User Guide

Linksys E1000 | Wireless-N Router

Contents

Chapter 1: Product Overview

Thank you for choosing the Linksys E1000 Wireless-N Router. 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.

A variety of security features help to protect your data and your privacy while you are online. Security features include Wi-Fi Protected Access 2 (WPA2) security, which encrypts data on your wireless network; a Stateful Packet Inspection (SPI) firewall to help block unauthorized access to your Router; and Network Address Translation (NAT) technology, which enhances network protection by allowing your computers to share Internet access through a single, public Internet IP address. (IP stands for Internet Protocol.)

Setup and use of the Router is easy using Cisco Connect, the software that is installed when you run the included CD. Advanced configuration of the Router is available through the provided browser-based utility.

Top

1, 2, 3, 4 (Blue) These numbered LEDs, corresponding with the numbered ports on the Router's back panel, serve two purposes. The LED is continuously lit when the Router is connected to a device through that port. It flashes to indicate 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 the Wi-Fi Protected Setup button to automatically configure wireless security for your wireless network.

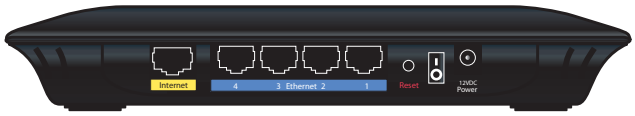
To use Wi-Fi Protected Setup, refer to "**Wi-Fi Protected Setup**" on page 11.

Wireless (Blue) The Wireless LED lights up when the wireless feature is enabled. It flashes when the Router sends or receives data over the wireless 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 when the Router is powered on. When the Router goes through its self-diagnostic mode during every boot-up, the LED flashes. When the diagnostic is complete, the LED is continuously lit.

Back



Internet Using an Ethernet cable (also called a network or Internet cable), the Internet port connects the Router to your Internet connection, which is typically a cable or Digital Subscriber Line (DSL) modem.

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

Reset 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 in the Router's browser-based utility (refer to "**Administration > Factory Defaults**" on page 26).

Power Switch (available on some international models) Press the **I** end to power on the Router. Press the **O** end to power off the Router.

Power The Power port connects to the included power adapter.

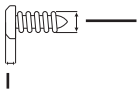
Horizontal Placement

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

Wall-Mounting Placement

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

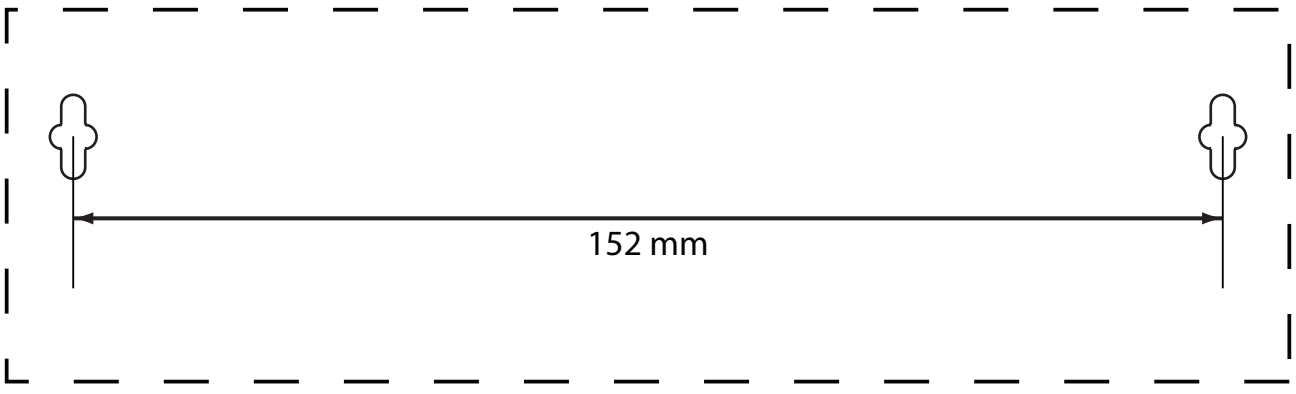
Two screws are needed to mount the Router.

Suggested Mounting Hardware	
 4-5 mm	 2.5-3.0 mm 1-1.5 mm

NOTE: Cisco is not responsible for damages incurred by unsecured wall-mounting hardware.

Follow these instructions:

1. Determine where you want to mount the Router. Make sure that the wall you use is smooth, flat, dry, and sturdy. Also make sure the location is within reach of an electrical outlet.
2. Drill two holes into the wall. Make sure the holes are 152 mm apart.
3. Insert a screw into each hole and leave 3 mm of its head exposed.
4. Position the Router so the wall-mount slots line up with the two screws.
5. Place the wall-mount slots over the screws and slide the Router down until the screws fit snugly into the wall-mount slots.



Print this page at 100% size.

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

Wall-Mounting Template

Chapter 2: Advanced Configuration

After setting up the Router with the setup software (located on the CD-ROM), the Router will be ready for use. If you would like to change its advanced settings, use the Router's browser-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 browser-based utility has these main tabs: *Setup*, *Wireless*, *Security*, *Access Restrictions*, *Applications & Gaming*, *Administration*, and *Status*. Additional tabs will be available after you click one of the main tabs.

How to Access the Browser-Based Utility

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

NOTE: You can also access the browser-based utility on Windows computers by entering the device name in the *Address* field. Refer to *Device Name* under "**Router IP**" on page 6.

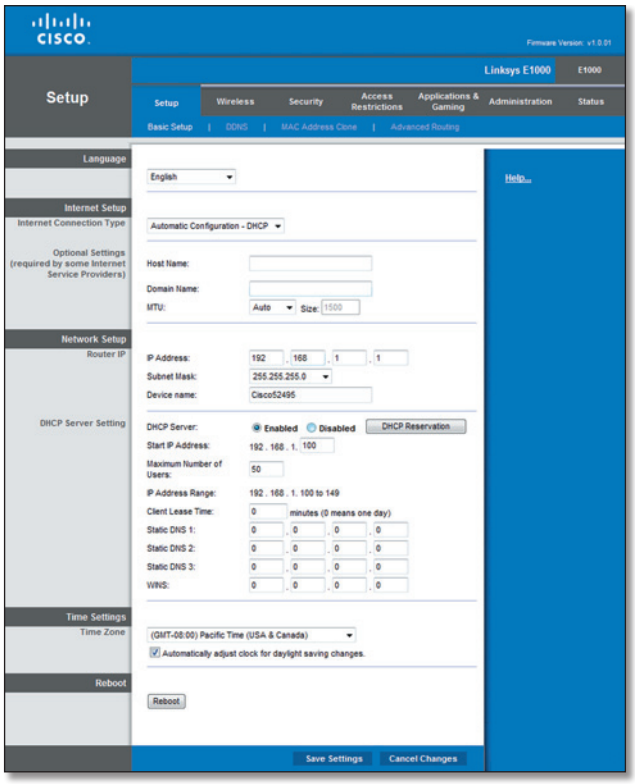
A login screen will appear. (Non-Windows 7 users will see a similar screen.) Leave the *User name* field blank. Then enter the password you set up during the setup software. (If you did not run the setup software, then use the default password, **admin**. You can set a new password on the *Administration* > *Management* screen. Refer to "**Administration > Management**" on page 24.) Click **OK** to continue.

Login Screen

NOTE: You can also access the browser-based utility through Cisco Connect.

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

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

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

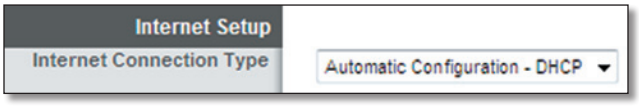
Internet Connection Type

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

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

Automatic Configuration - DHCP

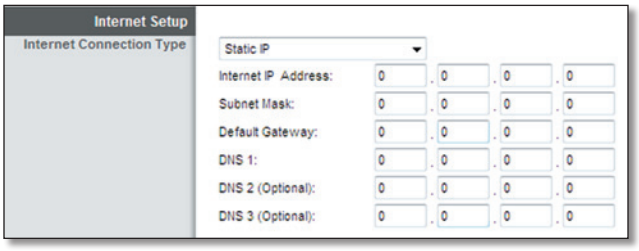
The default Internet Connection Type is set to **Automatic Configuration - DHCP** (Dynamic Host Configuration Protocol). Keep the default only if your ISP supports DHCP or if you connect using a dynamic IP address. (This option usually applies to cable connections.)



Internet Connection Type > Automatic Configuration - DHCP

Static IP

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



Internet Connection Type > Static IP

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

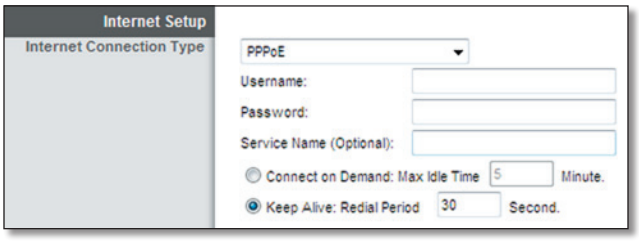
Subnet Mask This is the Router's Subnet Mask, as seen by users on the Internet (including your ISP). Your ISP will provide you with the Subnet Mask.

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

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 Point-to-Point Protocol over Ethernet (PPPoE) 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.

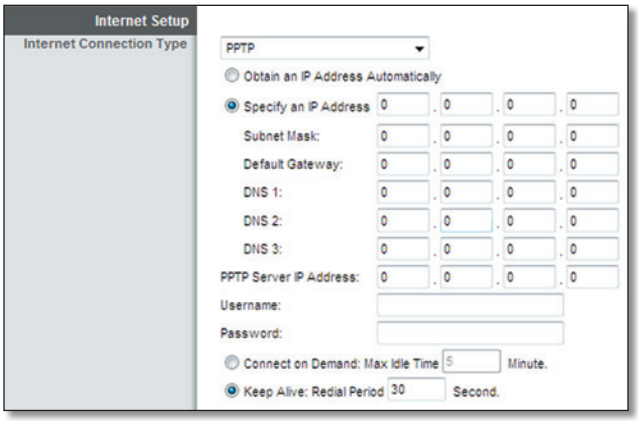
Service Name (optional) If provided by your ISP, enter the Service Name.

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 is **5** 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, specify how often the Router should check the Internet connection. The default 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 Gateway address, which is the ISP server's IP address.

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.

