

**LINKSYS**® by Cisco



USER GUIDE

# Wireless-N Broadband Router with Storage Link

Model: WRT160NL



# About This Guide

## Icon Descriptions

While reading through the User Guide you may see various icons that call attention to specific items. Below is a description of these icons:



**NOTE:** This check mark indicates that there is a note of interest and is something that you should pay special attention to while using the product.



**WARNING:** This exclamation point indicates that there is a caution or warning and it is something that could damage your property or product.



**WEB:** This globe icon indicates a noteworthy website address or e-mail address.

## Online Resources

Website addresses in this document are listed without **http://** in front of the address because most current web browsers do not require it. If you use an older web browser, you may have to add **http://** in front of the web address.

Resource	Website
Linksys	<a href="http://www.linksysbycisco.com">www.linksysbycisco.com</a>
Linksys International	<a href="http://www.linksysbycisco.com/international">www.linksysbycisco.com/international</a>
Glossary	<a href="http://www.linksysbycisco.com/glossary">www.linksysbycisco.com/glossary</a>
Network Security	<a href="http://www.linksysbycisco.com/security">www.linksysbycisco.com/security</a>

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## Chapter 1: Product Overview

Thank you for choosing the Linksys Wireless-N Broadband Router with Storage Link. The Router lets you access the Internet via a wireless connection or through one of its four switched ports. You can also use the Router to share resources such as computers, printers and files. The Router's USB port connects to a USB storage device, so you can access your portable files. (A USB hard drive may require an external power supply.) A variety of security features help to protect your data and your privacy while you are online. Security features include WPA2 security, a Stateful Packet Inspection (SPI) firewall, and NAT technology. Configuring the Router is easy using the provided browser-based utility.

### Front Panel



 **1, 2, 3, 4** (Blue) 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.


 **Wi-Fi Protected Setup Button** If you have client devices, such as wireless adapters, that support Wi-Fi Protected Setup, then you can use Wi-Fi Protected Setup to automatically configure wireless security for your wireless network(s).


To use Wi-Fi Protected Setup, run the Setup Wizard, or refer to **Wi-Fi Protected Setup, page 11**.


**Wi-Fi Protected Setup LED** (Blue/Amber) The LED lights up blue when wireless security is enabled. It flashes blue for two minutes during Wi-Fi Protected Setup.

The LED lights up amber if there is an error during the Wi-Fi Protected Setup process. Make sure the client device supports Wi-Fi Protected Setup. Wait until the LED is off, and then try again.

The LED flashes when a Wi-Fi Protected Setup session is active. The Router supports one session at a time. Wait until the LED is solidly lit, or off before starting the next Wi-Fi Protected Setup session.


 **Wireless** (Blue) The Wireless LED lights up when the wireless feature is enabled. If the LED is flashing, the Router is sending or receiving data over the network.


 **Internet** (Blue) The Internet LED lights up when there is a connection made through the Internet port. It flashes to indicate network activity over the Internet port.


 **Power** (Blue) The Power LED lights up and will stay on while 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.


### Back Panel




 **Antenna Ports** The R-SMA antenna ports connect to the SMA connectors of the included antennas.

 **Internet** The Internet port is where you will connect your cable or DSL Internet connection.

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

 **USB Port** The USB port connects to a USB storage device. If the storage device does not fit (for example, it may block port 1), then use the included USB extension cable.

 **Power** The Power port connects to the included power adapter.

### Bottom Panel



- **Reset** The Reset button is located on the right side of the product label. There are two ways to reset the Router's factory defaults. Either press and hold the Reset button for approximately five seconds, or restore the defaults from the *Administration > Factory Defaults* screen of the Router's web-based utility.

### Horizontal Placement

The Router has four rubber feet on its bottom panel. Place the Router on a level surface near an electrical outlet.





### Wall-Mounting Placement

The Router has two wall-mount slots on its bottom panel. The distance between the slots is 152 mm (6 inches).

Two screws are needed to mount the Router.

#### Suggested Mounting Hardware

 4-5 mm	 1-1.5 mm	2.5-3.0 mm
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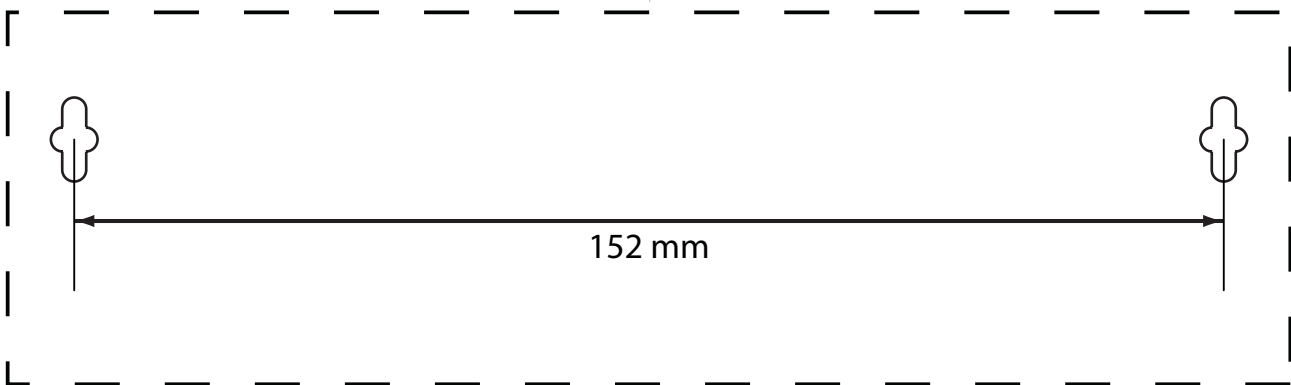
†Note: Mounting hardware illustrations are not true to scale.



**NOTE:** Linksys is not responsible for damages incurred by insecure wall-mounting hardware.

Follow these instructions:

1. Determine where you want to mount the Router. Make sure that the wall you use is smooth, flat, dry, and sturdy. Also make sure the location is within reach of an electrical outlet.
2. Drill two holes into the wall. Make sure the holes are 152 mm (6 inches) apart.
3. Insert a screw into each hole and leave 3 mm (0.12 inches) of its head exposed.
4. Maneuver the Router so the 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.



Print this page at 100% size.

Cut along the dotted line, and place on the wall to drill precise spacing.

Wall-Mounting Template

## Chapter 2: Wireless Security Checklist

Wireless networks are convenient and easy to install, so homes with high-speed Internet access are adopting them at a rapid pace. Because wireless networking operates by sending information over radio waves, it can be more vulnerable to intruders than a traditional wired network. Like signals from your cellular or cordless phones, signals from your wireless network can also be intercepted. Since you cannot physically prevent someone from connecting to your wireless network, you need to take some additional steps to keep your network secure.

### 1. Change the default wireless network name or SSID

Wireless devices have a default wireless network name or Service Set Identifier (SSID) set by the factory. This is the name of your wireless network, and can be up to 32 characters in length. Linksys wireless products use **linksys** as the default wireless network name. You should change the wireless network name to something unique to distinguish your wireless network from other wireless networks that may exist around you, but do not use personal information (such as your Social Security number) because this information may be available for anyone to see when browsing for wireless networks.

### 2. Change the default password

For wireless products such as access points and routers, you will be asked for a password when you want to change their settings. These devices have a default password set by the factory. The Linksys default password is **admin**. Hackers know these defaults and may try to use them to access your wireless device and change your network settings. To thwart any unauthorized changes, customize the device's password so it will be hard to guess.

### 3. Enable MAC address filtering

Linksys routers give you the ability to enable Media Access Control (MAC) address filtering. The MAC address is a unique series of numbers and letters assigned to every networking device. With MAC address filtering enabled, wireless network access is provided solely for wireless devices with specific MAC addresses. For example, you can specify the MAC address of each computer in your home so that only those computers can access your wireless network.

### 4. Enable encryption

Encryption protects data transmitted over a wireless network. Wi-Fi Protected Access (WPA/WPA2) and Wired Equivalent Privacy (WEP) offer different levels of security for wireless communication.

A network encrypted with WPA/WPA2 is more secure than a network encrypted with WEP, because WPA/WPA2 uses dynamic key encryption. To protect the information as it passes over the airwaves, you should enable the highest level of encryption supported by your network equipment.

WEP is an older encryption standard and may be the only option available on some older devices that do not support WPA.

### General Network Security Guidelines

Wireless network security is useless if the underlying network is not secure.

- Password protect all computers on the network and individually password protect sensitive files.
- Change passwords on a regular basis.
- Install anti-virus software and personal firewall software.
- Disable file sharing (peer-to-peer). Some applications may open file sharing without your consent and/or knowledge.

### Additional Security Tips

- Keep wireless routers, access points, or gateways away from exterior walls and windows.
- Turn wireless routers, access points, or gateways off when they are not being used (at night, during vacations).
- Use strong passphrases that are at least eight characters in length. Combine letters and numbers to avoid using standard words that can be found in the dictionary.



**WEB:** For more information on wireless security, visit [www.linksysbycisco.com/security](http://www.linksysbycisco.com/security)

## Chapter 3: Advanced Configuration

After setting up the Router with the Setup Wizard (located on the CD-ROM), the Router will be ready for use. However, if you want to change its advanced settings, use the Router's web-based utility. This chapter describes each web page of the utility and each page's key functions. You can access the utility via a web browser on a computer connected to the Router.

The web-based utility has these 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.



**NOTE:** When first installing the Router, you should use 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.

### How to Access the Web-Based Utility

To access the web-based utility, launch the web browser on your computer, and enter the Router's default IP address, **192.168.1.1**, in the *Address* field. Then press **Enter**.

A login screen will appear. (Non-Windows XP users will see a similar screen.) 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 > Management* screen.) Click **OK** to continue.



Login Screen

### Setup > Basic Setup

The first screen that appears is the *Basic Setup* screen. This allows you to change the Router's general settings.



