LINKSYS®

A Division of Cisco Systems, Inc.

2.4GHz

Wireless-N

Gigabit Gaming Router

User Guide

WIRELESS

Model No. **WRT330N**

CISCO SYSTEMS

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WARNING: This product contains chemicals, including lead, known to the State of California to cause cancer, and birth defects or other reproductive harm. ***Wash hands after handling.***

How to Use This User Guide

This User Guide has been designed to make understanding networking with the Wireless-N Gigabit Gaming Router 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-N Gigabit Gaming Router.

This exclamation point means there is a caution or warning and is something that could damage your property or the Wireless-N Gigabit Gaming Router.

This question mark provides you with a reminder about something you might need to do while using the Wireless-N Gigabit Gaming Router.

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".

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Chapter 1: Introduction

Welcome

Thank you for choosing the Linksys Wireless-N Gigabit Gaming Router. The Wireless-N Gigabit Gaming Router will allow you to network wirelessly better than ever, sharing Internet access, files and fun, easily and securely and with a greater range of up to three times farther than standard Wireless-G.

How does the Wireless-N Gigabit Gaming Router do all of this? A router is a device that allows access to an Internet connection over a network. With the Wireless-N Gigabit Gaming Router, this access can be shared over the four switched ports or via the wireless broadcast.

Use the 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. The Router also offers VPN passthrough and other features, which can be configured through the easy-to-use, browser-based utility.

The incredible speed of Wireless-N makes it ideal for media-centric applications like streaming video and Voice over IP (VoIP) telephony, so your network can handle multiple data streams at the same time, with no degradation in performance.

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-N Gigabit Gaming Router bridges wireless and wired networks, allowing them to communicate with each other.

Linksys recommends using the Setup Wizard on the Setup CD-ROM for first-time installation of the Router. If you do not wish to run the Setup Wizard, then use the instructions in this Guide to help you connect the Router and configure it. These instructions should be all you need to get the most out of the Wireless-N Gigabit Gaming Router.

***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.*

***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.*

What's in this User Guide?

This user guide covers the steps for setting up and using the Wireless-N Gigabit Gaming Router.

- 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-N Gigabit Gaming Router
  This chapter describes the physical features of the Router.

- Chapter 4: Connecting the Wireless-N Gigabit Gaming Router
  This chapter instructs you on how to connect the Router to your network.

- Chapter 5: Configuring the Wireless-N Gigabit Gaming Router
  This chapter explains how to use the Web-based Utility to configure the settings on the Wireless-N Gigabit Gaming Router.

- Appendix A: Troubleshooting
  This appendix describes some problems and solutions, as well as frequently asked questions, regarding installation and use of the Wireless-N Gigabit Gaming Router.

- 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.*

***ad-hoc**: a group of wireless devices communicating directly to each other (peer-to-peer) without the use of 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-N Gigabit Gaming Router, 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.

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-N Gigabit Gaming Router has been specifically designed for use with your Wireless-N, Wireless-G, and Wireless-B products. It will work with notebook adapters for your laptop computers, PCI adapters for your

desktop computers, and USB adapters for your USB connectivity needs. The Router can also communicate with other devices, such as wireless print servers and bridges.

When you wish to connect your wireless network to your wired network, you can use the Router's four local Ethernet ports. To add more ports, connect one of the Router's local ports to any Linksys switch.

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-N Gigabit Gaming Router.

Chapter 3: Getting to Know the Wireless-N Gigabit Gaming Router

The Back Panel

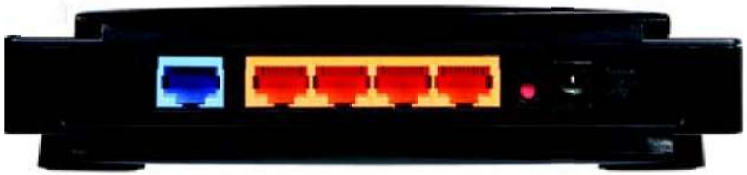

Figure 3-1: The Router's Back Panel

The Router's ports, where the cables are connected, and Reset button are located on the back panel.

INTERNET The Internet port is where you will connect your broadband modem.

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

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 - Factory Defaults tab of the Router's Web-based Utility.

