

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 tick 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 mark 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 email 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	www.linksysbycisco.com
Linksys International	www.linksysbycisco.com/international
Glossary	www.linksysbycisco.com/glossary
Network Security	www.linksysbycisco.com/security

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Chapter 1:

Product Overview

Thank you for choosing the Linksys by Cisco 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.

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 female R-SMA antenna ports connect to the male R-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 to its 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 socket.



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

		2.5–3.0 mm
4–5 mm	1–1.5 mm	

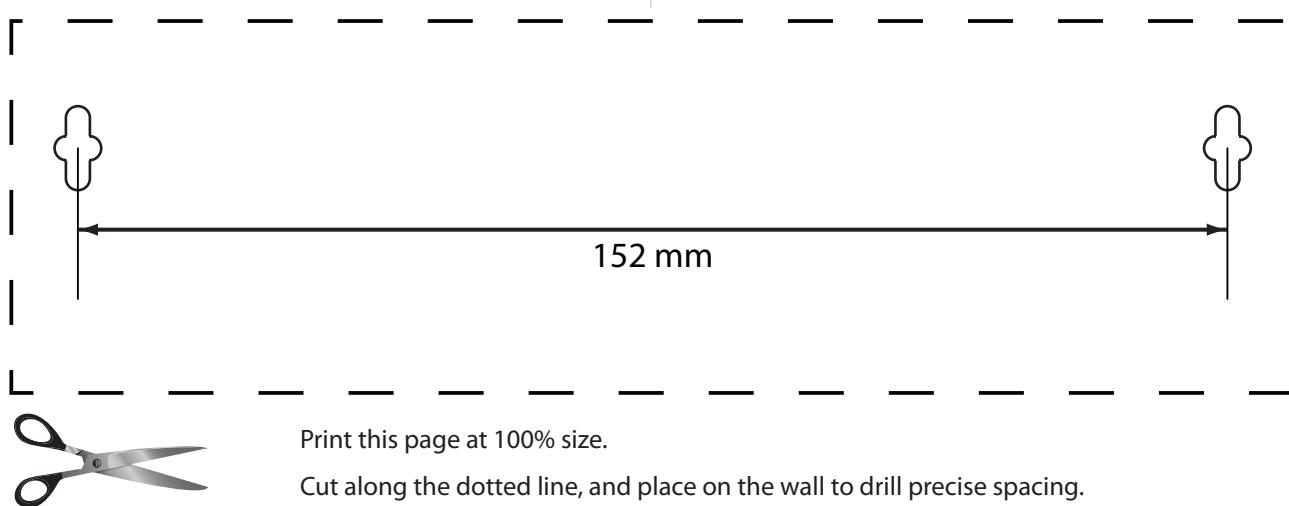
Note: Mounting hardware illustrations are not true to scale.



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 socket.
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. Manoeuvre 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.



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 mobile 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 National Insurance 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 unauthorised changes, customise 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 holidays).
- 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

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, Storage, 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.

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**.

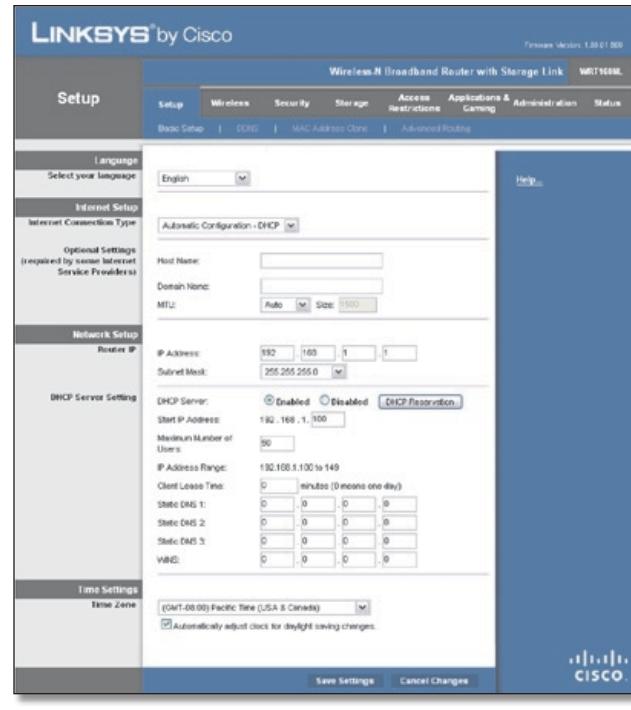
A login screen will appear. (Non-Windows XP users will see a similar screen). Leave the *Username* field blank. The first time you open the Web-based utility, use the default password **admin**. (You can set a new password from the *Administration > Management* screen.) Click **OK** to continue.



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).

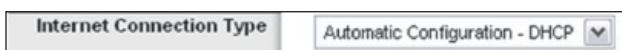
Internet Connection Type

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

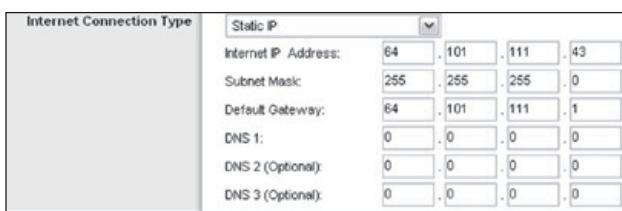
By default, the Router's Internet Connection Type is set to **Automatic Configuration - DHCP**, which should be kept only if your ISP supports DHCP or you are connecting through a dynamic IP address. (This option usually applies to cable connections).



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, as seen from the Internet. Your ISP will provide you with the IP Address you need to specify here.

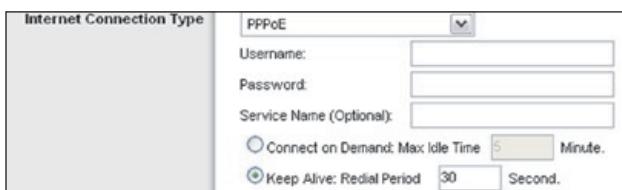
Subnet Mask This is the Router's Subnet Mask, as seen by users on the Internet (including your ISP). Your ISP will provide you with the Subnet Mask.

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.

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.

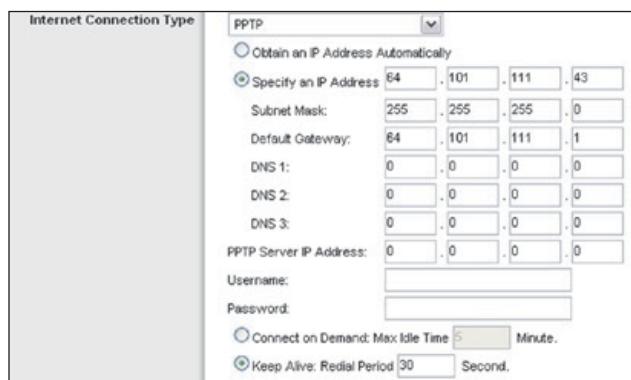
Service Name If provided by your ISP, enter the Service Name.

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 elapse 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 elapse 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:	0 . 0 . 0 . 0
Username:	[]
Password:	[]
<input type="radio"/> Connect on Demand: Max Idle Time	5 Minute.
<input checked="" type="radio"/> Keep Alive: Redial Period	30 Second.

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 elapse 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

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

Internet Connection Type	Telstra Cable
Server IP Address:	0 . 0 . 0 . 0
Username:	[]
Password:	[]
<input type="radio"/> Connect on Demand: Max Idle Time	5 Minute.
<input checked="" type="radio"/> Keep Alive: Redial Period	30 Second.

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 elapse 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 (required by some Internet Service Providers)	Host Name:	[]
	Domain Name:	[]
	MTU:	Auto Size: 1500

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 setting of **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 of the local network. 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	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled	DHCP Reservation
DHCP Server:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled	
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
Static DNS 2:	0	0
Static DNS 3:	0	0
WINS:	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 Tables	Client Name	Interface	IP Address	MAC Address	Select
	None	None	None	None	<input type="checkbox"/>
	Add Clients				
Manually Add Client	Enter Client Name	Assign IP Address	To This MAC Address		
		192 . 168 . 1 . 0	00:00:00:00:00:00	Add	
Clients Already Reserved	Client Name	Assign IP Address	To This MAC Address	MAC Address	

DHCP Reservation

- **Select Clients from DHCP Table** Click the **Select** tick 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 update the on-screen 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 setting 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 value 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 has elapsed, the user will be automatically assigned a new dynamic IP address. The default setting 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 Zone	(GMT-08:00) Pacific Time (USA & Canada)
<input checked="" type="checkbox"/> Automatically adjust clock for daylight saving changes.	

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.

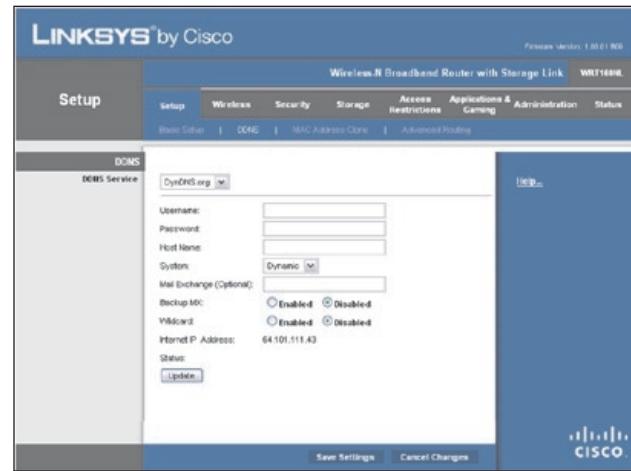
Before you can use this feature, you have to sign up for DDNS service with a DDNS service provider, www.dyndns.org or www.TZO.com. If you do not want to use this feature, keep the default setting of **Disabled**.

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 The 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 emails 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 setting of **Disabled**. To enable the feature, select **Enabled**. If you are not sure which setting to select, keep the default setting of **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 setting of **Disabled**. To enable wildcards, select **Enabled**. If you are not sure which setting to select, keep the default setting of **Disabled**.

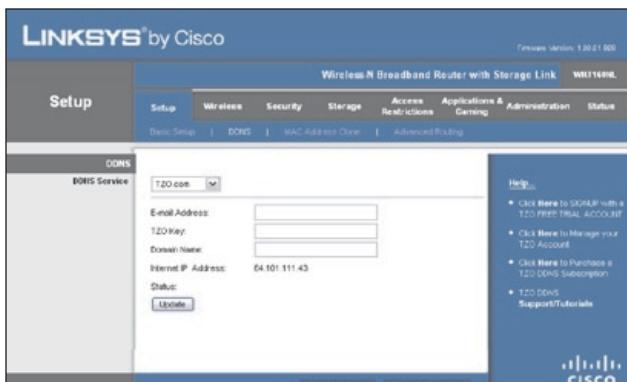
Internet IP Address The Router's Internet IP address is displayed here. Because it is dynamic, it will change.

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**.

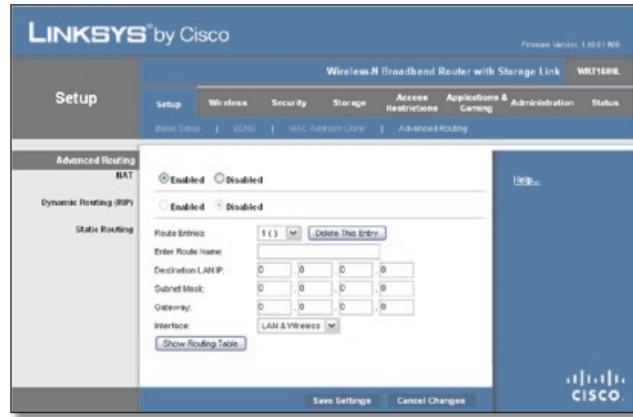
MAC Address Enter the MAC Address registered with your ISP here.

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 setting of **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 **WAN** (Internet).

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

Routing Table				
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)
239.0.0.0	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.

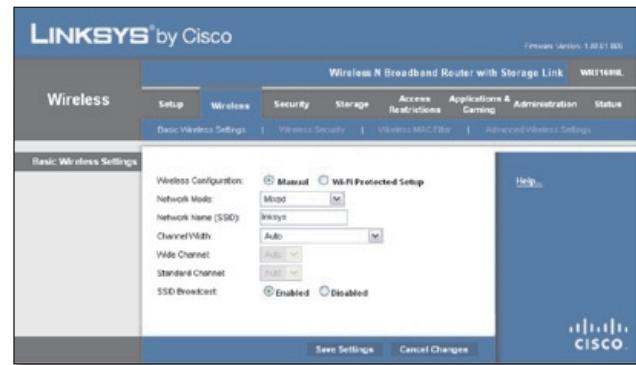
There are two ways to configure the Router's wireless network(s), manual and Wi-Fi Protected Setup.

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 [Basic Wireless Settings, page 10](#). To use Wi-Fi Protected Setup,

select **Wi-Fi Protected Setup**. Proceed to [Wi-Fi Protected Setup, page 11](#).

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 setting of **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 setting of **Standard - 20MHz Channel**. If you are not sure which option to use, 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 setting of **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, keep the default setting of **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).

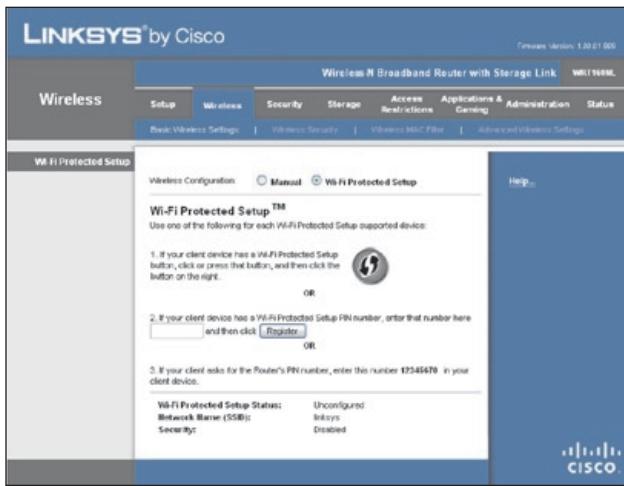
If you selected a specific channel for the Wide Channel setting, then the Standard Channel options will vary. Select the appropriate channel for your wireless network.

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

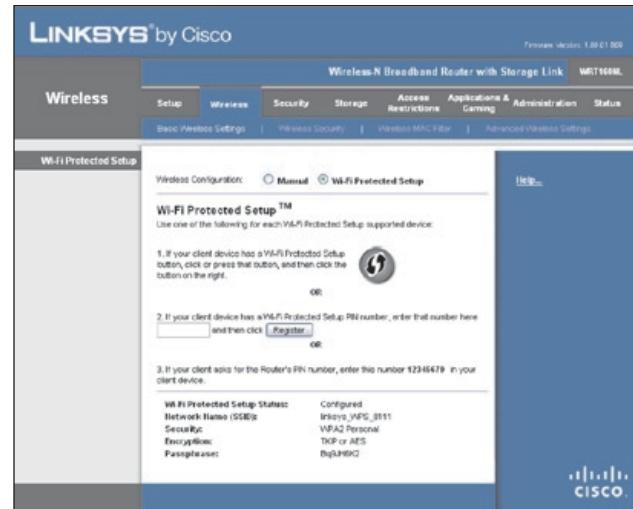
Click **Save Settings** to apply your changes or click **Cancel Changes** to cancel your changes.