Setup > Basic Setup

### Language

**Select your language** To use a different language, select one from the drop-down menu. The language of the web-based utility will change five seconds after you select another language.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

### Internet Setup

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

#### Internet Connection Type

Select the type of Internet connection your ISP provides from the drop-down menu. These are the available types:

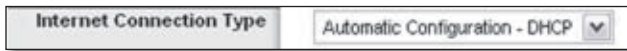
- Automatic Configuration - DHCP
- Static IP
- PPPoE
- PPTP
- L2TP
- Telstra Cable

#### Automatic Configuration - 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



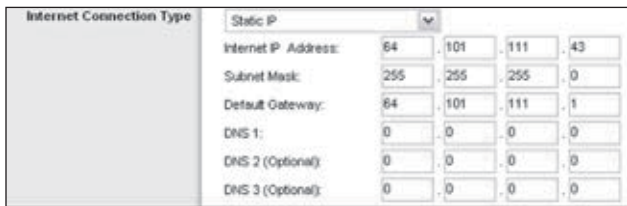
through a dynamic IP address. (This option usually applies to cable connections.)



Internet Connection Type > Automatic Configuration - DHCP

### Static IP

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



Internet Connection Type > 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.

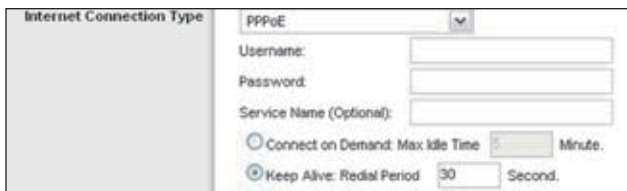
**Subnet Mask** This is the Router's Subnet Mask, as seen by users on the Internet (including your ISP). Your ISP will provide you with the Subnet Mask.

**Default Gateway** Your ISP will provide you with the IP address of the ISP server.

**DNS 1-3** 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**.



Internet Connection Type > PPPoE

**Username and Password** Enter the Username and Password provided by your ISP.

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

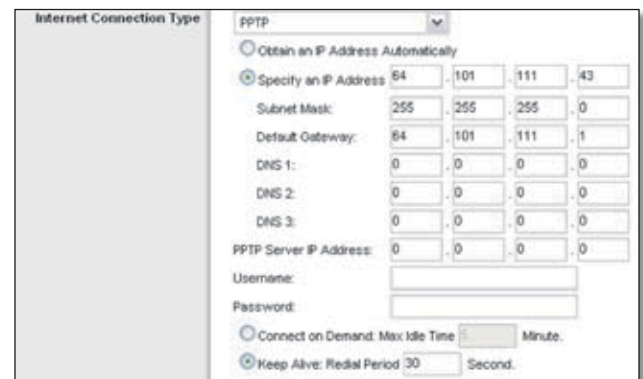
**Connect on Demand: Max Idle Time** You can configure the Router to cut the Internet connection after it has been inactive for a specified period of time (Max Idle Time). If your Internet connection has been terminated due to

inactivity, Connect on Demand enables the Router to automatically re-establish your connection as soon as you attempt to access the Internet again. To use this option, select **Connect on Demand**. In the *Max Idle Time* field, enter the number of minutes you want to have elapsed before your Internet connection terminates. The default Max Idle Time is **15** minutes.

**Keep Alive: 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, select **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 Connection Type > PPTP

If your ISP supports DHCP or you are connecting through a dynamic IP address, then select **Obtain an IP Address Automatically**. If you are required to use a permanent IP address to connect to the Internet, then select **Specify an IP Address**. Then configure the following:

- **Specify an 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.
- **Default Gateway** Your ISP will provide you with the IP address of the ISP server.
- **DNS 1-3** Your ISP will provide you with at least one DNS (Domain Name System) server IP address.

**PPTP Server IP Address** Your ISP will provide you with the IP address of the PPTP server.

**Username and Password** Enter the Username 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. To use this option, select **Connect on Demand**. In the *Max Idle Time* field, enter the number of minutes you want to have elapsed before your Internet connection terminates. The default Max Idle Time is **15** minutes.

**Keep Alive: 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, select **Keep Alive**. In the *Redial Period* field, you specify how often you want the Router to check the Internet connection. The default value is **30** seconds.

## L2TP

L2TP is a service that applies to connections in Israel only.

Internet Connection Type > L2TP

**Server IP Address** This is the IP address of the L2TP Server. Your ISP will provide you with the IP Address you need to specify here.

**Username and Password** Enter the Username 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. To use this option, select **Connect on Demand**. In the *Max Idle Time* field, enter the number of minutes you want to have elapsed before your Internet connection terminates. The default Max Idle Time is **15** minutes.

**Keep Alive: 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, select **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.

## Telstra Cable

Wireless-N Broadband Router with Storage Link

Telstra Cable is a service that applies to connections in Australia only.

Internet Connection Type > Telstra Cable

**Server IP Address** This is the IP address of the Heartbeat Server. Your ISP will provide you with the IP Address you need to specify here.

**Username and Password** Enter the Username 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. To use this option, select **Connect on Demand**. In the *Max Idle Time* field, enter the number of minutes you want to have elapsed before your Internet connection terminates. The default Max Idle Time is **15** minutes.

**Keep Alive: 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, select **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.

Optional Settings

**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.

**MTU** MTU is the Maximum Transmission Unit. It specifies the largest packet size permitted for Internet transmission.

Select Manual if you want to manually enter the largest packet size that is transmitted. To have the Router select the best MTU for your Internet connection, keep the default, **Auto**.

**Size** When Manual is selected in the *MTU* field, this option is enabled. Leave this value in the 1200 to 1500 range. The default size depends on the Internet Connection Type:

- DHCP, Static IP, or Telstra: **1500**
- PPPoE: **1492**
- PPTP or L2TP: **1460**

## 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.

Router IP	IP Address:	192	.	168	.	1	.	1
	Subnet Mask:	255	.	255	.	255	.	0

Router IP

### DHCP Server Setting

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, make sure there is no other DHCP server on your network.

DHCP Server Setting		DHCP Server:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled	<a href="#">DHCP Reservation</a>			
Start IP Address:	192	.	168	.	1	.	100
Maximum Number of Users:	50						
IP Address Range:	192.168.1.100 to 149						
Client Lease Time:	0 minutes (0 means one day)						
Static DNS 1:	0	.	0	.	0	.	0
Static DNS 2:	0	.	0	.	0	.	0
Static DNS 3:	0	.	0	.	0	.	0
WINS:	0	.	0	.	0	.	0

DHCP Server Setting

**DHCP Server** DHCP is enabled by factory default. If you already have a DHCP server on your network, or you do not want a DHCP server, then select **Disabled** (no other DHCP features will be available).

**DHCP Reservation** Click this button if you want to assign a fixed local IP address to a MAC address.

### DHCP Reservation

You will see a list of DHCP clients with the following information: Client Name, Interface, IP Address, and MAC Address.

DHCP Reservation

- **Select Clients from DHCP Table** Click the **Select** check box to reserve a client's IP address. Then click **Add Clients**.
- **Manually Adding Client** To manually assign an IP address, enter the client's name in the *Enter Client Name* field. Enter the IP address you want it to have in the *Assign IP Address* field. Enter its MAC address in the *To This MAC Address* field. Then click **Add**.

### Clients Already Reserved

A list of DHCP clients and their fixed local IP addresses will be displayed at the bottom of the screen. If you want to remove a client from this list, click **Remove**.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes. To view the most up-to-date information, click **Refresh**. To exit this screen, click **Close**.

**Start 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 Start 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**.

**Maximum Number of 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**.

**IP Address Range** Displayed here is the range of available IP addresses.

**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, enter that IP Address in one of these fields. 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) 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 Settings

**Time Zone** Select the time zone in which your network functions from this drop-down menu. (You can even automatically adjust for daylight saving time.)



Time Settings

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

## Setup > 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.

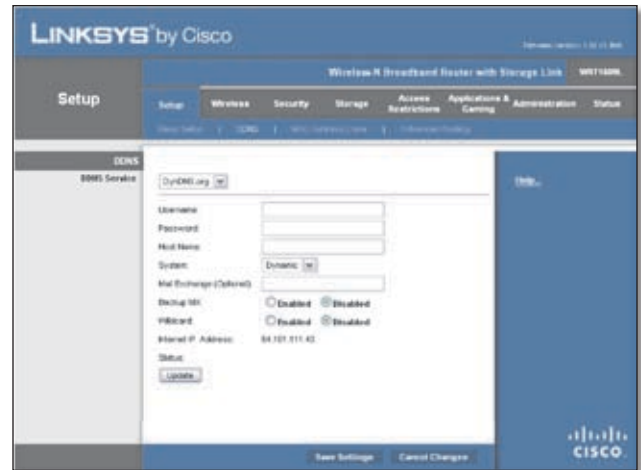
Before you can use this feature, you need to sign up for DDNS service with a DDNS service provider, [www.dyndns.org](http://www.dyndns.org) or [www.TZO.com](http://www.TZO.com). If you do not want to use this feature, keep the default, **Disabled**.

## DDNS

### 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



Setup > DDNS > DynDNS

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

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

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

**System** Select the DynDNS service you use: **Dynamic**, **Static**, or **Custom**. The default selection is **Dynamic**.

**Mail Exchange (Optional)** Enter the address of your mail exchange server, so e-mails to your DynDNS address go to your mail server.

**Backup MX** This feature allows the mail exchange server to be a backup. To disable this feature, keep the default, **Disabled**. To enable the feature, select **Enabled**. If you are not sure which setting to select, keep the default, **Disabled**.

**Wildcard** This setting enables or disables wildcards for your host. For example, if your DDNS address is *myplace.dyndns.org* and you enable wildcards, then *x.myplace.dyndns.org* will work as well (x is the wildcard). To disable wildcards, keep the default, **Disabled**. To enable wildcards, select **Enabled**. If you are not sure which setting to select, keep the default, **Disabled**.

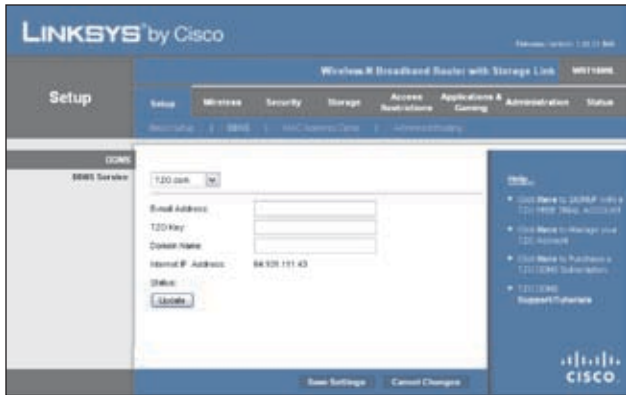
**Internet IP Address** The Router's Internet IP address is displayed here. Because it is dynamic, it will change.

