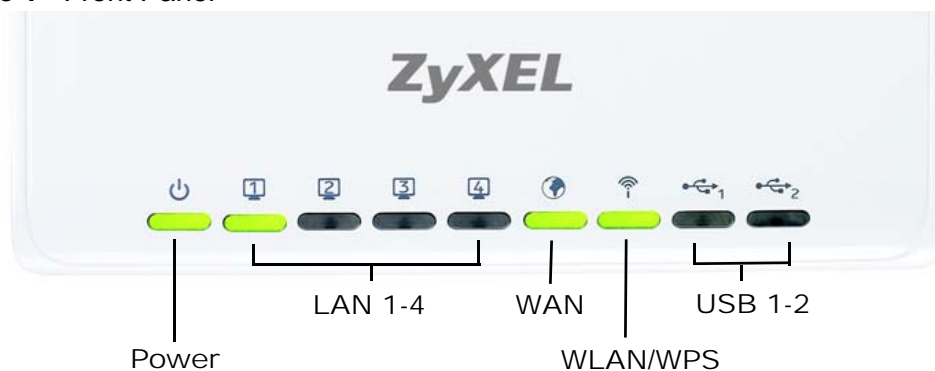
The following table describes the LEDs and the WPS button.

Table 1 Front panel LEDs and WPS button

LED	COLOR	STATUS	DESCRIPTION
Power	Green	On	The NBG4615 is receiving power and functioning properly.
	Off		The NBG4615 is not receiving power.
LAN 1-4	Green	On	The NBG4615's LAN connection is ready.
		Blinking	The NBG4615 is sending/receiving data through the LAN with a 10/100Mbps transmission rate.
	Amber	Blinking	The NBG4615 is sending/receiving data through the LAN with a 1000Mbps transmission rate.
	Off		The LAN connection is not ready, or has failed.
WAN	Green	On	The NBG4615's WAN connection is ready.
		Blinking	The NBG4615 is sending/receiving data through the WAN with a 10/100Mbps transmission rate.
	Amber	Blinking	The NBG4615 is sending/receiving data through the WAN with a 1000Mbps transmission rate.
	Off		The WAN connection is not ready, or has failed.
WLAN/WPS	Green	On	The NBG4615 is ready, but is not sending/receiving data through the wireless LAN.
		Blinking	The NBG4615 is sending/receiving data through the wireless LAN. The NBG4615 is negotiating a WPS connection with a wireless client.
	Off		The wireless LAN is not ready or has failed.
USB 1-2	Green	On	The NBG4615 has a USB device installed.
		Blinking	The NBG4615 is transmitting and/or receiving data from routers through an installed USB device.
	Off		There is no USB device connected to the NBG4615.

The WPS Button

2.1 Overview

Your NBG4615 supports WiFi Protected Setup (WPS), which is an easy way to set up a secure wireless network. 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. 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.

For more information on using WPS, see .

ZyXEL NetUSB Share Center Utility

3.1 Overview

The ZyXEL NetUSB Share Center Utility allows you to work with the USB devices that are connected directly to the NBG4615 as if they are connected directly to your computer. This allows you to easily share USB-based devices such as printers, scanners, portable hard disks, 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 NBG4615 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.

Figure 2   Example of NetUSB
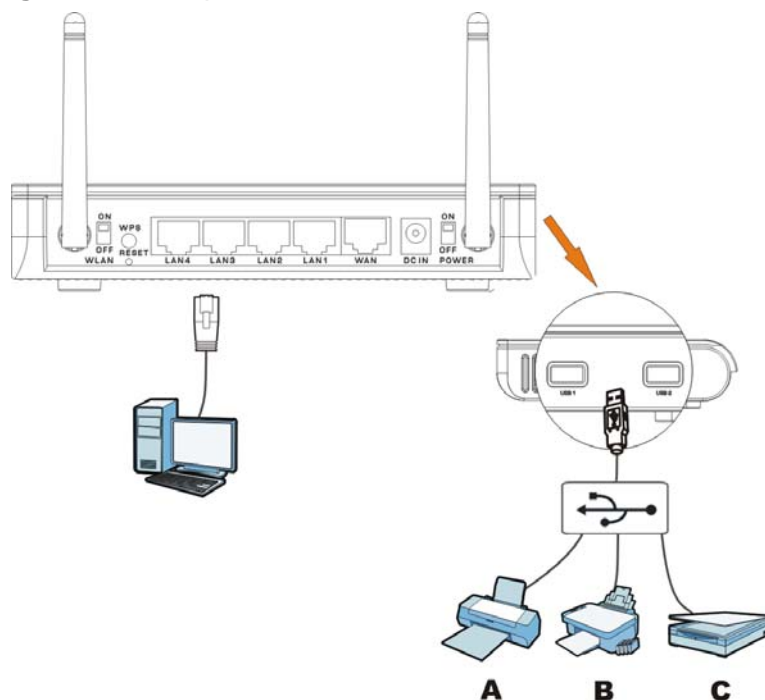
In this example, a USB printer, fax machine, and scanner are all connected to a USB hub. The hub is in turn connected directly to the NBG4615. Any computer with a ZyXEL NetUSB Share Center Utility installed on it and which is connected to the NBG4615's LAN ports can access these devices.

Note: A USB hub attached to the NBG4615 requires its own power adapter.

3.1.1 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 NBG4615.

2 Connect a USB device to the USB port on the NBG4615.

Note: If you are connecting multiple devices to the NBG4615, first connect a USB hub to the NBG4615 then connect your other USB devices to it.

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.

3.1.2 Installing ZyXEL NetUSB Share Center Utility

Before you can access USB devices connected to the NBG4615, 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 NBG4615, ensure that the NBG4615 firmware is version v1.00(BWQ.0) or higher. See Chapter 28 on page 230 for information on updating your device's firmware.

To install the ZyXEL NetUSB Share Center Utility:

1 Insert the disc that came with your NBG4615 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).

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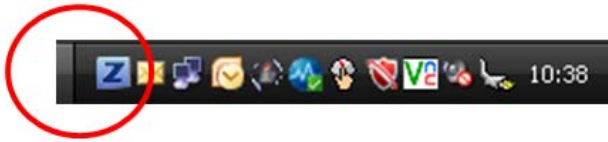
3.2 The ZyXEL NetUSB Share Center Utility

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

Figure 3   ZyXEL NetUSB Share Center Utility Main Window
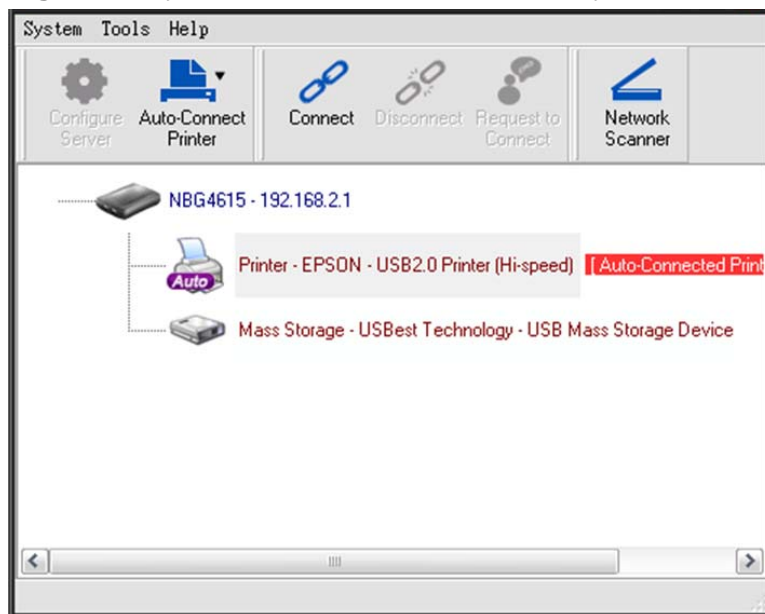
3.2.1 The Menus

This section describes the utility's menus.

Figure 4   ZyXEL NetUSB Share Center Utility Menus
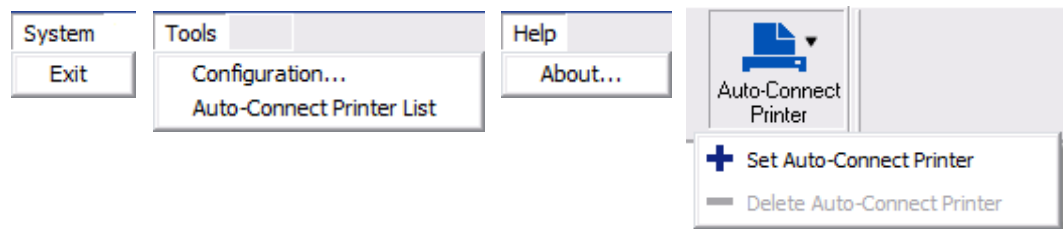
3.2.2 The Share Center Configuration Window

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 NBG4615.

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

Figure 5   ZyXEL NetUSB Share Center Utility Configuration Window
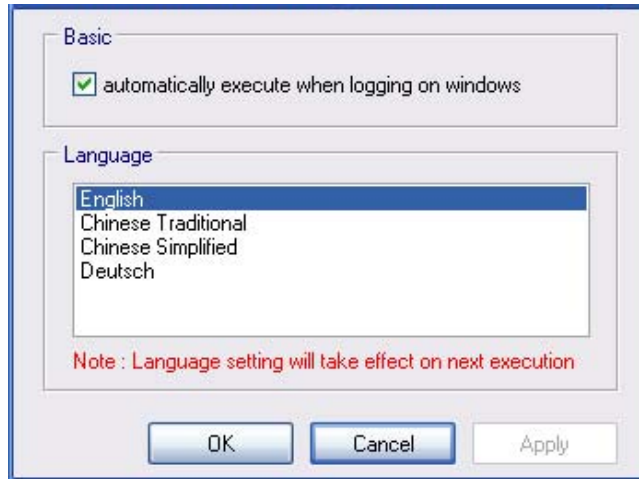
The following table describes the labels in this window.

Table 2   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.

3.2.3 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.

Figure 6   ZyXEL NetUSB Share Center Utility Auto-Connect Printer List Window
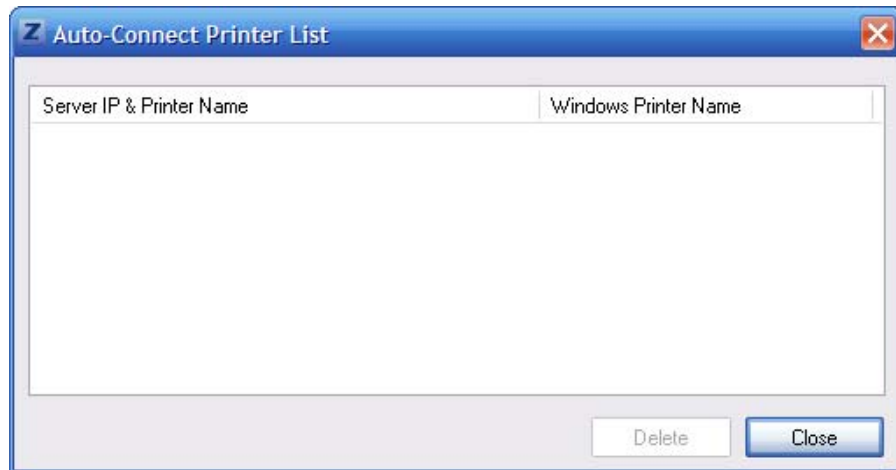
The following table describes the labels in this screen.

Table 3   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 NBG4615.
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.

3.3 Manually Connecting to USB Devices

This example shows you how to connect to a USB device over your NBG4615 network. Makes sure that you have first installed the ZyXEL NetUSB Share Center Utility on the computer to which you want to connect the USB devices.

Note: If you do this with a USB printer but do not yet have the print driver installed you will be prompted to install one by the Windows New Hardware Wizard.

1 Connect a USB device to the NBG4615.
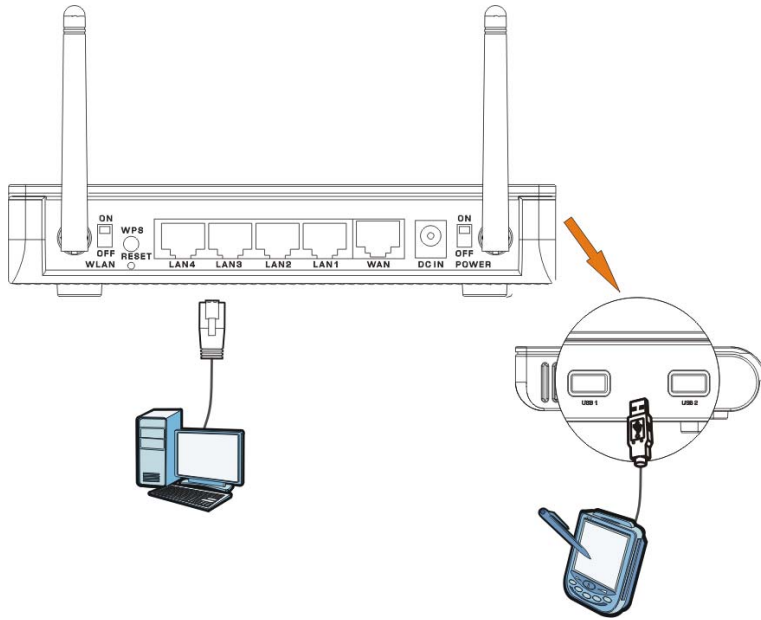
2 In the **ZyXEL NetUSB Share Center Utility**, select the device and click **Connect**.

3 The device mounts on your system.
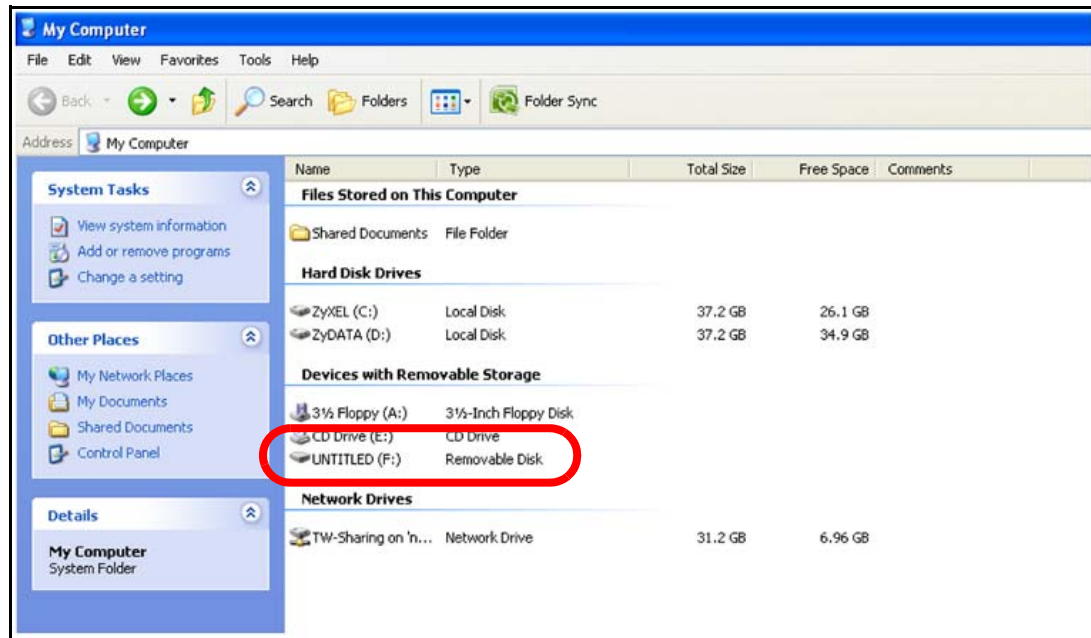
3.4 Automatically Connecting to a USB Printer

This example shows you how to set your computer to automatically connect to a shared USB printer over your NBG4615 network each time you log into your computer. Makes sure that you have first installed the ZyXEL NetUSB Share Center Utility.