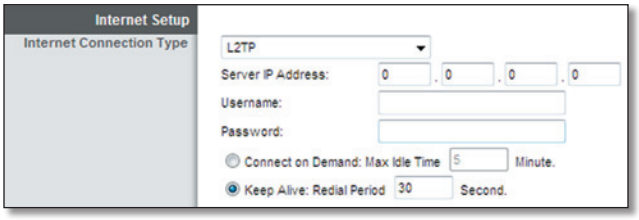
Username and Password Enter the Username and Password provided by your ISP.

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 is **5** 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, specify how often the Router should check the Internet connection. The default is **30** seconds.

L2TP

Layer 2 Tunneling Protocol (L2TP) is a service that applies to connections in Israel only.



Internet Connection Type > L2TP

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

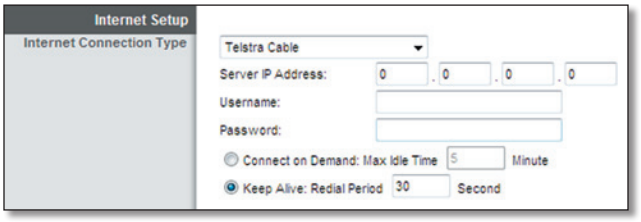
Username and Password Enter the Username and Password provided by your ISP.

Connect on Demand: Max Idle Time You can configure the Router to cut the Internet connection after it has been inactive for a specified period of time (Max Idle Time). If your Internet connection has been terminated due to inactivity, Connect on Demand enables the Router to automatically re-establish your connection as soon as you attempt to access the Internet again. To use this option, select **Connect on Demand**. In the *Max Idle Time* field, enter the number of minutes you want to elapse before your Internet connection terminates. The default is **5** 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, specify how often the Router should check the Internet connection. The default 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 This is the IP address of the Telstra Cable. Your ISP will provide you with the IP address you need to specify here.

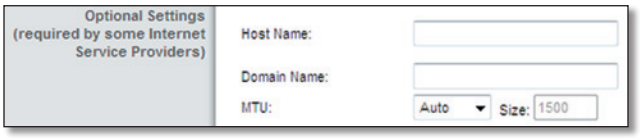
Username and Password Enter the Username and Password provided by your ISP.

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 is **5** 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, specify how often the Router should check the Internet connection. The default is **30** seconds.

Optional Settings

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



Optional Settings

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

MTU MTU is the Maximum Transmission Unit. It specifies the largest packet size permitted for Internet transmission. Select **Manual** if you want to manually enter the largest packet size that is transmitted. To have the Router select the best MTU for your Internet connection, keep the default setting, **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

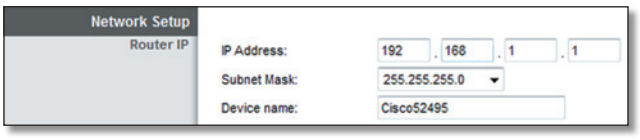
The *Network Setup* section configures the IP settings for your local network.

Router IP

IP Address The Router's IP address, as seen by your network, is displayed. The default Router IP address is **192.168.1.1**.

Subnet Mask The Router's Subnet Mask, as seen by your network, is displayed.

Device name To access the browser-based utility, enter the Router's Device name or IP address. The default is **Ciscoxxxxx** (xxxxx are the last five digits of the Router's serial number, found on the product label on the left side of the Router's bottom panel). If you want to change the default, enter a new Device name. (The Device name is also the Router's NetBIOS name.)

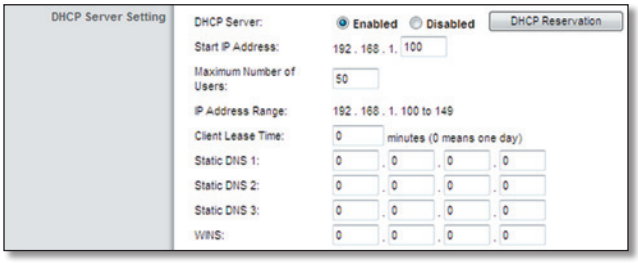


Router IP

DHCP Server Settings

The settings allow you to configure the Router's 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 or device on your network.

NOTE: If you choose to enable the DHCP server option, make sure there is no other DHCP server on your network.



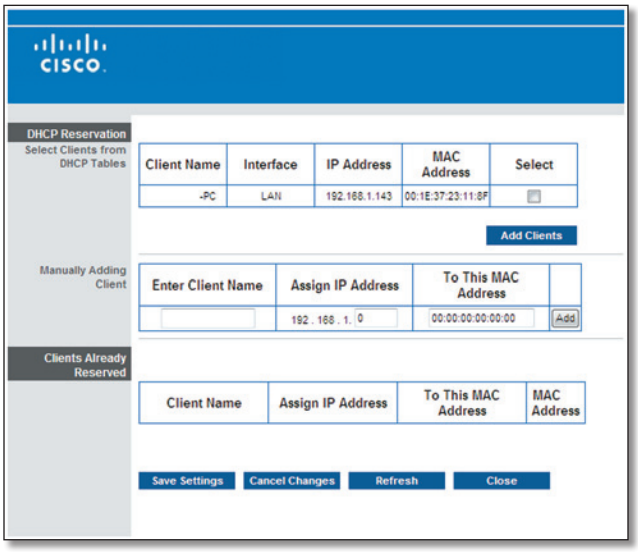
DHCP Server Settings

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 **DHCP Reservation** if you want to assign a fixed local IP address to a specific device on your network. This is helpful if you have a device you need to access at the same address all the time, such as a media server or print server. You can reserve the IP address for the specific device by selecting it from the list of devices or by manually entering the MAC address of the device.

DHCP Reservation

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



DHCP Reservation

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

Clients Already Reserved

A list of DHCP clients and their fixed local IP addresses is 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 clear your changes. To update the on-screen information, click **Refresh**. To exit this screen, click **Close**.

Start IP Address The Start IP Address specifies the starting IP address for the range of addresses assigned by your Router when it functions as a DHCP server. (The first IP address assigned by the Router will be randomly selected within the range you specify.)

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 192.168.1.254. The default Start IP Address is **192.168.1.100**.

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

IP Address Range The range of available IP addresses is displayed.

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

Static DNS 1-3 The Domain Name System (DNS) is how the Internet translates domain or website names into Internet addresses or Uniform Resource Locators (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 computer's interaction with the Internet. If you use a WINS server, enter that server's IP address here. Otherwise, leave this blank.

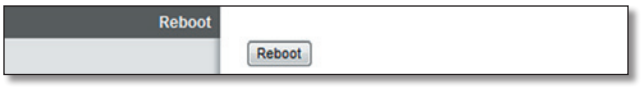
Time Settings

Time Setting

Time Zone Select the time zone in which your network functions from this drop-down menu.

Automatically adjust clock for daylight saving changes Select this option to have the Router automatically adjust for daylight saving time.

Reboot



Reboot

Reboot Click **Reboot** to restart the Router.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear 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, File Transfer Protocol (FTP) server, or other server behind the Router.

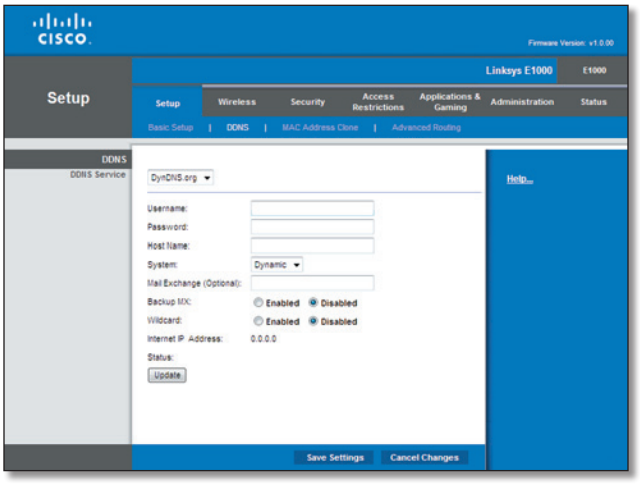
Before you can use this option, you need to sign up for DDNS service with a DDNS service provider, **www.dyndns.org** or **www.tzo.com**. If you do not want to use this option, keep the default, **Disabled**.

DDNS

DDNS Service

If your DDNS service is provided by DynDNS.org, then select **DynDNS.org** from the drop-down menu. If your DDNS service is provided by TZO, then select **TZO.com**. The options 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 DDNS URL assigned by the DDNS service is displayed.

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 option allows the Mail eXchange (MX) server to be a backup. To disable this option, keep the default, **Disabled**. To enable the option, select **Enabled**. If you are not sure which setting to select, keep the default, **Disabled**.

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

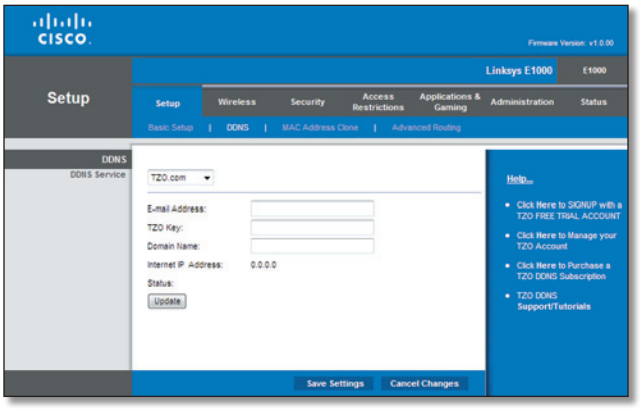
Internet IP Address The Router's Internet IP address is displayed here. Because it is dynamic, it will change.

Status The status of the DDNS service connection is displayed.

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

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

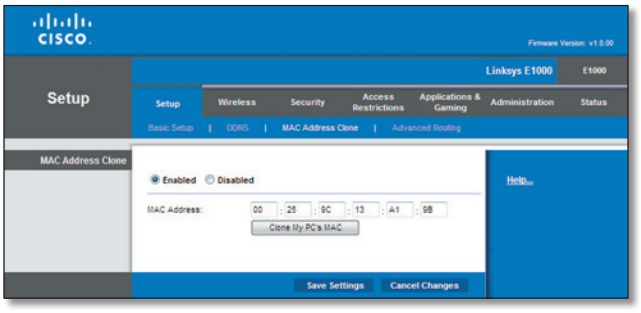
Status The status of the DDNS service connection is displayed.