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

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

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

TZO.com



Setup > DDNS > TZO

**E-mail Address, TZO Key, 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.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

## Setup > 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.



Setup > MAC Address Clone

## MAC Address Clone

**Enabled/Disabled** To have the MAC Address cloned, select **Enabled**.

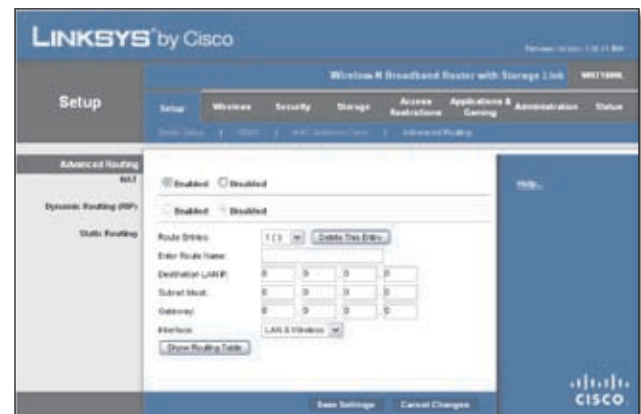
**MAC Address** Enter the MAC Address registered with your ISP here.

**Clone My PC's MAC** Click this button to clone the MAC address of the computer you are using.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

## Setup > Advanced Routing

This screen 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 automatically adjusts how packets travel on your network. Static Routing sets up a fixed route to another network destination.



Setup > Advanced Routing

## Advanced Routing

### NAT

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

### Dynamic Routing (RIP)

**Enabled/Disabled** 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. When the NAT setting is enabled, the Dynamic Routing feature is automatically disabled. When the NAT setting is disabled, this feature is available. Select **Enabled** to use the Dynamic Routing feature.

### Static Routing

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.

**Route Entries** To set up a static route between the Router and another network, select a number from the drop-down list. Click **Delete This Entry** 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.

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

**Interface** This interface tells you whether the Destination IP Address is on the **LAN & Wireless** (Ethernet and wireless networks) or the **Internet (WAN)**.

Click **Show Routing Table** to view the static routes you have already set up.

Destination LAN IP	Subnet Mask	Gateway	Hop Count	Interface
192.168.1.0	255.255.255.0	0.0.0.0	1	LAN & Wireless
64.101.111.0	255.255.255.0	0.0.0.0	1	Internet (WAN)
208.0.0.0	255.0.0.0	0.0.0.0	1	LAN & Wireless
0.0.0.0	0.0.0.0	64.101.111.1	1	Internet (WAN)

Advanced Routing > Routing Table

### Routing Table

For each route, the Destination LAN IP address, Subnet Mask, Gateway, and Interface are displayed. Click **Refresh** to update the information. Click **Close** to exit this screen.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

## Wireless > Basic Wireless Settings

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

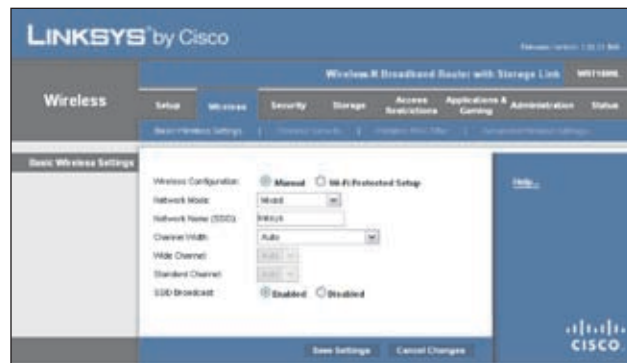
There are two ways to configure the Router's wireless network(s), manual and Wi-Fi Protected Setup.

Wi-Fi Protected Setup is a feature that makes it easy to set up your wireless network. If you have client devices, such as wireless adapters, that support Wi-Fi Protected Setup, then you can use Wi-Fi Protected Setup.

**Wireless Configuration** To manually configure your wireless network, select **Manual**. Proceed to the "Basic Wireless Settings" section. To use Wi-Fi Protected Setup,

select **Wi-Fi Protected Setup**. Proceed to the "Wi-Fi Protected Setup" section.

## Basic Wireless Settings



Wireless > Basic Wireless Settings (Manual Setup)

**Network Mode** 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, **Mixed**. If you have only Wireless-G and Wireless-B devices in your network, select **BG-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 **Disabled**.

**Network 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.

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



**NOTE:** If you select Wide - 40MHz Channel for the Channel Width 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.

**Wide Channel** If Wide - 40MHz Channel is the Channel Width setting, then this setting will be available for your primary Wireless-N channel. Select any channel from the drop-down menu. If you are not sure which channel to select, keep the default, **Auto**.

**Standard Channel** If Standard - 20 MHz Channel is the Channel Width setting, then this setting will be available. Select the appropriate channel for your wireless network. If you are not sure which channel to select, then keep the default, **Auto**.

If Wide - 40MHz Channel is the Channel Width setting, then the Standard Channel will be a secondary channel for Wireless-N (2.4 GHz).

If you selected a specific channel for the Wide Channel setting, then the Standard Channel options will vary. Select the appropriate channel for your wireless network.

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

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

## Wi-Fi Protected Setup

There are three methods available. Use the method that applies to the client device you are configuring.



Wireless > Basic Wireless Settings (Wi-Fi Protected Setup)



Wi-Fi Protected Setup Configured

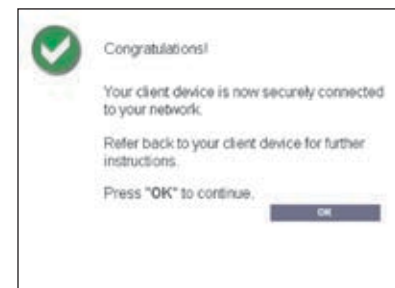


**NOTE:** Wi-Fi Protected Setup configures one client device at a time. Repeat the instructions for each client device that supports Wi-Fi Protected Setup.

### Method #1

Use this method if your client device has a Wi-Fi Protected Setup button.

1. Click or press the **Wi-Fi Protected Setup** button on the client device.
2. Click the **Wi-Fi Protected Setup** button on this screen.
3. After the client device has been configured, click **OK**. Then refer back to your client device or its documentation for further instructions.



Wi-Fi Protected Setup > Congratulations

### Method #2

Use this method if your client device has a Wi-Fi Protected Setup PIN number.

1. Enter the PIN number in the field on this screen.
2. Click **Register**.

- After the client device has been configured, click **OK**. Then refer back to your client device or its documentation for further instructions.

### Method #3

Use this method if your client device asks for the Router's PIN number.

- Enter the PIN number listed on this screen. (It is also listed on the label on the bottom of the Router.)
- After the client device has been configured, click **OK**. Then refer back to your client device or its documentation for further instructions.

The Wi-Fi Protected Setup Status, Network Name (SSID), Security, Encryption, and Passphrase are displayed at the bottom of the screen.



**NOTE:** If you have client devices that do not support Wi-Fi Protected Setup, note the wireless settings, and then manually configure those client devices.

## Wireless > Wireless Security

The *Wireless Security* screen configures the security of your wireless network. There are six wireless security mode options supported by the Router: WPA Personal, WPA Enterprise, WPA2 Personal, 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 six are briefly discussed here. For detailed instructions on configuring wireless security for the Router, refer to "Chapter 2: Wireless Security."

## Wireless Security

### Security Mode

Select the security method for your wireless network. If you do not want to use wireless security, keep the default, **Disabled**.

### WPA Personal



**NOTE:** If you are using WPA, 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.



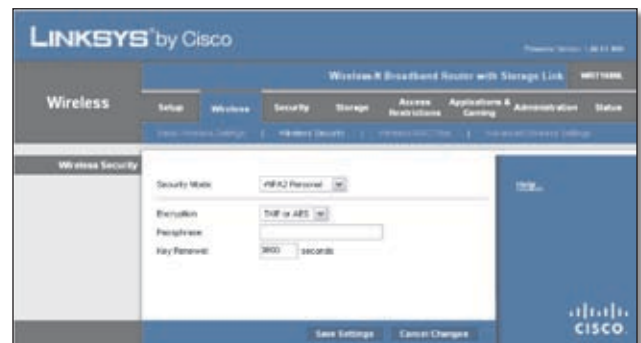
Security Mode > WPA Personal

**Encryption** WPA supports two encryption methods, TKIP and AES, with dynamic encryption keys. Select the type of algorithm, **TKIP** or **AES**. The default is **TKIP**.

**Passphrase** Enter a Passphrase of 8-63 characters.

**Key Renewal** Enter a Key Renewal period, which instructs the Router how often it should change the encryption keys. The default Group Key Renewal period is **3600** seconds.

### WPA2 Personal



Security Mode > WPA2 Personal

**Encryption** WPA2 supports two encryption methods, TKIP and AES, with dynamic encryption keys. Select the type of algorithm, **AES** or **TKIP or AES**. The default is **TKIP or AES**.

**Passphrase** Enter a Passphrase of 8-63 characters.

**Key Renewal** Enter a Key Renewal period, which instructs the Router how often it should change the encryption keys. The default Group Key Renewal period is **3600** seconds.

### 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.)





Security Mode &gt; WPA Enterprise

**Encryption** WPA supports two encryption methods, TKIP and AES, with dynamic encryption keys. Select the type of algorithm, **TKIP** or **AES**. The default is **TKIP**.

