FRONT COVER

Product Overview

Setting Up: Basics

Using an External Drive

Setting Up: Advanced

Port Forwarding and Port Triggering

Maintaining and Monitoring

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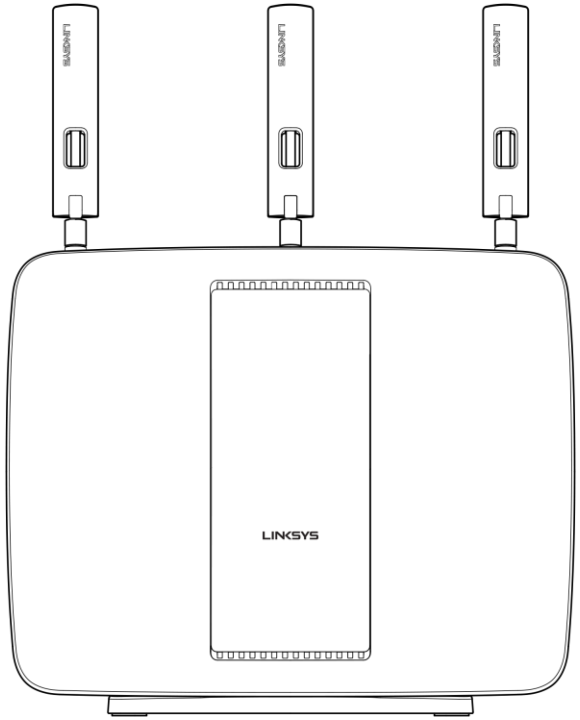
Specifications