1 Connect a USB printer to the NBG4615.
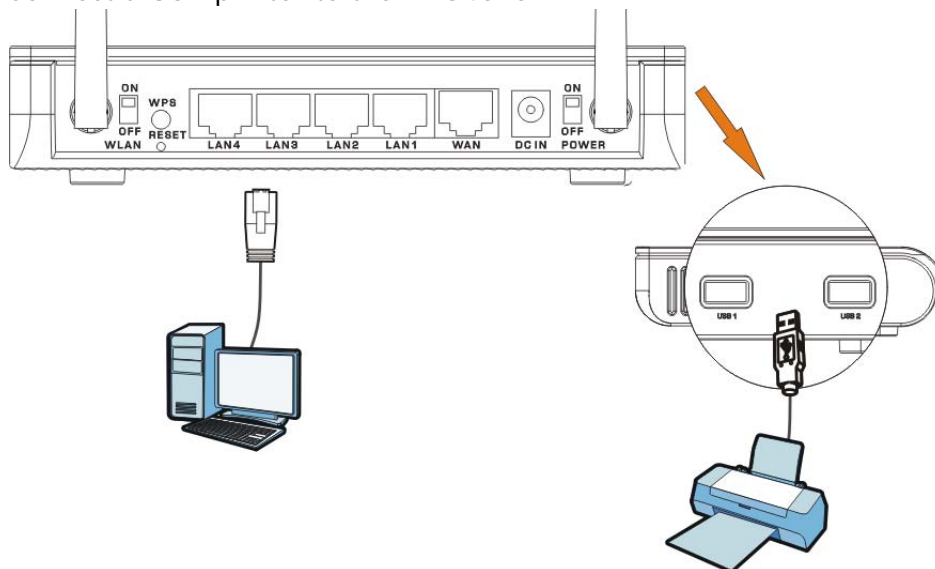
2 Open the **ZyXEL NetUSB Sharing Center Utility** on the computer that you want to use to connect to the printer.
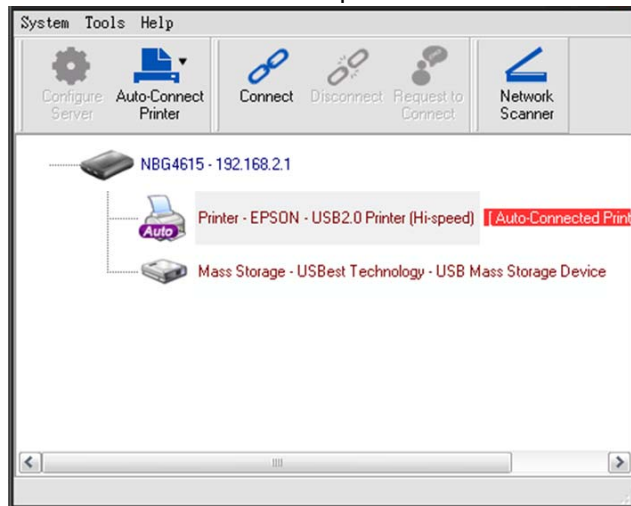
Click the **Connect** button. You may be prompted to install a printer driver or to configure other settings.

3 Finally, click the **Auto-Connect Printer** menu and select **Set Auto-Connect Printer** from the menu.

Connection Wizard

4.1 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.

4.2 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 NBG4615 is accessed for the first time or when you reset the NBG4615 to its default factory settings.

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

Figure 7   Welcome
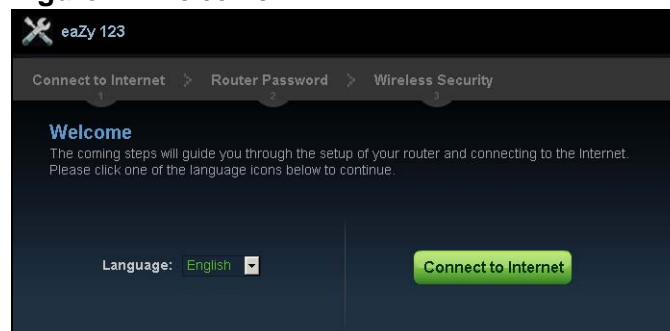
4.3 Connect to Internet

The NBG4615 offers five Internet connection types. They are **Static IP**, **DHCP**, **PPPoE**, **PPTP** or **L2TP**. 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 NBG4615 detects the following Internet Connection type.

Table 4   Internet Connection Type

CONNECTION TYPE	DESCRIPTION
Static IP	Select the **Static IP** if an administrator assigns the IP address of your computer.
DHCP	Select the **DHCP** (Dynamic Host Configuration Protocol) option when the WAN port is used as a regular Ethernet.

Table 4 Internet Connection Type (continued)

CONNECTION TYPE	DESCRIPTION
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.
L2TP	Select the **L2TP** (Layer 2 Tunnel Protocol) if you are connecting to another device over another network (like the Internet or VPN).

4.3.1 Connection Type: DHCP

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

Figure 10   Internet Connection Type: DHCP

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.

4.3.2 Connection Type: Static IP

Choose **Static IP** as the **Internet Connection Type** if your ISP assigned an IP address for your Internet connection. Click **Next**.

Figure 11   Internet Connection Type: Static IP

The following table describes the labels in this screen.

Table 5   Internet Connection Type: Static IP

LABEL	DESCRIPTION
Internet Connection Type	Select the **Static IP** option.
IP Address	Enter the IP address provided by your ISP.
Subnet Mask	Enter the IP subnet mask in this field.
Default Gateway	Enter the gateway IP address in this field.
Primary DNS	DNS (Domain Name System) is for mapping a domain name to its corresponding IP address and vice versa. The DNS server is extremely important because without it, you must know the IP address of a computer before you can access it. The NBG4615 uses a system DNS server (in the order you specify here) to resolve domain names for DDNS and the time server. Enter the primary DNS server's IP address in the fields provided.
Secondary DNS	Enter the secondary DNS server's IP address in the fields provided.
Exit	Click this to close the wizard screen without saving.
Back	Click this to return to the previous screen.
Next	Click this to continue.

4.3.3 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 NBG4615 (rather than individual computers), the computers on the LAN do not need PPPoE software installed, since the NBG4615 does that part of the task. Furthermore, with NAT, all of the LAN's computers will have Internet access.

Figure 12   Internet Connection Type: PPPoE

The following table describes the labels in this screen.

Table 6   Internet Connection Type: PPPoE

LABEL	DESCRIPTION
Internet Connection Type	Select the **PPPoE** option for a dial-up connection.
Dynamic IP	Select this radio button if your ISP did not assign you a fixed IP address.
Static IP	Select this radio button, provided by your ISP to give the NBG4615 a fixed, unique IP address.
IP Address	Type the name of your service provider.
User Name	Type the user name given to you by your ISP.
Password	Type the password associated with the user name above.
Exit	Click this to close the wizard screen without saving.

Table 6 Internet Connection Type: PPPoE (continued)

LABEL	DESCRIPTION
Back	Click this to return to the previous screen.
Next	Click this to continue.

4.3.4 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 NBG4615 supports one PPTP server connection at any given time.

Figure 13 Internet Connection Type: PPTP

The following table describes the fields in this screen

Table 7 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 **User Name** and **Password** fields for a PPP connection and the PPTP parameters for a PPTP connection.
Dynamic IP	Select this radio button if your ISP did not assign you a fixed IP address.
Static IP	Select this radio button, provided by your ISP to give the NBG4615 a fixed, unique IP address.
PPTP Address	Type the (static) IP address assigned to you by your ISP.
PPTP Subnet Mask	Type the subnet mask assigned to you by your ISP (if given).

Table 7 Internet Connection Type: PPTP (continued)

LABEL	DESCRIPTION
PPTP Gateway IP Address	Type the gateway IP address of the PPTP server.
PPTP Server IP Address	Type the server IP address of the PPTP server.
User Name	Type the user name given to you by your ISP.
Password	Type the password associated with the User Name above.
Exit	Click this to close the wizard screen without saving.
Back	Click this to return to the previous screen.
Next	Click this to continue.

4.3.5 Connection Type: L2TP

The Layer 2 Tunneling Protocol (L2TP) works at layer 2 (the data link layer) to tunnel network traffic between two peer devices over another network (like the Internet).

Figure 14   Internet Connection Type: L2TP

The following table describes the fields in this screen

Table 8   Internet Connection Type: L2TP

LABEL	DESCRIPTION
Internet Connection Type	Select **L2TP** from the drop-down list box.
Dynamic IP	Select this radio button if your ISP did not assign you a fixed IP address.
Static IP	Select this radio button, provided by your ISP to give the NBG4615 a fixed, unique IP address.
L2TP Address	Type the (static) IP address assigned to you by your ISP.
L2TP Subnet Mask	Type the subnet mask assigned to you by your ISP (if given).

Table 8 Internet Connection Type: L2TP (continued)

LABEL	DESCRIPTION
L2TP Gateway IP Address	Type the gateway IP address of the L2TP server.
L2TP Server IP Address	Type the server IP address of the L2TP server.
User Name	Type the user name given to you by your ISP.
Password	Type the password associated with the User Name above.
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 NBG4615 connects to the Internet.

Figure 15 Connecting to the Internet
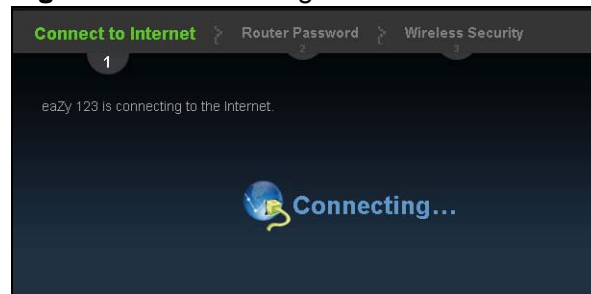
Note: If the Wizard successfully connects to the Internet, it proceeds to the next step. If you get an error message, go back to the previous screen and make sure you have entered the correct information provided by your ISP.

4.4 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 16   Router Password

4.5 Wireless Security

Configure Wireless Settings. Configure the wireless network settings on your NBG4615 in the following screen. The fields that show up depend on the kind of security you select.

4.5.1 Wireless Security: No Security

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

Figure 17   Wireless Security: No Security

The following table describes the labels in this screen.

Table 9 Wireless Security: No Security

LABEL	DESCRIPTION
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 NBG4615, 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 NBG4615, 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.

4.5.2 Wireless Security: WPA-PSK/WPA2-PSK

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

Figure 18   Wireless Security: WPA-PSK/WPA2-PSK

The following table describes the labels in this screen.

Table 10   Wireless Security: WPA-PSK/WPA2-PSK

LABEL	DESCRIPTION
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 NBG4615, 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 **WPA-PSK** or **WPA2-PSK** security to configure a Pre-Shared Key. Choose this option only if your wireless clients support WPA-PSK or WPA2-PSK respectively.
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 NBG4615's LAN ports, check your connections. Then turn the NBG4615 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 19   Congratulations

You can also click **GO** to open the **Easy Mode** Web Configurator of your NBG4615.

You have successfully set up your NBG4615 to operate on your network and access the Internet. You are now ready to connect wirelessly to your NBG4615 and access the Internet.

Introducing the Web Configurator

5.1 Overview

This chapter describes how to access the NBG4615 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 NBG4615 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 29 on page 239) to see how to make sure these functions are allowed in Internet Explorer.

5.2 Accessing the Web Configurator

1 Make sure your NBG4615 hardware is properly connected and prepare your computer or computer network to connect to the NBG4615 (refer to the Quick Start Guide).

2 Launch your web browser.

3 Type "http://192.168.1.1" as the website address.

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

5.2.1 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 4 on page 35 for the Connection Wizard screens.

The Web Configurator initially displays the following login screen.

Figure 20   Login screen

The following table describes the labels in this screen.

Table 11   Login screen

LABEL	DESCRIPTION
Password	Type "1234" (default) as the password.
Language	Select the language you want to use to configure the Web Configurator. Click **Login**.
	This shows the current weather, either in celsius or fahrenheit, of the city you specify in Section 5.2.3.1 on page 50.
	This shows the time (hh:mm:ss) and date (yyyy:mm:dd) of the timezone you select in Section 5.2.3.2 on page 51 or Section 28.5 on page 228. The time is in 24-hour format, for example 15:00 is 3:00 PM.

5.2.2 Password Screen

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

Figure 21   Change Password Screen

The following table describes the labels in this screen.

Table 12   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 NBG4615.
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 to change this). Simply log back into the NBG4615 if this happens.

5.2.3 Home Screen

If you have previously logged into the Web Configurator but did not click **Logout**, you may be redirected to the Home screen.

You can also open this screen by clicking **Home** (🏠 Home or 🏠 Home) in the Easy Mode or Expert mode screens.
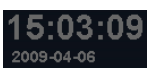
The Home screen displays as follows.

Figure 22 Home Screen

The following table describes the labels in this screen.

Table 13 Home Screen

LABEL	DESCRIPTION
Go	Click this to open the **Easy Mode** Web Configurator.
Language	Select a language to go to the Easy mode Web Configurator in that language and click **Login**.
	(This is just an example). This shows the current weather, either in celsius or fahrenheit, of the city you specify in Section 5.2.3.1 on page 50.
	(This is just an example). This shows the time (hh:mm:ss) and date (yyyy:mm:dd) of the timezone you select in Section 5.2.3.2 on page 51 or Section 28.5 on page 228.

5.2.3.1 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 23 Change Weather
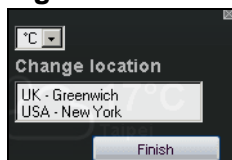
The following table describes the labels in this screen.

Table 14 Change Weather

LABEL	DESCRIPTION
ºC or ºF	Choose which temperature unit you want the NBG4615 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.

5.2.3.2 Time/Date Edit

One timezone can cover more than one country. You can choose a particular country in which the NBG4615 is located and have the NBG4615 display and use the current time and date for its logs.

Click the ![icon] icon to change the Weather display.

Figure 24 Change Password Screen

The following table describes the labels in this screen.

Table 15 Change Password Screen

LABEL	DESCRIPTION
Change time zone	Select the specific country whose current time and date you want the NBG4615 to display.
Finish	Click this to apply the settings and refresh the weather display.

Note: You can also edit the timezone in Section 28.5 on page 228.

5.3 Resetting the NBG4615

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 NBG4615 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".

5.3.1 How to Use the RESET Button

1 Make sure the power LED is on.

2 Press the **RESET** button for longer than 1 second to restart/reboot the NBG4615.

3 Press the **RESET** button for longer than 5 seconds to set the NBG4615 back to its factory-default configurations.

Monitor

6.1 Overview

This chapter discusses read-only information related to the device state of the NBG4615.

To access the Monitor screens, go to **Expert Mode** after login, then click [icon]. Click **open all** to show the complete menu.
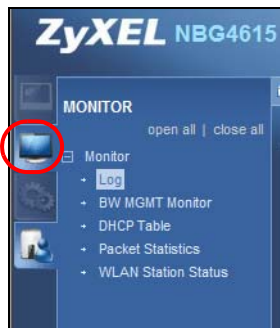
You can also click the links in the **Summary** table of the **Status** screen to view the bandwidth consumed, packets sent/received as well as the status of clients connected to the NBG4615.

6.2 What You Can Do

- Use the **Log** screen to see the logs for the activity on the NBG4615 (Section 6.3 on page 54).

- Use the **BW MGMT Monitor** screen to view the amount of network bandwidth that applications running in the network are using (Section 6.4 on page 55).

- Use the **DHCP Table** screen to view information related to your DHCP status (Section 6.5 on page 56).

- use the **Packet Statistics** screen to view port status, packet specific statistics, the "system up time" and so on (Section 6.6 on page 57).

- Use the **WLAN Station Status** screen to view the wireless stations that are currently associated to the NBG4615 (Section 6.7 on page 58).

6.3 The Log Screen

The Web Configurator allows you to look at all of the NBG4615's logs in one location.

6.3.1 View Log

Use the **View Log** screen to see the logged messages for the NBG4615. 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 Settings** screen. Click **Refresh** to renew the log screen. Click **Clear** to delete all the logs.