**RADIUS Server** Enter the IP Address of the RADIUS server.

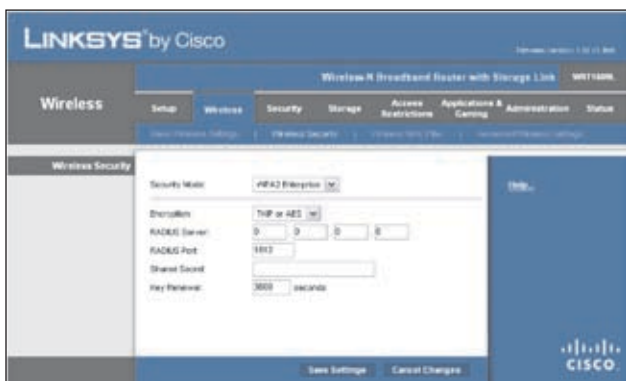
**RADIUS Port** Enter the port number of the RADIUS server. The default value is **1812**.

**Shared Secret** Enter the key shared between the Router and the server.

**Key Renewal** Enter a Key Renewal period, which instructs the Router how often it should change the encryption keys. The default Key Renewal period is **3600** seconds.

### 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.)



Security Mode &gt; WPA2 Enterprise

**Encryption** WPA2 supports two encryption methods, TKIP and AES, with dynamic encryption keys. Select the type of algorithm, **AES** or **TKIP or AES**. The default is **TKIP or AES**.

**RADIUS Server** Enter the IP Address of the RADIUS server.

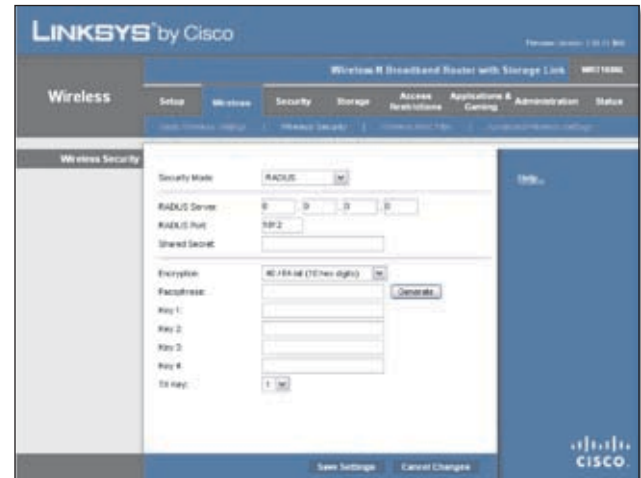
**RADIUS Port** Enter the port number of the RADIUS server. The default value is **1812**.

**Shared Secret** Enter the key shared between the Router and the server.

**Key Renewal** Enter a Key Renewal period, which instructs the Router how often it should change the encryption keys. The default Key Renewal period is **3600** seconds.

### 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.)



Security Mode &gt; RADIUS



**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.

**RADIUS Server** Enter the IP Address of the RADIUS server.

**RADIUS Port** Enter the port number of the RADIUS server. The default value is **1812**.

**Shared Secret** Enter the key shared between the Router and the server.

**Encryption** Select a level of WEP encryption, **40/64 bits (10 hex digits)** or **104/128 bits (26 hex digits)**. The default is **40/64 bits (10 hex digits)**.

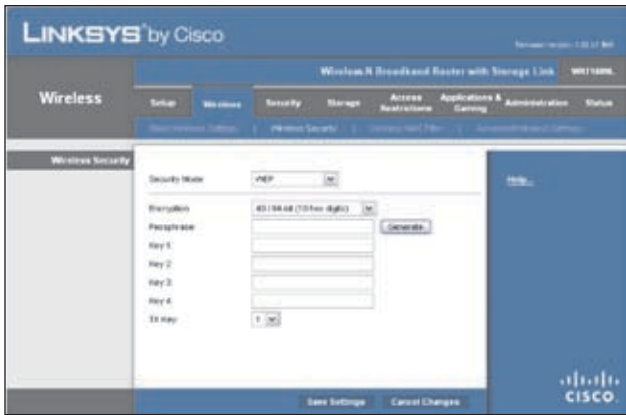
**Passphrase** Enter a Passphrase to automatically generate WEP keys. Then click **Generate**.

**Key 1-4** If you did not enter a Passphrase, enter the WEP key(s) manually.

**TX Key** Select which TX (Transmit) Key to use. The default is **1**.

### WEP

WEP is a basic encryption method, which is not as secure as WPA.



Security Mode &gt; WEP

**Encryption** Select a level of WEP encryption, **40/64 bits (10 hex digits)** or **104/128 bits (26 hex digits)**. The default is **40/64 bits (10 hex digits)**.

**Passphrase** Enter a Passphrase to automatically generate WEP keys. Then click **Generate**.

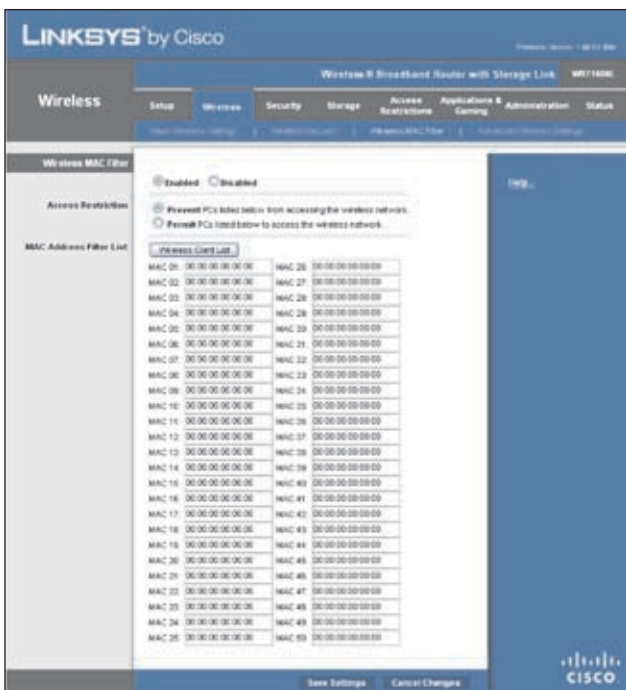
**Key 1-4** If you did not enter a Passphrase, enter the WEP key(s) manually.

**TX Key** Select which TX (Transmit) Key to use. The default is **1**.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

## Wireless > Wireless MAC Filter

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



Wireless &gt; Wireless MAC Filter

## Wireless MAC Filter

**Enabled/Disabled** To filter wireless users by MAC Address, either permitting or blocking access, select **Enabled**. If you do not wish to filter users by MAC Address, keep the default, **Disabled**.

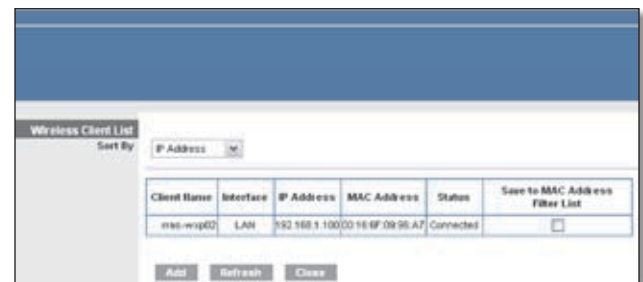
### Access Restriction

**Prevent** Select this to block wireless access by MAC Address. This button is selected by default.

**Permit** Select this to allow wireless access by MAC Address. This button is not selected by default.

### MAC Address Filter List

**Wireless Client List** Click this to open the *Wireless Client List* screen.



Wireless Client List

### Wireless Client List

This screen shows computers and other devices on the wireless network. The list can be sorted by Client Name, Interface, IP Address, MAC Address, and Status.

Select **Save to MAC Address Filter List** for any device you want to add to the MAC Address Filter List. Then click **Add**.

To view the most up-to-date information, click **Refresh**. To exit this screen and return to the *Wireless MAC Filter* screen, click **Close**.

**MAC 01-50** Enter the MAC addresses of the devices whose wireless access you want to block or allow.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

## Wireless > Advanced Wireless Settings

This *Advanced Wireless Settings* screen 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.



Wireless &gt; Advanced Wireless Settings

## Advanced Wireless

**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 **Enabled**. AP Isolation is disabled by default.

**Authentication Type** The Authentication Type setting is available if the Security Mode is RADIUS or WEP. 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. Select **Shared Key** to only use Shared Key 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 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.) 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 (1-2 Mbps, 5.5 Mbps, 11 Mbps, 18 Mbps, and 24Mbps). Select **1-2Mbps** for use with older wireless technology. Select **All**, when the Router can transmit at all wireless rates.

**Transmission Rate** The Transmission setting is available if the Network Mode is BG-Mixed, Wireless-G Only, or Wireless-B Only. The rate of data transmission should be set depending on the speed of your wireless network. Select from a range of transmission speeds, or keep the default, **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.

**N Transmission Rate** The N Transmission setting is available if the Network Mode is Mixed or Wireless-N Only. The rate of data transmission should be set depending on the speed of your Wireless-N networking. Select from a range of transmission speeds, or keep the default, **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.

**CTS Protection Mode** The Router automatically uses CTS (Clear-To-Send) Protection Mode when your Wireless-N and Wireless-G devices are experiencing severe problems and are not able to transmit to the Router in an environment with heavy 802.11b traffic. This option boosts the Router's ability to catch all Wireless-N and Wireless-G transmissions but severely decreases performance. To use this option, keep the default, **Auto**. To disable this option, select **Disabled**.

**Beacon Interval** 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. The default is **100** milliseconds.

**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 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**.

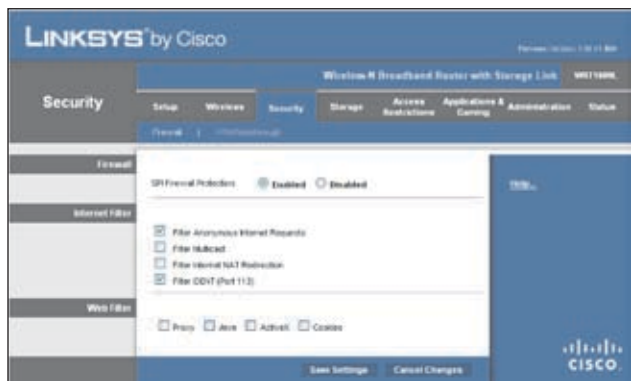
**Fragmentation Threshold** This value specifies the maximum size for a packet before data is fragmented into multiple packets. If you experience a high packet error rate, you may slightly increase the Fragmentation Threshold. Setting the Fragmentation Threshold too low may result in poor network performance. 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**.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

## Security > Firewall

The *Firewall* screen is used to configure a firewall that can filter out various types of unwanted traffic on the Router's local network.