Product Overview

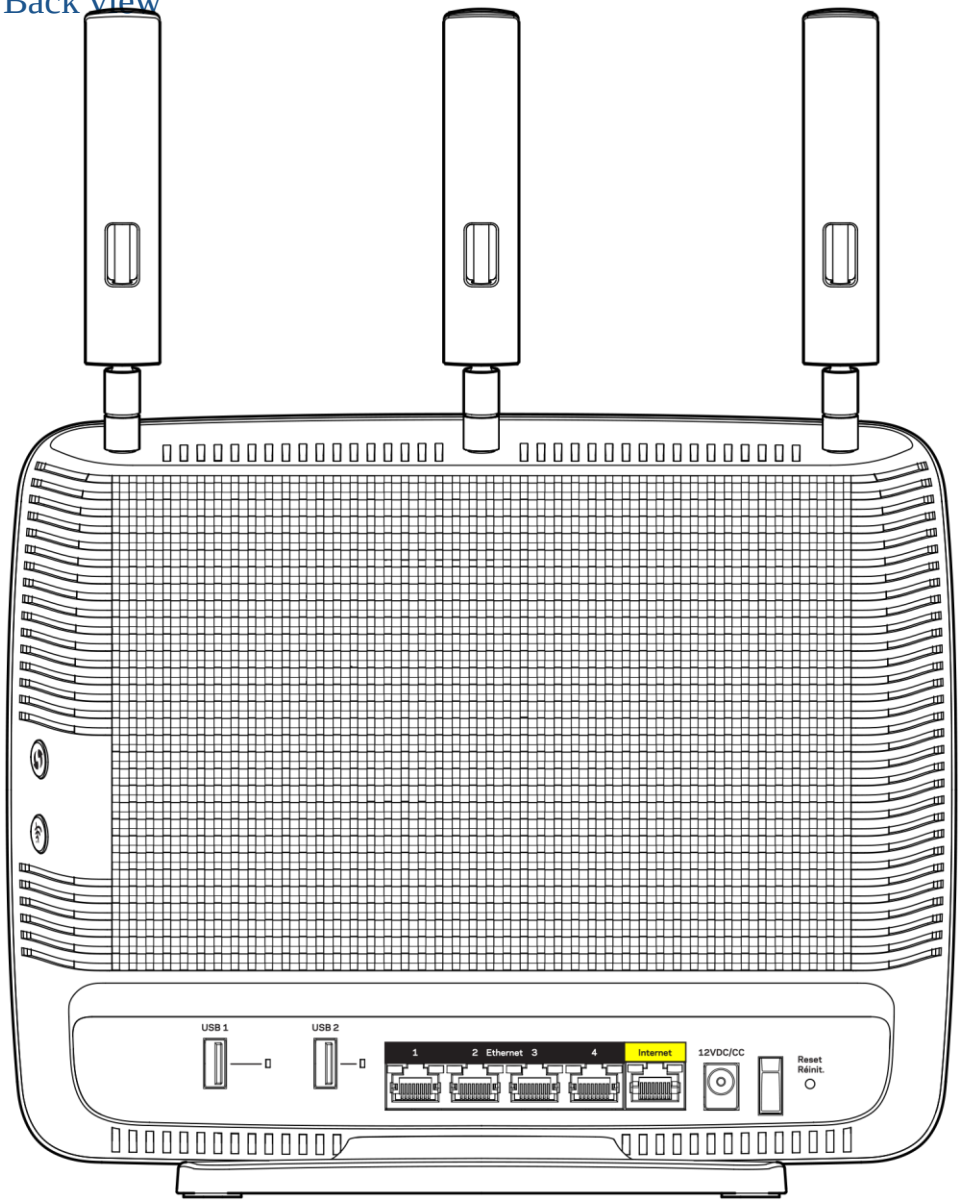
EA4500 V3

Front/top view



Main green LED

Back view



- **Ethernet ports** — Connect Ethernet cables to these blue gigabit (10/100/1000) ports, and to wired devices on your network.

  NOTE For best performance, use CAT5E or higher rated cables on the Ethernet ports.

- **INTERNET port —** Connect an Ethernet cable to this yellow gigabit (10/100/1000) port, and to a broadband Internet cable/DSL or fiber modem.

  NOTE For best performance, use CAT5E or higher rated cables on the Ethernet ports.

- **Wi-Fi Protected Setup™ button —** Press to configure wireless security on Wi-Fi Protected Setup-enabled network devices.

-

- **USB 2.0 port —** Connect and share USB drives on your network or on the Internet.**Reset button —** Press and hold for 10 seconds (until the power LED starts flashing) to reset the router to factory settings. You can also restore the factory settings using Linksys Smart Wi-Fi on the Internet or mobile app.

- **Power port —** Connect the included AC power adapter.

- **Power switch —** Press to turn on the router (European only).

Top view

Setting Up: Basics

Where to find more help

In addition to this User Guide, you can find help at these locations:

Linksys.com/support/EA4500 V3 (documentation, downloads, FAQs, technical support, live chat, forums)

Linksys Smart Wi-Fi help (connect to **Linksys Smart Wi-Fi**, then click **Help** at the top of the screen)

How to install your router

1. If replacing an existing router, disconnect that router first.
2. Unplug and plug in your modem before connecting your new router.
3. Plug in your router to a power source.
4. Connect the Internet cable from your modem to the yellow Internet port on your router. Wait until the power light on the front of the router is solid.
5. Connect to the secure wireless name shown in the *Quick Start Guide* that came with your router. (You can change the network name and password later.) If you need help connecting to the network refer to your device documentation on the provided CD. **Note:** You will not have Internet access until router setup is complete.
6. Open a web browser to launch the Linksys Smart Wi-Fi Router setup instructions. If you don't see the instructions, type linksyssmartwifi.com in the address bar.

At the end of setup, follow the on-screen instructions to set up your Linksys Smart Wi-Fi account. Use Linksys Smart Wi-Fi to configure your router from any computer with an Internet connection. Manage your router's settings:

Change your router's name and password

Set up guest access

Configure parental controls

Connect devices to your network

Test your Internet connection speed

NOTE:
As part of the router setup process, you will be sent a verification e-mail. From your home network, click the link in the e-mail to associate your router with the Linksys Smart Wi-Fi account.

TIP:
Print this page, then record your router and account settings in the table below as a reference. Store your notes in a safe place.

2.4 GHz Network Name	
Network Password	
5 GHz Network Name	
Network Password	
Router Password	

Guest Network Name	
Guest Network Password	
Linksys Smart Wi-Fi Username	
Linksys Smart Wi-Fi Password	

How to configure your router

You can change router settings to make your network more secure or to work better with a device or game. Being able to adjust the settings while you're away from home can help make router administration easier. You can configure your router from anywhere in the world by using Linksys Smart Wi-Fi, but you can also configure your router directly from your home network.

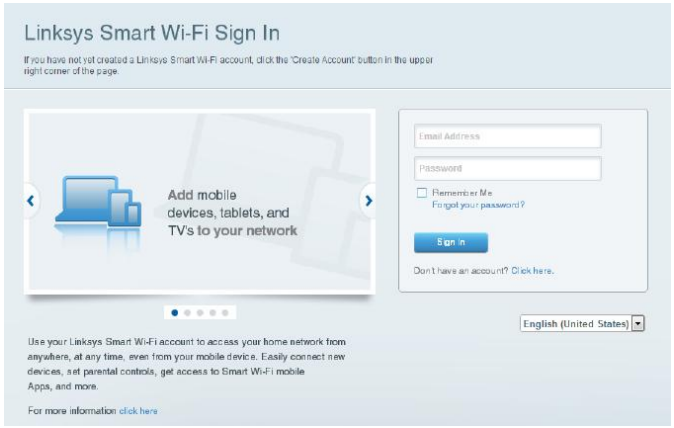
Linksys Smart Wi-Fi may be available for your mobile device, as well. See your device's app store for information.

