# LINKSYS®

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2.4 GHz
802.11g

WIRELESS

# Wireless-G

## Router for Mobile Broadband

## User Guide

CISCO SYSTEMS

Model No. **WRT54G3G-ST**

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## How to Use This User Guide

This User Guide has been designed to make understanding networking with the Wireless-G Router for Mobile Broadband easier than ever. Look for the following items when reading this User Guide:

This checkmark means there is a note of interest and is something you should pay special attention to while using the Wireless-G Router for Wireless Broadband.

This exclamation point means there is a caution or warning and is something that could damage your property or the Wireless-G Router for Mobile Broadband.

This question mark provides you with a reminder about something you might need to do while using the Wireless-G Router for Mobile Broadband.

In addition to these symbols, there are definitions for technical terms that are presented like this:

*word:* *definition.*

Also, each figure (diagram, screenshot, or other image) is provided with a figure number and description, like this:

**Figure 0-1: Sample Figure Description**

Figure numbers and descriptions can also be found in the "List of Figures" section in the "Table of Contents".

WRT54G3G-ST-UG 60622NC BW

# Table of Contents

# List of Figures

# Chapter 1: Introduction

## Welcome

Thank you for choosing the Linksys Wireless-G Router for Mobile Broadband The Wireless-G Router for Mobile Broadband will allow you to network wirelessly better than ever, sharing Internet access, files and fun, easily and securely.

How does the Wireless-G Router for Mobile Broadband do all of this? A router is a device that allows access to an Internet connection over a network. With the Wireless-G Router for Mobile Broadband, you can access the Internet through either your mobile broadband service (requires a mobile broadband data card, available separately), or you can use a cable or DSL modem for broadband service. Plus, this access can be shared over the four switched ports or via the wireless broadcast at up to 54Mbps for Wireless-G or up to 11Mbps for Wireless-B.

Use the WPA or WPA2 standard to secure your wireless network while the whole network is protected through a Stateful Packet Inspection (SPI) firewall and Network Address Translation (NAT) technology. Run the Setup Wizard and it will guide you through the steps. You can also access the Router's features through the easy-to-use, browser-based utility.

But what does all of this mean?

Networks are useful tools for sharing computer resources. You can access one printer from different computers and access data located on another computer's hard drive. Networks are even used for playing multiplayer video games. So, networks are not only useful in homes and offices, they can also be fun.

PCs on a wired network create a LAN, or Local Area Network. They are connected with Ethernet cables, which is why the network is called "wired".

PCs equipped with wireless cards or adapters can communicate without cumbersome cables. By sharing the same wireless settings, within their transmission radius, they form a wireless network. This is sometimes called a WLAN, or Wireless Local Area Network. The Wireless-G Router for Mobile Broadband bridges wireless networks of both 802.11b and 802.11g standards and wired networks, allowing them to communicate with each other.

With your networks all connected, wired, wireless, and the Internet, you can now share files and Internet access—and even play games. All the while, the Wireless-G Router for Mobile Broadband protects your networks from unauthorized and unwelcome users.

*wpa* (wi-fi protected access): a wireless security protocol using TKIP (Temporal Key Integrity Protocol) encryption, which can be used in conjunction with a RADIUS server.

*wpa2* (wi-fi protected access2: a wireless security protocol using TKIP (Temporal Key Integrity Protocol) encryption and AES (Advanced Encryption System) *with dynamic encryption keys, which can be used in conjunction with a RADIUS server.*

*spi* (stateful packet inspection) *firewall*: a technology that inspects incoming packets of information before allowing them to enter the network.

*firewall*: Security measures that protect the resources of a local network from intruders.

*nat* (network address translation): NAT technology translates IP addresses of a local area network to a different IP address for the Internet.

*lan* (local area network): The computers and networking products that make up the network in your home or office.

Linksys recommends using the Setup CD-ROM for first-time installation of the Router. If you do not wish to run the Setup Wizard on the Setup CD-ROM, then use the instructions in this Guide to help you connect the Wireless-G Router for Mobile Broadband, set it up, and configure it to bridge your different networks. These instructions should be all you need to get the most out of the Wireless-G Router for Mobile Broadband.

## What's in this User Guide?

This user guide covers the steps for setting up and using the Wireless-G Router for Mobile Broadband.

- Chapter 1: Introduction
  This chapter describes the Router's applications and this User Guide.

- Chapter 2: Planning Your Wireless Network
  This chapter describes the basics of wireless networking.

- Chapter 3: Getting to Know the Wireless-G Router for Mobile Broadband
  This chapter describes the physical features of the Router.

- Chapter 4: Connecting the Wireless-G Router for Mobile Broadband
  This chapter instructs you on how to connect the Router to your network.

- Chapter 5: Setting up the Wireless-G Router for Mobile Broadband Service
  This chapter walks you through the steps of the Setup Wizard to configure the Router for Mobile Broadband service only.

- Chapter 6: Setting up the Wireless-G Router for Broadband WAN Service Only
  This chapter walks you through the steps of the Setup Wizard to configure the Router for broadband WAN service only.

- Chapter 7: Setting up the Wireless-G Router for Broadband WAN and Wireless Broadband Service
  This chapter walks you through the steps of the Setup Wizard to configure the Router for broadband WAN and Wireless Broadband service.

- Chapter 8: Configuring the Wireless-G Router for Mobile Broadband
  This chapter explains how to use the Web-based Utility to configure the settings on the Wireless-G Router for Mobile Broadband.

- Appendix A: Troubleshooting
  This appendix describes some problems and solutions, as well as frequently asked questions, regarding installation and use of the Wireless-G Router for Mobile Broadband.

- Appendix B: Wireless Security
  This appendix explains the risks of wireless networking and some solutions to reduce the risks.

- Appendix C: Upgrading Firmware
  This appendix instructs you on how to upgrade the firmware on the Router should you need to do so.

- Appendix D: Windows Help
  This appendix describes how you can use Windows Help for instructions about networking, such as installing the TCP/IP protocol.

- Appendix E: Finding the MAC Address and IP Address for your Ethernet Adapter.
  This appendix describes how to find the MAC address for your computer's Ethernet adapter so you can use the MAC filtering and/or MAC address cloning feature of the Router.

- Appendix F: Glossary
  This appendix gives a brief glossary of terms frequently used in networking.

- Appendix G: Specifications
  This appendix provides the technical specifications for the Router.

- Appendix H: Warranty Information
  This appendix supplies the warranty information for the Router.

- Appendix I: Regulatory Information
  This appendix supplies the regulatory information regarding the Router.

- Appendix J: Contact Information
  This appendix provides contact information for a variety of Linksys resources, including Technical Support.

# Chapter 2: Planning Your Wireless Network

## Network Topology

A wireless local area network (WLAN) is exactly like a regular local area network (LAN), except that each computer in the WLAN uses a wireless device to connect to the network. Computers in a WLAN share the same frequency channel and SSID, which is an identification name shared by the wireless devices belonging to the same wireless network.

*ssid (service set identifier): your wireless network's name.*

## Ad-Hoc versus Infrastructure Mode

Unlike wired networks, wireless networks have two different modes in which they may be set up: infrastructure and ad-hoc. An infrastructure configuration is a WLAN and wired LAN communicating to each other through an access point. An ad-hoc configuration is wireless-equipped computers communicating directly with each other. Choosing between these two modes depends on whether or not the wireless network needs to share data or peripherals with a wired network or not.

*infrastructure: a wireless network that is bridged to a wired network via an access point.*

If the computers on the wireless network need to be accessible by a wired network or need to share a peripheral, such as a printer, with the wired network computers, the wireless network should be set up in Infrastructure mode. The basis of Infrastructure mode centers around a wireless router or an access point, such as the Wireless-G Router for Mobile Broadband, which serves as the main point of communications in a wireless network. The Router transmits data to PCs equipped with wireless network adapters, which can roam within a certain radial range of the Router.  You can arrange the Router and multiple access points to work in succession to extend the roaming range, and you can set up your wireless network to communicate with your Ethernet hardware as well.

*ad-hoc: a group of wireless devices communicating directly to each other (peer-to-peer) without the use of an access point.*

If the wireless network is relatively small and needs to share resources only with the other computers on the wireless network, then the Ad-Hoc mode can be used. Ad-Hoc mode allows computers equipped with wireless transmitters and receivers to communicate directly with each other, eliminating the need for a wireless router or access point. The drawback of this mode is that in Ad-Hoc mode, wireless-equipped computers are not able to communicate with computers on a wired network. And, of course, communication between the wireless-equipped computers is limited by the distance and interference directly between them.

## Network Layout

The Wireless-G Router for Mobile Broadband has been specifically designed for use with both your 802.11b and 802.11g products. It is compatible with all 802.11g and 802.11b adapters, such as the notebook adapters for your

laptop computers, PCI adapters for your desktop PCs, and USB adapters when you want to enjoy USB connectivity. The Router will also communicate with the Wireless PrintServer and Wireless Ethernet Bridges.

When you wish to connect your wireless network with your wired network, you can use the Wireless-G Router for Mobile Broadband's four Ethernet LAN ports. To add more ports, any of the Router's LAN ports can be connected to any of Linksys's switches.

With these, and many other Linksys products, your networking options are limitless. Go to the Linksys website at www.linksys.com for more information about products that work with the Wireless-G Router for Mobile Broadband.

# Chapter 3: Getting to Know the Wireless-G Router for Mobile Broadband

## The Router's Ports

The Router's ports and Reset button are located on the side panel with the antenna port.



**Figure 3-1: The Router's Ports**

**Antenna**          The antenna port is where you will attach the Router's antenna.

**Internet**          The **Internet** port is where you will connect your broadband Internet connection, if you are using broadband WAN service.

**Ethernet**
**1, 2, 3, 4**          These ports (1, 2, 3, 4) connect the Router to your PCs and other Ethernet network devices.

**Security Bracket**  The bracket labeled "RESET" clips onto the Router. It covers the Reset button and the security slot on the Router's front panel. You can remove the security bracket to access the Reset button. To protect the Router from theft, you can attach a lock to the Router using the security slot and bracket.

**Reset Button**     There are two ways to reset the Router's factory defaults. Either press the **Reset** button, for approximately five seconds, or restore the defaults from the Administration tab - Factory Defaults tab in the Router's Web-based Utility.

**Power**             The **Power** port is where you will connect the power adapter.



Security Bracket
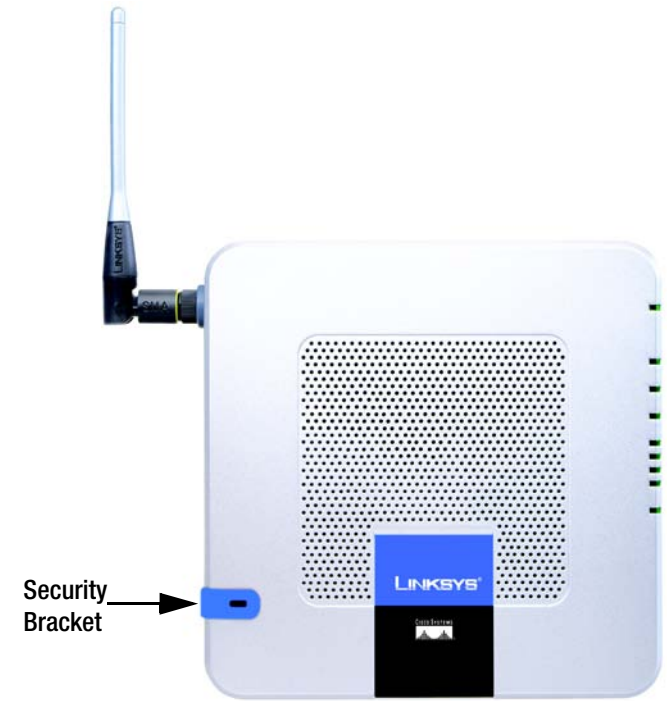
**Figure 3-2: The Router's Front Panel**

> **IMPORTANT:** Resetting the Router will erase all of your settings (Internet connection, wireless security, and other settings) and replace them with the factory defaults. Do not reset the Router if you want to retain these settings.

## The Router's LEDs

The Router's LEDs are located on the Router's other side panel.



**Figure 3-3: The Router's LEDs**

**Data Card Button** This button allows you to connect to and disconnect from the mobile network (you can also connect and disconnect using the Basic Setup tab of the Router's Web-based Utility).

**POWER**          Green. The **POWER** LED lights up and will stay on when the Router is powered on. When the Router goes through its self-diagnostic mode during every boot-up, this LED will flash. When the diagnostic is complete, the LED will be solidly lit.

**ETHERNET
1, 2, 3, 4**       Green. These numbered LEDs, corresponding with the numbered ports on the Router's back panel, serve two purposes. If the LED is continuously lit, the Router is successfully connected to a device through that port. A flashing LED indicates network activity over that port.

**DMZ**            Green. The **DMZ** LED lights up and will remain lit while the Router uses its DMZ function.

**WIRELESS**       Green. The **WIRELESS** LED lights up whenever there is a successful wireless connection. If the LED is flashing, the Router is actively sending or receiving data over the wireless network.

**DATA CARD**      Blue.The **DATA CARD** LED flashes as the Router connects to the mobile network. It is solidly lit when the connection is established.

                   The LED quickly flashes if the Router does not have a connection to the mobile network. A data card must be inserted into the Router when you press the Data Card Connect/Disconnect button.

**INTERNET**       Green. The **INTERNET** LED lights up when a connection is made through the Internet port.

## The Router's Data Card Slot

The Router's Data Card slot is located on the Router's top panel.



**Figure 3-4: The Router's Data Card Slot**

**Data Card Slot**    Insert the mobile broadband data card (available separately) into this slot if the Router will connect to a mobile broadband service.

# Chapter 4: Connecting the Wireless-G Router for Mobile Broadband

## Overview

Most users who are connecting the Router to the Internet for the first time can proceed to the appropriate chapter about the Setup Wizard and use this chapter as reference on how to connect the hardware. There are three chapters about the Setup Wizard available. If you want to configure the Router for mobile broadband service only, go to "Chapter 5: Setting up the Wireless-G Router for Mobile Broadband Service." If you want to configure the Router for broadband WAN service only, go to "Chapter 6: Setting up the Wireless-G Router for Broadband WAN Service Only." If you want to configure the Router for broadband WAN and mobile broadband service, go to "Chapter 7: Setting up the Wireless-G Router for Broadband WAN and Mobile Broadband Service."

This chapter includes three sets of instructions. Follow the instructions for your configuration.

- If the Router will use the mobile broadband service only, follow the instructions in "Hardware Installation for Use of the Mobile Broadband Service."

- If the Router will be the only router in your network and you have a broadband modem, follow the instructions in "Hardware Installation for Connection to Your Broadband Modem."

- If you want to install the Wireless-G Router for Mobile Broadband behind another router in your network, then follow the instructions in "Hardware Installation for Connection to Another Router."

## Hardware Installation for Use of the Mobile Broadband Service Only

1. Power down your network devices.

2. Locate an optimum location for the Router. The best place for the Router is usually at the center of your wireless network, with line of sight to all of your mobile stations.

3. Attach the antenna and fix its direction. Try to place the Router in a position that will best cover your wireless network. Normally, the higher you place the antenna, the better the performance will be.

4.  Connect your network PCs or Ethernet devices to the Router's numbered ports using standard Ethernet network cabling.
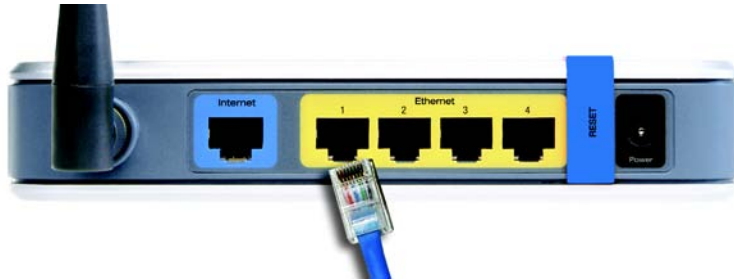


**Figure 4-1: Connect Your Computer**

5.  Connect the power adapter to the Router's Power port, and plug the other end into an electrical outlet. Only use the power adapter supplied with the Router. Use of a different adapter may result in product damage.