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

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

Setup > MAC Address Clone

A Media Access Control (MAC) address is a 12-digit code assigned to a unique piece of hardware for identification. Some ISPs require you to register a MAC address in order to access the Internet. If you have your computer's MAC address registered with your ISP and you do not wish to re-register the MAC address, then you may assign the registered MAC address 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**.

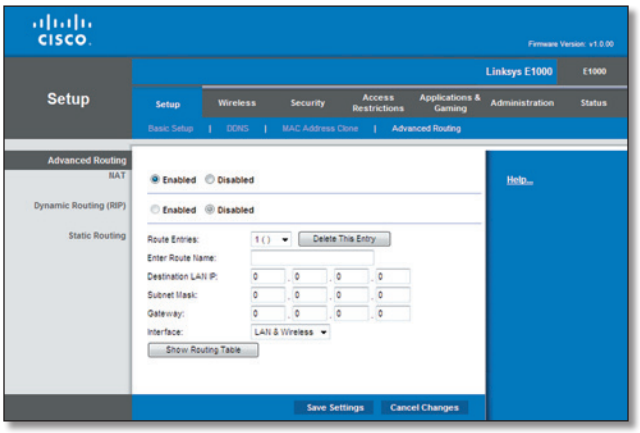
MAC Address Enter the MAC address registered with your ISP here.

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

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

Setup > Advanced Routing

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



Setup > Advanced Routing

Advanced Routing

NAT

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

Dynamic Routing (RIP)

Dynamic routing uses the Routing Information Protocol (RIP). This option 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.

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

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.

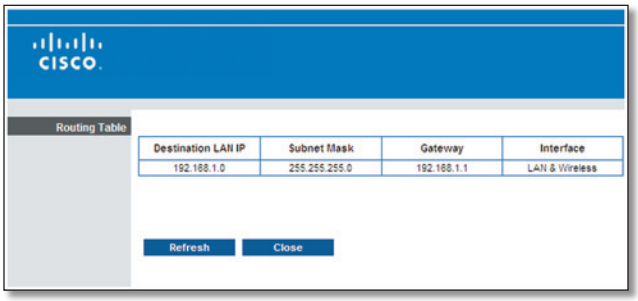
Destination LAN IP The Destination LAN (Local Area Network) IP is the address of the remote network or host to which you want to assign a static route.

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

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

Interface This interface tells you whether the Destination IP address is on the **LAN & Wireless** (Ethernet and wireless networks) or the **Internet (WAN)**. (WAN stands for Wide Area Network.)

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



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 clear your changes.

Wireless > Basic Wireless Settings

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

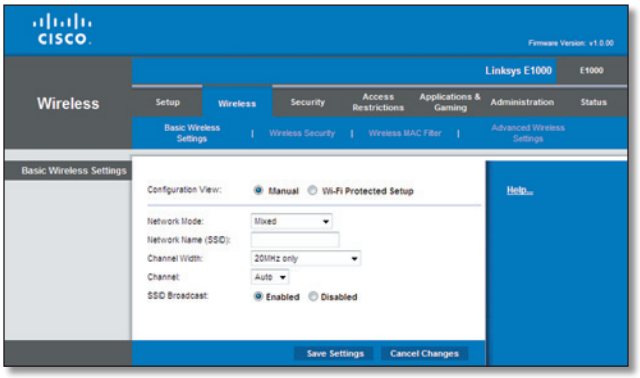
There are two ways to configure the Router's wireless network(s), manual and Wi-Fi Protected Setup.

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.

Configuration View To manually configure your wireless networks, select **Manual**. Proceed to the *Manual Setup* section. To use Wi-Fi Protected Setup, select **Wi-Fi Protected Setup**. Proceed to "**Wi-Fi Protected Setup**" on page 11.

Manual Setup

If you set the *Configuration View* to **Manual**, the *Basic Wireless Settings* screen displays the following fields.



Wireless > Basic Wireless Settings (Manual Setup)

Network Mode From this drop-down menu, you can select the wireless standards running on your network.

- **Mixed** If you have Wireless-N, Wireless-G, and Wireless-B devices in your network, keep the default, **Mixed**.
- **BG-Mixed** If you have only Wireless-G and Wireless-B devices in your network, select **BG-Mixed**.
- **Wireless-N Only** If you have only Wireless-N devices, select **Wireless-N Only**.
- **Wireless-G Only** If you have only Wireless-G devices, select **Wireless-G Only**.
- **Wireless-B Only** If you have only Wireless-B devices, select **Wireless-B Only**.
- **Disabled** If you do not have any wireless devices in your network, select **Disabled**.

NOTE: If you are not sure which mode to use, keep the default, **Mixed**.

Network Name (SSID) The Service Set Identifier (SSID) is the network name shared by all devices in a wireless network. It is case-sensitive and must not exceed 32 keyboard characters. The default is **Ciscoxxxxx** (xxxxx are the last five digits of the Router's serial number, found on the product label on the left side of the Router's bottom panel). The setup software that you use to install your Router and set up your wireless network changes the default Network Name to an easy-to-remember name.

NOTE: If you restore the Router's factory default settings (by pressing the Reset button or using the *Administration* > *Factory Defaults* screen), the Network Name will return to its default value, and all devices on your wireless network will need to be reconnected.

Channel Width The default is **20 MHz Only**. For best performance, select **Auto (20 MHz or 40 MHz)** to have the Router automatically select the Channel Width, 20 MHz or 40 MHz.

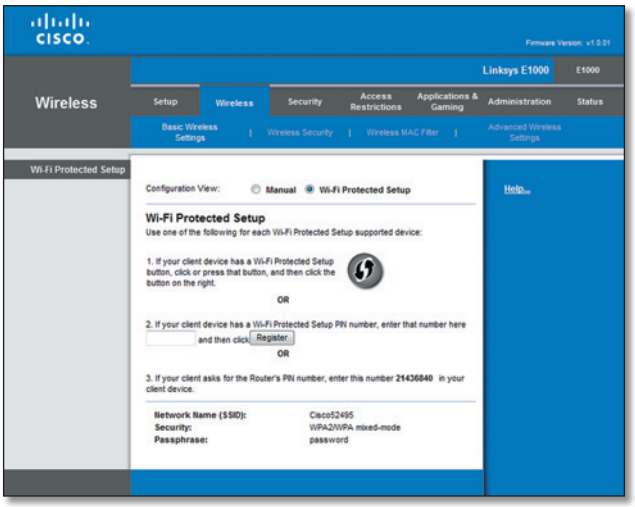
Channel Select the appropriate channel for your wireless network. If you are not sure which channel to select, then keep the default, **Auto**.

SSID Broadcast When wireless clients survey the local area for wireless networks to associate with, they will detect the SSID broadcast by the Router. To broadcast the Router's SSID, keep the default, **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 clear 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)

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.

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

  a. Click or press the **Wi-Fi Protected Setup** button on the client device.

  b. Click the **Wi-Fi Protected Setup** button on the Router's *Wi-Fi Protected Setup* screen.

  The Wi-Fi Protected Setup LED flashes blue for two minutes during the Wi-Fi Protected Setup process and lights up blue when the Wi-Fi Protected Setup process is successful.

  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 continuously lit, or off before starting the next Wi-Fi Protected Setup session.

  c. After the client device has been configured, click **OK** on the Router's *Wi-Fi Protected Setup* screen. Then refer back to your client device or its documentation for further instructions.

- **Enter Client Device PIN on Router** Use this method if your client device has a Wi-Fi Protected Setup PIN (Personal Identification Number).

  a. Enter the PIN from the client device in the field on the Router's *Wi-Fi Protected Setup* screen.

  b. Click the **Register** button on the Router's *Wi-Fi Protected Setup* screen.

  c. After the client device has been configured, click **OK** on the Router's *Wi-Fi Protected Setup* screen. Then refer back to your client device or its documentation for further instructions.

- **Enter Router PIN on Client Device** Use this method if your client device asks for the Router's PIN.

  a. On the client device, enter the PIN listed on the Router's *Wi-Fi Protected Setup* screen. (It is also listed on the label on the bottom of the Router.)

  b. After the client device has been configured, click **OK** on the Router's *Wi-Fi Protected Setup* screen. Then refer back to your client device or its documentation for further instructions.

The Network Name (SSID), Security, 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 settings configure the security of your wireless network(s). The Router supports the following wireless security options: WPA2/WPA Mixed Mode, WPA2 Personal, WPA Personal, WPA2/WPA Enterprise Mixed Mode, WPA2 Enterprise, WPA Enterprise, WEP, and RADIUS. (WPA stands for Wi-Fi Protected Access. WEP stands for Wireless Equivalent Privacy. RADIUS stands for Remote Authentication Dial-In User Service.)

Personal Options

Security Option	Strength
WPA2 Personal	Strongest
WPA2/WPA mixed mode	WPA2: Strongest WPA: Strong
WPA Personal	Strong
WEP	Basic

Office Options

The office options are available for networks that use a RADIUS server for authentication. The office options are stronger than the personal options because WPA2 or WPA provides encryption while RADIUS provides authentication.

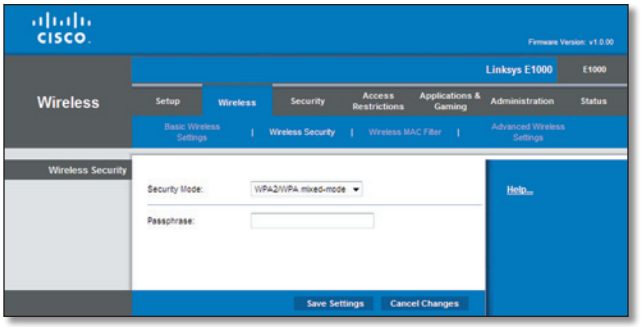
Security Option	Strength
WPA2 Enterprise	Strongest
WPA2/WPA Enterprise Mixed Mode	WPA2: Strongest WPA: Strong
WPA Enterprise	Strong
RADIUS	Basic

Security Mode

Select the security method for your wireless network.

WPA2/WPA Mixed Mode

NOTE: If you select WPA2/WPA Mixed Mode as your Security Mode, each device in your wireless network MUST use WPA2/WPA and the same passphrase.