How to connect to Linksys Smart Wi-Fi

To connect to Linksys Smart Wi-Fi:

Open your computer's web browser.

Go to **www.linksyssmartwifi.com** and log into your account.



If you can't remember your password, click **Forgot your password?** and follow the on-screen instructions to recover it.

How to disable remote access

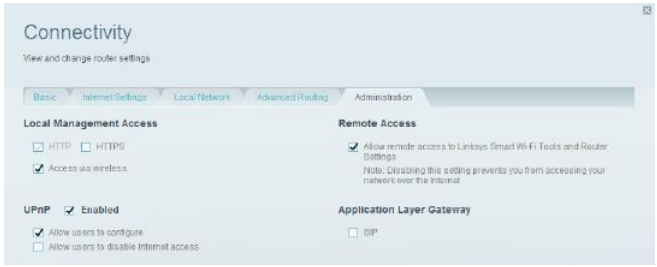
If you want to configure your router only while you are on your home network, you should disable remote access.

To disable remote access:

Log in to Linksys Smart Wi-Fi.

Under **Router Settings**, click **Connectivity**.

Click the **Administration** tab, then deselect **Allow remote access to Linksys Smart Wi-Fi**.



Click **OK**.

How to connect directly to your router

You can configure your router by directly accessing it on your home network instead of through the Internet-based Linksys Smart Wi-Fi.

To connect to your router while you are on your home network:

Open your computer's web browser.

Go to **www.linksyssmartwifi.com** and log into your router using the router password you created when you installed your router. (When there is no Internet connection, click "click here" in the bottom-right corner to log in with your router admin password.)

How to improve your wireless connection speed

Make sure that your router is in a good location:

For the widest coverage area, install your router near the center of your home, and near the ceiling, if possible.

Avoid placing the router on or near metal objects (file cabinets and metal furniture), reflective surfaces (glass or mirrors), or masonry walls.

Any obstruction can weaken the wireless signal (even non-metallic objects), so the fewer obstructions between the router and the wireless device, the better.

Place the router in a location away from other electronics, motors, and fluorescent lighting.

Many environmental variables can affect the router's performance, so if your wireless signal is weak, place the router in several locations and test the signal strength to determine the ideal position.

If possible, upgrade wireless network interfaces such as wireless network cards in computers from older wireless standards to 802.11n. If a wirelessly networked device uses an older standard, the performance of the entire wireless network may be slower.

How to change your network's name and password

You can change the name and password of your network, but if you do so, all wireless devices connected to your router will lose their Internet connection until you reconnect them using the new network name and password.

To change your router's name and password:

Log into Linksys Smart Wi-Fi. (See ""How to connect to Linksys Smart Wi-Fi" on page 4.)

Under **Router Settings**, click **Wireless**.

Click the **Wireless** tab.

To change the network name, type a new name in the **Network name** box.

To change the network password, type a new password in the **Password** box.

Click **Apply** to apply your changes.

How to change your router's local access password

Your router's local access password was set when you ran the router's setup software, but you can change it at any time. You need the router password to change router settings when you don't have an Internet connection. When you do have an Internet connection, log into your Linksys Smart Wi-Fi account by following the directions under "How to connect to Linksys Smart Wi-Fi" on page 4.

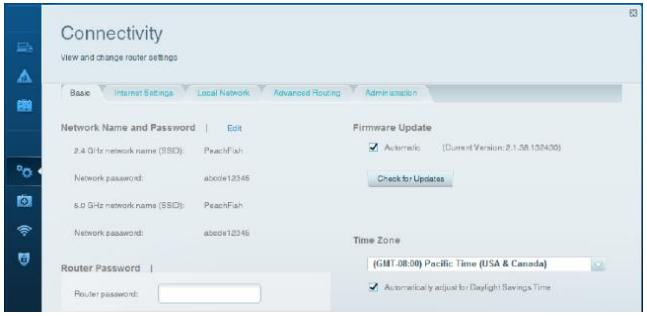
To change your router's local access password

Log into Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

Click **Connectivity** under *Router Settings*.

Click the **Basic** tab.

Click **Edit** next to **Router Password.** Type your current password, then the new password. Confirm the new password and click **Apply**.



How to change your router's time zone

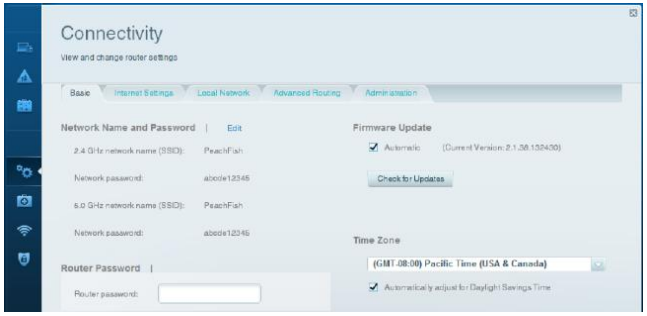
Your router's time zone should be set to your local time zone.