**IMPORTANT:** Make sure you use the power adapter that is supplied with the Router. Use of a different power adapter could damage the Router.
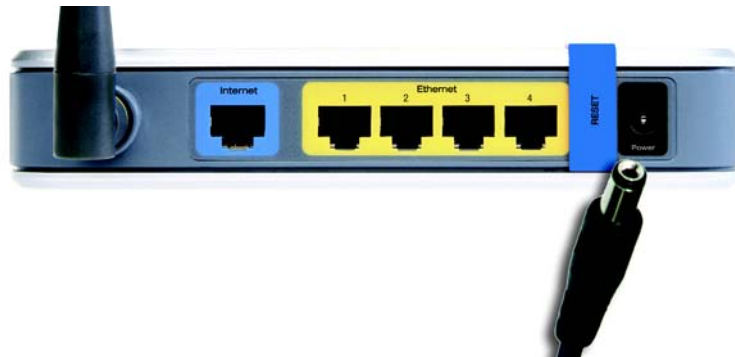


**Figure 4-2: Connect the Power**

Proceed to the section at the end of this chapter, "Placement Options."

Chapter 4: Connecting the Wireless-G Router for Mobile Broadband
Hardware Installation for Use of the Mobile Broadband Service Only

10

## Hardware Installation for Connection to Your Broadband Modem

1.  Power down your network devices.

2.  Locate an optimum location for the Router. The best place for the Router is usually at the center of your wireless network, with line of sight to all of your mobile stations.

3.  Attach the antenna and fix its direction. Try to place the Router in a position that will best cover your wireless network. Normally, the higher you place the antenna, the better the performance will be.

4.  Connect a standard Ethernet network cable to the Router's Internet port. Then, connect the other end of the Ethernet cable to your cable or DSL broadband modem.
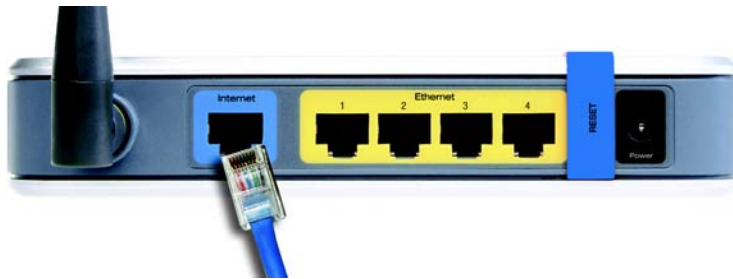


**Figure 4-3: Connect the Broadband Modem**

Chapter 4: Connecting the Wireless-G Router for Mobile Broadband
Hardware Installation for Connection to Your Broadband Modem

11

5.  Connect your network PCs or Ethernet devices to the Router's numbered ports using standard Ethernet network cabling.

6.  Connect the power adapter to the Router's Power port, and plug the other end into an electrical outlet. Only use the power adapter supplied with the Router. Use of a different adapter may result in product damage.

**Proceed to the section at the end of this chapter, "Placement Options."**
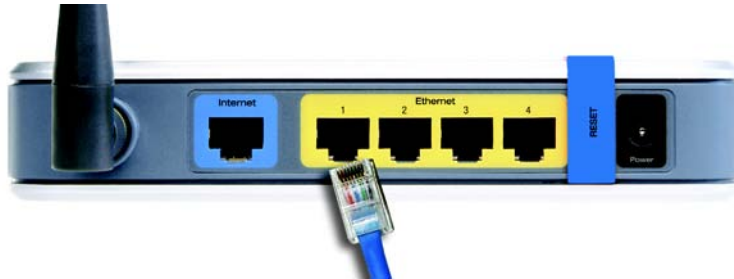
**Figure 4-4: Connect Your Computer**

> **IMPORTANT:** Make sure you use the power adapter that is supplied with the Router. Use of a different power adapter could damage the Router.
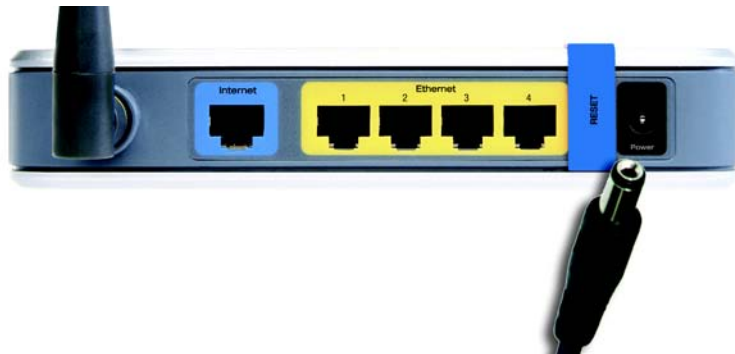
**Figure 4-5: Connect the Power**

**Chapter 4: Connecting the Wireless-G Router for Mobile Broadband**
**Hardware Installation for Connection to Your Broadband Modem**

**12**

# Hardware Installation for Connection to Another Router

Before you install the Wireless-G Router for Mobile Broadband, you will need to check if the default IP address of the other Router is **192.168.1.1.** If so, there will be an IP address conflict with the new Router. Follow the instructions below to change the default IP address of the existing Router to **192.168.2.1**.

**NOTE:** Steps 1-4 are instructions for a typical Linksys router; however, if you are using a non-Linksys router, refer to the other router's documentation for instructions on how to change its local IP address to 192.168.2.1.

First, make sure the Router is NOT connected to your network. Then follow these instructions:

1. To access the other Router's Web-based Utility, launch Internet Explorer or Netscape Navigator, and enter the other router's default IP address in the *Address* field. Then press **Enter**.

2. A password request page will appear. Leave the *User Name* field blank. In the *Password* field, enter the password you have set (the default password is **admin**). Then click the **OK** button.

3. The first screen that appears will display the Setup tab. In the *Network Setup* section, there is a setting called *Local IP Address*, which is set to 192.168.1.1. Change this to **192.168.2.1**.

4. Click the **Save Settings** button to save your change, and then exit the Web-based Utility.

5. Power down your network devices. Now you will begin the hardware installation of Router.

6. Locate an optimum location for the Router. The best place for the Router is usually at the center of your wireless network, with line of sight to all of your mobile stations.

7. Attach the antenna and fix its direction. Try to place the Router in a position that will best cover your wireless network. Normally, the higher you place the antenna, the better the performance will be.

8. Connect a standard Ethernet network cable to the Router's Internet port. Then, connect the other end of the Ethernet cable to one of the numbered Ethernet ports on your other router.
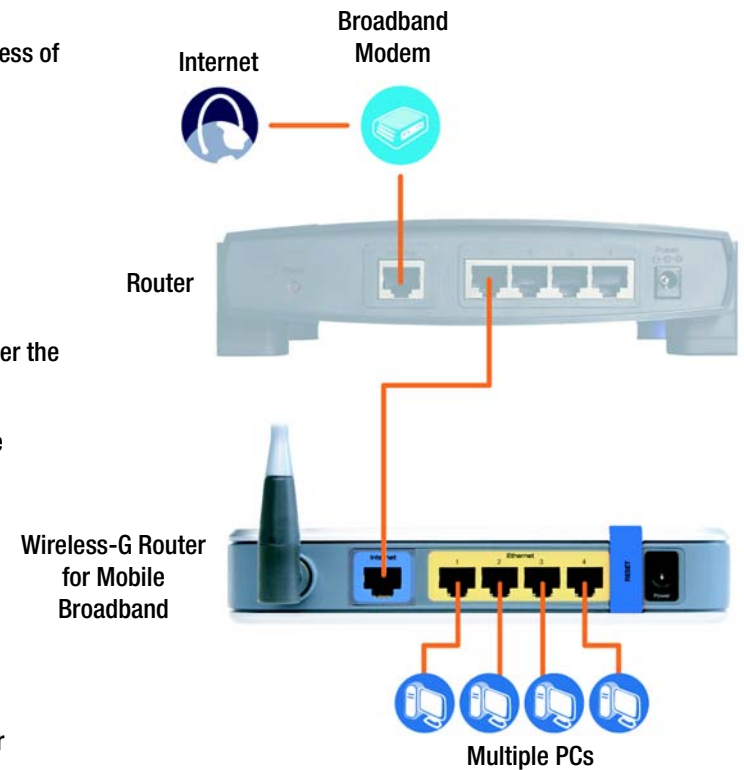
**Figure 4-6: Diagram for Connection to Another Router**
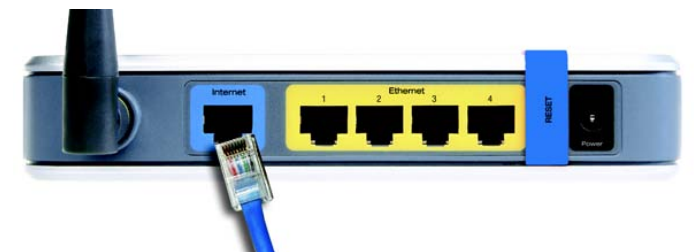
**Figure 4-7: Connect Another Router**

9. Decide which network computers or Ethernet devices you want to connect to the Router.

   Disconnect the selected computers or devices from the other router, and then connect them to the Router's numbered ports using standard Ethernet network cabling.
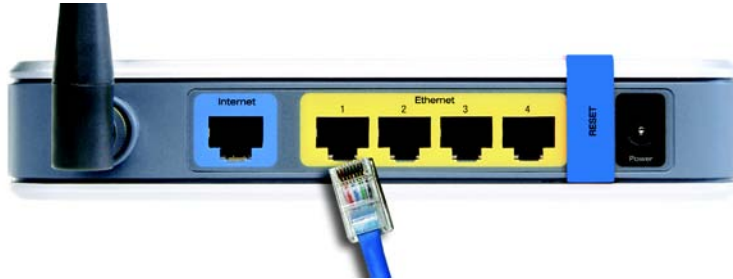


**Figure 4-8: Connect Your Computer**

10. Connect the power adapter to the Router's Power port, and plug the other end into an electrical outlet. Only use the power adapter supplied with the Router. Use of a different adapter may result in product damage.

**IMPORTANT:** Make sure that you use the power adapter that is supplied with the Router. Use of a different power adapter could damage the Router.



**Figure 4-9: Connect the Power**

**Proceed to the next section, "Placement Options."**

**Chapter 4: Connecting the Wireless-G Router for Mobile Broadband**
**Hardware Installation for Connection to Another Router**

14

# Placement Options

There are three ways to place the Router. The first way is to place it horizontally on a surface, so it sits on its four rubber feet. The second way is to stand the Router vertically on a surface. The third way is to mount it on a wall. The second and third options are explained in further detail below.

## Stand Option

1. Line up the center of the Router's stand with the center of the Router's labeled edge.

2. Insert the Router into the stand.

**If you want to configure the Router for mobile broadband service only, go to "Chapter 5: Setting up the Wireless-G Router for Mobile Broadband Service."**

**If you want to configure the Router for broadband WAN service only, go to "Chapter 6: Setting up the Wireless-G Router for Broadband WAN Service Only."**

**If you want to configure the Router for broadband WAN and mobile broadband service, go to "Chapter 7: Setting up the Wireless-G Router for Broadband WAN and Mobile Broadband Service."**

**Figure 4-10: Stand Attached to the Router**

## Wall-Mount Option

The Router has four wall-mount slots on its bottom panel. The distance between two adjacent slots is 68 mm (2.68 inches).

Before you begin, make sure you have two screws that are size #4—this indicates a diameter measurement of 2.845 mm (0.112 inches).

1.  Determine where you want to mount the Router.

2.  Drill two holes into the wall. Make sure adjacent holes are 68 mm (2.68 inches) apart.

3.  Insert a screw into each hole, and leave 5 mm (0.2 inches) of its head exposed.

4.  Maneuver the Router so the top wall-mount slots line up with the two screws.

5.  Place the wall-mount slots over the screws and slide the Router down until the screws fit snugly into the wall-mount slots.

**If you want to configure the Router for mobile broadband service only, go to "Chapter 5: Setting up the Wireless-G Router for Mobile Broadband Service."**

**If you want to configure the Router for broadband WAN service only, go to "Chapter 6: Setting up the Wireless-G Router for Broadband WAN Service Only."**

**If you want to configure the Router for broadband WAN and mobile broadband service, go to "Chapter 7: Setting up the Wireless-G Router for Broadband WAN and Mobile Broadband Service."**
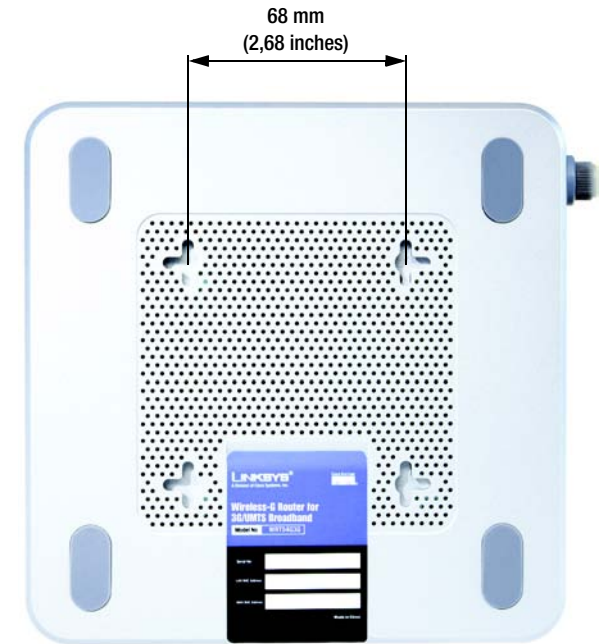


**Figure 4-11: Measurement between Wall-Mount Slots**

# Chapter 5: Setting up the Wireless-G Router for Mobile Broadband Service

## Overview

This chapter covers the steps for configuring the Router for mobile broadband service only. If you want to configure the Router for broadband WAN service only, go to "Chapter 6: Setting up the Wireless-G Router for Broadband WAN Service Only." If you want to configure the Router for broadband WAN and mobile broadband service, go to "Chapter 7: Setting up the Wireless-G Router for Broadband WAN and Mobile Broadband Service."

## Before You Begin

Before you begin, make sure that you have the following:
• your activated Mobile Broadband Data Card
• your Mobile Broadband Data Card Service information.

The information about your Mobile Broadband Data Card was included with your Mobile Broadband Data Card package. If you do not have this information, contact the mobile broadband service provider's customer support.

**IMPORTANT:** If you do NOT have your Mobile Broadband Data Card you cannot configure the Router for mobile broadband service. However, you can configure the Router for broadband WAN service; for instructions, proceed to "Chapter 6: Setting up the Wireless-G Router for Broadband WAN Service Only."

**IMPORTANT:** Make sure your Mobile Broadband Data Card is activated before starting the setup. If you have not already done so, follow the instructions provided in your Card's documentation.

# Using the Setup Wizard

1. Insert the Setup Wizard CD-ROM into your CD-ROM drive. The Setup Wizard should run automatically, and the *Welcome* screen should appear.  If it does not, click the **Start** button and choose **Run**. In the field that appears, enter **D:\SetupWizard.exe** (if "D" is the letter of your CD-ROM drive).

2. On the *Welcome* screen, click the **Click Here to Start** button if this is the first time you are running the Setup Wizard. These are your other choices:

   **User Guide** - Click the **User Guide** button to open the PDF file of this User Guide.

   **Exit** - Click the **Exit** button to exit the Setup Wizard.



**Figure 5-1: Setup Wizard's Welcome - Start Wizard Screen**

3. Click the **Mobile Broadband Only** radio button to configure the Router for mobile broadband service.

> **NOTE:** If you click the **Broadband WAN Only** radio button to configure the Router for broadband WAN service only, go to "Chapter 6: Setting up the Wireless-G Router for Broadband WAN Service Only." If you click the **Broadband WAN and Mobile Broadband** radio button to configure the Router for broadband WAN and mobile broadband service, go to "Chapter 7: Setting up the Wireless-G Router for Broadband WAN and Mobile Broadband Service."



**Figure 5-2: Select Service Screen**

4. Make sure the Router is powered off. Insert your mobile broadband data card into the Router's Data Card Slot on the top panel of the Router. Then click the **Next** button.



**Figure 5-3: Insert Mobile Broadband Data Card Screen**

5. Connect the included Ethernet network cable to the Ethernet network port of your computer. (This cable is color-coded yellow to match the yellow Ethernet ports on the Router.)

   Click the **Next** button.



**Figure 5-4: Connect the Router to a Computer Screen**

6. Connect the other end of the cable to one of the Ethernet ports labeled 1-4 on the side panel of the Router.

   If necessary, connect any additional computers or other devices to the Router.