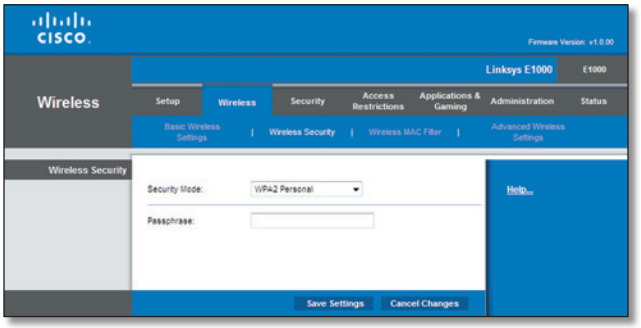
Wireless Security > WPA2/WPA Mixed Mode

Passphrase Enter a passphrase of 8-63 characters. The default is **password**.

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

WPA2 Personal

NOTE: If you select WPA2 Personal as your Security Mode, each device in your wireless network MUST use WPA2 Personal and the same passphrase.



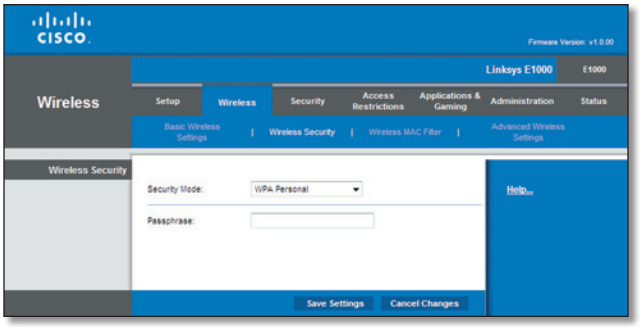
Wireless Security > WPA2 Personal

Passphrase Enter a passphrase of 8-63 characters. The default is **password**.

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

WPA Personal

NOTE: If you select WPA Personal as your Security Mode, each device in your wireless network MUST use WPA Personal and the same passphrase.



Wireless Security > WPA Personal

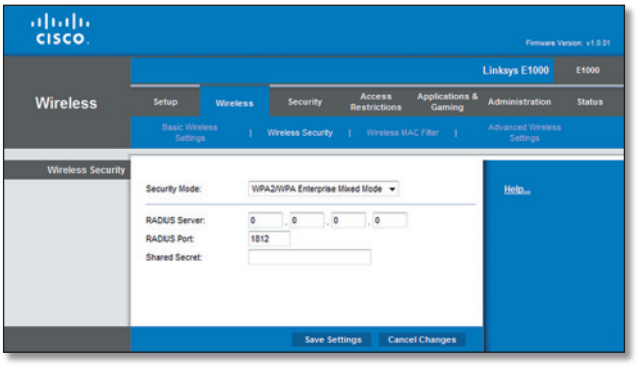
Passphrase Enter a passphrase of 8-63 characters. The default is **password**.

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

WPA2/WPA Enterprise Mixed Mode

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

NOTE: If you select WPA2/WPA Enterprise Mixed Mode as your Security Mode, each device in your wireless network MUST use WPA2/WPA Enterprise and the same shared key.



WPA2/WPA Enterprise Mixed Mode

RADIUS Server Enter the IP address of the RADIUS server.

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

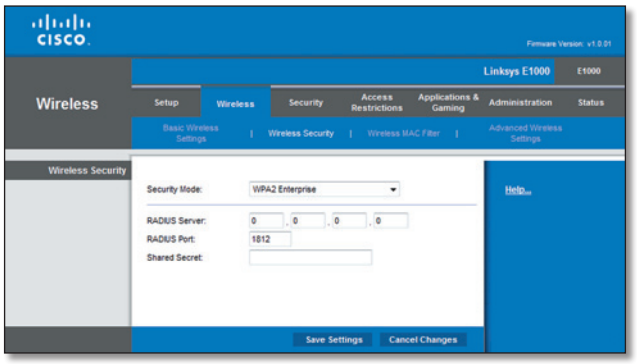
Shared Secret Enter the key shared between the Router and the server.

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

WPA2 Enterprise

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

NOTE: If you select WPA2 Enterprise as your Security Mode, each device in your wireless network MUST use WPA2 Enterprise and the same shared key.



WPA2 Enterprise

RADIUS Server Enter the IP address of the RADIUS server.

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

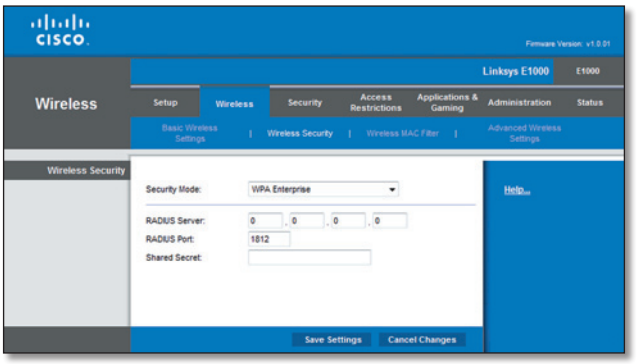
Shared Secret Enter the key shared between the Router and the server.

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

WPA Enterprise

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

NOTE: If you select WPA Enterprise as your Security Mode, each device in your wireless network MUST use WPA Enterprise and the same shared key.



WPA Enterprise

RADIUS Server Enter the IP address of the RADIUS server.

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

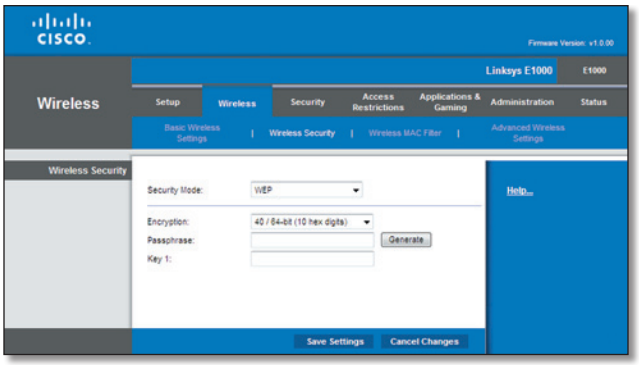
Shared Secret Enter the key shared between the Router and the server.

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

WEP

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

NOTE: If you select WEP as your Security Mode, each device in your wireless network MUST use WEP and the same encryption and shared key.



Wireless Security > WEP

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

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

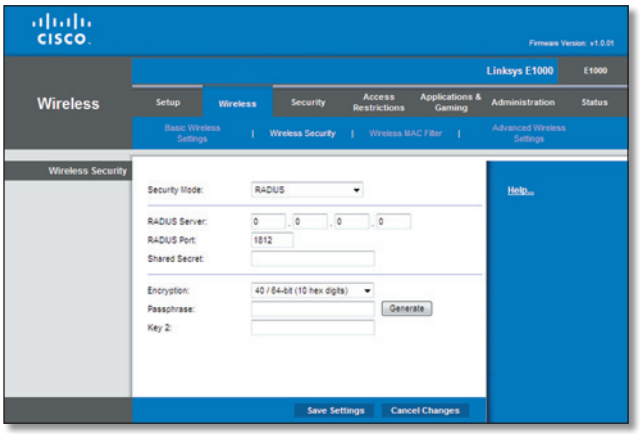
Key 1 If you did not enter a Passphrase, enter the WEP key manually.

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

RADIUS

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

NOTE: If you select RADIUS as your Security Mode, each device in your wireless network MUST use RADIUS and the same encryption and shared key.



RADIUS

RADIUS Server Enter the IP address of the RADIUS server.

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

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

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

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

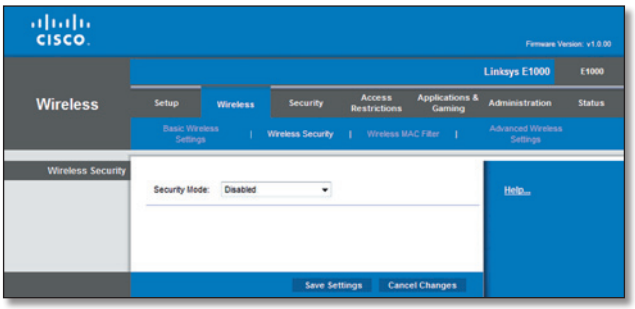
Key 2 If you did not enter a Passphrase, enter the WEP key manually.

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

Disabled

If you choose to disable wireless security, you will be informed that wireless security is disabled when you first attempt to access the Internet. You will given the option to enable wireless security, or confirm that you understand the risks but still wish to proceed without wireless security.

NOTE: When wireless security is disabled, anyone can access your wireless network at any time.

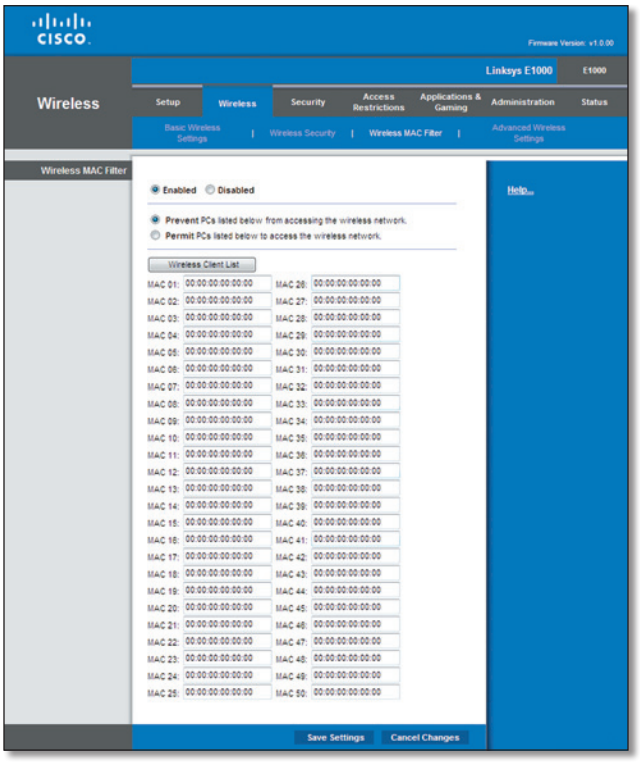


Disabled

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

Wireless > Wireless MAC Filter

Wireless access can be filtered (restricted) by specifying the MAC addresses of the devices in your wireless network.



Wireless > Wireless MAC Filter

Wireless MAC Filter

Enabled/Disabled To filter wireless users by the MAC addresses of their computers or devices, select **Enabled**. Otherwise, keep the default, **Disabled**.