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

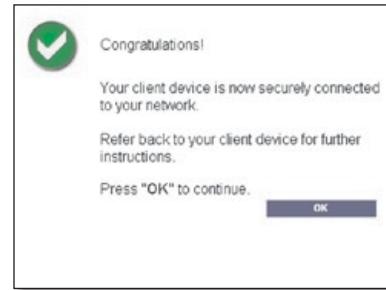


NOTE: Wi-Fi Protected Setup configures one client device at a time. Repeat the instructions for each client device that supports Wi-Fi Protected Setup.

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 Checklist, page 3](#).

Wireless Security

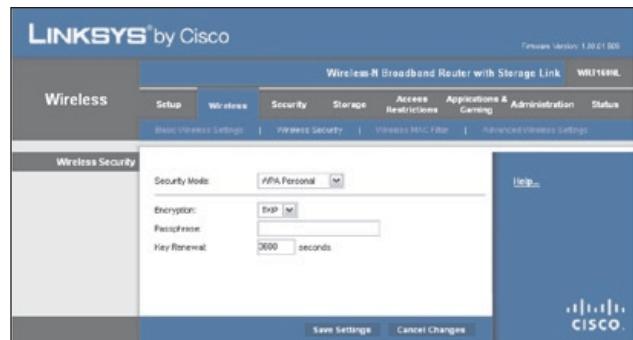
Security Mode

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

WPA Personal



NOTE: If you are using WPA, then each device in your wireless network MUST use the same WPA method and shared key, or else the network will not function properly.



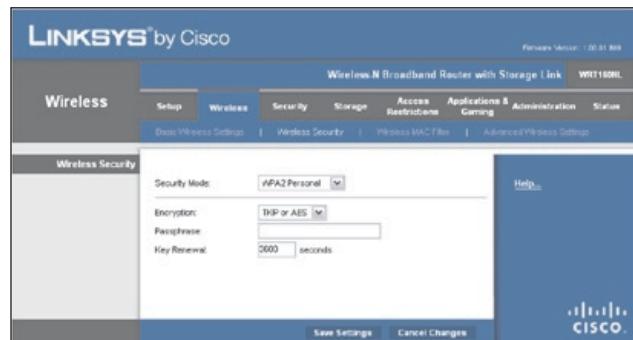
Security Mode > WPA Personal

Encryption WPA supports two encryption methods, TKIP and AES, with dynamic encryption keys. Select the type of algorithm, **TKIP** or **AES**. The default setting 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 value is **3600** seconds.

WPA2 Personal



Security Mode > WPA2 Personal

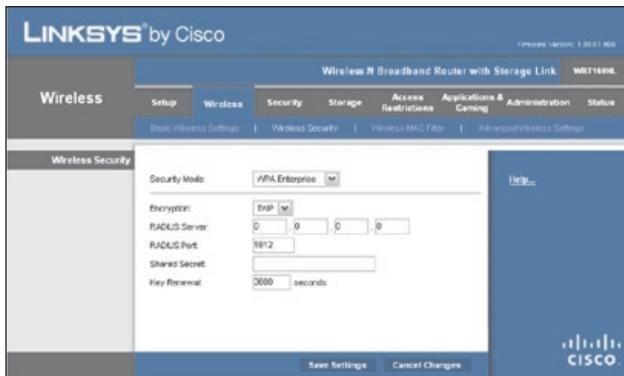
Encryption WPA2 supports two encryption methods, TKIP and AES, with dynamic encryption keys. Select the type of algorithm, **AES** or **TKIP or AES**. The default setting is **TKIP or AES**.

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 value is **3600** seconds.

WPA Enterprise

This option features WPA used with a RADIUS server. (This should only be used when a RADIUS server is connected to the Router).



Security Mode > 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 setting is **TKIP**.

RADIUS Server Enter the IP address of the server.

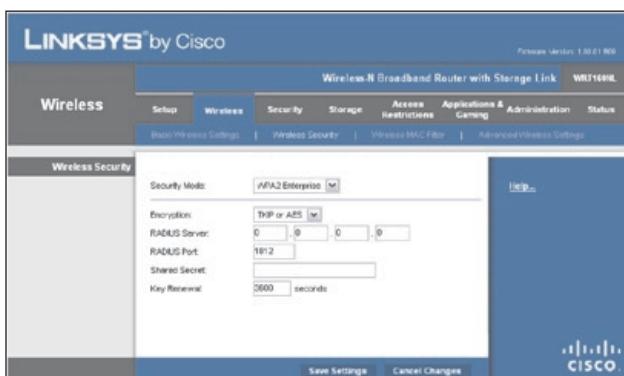
RADIUS Port Enter the port number of the server. The default value is **1812**.

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 value is **3600** seconds.

WPA2 Enterprise

This option features WPA2 used with a RADIUS server. (This should only be used when a RADIUS server is connected to the Router).



Security Mode > 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 setting is **TKIP or AES**.

RADIUS Server Enter the IP address of the server.

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

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

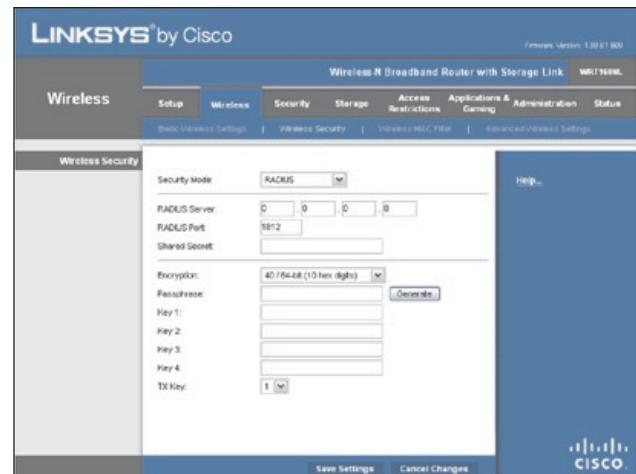
Key Renewal Enter a Key Renewal period, which instructs the Router how often it should change the encryption keys. The default value is **3600** seconds.

RADIUS

This option features WEP used with a RADIUS server. (This should only be used when a RADIUS server is connected to the Router).



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



Security Mode > RADIUS

RADIUS Server Enter the IP address of the server.

RADIUS Port Enter the port number of the 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 setting 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 value is **1**.

WEP

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



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

Security Mode > WEP

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

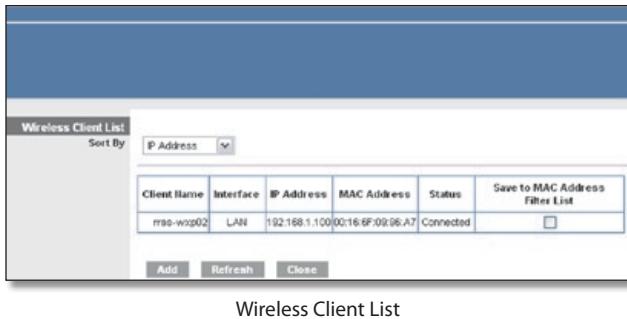
Access Restriction

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

Permit Select this option 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**.

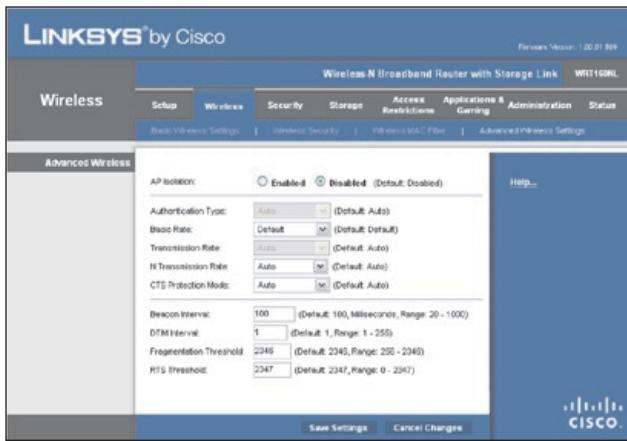
To update the on-screen information, click **Refresh**. To exit this screen and return to the *Wireless MAC Filter* screen, click **Close**.

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 > 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 setting of **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 setting of **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 setting of **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 synchronise the wireless network. The default value 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**.

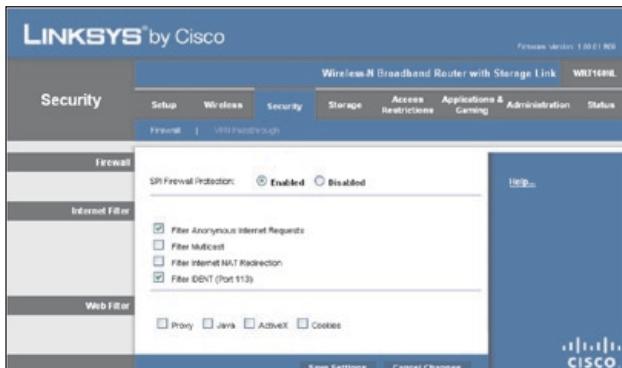
Fragmentation Threshold This value specifies the maximum size for a packet before data is fragmented into multiple packets. If you experience a high packet error rate, you may slightly increase the Fragmentation Threshold. Setting the Fragmentation Threshold too low may result in poor network performance. 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 a 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 of **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 option 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 option to filter Internet NAT redirection. It is not selected by default.

Filter IDENT (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 option 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 option 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 option 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 option 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 option 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 setting of **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 setting of **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 setting of **Enabled**.

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

Storage > Disk

The storage options are available when a USB storage device is connected to the USB port of the Router. If the storage device does not fit (for example, it may block port 1), then use the included USB extension cable.

The **Disk** screen describes the disk currently attached to the Router. Use this screen to create shared folders, safely remove a disk, or format a disk (any data on the disk will be deleted during formatting).

Shared folders are folders you create to manage access to the folders on the disk. By default the Router creates a shared folder called **Public**, which includes all of the folders on the disk. For the Public folder, the admin group has read-and-write access rights and the guest group has read-only access rights. (By default the Router creates two user groups, **admin** and **guest**.)



Storage > Disk

Disk Management

If a formatted disk is connected to the Router, then its name is displayed. For each partition of the disk, the Partition, File System, Capacity and Free Space information are displayed.

Safely Remove Disk Before physically disconnecting a disk from the Router, click **Safely Remove Disk** first. This prevents the possible loss of data, which may occur if you remove the disk while it is transferring data.

Create Share To create a shared folder, click this option for the appropriate partition and the *Shared Folder* screen appears. Proceed to [Create or Edit a Shared Folder, page 18](#).

Shared Folder

Shared Disk IP Address The IP address of the disk is displayed.

Summary To view a list of shared folders, click this option. Proceed to [Shared Folders Summary, page 18](#).

For each shared folder, the Display Name, Partition and Shared Folder location are displayed.

Edit To change the access settings of a shared folder, click this option and the *Shared Folder* screen appears. Proceed to [Create or Edit a Shared Folder, page 18](#).

Delete To delete a shared folder, click this option.

Shared Folders Summary

The *Shared Folders Summary* screen displays the following information: Display Name, Partition, Shared Folder and Groups with Access.



Summary

To exit the *Shared Folders Summary* screen and return to the *Disk Management* screen, click **Close**.

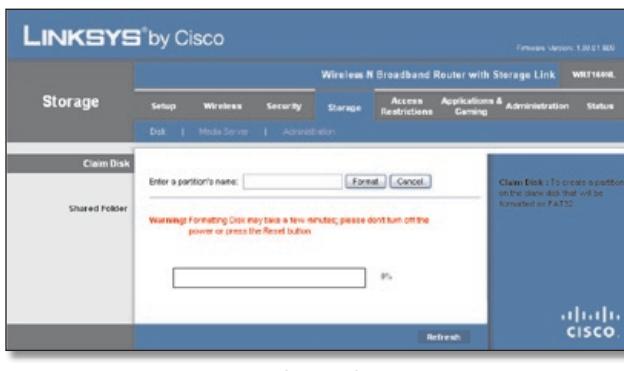
Format Disk

Disk To format a disk and create a new partition, select the disk you want to format and then click **Format Disk**. (If your disk was formatted with multiple partitions, then the formatting will delete them and create a single partition.) The *Claim Disk* screen appears.

Claim Disk

Enter a partition's name Create a name for the partition.

To format the disk as FAT32, click **Format** and follow the on-screen instructions. To cancel the formatting, click **Cancel**. To update the on-screen information, click **Refresh**.

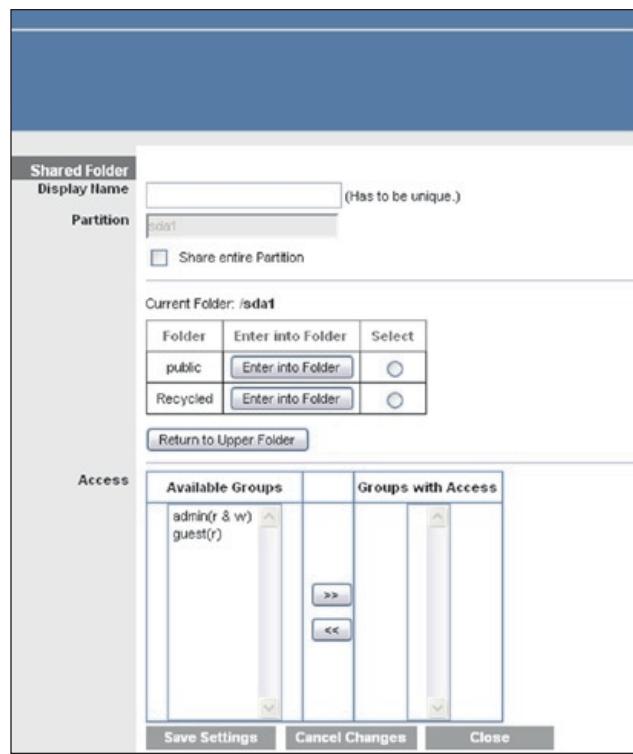


Claim Disk

On the *Disk Management* screen, click **Refresh** to update the on-screen information.

Create or Edit a Shared Folder

Use this screen to add a shared folder.



Shared Folder

Display Name

Create a name for the shared folder.

Partition

The name of the partition is displayed.

Share entire Partition Select this option if the shared folder should include the entire partition.

If you do not want to share the entire partition, then select the folder you do want to share.