Security > Firewall

### Firewall

**SPI Firewall Protection** To use firewall protection, keep the default selection, **Enabled**. To turn off firewall protection, select **Disabled**.

### Internet Filter

**Filter Anonymous Internet Requests** This feature makes it more difficult for outside users to work their way into your network. This feature is selected by default. Deselect the feature 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. Select this feature to filter multicasting. This feature is not selected by default.

**Filter Internet NAT Redirection** This feature uses port forwarding to block access to local servers from local networked computers. Select this feature to filter Internet NAT redirection. It is not selected by default.

**Filter IDNT (Port 113)** This feature keeps port 113 from being scanned by devices outside of your local network. This feature is selected by default. Deselect this feature to disable it.

### Web Filter

**Proxy** Use of WAN proxy servers may compromise the Gateway's security. Denying Proxy will disable access to any WAN proxy servers. Select this feature to enable proxy filtering. Deselect the feature to allow proxy access.

**Java** Java is a programming language for websites. If you deny Java, you run the risk of not having access to Internet

sites created using this programming language. Select this feature to enable Java filtering. Deselect the feature to allow Java usage.

**ActiveX** ActiveX is a programming language for websites. If you deny ActiveX, you run the risk of not having access to Internet sites created using this programming language. Select this feature to enable ActiveX filtering. Deselect the feature to allow ActiveX usage.

**Cookies** A cookie is data stored on your computer and used by Internet sites when you interact with them. Select this feature to filter cookies. Deselect the feature to allow cookie usage.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

## Security > VPN Passthrough

The *VPN Passthrough* screen allows you to enable VPN tunnels using IPSec, PPTP, or L2TP protocols to pass through the Router's firewall.



Security > VPN Passthrough

### 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, keep the default, **Enabled**.

**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, keep the default, **Enabled**.

**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, keep the default, **Enabled**.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

## Storage > Disk

## Storage > Media Server

## Storage > Administration

### Access Restrictions > 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, and websites during specific days and times.



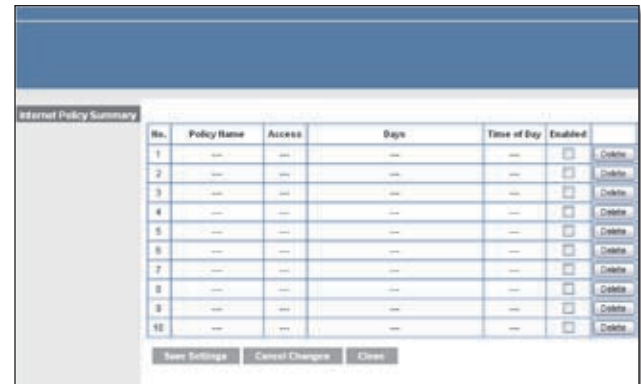
Access Restrictions > Internet Access

### Internet Access Policy

**Access Policy** Access can be managed by a policy. Use the settings on this screen to establish an access policy (after **Save Settings** 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 **Delete This Policy**. To view all the policies, click **Summary**.

#### Summary

The policies are listed with the following information: No., Policy Name, Access, Days, Time, and status (Enabled). To enable a policy, select **Enabled**. To delete a policy, click **Delete**. Click **Save Settings** to save your changes, or click **Cancel Changes** to cancel your changes. To return to the *Internet Access Policy* screen, click **Close**.

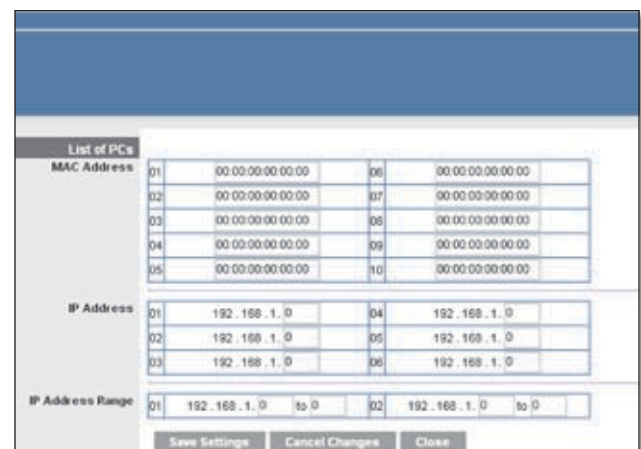


Summary

**Status** Policies are disabled by default. To enable a policy, select the policy number from the drop-down menu, and select **Enabled**.

To create a policy, follow steps 1-11. Repeat these steps to create additional policies, one at a time.

1. Select a number from the *Access Policy* drop-down menu.
2. Enter a Policy Name in the field provided.
3. To enable this policy, select **Enabled**.
4. Click **Edit List** to select which PCs will be affected by the policy. The *List of PCs* screen appears. 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 **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes. Then click **Close**.



List of PCs

5. Select 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**.

- You can block websites with specific URL addresses. Enter each URL in a separate *Website Blocking by URL Address* field.
- You can also block websites using specific keywords. Enter each keyword in a separate *Website Blocking by Keyword* field.
- You can filter access to various services accessed over the Internet, such as FTP or telnet. (You can block up to three applications per policy.)

From the Applications list, select the application you want to block. Then click the >> button to move it to the Blocked List. To remove an application from the Blocked List, select it and click the << button.

- If the application you want to block is not listed or you want to edit a service's settings, enter the application's name in the *Application Name* field. Enter its range in the **Port Range** fields. Select its protocol from the *Protocol* drop-down menu. Then click **Add**.

To modify a service, select it from the Application list. Change its name, port range, and/or protocol setting. Then click **Modify**.

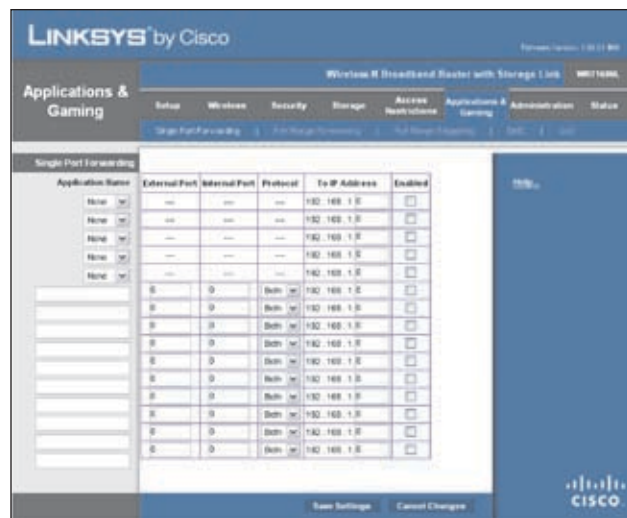
To delete a service, select it from the Application list. Then click **Delete**.

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

## Applications and Gaming > Single Port Forwarding

The *Single Port Forwarding* screen allows you to customize port services for common applications on this screen.

When users send these types of requests to your network via the Internet, the Router will forward those requests to the appropriate servers (computers). Before using forwarding, you should assign static IP addresses to the designated servers (use the DHCP Reservation feature on the *Basic Setup* screen).



Applications and Gaming > Single Port Forwarding

### Single Port Forwarding

Common applications are available for the first five entries. Select the appropriate application. Then enter the IP address of the server that should receive these requests. Select **Enabled** to activate this entry.

For additional applications, complete the following fields:

**Application Name** Enter the name you wish to give the application. Each name can be up to 12 characters.

**External Port** Enter the external port number used by the server or Internet application. Check with the Internet application documentation for more information.

**Internal Port** Enter the internal port number used by the server or Internet application. Check with the Internet application documentation for more information.

**Protocol** Select the protocol(s) used for this application, **TCP**, **UDP**, or **Both**.

**To IP Address** For each application, enter the IP address of the PC that should receive the requests. If you assigned a static IP address to the PC, then you can click **DHCP Reservation** on the *Basic Setup* screen to look up its static IP address.

**Enabled** For each application, select **Enabled** to enable port forwarding.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

### Applications and Gaming > Port Range Forwarding

The *Port Range Forwarding* screen 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.)

When users send these types of requests to your network via the Internet, the Router will forward those requests to the appropriate servers (computers). Before using forwarding, you should assign static IP addresses to the designated servers (use the DHCP Reservation feature on the *Basic Setup* screen).

If you need to forward all ports to one computer, click the **DMZ** tab.



Applications and Gaming > Port Range Forwarding

## Port Range Forwarding

To forward a port, enter the information on each line for the criteria required.

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

**Start~End Port** Enter the number or range of port(s) used by the server or Internet applications. Check with the Internet application documentation for more information.

**Protocol** Select the protocol(s) used for this application, **TCP**, **UDP**, or **Both**.

**To IP Address** For each application, enter the IP address of the PC running the specific application. If you assigned a static IP address to the PC, then you can click **DHCP Reservation** on the *Basic Setup* screen to look up its static IP address.

**Enabled** Select **Enabled** to enable port forwarding for the applications you have defined.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

## Applications & Gaming > Port Range Triggering

The *Port Range 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.



Applications and Gaming > Port Range Triggering

## Port Range Triggering

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

**Triggered Range** For each application, enter the starting and ending port numbers of the triggered port number range. Check with the Internet application documentation for the port number(s) needed.

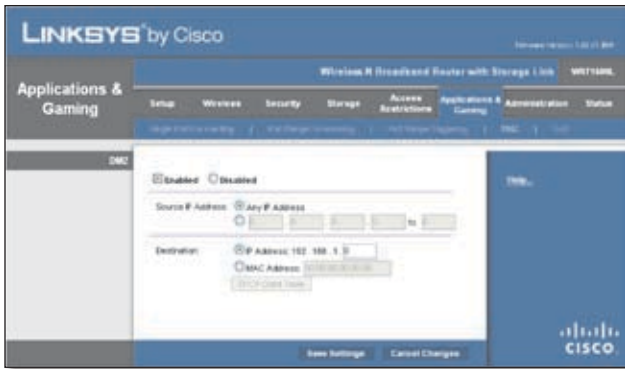
**Forwarded Range** For each application, enter the starting and ending port numbers of the forwarded port number range. Check with the Internet application documentation for the port number(s) needed.