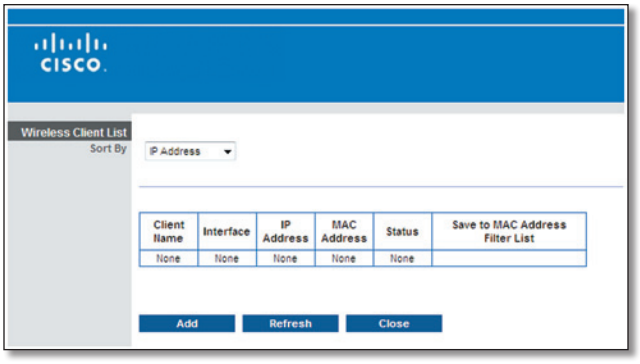
Access Restriction

Prevent PCs listed below from accessing the wireless network When the Wireless Mac Filter is enabled and this option is selected, computers listed in the MAC Address filter list will be prevented from accessing the wireless network. This option is enabled by default.

Permit PCs listed below access to the wireless network When the Wireless Mac Filter is enabled and this option is selected, only computers listed in the MAC Address filter list will be granted access to the wireless network. This option is disabled by default.

MAC Address Filter List

Wireless Client List Click this option 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**.

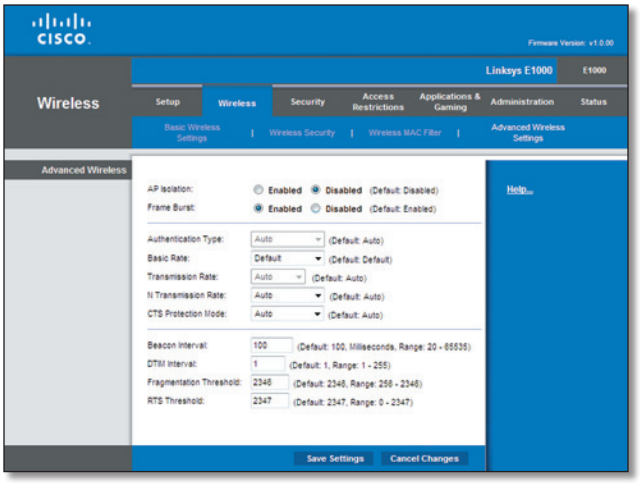
To update the on-screen information, click **Refresh**. To exit this screen and return to the *Wireless MAC Filter* screen, click **Close**.

MAC 01-50 Enter the MAC addresses of the devices whose wireless access you want to control.

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

Wireless > Advanced Wireless Settings

The *Advanced Wireless Settings* screen is used to set up the Router's advanced wireless functions. These settings should only be adjusted by an advanced user because incorrect settings can reduce wireless performance. In most cases, keep the default settings.



Wireless > Advanced Wireless Settings

Advanced Wireless

AP Isolation The AP (Access Point) Isolation feature 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 option, select **Enabled**. AP Isolation is disabled by default.

Frame Burst This option should provide your network with greater performance, depending on the manufacturer of your wireless products. To use this option, keep the default, **Enabled**. Otherwise, select **Disabled**.

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 24 Mbps). Select **1-2 Mbps** for use with older wireless technology. Select **All**, when the Router can transmit at all wireless rates.

Transmission Rate The Transmission setting is available if the Network Mode is BG-Mixed, Wireless-G Only, or Wireless-B Only. The rate of data transmission should be set depending on the speed of your wireless network. Select from a range of transmission speeds, or keep the default, **Auto**, to have the Router automatically use the fastest possible data rate and enable the Auto-Fallback feature. Auto-Fallback will negotiate the best possible connection speed between the Router and a wireless client.

N Transmission Rate The N Transmission setting is available if the Network Mode is Mixed or Wireless-N Only. The rate of data transmission should be set depending on the speed of your Wireless-N networking. Select from a range of transmission speeds, or keep the default, **Auto**, to have the Router automatically use the fastest possible data rate and enable the Auto-Fallback feature. Auto-Fallback will negotiate the best possible connection speed between the Router and a wireless client.

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

Beacon Interval A beacon is a packet broadcast by the Router to synchronize the wireless network. The Beacon Interval value indicates the frequency interval of the beacon. Enter a value between 20 and 65,535 milliseconds. The default value is **100**.

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

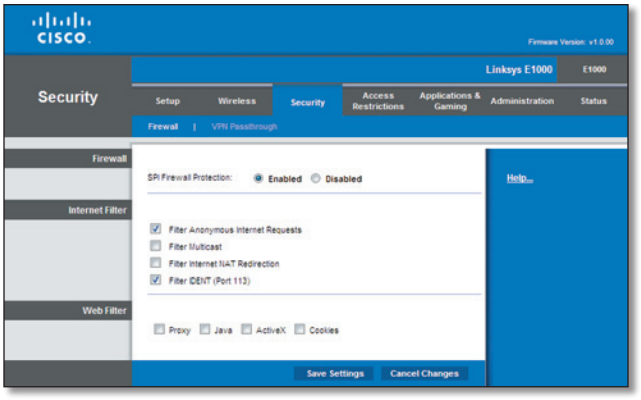
Fragmentation Threshold This value specifies the maximum size for a packet before data is fragmented into multiple packets. If you experience a high packet error rate, you may slightly increase the Fragmentation Threshold. Setting the Fragmentation Threshold too low may result in poor network performance.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

RTS Threshold Should you encounter inconsistent data flow, only minor reduction of the default value, **2347**, is recommended. If a network packet is smaller than the preset Request to Send (RTS) threshold size, the RTS/CTS (Clear to Send) mechanism will not be enabled. The Router sends 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 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 clear your changes.

Security > Firewall

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



Security > Firewall

Firewall

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

Internet Filters

Filter Anonymous Internet Requests This option makes it more difficult for outside users to work their way into your network. This option is enabled by default. Disable it to allow anonymous Internet requests.

Filter Multicast The multicasting feature 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 enable the filter. This option is disabled by default.

Filter Internet NAT Redirection This option is used to prevent a local computer from using a URL or Internet address to access the local server. Select this option to enable the filter. This option is disabled by default.

Filter IDENT (Port 113) The Filter IDENT (Identification) option keeps port 113 from being scanned by devices outside of your local network. This option is enabled by default. Disable it to allow port 113 to be scanned.

Web Filters

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 option 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 option 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.

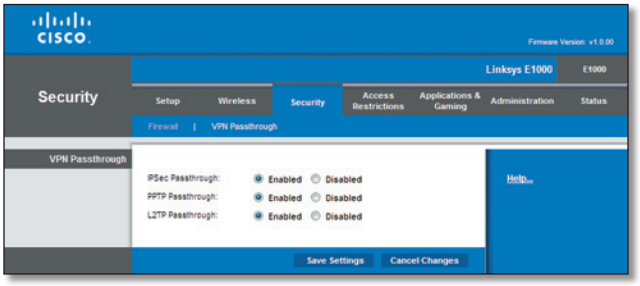
Select this option to enable ActiveX filtering. Deselect the option to allow ActiveX usage.

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 option to allow cookie usage.

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

Security > VPN Passthrough

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



Security > VPN Passthrough

VPN Passthrough

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

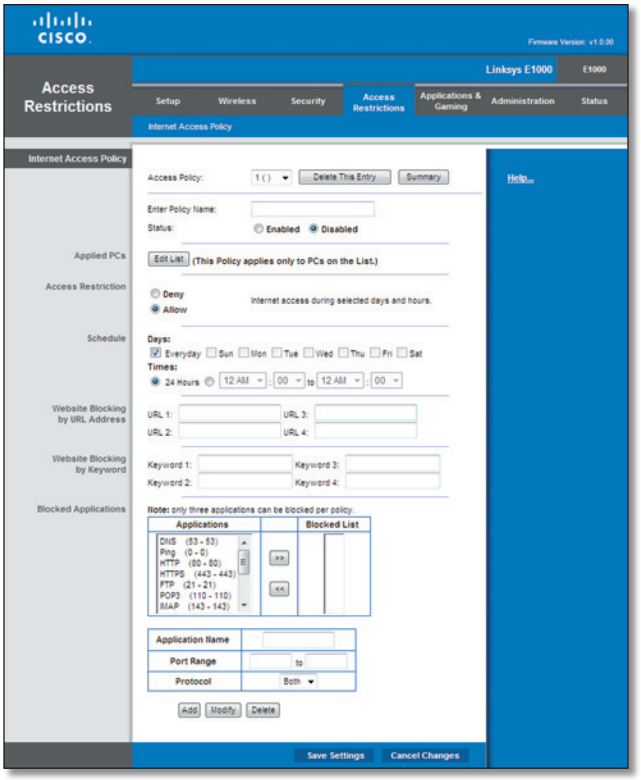
PPTP Passthrough Point-to-Point Tunneling Protocol (PPTP) allows the Point-to-Point Protocol (PPP) to be tunneled through an IP network. To allow PPTP tunnels to pass through the Router, keep the default, **Enabled**.

L2TP Passthrough Layer 2 Tunneling Protocol (L2TP) is the method used to enable Point-to-Point sessions via the Internet on the Layer 2 level. To allow L2TP tunnels to pass through the Router, keep the default, **Enabled**.

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

Access Restrictions > Internet Access

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



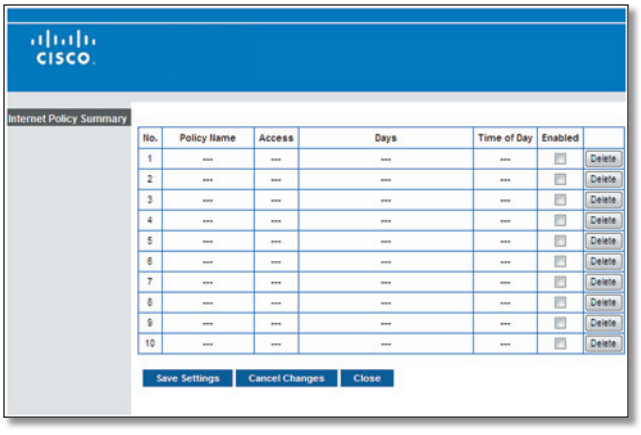
Access Restrictions > Internet Access

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 clear your changes. To return to the *Internet Access Policy* screen, click **Close**.