   Click the **Next** button.
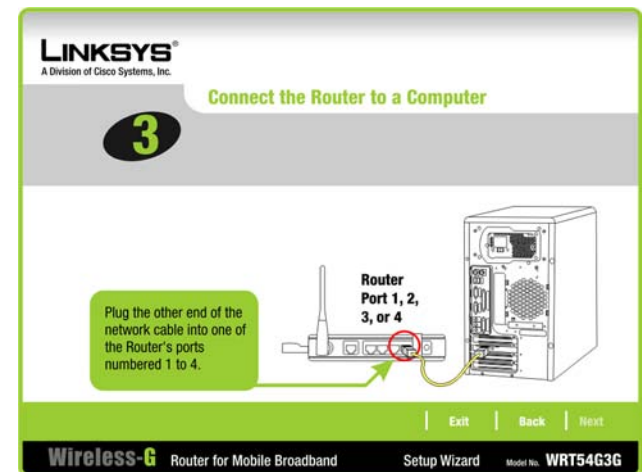


**Figure 5-5: Connect the Router to a Computer Screen, Continued**

7.  Connect the power adapter to the Router's Power port. Plug the other end into an electrical outlet.

    Click the **Next** button.



**Figure 5-6: Power on the Router Screen**

8.  Make sure the LEDs on the Router light up. The Power LED will flash for a few seconds while the Router goes through its self-diagnostics test. This LED will be solidly lit when the self-test is complete. If it does not stop flashing, refer to "Appendix A: Troubleshooting."

    Click the **Next** button.
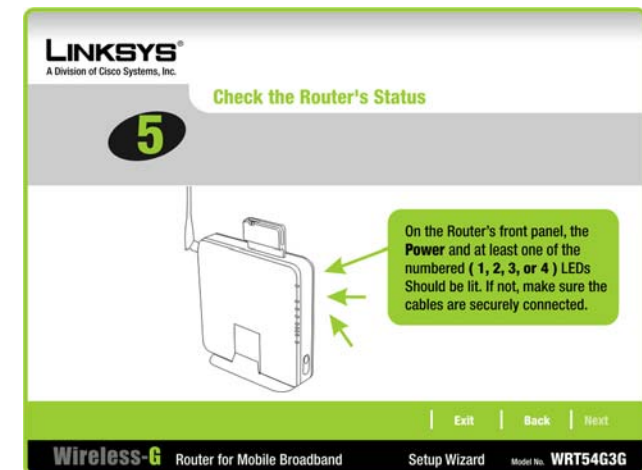


**Figure 5-7: Check the Router's Status Screen**

9. The Router provides a Web-based Utility you can use for configuring the Router from any networked PC.

   **Password** - Enter a password that will control access to the Utility.

   **Confirm** - Then enter it again in the *Confirm* field.

   Click the **Next** button.

   ⚠️ **IMPORTANT:** If you do NOT have your mobile broadband data card, you cannot configure the Router for mobile broadband service. You have two choices. To continue with the Setup Wizard to configure the wireless settings, proceed to step 14, or to configure the Router for broadband WAN service only, proceed to "Chapter 6: Setting up the Wireless-G Router for Broadband WAN Service Only" for instructions.



**Figure 5-8: Set the Router's Password Screen**

10. The Setup Wizard will ask you to enter the settings for your wireless network.

    **Wireless Network Name** - In the *Wireless Network Name* field, enter the name of your wireless network, also called the SSID. The name must be identical for all devices in the network. The default setting is **linksys** (all lowercase).

    **Channel** - Select the operating channel for your wireless network. All of your wireless devices will use this channel to communicate.

    Click the **Next** button.



**Figure 5-9: Wireless Settings Screen**

11. Select the method of security you want to use: **WPA2-PSK**, **WPA-PSK**, **WEP (128-Bit)**, or **WEP (64-Bit)**. WPA stands for Wi-Fi Protected Access, and WEP stands for Wired Equivalent Privacy. WPA is a stronger security method than WEP. WPA2 is the strongest security method. Proceed to the appropriate section for your security method.

If you want to use WPA-Enterprise (also called WPA-RADIUS), WPA2-Enterprise, or RADIUS, then you should select **Disabled** and use the Router's Web-based Utility to configure your wireless security settings. Click the **Next** button. You will see a warning message that recommends that you enable wireless security on your wireless network. Click the **Exit** button and proceed to step 15.

If you do not want to use any wireless security method, select **Disabled** and then click the **Next** button.You will see a warning message that recommends that you enable wireless security on your wireless network.

**IMPORTANT:** Linksys strongly recommends that you enable wireless security on your wireless network. Otherwise, unauthorized users may be able to access the Internet using your service and incur additional charges. You are liable for any and all additional charges from your service provider.

## WPA2-PSK

To use WPA2-PSK security, enter a Passphrase that is 8-32 characters in length.

**Passphrase** - Enter a passphrase, also called a pre-shared key, of 8-63 characters in the *Passphrase* field. The longer and more complex your Passphrase is, the more secure your network will be.

Click the **Next** button to continue or the **Back** button to return to the previous screen.



**Figure 5-10: Configure Wireless Security Settings Screen**



**Figure 5-11: Configure Wireless Security Settings - WPA2-PSK Screen**

*wpa2 (wi-fi protected access2: a wireless security protocol using TKIP (Temporal Key Integrity Protocol) encryption and AES (Advanced Encryption System) with dynamic encryption keys, which can be used in conjunction with a RADIUS server.*

## WPA-PSK

To use WPA-PSK security, enter a Passphrase that is 8-32 characters in length.

**Passphrase** - Enter a passphrase, also called a pre-shared key, of 8-63 characters in the *Passphrase* field. The longer and more complex your Passphrase is, the more secure your network will be.

Click the **Next** button to continue or the **Back** button to return to the previous screen.



**Figure 5-12: Configure Wireless Security Settings - WPA-PSK Screen**

*wpa (wi-fi protected access: a wireless security protocol using TKIP (Temporal Key Integrity Protocol) encryption, which can be used in conjunction with a RADIUS server.*

*wep (wired equivalent privacy): a method of encrypting network data transmitted on a wireless network for greater security.*

## WEP (128-Bit)

Enter a passphrase or WEP key.

**Passphrase** - Enter a passphrase, and then click the **Generate** button, so a WEP key is automatically generated. The passphrase is case-sensitive and should not be longer than 16 alphanumeric characters. It must match the passphrase of your other wireless network devices and is compatible with Linksys wireless products only. (For any non-Linksys wireless products, enter the WEP key manually on those products.)

**Key 1**- The WEP key you enter must match the WEP key of your wireless network. For 128-bit encryption, enter exactly 26 hexadecimal characters. Valid hexadecimal characters are "0" to "9" and "A" to "F".

Click the **Next** button.



**Figure 5-13: Configure Wireless Security Settings - WEP (128-Bit) Screen**

## WEP (64-Bit)

Enter a passphrase or WEP key.

**Passphrase** - Enter a passphrase, and then click the **Generate** button, so a WEP key is automatically generated. The passphrase is case-sensitive and should not be longer than 16 alphanumeric characters. It must match the passphrase of your other wireless network devices and is compatible with Linksys wireless products only. (For any non-Linksys wireless products, enter the WEP key manually on those products.)

**Key 1** - The WEP key you enter must match the WEP key of your wireless network. For 64-bit encryption, enter exactly 10 hexadecimal characters. Valid hexadecimal characters are "0" to "9" and "A" to "F".

Click the **Next** button.



**Figure 5-14: Configure Wireless Security Settings - WEP (64-Bit) Screen**

12. If you do not use any wireless security method, you will see a warning message. Linksys strongly recommends that you enable wireless security on your wireless network. Otherwise, unauthorized users may be able to access the Internet using your service and incur additional charges. You are liable for any and all additional charges from your service provider. Click the **Exit** button. Proceed to step 13.
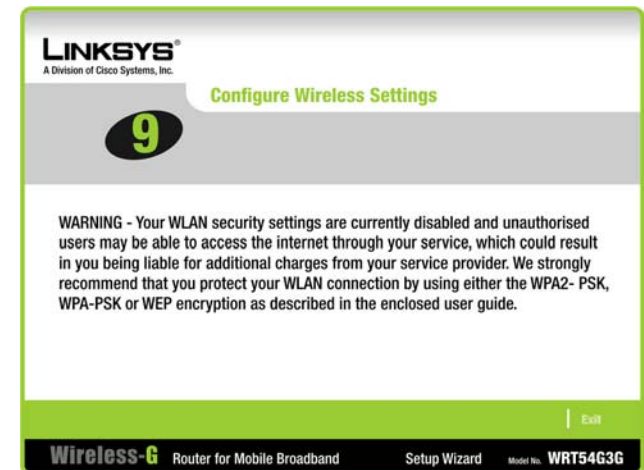


**Figure 5-15: Warning about Disabled Wireless Security Screen**

13. The Setup Wizard will ask you to review your settings before it saves them. Click the **Yes** button if you are satisfied with your settings, or click the **No** button if you do not want to save your new settings.



**Figure 5-16: Confirm New Settings Screen**

14. If your mobile broadband connection cannot be established, a warning message will appear. Make sure that your card is inserted correctly and try again. If the warning appears again, make sure that your mobile broadband data card is activated or contact your mobile service provider.
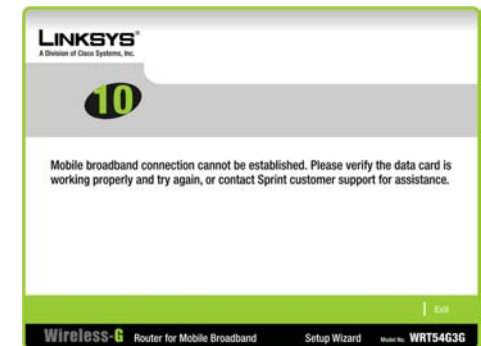


**Figure 5-17: Mobile Broadband Connection Cannot be Established Screen**

15. The *Congratulations* screen will appear. Click the **Online Registration** button to register the Router, or click the **Exit** button to exit the Setup Wizard.

**Congratulations! The installation of the Wireless-G Router for Mobile Broadband is complete.**

**If you want to make advanced configuration changes, proceed to "Chapter 8: Configuring the Wireless-G Router for Mobile Broadband."**



**Figure 5-18: Congratulations Screen**

# Chapter 6: Setting up the Wireless-G Router for Broadband WAN Service Only

## Overview

This chapter covers the steps for configuring the Router for broadband WAN service only, such as cable or DSL service. If you want to configure the Router for mobile broadband service only, go to "Chapter 5: Setting up the Wireless-G Router for Mobile Broadband Service." If you want to configure the Router for broadband WAN and mobile broadband service, go to "Chapter 7: Setting up the Wireless-G Router for Broadband WAN and Mobile Broadband Service."

## Before You Begin

Before you begin, make sure that you have the following:
- broadband modem
- settings for your Internet connection.

The information about your Internet connection should have been provided when your broadband modem was installed. If you do not have this information, contact your Internet Service Provider (ISP) for your settings.

> ⚠️ **IMPORTANT:** If you want to configure the Router for mobile broadband service in addition to broadband WAN service, proceed to "Chapter 7: Setting up the Wireless-G Router for Broadband WAN and Mobile Broadband Service."

## Using the Setup Wizard

1. Insert the Setup Wizard CD-ROM into your CD-ROM drive. The Setup Wizard should run automatically, and the *Welcome* screen should appear. If it does not, click the **Start** button and choose **Run**. In the field that appears, enter **D:\SetupWizard.exe** (if "D" is the letter of your CD-ROM drive).

2. On the *Welcome* screen, click the **Click Here to Start** button if this is the first time you are running the Setup Wizard. These are your other choices:

   **User Guide** - Click the **User Guide** button to open the PDF file of this User Guide.
   **Exit** - Click the **Exit** button to exit the Setup Wizard.



**Figure 6-1: Setup Wizard's Welcome - Start Wizard Screen**

3.  Click the **Broadband WAN Only** radio button to configure the Router for broadband WAN service. Make sure the Router is powered off.

> **NOTE:** If you click the **Mobile Broadband** radio button to configure the Router for mobile broand service only, go to "Chapter 5: Setting up the Wireless-G Router for Mobile Broadband Service." If you click the **Broadband WAN and Mobile Broadband** radio button to configure the Router for broadband WAN and mobile broadband service, go to "Chapter 7: Setting up the Wireless-G Router for Broadband WAN and Mobile Broadband Service."



**Figure 6-2: Select Service Screen**

4.  Disconnect the Ethernet network cable from your computer. (This is the cable that connects the computer to your modem.) Then click the **Next** button.
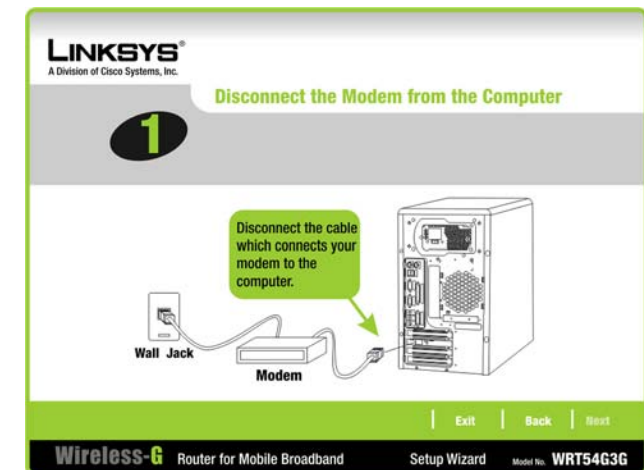


**Figure 6-3: Disconnect the Modem from the Computer Screen**

5. Connect the cable from the modem to the Internet port on the Router. (This is the same cable that you just disconnected from your computer.) Click the **Next** button.
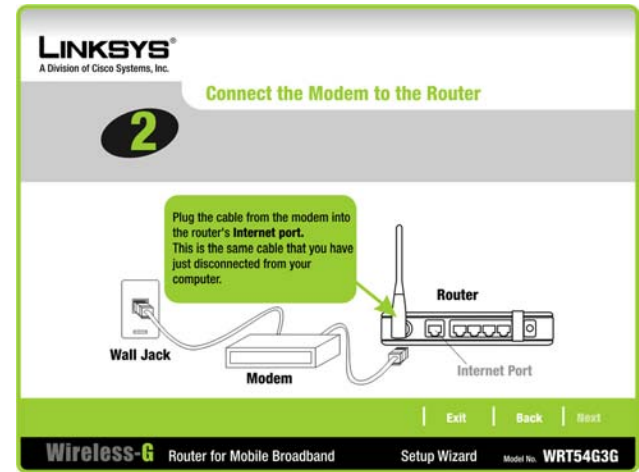


**Figure 6-4: Connect the Modem to the Router Screen**

6. Connect the included Ethernet network cable to the Ethernet network port of your computer. (This cable is color-coded yellow to match the yellow Ethernet ports on the Router.)

Click the **Next** button.
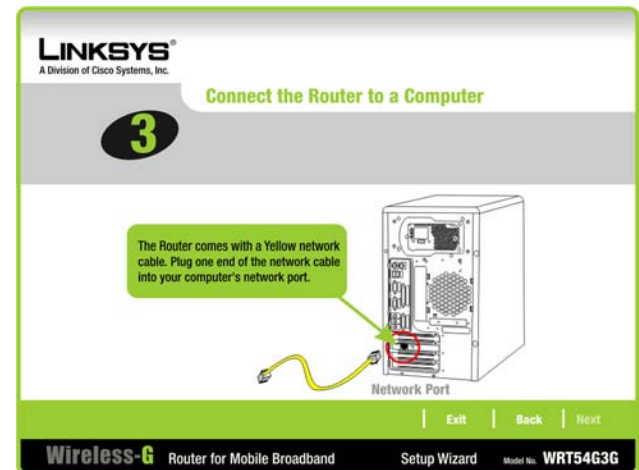


**Figure 6-5: Connect the Router to a Computer Screen**

7.  Connect the other end of the cable to one of the Ethernet ports labeled 1-4 on the side panel of the Router.

    If necessary, connect any additional computers or other devices to the Router.