Current Folder The current folder is displayed.

Folder The available folders are listed by Folder name.

Enter into Folder To display sub-folders, click this button.

Select Select a folder.

Return to Upper Folder To return to the previous folder, click this button.

Access

Specify which user groups have read-and-write or read-only access to the shared folders. (To create user groups, refer to [Create or Edit a Group Account, page 20](#).)

Available Groups To allow a group access to the shared folder, select it and then click the **>>** button.

Groups with Access To block a group from accessing the shared folder, select it and then click the **<<** button.

Click **Save Settings** to apply your changes or click **Cancel Changes** to cancel your changes. Click **Close** to exit the screen.

Storage > Media Server

The storage options are available when a USB storage device is connected to the USB port of the Router. If the storage device does not fit (for example, it may block port 1), then use the included USB extension cable.



Storage > Media Server

UPnP Media Server

If you have UPnP AV-enabled (or DLNA-certified) devices in your home, then you can use the Router as a media server. Examples of UPnP AV-enabled devices include a digital media adapter, a gaming console with a built-in media player, or a digital picture frame.

For example, if you have a digital media adapter that sends content to your entertainment system, then the digital media adapter can locate the Router using the UPnP AV standard. The folders you specify can then be accessed and played by the digital media adapter.

Setup

Server Name The default server name of the Router is **WRT160NL**. You can change this name on the *Storage > Administration* screen. Please refer to [Storage > Administration, page 20](#).

UPnP Media Server To use the Router's media server function, select **Enabled**. Otherwise, select **Disabled**.

Database Setup

Specify Folder to Scan To add a media folder to the database of the Router's media server, click this button. The *Media Folder* screen appears. Proceed to [Create a Media Folder, page 19](#).

Auto-scan every _____ To automatically scan the media folders, select this option. Then select the appropriate interval: **2 Hours** (default), **6 Hours**, **12 Hours**, **24 Hours**, or **48 Hours**.

Scan All To scan all media files, click this button.

The database table lists the media folders with the following information: Name, Partition and Folder.

Scan To scan a folder, click **Scan**.

Delete To delete a folder, click **Delete**.

Create a Media Folder

Use this screen to add a media folder.



Media Folder

Display Name

Create a name for the media folder.

Partition

The name of the partition is displayed.

Share entire Partition Select this option if the media folder should include the entire partition.

If you do not want to share the entire partition, then select the folder you do want to share.

Current Folder The current folder is displayed.

Folder The available folders are listed by Folder name.

Enter into Folder To display sub-folders, click this button.

Select Select a folder.

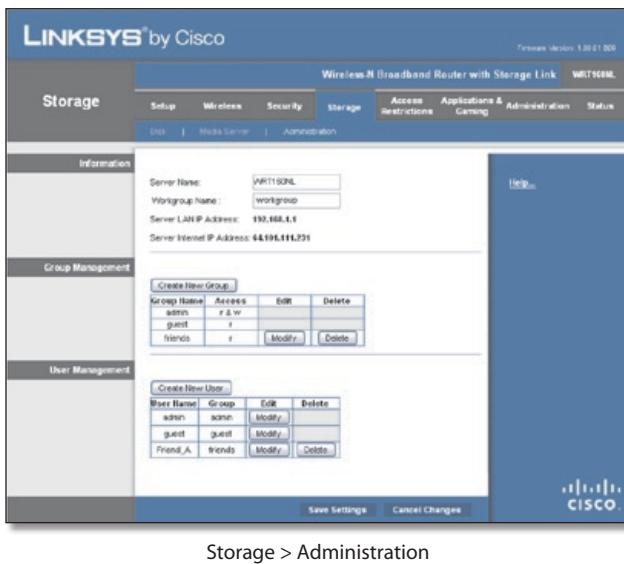
Return to Upper Folder To return to the previous folder, click this button.

Click **Save Settings** to apply your changes or click **Cancel Changes** to cancel your changes. Click **Close** to exit the screen.

On the *Media Server* screen, click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

Storage > Administration

The *Administration* screen allows you to manage the user groups and individual users who can access the shared folders.



Storage > Administration

Information

Server Name Enter the server name for the Router; it will be used for the disk and media server features. Use only alphanumeric characters (letters A to Z and numbers 0 to 9) in the server name. The default setting is **WRT160NL**.

Workgroup Name Enter the workgroup name for the Router; it should match the workgroup name of the computers on your local network. The Router's default is **workgroup**.

Server LAN IP Address The local IP address of the Router is displayed.

Server Internet IP Address The Internet IP address of the Router is displayed.

Group Management

By default the Router creates two user groups, **admin** and **guest**.

The groups are listed by Group Name and Access level. There are two levels of access, **r & w** (read-and-write) and **r** (read-only).

Create New Group To create a new group of users, click this button. The *Group Account* screen appears. Proceed to [Create or Edit a Group Account, page 20](#).

Edit To change the description or access rights of a group, click **Modify** and the *Group Account* screen appears. Proceed to [Create or Edit a Group Account, page 20](#).

Delete To delete a group, click this button.

User Management

By default the Router creates two users, **admin** and **guest**.

The users are listed by Username and Group.

Create New User To create a new user, click this button. The *User Account* screen appears. Proceed to [Create or Edit a User Account, page 21](#).

Edit To change the settings of a user account, click **Modify** and the *User Account* screen appears. Proceed to [Create or Edit a User Account, page 21](#).

Delete To delete a user, click this button.

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

Create or Edit a Group Account

This screenshot shows the 'Group Account' configuration screen. It has fields for 'Group Name' (with a text input field), 'Description' (with a text input field), and 'Access' (with a dropdown menu set to 'read and write'). Below the form are 'Create', 'Cancel', and 'Close' buttons.

Group Account

Group Account

Group Name Create a name for the group.

Description Enter keywords to describe the group.

Access Select the appropriate level of access, **read and write** or **read only**.

Click **Create** or **Modify** to apply your changes, or click **Cancel** to clear your changes. Click **Close** to exit the screen.

Create or Edit a User Account

This screenshot shows the 'User Account' configuration page. It includes fields for Name, Full Name, Description, Password, Confirm Password, Group Member (set to 'admin'), and an Account Disabled checkbox. Buttons for Create User, Close, and Cancel are at the bottom.

User Account

User Account

Name Create a name for the user.

Full Name Enter the actual name of the user.

Description Enter keywords to describe the user.

Password Enter the password that the user will use for login

Confirm Password Enter the password again to confirm.

Group Member Select the appropriate user group.

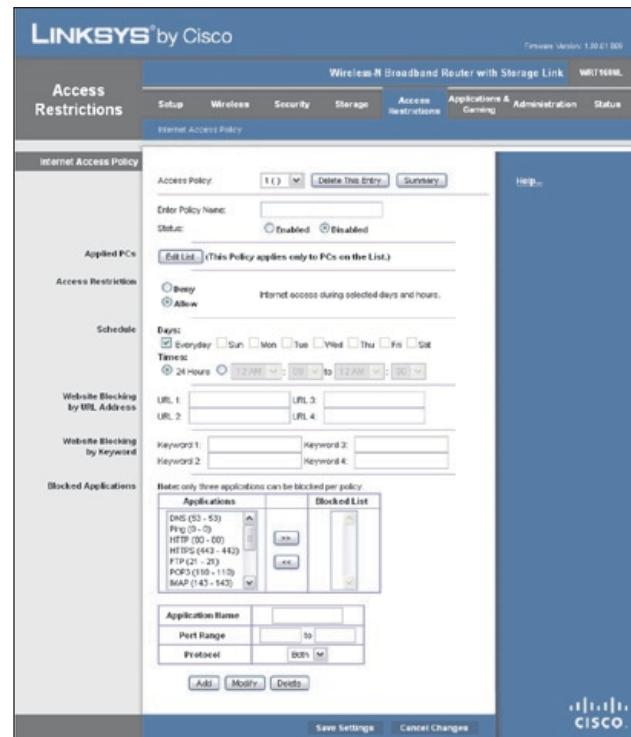
Account disabled To temporarily disable an account, select this option.

Click **Create User** or **Modify User** to apply your changes, or click **Cancel** to clear your changes. Click **Close** to exit the screen.

On the *Media Server* screen, click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

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**.

This screenshot shows the 'Internet Policy Summary' table. It lists 10 policies with columns for No., Policy Name, Access, Days, Time of Day, Enabled, and Delete. Buttons for Save Settings, Cancel Changes, and Close are at the bottom.

No.	Policy Name	Access	Days	Time of Day	Enabled	Delete
1	---	---	---	---	<input type="checkbox"/>	Delete
2	---	---	---	---	<input type="checkbox"/>	Delete
3	---	---	---	---	<input type="checkbox"/>	Delete
4	---	---	---	---	<input type="checkbox"/>	Delete
5	---	---	---	---	<input type="checkbox"/>	Delete
6	---	---	---	---	<input type="checkbox"/>	Delete
7	---	---	---	---	<input type="checkbox"/>	Delete
8	---	---	---	---	<input type="checkbox"/>	Delete
9	---	---	---	---	<input type="checkbox"/>	Delete
10	---	---	---	---	<input type="checkbox"/>	Delete

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 clear your changes. Then click **Close**.

List of PCs				
	MAC Address			
01	00:00:00:00:00:00	06	00:00:00:00:00:00	
02	00:00:00:00:00:00	07	00:00:00:00:00:00	
03	00:00:00:00:00:00	08	00:00:00:00:00:00	
04	00:00:00:00:00:00	09	00:00:00:00:00:00	
05	00:00:00:00:00:00	10	00:00:00:00:00:00	

IP Address				
	IP Address			
01	192.168.1.0	04	192.168.1.0	
02	192.168.1.0	05	192.168.1.0	
03	192.168.1.0	06	192.168.1.0	

IP Address Range							
	IP Address Range		to	IP Address Range	to		
01	192.168.1.0	to	0	02	192.168.1.0	to	0

Save Settings **Cancel Changes** **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**.
7. You can block websites with specific URL addresses. Enter each URL in a separate *Website Blocking by URL Address* field.
8. You can also block websites using specific keywords. Enter each keyword in a separate *Website Blocking by Keyword* field.
9. 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.

10. 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**.

11. Click **Save Settings** to save the policy's settings or click **Cancel Changes** to clear the changes.

Applications and Gaming > Single Port Forwarding

The *Single Port Forwarding* screen allows you to customise 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; refer to [DHCP Reservation, page 7](#)).

Application Name	External Port	Internal Port	Protocol	To IP Address	Enabled
None	---	---	---	192.168.1.0	<input type="checkbox"/>
None	---	---	---	192.168.1.0	<input type="checkbox"/>
None	---	---	---	192.168.1.0	<input type="checkbox"/>
None	---	---	---	192.168.1.0	<input type="checkbox"/>
None	---	---	---	192.168.1.0	<input type="checkbox"/>
0	0	Both	---	192.168.1.0	<input type="checkbox"/>
0	0	Both	---	192.168.1.0	<input type="checkbox"/>
0	0	Both	---	192.168.1.0	<input type="checkbox"/>
0	0	Both	---	192.168.1.0	<input type="checkbox"/>
0	0	Both	---	192.168.1.0	<input type="checkbox"/>

Save Settings **Cancel Changes**

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, email servers or other specialised Internet applications. (Specialised 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; refer to [DHCP Reservation, page 7](#)).

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**.

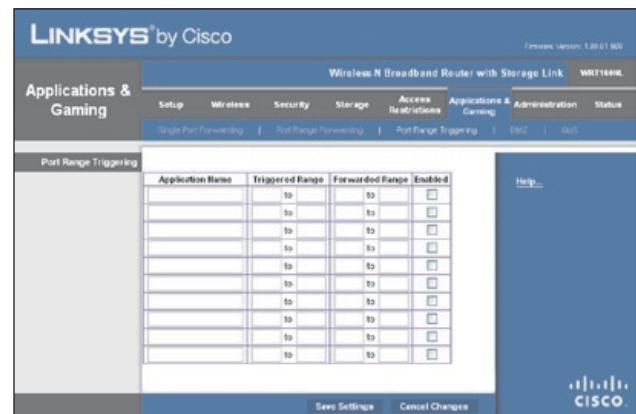
To IP Address For each application, enter the IP address of the PC running the specific application. If you assigned a static IP address to the PC, then you can click **DHCP Reservation** on the *Basic Setup* screen to look up its static IP address.

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.

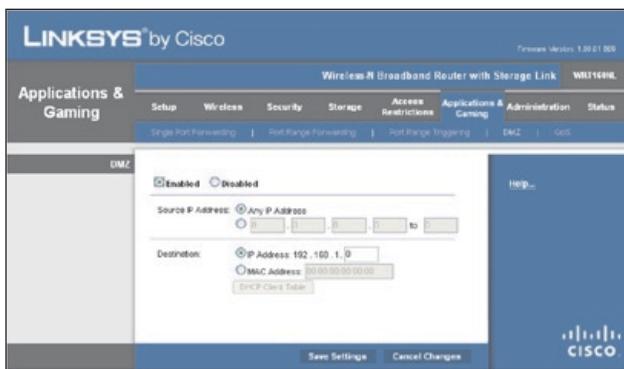
Forwarded Range For each application, enter the starting and ending port numbers of the forwarded port number range. Check with the Internet application documentation for the port number(s) needed.

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 > 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**.

DHCP Client Table			
To Sort by			
Client Name	Interface	IP Address	MAC Address
rmas-wxip02	Wireless	192.168.1.100	00:16:0F:09:96:A7
m000a-wxip	LAN	192.168.1.101	00:15:58:7F:9B:D7

DMZ > 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 update the on-screen 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.

QoS (Quality of Service)	
Wireless	WMM Support
Internet Access Priority Category	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled (Default: Enabled)
	No Acknowledgement <input checked="" type="radio"/> Enabled <input type="radio"/> Disabled (Default: Disabled)
	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
Summary	Priority Applications Name Information
	Add
	Priority Name Information

Applications and Gaming > 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 setting of **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 setting of **Disabled**.

Internet Access Priority

In this section, you can set the bandwidth priority for a variety of applications and devices. There are four levels of priority: High, Medium, Normal or Low. When you set the 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 setting of **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.

Summary

This lists the QoS entries you have created for your applications and devices. Refer to [Summary, page 26](#) for more information.