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

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 Front Panel

Figure 3-2: The Router's Front Panel

The Router's LEDs are located on the front panel.

POWER	Green. The **POWER** LED lights up and will stay on while the Router is powered on.
ETHERNET 1, 2, 3, 4	Green. These numbered LEDs, corresponding with the numbered ports on the Router's back panel, serve two purposes. The LED lights up when the Router is connected to a device through the corresponding port. If the LED is flashing, the Router is sending or receiving data over that port.
INTERNET	Green. The **INTERNET** LED lights up when there is a connection through the Internet port.
WIRELESS	Green. The **WIRELESS** LED lights up when there is a wireless connection. If the LED is flashing, the Router is sending or receiving data over the wireless network.
SECURITY	Green. The **SECURITY** LED indicates when wireless security is enabled.

The Top Panel

The Router has a button reserved for a future function.

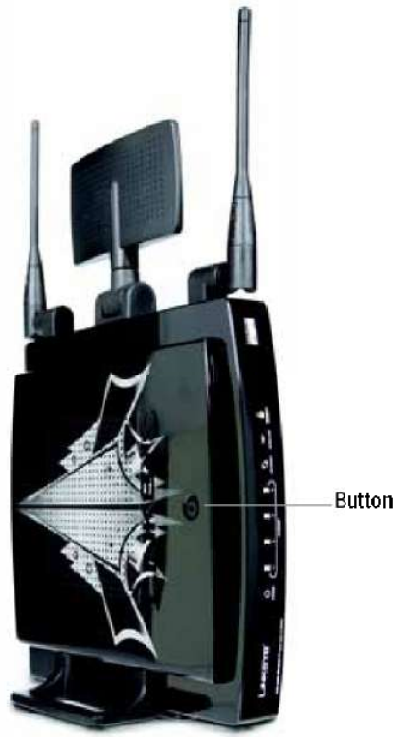

Figure 3-3: The Router's Top Panel

Chapter 4: Connecting the Wireless-N Gigabit Gaming Router

Hardware Installation

1. Make sure that all of your hardware is powered off, including the broadband modem and PCs.
2. Connect your broadband modem's Ethernet cable to the Router's Internet port.
3. Connect one end of an Ethernet network cable to one of the numbered ports on the back of the Router. Connect the other end to an Ethernet port on a network device, e.g., a PC, print server, or switch.

   Repeat this step to connect more PCs or other network devices to the Router.
4. Power on the broadband modem.
5. Connect the included power adapter to the Router's Power port, and then plug the power adapter into an electrical outlet. The Power LED on the front panel will light up when the adapter is connected properly.
6. Power on your PC(s).
7. 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 wireless devices.

Proceed to "Chapter 5: Configuring the Wireless-N Gigabit Gaming Router".

Figure 4-1: Connect the Modem

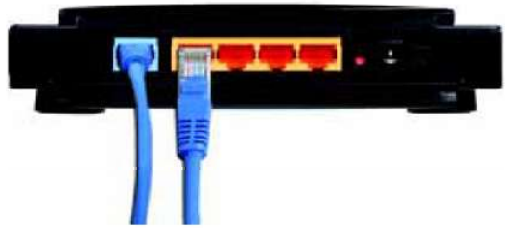

Figure 4-2: Connect a PC

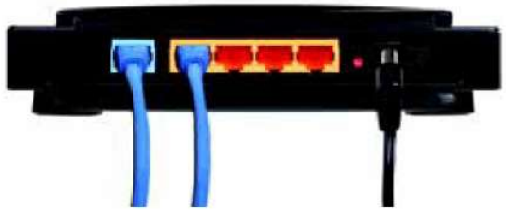

Figure 4-3: Connect the Power

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

Chapter 5: Configuring the Wireless-N Gigabit Gaming Router

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 describes each web page on 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 only have to use the following screens of the Utility:

- BASIC SETUP. On the *BASIC SETUP* screen, enter the Internet connection settings provided by your Internet Service Provider (ISP). If you do not have this information, you can call your ISP to request the settings. When you have the setup information, then you can configure the Router.
- 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.
- WIRELESS. On the *BASIC WIRELESS SETTINGS* screen, set the basic configuration for your wireless network.

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.