Figure 25   View Log
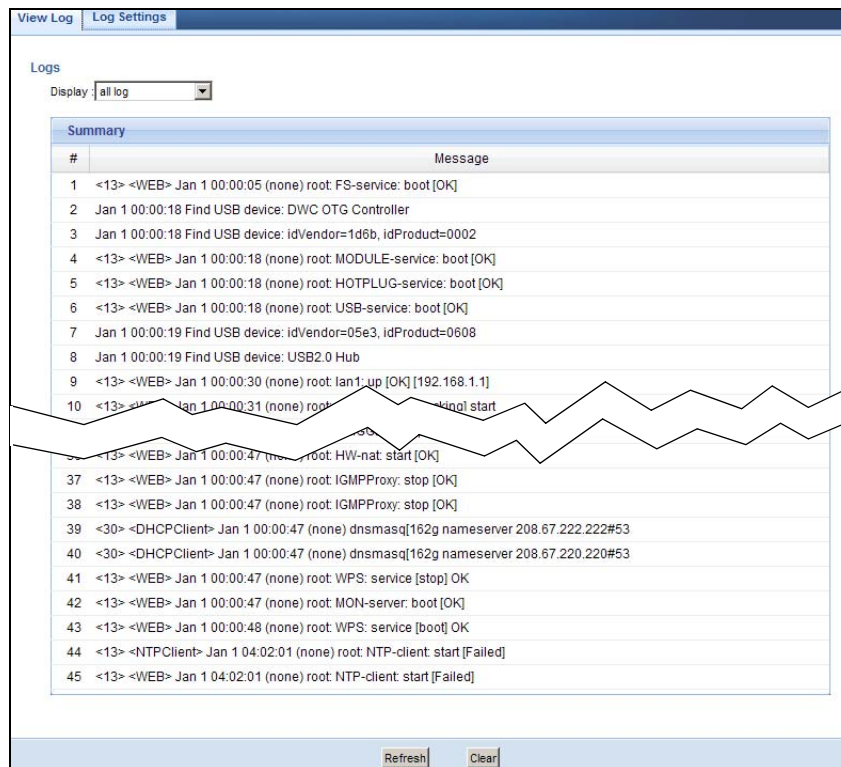
You can configure which logs to display in the **View Log** screen. Go to the **Log Settings** screen and select the logs you wish to display. Click **Apply** to save your settings. Click **Refresh** to start the screen afresh.

Figure 26   Log Settings
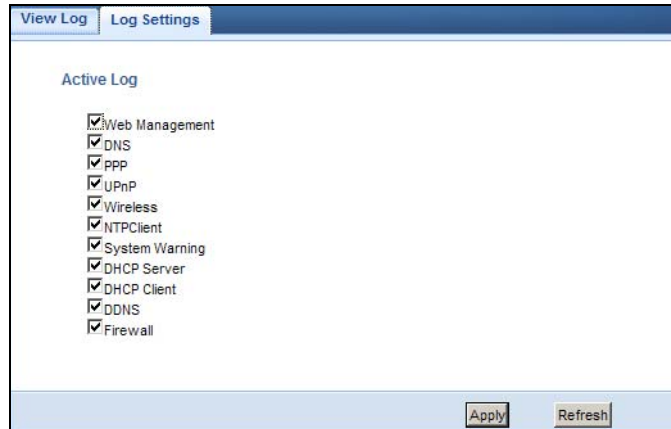
6.4 BW MGMT Monitor

The Bandwidth Management (BW MGMT) Monitor allows you to view the amount of network bandwidth that applications running in the network are using.

The bandwidth is measured in kilobytes per second (kbps).

The monitor shows what kinds of applications are running in the network, the maximum kbps that each application can use, as well as the percentage of bandwidth it is using.

Figure 27   Summary: BW MGMT Monitor
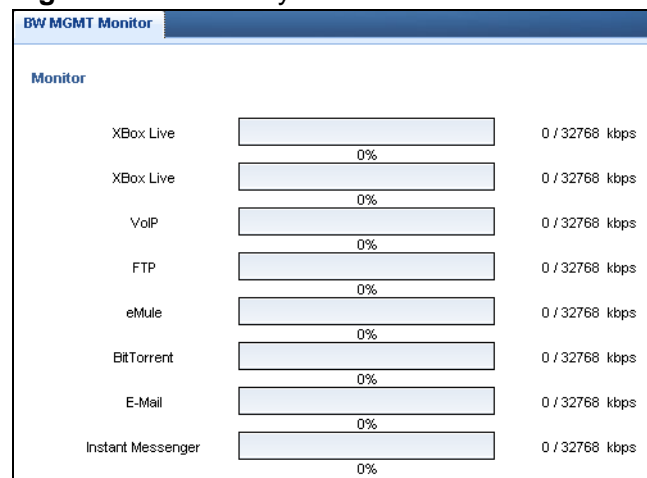
6.5 DHCP Table

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 NBG4615's LAN as a DHCP server or disable it. When configured as a server, the NBG4615 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 the **DHCP Table (Details...)** hyperlink in the **Status** screen. Read-only information here relates to your DHCP status. The DHCP table shows current DHCP client information (including **MAC Address, IP Address**, and **Expiration time**) of all network clients using the NBG4615's DHCP server.

Figure 28   Summary: DHCP Table

The following table describes the labels in this screen.

Table 16   Summary: DHCP Table

LABEL	DESCRIPTION
#	This is the index number of the host computer.
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.
IP Address	This field displays the IP address relative to the # field listed above.
Expires in	This field displays the time when the IP address and MAC address association ends.
Refresh	Click **Refresh** to renew the screen.

6.6 Packet Statistics

Click 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 29   Summary: Packet Statistics

The following table describes the labels in this screen.

Table 17   Summary: Packet Statistics

LABEL	DESCRIPTION
Port	This is the NBG4615's port 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 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 NBG4615 has been for each session.
System Up Time	This is the total time the NBG4615 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.

6.7 WLAN Station Status

Click the **WLAN Station Status (Details...)** hyperlink in the **Status** screen. View the wireless stations that are currently associated to the NBG4615 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 30   Summary: Wireless Association List

The following table describes the labels in this screen.

Table 18   Summary: Wireless Association List

LABEL	DESCRIPTION
#	This is the index number of an associated wireless station.
MAC Address	This field displays the MAC address of an associated wireless station.
Association Time	This field displays the time a wireless station first associated with the NBG4615's WLAN network.
Refresh	Click **Refresh** to reload the list.

7

NBG4615 Modes

7.1 Overview

This chapter introduces the different modes available on your NBG4615. 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 NBG4615 features.
• **Device mode**. This is the operating mode of your NBG4615, or simply how the NBG4615 is being used in the network.

7.1.1 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 8 on page 61 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 NBG4615. Click **Expert Mode** after logging into the Web Configurator. The User's Guide Chapter 5 on page 47 through Chapter 28 on page 236 discusses the screens in this mode.

7.1.2 Device Modes

This refers to the operating mode of the NBG4615, which can act as a:

• **Router**: This is the default device mode of the NBG4615. Use this mode to connect the local network to another network, like the Internet. Go to Section 9.2 on page 74 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 NBG4615 wirelessly. Go to Section 10.4 on page 84 to view the **Status** screen in this mode.

• **Universal Repeater**: In this mode, the NBG4615 can be an access point and a wireless client at the same time. Use this mode if there is an existing wireless router or access point in your network and you also want to allow clients to connect to the NBG4615. Go to Section 11.5 on page 92 to view the **Status** screen in this mode.

• **WISP**: Use this mode if there is an existing wireless router or access point in the network to which you want to connect your local network. Go to Section 12.4 on page 101 to view the **Status** screen in this mode.

The following figure is a simple illustration of the device configuration modes of the NBG4615.

Figure 31   Device Mode Example
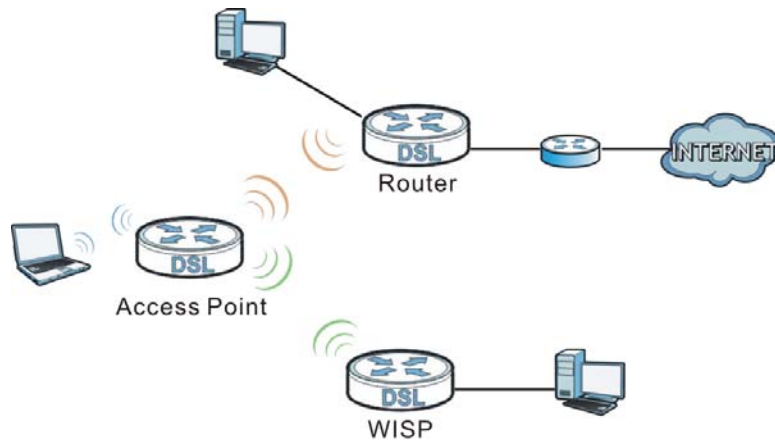
For more information on these modes and to change the mode of your NBG4615, refer to Chapter 28 on page 236.

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 NBG4615 changes. The running applications and services of the network devices connected to the NBG4615 can be interrupted.

In **WISP** mode, you should know the SSID and wireless security details of the access point to which you want to connect.

Easy Mode

8.1 Overview

The Web Configurator is set to **Easy Mode** by default. You can configure several key features of the NBG4615 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 32   Easy Mode: Network Map
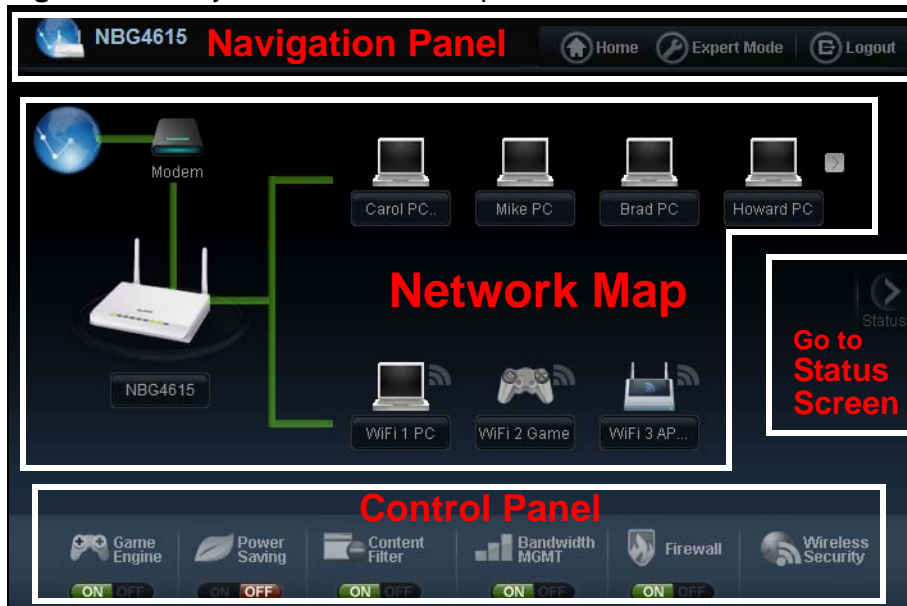
Click **Status** to open the following screen.

Figure 33   Easy Mode: Status Screen
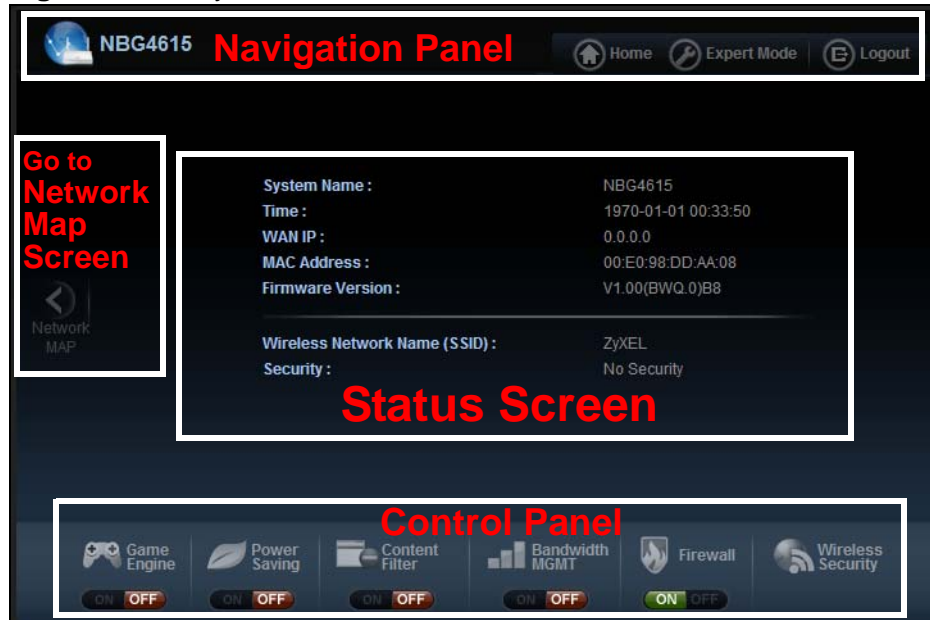
8.2 What You Can Do

You can do the following in this mode:

• Use this **Navigation Panel** to opt out of the **Easy** mode (Section 8.4 on page 63).

• Use the **Network Map** screen to check if your NBG4615 can ping the gateway and whether it is connected to the Internet (Section 8.5 on page 63).

• Use the **Control Panel** to configure and enable NBG4615 features, including wireless security, wireless scheduling and bandwidth management and so on (Section 8.6 on page 64).

• Use the **Status Screen** to view read-only information about the NBG4615, including the WAN IP, MAC Address of the NBG4615 and the firmware version (Section 8.7 on page 71).

8.3 What You Need to Know

Between the different device modes, the **Control Panel** (Section 8.6 on page 64) 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.
- **Universal Repeater Mode**: Only **Power Saving** and **Wireless Security** are available.
- **WISP Mode**: The available features for this mode are **Game Console**, **Content Filter**, **Bandwidth MGMT**, and **Firewall**.

8.4 Navigation Panel

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

Figure 34   Control Panel

The following table describes the labels in this screen.

Table 19   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 NBG4615.
Logout	Click this to end the Web Configurator session.

8.5 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 NBG4615 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 () in the Easy Mode and the NBG4615 features that you want to use in the Expert Mode.

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

Figure 35 Network Map

The line connecting the NBG4615 to the gateway becomes green when the NBG4615 is able to ping the gateway. It becomes red when the ping initiating from the NBG4615 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 NBG4615, including those connecting wirelessly. Right-click on the NBG4615 icon to refresh the network map and go to the Wizard. Right click on the other icons to view information about the device.

8.6 Control Panel

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

Figure 36 Control Panel
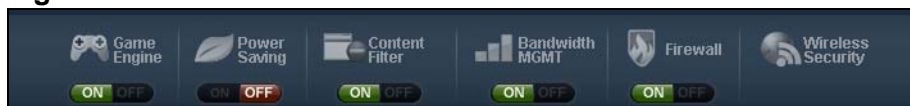
Switch **ON** to enable the feature. Otherwise, switch **OFF**. If the feature is turned on, the green light flashes. If it is turned off, the red light flashes.

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

The following table describes the labels in this screen.

Table 20 Control Panel

| ITEM	DESCRIPTION
Game Engine	Switch **ON** to maximize bandwidth for gaming traffic in your network. Otherwise, switch **OFF**. Refer to Section 8.6.1 on page 65 to see this screen.
Power Saving	Click this to schedule the wireless feature of the NBG4615. Disabling the wireless function helps lower the energy consumption of the NBG4615. Switch **ON** to apply wireless scheduling. Otherwise, switch **OFF**. Refer to Section 8.6.2 on page 66 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 8.6.3 on page 67 to see this screen.
Bandwidth MGMT	Click this to edit bandwidth management for predefined applications. Switch **ON** to have the NBG4615 management bandwidth for uplink and downlink traffic according to an application or service. Otherwise, switch **OFF**. Refer to Section 8.6.4 on page 68 to see this screen.
Firewall	Switch **ON** to ensure that your network is protected from Denial of Service (DoS) attacks. Otherwise, switch **OFF**. Refer to Section 8.6.5 on page 68 to see this screen.
Wireless Security	Click this to configure the wireless security, such as SSID, security mode and WPS key on your NBG4615. Refer to Section 8.6.6 on page 69 to see this screen.

8.6.1 Game Engine

When this feature is enabled, the NBG4615 maximizes the bandwidth for gaming traffic that it forwards out through an interface.

Figure 37 Game Engine
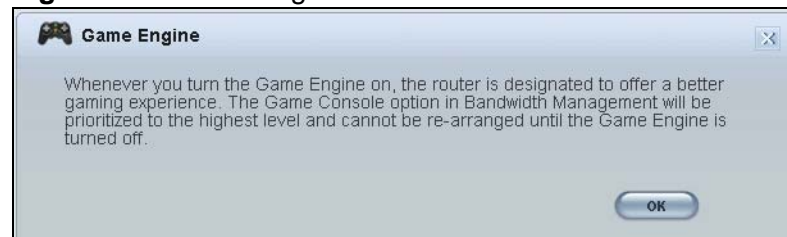
Note: When this is switched on, the **Game Console** tab in the **Bandwidth Mgmt** screen is automatically positioned on top.

Turn this off if your network is not using gaming.

Click **OK** to close this screen.

8.6.2 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 NBG4615.

Figure 38 Power Saving

The following table describes the labels in this screen.