    Click the **Next** button.
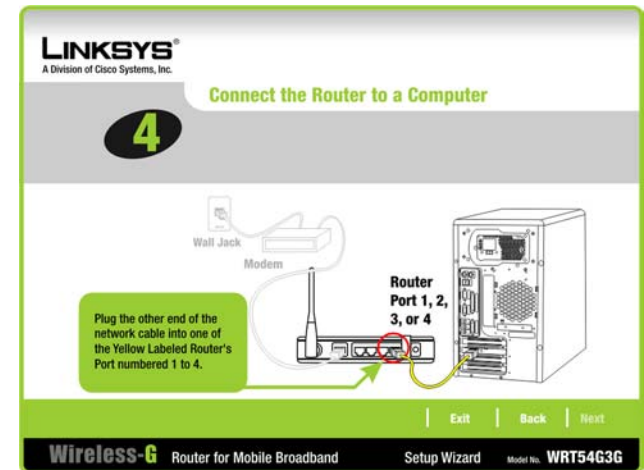


**Figure 6-6: Connect the Router to a Computer Screen, continued**

8. Connect the power adapter to the Router's Power port. Plug the other end into an electrical outlet.

   Click the **Next** button.
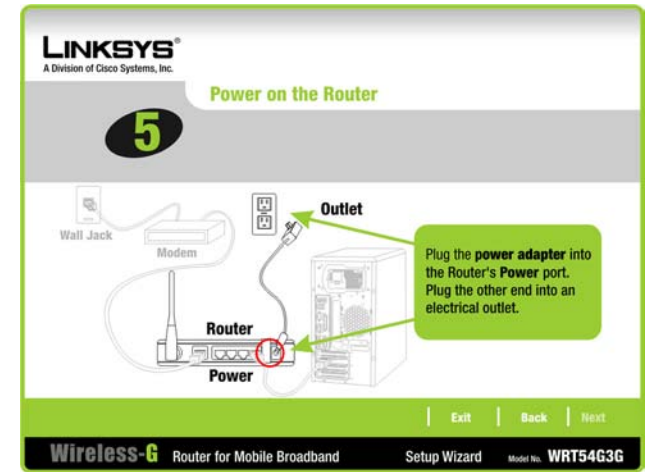


**Figure 6-7: Power on the Router Screen**

9. Make sure the Power, Internet, and at least one of the numbered LEDs on the Router light up. If they do not light up, make sure the cables are securely connected.

   The Power LED will flash for a few seconds while the Router goes through its self-diagnostics test. This LED will be solidly lit when the self-test is complete. If it does not stop flashing, refer to "Appendix A: Troubleshooting."

   Click the **Next** button.
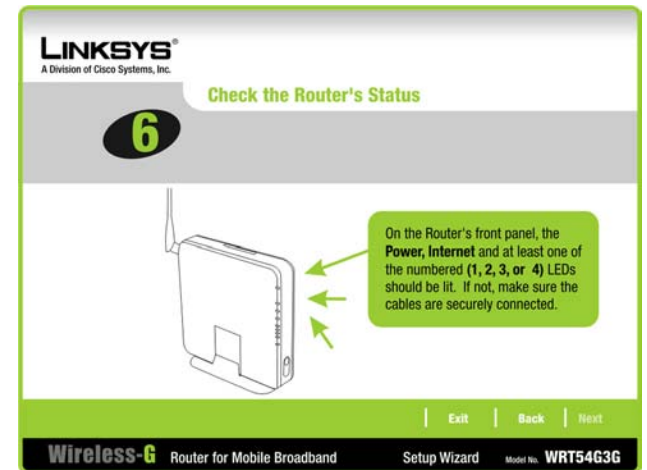


**Figure 6-8: Check the Router's Status Screen**

10. Select the Internet connection type you use: **Cable (DHCP)**, **DSL (PPPoE)**, or **Static IP**. Proceed to the appropriate section for your Internet connection type.

> **NOTE:** If the Internet connection type you use is not listed here, keep the default, **Cable (DHCP)** for now, and click the **Next** button. After you have completed the Setup Wizard, go to "Chapter 8: Configuring the Wireless-G Router for Mobile Broadband." You will use the Router's Web-based Utility to configure the Internet connection type settings.

### Cable (DHCP)

Click the **Next** button.



**Figure 6-9: Configure Cable or DHCP Settings Screen**

### DSL (PPPoE)

**User Name** - Enter the User Name provided by your ISP.

**Password** - Enter the Password provided by your ISP.

**Confirm** - To confirm the Password, enter it again in this field.

Click the **Next** button to continue.
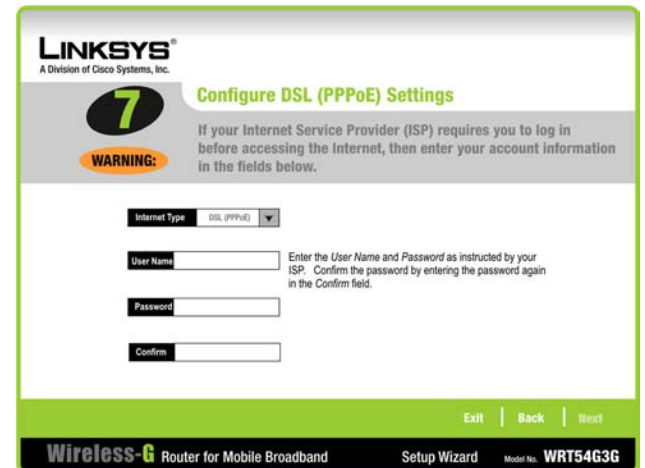


**Figure 6-10: Configure DSL (PPPoE) Settings Screen**

### Static IP

**IP Address** - Enter the IP address provided by your ISP.

**Subnet Mask**- Enter the Subnet Mask provided by your ISP.

**Gateway** - Enter the Gateway IP address provided by your ISP.

**DNS 1-2** - Enter the DNS (Domain Name System) server IP address(es) provided by your ISP. You need to enter at least one DNS address.

Click the **Next** button to continue.



**Figure 6-11: Enter Static IP Address Settings Screen**

11. The Setup Wizard will ask you to review your settings before it saves them. Click the **Yes** button if you are satisfied with your settings, or click the **No** button if you do not want to save the new settings.



**Figure 6-12: Confirm New Settings Screen**

12. The Router provides a Web-based Utility you can use for configuring the Router from any networked PC.

    **Password** - Enter a password that will control access to the Utility.

    **Confirm** - Then enter it again in the *Confirm* field.

    Click the **Next** button.



Figure 6-13: Set the Router's Password Screen

13. The Setup Wizard will ask you to enter the settings for your wireless network.

    **Wireless Network Name** - In the *Wireless Network Name* field, enter the name of your wireless network, also called the SSID. The name must be identical for all devices in the network. The default setting is **linksys** (all lowercase).

    **Channel** - Select the operating channel for your wireless network. All of your wireless devices will use this channel to communicate.

    Click the **Next** button.



Figure 6-14: Wireless Settings Screen

14. Select the method of security you want to use: **WPA2-PSK**, **WPA-PSK**, **WEP (128-Bit)**, or **WEP (64-Bit)**. WPA stands for Wi-Fi Protected Access, and WEP stands for Wired Equivalent Privacy. WPA is a stronger security method than WEP. WPA2 is the strongest security method. Proceed to the appropriate section for your security method.

If you want to use WPA-Enterprise (also called WPA-RADIUS), WPA2-Enterprise, or RADIUS, then you should select **Disabled** and use the Router's Web-based Utility to configure your wireless security settings. Click the **Next** button. You will see a warning message that recommends that you enable wireless security on your wireless network. Click the **Exit** button and proceed to step 15.

If you do not want to use any wireless security method, select **Disabled** and then click the **Next** button.You will see a warning message that recommends that you enable wireless security on your wireless network.

⚠️ **IMPORTANT:** Linksys strongly recommends that you enable wireless security on your wireless network. Otherwise, unauthorized users may be able to access the Internet using your service and incur additional charges. You are liable for any and all additional charges from your service provider.

## WPA2-PSK

To use WPA2-PSK security, enter a Passphrase that is 8-32 characters in length.

**Passphrase** - Enter a passphrase, also called a pre-shared key, of 8-63 characters in the *Passphrase* field. The longer and more complex your Passphrase is, the more secure your network will be.

Click the **Next** button to continue or the **Back** button to return to the previous screen.

*wpa2* (wi-fi protected access2: a wireless security protocol using TKIP (Temporal Key Integrity Protocol) encryption and AES (Advanced Encryption System) with dynamic encryption keys, which can be used in conjunction with a RADIUS server.

*wpa* (wi-fi protected access: a wireless security protocol using TKIP (Temporal Key Integrity Protocol) encryption, which can be used in conjunction with a RADIUS server.

*wep* (wired equivalent privacy): a method of encrypting network data transmitted on a wireless network for greater security.

**encryption:** encoding data transmitted in a network.



**Figure 6-15: Configure Wireless Security Settings Screen**



**Figure 6-16: Configure Wireless Security Settings - WPA2-PSK Screen**

## WPA-PSK

To use WPA-PSK security, enter a Passphrase that is 8-32 characters in length.

**Passphrase** - Enter a passphrase, also called a pre-shared key, of 8-63 characters in the *Passphrase* field. The longer and more complex your Passphrase is, the more secure your network will be.

Click the **Next** button to continue or the **Back** button to return to the previous screen.



**Figure 6-17: Configure Wireless Security Settings - WPA-PSK Screen**

## WEP (128-Bit)

Enter a passphrase or WEP key.

**Passphrase** - Enter a passphrase, and then click the **Generate** button, so a WEP key is automatically generated. The passphrase is case-sensitive and should not be longer than 16 alphanumeric characters. It must match the passphrase of your other wireless network devices and is compatible with Linksys wireless products only. (For any non-Linksys wireless products, enter the WEP key manually on those products.)

**Key 1**- The WEP key you enter must match the WEP key of your wireless network. For 128-bit encryption, enter exactly 26 hexadecimal characters. Valid hexadecimal characters are "0" to "9" and "A" to "F".

Click the **Next** button.



**Figure 6-18: Configure Wireless Security Settings - WEP (128-Bit) Screen**

## WEP (64-Bit)

Enter a passphrase or WEP key.

**Passphrase** - Enter a passphrase, and then click the **Generate** button, so a WEP key is automatically generated. The passphrase is case-sensitive and should not be longer than 16 alphanumeric characters. It must match the passphrase of your other wireless network devices and is compatible with Linksys wireless products only. (For any non-Linksys wireless products, enter the WEP key manually on those products.)

**Key 1** - The WEP key you enter must match the WEP key of your wireless network. For 64-bit encryption, enter exactly 10 hexadecimal characters. Valid hexadecimal characters are "0" to "9" and "A" to "F".

Click the **Next** button.



**Figure 6-19: Configure Wireless Security Settings - WEP (64-Bit) Screen**

15. The Setup Wizard will ask you to review your settings before it saves them. Click the **Yes** button if you are satisfied with your settings, or click the **No** button if you do not want to save your new settings.
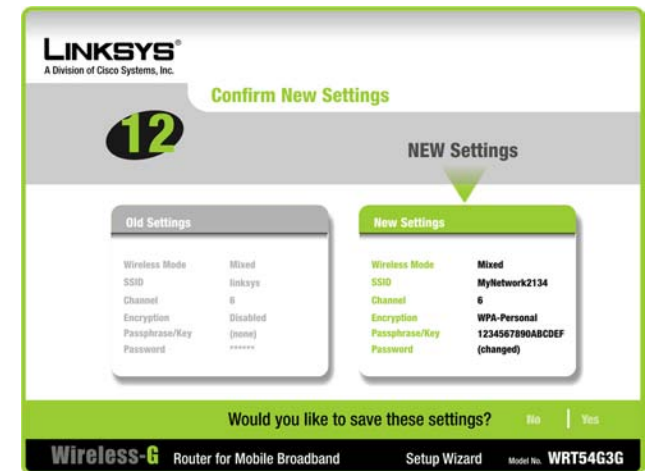


**Figure 6-20: Confirm New Settings Screen**

16. If you do not use any wireless security method, you will see a warning message that recommends that you enable wireless security on your wireless network. Otherwise, unauthorized users may be able to access the Internet using your service and incur additional charges. You are liable for any and all additional charges from your service provider. Click the **Exit** button. Proceed to step 17.



17. The *Congratulations* screen will appear. Click the **Online Registration** button to register the Router, or click the **Exit** button to exit the Setup Wizard.
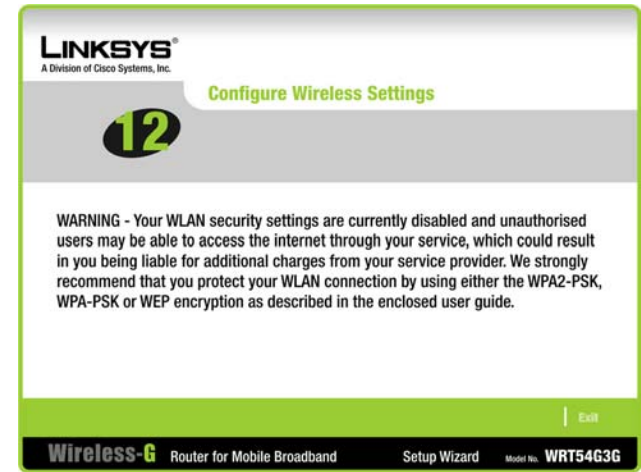
**Figure 6-21: Warning about Disabled Wireless Security Screen**

**Congratulations! The installation of the Wireless-G Router for Mobile Broadband is complete.**

**If you want to make advanced configuration changes, proceed to "Chapter 8: Configuring the Wireless-G Router for Mobile Broadband."**



**Figure 6-22: Congratulations Screen**

# Chapter 7: Setting up the Wireless-G Router for Broadband WAN and Mobile Broadband Service

## Overview

This chapter covers the steps for configuring the Router for broadband WAN and mobile broadband service. If you want to configure the Router for mobile broadband service only, go to "Chapter 5: Setting up the Wireless-G Router for Mobile Broadband Service." If you want to configure the Router for broadband WAN service only, go to "Chapter 6: Setting up the Wireless-G Router for Broadband WAN Service Only."

## Before You Begin

Before you begin, make sure that you have the following:
- your activated Mobile Broadband Data Card
- your Mobile Broadband Data Card Service information.
- broadband modem
- settings for your broadband Internet connection type.

The information about your Mobile Broadband Data Card was included with your Mobile Broadband Data Card package. If you do not have this information, contact the mobile broadband service provider's customer support.

**IMPORTANT:** If you do NOT have your Mobile Broadband Data Card you cannot configure the Router for mobile broadband service. However, you can configure the Router for broadband WAN service; for instructions, proceed to "Chapter 6: Setting up the Wireless-G Router for Broadband WAN Service Only."

**IMPORTANT:** If you do NOT have broadband WAN service, then you cannot configure the Router for broadband WAN service. However, you can configure the Router for mobile broadband service; for instructions, proceed to "Chapter 5: Setting up the Wireless-G Router for Mobile Broadband Service."

**IMPORTANT:** Make sure your Mobile Broadband Data Card is activated before starting the setup. If you have not already done so, follow the instructions provided in your Card's documentation.

## Using the Setup Wizard

1. Insert the Setup Wizard CD-ROM into your CD-ROM drive. The Setup Wizard should run automatically, and the *Welcome* screen should appear.  If it does not, click the **Start** button and choose **Run**. In the field that appears, enter **D:\SetupWizard.exe** (if "D" is the letter of your CD-ROM drive).

2. On the following *Welcome* screen, click the **Click Here to Start** button if this is the first time you are running the Setup Wizard. These are your other choices:

   **User Guide** - Click the **User Guide** button to open the PDF file of this User Guide.

   **Exit** - Click the **Exit** button to exit the Setup Wizard.



**Figure 7-1: Setup Wizard's Welcome - Start Wizard Screen**

3. Click the **Broadband WAN and Mobile Broaband** radio button to configure the Router for both broadband WAN and mobile broadband service.

> **NOTE:** If you click the **Mobile Broadband Only** radio button to configure the Router for mobile broadband service only, go to "Chapter 5: Setting up the Wireless-G Router for Mobile Broadband Service."If you click the **Broadband WAN Only** radio button to configure the Router for broadband WAN service only, go to "Chapter 6: Setting up the Wireless-G Router for Broadband WAN Service Only."