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

Category	Applications	Add a New Application
	Enter a Name	
	Port Range	(Optional) to Both
	(Optional)	to Both
	(Optional)	to Both
	Priority	Medium (Recommend)
	Add	

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

Category	Online Games
	Game Counter Strike
	Priority Medium (Recommend)
	Add

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

Category	Online Games
	Game Add a New Game
	Enter a Name
	Port Range
	(Optional) to Both
	(Optional) to Both
	(Optional) to Both
	Priority Medium (Recommend)
	Add

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

Category	MAC Address	My Current PC's MAC Address: 00:15:58:7F:9B:D7
	Enter a Name	<input type="text"/>
	MAC Address	00:00:00:00:00:00
	Priority	Medium (Recommend) <input type="button" value="▼"/>
	<input type="button" value="Add"/>	

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

Category	Ethernet Port	Ethernet Port 1
	Ethernet	<input type="button" value="▼"/>
	Priority	Medium (Recommend) <input type="button" value="▼"/>
	<input type="button" value="Add"/>	

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: 00:16:B6:29:71:6C
	Enter a Name	<input type="text"/>
	MAC Address	00:00:00:00:00:00
	Priority	High (Recommend) <input type="button" value="▼"/>
	<input type="button" value="Add"/>	

QoS > 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.

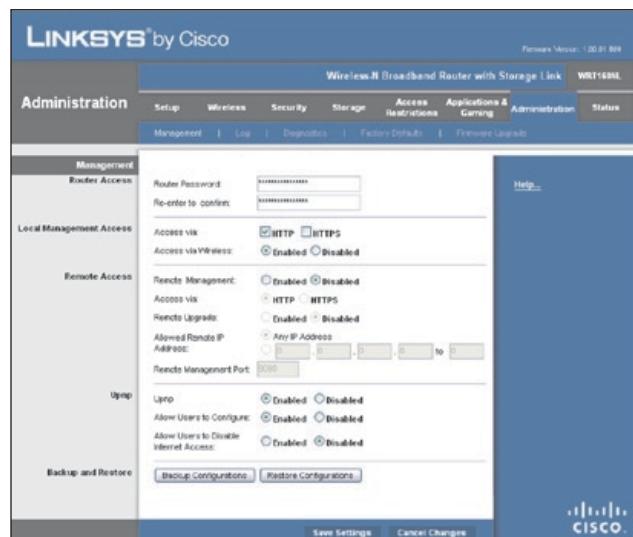
Remove Click this button to remove an entry.

Edit Click this button to make changes.

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

Administration > Management

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



Administration > 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 setting 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 setting.

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 setting of **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 setting of **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 setting.

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 setting of **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://xxx.xxx.xxx.xxx:yyyy** or **https://xxx.xxx.xxx.xxx:yyyy**, depending on whether you use HTTP or HTTPS. Enter the Router's specific Internet IP address in place of xxx.xxx.xxx.xxx and enter the Remote Management Port number in place of yyyy.

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 setting of **Enabled**. Otherwise, select **Disabled**.

Allow Users to Configure Keep the default setting of **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 setting of **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.

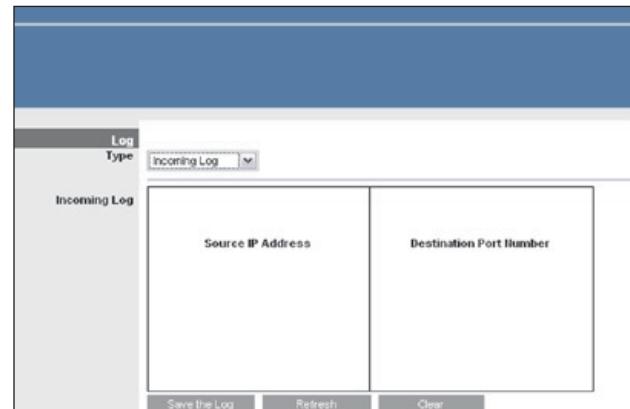


Administration > Log

Log

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

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



Log > View Log

Log

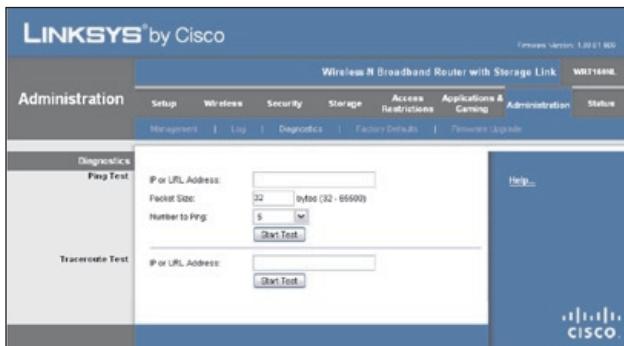
- Type** Select **Incoming Log**, **Outgoing Log**, **Security Log** or **DHCP Client Log**.
- <Type> Log** The Incoming Log displays a temporary log of the source IP addresses and destination port numbers for the incoming Internet traffic. The Outgoing Log displays a temporary log of the local IP addresses, 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

Ping 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 value is **32** bytes.

Number to Ping Enter the number of times you wish to test the connection. The default value is **5**.

Start Test To run the test, click this button. The *Ping* 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

Traceroute checks 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* 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

Restore the Router to its factory default settings.



Administration > Factory Defaults



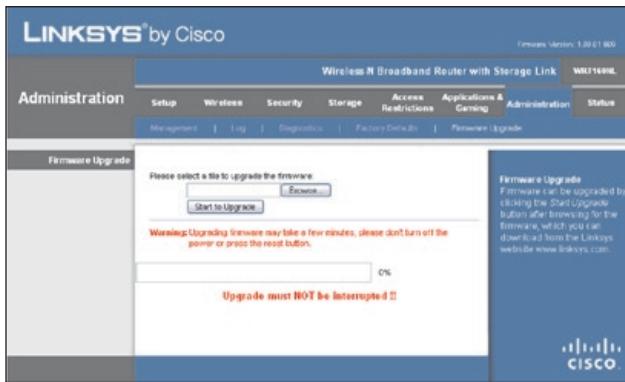
NOTE: Do not restore the factory defaults unless you are having difficulties with the Router and have exhausted all other troubleshooting measures. Once the Router is reset, you will have to re-enter all of your configuration settings.

Factory Defaults

Restore All Settings To reset the Router's settings to the defaults, 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 > Firmware Upgrade



NOTE: The Router may lose the settings you have customised. 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.

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

DHCP Client Table					
To Sort by					
IP Address					
Client Name	Interface	IP Address	MAC Address	Expires Time	
rras-wxp02	LAN	192.168.1.100	00:16:86:29:71:A7	23:37:52	<input type="button" value="Delete"/>
stocko-wxp	LAN	192.168.1.101	00:16:86:29:71:D7	23:38:05	<input type="button" value="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 update the on-screen 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.



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 switched on. The Power LED should be green and not flashing.
- If the Power LED is flashing, then switch off the power to all of your network devices, including the modem, Router and computers. Then switch the power back on to 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.

The Router does not recognise your USB storage device.

Make sure the USB storage device uses the NTFS or FAT format. To check its format, follow these instructions:

1. Connect the USB storage device directly to your computer.
2. On your desktop, double-click **Computer** or **My Computer** icon.
3. Right-click the USB storage device, and click **Properties**.
4. The format is listed in the File system description. If the format is not NTFS or FAT, then back up the data on the USB storage device.

After you have backed up the data on the USB storage drive, you can format it. Right-click the USB storage device, and click **Format**. Follow the on-screen instructions. For more information, refer to Windows Help.

If the Router still does not recognise the USB storage device, then remove the power adapter from the Router's Power port. Wait five seconds, and then re-connect the power adapter to the Router's Power port.

In Windows Vista, you do not see the USB storage device in the Network screen.

Make sure the Router and your computer use the same workgroup name. (The default workgroup name of the Router is **workgroup**. In Windows Vista, right-click the **Computer** icon and select **Properties**. Click **Advanced**

system settings. 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**.

In Windows XP, you do not see the Router in 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 in 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 **workgroup**. 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**.



WEB: If your questions are not addressed here, refer to the Linksys website, www.linksysbycisco.com

Appendix B: How to Install and Access USB Storage

Overview

This appendix explains how to do the following:

- connect and access a USB storage device
- map a shortcut to a USB storage device
- create a shared folder on a USB storage device (advanced users)
- manage access to shared folders using group and user accounts (advanced users)

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



NOTE: If the Computer icon is not displayed, then go to **Start > All Programs > Accessories > Windows Explorer**.

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 20**.



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

\<xxx.xxx.xxx.xxx>

The default setting 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 username and password. (For the admin account, **admin** is both the default username and password.)



Enter Account Username and Password

User accounts are set up on the *Storage > Administration* screen; for more information, refer to **Create a User Account, page 38**.

Windows XP

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



My Computer Icon



NOTE: If the My Computer icon is not displayed, then go to **Start > All Programs > Accessories > Windows Explorer**.

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 20**.



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

\xxx.xxx.xxx.xxx

The default setting 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 username and password. (For the admin account, **admin** is both the default username and password.)



Enter Account Username and Password

User accounts are set up on the *Storage > Administration* screen; for more information, refer to [Create a User Account, page 38](#).

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



NOTE: If the My Computer icon is not displayed, then go to *Start > All Programs > Accessories > Windows Explorer*.

- 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 20](#).

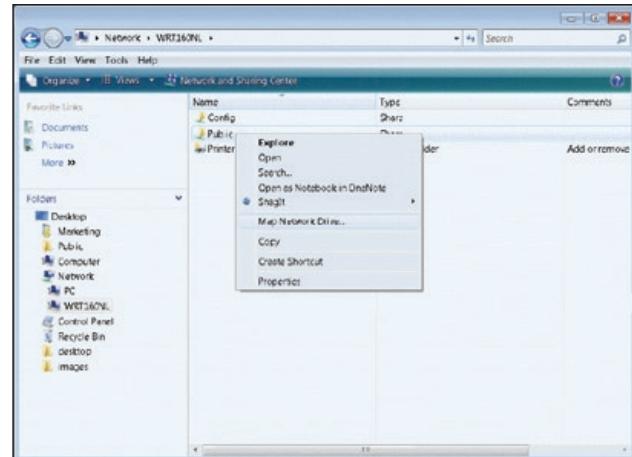


NOTE: Another option is to use the IP address of the Router. In the *Address* field, enter the local IP address of the Router:

\xxx.xxx.xxx.xxx

The default setting 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

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



Select Drive Letter

5. Click **Finish**.

Access Mapped Drive

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



Computer Icon



NOTE: If the Computer icon is not displayed, then go to **Start > All Programs > Accessories > Windows Explorer**.

2. Double-click the mapped drive to access it.



Double-Click Mapped Drive

Windows XP

Map a Drive

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



My Computer Icon



NOTE: If the My Computer icon is not displayed, then go to **Start > All Programs > Accessories > Windows Explorer**.

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 20**.



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

xxx.xxx.xxx.xxx

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

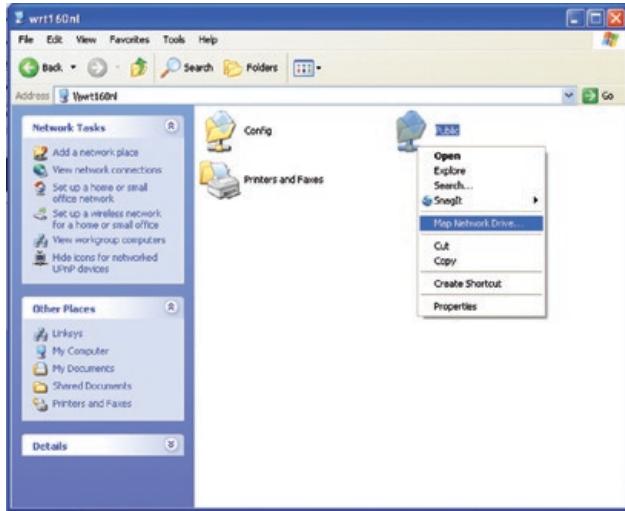
3. A login screen may appear. If prompted, enter your account username and password. (For the admin account, **admin** is both the default username and password.)



Enter Account Username and Password

User accounts are set up on the **Storage > Administration** screen; for more information, refer to **Create a User Account, page 38**.

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



Map Network Drive

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



Select Drive Letter

6. Click **Finish**.

Access Mapped Drive

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

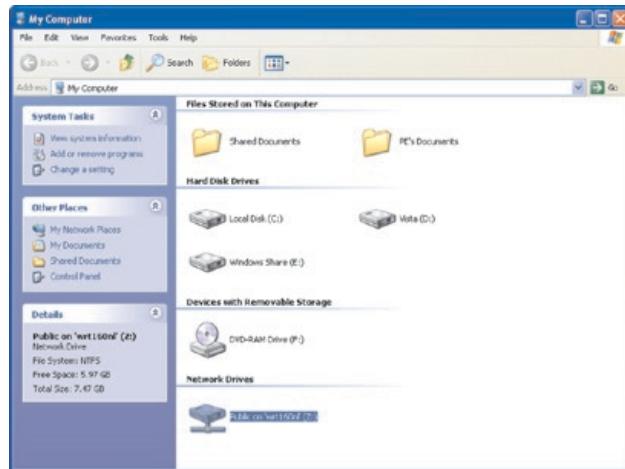


My Computer Icon



NOTE: If the My Computer icon is not displayed, then go to **Start > All Programs > Accessories > Windows Explorer**.

2. In the *Network Drives* section, double-click the mapped drive to access it.



Double-Click Mapped Drive

Advanced Configuration (Advanced Users Only)

To manage access to the USB storage device, you can create shared folders, user groups and user accounts.

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 *Username* 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

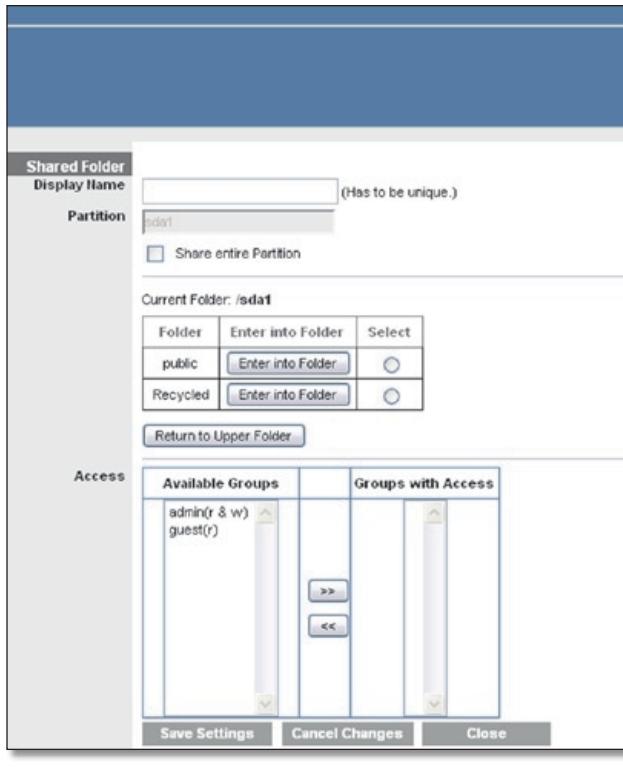
Create a Shared Folder

1. Click the **Storage** tab.
2. Click the **Disk** tab.



Storage > Disk

3. To create a shared folder, click **Create Share**.



Shared Folder

4. In the *Display Name* field, create a name for the shared folder.
 5. If the shared folder should include the entire partition, select **Share entire Partition** and proceed to step 7.
- If you do not want to share the entire partition, then specify the folder you do want to share.