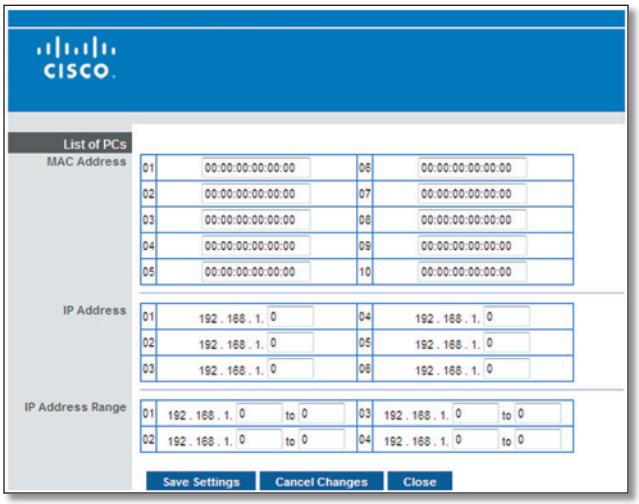


Summary

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

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

1. Select a number from the *Access Policy* drop-down menu.
2. Enter a Policy Name in the field provided.
3. To enable this policy, select **Enabled**.
4. Click **Edit List** to select which computers will be affected by the policy. The *List of PCs* screen appears. You can select a computer 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 computers. 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

5. Select the appropriate option, **Deny** or **Allow**, depending on whether you want to block or allow Internet access for the computers 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**.

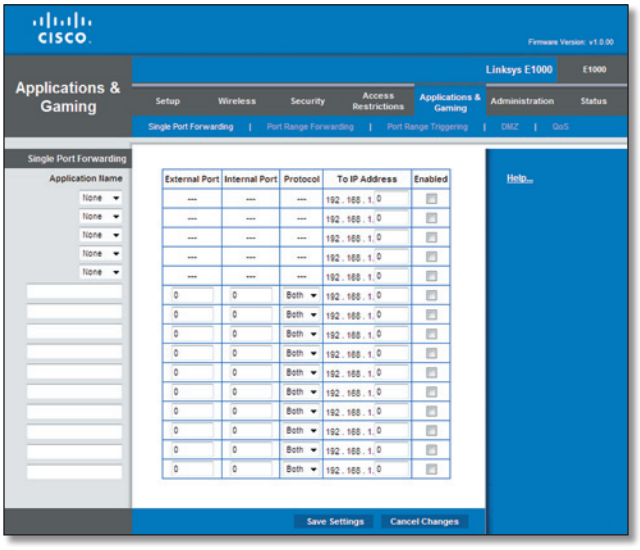
    To modify a service, select it from the Applications list. Change its Application Name, Port Range, and/or Protocol setting. Then click **Modify**.

    To delete a service, select it from the Applications 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 customize port services for various applications.

When users send these types of requests to your network via the Internet, the Router will forward those requests to the appropriate computers (also called servers). Before using forwarding, you should assign static IP addresses to the designated computers (use the DHCP Reservation option on the *Basic Setup* screen; refer to "**DHCP Reservation**" on page 6).



Applications and Gaming > Single Port Forwarding

Single Port Forwarding

Preset applications are available for the first five entries. For each entry, complete the following:

Application Name Select the appropriate application.

To IP Address Enter the IP address of the computer that should receive the requests. If you assigned a static IP address to the computer, then you can look up its static IP address; refer to "**DHCP Reservation**" on page 6.

Enabled Select **Enabled** to enable port forwarding.

You can customize entries for additional applications. For each entry, complete the following:

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 computer or Internet application. Check with the Internet application documentation for more information.

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

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

To IP Address Enter the IP address of the computer that should receive the requests. If you assigned a static IP address to the computer, then you can look up its static IP address; refer to "**DHCP Reservation**" on page 6.

Enabled Select **Enabled** to enable port forwarding.

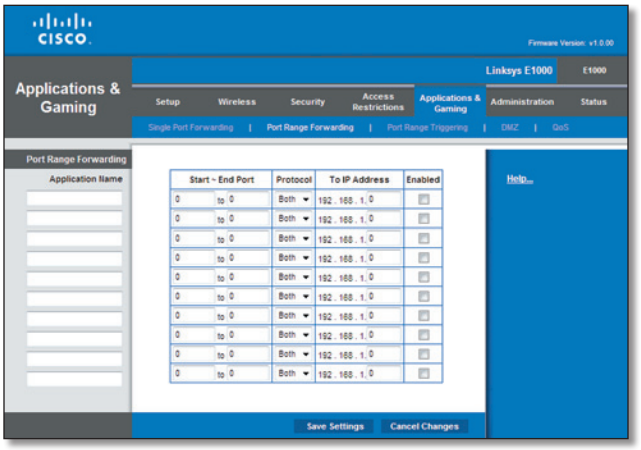
Click **Save Settings** to apply your changes, or click **Cancel Changes** to clear your changes.

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 specialized Internet applications. (Specialized Internet applications are any applications that use Internet access to perform functions such as videoconferencing or online gaming. Some Internet applications may not require any forwarding.)

When users send these types of requests to your network via the Internet, the Router will forward those requests to the appropriate computers (also called servers). Before using forwarding, you should assign static IP addresses to the designated computers (use the DHCP Reservation option on the *Basic Setup* screen; refer to "**DHCP Reservation**" on page 6).

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



Applications and Gaming > Port Range Forwarding

Port Range Forwarding

For each entry, complete the following:

Application Name 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 application. Check with the Internet application documentation for more information.

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

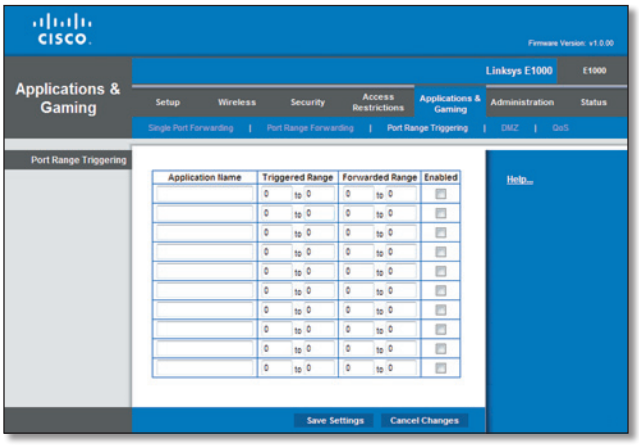
To IP Address Enter the IP address of the computer running the specific application. If you assigned a static IP address to the computer, then you can look up its static IP address; refer to "**DHCP Reservation**" on page 6.

Enabled Select **Enabled** to enable port forwarding.

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

For each entry, complete the following:

Application Name Enter the application name of the trigger.

Triggered Range 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.

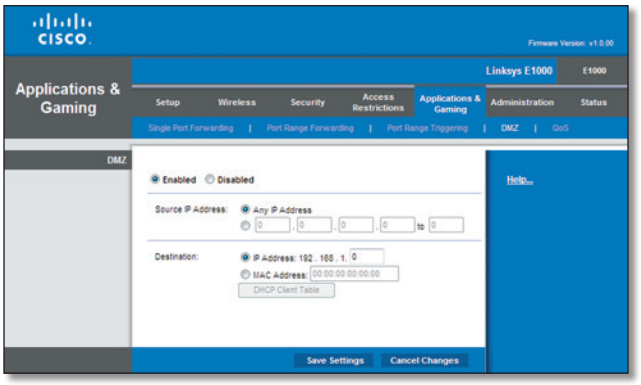
Forwarded Range Enter the starting and ending port numbers of the forwarded port number range. Check with the Internet application documentation for the port number(s) needed.

Enabled Select **Enabled** to enable port triggering.

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

Applications and Gaming > DMZ

The DMZ (Demilitarized Zone) 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 computer. 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

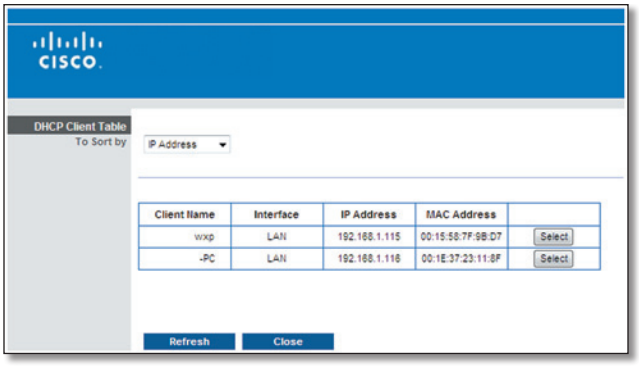
DMZ

Any computer whose port is being forwarded should have its DHCP client function disabled and 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 computer, select **Enabled**. Then configure the following settings:

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

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



DMZ > DHCP Client Table

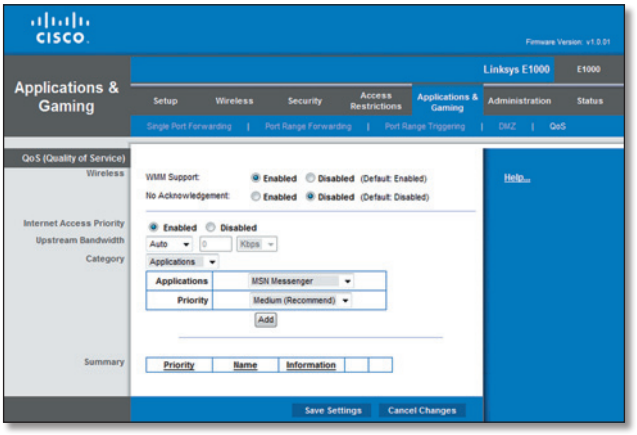
DHCP Client Table

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, and MAC 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 clear your changes.

Applications and Gaming > QoS

Quality of Service (QoS) is a method that assigns priority to specific types of network traffic, which often are demanding, real-time applications, such as gaming, videoconferencing, video streaming, and Voice over Internet Protocol (VoIP) telephony. QoS helps to ensure optimal performance for these types of uses.



Applications and Gaming > QoS

QoS (Quality of Service)

Wireless

WMM Support Wi-Fi Multimedia (WMM) is a wireless Quality of Service feature that improves quality for audio, video, and voice applications by prioritizing wireless traffic. To use this feature, the wireless client devices in your network must support Wireless WMM. To disable this option, select **Disabled**. Otherwise, keep the default, **Enabled**.

No Acknowledgement If you want to disable the Router's Acknowledgement option, so the Router will not re-send data if an error occurs, then select **Enabled**. Otherwise, keep the default, **Disabled**.