Table 21 Power Saving

LABEL	DESCRIPTION
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.

Table 21 Power Saving (continued)

LABEL	DESCRIPTION
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 NBG4615.
Reset	Click **Reset** to begin configuring this screen afresh.

8.6.3 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 39   Content Filter

The following table describes the labels in this screen.

Table 22   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 NBG4615 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**.

Table 22 Content Filter (continued)

LABEL	DESCRIPTION
Apply	Click **Apply** to save your changes.
Cancel	Click **Cancel** to close this screen without saving any changes.

8.6.4 Bandwidth MGMT

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

The NBG4615 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 40 Bandwidth MGNT
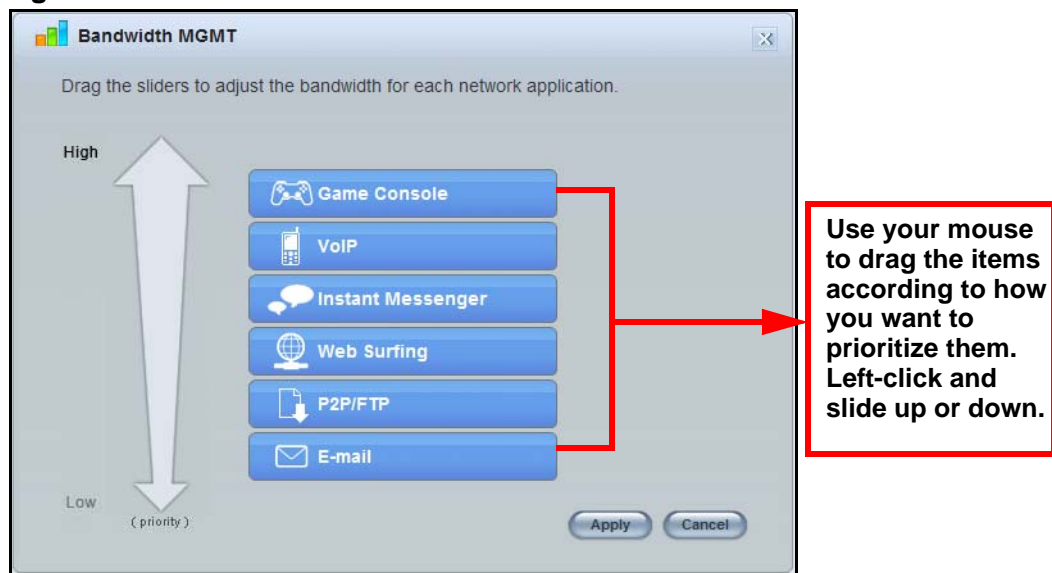
8.6.5 Firewall

Enable this feature to protect the network from Denial of Service (DoS) attacks. The NBG4615 blocks repetitive pings from the WAN that can otherwise cause systems to slow down or hang.

Figure 41 Firewall
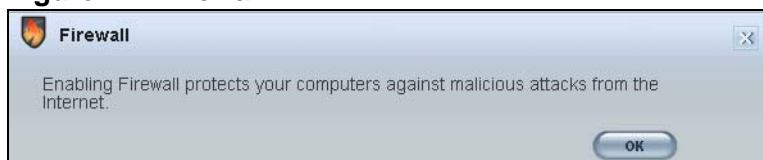
Click **OK** to close this screen.

8.6.6 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 NBG4615 by first turning on the switch in the back panel.

Figure 42   Wireless Security

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

Table 23   Wireless Security

LABEL	DESCRIPTION
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 **WPA-PSK** or **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 **WPA-PSK** or **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 NBG4615.
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.

8.6.7 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 43   Wireless Security: WPS

The following table describes the labels in this screen.

Table 24   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 NBG4615 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 NBG4615'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.

8.7 Status Screen in Easy Mode

In the Network Map screen, click **Status** to view read-only information about the NBG4615.

Figure 44 Status Screen in Easy Mode

The following table describes the labels in this screen.

**Table 25** Status Screen in Easy Mode

ITEM	DESCRIPTION
Name	This is the name of the NBG4615 in the network. You can change this in the **Maintenance > General** screen in Section 28.3 on page 226.
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 NBG4615.
Firmware Version	This shows the firmware version of the NBG4615. The firmware version format shows the trunk version, model code and release number.
Wireless Network Name	This shows the SSID of the wireless network. You can configure this in the Wireless Security screen (Section 8.6.6 on page 69; Section 14.2 on page 133).
Security	This shows the wireless security used by the NBG4615.

Router Mode

9.1 Overview

The NBG4615 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 NBG4615 connects the local network (**LAN1** ~ **LAN4**) to the Internet.

Figure 45   NBG4615 Network
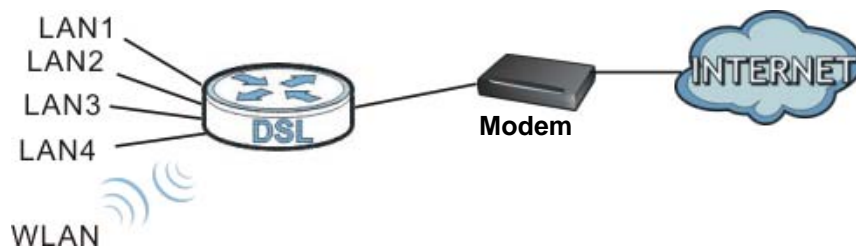
Note: The Status screen is shown after changing to the Expert mode of the Web Configurator. It varies depending on the device mode of your NBG4615.
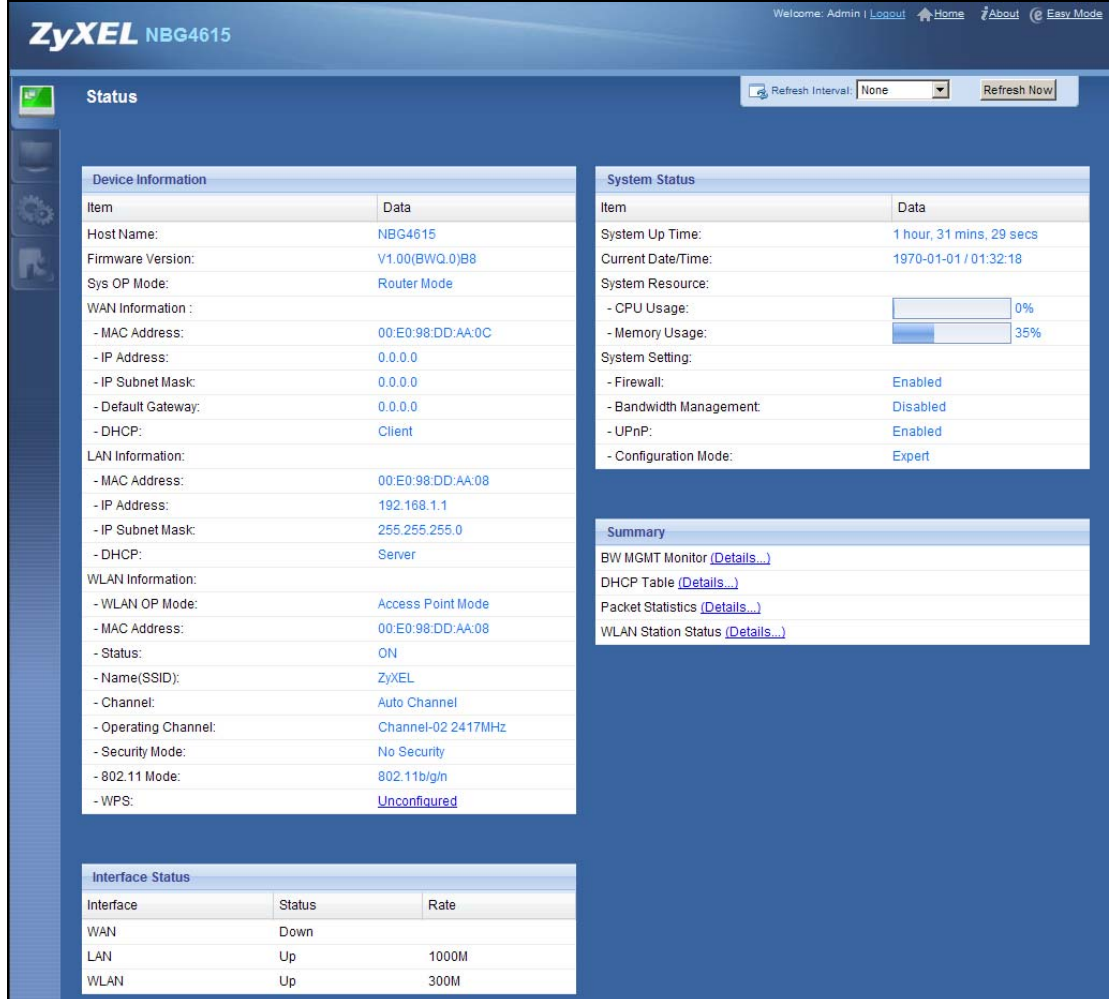
9.2 Router Mode Status Screen

Click ![icon] to open the status screen.

Figure 46   Status Screen: Router Mode

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

Table 26   Status Screen Icon Key: Router Mode

ICON	DESCRIPTION
![About icon]	Click this icon to view copyright and a link for related product information.
![Easy Mode icon]	Click this icon to go to Easy Mode. See Chapter 8 on page 61.
![Home icon]	Click this to go to the Home page. See Chapter 6 on page 53.
![Refresh Interval icon]	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.

Table 26 Status Screen Icon Key: Router Mode (continued)

ICON	DESCRIPTION
Refresh Now	Click this button to refresh the status screen statistics.
	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 27 Status Screen: Router Mode

| LABEL	DESCRIPTION
Logout	Click this at any time to exit the Web Configurator.
Device Information	
Host Name	This is the **System Name** you enter in the **Maintenance** > **General** screen. It is for identification purposes.
Firmware Version	This is the firmware version and the date created.
Sys OP Mode	This is the device mode (Section 7.1.2 on page 59) to which the NBG4615 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.
- DHCP	This shows the LAN port's DHCP role - **Client** or **None**.
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 Information	
- WLAN OP Mode	This is the device mode (Section 7.1.2 on page 59) to which the NBG4615's wireless LAN is set - **Access Point Mode**.
- MAC Address	This shows the wireless adapter MAC Address of your device.
- Status	This shows the current status of the Wireless LAN - **ON** or **OFF**.
- Name (SSID)	This shows a descriptive name used to identify the NBG4615 in the wireless LAN.
- Channel	This shows the channel number which you select manually.

Table 27   Status Screen: Router Mode (continued)

LABEL	DESCRIPTION
- Operating Channel	This shows the channel number which the NBG4615 is currently using over the wireless LAN.
- Security Mode	This shows the level of wireless security the NBG4615 is using.
- 802.11 Mode	This shows the wireless standard.
- WPS	This displays **Configured** when the WPS has been set up. This displays **Unconfigured** if the WPS has not been set up. Click the status to display **Network > Wireless LAN > WPS** screen.
System Status	
Item	This column shows the type of data the NBG4615 is recording.
Data	This column shows the actual data recorded by the NBG4615.
System Up Time	This is the total time the NBG4615 has been on.
Current Date/Time	This field displays your NBG4615's present date and time.
System Resource	
- CPU Usage	This displays what percentage of the NBG4615's processing ability is currently used. When this percentage is close to 100%, the NBG4615 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 NBG4615 is using.
System Setting	
- Firewall	This shows whether the firewall is enabled or not.
- Bandwidth Management	This shows whether the bandwidth management is enabled or not.
- UPnP	This shows whether UPnP is enabled or not.
- Configuration Mode	This shows the web configurator mode you are viewing - **Expert**.
Interface Status	
Interface	This displays the NBG4615 port types. The port types are: **WAN**, **LAN** and **WLAN**.
Status	For the LAN and WAN ports, this field displays **Down** (line is down) or **Up** (line is up or connected). For the WLAN, it displays **Up** when the WLAN is enabled or **Down** when the WLAN is disabled.
Rate	For the LAN ports, this displays the port speed and duplex setting or **N/A** when the line is disconnected. For the WAN port, it displays the port speed and duplex setting if you're using Ethernet encapsulation. This field displays **N/A** when the line is disconnected. For the WLAN, it displays the maximum transmission rate when the WLAN is enabled and **N/A** when the WLAN is disabled.
Summary	

Table 27 Status Screen: Router Mode (continued)

LABEL	DESCRIPTION
BW MGMT Monitor	Click **Details…** to go to the **Monitor > BW MGMT Monitor** screen (Section 6.4 on page 55). Use this screen to view the amount of network bandwidth that applications running in the network are using.
DHCP Table	Click **Details…** to go to the **Monitor > DHCP Table** screen (Section 6.5 on page 56). Use this screen to view current DHCP client information.
Packet Statistics	Click **Details…** to go to the **Monitor > Packet Statistics** screen (Section 6.6 on page 57). Use this screen to view port status and packet specific statistics.
WLAN Station Status	Click **Details…** to go to the **Monitor > WLAN Station Status** screen (Section 6.7 on page 58). Use this screen to view the wireless stations that are currently associated to the NBG4615.

9.2.1 Navigation Panel

Use the sub-menus on the navigation panel to configure NBG4615 features.

Figure 47 Navigation Panel: Router Mode
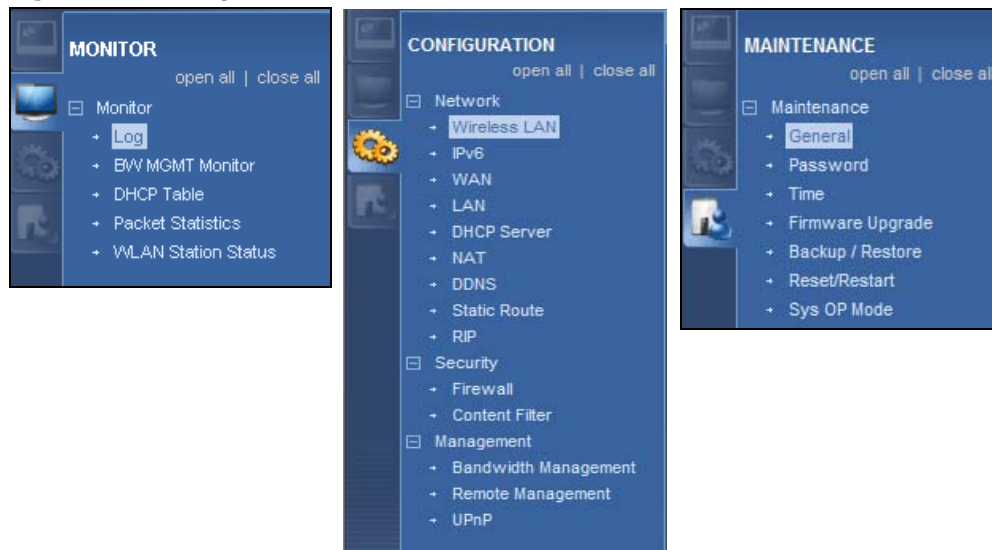
The following table describes the sub-menus.

Table 28 Navigation Panel: Router Mode

LINK	TAB	FUNCTION
Status		This screen shows the NBG4615'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 NBG4615.

Table 28 Navigation Panel: Router Mode (continued)

| LINK	TAB	FUNCTION
BW MGMT		Use this screen to view the amount of network bandwidth that applications running in the network are using.
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 Station Status		Use this screen to view the wireless stations that are currently associated to the NBG4615.
CONFIGURATION		
Network		
Wireless LAN	General	Use this screen to configure wireless LAN.
	Security	Use this screen to configure the level of wireless security for the NBG4615.
	MAC Filter	Use the MAC filter screen to configure the NBG4615 to block access to devices or block the devices from accessing the NBG4615.
	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.
	WDS	Use this screen to set up Wireless Distribution System (WDS) on your NBG4615.
IPv6	IPv6	Use this screen to set the IPv6 settings for your NBG4615.
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.
	IGMP Snooping	Use this screen to enable IGMP snooping if you have LAN users that subscribe to multicast services.
LAN	IP	Use this screen to configure LAN IP address and subnet mask.
	IP Alias	Use this screen to have the NBG4615 apply IP alias to create LAN subnets.
DHCP Server	General	Use this screen to enable the NBG4615'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.