6. Select the appropriate folder. To display sub-folders, click **Enter into Folder**. To return to the previous folder, click **Return to Upper Folder**.

7. To allow a group access to the shared folder, select it from the Available Groups column and then click the **>>** button.

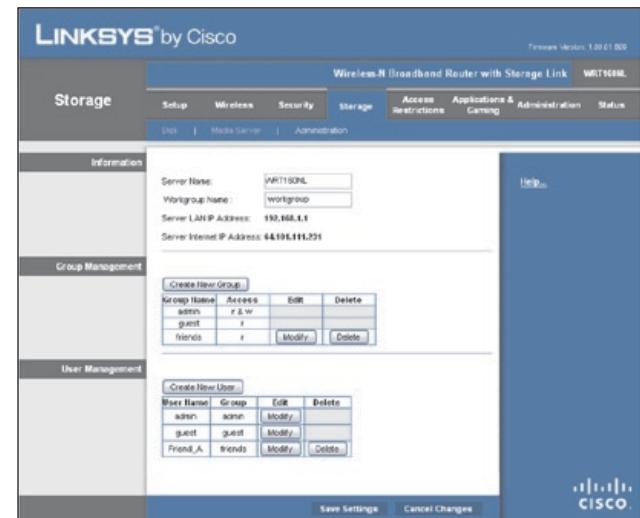


NOTE: Specify which user groups have read-and-write or read-only access to the shared folders.

8. To block a group from accessing the shared folder, select it from the Groups with Access column and then click the **<<** button.
9. Click **Save Settings** to apply your changes or click **Cancel Changes** to clear your changes. Click **Close** to exit the screen and return to the *Disk* screen.

Create a User Group Account

1. Click the **Storage** tab.
2. Click the **Administration** tab.



Storage > Administration

3. In the *Group Management* section, click **Create New Group**.

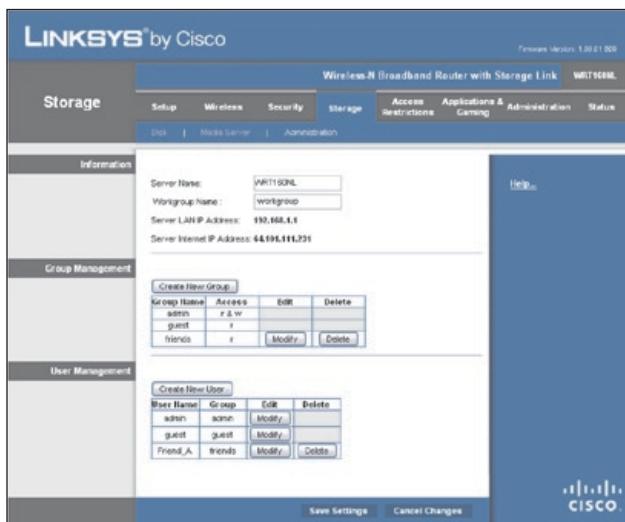


Group Account

4. In the *Group Name* field, create a name for the group.
5. In the *Description* field, enter keywords to describe the group.
6. From the *Access* drop-down menu, select the appropriate level of access: **read and write** or **read only**.
7. Click **Create** to apply your changes, or click **Cancel** to clear your changes. Click **Close** to exit the screen and return to the *Administration* screen.

Create a User Account

1. Click the **Storage** tab.
2. Click the **Administration** tab.



Storage > Administration

3. In the *User Management* section, click **Create New User**.

This is a detailed view of the 'User Account' creation dialog box. It includes fields for Name, Full Name, Description, Password, Confirm Password, and Group Member (set to 'admin'). There is also an 'Account Disabled' checkbox. At the bottom are 'Create User', 'Close', and 'Cancel' buttons.

User Account

4. In the *Name* field, create a name for the user.
5. In the *Full Name* field, enter the actual name of the user.

6. In the *Description* field, enter keywords to describe the user.
7. In the *Password* and *Confirm Password* fields, enter the password that the user will use to login.
8. From the *Group Member* drop-down menu, select the appropriate user group.



NOTE: To temporarily disable an account, select **Account Disabled**.

9. Click **Create User** to apply your changes, or click **Cancel** to clear your changes. Click **Close** to exit the screen and return to the *Administration* screen.

Appendix C: Specifications

Model	WRT160NL
Standards	802.3, 802.3u, 802.11b, 802.11g, Draft 802.11n
Ports	Internet, Ethernet [1-4], USB, Power
Buttons	Wi-Fi Protected Setup, Reset
LEDs	LAN [1-4], Wi-Fi Protected Setup™, Wireless, Internet, Power
Cabling Type	CAT 5e
# of Antennas	2
Connector Type	R-SMA
Detachable (y/n)	Yes
RF Pwr (EIRP) in dBm	Draft 11n: Typ. 13.5 +/- 1.5 dBm @ Normal Temp Range 802.11g: Typ. 13.5 +/- 1.5 dBm @ Normal Temp Range 802.11b: Typ. 16 +/- 1.5 dBm @ Normal Temp Range
Receive Sensitivity	802.11n HT40/MCS15 270 Mbps: -67 dBm 10% PER 802.11n HT40/MCS0 13.5 Mbps: -75 dBm 10% PER 802.11n HT20/MCS15 130 Mbps: -69 dBm 10% PER 802.11n HT20/MCS0 6.5 Mbps: -79 dBm 10% PER 802.11g 54 Mbps: -74 dBm 10% PER 802.11g 6 Mbps: -84 dBm 10% PER 802.11b 11 Mbps: -86 dBm 10% PER 802.11b 1 Mbps: -92 dBm 10% PER
Antenna Gain in dBi	802.11g: 2.4 GHz <= 1.8dBi Draft 11n: 2.4 GHz <= 1.8 dBi
UPnP able/cert	Able
.Net support	No
Security Features	WEP, WPA, WPA2, RADIUS, SPI Firewall
Security Key Bits	Up to 128-Bit Encryption
Supported File Systems for Storage Device	FAT16, FAT32, NTFS
Environmental	
Dimensions	7.98" x 6.27" x 1.30" (202.79 x 159.2 x 33.14 mm)
Unit Weight	9.98 oz (283 g)
Power	12V / 1.5A (switching)
Certifications	FCC, UL, cUL, IC, RSS210, CE

Operating Temp.	0 to 40°C (32 to 104°F)
Storage Temp.	-20 to 60°C (-4 to 140°F)
Operating Humidity	10 to 80%, Relative Humidity, Non-condensing
Storage Humidity	5 to 90% Non-condensing

Specifications are subject to change without notice.

Appendix D: Warranty Information

Limited Warranty

Linksys warrants that this Linksys hardware product will be substantially free of defects in materials and workmanship arising under normal use during the Warranty Period, which begins on the date of purchase by the original end-user purchaser and lasts for the period specified below:

- Two (2) years for new product
- Ninety (90) days for refurbished product

This limited warranty is non-transferable and extends only to the original end-user purchaser. Your exclusive remedy and Linksys' entire liability under this limited warranty will be for Linksys, at its option, to (a) repair the product with new or refurbished parts, (b) replace the product with a reasonably available equivalent new or refurbished Linksys product or (c) refund the purchase price of the product less any rebates. Any repaired or replacement products will be warranted for the remainder of the original Warranty Period or thirty (30) days, whichever is longer. All products and/or parts that are replaced become the property of Linksys.

This limited warranty shall apply in addition to any statutory or other rights which you may have under a contract of sale.

Exclusions and Limitations

This limited warranty does not apply if: (a) the product assembly seal has been removed or damaged, (b) the product has been altered or modified, except by Linksys, (c) the product damage was caused by use with non-Linksys products, (d) the product has not been installed, operated, repaired or maintained in accordance with instructions supplied by Linksys, (e) the product has been subjected to abnormal physical or electrical stress, misuse, negligence or accident, (f) the serial number on the Product has been altered, defaced or removed or (g) the product is supplied or licensed for beta, evaluation, testing or demonstration purposes for which Linksys does not charge a purchase price or licence fee.

ALL SOFTWARE PROVIDED BY LINKSYS WITH THE PRODUCT, WHETHER FACTORY LOADED ON THE PRODUCT OR CONTAINED ON MEDIA ACCOMPANYING THE PRODUCT, IS PROVIDED "AS IS" WITHOUT ANY WARRANTY OF ANY KIND. Without limiting the foregoing, Linksys does not warrant that the operation of the product or software will be uninterrupted or error-free. Also, due to the continual development of new techniques for intruding upon and attacking networks, Linksys does not warrant that the product, service, software or any equipment, system or

network on which the product or software is used will be free of vulnerability to intrusion or attack. The product may include or be bundled with third party software or service offerings. This limited warranty shall not apply to such third party software or service offerings. This limited warranty does not guarantee any continued availability of a third party's service for which this product's use or operation may require.

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TO THE EXTENT NOT PROHIBITED BY LAW, IN NO EVENT WILL LINKSYS BE LIABLE FOR ANY LOST DATA, TURNOVER OR PROFIT OR FOR SPECIAL, INDIRECT, CONSEQUENTIAL, INCIDENTAL OR PUNITIVE DAMAGES, REGARDLESS OF THE THEORY OF LIABILITY (INCLUDING NEGLIGENCE), ARISING OUT OF OR RELATED TO THE USE OF OR INABILITY TO USE THE PRODUCT (INCLUDING ANY SOFTWARE), EVEN IF LINKSYS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT WILL LINKSYS' LIABILITY EXCEED THE AMOUNT PAID BY YOU FOR THE PRODUCT. The foregoing limitations will apply even if any warranty or remedy provided under this limited warranty fails of its essential purpose. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Obtaining Warranty Service

If you have a question about your product or experience a problem with it, please go to www.linksysbycisco.com/support where you will find a variety of online support tools and information to assist you with your product. If the product proves defective during the Warranty Period, contact Linksys Technical Support for instructions on how to obtain warranty service. The telephone number for Linksys Technical Support in your area can be found in the product User Guide and at www.linksysbycisco.com. Have your product serial number and proof of purchase on hand when calling. A DATED PROOF OF ORIGINAL PURCHASE IS REQUIRED TO PROCESS WARRANTY CLAIMS. If you are requested to return your product, you will be given a Return Materials Authorisation (RMA) number. You are responsible for properly packaging and shipping your product to Linksys

at your cost and risk. You must include the RMA number and a copy of your dated proof of original purchase when returning your product. Products received without a RMA number and dated proof of original purchase will be rejected. Do not include any other items with the product you are returning to Linksys. Defective product covered by this limited warranty will be repaired or replaced and returned to you without charge. Customers outside of the United States of America and Canada are responsible for all shipping and handling charges, custom duties, VAT and other associated taxes and charges. Repairs or replacements not covered under this limited warranty will be subject to charge at Linksys' then-current rates.

Technical Support

This limited warranty is neither a service nor a support contract. Information about Linksys' current technical support offerings and policies (including any fees for support services) can be found at www.linksysbycisco.com/support

General

This limited warranty is governed by the laws of the jurisdiction in which the Product was purchased by you.

If any portion of this limited warranty is found to be void or unenforceable, its remaining provisions shall remain in full force and effect.

Please direct all inquiries to: Linksys, P.O. Box 18558, Irvine, CA 92623.

For more information, please contact us

www.linksysbycisco.com

Select your country and then select SUPPORT/TECHNICAL

For product returns:

Select your Country and then select CUSTOMER SUPPORT

Appendix E: Regulatory Information

FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This product has been tested and complies with the specifications for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which is found by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment or devices
- Connect the equipment to an outlet other than the receiver's
- Consult a dealer or an experienced radio/TV technician for assistance

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

Safety Notices



WARNING: Do not use this product near water, for example, in a wet basement or near a swimming pool.



WARNING: Avoid using this product during an electrical storm. There may be a remote risk of electric shock from lightning.

Industry Canada Statement

This Class B digital apparatus complies with Canadian ICES-003 and RSS210.

Operation is subject to the following two conditions:

1. This device may not cause interference and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Industry Canada Radiation Exposure Statement

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Avis d'Industrie Canada

Cet appareil numérique de la classe B est conforme aux normes NMB-003 et RSS210 du Canada.

L'utilisation de ce dispositif est autorisée seulement aux conditions suivantes :

1. il ne doit pas produire de brouillage et
2. il doit accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.

Avis d'Industrie Canada concernant l'exposition aux radiofréquences

Ce matériel est conforme aux limites établies par IC en matière d'exposition aux radiofréquences dans un environnement non contrôlé. Ce matériel doit être installé et utilisé à une distance d'au moins 20 cm entre l'antenne et le corps de l'utilisateur.

L'émetteur ne doit pas être placé près d'une autre antenne ou d'un autre émetteur, ou fonctionner avec une autre antenne ou un autre émetteur.

Wireless Disclaimer

The maximum performance for wireless is derived from IEEE Standard 802.11 specifications. Actual performance can vary, including lower wireless network capacity, data throughput rate, range and coverage. Performance depends on many factors, conditions and variables, including distance from the access point, volume of network traffic, building materials and construction, operating system used, mix of wireless products used, interference and other adverse conditions.

Avis de non-responsabilité concernant les appareils sans fil

Les performances maximales pour les réseaux sans fil sont tirées des spécifications de la norme IEEE 802.11. Les performances réelles peuvent varier, notamment en fonction de la capacité du réseau sans fil, du débit de la transmission de données, de la portée et de la couverture. Les performances dépendent de facteurs, conditions et variables multiples, en particulier de la distance par rapport au point d'accès, du volume du trafic réseau, des matériaux utilisés dans le bâtiment et du type de construction, du système d'exploitation et de la combinaison de produits sans fil utilisés, des interférences et de toute autre condition défavorable.