Internet Access Priority

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

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

Upstream Bandwidth

Upstream Bandwidth This option sets the maximum outgoing bandwidth that applications can use. To allow the Router to set the maximum, keep the default, **Auto**. To specify the maximum, select **Manual**. Then enter the appropriate value and select **Kbps** or **Mbps**.

Category

You can define the Internet access priority level for as many categories as you want. The *Summary* section will display all of the priority selections that you enter. Select from the following categories:

- **Applications** Allows you to assign a priority level for a pre-defined application or one that you add.
- **Online Games** Allows you to assign a priority level for a pre-defined game or one that you add.
- **MAC Address** This option lets you prioritize network traffic based on the device that is accessing the network. For example, if you want your gaming console to have higher priority accessing the Internet than your computer, you can assign their priority levels using their respective MAC addresses.
- **Voice Device** Voice devices require a higher priority level. You can assign a higher priority level to voice devices using their respective MAC addresses.

Summary

This lists the QoS entries you have created for your applications and devices. Refer to "**Summary**" on page 24 for more information.

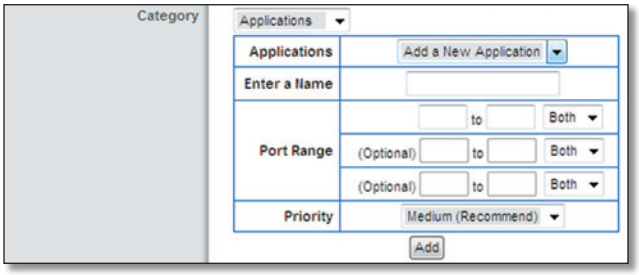
Applications

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

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 Application



QoS > Add a New Application

Enter a Name Enter a name for this application.

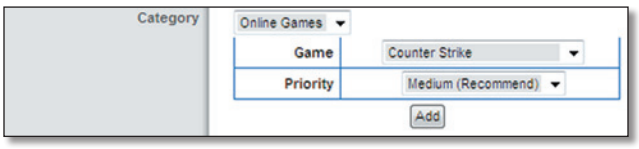
Port Range Enter the port range that the application will be using. For example, if you want to allocate bandwidth for FTP, you can enter 21-21. If you need services for an application that uses from 1000 to 1250, you enter 1000-1250 as your settings. You can have up to three ranges to define for this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

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

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

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

Online Games



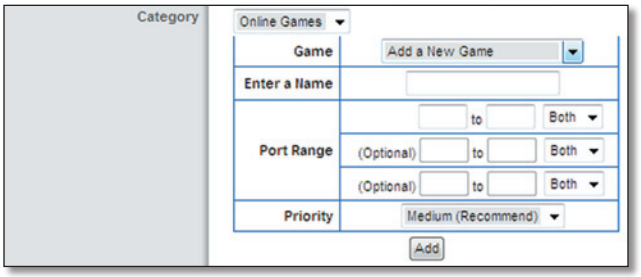
QoS > Online Games

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

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

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

Add a New Game



QoS > Add a New Game

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

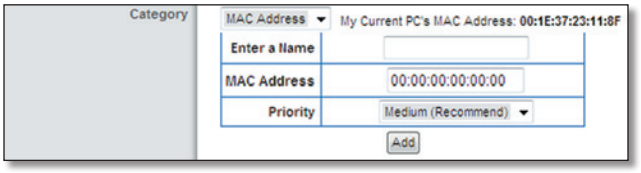
Port Range Enter the port range that the game will be using. You can have up to three ranges to define for this bandwidth allocation. Port numbers can range from 1 to 65535. Check your application's documentation for details on the service ports used.

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

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

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

MAC Address



QoS > MAC Address

The MAC address of the computer you are using is displayed.

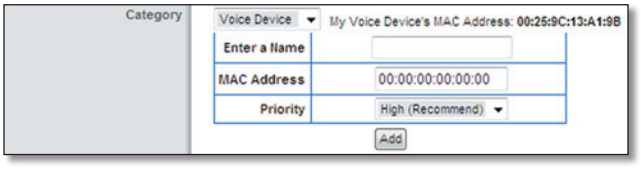
Enter a Name Enter a name for your device.

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.

Voice Device



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, game, 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.

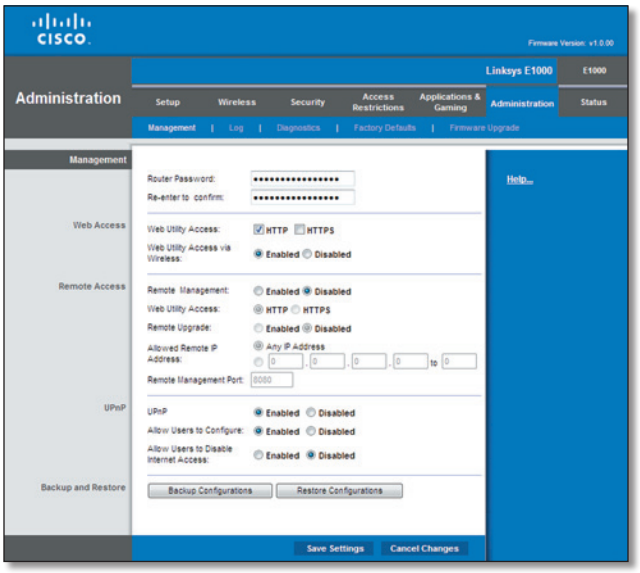
Remove Click this option to remove an entry.

Edit Click this option to make changes.

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

Administration > Management

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



Administration > Management

Management

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

Router Password Enter a new password for the Router.

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

Web Access

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

Web Utility 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 browser-based utility. You will only be able to access the utility via a wired connection if you disable the setting. Keep the default, **Enabled**, to allow wireless access to the utility, or select **Disabled** to block wireless access to the utility.

Remote Access

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

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

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

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

Remote Management Port Enter the port number that will be open to outside access. (To access the Router, you will need to enter the Router's password.)

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, **Enabled**. Otherwise, select **Disabled**.

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

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

Backup and Restore

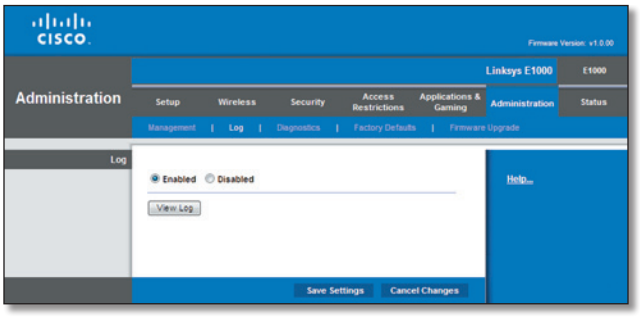
Backup Configurations To back up the Router's configuration settings, click this option and follow the on-screen instructions.

Restore Configurations To restore the Router's configuration settings, click this option 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 clear your changes.

Administration > Log

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



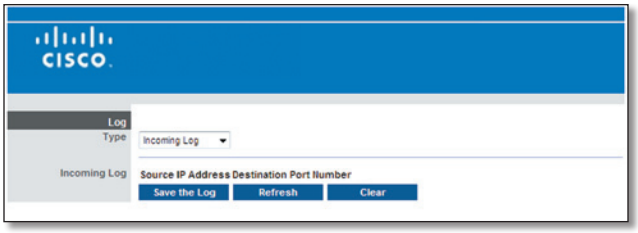
Administration > Log

Log

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

Click **Save Settings** to apply your change, or click **Cancel Changes** to clear your change.

View Log When you wish to view the logs, click this option.



Log > View Log

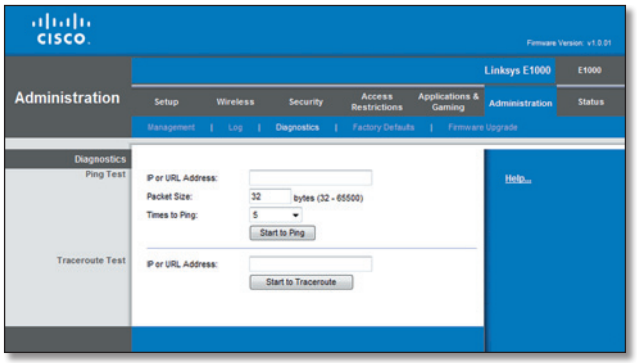
Log

- **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 browser-based utility. The DHCP Client Log displays the local DHCP server status information.

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

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

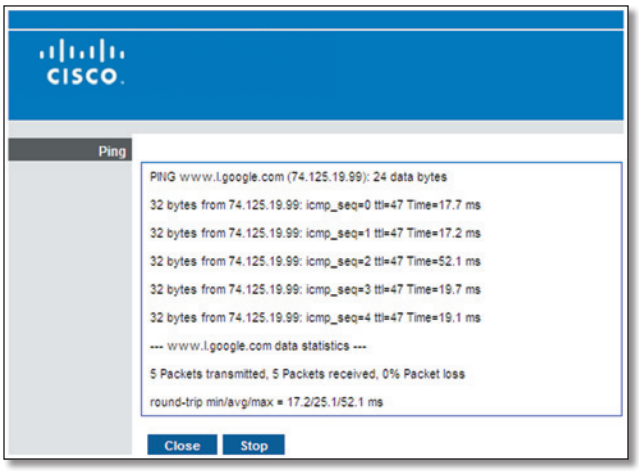
Ping checks the status of a connection.

IP or URL Address Enter the address of the computer, device, or website whose connection you wish to test.

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

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

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



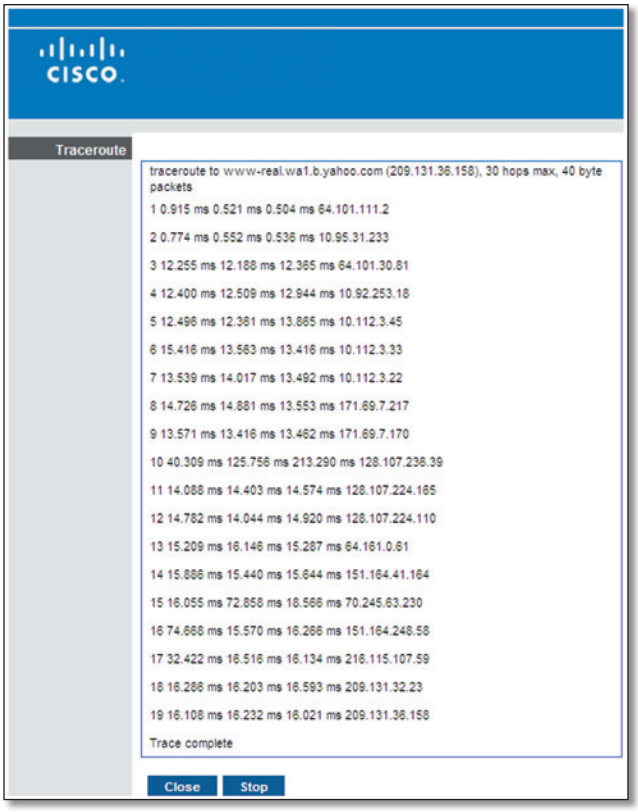
Diagnostics > Ping

Traceroute Test

Traceroute checks the performance of a connection.