Table 28 Navigation Panel: Router Mode (continued)

LINK	TAB	FUNCTION
NAT	General	Use this screen to enable NAT.
	Application	Use this screen to configure servers behind the NBG4615.
	Advanced	Use this screen to change your NBG4615's port triggering settings.
DDNS	General	Use this screen to set up dynamic DNS.
Static Route	IP Static Route	Use this screen to configure IP static routes.
RIP	RIP	Use this screen to enable RIPv1 or RIPv2, which are LAN broadcast protocols.
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.
	Monitor	Use this screen to view the amount of network bandwidth that applications running in the network are using.
Remote Management	WWW	Use this screen to be able to access the NBG4615 from the LAN, WAN or both.
UPnP	General	Use this screen to enable UPnP on the NBG4615.
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 NBG4615.
Time	Time Setting	Use this screen to change your NBG4615's time and date.
Firmware Upgrade	Firmware Upgrade	Use this screen to upload firmware to your NBG4615.
Backup/ Restore	Backup/ Restore	Use this screen to backup and restore the configuration or reset the factory defaults to your NBG4615.
Reset/ Restart	Restart	This screen allows you to reboot the NBG4615 without turning the power off.
Sys OP Mode	Sys OP Mode	This screen allows you to select whether your device acts as a Router or a Access Point.

Access Point Mode

10.1 Overview

Use your NBG4615 as an access point (AP) if you already have a router or gateway on your network. In this mode your NBG4615 bridges a wired network (LAN) and wireless LAN (WLAN) in the same subnet. See the figure below for an example.

Figure 48   Wireless Internet Access in Access Point Mode
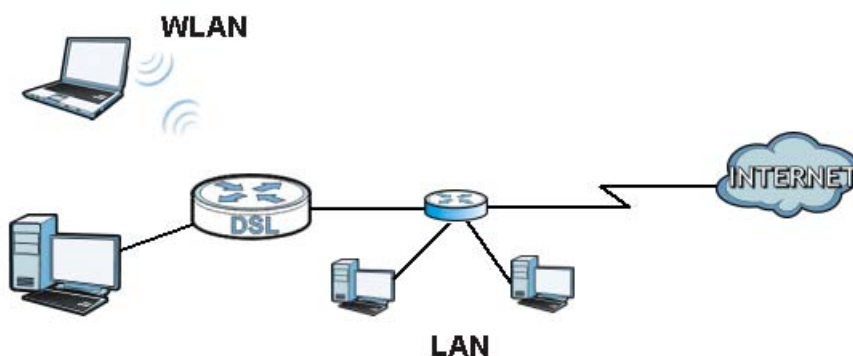
Many screens that are available in Router mode are not available in Access Point mode, such as bandwidth management and firewall.

Note: See Chapter 13 on page 111 for an example of setting up a wireless network in Access Point mode.

10.2 What You Can Do

• Use the **Status** screen to view read-only information about your NBG4615 (Section 10.4 on page 84).

• Use the **LAN** screen to set the IP address for your NBG4615 acting as an access point (Section 10.5 on page 86).

10.3 What You Need to Know

See for a tutorial on setting up a network with the NBG4615 as an access point.

10.3.1 Setting your NBG4615 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 NBG4615 as an access point, go to **Maintenance > Sys OP Mode > General** and select **Access Point mode**.

Figure 49   Changing to Access Point mode
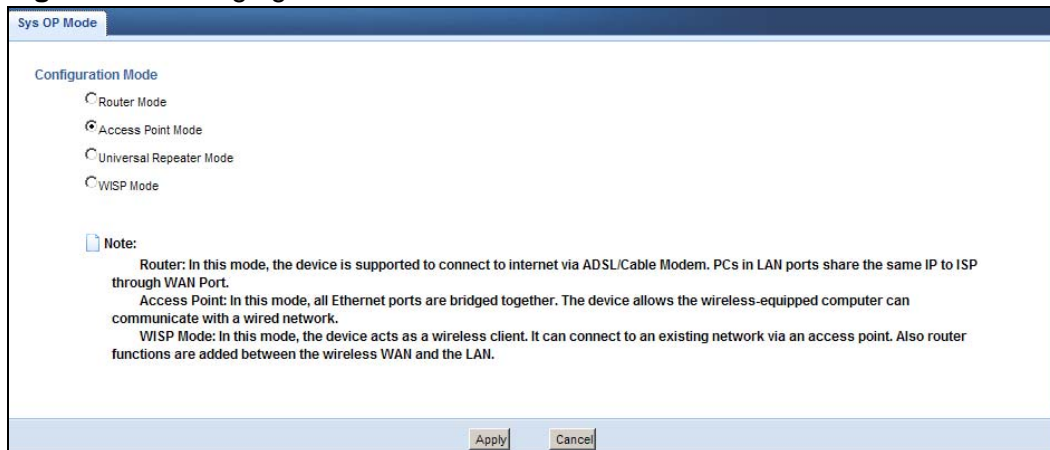
Note: You have to log in to the Web Configurator again when you change modes.As soon as you do, your NBG4615 is already in Access Point mode.

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

Figure 50   Pop up for Access Point mode

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

10.3.2 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 NBG4615.

2 The default IP address of the NBG4615 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 D on page 277 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 61 for the Easy mode screens. Change to Expert mode to see the screens described in the sections following this.

10.3.3 Configuring your WLAN, Bandwidth Management and Maintenance Settings

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

- See Chapter 14 on page 129 for information on the configuring your wireless network.
- See Chapter 25 on page 205 for information on configuring your Bandwidth Management screen.
- See Chapter 28 on page 225 for information on configuring your Maintenance settings.

10.4 AP Mode Status Screen
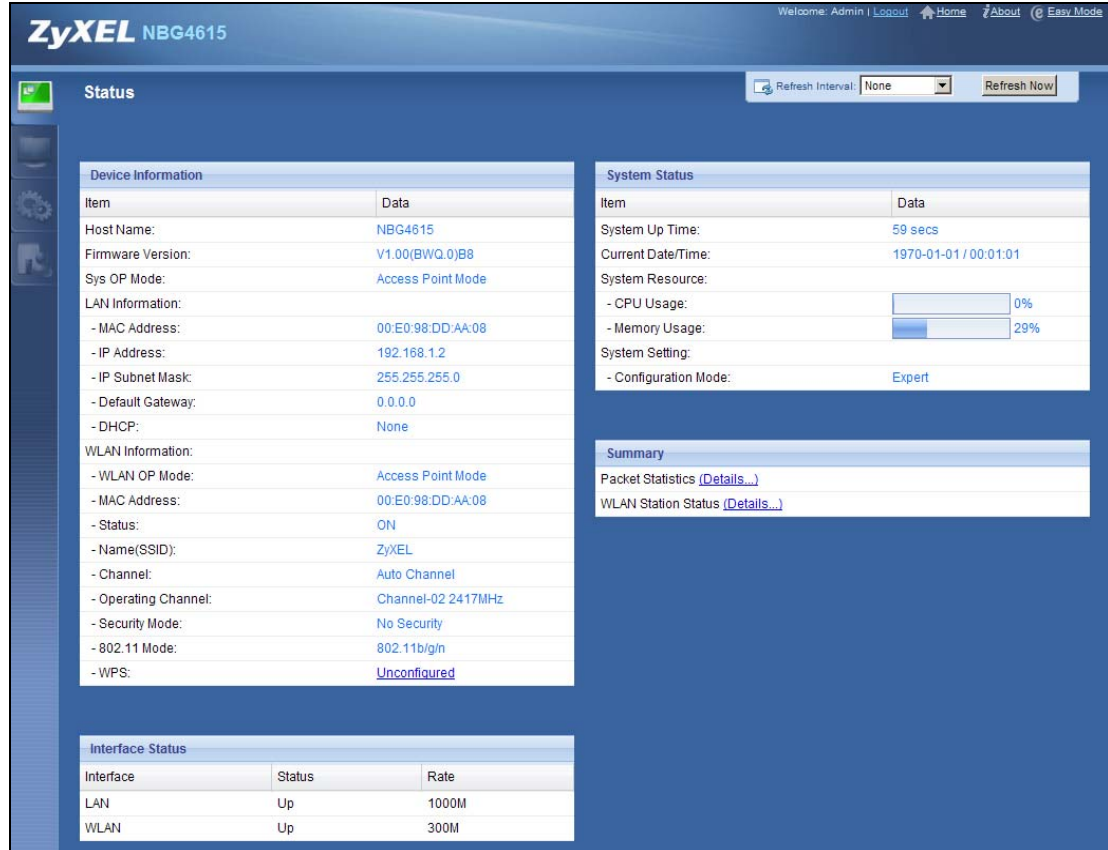
Click ![icon] to open the **Status** screen.

Figure 51   Status Screen: Access Point Mode

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

Table 29   Status Screen: Access Point Mode

LABEL	DESCRIPTION
Logout	Click this at any time to exit the Web Configurator.
Device Information	
Host Name	This is the **System Name** you enter in the **Maintenance** > **General** screen. It is for identification purposes.
Firmware Version	This is the firmware version and the date created.
Sys OP Mode	This is the device mode (Section 7.1.2 on page 59) to which the NBG4615 is set - **Access Point 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.**

Table 29   Status Screen: Access Point Mode (continued)

LABEL	DESCRIPTION
WLAN Information	
- WLAN OP Mode	This is the device mode (Section 7.1.2 on page 59) to which the NBG4615's wireless LAN is set - **Access Point Mode**.
- MAC Address	This shows the wireless adapter MAC Address of your device.
- Status	This shows the current status of the Wireless LAN - **ON** or **OFF**.
- Name (SSID)	This shows a descriptive name used to identify the NBG4615 in the wireless LAN.
- Channel	This shows the channel number which you select manually.
- Operating Channel	This shows the channel number which the NBG4615 is currently using over the wireless LAN.
- Security Mode	This shows the level of wireless security the NBG4615 is using.
- 802.11 Mode	This shows the wireless standard.
- WPS	This displays **Configured** when the WPS has been set up. This displays **Unconfigured** if the WPS has not been set up. Click the status to display **Network > Wireless LAN > WPS** screen.
System Status	
Item	This column shows the type of data the NBG4615 is recording.
Data	This column shows the actual data recorded by the NBG4615.
System Up Time	This is the total time the NBG4615 has been on.
Current Date/Time	This field displays your NBG4615's present date and time.
System Resource	
- CPU Usage	This displays what percentage of the NBG4615's processing ability is currently used. When this percentage is close to 100%, the NBG4615 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 NBG4615 is using.
System Setting	
- Configuration Mode	This shows the web configurator mode you are viewing - **Expert**.
Interface Status	
Interface	This displays the NBG4615 port types. The port types are: **LAN** and **WLAN**.
Status	For the LAN and WAN ports, this field displays **Down** (line is down) or **Up** (line is up or connected). For the WLAN, it displays **Up** when the WLAN is enabled or **Down** when the WLAN is disabled.

Table 29 Status Screen: Access Point Mode (continued)

LABEL	DESCRIPTION
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 WLAN, it displays the maximum transmission rate when the WLAN is enabled and **N/A** when the WLAN is disabled.
Summary	
Packet Statistics	Click **Details...** to go to the **Monitor > Packet Statistics** screen (Section 6.6 on page 57). Use this screen to view port status and packet specific statistics.
WLAN Station Status	Click **Details...** to go to the **Monitor > WLAN Station Status** screen (Section 6.7 on page 58). Use this screen to view the wireless stations that are currently associated to the NBG4615.

10.4.0.1 Navigation Panel

Use the menu in the navigation panel to configure NBG4615 features in Access Point mode.

The following screen and table show the features you can configure in Access Point mode.

Figure 52 Menu: Access Point Mode

Refer to Table 28 on page 77 for descriptions of the labels shown in the **Navigation** panel.

10.5 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 NBG4615 in the screen below, you will need to log into the NBG4615 again using the new IP address.

Figure 53   Network > LAN > IP

The table below describes the labels in the screen.

Table 30   Network > LAN > IP

LABEL	DESCRIPTION
Get from DHCP Server	Click this to deploy the NBG4615 as an access point in the network. When you enable this, the NBG4615 gets its IP address from the network's DHCP server (for example, your ISP). Users connected to the NBG4615 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 NBG4615. You need to reset the NBG4615 to be able to access the Web Configurator again (see Section 28.7 on page 231 for details on how to reset the NBG4615). Also when you select this, you cannot enter an IP address for your NBG4615 in the field below.
Use Defined LAN IP Address	Click this if you want to specify the IP address of your NBG4615. 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.
IP Subnet Mask	The subnet mask specifies the network number portion of an IP address. Your NBG4615 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 NBG4615.
Gateway IP Address	Enter a **Gateway IP Address** (if your ISP or network administrator gave you one) in this field.
DNS Assignment	

Table 30 Network > LAN > IP (continued)

LABEL	DESCRIPTION
First DNS Server Second DNS Server	Select **From ISP** if your ISP dynamically assigns DNS server information (and the NBG4615'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.
Apply	Click **Apply** to save your changes to the NBG4615.
Cancel	Click **Cancel** to reload the previous configuration for this screen.

Universal Repeater Mode

11.1 Overview

In universal repeater mode, your NBG4615 can act as an access point and wireless client at the same time. The NBG4615 can connect to an existing network through another access point and also lets wireless clients connect to the network through it. This helps you expand wireless coverage when you have an access point or wireless router already in your network.

In the example below, the NBG4615 (**A**) is configured as a universal repeater. It has three clients that want to connect to the Internet. The NBG4615 wirelessly connects to the available access point (**B**).

Figure 54   Universal Repeater Mode

After the NBG4615 and the access point connect, the NBG4615 acquires its IP address from the access point. The clients of the NBG4615 can now surf the Internet.

11.2 What You Can Do

- Use the **Status** screen to view read-only information about your NBG4615 (Section 11.5 on page 92).

- Use the **LAN** screen to set the IP address for your NBG4615 acting as an access point (Section 10.5 on page 86).

- Use the **Universal Repeater** screen to configure the security between the NBG4615 and another access point (Section 11.6 on page 94).

- Use other **Wireless LAN** screens to configure the wireless settings and wireless security between the wireless clients and the NBG4615.

11.3 What You Need to Know

With the exception of the **Wireless LAN > AP Client** screen, other configuration screens in Universal Repeater mode are similar to the ones in Access Point Mode. See Chapter 14 on page 129 through Chapter 28 on page 236 of this User's Guide.

11.4 Setting your NBG4615 to Universal Repeater Mode

1 Connect your computer to the LAN port of the NBG4615.

2 The default IP address of the NBG4615 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 C on page 163 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://192.168.1.2" 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 To set your NBG4615 to **Universal Repeater Mode**, on the left of the screen, click **Maintenance > Sys OP Mode** and select **Universal Repeater Mode**.

Figure 55 Changing to Universal Repeater mode
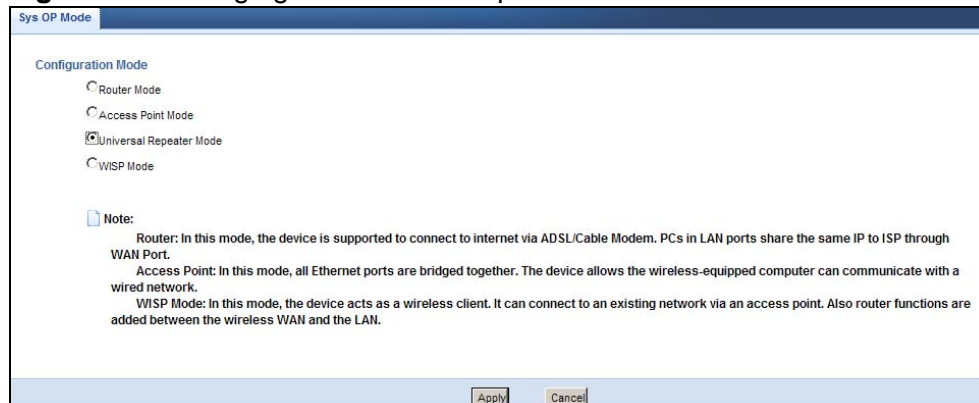
Note: You have to log in to the Web Configurator again when you change modes. As soon as you do, your NBG4615 is already in Universal Repeater mode.

Note: The Universal Repeater mode IP address is always the same as the Access Point mode IP address. If you changed the IP address of your NBG4615 while in Access Point mode, use this IP address in Universal Repeater mode.

9 When you select **Universal Repeater Mode**, the following pop-up message window appears.

Figure 56 Pop up for Universal Repeater mode

Click **OK**. The Web Configurator refreshes once the change to Universal Repeater mode is successful.