**Figure 7-2: Select Service Screen**

4. Make sure the Router is powered off. Insert your mobile broadband data card into the Router's Data Card Slot on the top panel of the Router. Then click the **Next** button.
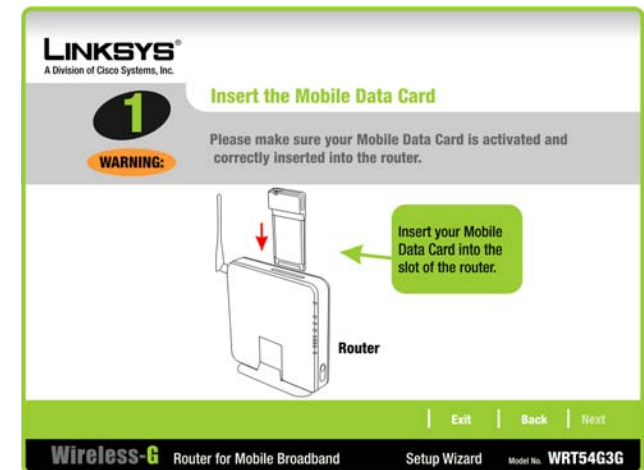


**Figure 7-3: Insert Broadband Mobile Data Card Screen**

5. Disconnect the Ethernet network cable from your computer. (This is the cable that connects the computer to your modem.) Then click the **Next** button.
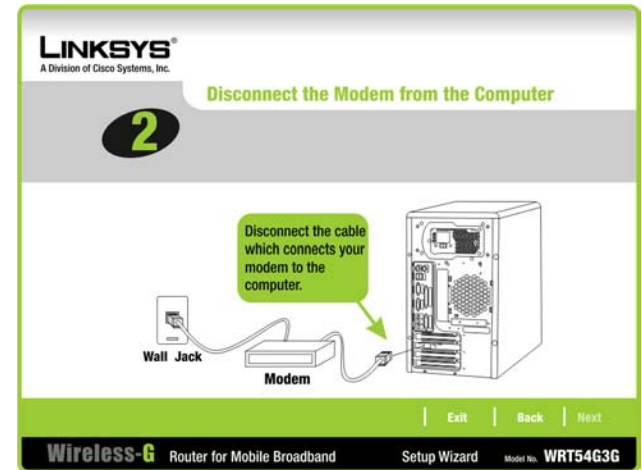


**Figure 7-4: Disconnect the Modem from the Computer Screen**

6. Connect the cable from the modem to the Internet port on the Router. (This is the same cable that you just disconnected from your computer.) Click the **Next** button.
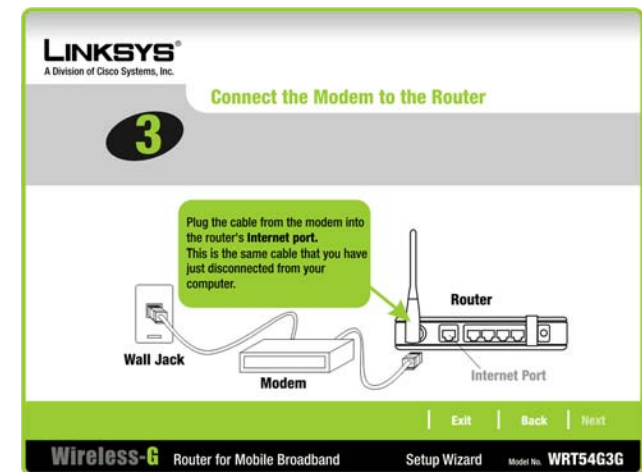


**Figure 7-5: Connect the Modem to the Router Screen**

7.  Connect the included Ethernet network cable to the Ethernet network port of your computer. (This cable is color-coded yellow to match the yellow Ethernet ports on the Router.)

    Click the **Next** button.



**Figure 7-6: Connect the Router to a Computer Screen**

8.  Connect the other end of the cable to one of the Ethernet ports labeled 1-4 on the side panel of the Router.

    Connect additional computers or other devices to the Router.

    Click the **Next** button.
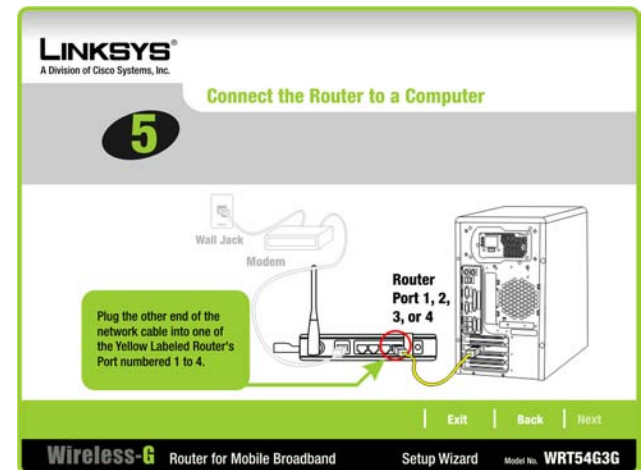


**Figure 7-7: Connect the Router to a Computer Screen, continued**

9. Connect the power adapter to the Router's Power port. Plug the other end into an electrical outlet.

   Click the **Next** button.
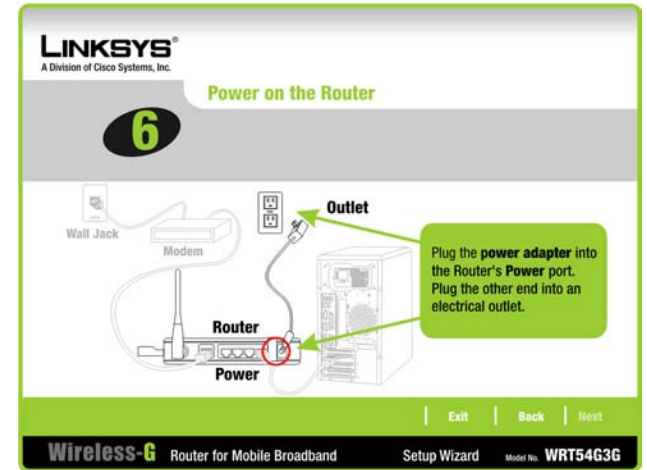


**Figure 7-8: Power on the Router Screen**

10. Make sure the Power, Internet, and at least one of the numbered LEDs on the Router light up. If they do not light up, make sure the cables are securely connected.

    The Power LED will flash for a few seconds while the Router goes through its self-diagnostics test. This LED will be solidly lit when the self-test is complete. If it does not stop flashing, refer to "Appendix A: Troubleshooting."

    Click the **Next** button.
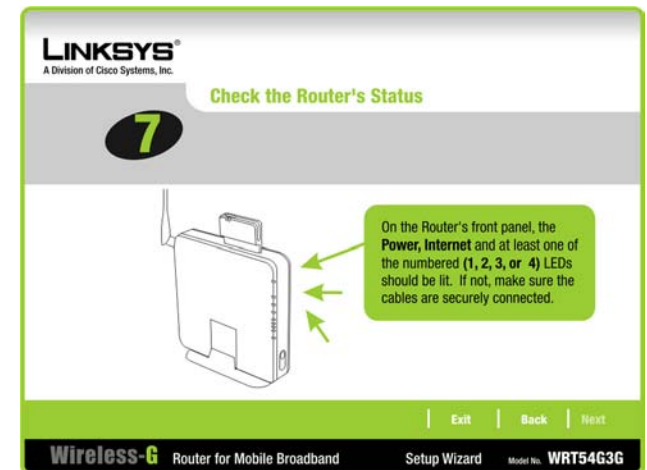


**Figure 7-9: Check the Router's Status Screen**

11. Select the Internet connection type you use: **Cable (DHCP)**, **DSL (PPPoE)**, or **Static IP**. Proceed to the appropriate section for your Internet connection type.

> **NOTE:** If the Internet connection type you use is not listed here, keep the default, **Cable (DHCP)** for now, and click the **Next** button. After you have completed the Setup Wizard, go to "Chapter 8: Configuring the Wireless-G Router for Mobile Broadband." You will use the Router's Web-based Utility to configure the Internet connection type settings.

### Cable (DHCP)

Click the **Next** button.



Figure 7-10: Configure Cable or DHCP Settings Screen

### DSL (PPPoE)

**User Name** - Enter the User Name provided by your ISP.

**Password** - Enter the Password provided by your ISP.

**Confirm** - To confirm the Password, enter it again in this field.

Click the **Next** button to continue.



Figure 7-11: Configure DSL (PPPoE) Settings Screen

## Static IP

**IP Address** - Enter the IP address provided by your ISP.

**Subnet Mask**- Enter the Subnet Mask provided by your ISP.

**Gateway** - Enter the Gateway IP address provided by your ISP.

**DNS 1-2** - Enter the DNS (Domain Name System) server IP address(es) provided by your ISP. You need to enter at least one DNS address.

Click the **Next** button to continue.



**Figure 7-12: Enter Static IP Address Settings Screen**

12. The Setup Wizard will ask you to review your settings before it saves them. Click the **Yes** button if you are satisfied with your settings, or click the **No** button if you do not want to save the new settings.



**Figure 7-13: Confirm New Settings Screen**

13. The Router provides a Web-based Utility you can use for configuring the Router from any networked PC.

**Password** - Enter a password that will control access to the Utility.

**Confirm** - Then enter it again in the *Confirm* field.

Click the **Next** button.



**Figure 7-14: Set the Router's Password Screen**

14. The Setup Wizard will ask you to enter the settings for your wireless network.

**Wireless Network Name** - In the *Wireless Network Name* field, enter the name of your wireless network, also called the SSID. The name must be identical for all devices in the network. The default setting is **linksys** (all lowercase).

**Channel** - Select the operating channel for your wireless network. All of your wireless devices will use this channel to communicate.

Click the **Next** button.
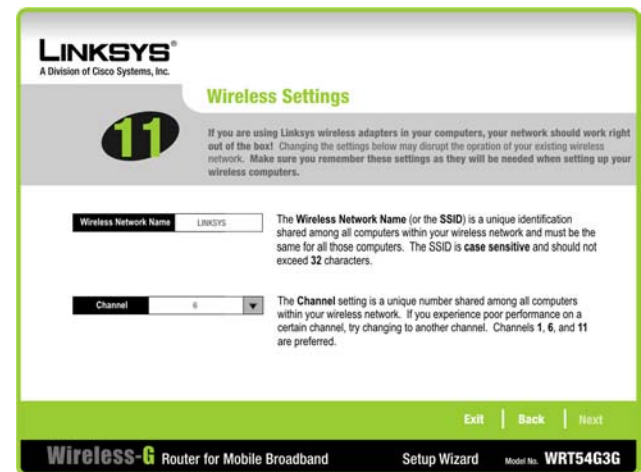


**Figure 7-15: Wireless Settings Screen**

15. Select the method of security you want to use: **WPA2-PSK**, **WPA-PSK**, **WEP (128-Bit)**, or **WEP (64-Bit)**. WPA stands for Wi-Fi Protected Access, and WEP stands for Wired Equivalent Privacy. WPA is a stronger security method than WEP. WPA2 is the strongest security method. Proceed to the appropriate section for your security method.

If you want to use WPA-Enterprise (also called WPA-RADIUS), WPA2-Enterprise, or RADIUS, then you should select **Disabled** and use the Router's Web-based Utility to configure your wireless security settings. Click the **Next** button. You will see a warning message that recommends that you enable wireless security on your wireless network. Click the **Exit** button and proceed to step 18.

If you do not want to use any wireless security method, select **Disabled** and then click the **Next** button.You will see a warning message that recommends that you enable wireless security on your wireless network.

> ⚠️ **IMPORTANT:** Linksys strongly recommends that you enable wireless security on your wireless network. Otherwise, unauthorized users may be able to access the Internet using your service and incur additional charges. You are liable for any and all additional charges from your service provider.

## WPA2-Personal

To use WPA2-PSK security, enter a Passphrase that is 8-32 characters in length.

**Passphrase** - Enter a passphrase, also called a pre-shared key, of 8-63 characters in the *Passphrase* field. The longer and more complex your Passphrase is, the more secure your network will be.

Click the **Next** button to continue or the **Back** button to return to the previous screen.

*wpa2 (wi-fi protected access2: a wireless security protocol using TKIP (Temporal Key Integrity Protocol) encryption and AES (Advanced Encryption System) with dynamic encryption keys, which can be used in conjunction with a RADIUS server.*

*wpa (wi-fi protected access: a wireless security protocol using TKIP (Temporal Key Integrity Protocol) encryption, which can be used in conjunction with a RADIUS server.*

*wep (wired equivalent privacy): a method of encrypting network data transmitted on a wireless network for greater security.*

*encryption: encoding data transmitted in a network.*



**Figure 7-16: Configure Wireless Security Settings Screen**



**Figure 7-17: Configure Wireless Security Settings - WPA2-PSK Screen**

### WPA-Personal

To use WPA-PSK security, enter a Passphrase that is 8-32 characters in length.

**Passphrase** - Enter a passphrase, also called a pre-shared key, of 8-63 characters in the *Passphrase* field. The longer and more complex your Passphrase is, the more secure your network will be.

Click the **Next** button to continue or the **Back** button to return to the previous screen.



**Figure 7-18: Configure Wireless Security Settings - WPA-PSK Screen**

### WEP (128-Bit)

Enter a passphrase or WEP key.

**Passphrase** - Enter a passphrase, and then click the **Generate** button, so a WEP key is automatically generated. The passphrase is case-sensitive and should not be longer than 16 alphanumeric characters. It must match the passphrase of your other wireless network devices and is compatible with Linksys wireless products only. (For any non-Linksys wireless products, enter the WEP key manually on those products.)

**Key 1**- The WEP key you enter must match the WEP key of your wireless network. For 128-bit encryption, enter exactly 26 hexadecimal characters. Valid hexadecimal characters are "0" to "9" and "A" to "F".

Click the **Next** button.



**Figure 7-19: Configure Wireless Security Settings - WEP (128-Bit)**

## WEP (64-Bit)

Enter a passphrase or WEP key.

**Passphrase** - Enter a passphrase, and then click the **Generate** button, so a WEP key is automatically generated. The passphrase is case-sensitive and should not be longer than 16 alphanumeric characters. It must match the passphrase of your other wireless network devices and is compatible with Linksys wireless products only. (For any non-Linksys wireless products, enter the WEP key manually on those products.)

**Key 1** - The WEP key you enter must match the WEP key of your wireless network. For 64-bit encryption, enter exactly 10 hexadecimal characters. Valid hexadecimal characters are "0" to "9" and "A" to "F".

Click the **Next** button.



Figure 7-20: Configure Wireless Security Settings - WEP (64-Bit)

16. The Setup Wizard will ask you to review your settings before it saves them. Click the **Yes** button if you are satisfied with your settings, or click the **No** button if you do not want to save your new settings.
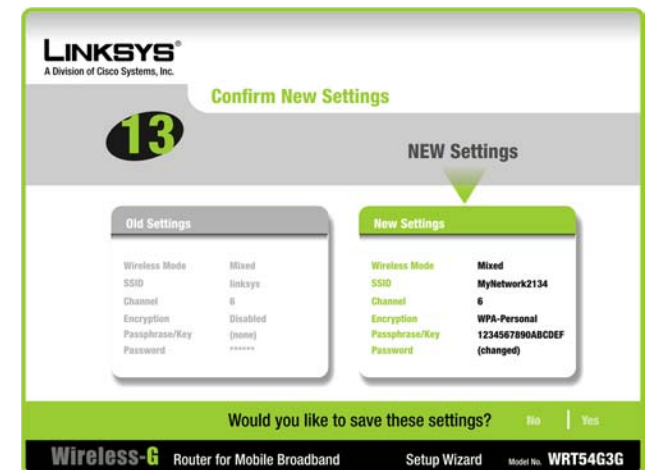


Figure 7-21: Configure Wireless Security Settings - WEP (64-Bit)

17. If you do not use any wireless security method, you will see a warning message that recommends that you enable wireless security on your wireless network. Otherwise, unauthorized users may be able to access the Internet using your service and incur additional charges. You are liable for any and all additional charges from your service provider. Click the **Exit** button. Proceed to step 20.
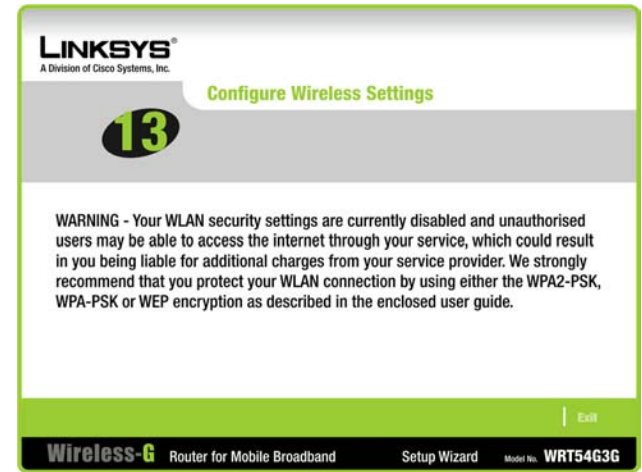


Figure 7-22: Warning about Disabled Wireless Security Screen

18. The Setup Wizard will ask you to review your settings before it saves them. Click the **Yes** button if you are satisfied with your settings, or click the **No** button if you do not want to save your new settings.
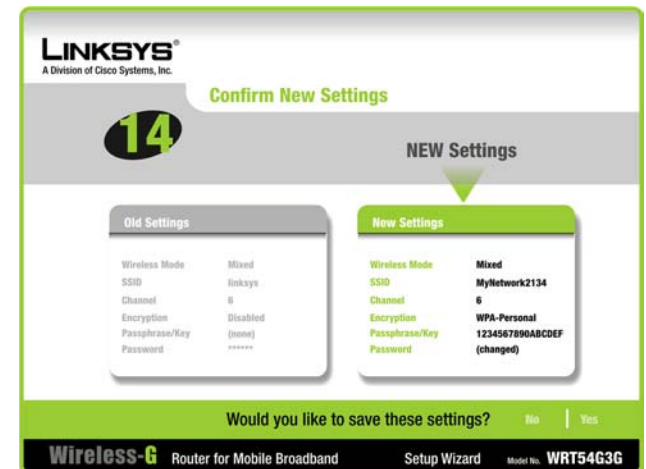


Figure 7-23: Confirm New Settings

19. If your mobile broadband connection cannot be established, a warning message will appear. Make sure that your card is inserted correctly and try again. If the warning appears again, make sure that your mobile broadband data card is activated or contact your mobile service provider.