SETUP

- BASIC SETUP. Enter the Internet connection and network settings on this screen.
- DDNS. Enable the Router's Dynamic Domain Name System (DDNS) feature on this screen.
- MAC ADDRESS CLONE. If you need to clone a MAC address onto the Router, use this screen.
- ADVANCED ROUTING. Use this screen to alter dynamic and static routing configurations.

WIRELESS

- BASIC WIRELESS SETTINGS. Enter the basic settings for your wireless network on this screen.
- WIRELESS SECURITY. Enable and configure the security settings for your wireless network.
- WIRELESS MAC FILTER. Wireless access can be filtered by using the MAC addresses of the wireless devices transmitting within your network's radius.
- ADVANCED WIRELESS SETTINGS. For advanced users, you can alter data transmission settings on this screen.
- WISH. WISH (Wireless Intelligent Stream Handling) allows you to prioritize the traffic of various wireless applications.

SECURITY

- FIREWALL. You can enable or disable the Router's firewall, as well as various filters.
- VPN PASSTHROUGH. To enable or disable IPSec, L2TP, and/or PPTP Passthrough, use this screen.

ACCESS RESTRICTIONS

INTERNET ACCESS POLICY. Create policies to control Internet access for your local network users.

APPLICATIONS & GAMING

- SINGLE PORT FORWARDING. This allows you to do port mapping and forwarding for a single service port.
- PORT RANGE FORWARDING. Set up public services or other specialized Internet applications on your network.
- PORT Range Triggering. Configure the Router to watch outgoing data for specific port numbers.
- DMZ. Click this tab to allow one local user to be exposed to the Internet for use of special-purpose services.
- QoS. QUALITY of SERVICE (QoS) ensures better service to high-priority types of network traffic.

ADMINISTRATION

- MANAGEMENT. On this screen, alter the Router's password, access privileges, and UPnP settings. You can also use this screen to back up and restore the Router's configuration file.

- LOG. If you want to view activity logs, click this tab.
- DIAGNOSTICS. If you want to run a ping or traceroute test, then use this screen.
- FACTORY DEFAULTS. If you want to restore the Router's factory defaults, then use this screen.
- FIRMWARE UPGRADE. Click this tab if you want to upgrade the Router's firmware.

STATUS

- ROUTER. This screen provides status information about the Router.
- LOCAL NETWORK. This provides status information about the local network.
- WIRELESS NETWORK. This provides status information about the wireless network.

How to Access the Web-based Utility

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

A screen will appear asking you for your User name and Password. Leave the *User Name* field blank. Enter **admin** in the *Password* field. Then click the **OK** button.

Make the necessary changes through the Utility. When you have finished making changes to a screen, click **SAVE SETTINGS** to save the changes, or click **CANCEL CHANGES** to undo your changes.

Figure 5-1: Router Login

***static ip address**: a fixed address assigned to a computer or device connected to a network.*

***subnet mask**: an address code that determines the size of the network*

***pppoe**: a type of broadband connection that provides authentication (username and password) in addition to data transport*

***default gateway**: a device that forwards Internet traffic from your local area network*

The SETUP Tab - BASIC SETUP

The *BASIC SETUP* screen is the first screen you see when you access the Web-based Utility. An overview of the screens is presented here. Screen variations are described in detail under each Internet Connection Type.

Internet Connection Type

The Internet Setup section configures the Router for your Internet connection type. This information can be obtained from your ISP. The Router supports four connection types: Static IP, PPPoE, PPTP and Telstra BigPond.

NOTE: Some of the Internet Connection Types may not be available in your area.

Optional Settings (Required by some ISPs)

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

Router Name. You can customize the Router's name. The default is WRT330N.

Host Name and Domain Name. Some 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.

MTU and Size. The MTU (Maximum Transmission Unit) setting specifies the largest packet size permitted for network transmission. To manually set a value, select **Manual** and enter the value desired in the *Size* field. You should leave this value in the 1200 to 1500 range. Most DSL users should use the value 1492. The default is **Auto**, which allows the Router to select the best MTU for your Internet connection.

Router IP

The Router's Local IP Address and Subnet Mask are shown here. In most cases, you should keep the defaults.