11.5 Universal Repeater Mode Status Screen
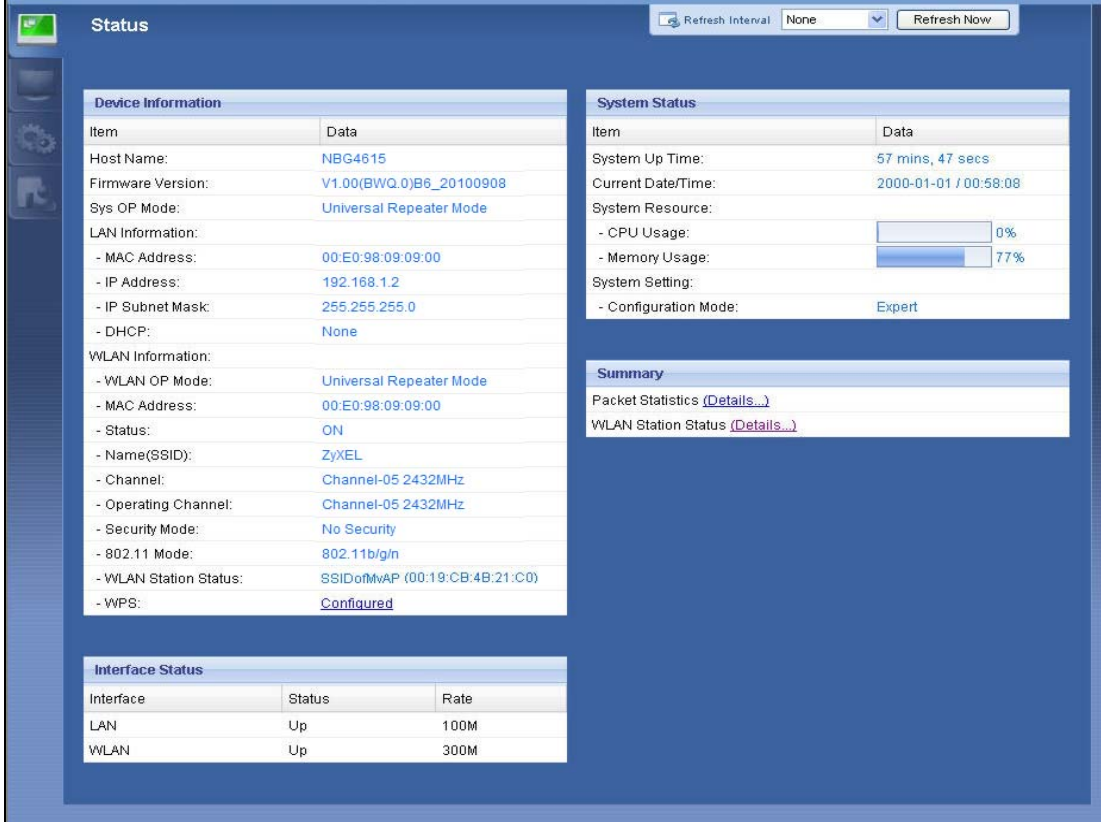
Click ![icon] to open the status screen.

Figure 57   Status: Universal Repeater Mode

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

Table 31   Status Screen: Universal Repeater Mode

LABEL	DESCRIPTION
Logout	Click this at any time to exit the Web Configurator.
Device Information	
Host Name	This is the **System Name** you enter in the **Maintenance** > **General** screen. It is for identification purposes.
Firmware Version	This is the firmware version and the date created.
Sys OP Mode	This is the device mode (Section 7.1.2 on page 59) to which the NBG4615 is set - **Universal Repeater 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**.

Table 31 Status Screen: Universal Repeater Mode (continued)

LABEL	DESCRIPTION
WLAN Information	
WLAN OP Mode	This is the device mode (Section 7.1.2 on page 59) to which the NBG4615's wireless LAN is set - **Universal Repeater Mode**.
MAC Address	This shows the wireless adapter MAC Address of your device.
Status	This shows the current status of the Wireless LAN - **ON**.
Name (SSID)	This shows a descriptive name used to identify the NBG4615 in the wireless LAN.
Channel	This shows the channel number which you select manually or the NBG4615 automatically scans and selects.
Operating Channel	This shows the channel number which the NBG4615 is currently using over the wireless LAN.
Security Mode	This shows the level of wireless security the NBG4615 is using.
802.11 Mode	This shows the wireless standard.
WLAN Station Status	If the NBG4615 has successfully connected to an AP or wireless router, it displays the SSID and MAC address of the AP or wireless router in this field.
WPS	This displays **Configured** when the WPS has been set up. This displays **Unconfigured** if the WPS has not been set up. Click the status to display **Network > Wireless LAN > WPS** screen.
Interface Status	
Interface	This displays the NBG4615 port types. The port types are: **LAN** and **WLAN**.
Status	For the LAN and WAN ports, this field displays **Down** (line is down) or **Up** (line is up or connected). For the WLAN, it displays **Up** when the WLAN is enabled or **Down** when the WLAN is disabled.
Rate	For the LAN ports, this displays the port speed or **N/A** when the line is disconnected. For the WLAN, it displays the maximum transmission rate when the WLAN is enabled and **N/A** when the WLAN is disabled.
System Status	
Item	This column shows the type of data the NBG4615 is recording.
Data	This column shows the actual data recorded by the NBG4615.
System Up Time	This is the total time the NBG4615 has been on.
Current Date/Time	This field displays your NBG4615's present date and time.
System Resource	
CPU Usage	This displays what percentage of the NBG4615's processing ability is currently used. When this percentage is close to 100%, the NBG4615 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 NBG4615 is using.

Table 31 Status Screen: Universal Repeater Mode (continued)

LABEL	DESCRIPTION
System Setting	
Configuration Mode	This shows the web configurator mode you are viewing - **Expert**.
Summary	
Packet Statistics	Click **Details...** to go to the **Monitor > Packet Statistics** screen (Section 6.6 on page 57). Use this screen to view port status and packet specific statistics.
WLAN Station Status	Click **Details...** to go to the **Monitor > WLAN Station Status** screen (Section 6.7 on page 58). Use this screen to view the wireless stations that are currently associated to the NBG4615.

11.5.0.1 Navigation Panel

Use the menu in the navigation panel to configure NBG4615 features in **Universal Repeater** mode.

The following screen and table show the features you can configure in **Universal Repeater** mode.

Figure 58   Menu: Universal Repeater Mode

Refer to Table 28 on page 77 for descriptions of the labels shown in the **Navigation** panel.

11.6 Universal Repeater Screen

Use this screen to enter the SSID and select the wireless security mode used by the wireless device to which you want to connect. Go to **Configuration > Wireless LAN > Universal Repeater** to open the **Universal Repeater** screen. The screen varies depending on security mode.

Note: To have wireless clients access or acquire an IP address from another access point or wireless router (**B**) through the NBG4615 (**A**) in universal repeater mode, you must set the channel number in the **Wireless LAN > General** screen to be the same as the one on the wireless router or AP to which the NBG4615 wants to connect.
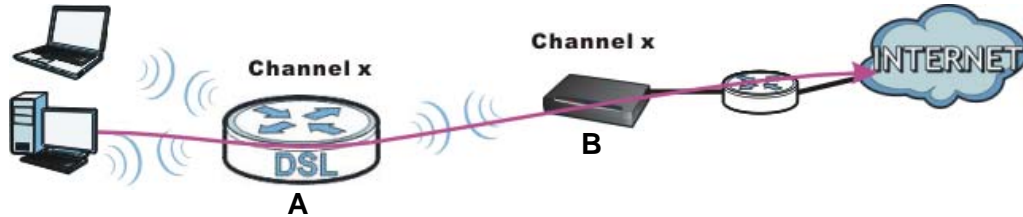
11.6.1 No Security

Figure 59   Universal Repeater Mode: Wireless LAN > Universal Repeater: No Security

The following table describes the labels in this screen.

Table 32   Universal Repeater Mode: Wireless LAN > Universal Repeater: No Security

LABEL	DESCRIPTION
Universal Repeater Parameters	
Enable	Select this option to have the NBG4615 connect to the specified access point.
SSID	Enter the name of the access point to which you are connecting.
MAC Address (Optional)	Enter the MAC address of the access point to which you are connecting.
Security Mode	Select **No Security** if the access point to which you want to connect does not use encryption.
Apply	Click **Apply** to save your changes back to the NBG4615.
Cancel	Click **Cancel** to reload the previous configuration for this screen.

11.6.2 Static WEP

Figure 60   Universal Repeater Mode: Wireless LAN > Universal Repeater: Static WEP

The following table describes the labels in this screen.

Table 33   Universal Repeater Mode: Wireless LAN > Universal Repeater: Static WEP

LABEL	DESCRIPTION
Universal Repeater Parameters	
Enable	Select this option to have the NBG4615 connect to the specified access point.
SSID	Enter the name of the access point to which you are connecting.
MAC Address (Optional)	Enter the MAC address of the access point to which you are connecting.
Security Mode	Select **Static WEP** if the access point to which you want to connect uses WEP data encryption.
Encryption Type	Select **Open** or **Shared Key** from the drop-down list box. This field specifies whether the wireless clients have to provide the WEP key to log into the wireless network. Keep this setting at **Open** unless you want to force a key verification before communication between the wireless client and the NBG4615 occurs. Select **Shared Key** to force the clients to provide the WEP key prior to communication.
WEP Key Title	
WEPKey Default	Select a default WEP key to use for data encryption.

Table 33   Universal Repeater Mode: Wireless LAN > Universal Repeater: Static WEP (continued)

LABEL	DESCRIPTION
WEP Key 1 ~ WEP Key 4	The WEP keys are used to encrypt data. Both the NBG4615 and the access point must use the same WEP key for data transmission.
	If you chose **HEX**, enter 10 or 26 hexadecimal characters in the range of "A-F", "a-f" and "0-9" (for example, 11AA22BB33) for a 64-bit or 128-bit WEP key respectively.
	If you chose **ASCII**, enter any 5 or 13 ASCII characters (case sensitive) ranging from "a-z", "A-Z" and "0-9" (for example, MyKey) for a 64-bit or 128-bit WEP key respectively.
	You must configure at least one key, only one key can be activated at any one time.
Apply	Click **Apply** to save your changes back to the NBG4615.
Cancel	Click **Cancel** to reload the previous configuration for this screen.

11.6.3 WPA(2)-PSK

Figure 61   Universal Repeater Mode: Wireless LAN > Universal Repeater: WPA(2)-PSK

The following table describes the labels in this screen.

Table 34   Universal Repeater Mode: Wireless LAN > Universal Repeater: WPA(2)-PSK

LABEL	DESCRIPTION
Universal Repeater Parameters	
Enable	Select this option to have the NBG4615 connect to the specified access point.
SSID	Enter the name of the access point to which you are connecting.
MAC Address (Optional)	Enter the MAC address of the access point to which you are connecting.
Security Mode	Select **WPA-PSK** or **WPA2-PSK** if the access point to which you want to connect uses WPA-PSK or WPA2-PSK.

Table 34 Universal Repeater Mode: Wireless LAN > Universal Repeater: WPA(2)-PSK (continued)

LABEL	DESCRIPTION
Encryption Type	Select the type of wireless encryption employed by the access point to which you want to connect.
Pre-Shared Key	**WPA-PSK** or **WPA2-PSK** uses a simple common password for authentication. Type the password employed by the access point to which you want to connect.
Apply	Click **Apply** to save your changes back to the NBG4615.
Reset	Click **Reset** to reload the previous configuration for this screen.

WISP Mode

12.1 Overview

Your NBG4615 can act as a wireless client. In wireless client mode, it can connect to an existing network via an access point. Use this mode if you already have an access point or router in your network.

In the example below, one NBG4615 (**A**) is configured as a wireless client and another is used as an access point (**B**). The wireless client has two clients that need to connect to the Internet. The NBG4615 wirelessly connects to the available access point (**B**).

Figure 62   Wireless Client Mode
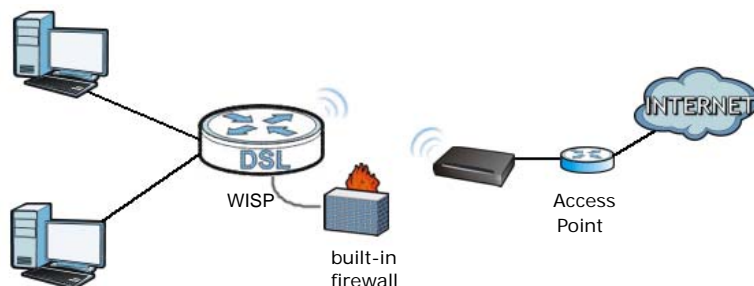
After the NBG4615 and the access point connect, the NBG4615 acquires its WAN IP address from the access point. The clients of the NBG4615 can now surf the Internet.

12.2 What You Can Do

- Use the **Status** screen to view read-only information about your NBG4615 (Section 12.4 on page 101).
- Use the **LAN** screen to set the IP address for your NBG4615 acting as an access point (Section 10.5 on page 86).
- Use the **Wireless LAN** screen to associate your NBG4615 (acting as a wireless client) with an existing access point (Section 12.5 on page 104).

12.3 What You Need to Know

With the exception of the **Wireless LAN** screen, the **Monitor**, **Configuration** and **Maintenance** screens in **WISP** mode are similar to the ones in **Router** mode. See Chapter 14 on page 129 through Chapter 28 on page 236 of this User's Guide.

12.3.1 Setting your NBG4615 to WISP 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 set your NBG4615 to **WISP Mode**, go to **Maintenance > Sys OP Mode > General** and select **WISP Mode.**

Figure 63   Changing to WISP mode
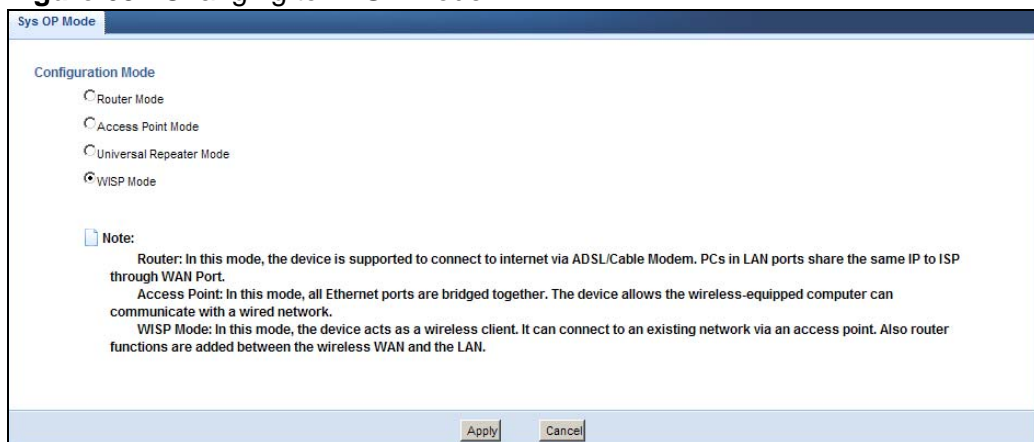
Note: You have to log in to the Web Configurator again when you change modes.As soon as you do, your NBG4615 is already in WISP mode.

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

Figure 64   Pop up window for WISP mode
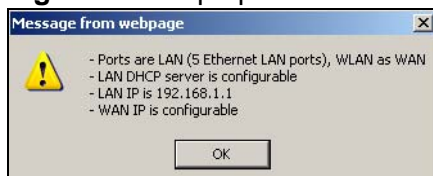
Click **OK**. The Web Configurator refreshes once the change to **WISP** mode is successful.

12.3.2 Accessing the Web Configurator in WISP Mode

To login to Web Configurator in **WISP Mode**, do the following:

1 Connect your computer to the LAN port of the NBG4615.

2 The default IP address of the NBG4615 is "192.168.1.1". If you did not change this, you can use the same IP address in **WISP Mode**. Open a web browser such as Internet Explorer and type "192.168.1.1" as the web address in your web browser.

If you changed the IP address of your NBG4615 while in **Router** mode, use this IP address in **WISP Mode**. The **WISP Mode** IP address is always the same as the **Router** mode IP address.

Note: After clicking Login, the **Easy Mode** appears. Refer to for the **Easy Mode** screens. Click **Expert** mode to see the screens described in the sections following this.