Figure 7-24: Mobile Broadband Connection Cannot be Established Screen

20. The *Congratulations* screen will appear. Click the **Online Registration** button to register the Router, or click the **Exit** button to exit the Setup Wizard.

**Congratulations! The installation of the Wireless-G Router for Mobile Broadband is complete.**

**If you want to make advanced configuration changes, proceed to "Chapter 8: Configuring the Wireless-G Router for Mobile Broadband."**



Figure 7-25: Congratulations Screen

# Chapter 8: Configuring the Wireless-G Router for Mobile Broadband

## Overview

Linksys recommends using the Setup CD-ROM for first-time installation of the Router. If you do not wish to run the Setup Wizard on the Setup CD-ROM, then you can use the Web-based Utility to configure the Router. For advanced users, you may configure the Router's advanced settings through the Web-based Utility.

This chapter will describe each web page in the Utility and each page's key functions. The utility can be accessed via your web browser through use of a computer connected to the Router. For a basic network setup, most users will use these two screens of the Utility:

• Basic Setup. On the *Basic Setup* screen, enter the settings provided by your Internet Service Provider (ISP).

• Management. Click the **Administration** tab and then the **Management** tab. The Router's default password is **admin**. To secure the Router, change the Password from its default.

There are seven main tabs: Setup, Wireless, Security, Access Restrictions, Applications & Gaming, Administration, and Status. Additional tabs will be available after you click one of the main tabs.

To access the Web-based Utility, launch Internet Explorer or Netscape Navigator, and enter the Router's default IP address, **192.168.1.1**, in the *Address* field. Then press **Enter**.

A password request page will appear. Leave the *User Name* field blank. The first time you open the Web-based Utility, use the default password **admin**. (You can set a new password from the Administration tab's *Management* screen.) Then click the **OK** button.

**NOTE:** For first-time installation, Linksys recommends using the Setup Wizard on the Setup CD-ROM. If you want to configure advanced settings, use this chapter to learn about the Web-based Utility.

**HAVE YOU:** Enabled TCP/IP on your PCs? PCs communicate over the network with this protocol. Refer to "Appendix D: Windows Help" for more information on TCP/IP.



**Figure 8-1: Password Screen**

# The Setup Tab - Basic Setup

The first screen that appears displays the Setup tab. This allows you to change the Router's general settings. Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.

## Mobile Network Setup

Configure the mobile network settings for the Router in this section.

**Mobile Connection**. This button enables you to connect to and disconnect from the mobile network through the Web-based Utility (you can also connect and disconnect using the hardware button on the Router). It will also indicate the status of the Router's mobile broadband data card connection.

### Status

**Network Name**. Displayed here is the name of the mobile network the Router is using.

**Signal Strength**. This indicates the strength of the mobile broadband signal that the Router is receiving.

## Internet Setup

The Internet Setup section configures the Router to your Internet connection. Most of this information can be obtained through your ISP.

### Internet Connection Type

Choose the type of Internet connection your ISP provides from the drop-down menu.

- **DHCP**. By default, the Router's Internet Connection Type is set to **Automatic Configuration - DHCP**, which should be kept only if your ISP supports DHCP or you are connecting through a dynamic IP address.
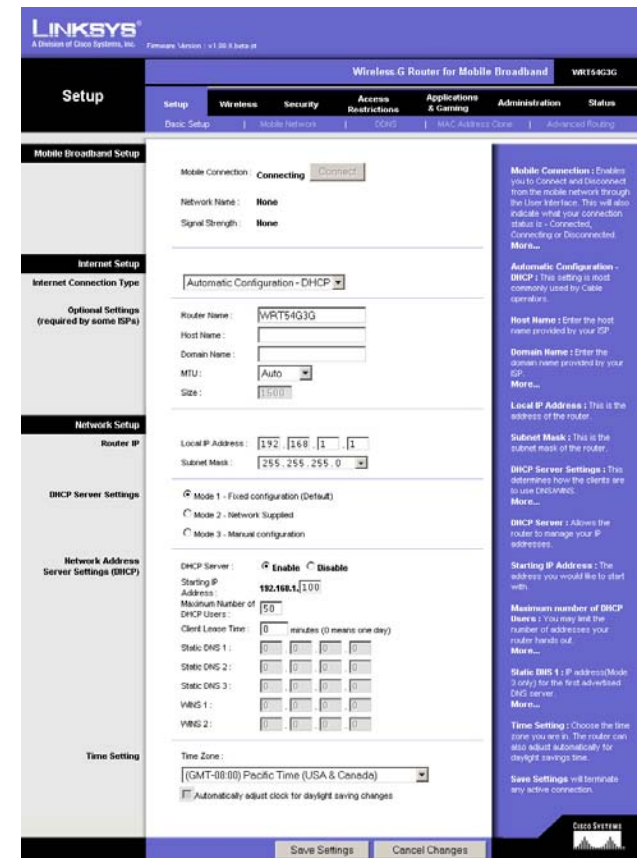


**Figure 8-2: Setup Tab - Basic Setup**



**Figure 8-3: DHCP Connection Type**

- **Static IP**. If you are required to use a permanent IP address to connect to the Internet, select **Static IP**.

  Internet IP Address. This is the Router's IP address, when seen from the Internet. Your ISP will provide you with the IP Address you need to specify here.

  Subnet Mask. This is the Router's Subnet Mask, as seen by users on the Internet (including your ISP). Your ISP will provide you with the Subnet Mask.

  Gateway. Your ISP will provide you with the Gateway Address, which is the ISP server's IP address.

  DNS. Your ISP will provide you with at least one DNS (Domain Name System) Server IP Address.

- **PPPoE**. Some DSL-based ISPs use PPPoE (Point-to-Point Protocol over Ethernet) to establish Internet connections. If you are connected to the Internet through a DSL line, check with your ISP to see if they use PPPoE. If they do, you will have to enable **PPPoE**.

  User Name and Password. Enter the User Name and Password provided by your ISP.

  Connect on Demand: Max Idle Time. You can configure the Router to cut the Internet connection after it has been inactive for a specified period of time (Max Idle Time). If your Internet connection has been terminated due to inactivity, Connect on Demand enables the Router to automatically re-establish your connection as soon as you attempt to access the Internet again. If you wish to activate Connect on Demand, click the radio button. In the *Max Idle Time* field, enter the number of minutes you want to have elapsed before your Internet connection terminates.

  Keep Alive Option: Redial Period. If you select this option, the Router will periodically check your Internet connection. If you are disconnected, then the Router will automatically re-establish your connection. To use this option, click the radio button next to *Keep Alive*. In the *Redial Period* field, you specify how often you want the Router to check the Internet connection.  The default Redial Period is **30** seconds.

- **PPTP**. Point-to-Point Tunneling Protocol (**PPTP**) is a service that applies to connections in Europe only.

  Internet IP Address. This is the Router's IP address, as seen from the Internet. Your ISP will provide you with the IP Address you need to specify here.

  Subnet Mask. This is the Router's Subnet Mask, as seen by users on the Internet (including your ISP). Your ISP will provide you with the Subnet Mask.

  Gateway. Your ISP will provide you with the Gateway Address.

  User Name and Password. Enter the User Name and Password provided by your ISP.



**Figure 8-4: Static IP Connection Type**

*Static IP address: a fixed address assigned to a computer or device connected to a network.*



**Figure 8-5: PPPoE Connection Type**



**Figure 8-6: PPTP Connection Type**

Connect on Demand: Max Idle Time. You can configure the Router to cut the Internet connection after it has been inactive for a specified period of time (Max Idle Time). If your Internet connection has been terminated due to inactivity, Connect on Demand enables the Router to automatically re-establish your connection as soon as you attempt to access the Internet again. If you wish to activate Connect on Demand, click the radio button. In the *Max Idle Time* field, enter the number of minutes you want to have elapsed before your Internet connection terminates.

Keep Alive Option: Redial Period. If you select this option, the Router will periodically check your Internet connection. If you are disconnected, then the Router will automatically re-establish your connection. To use this option, click the radio button next to *Keep Alive*. In the *Redial Period* field, you specify how often you want the Router to check the Internet connection.  The default Redial Period is **30** seconds.

- **L2TP**. Layer 2 Tunneling Protocol (L2TP) is a service that tunnels Point-to-Point Protocol (PPP) across the Internet. It is used mostly in European countries.

  Server IP Address. Enter the IP address of your ISP's server. This is provided by your ISP.

  User Name and Password. Enter the User Name and Password provided by your ISP.

  Connect on Demand: Max Idle Time. You can configure the Router to cut the Internet connection after it has been inactive for a specified period of time (Max Idle Time). If your Internet connection has been terminated due to inactivity, Connect on Demand enables the Router to automatically re-establish your connection as soon as you attempt to access the Internet again. If you wish to activate Connect on Demand, click the radio button. In the *Max Idle Time* field, enter the number of minutes you want to have elapsed before your Internet connection terminates.

  Keep Alive Option: Redial Period. If you select this option, the Router will periodically check your Internet connection. If you are disconnected, then the Router will automatically re-establish your connection. To use this option, click the radio button next to *Keep Alive*. In the *Redial Period* field, you specify how often you want the Router to check the Internet connection.  The default Redial Period is **30** seconds.

## Optional Settings

Some of these settings may be required by your ISP. Verify with your ISP before making any changes.

**Router Name**. In this field, you can type a name of up to 39 characters to represent the Router.

**Host Name and Domain Name**. These fields allow you to supply a host and domain name for the Router. Some ISPs, usually cable ISPs, require these names as identification. You may have to check with your ISP to see if your broadband Internet service has been configured with a host and domain name. In most cases, leaving these fields blank will work.



**Figure 8-7: L2TP Connection Type**



**Figure 8-8: Optional Settings**

**MTU**. MTU is the Maximum Transmission Unit. It specifies the largest packet size permitted for Internet transmission. The default setting, **Manual**, allows you to enter the largest packet size that will be transmitted. The recommended size, entered in the *Size* field, is 1492. You should leave this value in the 1200 to 1500 range. To have the Router select the best MTU for your Internet connection, select **Auto**.

## Network Setup

The Network Setup section changes the settings on the network connected to the Router's Ethernet ports. Wireless setup is performed through the Wireless tab.

### Router IP

This presents both the Router's IP Address and Subnet Mask as seen by your network.



**Figure 8-9: Router IP**

### Network Address Server Settings (DHCP)

The settings allow you to configure the Router's Dynamic Host Configuration Protocol (DHCP) server function. The Router can be used as a DHCP server for your network. A DHCP server automatically assigns an IP address to each computer on your network. If you choose to enable the Router's DHCP server option, you must configure all of your network PCs to connect to a DHCP server (the Router), and make sure there is no other DHCP server on your network.

**DHCP Server**. DHCP is enabled by factory default. If you already have a DHCP server on your network, or you don't want a DHCP server, then click the **Disable** radio button (no other DHCP features will be available).

**Starting IP Address**. Enter a value for the DHCP server to start with when issuing IP addresses.  Because the Router's default IP address is 192.168.1.1, the Starting IP Address must be 192.168.1.2 or greater, but smaller than 192.168.1.253. The default Starting IP Address is **192.168.1.100**.



**Figure 8-10: Network Address Server Settings**

**Maximum Number of DHCP Users**. Enter the maximum number of PCs that you want the DHCP server to assign IP addresses to. This number cannot be greater than 253. The default is **50**.

**Client Lease Time**. The Client Lease Time is the amount of time a network user will be allowed connection to the Router with their current dynamic IP address. Enter the amount of time, in minutes, that the user will be "leased" this dynamic IP address. After the time is up, the user will be automatically assigned a new dynamic IP address. The default is 0 minutes, which means one day.

**Static DNS** (1-3). The Domain Name System (DNS) is how the Internet translates domain or website names into Internet addresses or URLs. Your ISP will provide you with at least one DNS Server IP Address. If you wish to use another, type that IP Address in one of these fields. You can type up to three DNS Server IP Addresses here. The Router will use these for quicker access to functioning DNS servers.

**WINS**. The Windows Internet Naming Service (WINS) manages each PC's interaction with the Internet. If you use a WINS server, enter that server's IP Address here. Otherwise, leave this blank.

## Time Setting

Change the time zone in which your network functions from this pull-down menu. Click the checkbox to have the Router automatically adjust the clock for daylight savings time.

Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.
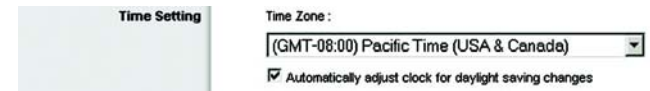


**Figure 8-11: Time Setting**

# The Setup Tab - Mobile Network

On this screen, you can configure mobile network settings and view mobile broadband status information for the Router. Some of these settings will be automatically configured by the Router and, in most cases, should not be changed unless you are instructed to do so.

## Mobile Network Settings

**Auto Connect**. If this feature is enabled, the Router will automatically connect to the default mobile network when it powers on. The default is **Enable**.

**Connect on Demand**. If you want to disconnect the Router from the mobile network if no data has been sent or received for a specific period of time, then enter the number of minutes you want to specify in the field provided.

## Mobile Network Status

**Network Name**. Displayed here is the name of the mobile network the Router is using.

**Signal Strength**. This indicates the strength of the mobile broadband signal that the Router is receiving.

**Connection Time**. This is the length of time the Router has been connected to the mobile network since your last connection.

**Current Session Usage**. Displayed here is the amount of data that has been sent to and received from the mobile network since your last connection.

## Data Card Status

**Card Model**. Displayed here is the model number of your mobile broadband data card.

**Card Firmware**. This is the firmware version of your mobile broadband data card.

To update the screen with the latest status information, click the **Refresh** button.

Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.
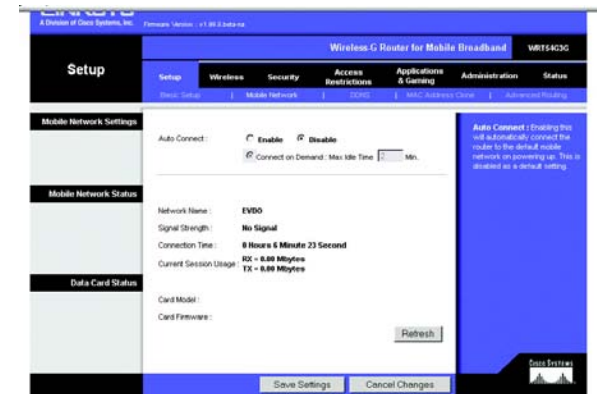


**Figure 8-12: Setup Tab - Mobile Network**

## The Setup Tab - DDNS

The Router offers a Dynamic Domain Name System (DDNS) feature. DDNS lets you assign a fixed host and domain name to a dynamic Internet IP address. It is useful when you are hosting your own website, FTP server, or other server behind the Router. Before you can use this feature, you need to sign up for DDNS service with a DDNS service provider, www.dyndns.org or www.TZO.com.

### DynDNS.org

**DDNS Service**. From this pull-down menu, enter the DDNS service with which you have membership.

**User Name**. Enter the User Name for your DDNS account

**Password**. Enter the Password for your DDNS account.

**Host Name**. The is the DDNS URL assigned by the DDNS service.

**Internet IP Address**. This is the Router's current IP Address as seen on the Internet.

**Status**. This displays the status of the DDNS connection.

**User Name, Password, and Host Name**. Enter the User Name, Password, and Host Name of the account you set up with DynDNS.org.