Declaration of Conformity with Regard to EU Directive 1999/5/EC (R&TTE Directive)

Compliance Information for 2.4-GHz and 5-GHz Wireless Products Relevant to the EU and Other Countries Following the EU Directive 1999/5/EC (R&TTE Directive)

Български [Bulgarian]	Това оборудване отговаря на съществените изисквания и приложими клаузи на Директива 1999/5/ЕС.
Česky [Czech]:	Toto zařízení je v souladu se základními požadavky a ostatními odpovídajícími ustanoveními Směrnice 1999/5/EU.
Dansk [Danish]:	Dette udstyr er i overensstemmelse med de væsentlige krav og andre relevante bestemmelser i Direktiv 1999/5/EU.
Deutsch [German]:	Dieses Gerät entspricht den grundlegenden Anforderungen und den weiteren entsprechenden Vorgaben der Richtlinie 1999/5/EU.
Eesti [Estonian]:	See seade vastab direktiivi 1999/5/EÜ olulistele nõuetele ja teistele asjakohastele sätetele.
English:	This equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Español [Spanish]:	Este equipo cumple con los requisitos esenciales así como con otras disposiciones de la Directiva 1999/5/CE.
Ελληνική [Greek]:	Αυτός ο εξοπλισμός είναι σε συμμόρφωση με τις ουσιώδεις απαιτήσεις και άλλες σχετικές διατάξεις της Οδηγίας 1999/5/ΕΚ.
Français [French]:	Cet appareil est conforme aux exigences essentielles et aux autres dispositions pertinentes de la Directive 1999/5/EC.
Íslenska [Icelandic]:	Þetta tæki er samkvæmt grunnkröfum og öðrum viðeigandi ákvæðum Tilskipunar 1999/5/EC.
Italiano [Italian]:	Questo apparato è conforme ai requisiti essenziali ed agli altri principi sanciti dalla Direttiva 1999/5/CE.
Latviski [Latvian]:	Šī iekārta atbilst Direktivas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]:	Šis įrenginys tenkina 1999/5/EB Direktyvos esminius reikalavimus ir kitas šios direktyvos nuostatas.

Nederlands [Dutch]:	Dit apparaat voldoet aan de essentiële eisen en andere van toepassing zijnde bepalingen van de Richtlijn 1999/5/EC.
Malta [Maltese]:	Dan l-apparat huwa konformi mal-htiġiet essenzjali u l-provedimenti l-oħra rilevanti tad-Direttiva 1999/5/EC.
Magyar [Hungarian]:	Ez a készülék teljesíti az alapvető követelményeket és más 1999/5/EK irányelvben meghatározott vonatkozó rendelkezéseket.
Norsk [Norwegian]:	Dette utstyret er i samsvar med de grunnleggende krav og andre relevante bestemmelser i EU-direktiv 1999/5/EF.
Polski [Polish]:	Urządzenie jest zgodne z ogólnymi wymaganiami oraz szczególnymi warunkami określonymi Dyrektywą UE: 1999/5/EC.
Português [Portuguese]:	Este equipamento está em conformidade com os requisitos essenciais e outras provisões relevantes da Directiva 1999/5/EC.
Română [Romanian]:	Acest echipament este în conformitate cu cerințele esențiale și cu alte prevederi relevante ale Directivei 1999/5/EC.
Slovensko [Slovenian]:	Ta naprava je skladna z bistvenimi zahtevami in ostalimi relevantnimi pogoji Direktive 1999/5/EC.
Slovensky [Slovak]:	Toto zariadenie je v zhode so základnými požiadavkamiainýmiprísľušnýminariadeniami direktív: 1999/5/EC.
Suomi [Finnish]:	Tämä laite täyttää direktiivin 1999/5/EY olennaiset vaatimukset ja on siinä asetettujen muiden laitetta koskevien määräysten mukainen.
Svenska [Swedish]:	Denna utrustning är i överensstämmelse med de väsentliga kraven och andra relevanta bestämmelser i Direktiv 1999/5/EC.

For all products, the Declaration of Conformity (DoC) is available through one or more of these options:

- A pdf file is included on the product's CD.
- A print copy is included with the product.
- A pdf file is available on the product's webpage. Visit www.linksysbycisco.com/international and select your country or region. Then select your product.

If you need any other technical documentation, see the "Technical Documents on www.linksysbycisco.com/international" section, as shown later in this appendix.

Wireless Equipment (Wireless-N/G/A/B Products)

The following standards were applied during the assessment of the product against the requirements of the Directive 1999/5/EC:

- Radio: EN 300 328 and/or EN 301 893 as applicable
- EMC: EN 301 489-1, EN 301 489-17
- Safety: EN 60950 and either EN 50385 or EN 50371

Dynamic Frequency Selection (DFS) and Transmit Power Control (TPC) are required for operation in the 5 GHz band.

DFS: The equipment meets the DFS requirements as defined in ETSI EN 301 893. This feature is required by the regulations to avoid interference with Radio Location Services (radars).

TPC: For operation in the 5 GHz band, the maximum power level is 3 dB or more below the applicable limit. As such, TPC is not required.

CE Marking

For the Linksys Wireless-N, -G, -B and/or -A products, the following CE mark, notified body number (where applicable) and class 2 identifier are added to the equipment.



or



Check the CE label on the product to find out which notified body was involved during the assessment.

National Restrictions

This product may be used in all EU countries (and other countries following the EU directive 1999/5/EC) without any limitation except for the countries mentioned below:

Ce produit peut être utilisé dans tous les pays de l'UE (et dans tous les pays ayant transposés la directive 1999/5/CE) sans aucune limitation, excepté pour les pays mentionnés ci-dessous:

Questo prodotto è utilizzabile in tutte i paesi EU (ed in tutti gli altri paesi che seguono le direttive EU 1999/5/EC) senza nessuna limitazione, eccetto per i paesi menzionati di seguito:

Das Produkt kann in allen EU Staaten ohne Einschränkungen eingesetzt werden (sowie in anderen Staaten die der EU Direktive 1999/5/CE folgen) mit Ausnahme der folgenden aufgeführten Staaten:

In the majority of the EU and other European countries, the 2.4- and 5-GHz bands have been made available for the use of wireless local area networks (LANs). The table labelled "Overview of Regulatory Requirements for Wireless LANs" provides an overview of the regulatory requirements applicable for the 2.4- and 5-GHz bands.

Later in this document you will find an overview of countries in which additional restrictions or requirements or both are applicable.

The requirements for any country may evolve. Linksys recommends that you check with the local authorities for the latest status of their national regulations for both the 2.4- and 5-GHz wireless LANs.

Overview of Regulatory Requirements for Wireless LANs

Frequency Band (MHz)	Max Power Level (EIRP) (mW)	Indoor ONLY	Indoor & Outdoor
2400-2483,5	100		X
5150-5250	200	X	
5250-5350 [†]	200	X	
5470-5725 [†]	1000		X

[†]Dynamic Frequency Selection and Transmit Power Control are required in the frequency ranges of 5250-5350 MHz and 5470-5725 MHz.

The following countries have restrictions and/or requirements in addition to those given in the table labelled "Overview of Regulatory Requirements for Wireless LANs":

Croatia

License is required in the band 5150-5350 MHz.

Za pojaz od 5150-5350 MHz potrebna je licenca.

Denmark

In Denmark, the band 5150 - 5350 MHz is also allowed for outdoor usage.

I Danmark må frekvensbåndet 5150 - 5350 også anvendes udendørs.

France

For 2,4 GHz, the product is allowed to be used outdoors in the band 2454 - 2483,5 MHz with the condition of eirp limited to 10mW (10 dBm). When operating in the band 2400-2454 MHz, it is restricted for indoor and outdoor use with eirp limited to 100mW (20 dBm). Check <http://www.arcep.fr/> for more details.

Pour la bande 2,4 GHz, l'équipement peut être utilisé en extérieur dans la bande 2 454 - 2 483,5 MHz, seulement si la puissance PIRE ne dépasse pas 10 mW (10 dBm). Lors du fonctionnement dans la bande 2 400 - 2 454 MHz, l'utilisation est limitée en intérieur et en extérieur avec une

puissance PIRE de à 100 mW (20 dBm) maximum. Consultez <http://www.arcep.fr/> pour de plus amples détails.

Applicable Power Levels in France

Frequency Band (MHz)	Power Level (EIRP), (mW)	Indoor	Outdoor
2400-2454	100 (20 dBm)	X	X
2454-2483,5	100 (20 dBm)	X	
2454-2483,5	10 (10 dBm)		X

Italy

This product meets the National Radio Interface and the requirements specified in the National Frequency Allocation Table for Italy. Unless this 2,4-GHz wireless LAN product is operating within the boundaries of the owner's property, its use requires a "general authorization". Bands 5150-5350 MHz and 5470-5725 MHz require general authorization if used outdoors. Please check <http://www.comunicazioni.it/it/> for more details.

Questo prodotto è conforme alla specifiche di Interfaccia Radio Nazionali e rispetta il Piano Nazionale di ripartizione delle frequenze in Italia. Se non viene installato all'interno del proprio fondo, l'utilizzo di prodotti Wireless LAN a 2,4 GHz richiede una "Autorizzazione Generale". L'utilizzo all'aperto delle bande di frequenza 5150-5350 MHz e 5470-5725 MHz è soggetto ad autorizzazione generale. Consultare <http://www.comunicazioni.it/it/> per maggiori dettagli.

Latvia

The outdoor usage of the 2,4 GHz band requires an authorization from the Electronic Communications Office. Please check <http://www.esd.lv> for more details.

2,4 GHz frekveču joslas izmantošanai ārpus telpām nepieciešama atļauja no Elektronisko sakaru direkcijas. Vairāk informācijas: <http://www.esd.lv>.

Notes:

1. Although Norway, Switzerland and Liechtenstein are not EU member states, the EU Directive 1999/5/EC has also been implemented in those countries.
2. The regulatory limits for maximum output power are specified in EIRP. The EIRP level of a device can be calculated by adding the gain of the antenna used (specified in dBi) to the output power available at the connector (specified in dBm).

Product Usage Restrictions

This product is designed for indoor usage only. Outdoor usage is not recommended, unless otherwise noted.

2.4 GHz Restrictions

This product is designed for use with the standard, integral or dedicated (external) antenna(s) that is/are shipped together with the equipment. However, some applications may require the antenna(s), if removable, to be separated from the product and installed remotely from the device by using extension cables. For these applications, Linksys offers an R-SMA extension cable (AC9SMA) and an R-TNC extension cable (AC9TNC). Both of these cables are 9 metres long and have a cable loss (attenuation) of 5 dB. To compensate for the attenuation, Linksys also offers higher gain antennas, the HGA7S (with R-SMA connector) and HGA7T (with R-TNC connector). These antennas have a gain of 7 dBi and may only be used with either the R-SMA or R-TNC extension cable.

Combinations of extension cables and antennas resulting in a radiated power level exceeding 100 mW EIRP are illegal.

Third-Party Software or Firmware

The use of software or firmware not supported/provided by Linksys may result in the equipment no longer being compliant with the regulatory requirements.

Technical Documents on www.linksysbycisco.com/international

Follow these steps to access technical documents:

1. Enter <http://www.linksysbycisco.com/international> in your web browser.
2. Select the country or region in which you live.
3. Click the **Products** tab.
4. Select the appropriate product category.
5. Select the product sub-category, if necessary.
6. Select the product.
7. Select the type of documentation you want from the More Information section. The document will open in PDF format if you have Adobe Acrobat installed on your computer.



NOTE: If you have questions regarding the compliance of this product or you cannot find the information you need, please contact your local sales office or visit www.linksysbycisco.com/international

User Information for Consumer Products Covered by EU Directive 2002/96/EC on Waste Electric and Electronic Equipment (WEEE)

This document contains important information for users with regards to the proper disposal and recycling of Linksys products. Consumers are required to comply with this notice for all electronic products bearing the following symbol:



English - Environmental Information for Customers in the European Union

European Directive 2002/96/EC requires that the equipment bearing this symbol  on the product and/or its packaging must not be disposed of with unsorted municipal waste. The symbol indicates that this product should be disposed of separately from regular household waste streams. It is your responsibility to dispose of this and other electric and electronic equipment via designated collection facilities appointed by the government or local authorities. Correct disposal and recycling will help prevent potential negative consequences to the environment and human health. For more detailed information about the disposal of your old equipment, please contact your local authorities, waste disposal service, or the shop where you purchased the product.

Български (Bulgarian) - Информация относно опазването на околната среда за потребители в Европейския съюз

Европейска директива 2002/96/ЕС изисква уредите, носещи този символ  върху изделието и/или опаковката му, да не се изхвърлят с несортирани битови отпадъци. Символът обозначава, че изделието трябва да се изхвърля отделно от сметосябирането на обикновените битови отпадъци. Ваша е отговорността този и другите електрически и електронни уреди да се изхвърлят в предварително определени от държавните или общински органи специализирани пунктове за събиране. Правилното изхвърляне и рециклиране ще спомогнат да се предотвратят евентуални вредни за околната среда и здравето на населението последствия. За по-подробна информация относно изхвърлянето на вашите стари уреди се обърнете към местните власти, службите за сметосябиране или магазина, от който сте закупили уреда.

Čeština (Czech) - Informace o ochraně životního prostředí pro zákazníky v zemích Evropské unie

Evropská směrnice 2002/96/ES zakazuje, aby zařízení označené tímto symbolem  na produktu anebo na obalu bylo likvidováno s netříděným komunálním odpadem. Tento symbol udává, že daný produkt musí být likvidován odděleně od běžného komunálního odpadu. Odpovídáte za likvidaci tohoto produktu a dalších elektrických a elektronických zařízení prostřednictvím určených sběrných míst stanovených vládou nebo místními úřady. Správná likvidace a recyklace pomáhá předcházet potenciálním negativním dopadům na životní prostředí a lidské zdraví. Podrobnější informace o likvidaci starého vybavení si laskavě vyžádejte od místních úřadů, podniku zabývajícího se likvidací komunálních odpadů nebo obchodu, kde jste produkt zakoupili.

Dansk (Danish) - Miljøinformation for kunder i EU

EU-direktiv 2002/96/EF kræver, at udstyr der bærer dette symbol  på produktet og/eller emballagen ikke må bortskaffes som usorteret kommunalt affald. Symbolbetyr, at dette produkt skal bortskaffes adskilt fra det almindelige husholdningsaffald. Det er dit ansvar at bortskaffe dette og andet elektrisk og elektronisk udstyr via bestemte indsamlingssteder udpeget af staten eller de lokale myndigheder. Korrekt bortskaffelse og genbrug vil hjælpe med til at undgå mulige skader for miljøet og menneskers sundhed. Kontakt venligst de lokale myndigheder, renovationstjenesten eller den butik, hvor du har købt produktet, angående mere detaljeret information om bortskaffelse af dit gamle udstyr.

Deutsch (German) - Umweltinformation für Kunden innerhalb der Europäischen Union

Die Europäische Richtlinie 2002/96/EC verlangt, dass technische Ausrüstung, die direkt am Gerät und/oder an der Verpackung mit diesem Symbol versehen ist , nicht zusammen mit unsortiertem Gemeindeabfall entsorgt werden darf. Das Symbol weist darauf hin, dass das Produkt von regulärem Haushaltmüll getrennt entsorgt werden sollte. Es liegt in Ihrer Verantwortung, dieses Gerät und andere elektrische und elektronische Geräte über die dafür zuständigen und von der Regierung oder örtlichen Behörden dazu bestimmten Sammelstellen zu entsorgen. Ordnungsgemäßes Entsorgen und Recyceln trägt dazu bei, potentielle negative Folgen für Umwelt und die menschliche Gesundheit zu vermeiden. Wenn Sie weitere Informationen zur Entsorgung Ihrer Altgeräte benötigen, wenden Sie sich bitte an die örtlichen Behörden oder städtischen Entsorgungsdienste oder an den Händler, bei dem Sie das Produkt erworben haben.