Local IP Address. The default value is **192.168.1.1.**

Subnet Mask. The default value is **255.255.255.0.**

Network Address Server Settings (DHCP)

The Network Address Server Settings section allows you to change the Router's local network settings. Detailed information is listed under each Internet Connection Type.

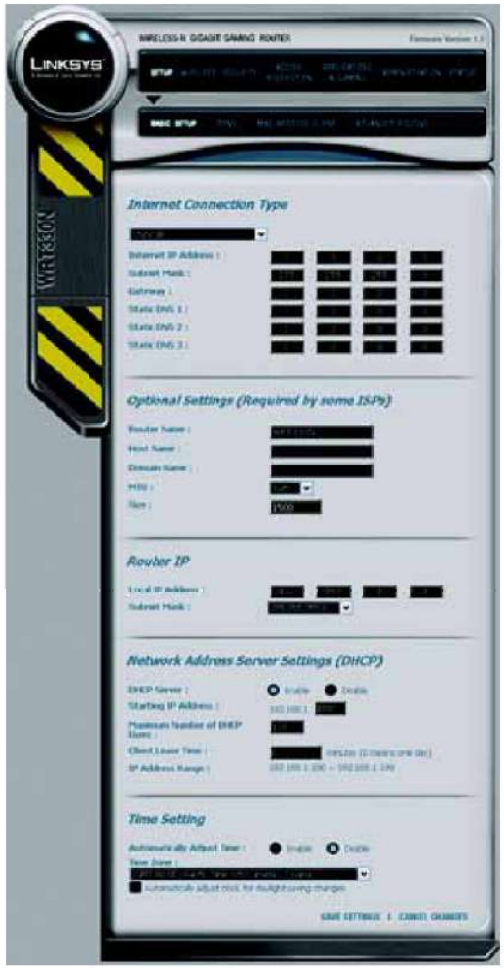

Figure 5-2: SETUP Tab - BASIC SETUP
Static IP

Time Setting

Automatically Adjust Time. You can choose to **Enable** or **Disable** the automatic time adjustment. If you select Enable, you will need to select the correct Time Zone for your Router.

Time Zone. Select the time zone in which your network functions. If you want the Router to automatically adjust the clock for daylight savings, then select the checkbox.

When you have finished making changes to this screen, click **SAVE SETTINGS** to save the changes, or click **CANCEL CHANGES** to undo your changes.

packet: *a unit of data sent over a network.*

Static IP

If you are required to use a permanent IP address, then select **Static IP**.

Internet Connection Type

Internet IP Address. This is the IP address that the Router has 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 external 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.

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. You can enter up to three DNS Server IP Addresses here. The Router will use these for quicker access to functioning DNS servers.

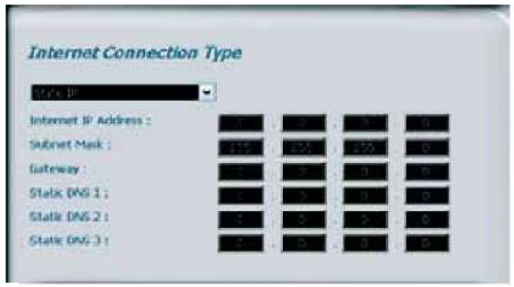

Figure 5-3: Static IP: Internet Connection Type

Network Address Server Settings (DHCP)

DHCP Server. The Router can be used as a Dynamic Host Configuration Protocol (DHCP) server for your network. A DHCP server automatically assigns an IP address to each computer on your network. Unless you already have one, it is highly recommended that you leave the Router enabled as a DHCP server. DHCP is enabled by factory default. If you already have a DHCP server on your network, set the Router's DHCP option to **Disable**.

Starting IP Address. Enter a value for the DHCP server to start with when issuing IP addresses. Because the default IP address for the Router is 192.168.1.1, the Start IP Address must be 192.168.**1**. 2 or greater, but smaller than 192.168.1.254. The default Start IP Address is **192.168.1.100**.

Maximum Number of DHCP Users (Optional)**.** 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 dynamic IP address has expired, the user will be automatically assigned a new dynamic IP address. The default is **0** minutes, which means one day.

IP Address Range. The IP Address Range is Static and cannot be changed.