**Figure 8-13: Setup Tab - DDNS (DynDNS.org)**

**Internet IP Address**. The Gateway's current Internet IP Address is displayed here. Because it is dynamic, it will change.

**Status**. The status of the DDNS service connection is displayed here.

### TZO.com

**E-mail Address, Password, and Domain Name**. Enter the E-mail Address, Password, and Domain Name of the account you set up with TZO.

**Internet IP Address**. The Gateway's current Internet IP Address is displayed here. Because it is dynamic, this will change.

**Status**. The status of the DDNS service connection is displayed here.

Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.



**Figure 8-14: Setup Tab - DDNS (TZO.org)**

## The Setup Tab - MAC Address Clone

A MAC address is a 12-digit code assigned to a unique piece of hardware for identification. Some ISPs will require you to register a MAC address in order to access the Internet.  If you do not wish to re-register the MAC address with your ISP, you may assign the MAC address you have currently registered with your ISP to the Router with the MAC Address Clone feature.

### MAC Clone

**Enable/Disable**. To have the MAC Address cloned, click the radio button beside *Enable*.

**User Defined Entry**. Enter the MAC Address registered with your ISP here.

**Clone Your PC's MAC**. Clicking this button will clone the MAC address.

Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.
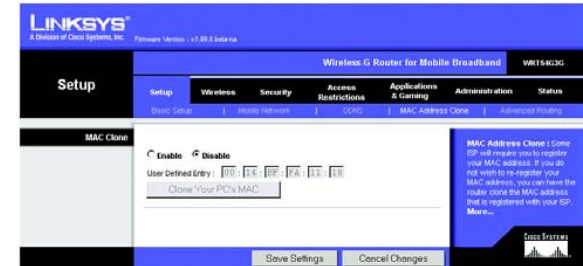


**Figure 8-15: Setup Tab - MAC Address Clone**

# The Setup Tab - Advanced Routing

This tab is used to set up the Router's advanced functions. Operating Mode allows you to select the type(s) of advanced functions you use. Dynamic Routing will automatically adjust how packets travel on your network. Static Routing sets up a fixed route to another network destination.

## Advanced Routing

**Operating Mode**. Select the mode in which this Router will function. If this Router is hosting your network's connection to the Internet, select **Gateway**. If another Router exists on your network, select **Router**. When Router is chosen, **Dynamic Routing** will be enabled.

### Dynamic Routing

**RIP**. Dynamic Routing enables the Router to automatically adjust to physical changes in the network's layout and exchange routing tables with the other router(s). The Router determines the network packets' route based on the fewest number of hops between the source and the destination. This feature is **Disabled** by default. From the drop-down menu, you can also select **LAN & Wireless**, which performs dynamic routing over your Ethernet and wireless networks. You can also select **WAN**, which performs dynamic routing with data coming from the Internet. Finally, selecting **Both** enables dynamic routing for both networks, as well as data from the Internet.

### Static Routing

**Select set number**. To set up a static route between the Router and another network, select a number from the *Static Routing* drop-down list. (A static route is a pre-determined pathway that network information must travel to reach a specific host or network.) Enter the information described below to set up a new static route. (Click the **Delete This Entry** button to delete a static route.)

> **Enter Route Name**. Enter a name for the Route here, using a maximum of 25 alphanumeric characters.

> **Destination LAN IP**. The Destination LAN IP is the address of the remote network or host to which you want to assign a static route.

> **Subnet Mask**. The Subnet Mask determines which portion of a Destination LAN IP address is the network portion, and which portion is the host portion.

> **Default Gateway**. This is the IP address of the gateway device that allows for contact between the Router and the remote network or host.



Figure 8-16: Setup Tab - Advanced Routing (Gateway)
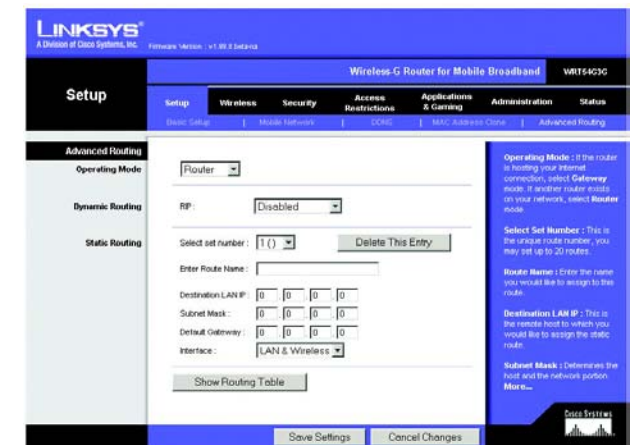


Figure 8-17: Setup Tab - Advanced Routing (Router)

**Interface**. This interface tells you whether the Destination IP Address is on the **LAN & Wireless** (Ethernet and wireless networks), the **WAN** (Internet), or **Loopback** (a dummy network in which one PC acts like a network—necessary for certain software programs).

Click the **Show Routing Table** button to view the Static Routes you've already set up.

Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.

## The Wireless Tab - Basic Wireless Settings

The basic settings for wireless networking are set on this screen.

### Wireless Network

**Wireless Network Mode**. From this drop-down menu, you can select the wireless standards running on your network. If you have both 802.11g and 802.11b devices in your network, keep the default setting, **Mixed**. If you have only 802.11g devices, select **G-Only**. If you have only 802.11b devices, select **B-Only**. If you do not have any 802.11g and 802.11b devices in your network, select **Disable**.

**Wireless Network Name (SSID)**. The SSID is the network name shared among all devices in a wireless network. The SSID must be identical for all devices in the wireless network. It is case-sensitive and must not exceed 32 characters (use any of the characters on the keyboard). Make sure this setting is the same for all devices in your wireless network. For added security, you should change the default SSID (**linksys**) to a unique name.

**Wireless Channel**. Select the appropriate channel from the list provided to correspond with your network settings. All devices in your wireless network must be broadcast on the same channel in order to function correctly.

**Wireless SSID Broadcast**. When wireless clients survey the local area for wireless networks to associate with, they will detect the SSID broadcast by the Router. To broadcast the Router's SSID, keep the default setting, **Enable**. If you do not want to broadcast the Router's SSID, then select **Disable**.

Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.



Figure 8-18: Wireless Tab - Basic Wireless Settings

# The Wireless Tab - Wireless Security

The Wireless Security settings configure the security of your wireless network. There are four wireless security mode options supported by the Router: WPA Personal, WPA2 Personal, WPA Enterprise (also known as WPA-RADIUS), WPA2 Enterprise, RADIUS, and WEP. (WPA stands for Wi-Fi Protected Access, which is a security standard stronger than WEP encryption. WEP stands for Wired Equivalent Privacy, while RADIUS stands for Remote Authentication Dial-In User Service.) These four are briefly discussed here. For detailed instructions on configuring wireless security for the Router, turn to "Appendix B: Wireless Security."

> ⚠️ **IMPORTANT:** Linksys strongly recommends that you enable wireless security on your wireless network. Otherwise, unauthorized users may be able to access the Internet using your service and incur additional charges. You are liable for any and all additional charges from your service provider.

## Wireless Security

**WPA2 Personal**. WPA2 automatically uses TKIP + AES with dynamic encryption keys. Enter a WPA Shared Key of 8-63 characters. Then enter a Group Key Renewal period, which instructs the Router how often it should change the encryption keys.

Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.

> ⚠️ **IMPORTANT:** If you are using WPA or WPA2, always remember that each device in your wireless network MUST use the same WPA method and shared key, or else the network will not function properly.

**WPA Personal**. WPA gives you two encryption methods, TKIP and AES, with dynamic encryption keys. Select the type of algorithm, **TKIP** or **AES**. Enter a WPA Shared Key of 8-63 characters. Then enter a Group Key Renewal period, which instructs the Router how often it should change the encryption keys.

Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.



**Figure 8-19: Wireless Tab - Wireless Security (WPA2 Personal)**



**Figure 8-20: Wireless Tab - Wireless Security (WPA Personal - TKIP)**



**Figure 8-21: Wireless Tab - Wireless Security (WPA Personal - AES)**

**WPA2 Enterprise**. This option features WPA2 used in coordination with a RADIUS server. (This should only be used when a RADIUS server is connected to the Router.) WPA2 automatically uses TKIP + AES with dynamic encryption keys. Enter the RADIUS server's IP Address and port number, along with a key shared between the Router and the server. Last, enter a Key Renewal Timeout, which instructs the Router how often it should change the encryption keys.

Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.



**Figure 8-22: Wireless Tab - Wireless Security (WPA2 Enterprise)**

**WPA Enterprise**. This option features WPA used in coordination with a RADIUS server. (This should only be used when a RADIUS server is connected to the Router.) First, select the type of WPA algorithm you want to use, **TKIP** or **AES**. Enter the RADIUS server's IP Address and port number, along with a key shared between the Router and the server. Last, enter a Key Renewal Timeout, which instructs the Router how often it should change the encryption keys.

Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.



**Figure 8-23: Wireless Tab - Wireless Security (WPA Enterprise - TKIP)**



**Figure 8-24: Wireless Tab - Wireless Security (WPA Enterprise - AES)**

**RADIUS**. This option features WEP used in coordination with a RADIUS server. (This should only be used when a RADIUS server is connected to the Router.) First, enter the RADIUS server's IP Address and port number, along with a key shared between the Router and the server. Then, select a Default Transmit Key (choose which Key to use), and a level of WEP encryption, **64 bits 10 hex digits** or **128 bits 26 hex digits**. Last, either generate a WEP key using the Passphrase or enter the WEP key manually. If you are using 64-bit WEP encryption, the key must be exactly 10 hexadecimal characters in length. If you are using 128-bit WEP encryption, the key must be exactly 26 hexadecimal characters in length. Valid hexadecimal characters are "0"-"9" and "A"-"F".

Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.

> ⚠️ **IMPORTANT:** If you are using WEP encryption, always remember that each device in your wireless network MUST use the same WEP encryption method and encryption key, or else your wireless network will not function properly.



**Figure 8-25: Wireless Tab - Wireless Security (RADIUS)**

**WEP**. WEP is a basic encryption method, which is not as secure as WPA. To use WEP, select a Default Transmit Key (choose which Key to use), and a level of WEP encryption, **64 bits 10 hex digits** or **128 bits 26 hex digits**. Then either generate a WEP key using the Passphrase or enter the WEP key manually. If you are using 64-bit WEP encryption, the key must be exactly 10 hexadecimal characters in length. If you are using 128-bit WEP encryption, the key must be exactly 26 hexadecimal characters in length. Valid hexadecimal characters are "0"-"9" and "A"-"F".

Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.

For detailed instructions on configuring wireless security for the Router, turn to "Appendix B: Wireless Security."



**Figure 8-26: Wireless Tab - Wireless Security (WEP)**

# The Wireless Tab - Wireless MAC Filter

Wireless access can be filtered by using the MAC addresses of the wireless devices transmitting within your network's radius.

## Wireless MAC Filter

**Wireless MAC Filter**. To filter wireless users by MAC Address, either permitting or blocking access, click **Enable**. If you do not wish to filter users by MAC Address, select **Disable**.

**Prevent**. Clicking this button will block wireless access by MAC Address.

**Permit Only**. Clicking this button will allow wireless access by MAC Address.

**Edit MAC Address Filter List**. Clicking this button will open the MAC Address Filter List. On this screen, you can list users, by MAC Address, to whom you wish to provide or block access. For easy reference, click the **Wireless Client MAC List** button to display a list of network users by MAC Address.

To save your list of MAC addresses, click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.

Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.



**Figure 8-27: Wireless Tab - Wireless MAC Filter**



**Figure 8-28: MAC Address Filter List**

## The Wireless Tab - Advanced Wireless Settings

This tab is used to set up the Router's advanced wireless functions. These settings should only be adjusted by an expert administrator as incorrect settings can reduce wireless performance.

### Advanced Wireless

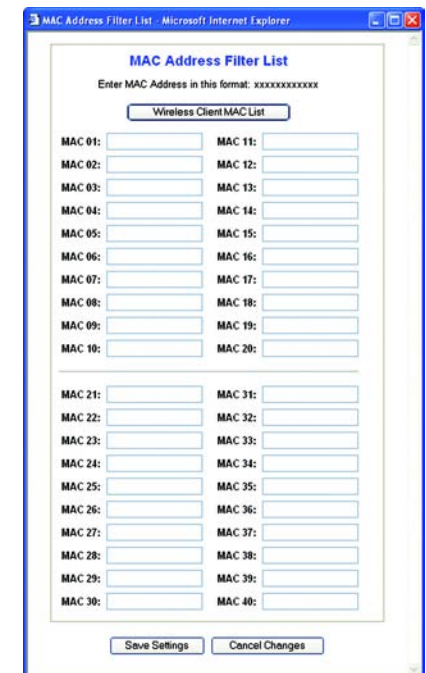**Authentication Type**. The default is set to **Auto**, which allows either Open System or Shared Key authentication to be used. With **Open System** authentication, the sender and the recipient do NOT use a WEP key for authentication. With **Shared Key** authentication, the sender and recipient use a WEP key for authentication.

**Basic Rate**. The Basic Rate setting is not actually one rate of transmission but a series of rates at which the Router can transmit. The Router will advertise its Basic Rate to the other wireless devices in your network, so they know which rates will be used. The Router will also advertise that it will automatically select the best rate for transmission. The default setting is **Default**, when the Router can transmit at all standard wireless rates (1-2Mbps, 5.5Mbps, 11Mbps, 18Mbps, and 24Mbps). Other options are **1-2Mbps**, for use with older wireless technology, and **All**, when the Router can transmit at all wireless rates. The Basic Rate is not the actual rate of data transmission. If you want to specify the Router's rate of data transmission, configure the Transmission Rate setting.

**Transmission Rate**. The rate of data transmission should be set depending on the speed of your wireless network. You can select from a range of transmission speeds, or you can select **Auto** to have the Router automatically use the fastest possible data rate and enable the Auto-Fallback feature. Auto-Fallback will negotiate the best possible connection speed between the Router and a wireless client. The default value is **Auto**.

**CTS Protection Mode**. CTS (Clear-To-Send) Protection Mode should remain disabled unless you are having severe problems with your Wireless-G products not being able to transmit to the Router in an environment with heavy 802.11b traffic. This function boosts the Router's ability to catch all Wireless-G transmissions but will severely decrease performance.

**Frame Burst**. Enabling this option should provide your network with greater performance, depending on the manufacturer of your wireless products. If you are not sure how to use this option, keep the default, **Disable**.

**Beacon Interval**. The default value is **100**. Enter a value between 1 and 65,535 milliseconds. The Beacon Interval value indicates the frequency interval of the beacon. A beacon is a packet broadcast by the Router to synchronize the wireless network.

**DTIM Interval**. This value, between 1 and 255, indicates the interval of the Delivery Traffic Indication Message (DTIM). A DTIM field is a countdown field informing clients of the next window for listening to broadcast and multicast messages. When the Router has buffered broadcast or multicast messages for associated clients, it



**Figure 8-29: Wireless Tab - Advanced Wireless Settings**

sends the next DTIM with a DTIM Interval value. Its clients hear the beacons and awaken to receive the broadcast and multicast messages. The default value is **1**.

**Fragmentation Threshold**. This value specifies the maximum size for a packet before data is fragmented into multiple packets. If you experience a high packet error rate, you may slightly increase the Fragmentation Threshold. Setting the Fragmentation Threshold too low may result in poor network performance. Only minor reduction of the default value is recommended. In most cases, it should remain at its default value of **2346**.

**RTS Threshold**. Should you encounter inconsistent data flow, only minor reduction of the default value, **2347**, is recommended. If a network packet is smaller than the preset RTS threshold size, the RTS/CTS mechanism will not be enabled. The Router sends Request to Send (RTS) frames to a particular receiving station and negotiates the sending of a data frame. After receiving an RTS, the wireless station responds with a Clear to Send (CTS) frame to acknowledge the right to begin transmission. The RTS Threshold value should remain at its default value of **2347**.

**AP Isolation**. This isolates all wireless clients and wireless devices on your network from each other. Wireless devices will be able to communicate with the Router but not with each other. To use this function, select **On**. AP Isolation is **Off** by default.

Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.

# The Security Tab - Firewall

## Firewall

**Firewall Protection**. Enable this feature to employ Stateful Packet Inspection (SPI) for more detailed review of data packets entering your network environment.