Eesti (Estonian) - Keskkonnaalane informatsioon Euroopa Liidus asuvatele klientidele

Euroopa Liidu direktiivi 2002/96/EÜ nõuete kohaselt on seadmeid, millel on tootel või pakendil käesolev sümbol , keelatud kõrvaldada koos sorteerimata olmehäätmeguga. See sümbol näitab, et toode tuleks kõrvaldada eraldi tavalistest olmehäätmeveogudest. Olete kohustatud kõrvaldamama käesoleva ja ka muud elektri- ja elektroonikaseadmed riigi või kohalike ametiasutuste poolt ette nähtud kogumispunktide kaudu. Seadmete korrektna kõrvaldamine ja ringlussevõtt aitab vältida võimalikke negatiivseid tagajärgi keskkonnale ning inimestele tervisele. Vanade seadmete kõrvaldamise kohta täpsema informatsiooni saamiseks võtke palun ühendust kohalike ametiasutustega, jäätmeäitusfirmaga või kauplusega, kust te toote ostsite.

Español (Spanish) - Información medioambiental para clientes de la Unión Europea

La Directiva 2002/96/CE de la UE exige que los equipos que lleven este símbolo  en el propio aparato y/o en su embalaje no deben eliminarse junto con otros residuos urbanos no seleccionados. El símbolo indica que el producto en cuestión debe separarse de los residuos domésticos convencionales con vistas a su eliminación. Es responsabilidad suya desechar este y cualesquier otros aparatos eléctricos y electrónicos a través de los puntos de recogida que ponen a su disposición el gobierno y las autoridades locales. Al desechar y reciclar correctamente estos aparatos estará contribuyendo a evitar posibles consecuencias negativas para el medio ambiente y la salud de las personas. Si desea obtener información más detallada sobre la eliminación segura de su aparato usado, consulte a las autoridades locales, al servicio de recogida y eliminación de residuos de su zona o pregunte en la tienda donde adquirió el producto.

Ελληνικά (Greek) - Στοιχεία περιβαλλοντικής προστασίας για πελάτες εντός της Ευρωπαϊκής Ένωσης

Σύμφωνα με την Κοινοτική Οδηγία 2002/96/EC, ο εξοπλισμός που φέρει αυτό το σύμβολο  στο προϊόν ή/και τη συσκευασία του δεν πρέπει να απορρίπτεται μαζί με τα μη διαχωρισμένα αστικά απορρίμματα. Το σύμβολο υποδεικνύει ότι αυτό το προϊόν θα πρέπει να απορρίπτεται ξεχωριστά από τα συνήθη οικιακά απορρίμματα. Είστε υπεύθυνος για την απόρριψη του παρόντος και άλλου ηλεκτρικού και ηλεκτρονικού εξοπλισμού μέσω των καθορισμένων εγκαταστάσεων συγκέντρωσης απορριμάτων, οι οποίες ορίζονται από το κράτος ή τις αρμόδιες τοπικές αρχές. Η σωστή απόρριψη και ανακύκλωση συμβάλλει στην πρόληψη ενδεχόμενων αρνητικών επιπτώσεων στο περιβάλλον και την υγεία. Για περισσότερες πληροφορίες σχετικά με την απόρριψη του παλαιού σας εξοπλισμού, επικοινωνήστε με τις τοπικές αρχές, τις υπηρεσίες αποκομιδής απορριμάτων ή το κατάστημα από το οποίο αγοράσατε το προϊόν.

Français (French) - Informations environnementales pour les clients de l'Union européenne

La directive européenne 2002/96/CE exige que l'équipement sur lequel est apposé ce symbole  sur le produit et/ou son emballage ne soit pas jeté avec les autres ordures ménagères. Ce symbole indique que le produit doit être éliminé dans un circuit distinct de celui pour les déchets des ménages. Il est de votre responsabilité de jeter ce matériel ainsi que tout autre matériel électrique ou électronique par les moyens de collecte indiqués par le gouvernement et les pouvoirs publics des collectivités territoriales. L'élimination et le recyclage en bonne et due forme ont pour but de lutter contre l'impact néfaste potentiel de ce type de produits sur l'environnement et la santé publique. Pour plus d'informations sur le mode d'élimination de votre ancien équipement, veuillez prendre contact avec les pouvoirs publics locaux, le service de traitement des déchets, ou l'endroit où vous avez acheté le produit.

Italiano (Italian) - Informazioni relative all'ambiente per i clienti residenti nell'Unione Europea

La direttiva europea 2002/96/EC richiede che le apparecchiature contrassegnate con questo simbolo  sul prodotto e/o sull'imballaggio non siano smaltite insieme ai rifiuti urbani non differenziati. Il simbolo indica che questo prodotto non deve essere smaltito insieme ai normali rifiuti domestici. È responsabilità del proprietario smaltire sia questi prodotti sia le altre apparecchiature elettriche ed elettroniche mediante le specifiche strutture di raccolta indicate dal governo o dagli enti pubblici locali. Il corretto smaltimento ed il riciclaggio aiuteranno a prevenire conseguenze potenzialmente negative per l'ambiente e per la salute dell'essere umano. Per ricevere informazioni più dettagliate circa lo smaltimento delle vecchie apparecchiature in Vostro possesso, Vi invitiamo a contattare gli enti pubblici di competenza, il servizio di smaltimento rifiuti o il negozio nel quale avete acquistato il prodotto.

Latviešu valoda (Latvian) - Ekoloģiska informācija klientiem Eiropas Savienības jurisdikcijā

Direktīvā 2002/96/EK ir prasība, ka aprīkojumu, kam pievienota zīme  uz paša izstrādājuma vai uz tā iesaiņojuma, nedrīkst izmest nešķirotā veidā kopā ar komūnālajiem atkritumiem (tiem, ko rada vietēji iedzīvotāji un uzņēmumi). Šī zīme nozīmē to, ka šī ierīce ir jāizmet atkritumos tā, lai tā nenonāktu kopā ar parastiem mājsaimniecības atkritumiem. Jūsu pienākums ir šo un citas elektriskas un elektroniskas ierīces izmest atkritumos, izmantojot īpašus atkritumu savākšanas veidus un līdzekļus, ko nodrošina valsts un pašvaldību iestādes. Ja izmēšana atkritumos un pārstrāde tiek veikta pareizi, tad mazinās iespējamais kaitējums dabai un cilvēku veselībai. Sīkākas ziņas par novecojuša aprīkojuma izmēšanu atkritumos jūs varat saņemt vietējā pašvaldībā, atkritumu savākšanas dienestā, kā arī veikalā, kur iegādājāties šo izstrādājumu.

Lietuvškai (Lithuanian) - Aplinkosaugos informacija, skirta Europos Sajungos vartotojams

Europos direktyva 2002/96/EC numato, kad įrangos, kuri ir  kurios pakuotė yra pažymėta šiuo simboliu (iveskite simbolį), negalima šalinti kartu su nerūšiuotomis komunalinėmis atliekomis. Šis simbolis rodo, kad gaminį reikia šalinti atskirai nuo bendro buitinių atliekų srauto. Jūs privalote užtikrinti, kad ši ir kita elektros ar elektroninė įranga būtų šalinama per tam tikras nacionalinės ar vietinės valdžios nustatytas atliekų rinkimo sistemas. Tinkamai šalinant ir perdibinant atliekas, bus išvengta galimos žalos aplinkai ir žmonių sveikatai. Daugiau informacijos apie jūsų senos įrangos šalinimą gali pateikti vietinės valdžios institucijos, atliekų šalinimo tarnybos arba parduotuvės, kuriose įsigijote tą gaminį.

Malti (Maltese) - Informazzjoni Ambjentali għal Klijenti fl-Unjoni Ewropea

Id-Direttiva Ewropea 2002/96/KE titlob li t-tagħmir li jkun fiċ-ċiġġ fuq il-prodott u/jew fuq l-ippakkjar ma jistax jintrema ma' skart municipali li ma ġiex isseparat. Is-simbolu jindika li dan il-prodott għandu jintrema separatament minn ma' l-iskart domestiku regolari. Hija responsabbiltà tiegħek li tarmi dan it-tagħmir u kull tagħmir ieħor ta' l-elettriku u elettroniku permezz ta' facilitajiet ta' ġbir appuntati apposta mill-gvern jew mill-awtoritatijiet lokali. Ir-riġi b'mod korrett u r-riċċiklaġġ jgħin jippreżjeni konsegwenzi negattivi potenzjali għall-ambjent u għas-saħħha tal-bniedem. Għal aktar informazzjoni dettaljata dwar ir-riġi tat-tagħmir antik tiegħek, jekk jogħġibok ikkuntattja lill-awtoritatijiet lokali tiegħek, is-servizzi għar-riġi ta' l-iskart, jew il-ħanut minn fejn xtrajt il-prodott.

Magyar (Hungarian) - Környezetvédelmi információ az európai uniós vásárlók számára

A 2002/96/EC számú európai uniós irányelv megkívánja, hogy azokat a termékeket, amelyeken, és/vagy amelyek csomagolásán az alábbi címke  megjelenik, tilos a többi szelektálatlan lakossági hulladékkel együtt kidobni. A címke azt jelöli, hogy az adott termék kidobásakor a szokványos háztartási hulladékelszállítási rendszerektől elkülönített eljárást kell alkalmazni. Az Ön felelőssége, hogy ezt, és más elektromos és elektronikus berendezéseit a kormányzati vagy a helyi hatóságok által kijelölt gyűjtőrendszeren keresztül számlalja fel. A megfelelő hulladékfeldolgozás segít a környezetre és az emberi egészségre potenciálisan ártalmas negatív hatások megelőzésében. Ha elavult berendezéseinek felszámolásához további részletes információra van szüksége, kérjük, lépjön kapcsolatba a helyi hatóságokkal, a hulladékfeldolgozási szolgáltattal, vagy azzal üzlettel, ahol a terméket vásárolta.

Nederlands (Dutch) - Milieu-informatie voor klanten in de Europese Unie

De Europese Richtlijn 2002/96/EC schrijft voor dat apparatuur die is voorzien van dit symbool  op het product of de verpakking, niet mag worden ingezameld met niet-gescheiden huishoudelijk afval. Dit symbool geeft aan dat het product apart moet worden ingezameld. U bent zelf verantwoordelijk voor de vernietiging van deze en andere elektrische en elektronische apparatuur via de daarvoor door de landelijke of plaatselijke overheid aangewezen inzamelingskanalen. De juiste vernietiging en recycling van deze apparatuur voorkomt mogelijke negatieve gevolgen voor het milieu en de gezondheid. Voor meer informatie over het vernietigen van uw oude apparatuur neemt u contact op met de plaatselijke autoriteiten of afvalverwerkingsdienst, of met de winkel waar u het product hebt aangeschaft.

Norsk (Norwegian) - Miljøinformasjon for kunder i EU

EU-direktiv 2002/96/EØS krever at utstyr med følgende symbol  avbildet på produktet og/eller pakningen, ikke må kastes sammen med usortert avfall. Symbolet indikerer at dette produktet skal håndteres atskilt fra ordinær avfallsinnsamling for husholdningsavfall. Det er ditt ansvar å kvitte deg med dette produktet og annet elektrisk og elektronisk avfall via egne innsamlingsordninger slik myndighetene eller kommunene bestemmer. Korrekt avfallshåndtering og gjenvinning vil være med på å forhindre mulige negative konsekvenser for miljø og helse. For nærmere informasjon om håndtering av det kasserte utstyret ditt, kan du ta kontakt med kommunen, en innsamlingsstasjon for avfall eller butikken der du kjøpte produktet.

Polski (Polish) - Informacja dla klientów w Unii Europejskiej o przepisach dotyczących ochrony środowiska

Dyrektyna Europejska 2002/96/EC wymaga, aby sprzęt oznaczony symbolem  znajdującym się na produkcie i/lub jego opakowaniu nie był wyrzucony razem z innymi niesortowanymi odpadami komunalnymi. Symbol ten wskazuje, że produkt nie powinien być usuwany razem ze zwykłymi odpadami z gospodarstw domowych. Na Państwie spoczywa obowiązek wyrzucania tego i innych urządzeń elektrycznych oraz elektronicznych w punktach odbioru wyznaczonych przez władze krajowe lub lokalne. Pozbywanie się sprzętu we właściwy sposób i jego recykling pomogą zapobiec potencjalnie negatywnym konsekwencjom dla środowiska i zdrowia ludzkiego. W celu uzyskania szczegółowych informacji o usuwaniu starego sprzętu, prosimy zwrócić się do lokalnych władz, służb oczyszczania miasta lub sklepu, w którym produkt został nabity.

Português (Portuguese) - Informação ambiental para clientes da União Europeia

A Directiva Europeia 2002/96/CE exige que o equipamento que exibe este símbolo ☒ no produto e/ou na sua embalagem não seja eliminado junto com os resíduos municipais não separados. O símbolo indica que este produto deve ser eliminado separadamente dos resíduos domésticos regulares. É da sua responsabilidade eliminar este e qualquer outro equipamento eléctrico e electrónico através das instalações de recolha designadas pelas autoridades governamentais ou locais. A eliminação e reciclagem correctas ajudarão a prevenir as consequências negativas para o ambiente e para a saúde humana. Para obter informações mais detalhadas sobre a forma de eliminar o seu equipamento antigo, contacte as autoridades locais, os serviços de eliminação de resíduos ou o estabelecimento comercial onde adquiriu o produto.

Română (Romanian) - Informații de mediu pentru clienții din Uniunea Europeană

Directiva europeană 2002/96/CE impune ca echipamentele care prezintă acest simbol ☒ pe produs și/sau pe ambalajul acestuia să nu fie casate împreună cu gunoiul menajer municipal. Simbolul indică faptul că acest produs trebuie să fie casat separat de gunoiul menajer obișnuit. Este responsabilitatea dvs. să casați acest produs și alte echipamente electrice și electronice prin intermediul unităților de colectare special desemnate de guvern sau de autoritățile locale. Casarea și reciclarea corecte vor ajuta la prevenirea potențialelor consecințe negative asupra sănătății mediului și a oamenilor. Pentru mai multe informații detaliate cu privire la casarea acestui echipament vechi, contactați autoritățile locale, serviciul de salubrizare sau magazinul de la care ați achiziționat produsul.