12.4 WISP Mode Status Screen
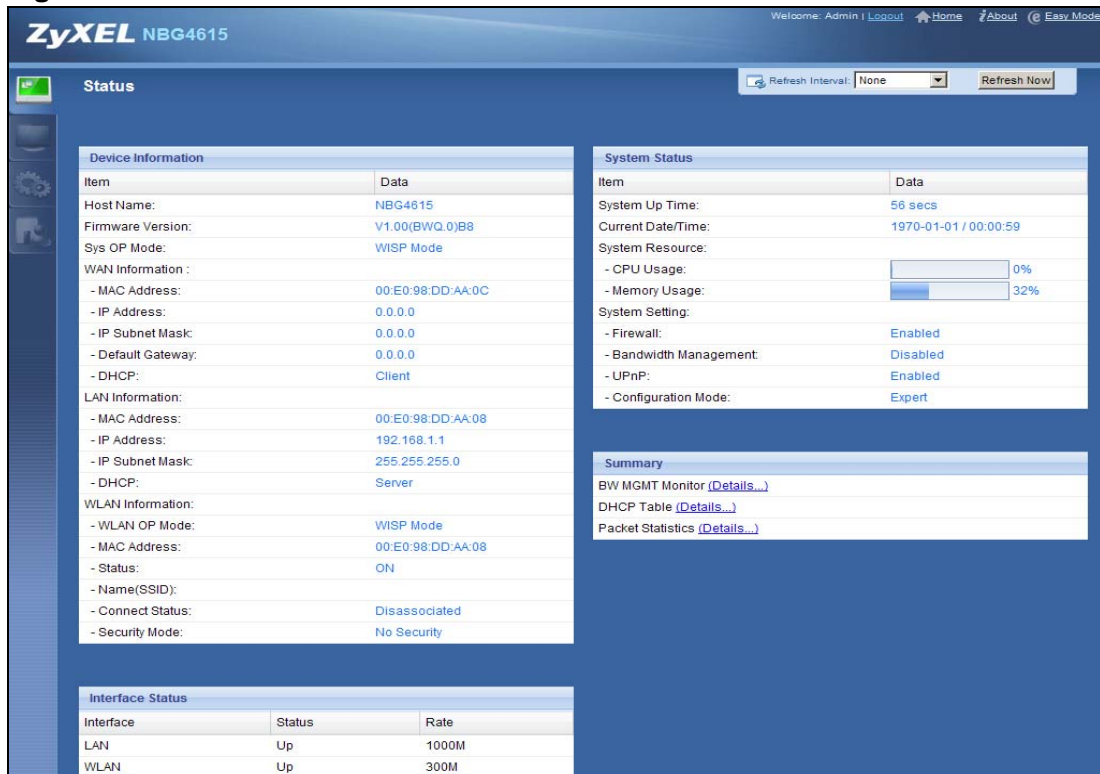
Click ![icon] to open the status screen.

Figure 65   Status: WISP Mode

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

Table 35   Status Screen: WISP Mode

LABEL	DESCRIPTION
Logout	Click this at any time to exit the Web Configurator.
Device Information	
Host Name	This is the **System Name** you enter in the **Maintenance** > **General** screen. It is for identification purposes.
Firmware Version	This is the firmware version and the date created.
Sys OP Mode	This is the device mode (Section 7.1.2 on page 59) to which the NBG4615 is set - **WISP 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.
- DHCP	This shows the LAN port's DHCP role - **Client** or **None**.
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 Information	
- WLAN OP Mode	This is the device mode (Section 7.1.2 on page 59) to which the NBG4615's wireless LAN is set - **WISP Mode**.
- MAC Address	This shows the wireless adapter MAC Address of your device.
- Status	This shows the current status of the Wireless LAN - **ON** or **OFF**.
- Name (SSID)	This shows a descriptive name used to identify the NBG4615 in the wireless LAN.
- Connect Status	This shows whether or not the NBG4615 has successfully associated with an access point - **Associated** or **Disassociated**.
- Security Mode	This shows the level of wireless security the NBG4615 is using.
- 802.11 Mode	This shows the wireless standard.
System Status	
Item	This column shows the type of data the NBG4615 is recording.
Data	This column shows the actual data recorded by the NBG4615.
System Up Time	This is the total time the NBG4615 has been on.
Current Date/Time	This field displays your NBG4615's present date and time.
System Resource	

Table 35 Status Screen: WISP Mode (continued)

LABEL	DESCRIPTION
- CPU Usage	This displays what percentage of the NBG4615's processing ability is currently used. When this percentage is close to 100%, the NBG4615 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 NBG4615 is using.
System Setting	
- Firewall	This shows whether the firewall is enabled or not.
- Bandwidth Management	This shows whether the bandwidth management is enabled or not.
- UPnP	This shows whether UPnP is enabled or not.
- Configuration Mode	This shows the web configurator mode you are viewing - **Expert**.
Interface Status	
Interface	This displays the NBG4615 port types. The port types are: **LAN** and **WLAN**.
Status	For the LAN and WAN ports, this field displays **Down** (line is down) or **Up** (line is up or connected). For the WLAN, it displays **Up** when the WLAN is enabled or **Down** when the WLAN is disabled.
Rate	For the LAN ports, this displays the port speed and duplex setting or **N/A** when the line is disconnected. For the WAN port, it displays the port speed and duplex setting if you're using Ethernet encapsulation and **Idle** (line (ppp) idle), **Dial** (starting to trigger a call) and **Drop** (dropping a call) if you're using PPPoE or PPTP encapsulation. This field displays **N/A** when the line is disconnected. For the WLAN, it displays the maximum transmission rate when the WLAN is enabled and **N/A** when the WLAN is disabled.
Summary	
BW MGMT Monitor	Click **Details...** to go to the **Monitor > BW MGMT Monitor** screen (Section 6.4 on page 55). Use this screen to view the amount of network bandwidth that applications running in the network are using.
DHCP Table	Click **Details...** to go to the **Monitor > DHCP Table** screen (Section 6.5 on page 56). Use this screen to view current DHCP client information.
Packet Statistics	Click **Details...** to go to the **Monitor > Packet Statistics** screen (Section 6.6 on page 57). Use this screen to view port status and packet specific statistics.

12.4.0.1 Navigation Panel

Use the menu in the navigation panel to configure NBG4615 features in WISP mode.

The following screen and table show the features you can configure in **Access Point** mode.

Figure 66 Menu: WISP Mode
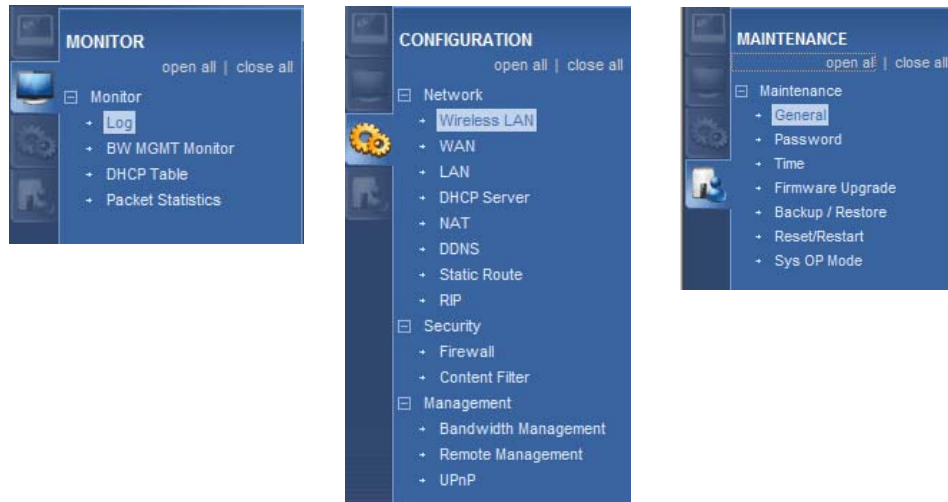
Refer to *Table 28 on page 77* for descriptions of the labels shown in the **Navigation** panel.

12.5 Wireless LAN General Screen

Use this screen to configure the wireless LAN settings of your NBG4615. Go to **Configuration > Wireless LAN > General** to open the following screen.

Figure 67 WISP Mode: Wireless LAN > General

The following table describes the labels in this screen.

Table 36 WISP Mode: Wireless LAN > General

LABEL	DESCRIPTION
WISP Parameters	
SSID	Enter the name of the access point to which you are connecting.
Channel Selection	The range of radio frequencies used by IEEE 802.11b/g/n wireless devices is called a channel. The device will automatically select the channel with the least interference.

Table 36 WISP Mode: Wireless LAN > General (continued)

LABEL	DESCRIPTION
Security Mode	Select the security mode of the access point to which you want to connect.
Apply	Click **Apply** to save your changes back to the NBG4615.
Cancel	Click **Cancel** to reload the previous configuration for this screen.

12.5.0.1 No Security

Use this screen if the access point to which you want to connect does not use encryption.

Figure 68 No Security (WISP)

The following table describes the labels in this screen.

Table 37 No Security (WISP)

LABEL	DESCRIPTION
WISP Parameters	
SSID	Enter the name of the access point to which you are connecting.
Channel Selection	The range of radio frequencies used by IEEE 802.11b/g/n wireless devices is called a channel. The device will automatically select the channel with the least interference.
Security Mode	Select **No Security** in this field.
Apply	Click **Apply** to save your changes back to the NBG4615.
Cancel	Click **Cancel** to reload the previous configuration for this screen.

12.5.1 Static WEP

Use this screen if the access point to which you want to connect to uses WEP security mode.

Figure 69 WEP (WISP)

The following table describes the labels in this screen.

Table 38 WEP (WISP)

LABEL	DESCRIPTION
WISP Parameters	
SSID	Enter the name of the access point to which you are connecting.
Channel Selection	The range of radio frequencies used by IEEE 802.11b/g/n wireless devices is called a channel. The device will automatically select the channel with the least interference.
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 NBG4615 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-bit WEP** or **128-bit WEP**. This dictates the length of the security key that the network is going to use.
ASCII	Select this option in order to enter ASCII characters as WEP key.

Table 38   WEP (WISP) (continued)

LABEL	DESCRIPTION
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 NBG4615 and the wireless stations must use the same WEP key for data transmission. If you chose **64-bit WEP**, then enter any 5 ASCII characters or 10 hexadecimal characters ("0-9", "A-F"). If you chose **128-bit WEP**, then enter 13 ASCII characters or 26 hexadecimal characters ("0-9", "A-F"). 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 NBG4615.
Cancel	Click **Cancel** to reload the previous configuration for this screen.

12.5.2 WPA(2)-PSK

Use this screen if the access point to which you want to connect uses WPA(2)-PSK security mode.

Figure 70   WPA-PSK/WPA2-PSK (WISP)

The following table describes the labels in this screen.

Table 39   WPA-PSK/WPA2-PSK (WISP)

LABEL	DESCRIPTION
WISP Parameters	
SSID	Enter the name of the access point to which you are connecting.
Channel Selection	The range of radio frequencies used by IEEE 802.11b/g/n wireless devices is called a channel. The device will automatically select the channel with the least interference.
Security Mode	Select **WPA-PSK** or **WPA2-PSK** to enable data encryption.
Encryption Type	Select the type of wireless encryption employed by the access point to which you want to connect.

Table 39 WPA-PSK/WPA2-PSK (WISP) (continued)

LABEL	DESCRIPTION
Pre-Shared Key	**WPA-PSK/WPA2-PSK** uses a simple common password for authentication. Type the pre-shared key employed by the access point to which you want to connect.
Apply	Click **Apply** to save your changes back to the NBG4615.
Cancel	Click **Cancel** to reload the previous configuration for this screen.

12.5.3 Site Survey Screen

Use this screen to scan for and connect to a wireless network automatically. Go to **Configuration > Site Survey** to open the following screen.

Figure 71 Configuration > Wireless LAN > Site Survey (WISP)

The following table describes the labels in this screen.

Table 40 Configuration > Wireless LAN > Site Survey (WISP)

LABEL	DESCRIPTION
Station Site Survey	
#	Select a wireless device and click **Add Profile** to open a configuration screen where you can add the selected wireless device to a profile and then enable it.
SSID	This displays the SSID of the wireless device. indicates the wireless device is added to an activated profile and the NBG4615 is connecting to it.
BSSID	This displays the MAC address of the wireless device.
Signal Strength	This displays the strength of the wireless signal. The signal strength mainly depends on the antenna output power and the distance between your NBG4615 and this device.
Channel	This displays the channel number used by this wireless device.
station encryp	This displays the data encryption method used by this wireless device.
station auth	This displays the authentication method used by this wireless device.

Table 40 Configuration > Wireless LAN > Site Survey (WISP) (continued)

LABEL	DESCRIPTION
Network Type	This displays the network type (**In** (Infrastructure) or **Ad** (Ad Hoc) of this wireless device.
Rescan	Click this button to search for available wireless devices within transmission range and update this table.
Setting	Select a wireless device and click this button to add it to a profile.

13

Tutorials

13.1 Overview

This chapter provides tutorials for setting up your NBG4615.

- Set Up a Wireless Network with WPS
- Configure Wireless Security without WPS
- Using Multiple SSIDs on the NBG4615
- Connecting the NBG4615 (in Universal Repeater Mode) to an AP or Wireless Router

13.2 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 NBG4615 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 13.2.1 on page 112.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 NBG4615′s interface. See Section 13.2.2 on page 113. This is the more secure method, since one device can authenticate the other.

13.2.1 Push Button Configuration (PBC)

1 Make sure that your NBG4615 is turned on. Make sure the **WLAN** switch (at the back panel of the NBG4615) is set to **ON**, and that the device is placed within range of your computer.

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 NBG4615's Web Configurator and press the **Push Button** in the **Configuration > Network > Wireless Client > WPS Station** screen.

Note: Your NBG4615 has a WPS button located on its back 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 NBG4615 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 NBG4615 securely.

The following figure shows you an example to set up wireless network and security by pressing a button on both NBG4615 and wireless client (the NWD210N in this example).

Figure 72   Example WPS Process: PBC Method
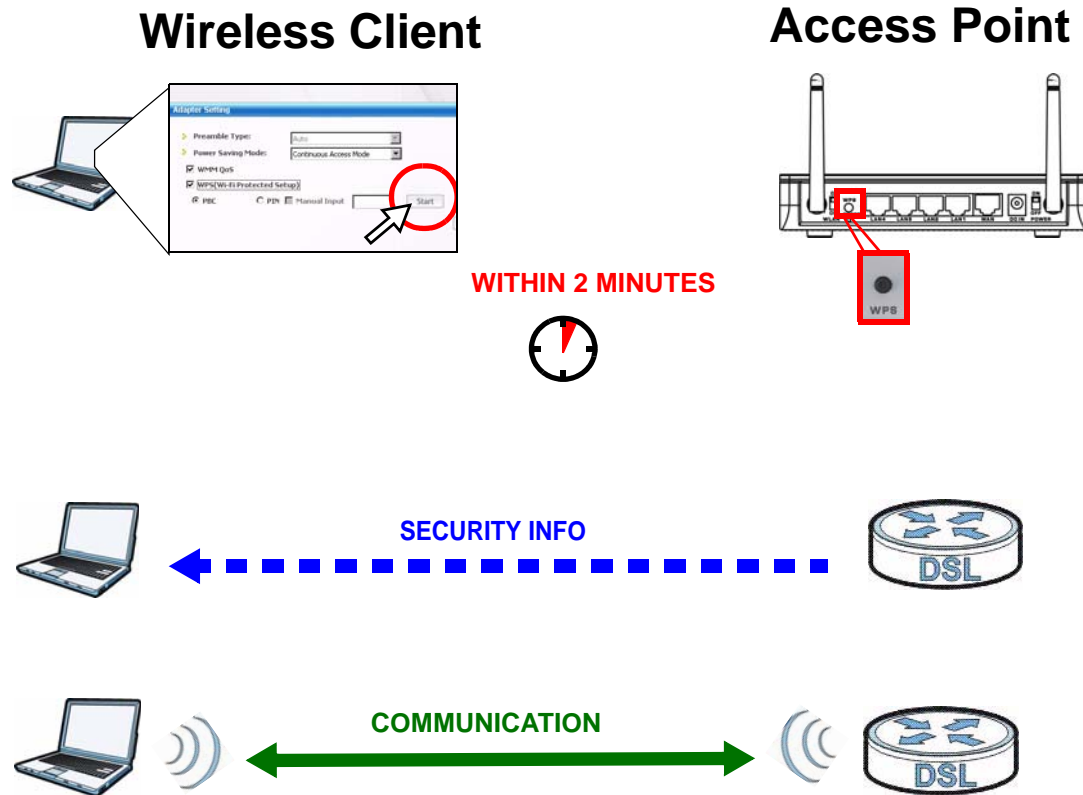
13.2.2 PIN Configuration

When you use the PIN configuration method, you need to use both NBG4615'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 > WPS Station** screen on the NBG4615.