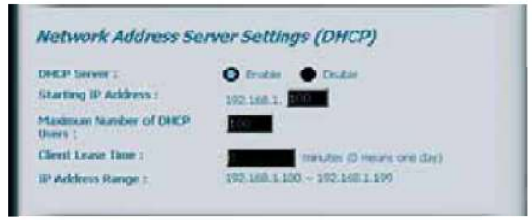

Figure 5-4: Static IP: Network Address Server Settings (DHCP)

When you have finished making changes to this screen, click **SAVE SETTINGS** to save the changes, or click **CANCEL CHANGES** to undo your changes.

PPPoE

Internet Connection Type

Some DSL-based ISPs use PPPoE (Point-to-Point Protocol over Ethernet) to establish Internet connections for end-users. If you use a DSL line, check with your ISP to see if they use PPPoE. If they do, you will have to enable it.

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

Service Name. If provided by your ISP, enter the Service Name.

Connect on Demand and Max Idle Time. You can configure the Router to cut the Internet connection after it has been inactive for a specific 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. To use Connect on Demand, click the radio button. If you want your Internet connection to remain on at all times, enter **0** in the *Max Idle Time* field. Otherwise, enter the number of minutes you want to have elapsed before your Internet access disconnects.

Keep Alive and Redial Period. This option keeps your Internet access connected indefinitely, even when it sits idle. If you select this option, the Router will periodically check your Internet connection. If the connection is down, then the Router will automatically re-establish the connection. To use this option, click the radio button next to *Keep Alive*. The default Redial Period is **30** seconds.

Figure 5-5: PPoE: Internet Connection Type

Network Address Server Settings (DHCP)

DHCP Server. The Router can be used as a Dynamic Host Configuration Protocol (DHCP) server for your network. A DHCP server automatically assigns an IP address to each computer on your network. Unless you already have one, it is highly recommended that you leave the Router enabled as a DHCP server.DHCP is enabled by factory default. If you already have a DHCP server on your network, set the Router's DHCP option to **Disable.**

Starting IP Address. Enter a value for the DHCP server to start with when issuing IP addresses. Because the default IP address for the Router is 192.168.1.1, the Start IP Address must be 192.168.**1.** 2 or greater, but smaller than 192.168.1.254. The default Start IP Address is **192.168.1.100**.

Maximum Number of DHCP Users (Optional). 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"

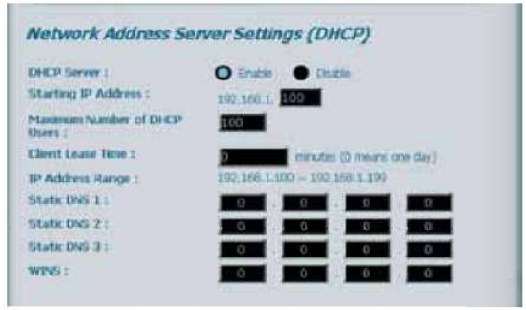

Figure 5-6: PPoE: Network Address Server Settings (DHCP)

this dynamic IP address. After the dynamic IP address has expired, the user will be automatically assigned a new dynamic IP address. The default is **0** minutes, which means one day.

IP Address Range. The IP Address Range is Static and cannot be changed.

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. You can enter 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) converts NetBIOS names to IP addresses. If you use a WINS server, enter that server's IP address here. Otherwise, leave this field blank.

When you have finished making changes to this screen, click **SAVE SETTINGS** to save the changes, or click **CANCEL CHANGES** to undo your changes.

IMPORTANT: For DSL users, if you need to enable PPPoE support, remember to remove any PPPoE applications that are installed on your PCs.

***dynamic ip address**: a temporary IP address assigned by a DHCP server.*

PPTP

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

Internet Connection Type

Internet IP Address. This is the IP address that the Router has, 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 external users on the Internet (including your ISP). Your ISP will provide you with the Subnet Mask.

Service IP Address: If provided by your ISP, enter the Service IP Address.

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

Connect on Demand and Max Idle Time Min. and Sec. You can configure the Router to cut the Internet connection after it has been inactive for a specific 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. To use Connect on Demand, click the radio button. If you want your Internet connection to remain on at all times, enter **0** in the *Max Idle Time* field. Otherwise, enter the number of minutes you want to have elapsed before your Internet access disconnects.