Slovenčina (Slovak) - Informácie o ochrane životného prostredia pre zákazníkov v Európskej únii

Podľa európskej smernice 2002/96/ES zariadenie s týmto symbolom ☒ na produkte a/alebo jeho balení nesmie byť likvidované spolu s netriedeným komunálnym odpadom. Symbol znamená, že produkt by sa mal likvidovať oddelenie od bežného odpadu z domácností. Je vašou povinnosťou likvidovať toto i ostatné elektrické a elektronické zariadenia prostredníctvom špecializovaných zberných zariadení určených vládou alebo miestnymi orgánmi. Správna likvidácia a recyklácia pomôže zabrániť prípadným negatívnym dopadom na životné prostredie a zdravie ľudí. Ak máte záujem o podrobnejšie informácie o likvidácii starého zariadenia, obráťte sa, prosím, na miestne orgány, organizácie zaobrajúce sa likvidáciou odpadov alebo obchod, v ktorom ste si produkt zakúpili.

Slovenščina (Slovene) - Okoljske informacije za stranke v Evropski uniji

Evropska direktiva 2002/96/ES prepoveduje odlaganje opreme s tem simbolum ☒ – na izdelku in/ali na embalaži z nesortiranimi komunalnimi odpadki. Ta simbol opozarja, da je treba izdelek zavreči ločeno od preostalih gospodinjskih odpadkov. Vaša odgovornost je, da to in preostalo električno in elektronsko opremo oddate na posebna zbirališča, ki jih določijo državne ustanove ali lokalne oblasti. S pravilnim odlaganjem in recikliranjem boste preprečili morebitne škodljive vplive na okolje in zdravje ljudi. Če želite izvedeti več o odlaganju stare opreme, se obrnite na lokalne oblasti, odlagališče odpadkov ali trgovino, kjer ste izdelek kupili.

Suomi (Finnish) - Ympäristöä koskevia tietoja EU-alueen asiakkaille

EU-direktiivi 2002/96/EY edellyttää, että jos laitteistossa on tämä symboli ☒ itse tuotteessa ja/tai sen pakkauksessa, laitteisto ei saa hävittää lajitelemattoman yhdyskuntajätteen mukana. Symboli merkitsee sitä, että tämä tuote on hävitettävä erillään tavallisesta kotitalousjätteestä. Sinun vastuullasi on hävittää tämä elektroniikkatuote ja muut vastaavat elektroniikkatuotteet viemällä tuote tai tuotteet viranomaisten määräämään keräyspisteesseen. Laitteiston oikea hävittäminen estää mahdolliset kielteiset vaikutukset ympäristöön ja ihmisten terveyteen. Lisätietoja vanhan laitteiston oikeasta hävitystavasta saa paikallisia viranomaisilta, jätteenhävityspalvelusta tai siitä myymälästä, josta ostit tuotteen.

Svenska (Swedish) - Miljöinformation för kunder i Europeiska unionen

Det europeiska direktivet 2002/96/EC kräver att utrustning med denna symbol ☒ på produkten och/eller förpackningen inte får kastas med osorterat kommunalt avfall. Symbolen visar att denna produkt bör kastas efter att den avskiljs från vanligt hushållsavfall. Det faller på ditt ansvar att kasta denna och annan elektrisk och elektronisk utrustning på fastställda insamlingsplatser utsedda av regeringen eller lokala myndigheter. Korrekt kassering och återvinning skyddar mot eventuella negativa konsekvenser för miljön och personhälsa. För mer detaljerad information om kassering av din gamla utrustning kontaktar du dina lokala myndigheter, avfallshanteringen eller butiken där du köpte produkten.



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Appendix F: Software End User Licence Agreement

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END OF SCHEDULE 1

Schedule 2 Network Magic Features

Network Magic Licence Restrictions. Other than as set forth in this Agreement, you may not install or execute the Network Magic Software on any non-personal computer product, including, but not limited to, a Web appliance, set top box, handheld device, phone, Web pad device, or any device running the Microsoft Windows CE operating system.

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3. Email Notification. Cisco may send you email from time to time to let you know about new products and services that are available to you. You will be able to opt out of receiving these emails using the link provided within the email. Cisco reserves the right, however, to send you Service related email messages as long as you are a subscriber to the Service. If you wish to opt out of receiving Service related email messages, you may cancel the Service by providing written notice via www.networkmagic.com/support to Cisco of such cancellation and uninstalling the Software and discontinuing your use of the Service.

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END OF SCHEDULE 2

Schedule 3 Open Source and Third Party Licences

Schedule 3-A

If this Cisco product contains open source software licensed under Version 2 of the "GNU General Public Licence" then the licence terms below in this Schedule 3-A will apply to that open source software. The licence terms below in this Schedule 3-A are from the public web site at <http://www.gnu.org/copyleft/gpl.html>

GNU GENERAL PUBLIC LICENCE

This is an unofficial translation of the GNU General Public Licence into [language]. It was not published by the Free Software Foundation and does not legally state the distribution terms for software that uses the GNU GPL—only the original English text of the GNU GPL does that. However, we hope that this translation will help [language] speakers understand the GNU GPL better.

Version 2, June 1991

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Everyone is permitted to copy and distribute verbatim copies of this licence document, but changing it is not allowed.

Preamble

The licences for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public Licence is intended to guarantee your freedom to share and change free software--to make sure the software is free for all its users. This General Public Licence applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by the GNU Lesser General Public Licence instead). You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price. Our General Public Licences are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the software or if you modify it.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must give the recipients all the rights that you have. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

We protect your rights with two steps: (1) copyright the software and (2) offer you this licence which gives you legal permission to copy, distribute and/or modify the software.

Also, for each author's protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is modified by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that redistributors of a free program will individually obtain patent licences, in effect making the program proprietary. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

The precise terms and conditions for copying, distribution and modification follow.

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This Licence applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public Licence. The "Program", below, refers to any such program or work and a "work based on the Program" means either the Program or any derivative work under copyright law: that is to say, a work containing the Program or a portion of it, either verbatim or with modifications and/or translated into another language. (Hereinafter, translation is included without limitation in the term "modification"). Each licensee is addressed as "you".

Activities other than copying, distribution and modification are not covered by this Licence; they are outside its scope. The act of running the Program is not restricted and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program). Whether that is true depends on what the Program does.

1. You may copy and distribute verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this Licence and to the absence of any warranty; and give any other recipients of the Program a copy of this Licence along with the Program.

You may charge a fee for the physical act of transferring a copy and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:
 - a. You must cause the modified files to carry prominent notices stating that you changed the files and the date of any change.
 - b. You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this Licence.

- c. If the modified program normally reads commands interactively when run, you must cause it, when it has started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions and telling the user how to view a copy of this Licence. (Exception: if the Program itself is interactive but does not normally print such an announcement, your work based on the Program is not required to print an announcement).

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Program and can be reasonably considered independent and separate works in themselves, then this Licence and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this Licence, whose permissions for other licensees extend to the entire whole and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program.

In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program) on a volume of a storage or distribution medium does not bring the other work under the scope of this Licence.

3. You may copy and distribute the Program (or a work based on it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the following:
 - a. Accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,
 - b. Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machine-readable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

- c. Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for non-commercial distribution and only if you received the program in object code or executable form with such an offer, in accord with Subsection b above).

The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

If distribution of executable or object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

4. You may not copy, modify, sublicense or distribute the Program except as expressly provided under this Licence. Any attempt otherwise to copy, modify, sublicense or distribute the Program is void and will automatically terminate your rights under this Licence. However, parties who have received copies or rights, from you under this Licence will not have their licenses terminated so long as such parties remain in full compliance.
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6. Each time you redistribute the Program (or any work based on the Program), the recipient automatically receives a licence from the original licensor to copy, distribute or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this Licence.

7. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this Licence, they do not excuse you from the conditions of this Licence. If you cannot distribute so as to satisfy simultaneously your obligations under this Licence and any other pertinent obligations, then as a consequence you may not distribute the Program at all. For example, if a patent licence would not permit royalty-free redistribution of the Program by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this Licence would be to refrain entirely from distribution of the Program.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system, which is implemented by public licence practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this Licence.

8. If the distribution and/or use of the Program are restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this Licence may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this Licence incorporates the limitation as if written in the body of this Licence.
9. The Free Software Foundation may publish revised and/or new versions of the General Public Licence from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies a version number of this Licence which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does

not specify a version number of this Licence, you may choose any version ever published by the Free Software Foundation.

10. If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

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END OF TERMS AND CONDITIONS

END OF SCHEDULE 3-A

Schedule 3-B

If this Cisco product contains open source software licensed under Version 2.1 of the "GNU Lesser General Public Licence" then the licence terms below in this Schedule 3-B will apply to that open source software. The licence terms below in this Schedule 3-B are from the public web site at <http://www.gnu.org/licenses/old-licenses/lgpl-2.1.html>

GNU LESSER GENERAL PUBLIC LICENCE

This is an unofficial translation of the GNU Lesser General Public Licence into [language]. It was not published by the Free Software Foundation and does not legally state the distribution terms for software that uses the GNU LGPL—only the original English text of the GNU LGPL does that. However, we hope that this translation will help [language] speakers understand the GNU LGPL better.

Version 2.1, February 1999

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Everyone is permitted to copy and distribute verbatim copies of this licence document, but changing it is not allowed.

[This is the first released version of the Lesser GPL. It also counts as the successor of the GNU Library Public Licence, version 2, hence the version number 2.1.]

Preamble

The licences for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public Licences are intended to guarantee your freedom to share and change free software—to make sure the software is free for all its users.

This licence, the Lesser General Public Licence, applies to some specially designated software packages—typically libraries—of the Free Software Foundation and other authors who decide to use it. You can use it too, but we suggest you first think carefully about whether this licence or the ordinary General Public Licence is the better strategy to use in any particular case, based on the explanations below.

When we speak of free software, we are referring to freedom of use, not price. Our General Public Licences are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish); that you receive source code or can get it if you want it; that you can change the software and use pieces of it in new free programs; and that you are informed that you can do these things.

To protect your rights, we need to make restrictions that forbid distributors to deny you these rights or to ask you to surrender these rights. These restrictions translate to certain responsibilities for you if you distribute copies of the library or if you modify it.

For example, if you distribute copies of the library, whether gratis or for a fee, you must give the recipients all the rights that we gave you. You must make sure that they, too, receive or can get the source code. If you link other code with the library, you must provide complete object files to the recipients, so that they can relink them

with the library after making changes to the library and recompiling it. And you must show them these terms so they know their rights.

We protect your rights with a two-step method: (1) we copyright the library and (2) we offer you this licence, which gives you legal permission to copy, distribute and/or modify the library.

To protect each distributor, we want to make it very clear that there is no warranty for the free library. Also, if the library is modified by someone else and passed on, the recipients should know that what they have is not the original version, so that the original author's reputation will not be affected by problems that might be introduced by others.

Finally, software patents pose a constant threat to the existence of any free program. We wish to make sure that a company cannot effectively restrict the users of a free program by obtaining a restrictive licence from a patent holder. Therefore, we insist that any patent licence obtained for a version of the library must be consistent with the full freedom of use specified in this licence.

Most GNU software, including some libraries, is covered by the ordinary GNU General Public Licence. This licence, the GNU Lesser General Public Licence, applies to certain designated libraries and is quite different from the ordinary General Public Licence. We use this licence for certain libraries in order to permit linking those libraries into non-free programs.

When a program is linked with a library, whether statically or using a shared library, the combination of the two is legally speaking a combined work, a derivative of the original library. The ordinary General Public Licence therefore permits such linking only if the entire combination fits its criteria of freedom. The Lesser General Public Licence permits more lax criteria for linking other code with the library.

We call this licence the "Lesser" General Public Licence because it does Less to protect the user's freedom than the ordinary General Public Licence. It also provides other free software developers Less of an advantage over competing non-free programs. These disadvantages are the reason we use the ordinary General Public Licence for many libraries. However, the Lesser licence provides advantages in certain special circumstances.

For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public Licence.

In other cases, permission to use a particular library in non-free programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.

Although the Lesser General Public Licence is less protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, whereas the latter must be combined with the library in order to run.

GNU LESSER GENERAL PUBLIC LICENCE

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This Licence Agreement applies to any software library or other program which contains a notice placed by the copyright holder or other authorised party saying it may be distributed under the terms of this Lesser General Public Licence (also called "this Licence"). Each licensee is addressed as "you".

A "library" means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.

The "Library", below, refers to any such software library or work which has been distributed under these terms. A "work based on the Library" means either the Library or any derivative work under copyright law: that is to say, a work containing the Library or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term "modification").

"Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

Activities other than copying, distribution and modification are not covered by this Licence; they are outside its scope. The act of running a program using the Library is not restricted and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether that is

true depends on what the Library does and what the program that uses the Library does.

1. You may copy and distribute verbatim copies of the Library's complete source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this Licence and to the absence of any warranty; and distribute a copy of this Licence along with the Library.

You may charge a fee for the physical act of transferring a copy and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

- a) The modified work must itself be a software library.
- b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.
- c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this Licence.
- d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots).

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library and can be reasonably considered independent and separate works in themselves, then this Licence and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this Licence, whose

permissions for other licensees extend to the entire whole and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this Licence.

3. You may opt to apply the terms of the ordinary GNU General Public Licence instead of this Licence to a given copy of the Library. To do this, you must alter all the notices that refer to this Licence, so that they refer to the ordinary GNU General Public Licence, version 2, instead of to this Licence. (If a newer version than version 2 of the ordinary GNU General Public Licence has appeared, then you can specify that version instead if you wish). Do not make any other change in these notices.

Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public Licence applies to all subsequent copies and derivative works made from that copy.

This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library and therefore falls outside the scope of this Licence.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the

Library), rather than a "work that uses the library". The executable is therefore covered by this Licence. Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6).

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this Licence. You must supply a copy of this Licence. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this Licence. Also, you must do one of these things:

- a) Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable "work that uses the Library", as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions).

- b) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.
- c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.
- d) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.
- e) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the licence restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

- 7. You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this Licence and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted and provided that you do these two things:
 - a) Accompany the combined library with a copy of the same work based on the Library, not combined with any other library facilities. This must be distributed under the terms of the Sections above.
 - b) Give prominent notice with the combined library of the fact that part of it is a work based on the Library and explaining where to find the accompanying not combined form of the same work.

- 8. You may not copy, modify, sublicense, link with or distribute the Library except as expressly provided under this Licence. Any attempt otherwise to copy, modify, sublicense, link with or distribute the Library is void and will automatically terminate your rights under this Licence. However, parties who have received copies, or rights, from you under this Licence will not have their licences terminated so long as such parties remain in full compliance.
- 9. You are not required to accept this Licence, since you have not signed it. However, nothing else grants you permission to modify or distribute the Library or its derivative works. These actions are prohibited by law if you do not accept this Licence. Therefore, by modifying or distributing the Library (or any work based on the Library), you indicate your acceptance of this Licence to do so and all its terms and conditions for copying, distributing or modifying the Library or works based on it.
- 10. Each time you redistribute the Library (or any work based on the Library), the recipient automatically receives a licence from the original licensor to copy, distribute, link with or modify the Library subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties with this Licence.
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