3   Click **Start** buttons (or button next to the PIN field) on both the wireless client utility screen and the NBG4615's **WPS Station** screen within two minutes.

The NBG4615 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 NBG4615 securely.

The following figure shows you the example to set up wireless network and security on NBG4615 and wireless client (ex. NWD210N in this example) by using PIN method.

Figure 73 Example WPS Process: PIN Method
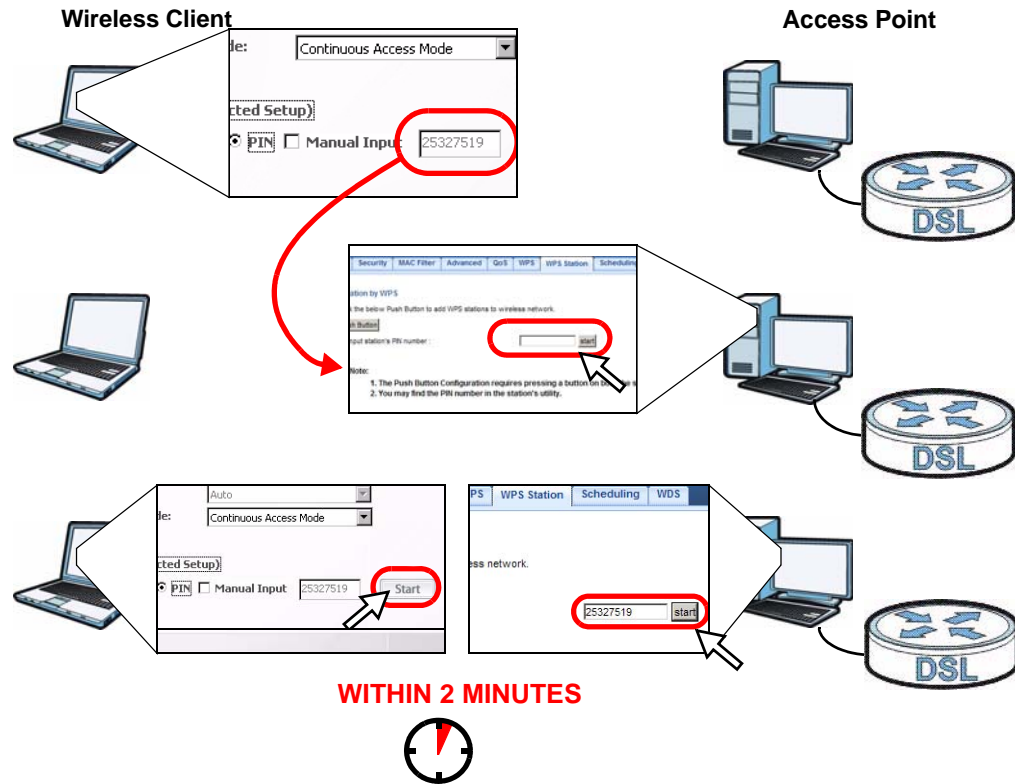
13.3 Configure Wireless Security without WPS

This example shows you how to configure wireless security settings with the following parameters on your NBG4615.

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

Follow the steps below to configure the wireless settings on your NBG4615.

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 5.2 on page 47).

1 Make sure the **WLAN** switch (at the back panel of the NBG4615) is set to **ON**.

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

3 Confirm that the status of wireless LAN is **ON**.

4 Enter **SSID_Example3** as the SSID and select **Channel-06** as the channel. Click **Apply**.

5 Go to the **Configuration > Network > Wireless LAN > Security** screen. Set security mode to **WPA-PSK** and enter **ThisismyWPA-PSKpre-sharedkey** in the **Pre-Shared Key** field. Click **Apply**.l

6 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**.

13.3.1 Configure Your Notebook

Note: We use the ZyXEL M-302 wireless adapter utility screens as an example for the wireless client. The screens may vary for different models.

1 The NBG4615 supports 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**.
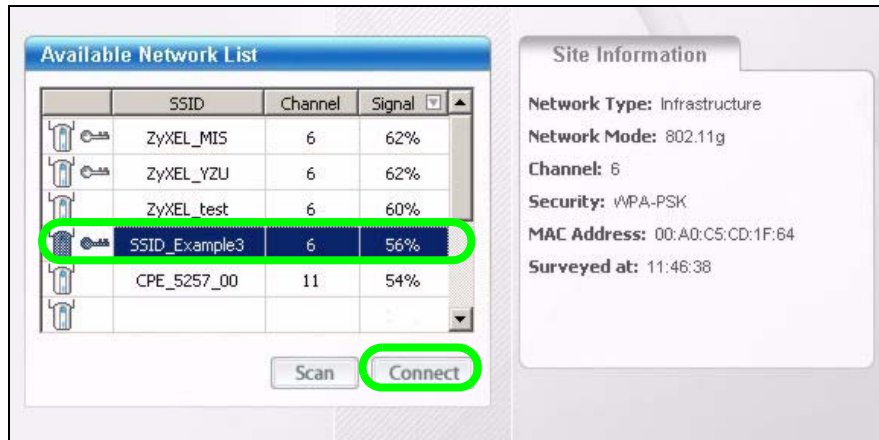
5 Select WPA-PSK and type the security key in the following screen. Click **Next**.
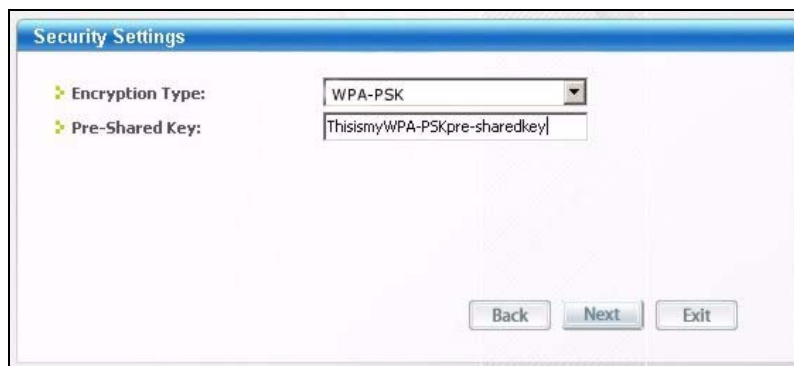
6 The **Confirm Save** window appears. Check your settings and click **Save** to continue.
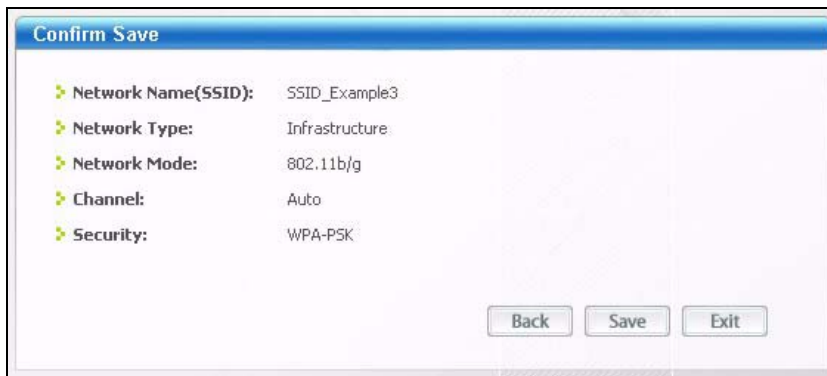
7 Check the status of your wireless connection in the screen below. If your wireless connection is weak or you have no connection, see the Troubleshooting section of this User's Guide.
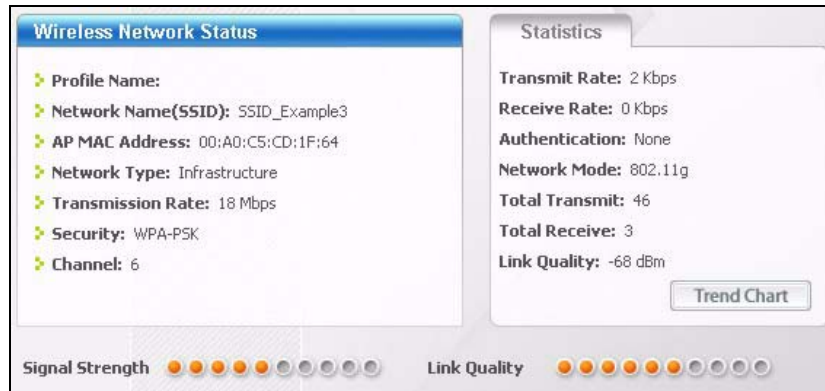
If your connection is successful, open your Internet browser and enter http://www.zyxel.com or the URL of any other web site in the address bar. If you are able to access the web site, your wireless connection is successfully configured.

13.4 Using Multiple SSIDs on the NBG4615

You can configure more than one SSID on a NBG4615 when it is operating in access point or universal repeater mode. This allows you to configure multiple independent wireless networks on the NBG4615 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 NBG4615 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 NBG4615 (such as a printer). You can allow communication between wireless clients of different SSIDs in the **Network > Wireless LAN > General** screen. See for more information.

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.
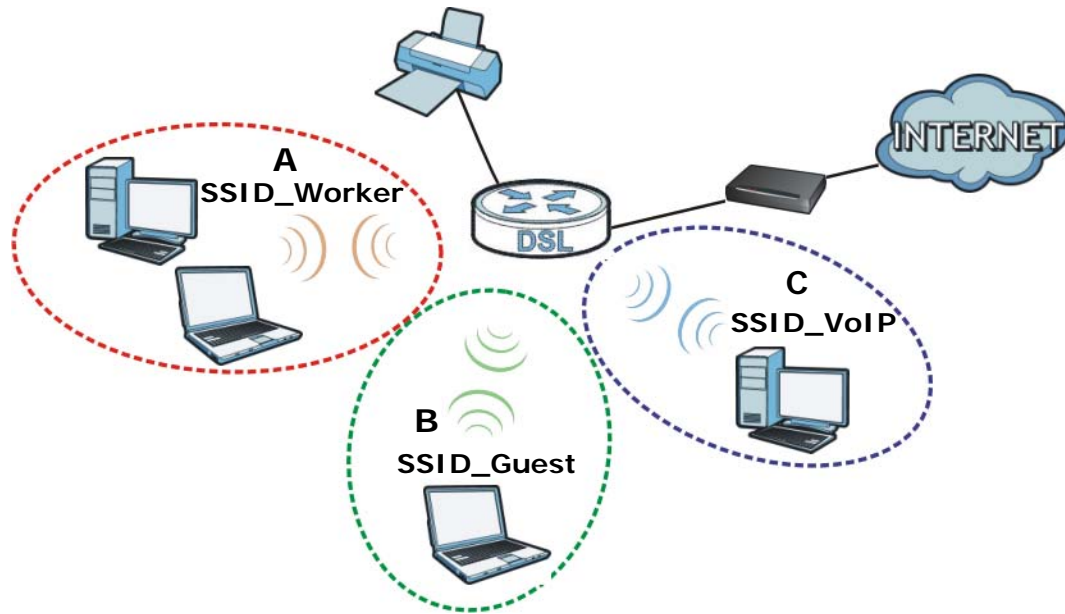
13.4.1 Configuring Security Settings of Multiple SSIDs

The NBG4615 is in access point mode by default. If you want to use multiple SSIDs when the NBG4615 is in universal repeater mode, see for how to set the NBG4615 to universal repeater mode.

This example shows you how to configure the SSIDs with the following parameters on your NBG4615 (in access point mode).

SSID	SECURITY TYPE	KEY	MAC FILTERING
SSID_Worker	WPA2-PSK WPA Compatible	DoNotStealMyWireless Network	Disable
SSID_Guest	Static WEP 128bit	keyexample123	Disable
SSID_VoIP	WPA-PSK	VoIPOnly12345678	Allow 00:A0:C5:01:23:45

1 Connect your computer to the LAN port of the NBG4615 using an Ethernet cable.

2 The default IP address of the NBG4615 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 C on page 163 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://192.168.1.2" 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 > General**. Configure the screen as follows. In this example, you select **Enable Intra-BSS Traffic** for **SSID_Worker** and **SSID_Guest** to allow wireless clients in the same wireless network to communicate with each other. Click **Apply**.

9 Click the **Security** tab to configure security settings for each SSID. Select **SSID_Worker** from the **SSID** drop-down list. Configure the screen as follows. Click **Apply**.

10 Select **SSID_Guest** from the **SSID** drop-down list. Configure the screen as follows. Click **Apply**.

11 Select **SSID_VoIP** from the **SSID** drop-down list. Configure the screen as follows. Click **Apply**.

12 Click the **MAC Filter** tab to configure MAC filtering for the **SSID_VoIP** wireless network. Select **SSID_VoIP** from the **SSID** drop-down list and select **Allow** in the **Policy** field. Enter the VoIP device's MAC address in the **Add a station Mac Address** field and click **Apply** to allow only the VoIP device to associate with the NBG4615 using this SSID.

13.5 Connecting the NBG4615 (in Universal Repeater Mode) to an AP or Wireless Router

If you have an access point or wireless router with Internet access deployed in your network already, and you want to have wireless clients connect to the existing AP or wireless router through the NBG4615, set the NBG4615 to

Universal Repeater mode and then associate the NBG4615 with the AP or wireless router. The NBG4615 must be within the transmission range of the AP or wireless router.

1 Connect your computer to the LAN port of the NBG4615 using an Ethernet cable.

2 The default IP address of the NBG4615 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 C on page 163 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://192.168.1.2" 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 On the left of the screen, click **Maintenance > Sys OP Mode** and select **Universal Repeater Mode**. Click **Apply**. The NBG4615 restarts.
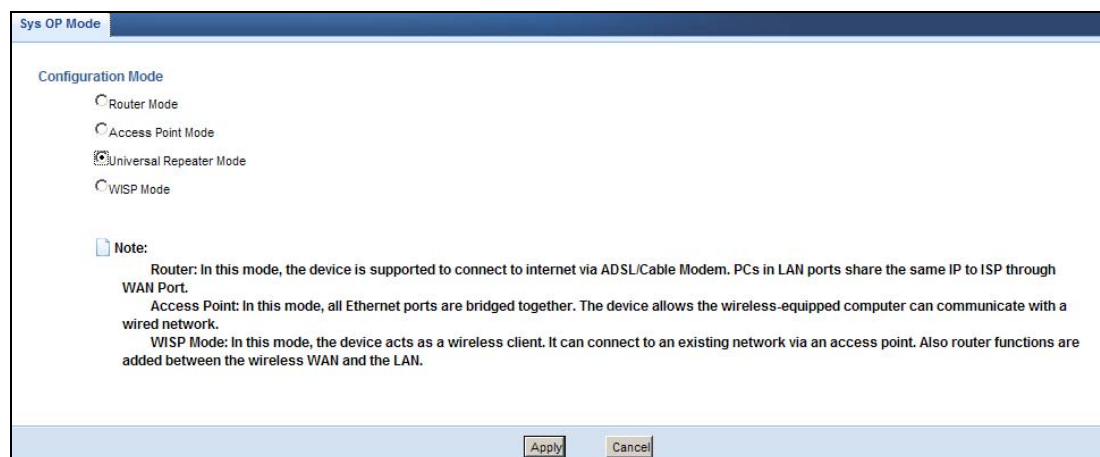
9 Enter the password and click **Login** to access the web configurator again. Click **Expert Mode**.

10 Go to **Configuration > Network > Wireless LAN > Universal Repeater** to connect the NBG4615 wirelessly to an AP. Select **Enable**. Enter the SSID of the existing AP or wireless router to which you want to connect ("SSIDofMyAP" in this example). Enter the wireless security settings which are the same as those on the existing AP or wireless router to access it (WPA-PSK and "KeyofMyWirelessNetwork" in this example). Click **Apply**.

11 Set the channel number in the **Wireless LAN > General** screen to be the same as the one on the wireless router or AP to which the NBG4615 is connecting. This allows wireless clients access or acquire an IP address from another AP or wireless router through the NBG4615 in universal repeater mode.

12 Go to the **Status** screen. If the NBG4615 has successfully connected to an AP or wireless router, it displays the SSID and MAC address of the AP or wireless router in the field next to **WLAN Station Status** under **Device Information**.

To check whether a wireless client is currently connecting to the NBG4615, click the **WLAN Station Status (Details…)** hyperlink under **Summary** in the **Status** screen or **Monitor > WLAN Station Status**. See for more information.

PART II
Technical Reference