Network Address Server Settings (DHCP)

DHCP Server. The Router can be used as a Dynamic Host Configuration Protocol (DHCP) server for your network. A DHCP server automatically assigns an IP address to each computer on your network. Unless you already have one, it is highly recommended that you leave the Router enabled as a DHCP server.DHCP is enabled by factory default. If you already have a DHCP server on your network, set the Router's DHCP option to **Disable**. DHCP is enabled by factory default. If you already have a DHCP server on your network, set the Router's DHCP option to **Disable**. If you disable DHCP, remember to assign a static IP address to the Router.

Starting IP Address. Enter a value for the DHCP server to start with when issuing IP addresses. Because the default IP address for the Router is 192.168.1.1, the Start IP Address must be 192.168.**1**. 2 or greater, but smaller than 192.168.1.254. The default Start IP Address is **192.168.1.100**.

Maximum Number of DHCP Users (Optional). 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"

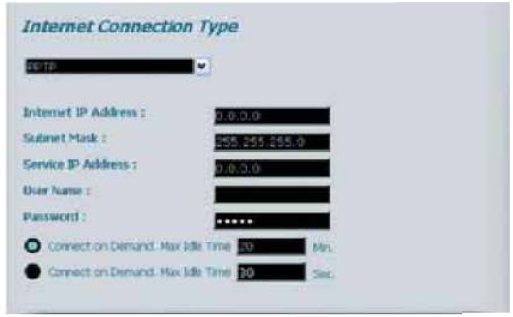

Figure 5-7: PPTP: Internet Connection Type

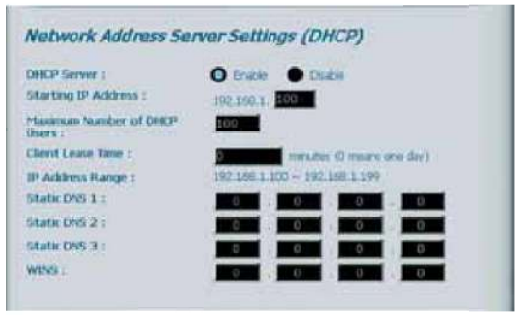

Figure 5-8: PPTP: Network Address Server Settings (DHCP)

this dynamic IP address. After the dynamic IP address has expired, the user will be automatically assigned a new dynamic IP address. The default is **0** minutes, which means one day.

IP Address Range. The IP Address Range is Static and cannot be changed.

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. You can enter 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) converts NetBIOS names to IP addresses. If you use a WINS server, enter that server's IP address here. Otherwise, leave this field blank.

When you have finished making changes to this screen, click **SAVE SETTINGS** to save the changes, or click **CANCEL CHANGES** to undo your changes.

Telstra Cable

Telstra Cable is a service used in Australia only. Check with your ISP for the necessary setup information.

Internet Connection Type

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

Heart Beat Server: Enter the Heart Beat Server information.

Network Address Server Settings (DHCP)

DHCP Server. The Router can be used as a Dynamic Host Configuration Protocol (DHCP) server for your network. A DHCP server automatically assigns an IP address to each computer on your network. Unless you already have one, it is highly recommended that you leave the Router enabled as a DHCP server.DHCP is enabled by factory default. If you already have a DHCP server on your network, set the Router's DHCP option to **Disable.**

Starting IP Address. Enter a value for the DHCP server to start with when issuing IP addresses. Because the default IP address for the Router is 192.168.1.1, the Start IP Address must be 192.168.**1.** 2 or greater, but smaller than 192.168.1.254. The default Start IP Address is **192.168.1.100**.