### Block WAN Requests

**Block Anonymous Internet Requests**. Use this feature to prevent your network from being "pinged," or detected, by other Internet users. The Block WAN Request feature also reinforces your network security by hiding your network ports. Both functions of the Block WAN Request feature make it more difficult for outside users to work their way into your network. This feature is enabled by default. Remove the checkmark to allow anonymous Internet requests.

**Filter Multicast**. Multicasting allows for multiple transmissions to specific recipients at the same time. If multicasting is permitted, then the Router will allow IP multicast packets to be forwarded to the appropriate computers. This feature is enabled by default. Remove the checkmark to disable this feature.

**Filter Internet NAT Redirection**. This feature uses port forwarding to block access to local servers from local networked computers. Click the checkbox to filter Internet NAT redirection, or remove the checkmark to disable this feature.

**Filter IDENT (Port 113)**. This feature keeps port 113 from being scanned by devices outside of your local network. This feature is enabled by default. Remove the checkmark to disable this feature.

Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.



**Figure 8-30: Security Tab - Firewall**

## The Security Tab - VPN Passthrough

Use this screen to allow VPN tunnels using IPSec, PPTP, or L2TP protocols to pass through the Router's firewall.

VPN Passthrough

**IPSec Passthrough**. Internet Protocol Security (IPSec) is a suite of protocols used to implement secure exchange of packets at the IP layer. To allow IPSec tunnels to pass through the Router, click **Enable**. IPSec Passthrough is enabled by default.

**PPTP Passthrough**. Point-to-Point Tunneling Protocol (PPTP) allows the Point-to-Point Protocol (PPP) to be tunneled through an IP network. To allow PPTP tunnels to pass through the Router, click **Enable**. PPTP Passthrough is enabled by default.

**L2TP Passthrough**. Layer 2 Tunneling Protocol is the method used to enable Point-to-Point sessions via the Internet on the Layer 2 level. To allow L2TP tunnels to pass through the Router, click **Enable**. L2TP Passthrough is enabled by default.

Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.

## The Access Restrictions Tab - Internet Access

The *Internet Access* screen allows you to block or allow specific kinds of Internet usage and traffic, such as Internet access, designated services, websites, and inbound traffic during specific days and times.

Internet Access

**Internet Access Policy**. Access can be managed by a policy. Use the settings on this screen to establish an access policy (after the **Save Settings** button is clicked). Selecting a policy from the drop-down menu will display that policy's settings. To delete a policy, select that policy's number and click the **Delete** button. To view all the policies, click the **Summary** button. (Policies can be deleted from the *Summary* screen by selecting the policy or policies and clicking the **Delete** button. To return to the Internet Access tab, click the **Close** button.)

**Status**. Policies are disabled by default. To enable a policy, select the policy number from the drop-down menu, and click the radio button beside *Enable*.

To create an Internet Access policy:

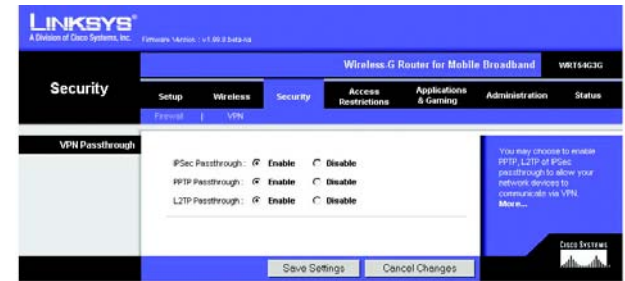1. Select a number from the *Internet Access Policy* drop-down menu.



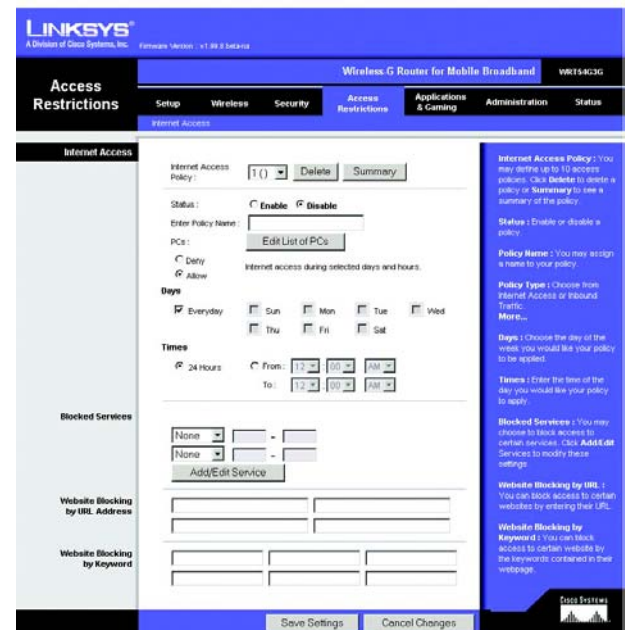**Figure 8-31: Security Tab - VPN Passthrough**



**Figure 8-32: Access Restrictions Tab - Internet Access**

2. To enable this policy, click the radio button beside *Enable*.

3. Enter a Policy Name in the field provided.

4. Click the **Edit List of PCs** button to select which PCs will be affected by the policy. The *List of PCs* screen will appear. You can select a PC by MAC Address or IP Address. You can also enter a range of IP Addresses if you want this policy to affect a group of PCs. After making your changes, click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes. Then click the **Close** button.

5. Click the appropriate option, **Deny** or **Allow**, depending on whether you want to block or allow Internet access for the PCs you listed on the *List of PCs* screen.

6. Decide which days and what times you want this policy to be enforced. Select the individual days during which the policy will be in effect, or select **Everyday**. Then enter a range of hours and minutes during which the policy will be in effect, or select **24 Hours**.

7. You can filter access to various services accessed over the Internet, such as FTP or telnet, by selecting services from the drop-down menus next to *Blocked Services*. Then enter the range of ports you want to filter.

   If the service you want to block is not listed or you want to edit a service's settings, then click the **Add/Edit Service** button. Then the *Port Services* screen will appear.

   To add a service, enter the service's name in the *Service Name* field. Select its protocol from the *Protocol* drop-down menu, and enter its range in the *Port Range* fields. Then click the **Add** button.

   To modify a service, select it from the list on the right. Make changes, and then click the **Modify** button.

   To delete a service, select it from the list on the right. Then click the **Delete** button.

   When you are finished making changes on the *Port Services* screen, click the **Apply** button to save changes. If you want to cancel your changes, click the **Cancel** button. To close the *Port Services* screen and return to the *Access Restrictions* screen, click the **Close** button.

8. If you want to block websites with specific URL addresses, enter each URL in a separate field next to *Website Blocking by URL Address*.

9. If you want to block websites using specific keywords, enter each keyword in a separate field next to *Website Blocking by Keyword*.

10. Click the **Save Settings** button to save the policy's settings. To cancel the policy's settings, click the **Cancel Changes** button.
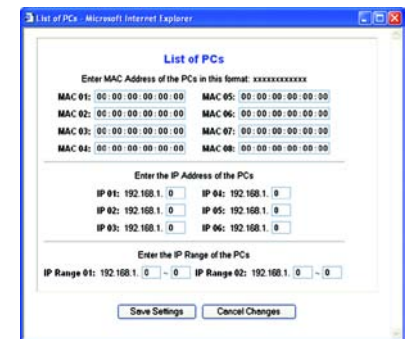


**Figure 8-33: Internet Policy Summary**



**Figure 8-34: List of PCs**



**Figure 8-35: Port Services**

# The Applications and Gaming Tab - Port Range Forward

The Applications and Gaming Tab allows you to set up public services on your network, such as web servers, ftp servers, e-mail servers, or other specialized Internet applications. (Specialized Internet applications are any applications that use Internet access to perform functions such as videoconferencing or online gaming. Some Internet applications may not require any forwarding.)

## Port Range Forward

To forward a port, enter the information on each line for the criteria required. The criteria are described here.

**Application**. In this field, enter the name you wish to give the application. Each name can be up to 12 characters.

**Start/End**. This is the port range. Enter the number that starts the port range under **Start** and the number that ends the range under **End**.

**Protocol**. Enter the protocol used for this application, either **TCP** or **UDP**, or **Both**.

**IP Address**. For each application, enter the IP Address of the PC running the specific application.

**Enable**. Click the **Enable** checkbox to enable port forwarding for the relevant application.

Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.
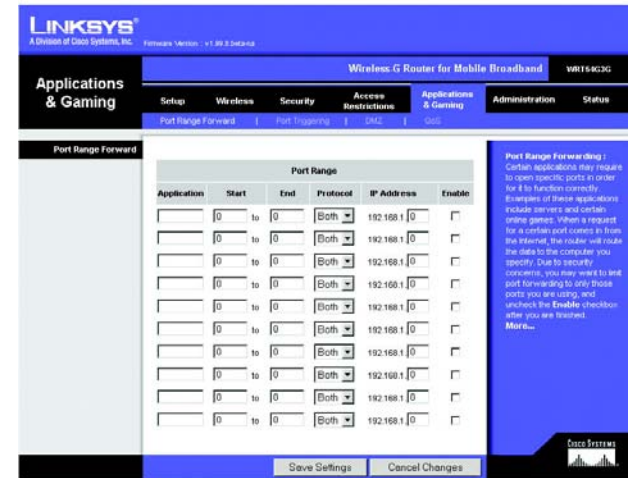


**Figure 8-36: Applications and Gaming Tab - Port Range Forward**

# The Applications & Gaming Tab - Port Triggering

The *Port Triggering* screen allows the Router to watch outgoing data for specific port numbers. The IP address of the computer that sends the matching data is remembered by the Router, so that when the requested data returns through the Router, the data is pulled back to the proper computer by way of IP address and port mapping rules.

## Port Triggering

**Application**. Enter the application name of the trigger.

## Triggered Range

For each application, list the triggered port number range. Check with the Internet application documentation for the port number(s) needed.

**Start Port**. Enter the starting port number of the Triggered Range.

**End Port**. Enter the ending port number of the Triggered Range.

## Forwarded Range

For each application, list the forwarded port number range. Check with the Internet application documentation for the port number(s) needed.

**Start Port**. Enter the starting port number of the Forwarded Range.

**End Port**. Enter the ending port number of the Forwarded Range.

**Enable**. Click the **Enable** checkbox to enable port triggering for the relevant application.

Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.



Figure 8-37: Applications and Gaming Tab - Port Triggering

# The Applications and Gaming Tab - DMZ

The DMZ feature allows one network user to be exposed to the Internet for use of a special-purpose service such as Internet gaming or videoconferencing. DMZ hosting forwards all the ports at the same time to one PC. The Port Range Forward feature is more secure because it only opens the ports you want to have opened, while DMZ hosting opens all the ports of one computer, exposing the computer to the Internet.

Any PC whose port is being forwarded must have its DHCP client function disabled and should have a new static IP address assigned to it because its IP address may change when using the DHCP function.

## DMZ

To expose one PC, select **Enable**. Then, enter the computer's IP address in the *DMZ Host IP Address* field.

Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.

# The Applications and Gaming Tab - QoS

Quality of Service (QoS) ensures better service to high-priority types of network traffic, which may involve demanding, real-time applications, such as videoconferencing.

There are three types of Wired QoS available, Device Priority, Application Priority, and Ethernet Port Priority. You can also configure Wireless QoS on this page.

## Wired QoS

**Enable/Disable**. To limit outgoing bandwidth for the QoS policies in use, select **Enable**. Otherwise, select **Disable**.

**Upstream Bandwidth**. Select the bandwidth to be used from the drop-down menu. This setting allows you to limit the outgoing bandwidth for the QoS policies in use, so you can control how much bandwidth a particular application is allowed to use.

## Device Priority

**Device name, Priority, and MAC Address**. For each device, enter the name of your network device in the *Device name* field. Then select its Priority and enter its MAC Address.


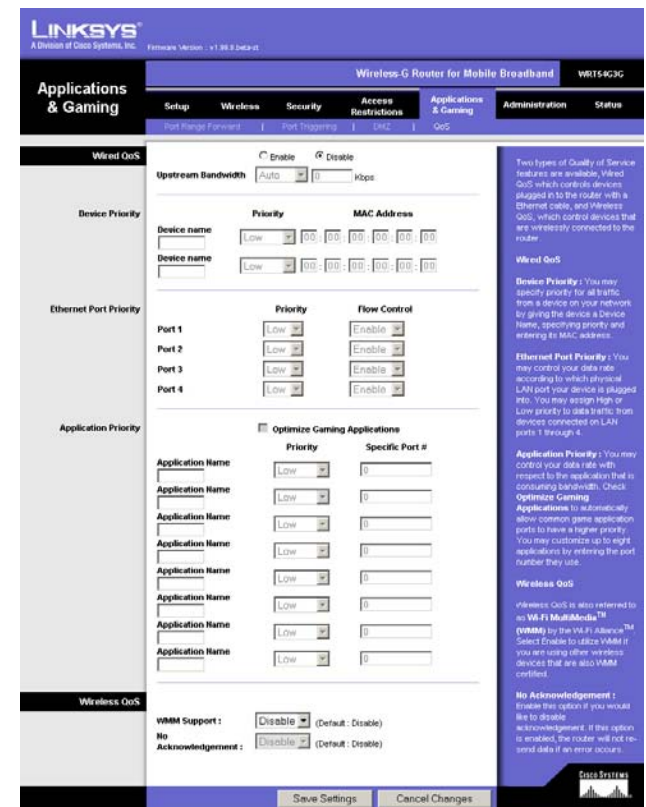
Figure 8-38: Applications and Gaming Tab - DMZ



Figure 8-39: Applications and Gaming Tab - QoS

### Ethernet Port Priority

**Port 1-4, Priority, and Flow Control**. Ethernet Port Priority QoS allows you to prioritize performance for four of the Router's ports, Ethernet (LAN) Ports 1-4. For each of these ports, select **High** or **Low** for *Priority*. For Flow Control, if you want the Router to control the transmission of data between network devices, select **Enable**. To disable this feature, select **Disable**.

Ethernet Port Priority QoS does not require support from your ISP because the prioritized ports are LAN ports going out to your network.

### Application Priority

Application Priority QoS manages information as it is transmitted and received. You can have gaming application ports assigned higher priority. You can also configure the Router to assign high or low priority to ports for applications that you specify.

**Optimize Gaming Applications**. Click this checkbox if you want the Router to automatically assign higher priority to common game application ports.

**Application Name, Priority, and Specific Port #**. Enter the name of the application in the *Application Name* field. For each application, select **High** or **Low** for *Priority* and enter its respective port number in the *Specific Port#* fields.

### Wireless QoS

You can configure the WMM™ (Wi-Fi Multimedia) support and No Acknowledgement settings in this section.

**WMM Support**. If you have other devices that support WMM on your network, select **Enable** from the drop-down menu. Otherwise, keep the default, **Disable**.

**No Acknowledgement**. If you want to disable the Router's Acknowledgement feature, so the Router will not re-send data if an error occurs, then select **Enable** from the drop-down menu. Otherwise, keep the default, **Disable**.

Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.

## The Administration Tab - Management

This section of the Administration tab allows the network's administrator to manage specific Router functions for access and security.

### Router Password

### Local Router Access

**Router Password and Re-enter to confirm**. You can change the Router's password from here. Enter a new Router password and then type it again in the *Re-enter to confirm* field to confirm.

### Web Access

**Access Server**. HTTP (HyperText Transport Protocol) is the communications protocol used to connect to servers on the World Wide Web. HTTPS is a similar protocol, but it uses SSL (Secured Socket Layer) to encrypt transmitted data, so security is increased. Select the protocol you want to use, **HTTP** or **HTTPS**.

**Wireless Access Web**. If you are using the Router in a public domain where you are giving wireless access to your guests, you can disable wireless access to the Router's Web-based Utility. You will only be able to access the Web-based Utility via a wired connection if you disable the setting. Select **Enable** to enable wireless access to the Router's Web-based Utility or **Disable** to disable wireless access to the Utility.

### Remote Router Access

**Remote Management and Management Port**. To access the Router remotely, from outside the network, verify that **Enable** is selected. Then, enter the port number that will be open to outside access. You will need to enter the Router's password when accessing the Router this way, as usual.

**Use https**. If you want to require the use of SSL (Secured Socket Layer) to encrypt transmitted data, click the checkbox.

### UPnP

**UPnP**. When using UPnP features, select **Enable**. Because allowing this may present a risk to security, this feature is disabled by default.

Change these settings as described here, and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.



**Figure 8-40: Administration Tab - Management**