**Enabled** Select **Enabled** to enable port triggering for the applications you have defined.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

## Applications and Gaming > DMZ

The DMZ feature allows one network computer 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 Forwarding 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.



Applications and Gaming &gt; DMZ

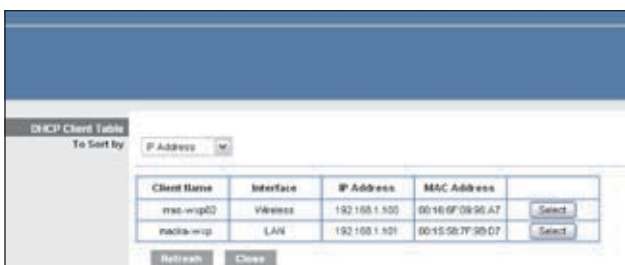
## DMZ

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.

**Enabled/Disabled** To disable DMZ hosting, select **Disabled**. To expose one PC, select **Enabled**. Then configure the following settings:

**Source IP Address** If you want any IP address to be the source, select **Any IP Address**. If you want to specify an IP address or range of IP addresses as the designated source, select and complete the IP address range fields.

**Destination** If you want to specify the DMZ host by IP address, select **IP Address** and enter the IP address in the field provided. If you want to specify the DMZ host by MAC address, select **MAC Address** and enter the MAC address in the field provided. To retrieve this information, click **DHCP Client Table**.



DMZ &gt; DHCP Client Table

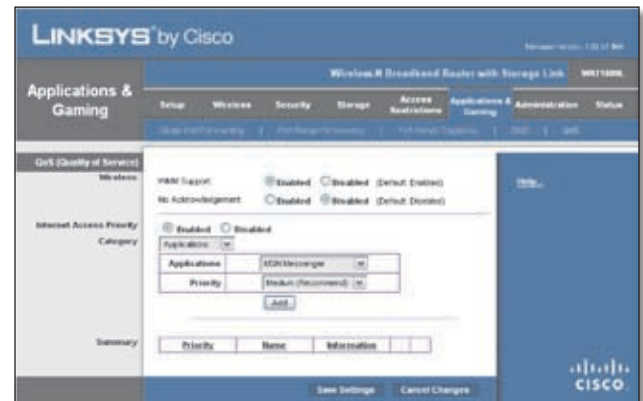
## DHCP Client Table

The DHCP Client Table lists computers and other devices that have been assigned IP addresses by the Router. The list can be sorted by Client Name, Interface, IP Address, MAC Address, and Expired Time (how much time is left for the current IP address). To select a DHCP client, click **Select**. To view the most up-to-date information, click **Refresh**. To exit this screen and return to the *DMZ* screen, click **Close**.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

## Applications and Gaming > 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.



Applications and Gaming &gt; QoS

## QoS (Quality of Service)

### Wireless

You can configure the support and No Acknowledgement settings in this section.

**WMM Support** If you have other devices that support Wi-Fi Multimedia (WMM) on your network, keep the default, **Enabled**. Otherwise, select **Disabled**.

**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 **Enabled**. Otherwise, keep the default, **Disabled**.

### Internet Access Priority

In this section, you can set the bandwidth priority for a variety of applications and devices. There are four levels priority: High, Medium, Normal, or Low. When you set priority, do not set all applications to High, because this will defeat the purpose of allocating the available bandwidth. If you want to select below normal bandwidth, select Low. Depending on the application, a few attempts may be needed to set the appropriate bandwidth priority.

**Enabled/Disabled** To use the QoS policies you have set, keep the default, **Enabled**. Otherwise, select **Disabled**.

### Category

There are four categories available. Select one of the following: **Applications**, **Online Games**, **MAC Address**,



**Ethernet Port**, or **Voice Device**. Proceed to the instructions for your selection.

### Applications

**Applications** Select the appropriate application. If you select Add a New Application, follow the Add a New Application instructions.

**Priority** Select the appropriate priority: **High**, **Medium**, **Normal**, or **Low**.

Click **Add** to save your changes. Your new entry will appear in the Summary list.

### Add a New Application

QoS > Add a New Application

**Enter a Name** Enter any name to indicate the name of the entry.

**Port Range** Enter the port range that the application will be using. For example, if you want to allocate bandwidth for FTP, you can enter 21-21. If you need services for an application that uses from 1000 to 1250, you enter 1000-1250 as your settings. You can have up to three ranges to define for this bandwidth allocation. Port numbers can range from 1 to 65535. Check your application's documentation for details on the service ports used.

Select the protocol **TCP** or **UDP**, or select **Both**.

**Priority** Select the appropriate priority: **High**, **Medium (Recommend)**, **Normal**, or **Low**.

Click **Add** to save your changes. Your new entry will appear in the Summary list.

### Online Games

QoS > Online Games

**Games** Select the appropriate game. If you select Add a New Game, follow the Add a New Game instructions.

**Priority** Select the appropriate priority: **High**, **Medium (Recommend)**, **Normal**, or **Low**.

Click **Add** to save your changes. Your new entry will appear in the Summary list.

### Add a New Game

QoS > Add a New Game

**Enter a Name** Enter any name to indicate the name of the entry.

**Port Range** Enter the port range that the game will be using. You can have up to three ranges to define for this bandwidth allocation. Port numbers can range from 1 to 65535. Check your application's documentation for details on the service ports used.

Select the protocol **TCP** or **UDP**, or select **Both**.

**Priority** Select the appropriate priority: **High**, **Medium (Recommend)**, **Normal**, or **Low**.

Click **Add** to save your changes. Your new entry will appear in the Summary list.

### MAC Address

QoS > MAC Address

**Enter a Name** Enter a name for your device.

**MAC Address** Enter the MAC address of your device.

**Priority** Select the appropriate priority: **High**, **Medium (Recommend)**, **Normal**, or **Low**.

Click **Add** to save your changes. Your new entry will appear in the Summary list.

### Ethernet Port

QoS > Ethernet Port

**Ethernet** Select the appropriate Ethernet port.

**Priority** Select the appropriate priority: **High**, **Medium (Recommend)**, **Normal**, or **Low**.

Click **Add** to save your changes. Your new entry will appear in the Summary list.

## Voice Device

Category	Voice Device	My Voice Device's MAC Address: 8616B629716C
Enter a Name		
MAC Address	00:00:00:00:00:00	
Priority	High (Recommend)	
Add		

QoS &gt; Voice Device

**Enter a Name** Enter a name for your voice device.

**MAC Address** Enter the MAC address of your voice device.

**Priority** Select the appropriate priority: **High (Recommend)**, **Medium**, **Normal**, or **Low**.

Click **Add** to save your changes. Your new entry will appear in the Summary list.

## Summary

This lists the QoS entries you have created for your applications and devices.

**Priority** This column displays the bandwidth priority of High, Medium, Normal, or Low.

**Name** This column displays the application, device, or port name.

**Information** This column displays the port range or MAC address entered for your entry. If a pre-configured application or game was selected, there will be no valid entry shown in this section.

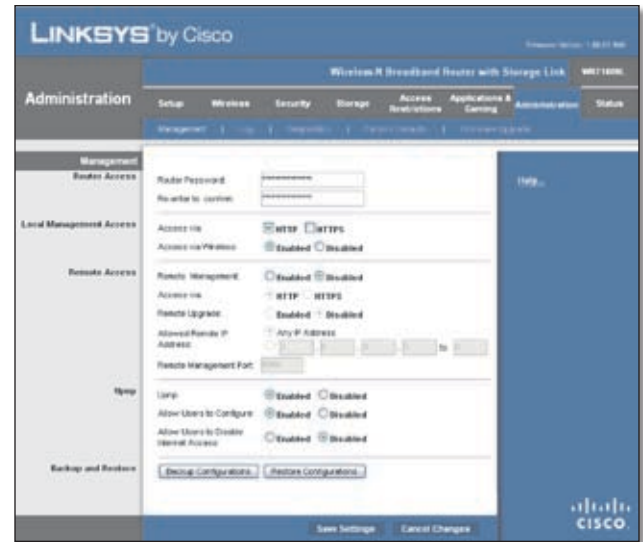
**Remove** Click this button to remove an entry.

**Edit** Click this button to make changes.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

## Administration &gt; Management

The *Administration > Management* screen allows the network's administrator to manage specific Router functions for access and security.



Administration &gt; Management

## Management

## Router Access

To ensure the Router's security, you will be asked for your password when you access the Router's web-based utility. The default is **admin**.

**Router Password** Enter a new password for the Router.

**Re-enter to confirm** Enter the password again to confirm.

## Local Management Access

**Access via HTTP** (HyperText Transport Protocol) is the communications protocol used to connect to servers on the World Wide Web. HTTPS uses SSL (Secured Socket Layer) to encrypt data transmitted for higher security. Select **HTTP** or **HTTPS**. **HTTP** is the default.

**Access via Wireless** 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 utility via a wired connection if you disable the setting. Keep the default, **Enabled**, to allow wireless access to the utility, or select **Disabled** to block wireless access to the utility.

## Remote Access

**Remote Management** To permit remote access of the Router, from outside the local network, select **Enabled**. Otherwise, keep the default, **Disabled**.

**Access via HTTP** (HyperText Transport Protocol) is the communications protocol used to connect to servers on the World Wide Web. HTTPS uses SSL (Secured Socket Layer) to encrypt data transmitted for higher security. Select **HTTP** or **HTTPS**. **HTTP** is the default.

**Remote Upgrade** If you want to be able to upgrade the Router remotely, from outside the local network, select **Enabled**. (You must have the Remote Management feature enabled as well.) Otherwise, keep the default, **Disabled**.

**Allowed Remote IP Address** If you want to be able to access the Router from any external IP address, select **Any IP Address**. If you want to specify an external IP address or range of IP addresses, then select the second option and complete the fields provided.

**Remote Management Port** Enter the port number that will be open to outside access.



**NOTE:** When you are in a remote location and wish to manage the Router, enter **http://<Internet\_IP\_address>:port** or **https://<Internet\_IP\_address>:port**, depending on whether you use HTTP or HTTPS. Enter the Router's specific Internet IP address in place of <Internet\_IP\_address>, and enter the Remote Management Port number in place of the word port.