Maximum Number of DHCP Users (Optional). 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"

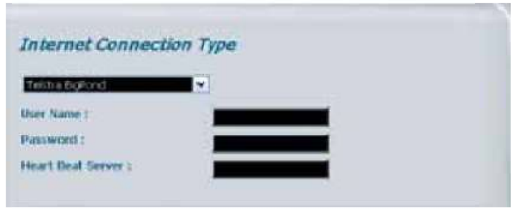

Figure 5-9: Telstra Cable: Internet Connection Type

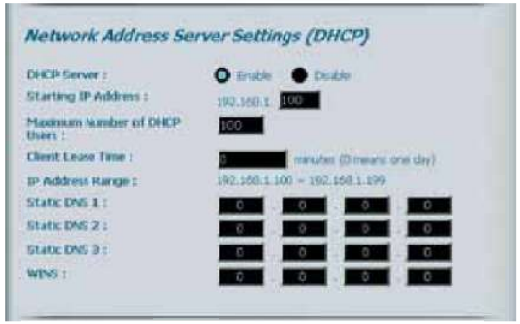

Figure 5-10: Telstra Cable: Network Address Server Settings (DHCP)

this dynamic IP address. After the dynamic IP address has expired, the user will be automatically assigned a new dynamic IP address. The default is 0 minutes, which means one day.

IP Address Range. The IP Address Range is Static and cannot be changed.

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. You can enter 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) converts NetBIOS names to IP addresses. If you use a WINS server, enter that server's IP address here. Otherwise, leave this field blank.

When you have finished making changes to this screen, click **SAVE SETTINGS** to save the changes, or click **CANCEL CHANGES** to undo your changes.

NOTE: To test your settings, connect to the Internet now.

The SETUP Tab - Dynamic DNS

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 at one of two DDNS service providers, DynDNS.org or TZO.com.

Dynamic DNS

DDNS Service

If your DDNS service is provided by DynDNS.org, then select **DynDNS.org** from the drop-down menu. If your DDNS service is provided by TZO, then select **TZO.com**. The features available on the *DDNS* screen will vary, depending on which DDNS service provider you use.

DynDNS.org

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

System. Select the DynDNS service you use: **Dynamic**, **Static**, or **Custom**.

Internet IP Address. The Router's Internet IP address is displayed here. Because it is dynamic, it will change.

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

Update. To manually trigger an update, click this button.

TZO.com

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

Internet IP Address. The Router's Internet IP address is displayed here. Because it is dynamic, it will change.

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

Update. To manually trigger an update, click this button.

When you have finished making changes to this screen, click **SAVE SETTINGS** to save the changes, or click **CANCEL CHANGES** to undo your changes.

Figure 5-11: SETUP Tab -DDNS-DynDNS.org

Figure 5-12: SETUP Tab -DDNS-tzo.com

***ddns**: allows the hosting of a website, FTP server, or e-mail server with a fixed domain name (e.g., www.xyz.com) and a dynamic IP address.*

The SETUP Tab - MAC ADDRESS CLONE

A MAC address is a 12-digit code assigned to a unique piece of hardware for identification, like a social security number. 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 Cloning

To use MAC address cloning, select **Enable**. Otherwise, keep the default, **Disable**.

MAC Address. Enter the MAC Address registered with your ISP.

ClonePC's MAC Address. If you want to clone the MAC address of the PC you are currently using to configure the Router, then click this button. The Router will automatically detect your PC's MAC address, so you do NOT have to call your ISP to change the registered MAC address to the Router's MAC address. It is recommended that the PC registered with the ISP is used to open the *MAC Address Clone* screen.

When you have finished making changes to this screen, click **SAVE SETTINGS** to save the changes, or click **CANCEL CHANGES** to undo your changes.

Figure 5-13: SETUP Tab- MAC ADDRESS CLONE

mac address: *the unique address that a manufacturer assigns to each networking device.*

The SETUP Tab - ADVANCED ROUTING

NAT

If this Router is hosting your network's connection to the Internet, select **Enabled**. If another Router exists on your network, select **Disabled**. When the NAT setting is disabled, dynamic routing will be enabled.

Dynamic Routing

This feature 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. To use dynamic routing, select **Enabled**. Otherwise, select **Disabled**. When the NAT setting is disabled, dynamic routing will be enabled.

Static Routing

A static route is a pre-determined pathway that network information must travel to reach a specific host or network. Use this feature to set up a static route between the Router and another network (you can have up to 20 static routes). To create a static route, alter the following settings:

Routing Entries. Select the number of the static route from the drop-down menu.

Enter Route Name. Enter a name for the static route, using a maximum of 25 alphanumeric characters.

Destination LAN IP. The Destination LAN IP Address is the address of the remote network or host to which you want to assign a static route. Enter the IP address of the host for which you wish to create a static route.