IP or URL Address Enter the address of the computer, device, or website whose connection you wish to test.

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

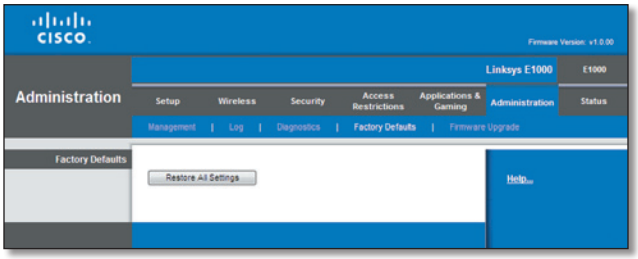


Diagnostics > Traceroute

Administration > Factory Defaults

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

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.



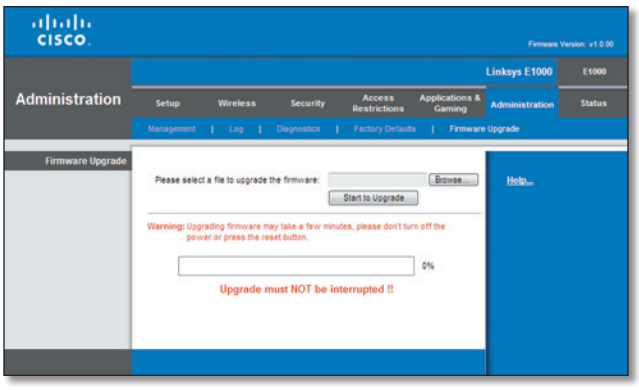
Administration > Factory Defaults

Factory Defaults

Restore All Settings To reset the Router's settings to the defaults, click this option 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 customized. Before you upgrade its firmware, write down all of your custom settings. After you upgrade its firmware, you will have to re-enter all of your configuration settings.

Firmware Upgrade

Before upgrading the firmware, download the Router's firmware upgrade file from the website, **www.linksys.com/support**.

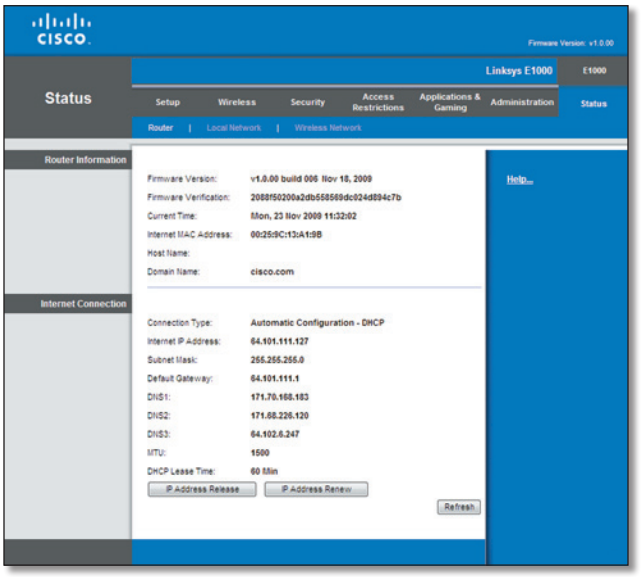
Please select a file to upgrade the firmware Click **Browse** and select the firmware upgrade file.

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

WARNING: Do not interrupt the upgrade process. You should not turn off the power or press the Reset button during the upgrade process. Doing so may disable the Router.

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 of the 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

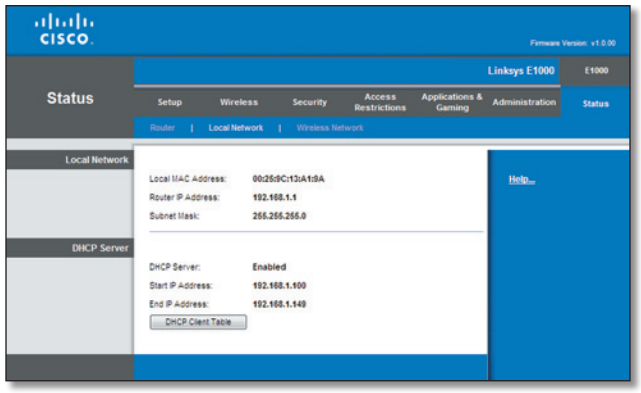
This section shows the current network information stored in the Router. The information varies depending on the Internet connection type selected on the *Setup* > *Basic Setup* screen.

For a DHCP connection, select **Release IP Address** or **Renew IP Address** as appropriate to release or renew a DHCP lease. For a PPPoE or similar connection, select **Connect** or **Disconnect** as appropriate to connect to or disconnect from the Internet.

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

Status > Local Network

The *Local Network* screen displays information about the local 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.

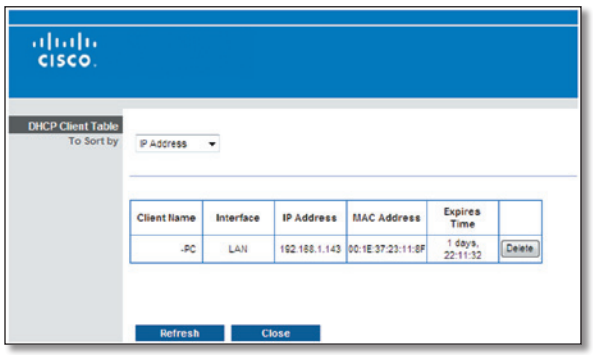
DHCP Server

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

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

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

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



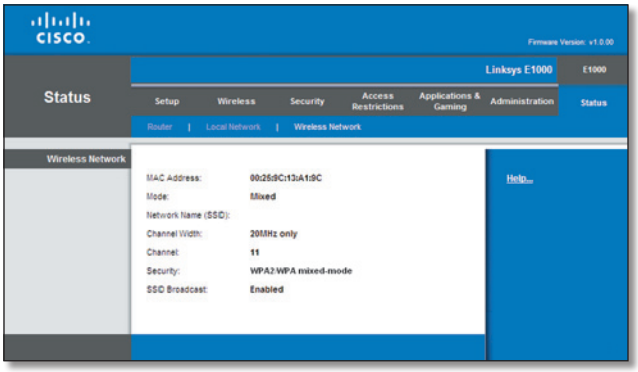
DHCP Client Table

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 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 Network

Wireless Network

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

Mode The wireless mode 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.

Channel The Channel setting selected on the *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 option is displayed.

Appendix A: Troubleshooting

Your computer cannot connect to the Internet.

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

- Verify that the power adapter is connected to the Router and to a power outlet. If connected to a power strip, make sure the power strip is turned on.
- Make sure that the Power LED, Internet LED, and Wireless LED are on. If you have any wired computers connected to the Router, make sure the appropriate port LED is lit.

NOTE: The Power LED flashes after the power adapter is plugged in to the Router. If the light remains flashing for more than 30 seconds, it may indicate the Router is not working properly. For assistance, use a computer or device with Internet access to refer to our Linksys E1000 support section on the web, **www.linksys.com/support/E1000**

- Make sure that your DSL or cable modem is connected to your Router's Internet port using an Ethernet cable.
- Reset all of the devices on your network:
  1. Turn off all of your network computers and devices, and then unplug the power adapter from your Router.
  2. Unplug your modem's power cord (and coaxial cable if you have a cable modem), and wait two minutes.
  3. Reconnect your modem's power cord (and coaxial cable) and wait two more minutes.
  4. Reconnect the power adapter to the Router, and then power on all of your network computers and devices.

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 **Set up your Linksys Router** 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 **Set up your Linksys Router** 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 change the settings on the Router.

Wireless network settings can be changed using Cisco Connect. To change the Router's advanced settings, refer "**How to Access the Browser-Based Utility**" on page 3.

You want to access the browser-based utility from Cisco Connect.

To enter the browser-based utility from Cisco Connect, follow these steps:

1. Open Cisco Connect.
2. On the main menu, click **Router settings**.
3. Click **Advanced settings**.
4. Write down the username and password that are displayed. (To help protect your password, you can copy it to the Clipboard by clicking **Copy password**.)
5. Click **OK**.

6. Your web browser automatically opens. Enter the username and password, and then click **OK**. (If you copied the password to the Clipboard in step 4, press **Ctrl-V** to paste it into the *Password* field.)

When you try to log into the browser-based utility, your password does not work.

Your wireless security password also serves as the browser-based utility's login password. To see this password:

1. Open Cisco Connect.
2. On the main menu, click **Router settings**.
3. The *Password* is displayed on the left side of the screen.

WEB: If your questions are not addressed here, refer to our E1000 section on the web, **www.linksys.com/support/E1000**

Appendix B: Specifications

Model Name	Linksys E1000
Description	Wireless-N Router
Model Number	E1000
Standards	802.11n, 802.11g, 802.11b, 802.3, 802.3u
Ports	Power, Internet, and Ethernet (1-4)
Buttons	Reset, Wi-Fi Protected Setup
LEDs	Ethernet (1-4), Wi-Fi Protected Setup, Wireless, Internet, Power
Cabling Type	CAT 5e
RF Pwr (EIRP) in dBm	17.5 dBm
Antenna Gain in dBi	1.5 dBi
UPnP able/cert	Able
Security Features	WEP, WPA, WPA2
Security Key Bits	Up to 128-Bit Encryption

Environmental

Dimensions	202 x 34 x 160 mm
Unit Weight	280 g
Power	12V, 0.5A
Certifications	FCC, CE, IC-03, Wi-Fi, Windows 7
Operating Temp.	0 to 40°C
Storage Temp.	-20 to 60°C
Operating Humidity	10 to 85% Noncondensing
Storage Humidity	5 to 90% Noncondensing

Specifications are subject to change without notice.

www.linksys.com/support