## UPnP

Universal Plug and Play (UPnP) allows the appropriate Windows operating system to automatically configure the Router for various Internet applications, such as gaming and videoconferencing.

**UPnP** If you want to use UPnP, keep the default, **Enabled**. Otherwise, select **Disabled**.

**Allow Users to Configure** Keep the default, **Enabled**, if you want to be able to make manual changes to the Router while using the UPnP feature. Otherwise, select **Disabled**.

**Allow Users to Disable Internet Access** Select **Enabled**, if you want to be able to prohibit any and all Internet connections. Otherwise, keep the default, **Disabled**.

## Backup and Restore

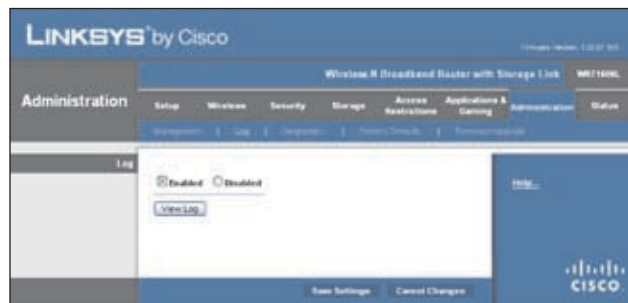
**Backup Configurations** To back up the Router's configuration settings, click this button and follow the on-screen instructions.

**Restore Configurations** To restore the Router's configuration settings, click this button and follow the on-screen instructions. (You must have previously backed up the Router's configuration settings.)

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

## Administration > Log

The Router can keep logs of all traffic for your Internet connection.

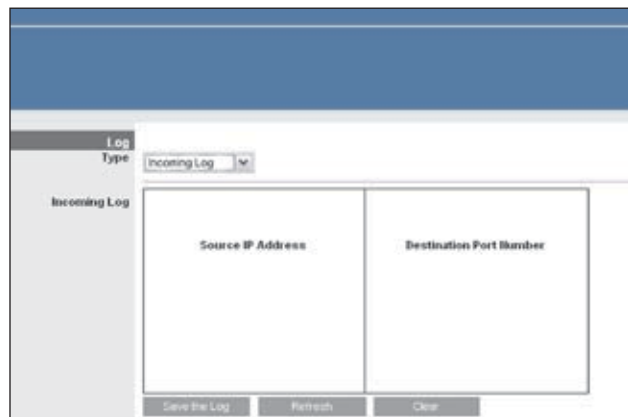


Administration > Log

## Log

**Log** To disable the Log function, select **Disabled**. To monitor traffic between the network and the Internet, keep the default, **Enabled**. With logging enabled, you can choose to view temporary logs.

**View Log** To view the logs, click **View Log**.



Log > View Log

## Log

- **Type** Select **Incoming Log**, **Outgoing Log**, **Security Log**, or **DHCP Client Log**.
- **<Type> Log** The Incoming Log displays a temporary log of the source IP addresses and destination port numbers for the incoming Internet traffic. The Outgoing Log displays a temporary log of the local IP addresses, destination URLs/IP addresses, and service/port numbers for the outgoing Internet traffic. The Security log displays the login information for the web-based utility. The DHCP Client Log displays the LAN DHCP server status information.

Click **Save the Log** to save this information to a file on your PC's hard drive. Click **Refresh** to update the log. Click **Clear** to clear all the information that is displayed.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

## Administration > Diagnostics

The diagnostic tests (Ping and Traceroute) allow you to check the connections of your network devices, including connection to the Internet.



Administration > Diagnostics

## Diagnostics

### Ping Test

The Ping test checks the status of a connection.

**IP or URL Address** Enter the address of the PC whose connection you wish to test.

**Packet Size** Enter the packet size you want to use. The default is **32** bytes.

**Times to Ping** Enter many times you wish to test it.

**Start Test** To run the test, click this button. The *Ping Test* screen shows if the test is successful. Click **Close** to return to the *Diagnostics* screen. Click **Stop** to stop the test.



Diagnostics > Ping

### Traceroute Test

The Traceroute test tests the performance of a connection.

**IP or URL Address** Enter the address of the PC whose connection you wish to test.

**Start Test** To run the test, click this button. The *Traceroute Test* screen shows if the test is successful. Click **Close** to

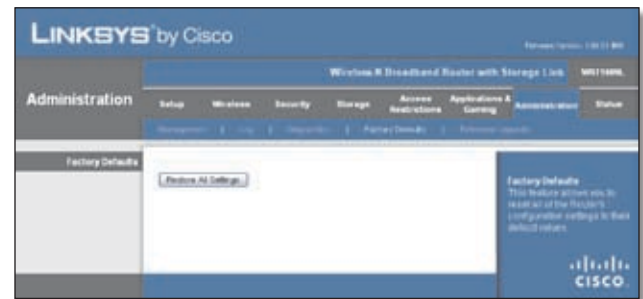
return to the *Diagnostics* screen. Click **Stop** to stop the test.



Diagnostics > Traceroute

## Administration > Factory Defaults

The *Administration > Factory Defaults* screen allows you to restore the Router's configuration to its factory default settings.



Administration > Factory Defaults



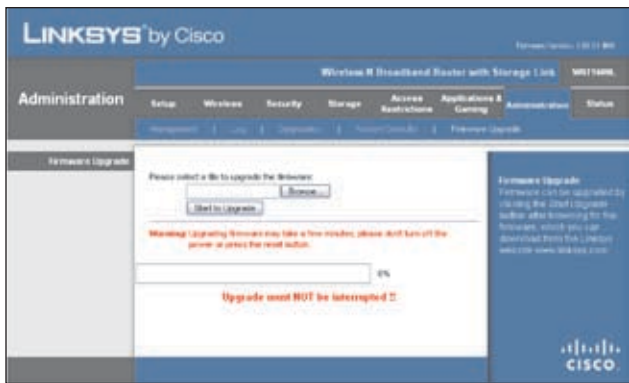
**NOTE:** Do not restore the factory defaults unless you are having difficulties with the Router and have exhausted all other troubleshooting measures. Once the Router is reset, you will have to re-enter all of your configuration settings.

## Factory Defaults

**Restore All Settings** To reset the Router's settings to the default values, click this button and then follow the on-screen instructions. Any settings you have saved will be lost when the default settings are restored.

## Administration > Firmware Upgrade

The *Firmware Upgrade* screen allows you to upgrade the Router's firmware. Do not upgrade the firmware unless you are experiencing problems with the Router or the new firmware has a feature you want to use.



Administration &gt; Firmware Upgrade



**NOTE:** The Router may lose the settings you have customized. Before you upgrade its firmware, write down all of your custom settings. After you upgrade its firmware, you will have to re-enter all of your configuration settings.

## Firmware Upgrade

Before upgrading the firmware, download the Router's firmware upgrade file from the Linksys website, [www.linksysbycisco.com](http://www.linksysbycisco.com). Then extract the file.

**Please select a file to upgrade the firmware** Click **Browse** and select the extracted firmware upgrade file.

**Start to Upgrade** After you have selected the appropriate file, click this button, and follow the on-screen instructions.

## Status > Router

The *Router* screen displays information about the Router and its current settings.



Status &gt; Router

## Router Information

**Firmware Version** The version number of the Router's current firmware is displayed.

**Firmware Verification** The unique identifier that verifies that you have valid firmware is displayed.

**Current Time** The time set on the Router is displayed.

**Internet MAC Address** The Router's MAC Address, as seen by your ISP, is displayed.

**Host Name** The Host Name of the Router is displayed (if it was entered on the *Setup > Basic Setup* screen).

**Domain Name** The Domain Name of the Router is displayed (if it was entered on the *Setup > Basic Setup* screen).

## Internet Connection

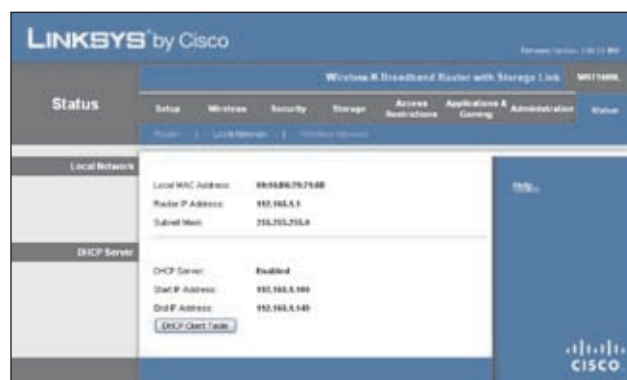
This section shows the current network information stored in the Router. The information varies depending on the Internet connection type selected on the *Setup > Basic Setup* screen.

Select **Release IP Address** or **Renew IP Address** as appropriate to release or renew a DHCP lease.

Click **Refresh** to update the on-screen information.

## Status > Local Network

The *Local Network* screen displays information about the local, wired network.



Status &gt; Local Network

## Local Network

**Local MAC Address** The MAC address of the Router's local, wired interface is displayed.

**Router IP Address** The Router's IP address, as it appears on your local network, is displayed.

**Subnet Mask** The Subnet Mask of the Router is displayed.

## DHCP Server

**DHCP Server** The status of the Router's DHCP server function is displayed.

**Start IP Address** For the range of IP addresses used by devices on your local network, the starting IP address is displayed.

**End IP Address** For the range of IP addresses used by devices on your local network, the ending IP address is displayed.

**DHCP Clients Table** Click this button to view a list of computers or other devices that are using the Router as a DHCP server.

Client Name	Interface	IP Address	MAC Address	Expires Time	
mpo-wp02	LAN	192.168.1.100	00:15:8F:09:9E:A7	23:37:52	Delete
mooka-wp0	LAN	192.168.1.101	00:15:58:7F:9B:07	23:38:05	Delete

DHCP Clients Table

## DHCP Client Table

The DHCP Client Table lists computers and other devices that have been assigned IP addresses by the Router. The list can be sorted by IP Address, MAC Address, Interface, and Client Name. To remove a DHCP client, click **Delete**. To view the most up-to-date information, click **Refresh**. To exit this screen and return to the *Local Network* screen, click **Close**.

## Status > Wireless Network

The *Wireless Network* screen displays information about your wireless network.