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

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

Interface. Select **LAN & Wireless** or **WAN (Internet)**, depending on the location of the final destination.

Show Routing Table. Click the **Show Routing Table** button to open a screen displaying how data is routed through your local network. For each route, the Destination LAN IP address, Subnet Mask, Gateway, and Interface are displayed. Click **REFRESH** to update the information. Click **CLOSE WINDOW** to exit this screen.

When you have finished making changes to the Advanced Routing screen, click **SAVE SETTINGS** to save the changes, or click **CANCEL CHANGES** to undo your changes.

Figure 5-14: SETUP Tab - ADVANCED ROUTING

Figure 5-15: Show Routing Table - Routing Table

The WIRELESS Tab - BASIC WIRELESS SETTINGS

Wireless Setting

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

Wireless Name (SSID). The SSID is the network name shared among all points 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 points in your wireless network. For added security, you should change the default SSID (**linksys**) to a unique name.

Radio Band. For best performance in a network using Wireless-N, Wireless-G and Wireless-B devices, keep the default, **Wide - 40MHz Channel**. For Wireless-G and Wireless-B networking only, select **Standard - 20MHz Channel.** If you are not sure which radio band to select, keep the default, **Auto.**

Wide Channel. If you selected Wide - 40MHz Channel for the Radio Band setting, then this setting will be available for your primary Wireless-N channel. Select any channel from the drop-down menu.

Standard Channel. Select the channel for Wireless-N, Wireless-G, and Wireless-B networking. If you selected Wide – 40MHz Channel for the Radio Band setting, then the Standard Channel will be a secondary channel for Wireless-N. If you are not sure which channel to select, keep the default, **Auto.**

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, **Enabled**. If you do not want to broadcast the Router's SSID, then select **Disable.**

When you have finished making changes to this screen, click **SAVE SETTINGS** to save the changes, or click **CANCEL CHANGES** to undo your changes.

Figure 5-16: WIRELESS Tab- BASIC WIRELESS SETTINGS

NOTE: If you select Wide - 40MHz Channel for the Radio Band setting, then Wireless-N can use two channels: a primary one (Wide Channel) and a secondary one (Standard Channel). This will enhance Wireless-N performance.

The WIRELESS Tab - WIRELESS SECURITY

These settings configure the security of your wireless network. There are six wireless security modes supported by the Router: PSK-Personal, PSK2-Personal, PSK-Enterprise, PSK-2 Enterprise, RADIUS, and WEP. (PSK (Pre-Shared Key), is a security standard stronger than WEP (Wired Equivalent Privacy (encryption), while RADIUS stands for Remote Authentication Dial-In User Service.) For details on configuring wireless security for the Router, turn to "Appendix B: Wireless Security." If you do not want to use wireless security, select **Disabled** in the Security Mode.

Wireless Security

Security Mode. Select the mode you want to use: **PSK-Personal, PSK2-Personal, PSK-Enterprise, PSK2-Enterprise, RADIUS,** or **WEP.** PSK2 is a more advanced, more secure version of PSK.

PSK Personal

Encryption. Select the algorithm you want to use, **TKIP** or **AES.** (AES is a stronger encryption method than TKIP.)

Pre-shared Key. Enter the key shared by the Router and your other network devices. It must have 8-63 characters.

Key Renewal. Enter the Key Renewal period, which tells the Router how often it should change encryption keys.

When you have finished making changes to this screen, click **SAVE SETTINGS** to save the changes, or click **CANCEL CHANGES** to undo your changes.

PSK2 Personal

Encryption. Select the algorithm(s) you want to use, **AES** or **TKIP or AES.** (AES is a stronger encryption method than TKIP.)

Pre-shared Key. Enter the key shared by the Router and your other network devices. It must have 8-63 characters.

Key Renewal. Enter the Key Renewal period, which tells the Router how often it should change encryption keys.

When you have finished making changes to this screen, click **SAVE SETTINGS** to save the changes, or click **CANCEL CHANGES** to undo your changes.

Figure 5-17: WIRELESS Tab - WIRELESS SECURITY - PSK Personal

Figure 5-18: WIRELESS Tab - WIRELESS SECURITY - PSK2 Personal