MAC Address:	981E86292758D
Mode:	Mixed
Network Name (SSID):	Linksys_WFS_2111
Channel Width:	Standard - 20MHz Channel
Wide Channel:	NA
Standard Channel:	6
Security:	WPA2 Personal
SSID Broadcast:	Enabled

Status > Wireless

## Wireless Network

**MAC Address** The MAC address of the Router's local, wireless interface is displayed.

**Mode** The wireless mode used by the network is displayed.

**Network Name (SSID)** The name of the wireless network, which is also called the SSID, is displayed.

**Channel Width** The Channel Width setting (selected on the *Wireless > Basic Wireless Settings* screen) is displayed.

**Wide Channel** The Wide Channel setting (selected on the *Wireless > Basic Wireless Settings* screen) is displayed.

**Standard Channel** The Standard Channel setting (selected on the *Wireless > Basic Wireless Settings* screen) is displayed.

**Security** The wireless security method used by the Router is displayed.

**SSID Broadcast** The status of the SSID Broadcast feature is displayed.

# Appendix A: Troubleshooting

## ***Your computer cannot connect to the Internet.***

Follow these instructions until your computer can connect to the Internet:

- Make sure that the Router is powered on. The Power LED should be green and not flashing.
- If the Power LED is flashing, then power off all of your network devices, including the modem, Router, and computers. Then power on each device in the following order:
  1. Cable or DSL modem
  2. Router
  3. Computer
- Check the cable connections. The computer should be connected to one of the ports numbered 1-4 on the Router, and the modem must be connected to the Internet port on the Router.

## ***The modem does not have an Ethernet port.***

The modem is a dial-up modem for traditional dial-up service. To use the Router, you need a cable/DSL modem and high-speed Internet connection.

## ***You cannot use the DSL service to connect manually to the Internet.***

After you have installed the Router, it will automatically connect to your Internet Service Provider (ISP), so you no longer need to connect manually.

## ***The DSL telephone line does not fit into the Router's Internet port.***

The Router does not replace your modem. You still need your DSL modem in order to use the Router. Connect the telephone line to the DSL modem, and then insert the setup CD into your computer. Click **Setup** and follow the on-screen instructions.

## ***When you double-click the web browser, you are prompted for a username and password. If you want to get rid of the prompt, follow these instructions.***

Launch the web browser and perform the following steps (these steps are specific to Internet Explorer but are similar for other browsers):

1. Select **Tools > Internet Options**.
2. Click the **Connections** tab.
3. Select **Never dial a connection**.

4. Click **OK**.

## ***The Router does not have a coaxial port for the cable connection.***

The Router does not replace your modem. You still need your cable modem in order to use the Router. Connect your cable connection to the cable modem, and then insert the setup CD into your computer. Click **Setup** and follow the on-screen instructions.

## ***The computer cannot connect wirelessly to the network.***

Make sure the wireless network name or SSID is the same on both the computer and the Router. If you have enabled wireless security, then make sure the same security method and key are used by both the computer and the Router.

## ***You need to modify the settings on the Router.***

Open the web browser (for example, Internet Explorer or Firefox), and enter the Router's IP address in the address field (the default IP address is **192.168.1.1**). When prompted, enter the password to the Router (the default is **admin**). Click the appropriate tab to change the settings.

## ***In Windows XP, you do not see the Router on the My Network Places screen.***

In the Network Tasks section, click **Show icons for networked UPnP devices**. If the Router does not appear, follow these instructions:

1. Go to **Start > Control Panel > Firewall**.
2. Click the **Exceptions** tab.
3. Select **UPnP Framework**.
4. Click **OK**.

## ***In Windows XP, you do not see your USB storage device on the View workgroup computers screen.***

Make sure the Router and your computer use the same workgroup name. (The default workgroup name of the Router is **linksys**. In Windows XP, go to **Start > Control Panel > System**. Click the **Computer Name** tab. The workgroup name is displayed.) If they differ, then change the workgroup name of the Router. Follow these instructions:

1. Access the web-based utility of the Router. (Refer to **Chapter 3: Advanced Configuration, page 4**.)
2. Click the **Storage** tab.
3. Click the **Administration** tab.
4. In the *Workgroup* field, enter the workgroup name of your computer.
5. Click **Save Settings**.



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**WEB:** If your questions are not addressed here, refer to the Linksys website, [www.linksysbycisco.com](http://www.linksysbycisco.com)

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# Appendix B: How to Install and Access USB Storage

## Overview

This appendix explains how to connect, access, and map a shortcut to an external USB storage device.

## Install the USB Storage Device

1. Make sure your computer has a wired or wireless connection to the Router.
2. Connect an external USB hard disk drive or USB flash disk to the USB port of the Router.

## Access the USB Storage Device

Follow the instructions for your Windows operating system, Vista or XP.

### Windows Vista

1. On your desktop, double-click the **Computer** icon.



Computer Icon

2. In the *Address* field, enter the server name of the Router:

\\<server\_name\_of\_Router>



Enter Server Name of Router

The default server name of the Router is **WRT160NL**. You can change this name on the *Storage > Administration* screen; refer to [Storage > Administration, page 17](#).



**NOTE:** Another option is to use the IP address of the Router. In the *Address* field, enter the local IP address of the Router:

\\<local\_IP\_address\_of\_Router>

The default is **192.168.1.1**. You can change this IP address on the *Setup > Basic Setup* screen; refer to [Setup > Basic Setup, page 4](#).

3. On the login screen, enter your account user name and password. (For the admin account, **admin** is both the default user name and password.)

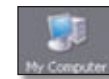


Enter Account User Name and Password

User accounts are set up on the *Storage > Administration* screen; refer to [Storage > Administration, page 17](#).

### Windows XP

1. On your desktop, double-click the **My Computer** icon.



My Computer Icon

2. In the *Address* field, enter the server name of the Router:

\\<server\_name\_of\_Router>



Enter Server Name of Router

The default server name of the Router is **WRT160NL**. You can change this name on the *Storage > Administration* screen; refer to [Storage > Administration, page 17](#).



**NOTE:** Another option is to use the IP address of the Router. In the *Address* field, enter the local IP address of the Router:

\\<local\_IP\_address\_of\_Router> (The default is **192.168.1.1**. You can change this IP address on the *Setup > Basic Setup* screen; refer to [Setup > Basic Setup, page 4](#).)

- Enter your account user name and password. (For the admin account, **admin** is both the default user name and password.)



Enter Account User Name and Password

User accounts are set up on the *Storage > Administration* screen; refer to **Storage > Administration, page 17**.

## Create a Shortcut to a Shared Folder

You can map any folder of the USB storage device as a separate drive. Follow the instructions for your Windows operating system, Vista or XP.

### Windows Vista

#### Map a Drive

- On your desktop, double-click the **Network** icon.



Network Icon

- In the *Address* field, enter the server name of the Router:

**\\<server\_name\_of\_Router>**



Enter Server Name of Router

The default server name of the Router is **WRT160NL**. You can change this name on the *Storage > Administration* screen; refer to **Storage > Administration, page 17**.

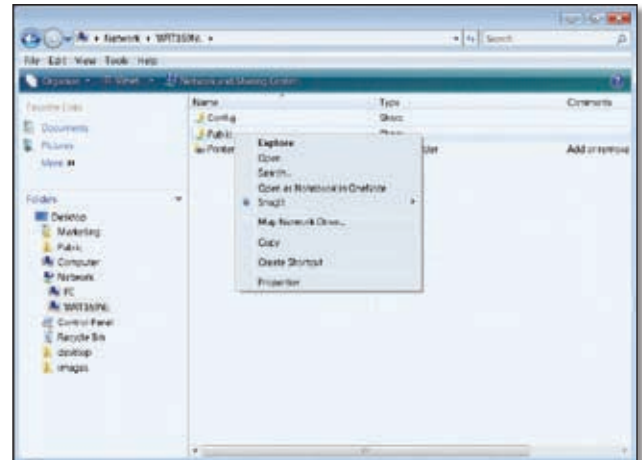


**NOTE:** Another option is to use the IP address of the Router. In the *Address* field, enter the local IP address of the Router:

**\\<local\_IP\_address\_of\_Router>**

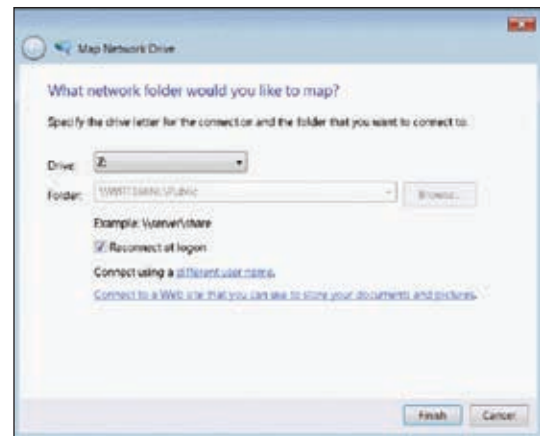
The default is **192.168.1.1**. You can change this IP address on the *Setup > Basic Setup* screen; refer to **Setup > Basic Setup, page 4**.

- Right-click the folder you want to share, and click **Map Network Drive**. (The default shared folder is named **Public**.)



Map Network Drive

- From the *Drive* drop-down menu, select an available drive letter.

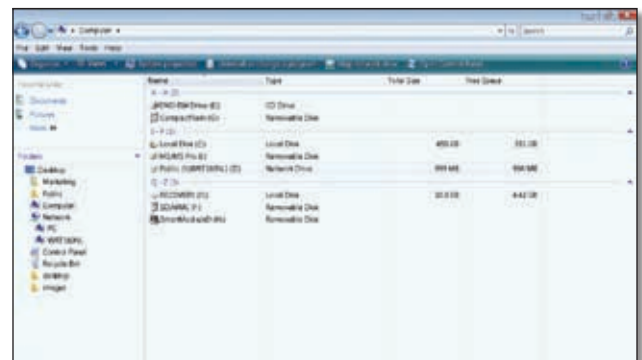


Select Drive Letter

- Click **Finish**.

#### Access Mapped Drive

- On your desktop, double-click the **Computer** icon.
- Double-click the mapped drive to access it.



Double-Click Mapped Drive