To set your router's time zone:

Log into Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

Click **Connectivity** under *Router Settings*.

Click the *Basic* tab, then select your time zone in the *Time Zone* drop-down list and click **Apply**.



How to test your Internet connection speed

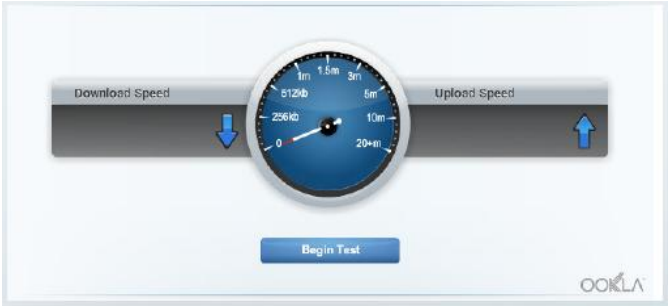
NOTE

To run the speed test, you must be accessing the Internet by using the router you are testing. You cannot run the speed test remotely.

To test your Internet connection speed

Log into Linksys Smart Wi-Fi. (See “How to connect to Linksys Smart Wi-Fi” on page 4.)

Click **Speed Test** under **Smart Wi-Fi Tools**. The *Speed Test* screen opens.



Click **Begin Test**. The test measures your download and upload speeds.

NOTE

Internet connection speeds are determined by a variety of factors, including ISP account type, local and worldwide Internet traffic, and number of devices in your home that are sharing the Internet connection.

Click **Restart Test** to run it again, and click **Show History** to display the results of past tests.

How to connect devices to your network

Your Linksys router is the nerve center of your home network. Your router safely opens the Internet to your network, and all of your computers and network devices rely on your router to pass files, media, and network commands in an organized, error-free way. Whether connected wirelessly or with cables, each part of your network needs the router in order to work reliably with the other parts of your network.

How to connect a computer to your network

At the computer you want to connect, enter your network's connection information into your wireless manager.

After that computer connects to your network, log in to Linksys Smart Wi-Fi, then click Device Listto confirm that your router recognizes the new computer. You can use the Network Map to monitor all network-attached devices.

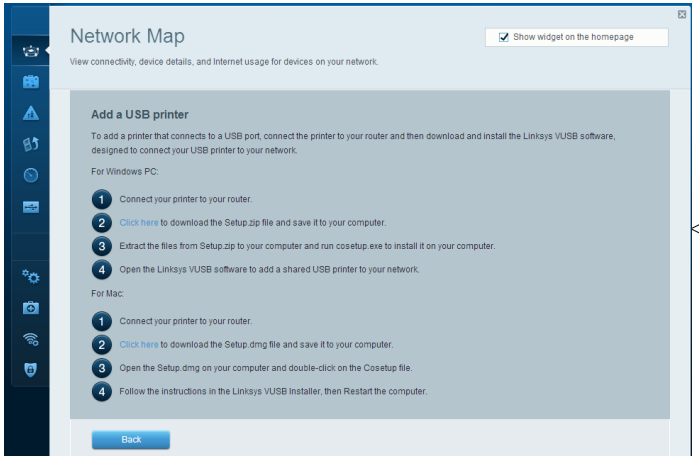
How to connect a USB printer

To connect a USB printer to your network through the router's USB port:

Log into Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

Click **Device List**, then click **Add a Device**.

Under *Select the type of device to add to your network*, click **USB Printer**. The *Add a USB printer* screen opens.



<AddUSBPrinter.png>

Follow the on-screen instructions for downloading and installing the VUSB (virtual USB) software for your computer.

To connect a wireless printer to your network:

Follow the printer's instructions to connect it to your network. Use the connection information available in Linksys Smart Wi-Fi.

After that printer connects to your network, log into Linksys Smart Wi-Fi, then click **Device List**to confirm that your router recognizes the new printer.

When you set up a wireless printer make sure that it supports the WPA/WPA2 wireless encryption standard.

If your wireless printer supports Wi-Fi Protected Setup, you should use Wi-Fi Protected Setup to connect the printer to your network. See "How to connect a network device using Wi-Fi Protected Setup" on page 9.

How to connect other devices

Many other types of wireless network devices can connect to your home network, including

Game consoles

Internet-capable TVs and media players

Digital music players

Smartphones

Because of the wide variety of devices and methods of connecting, you must manually enter network information into the devices for a successful network connection.

TIP
For more instructions on connecting a game console to your network,

see also:

“How to optimize your router for gaming and voice” on page 34

“How to set up port forwarding” on page 43

“How to set up port range triggering for online gaming” on page 41

How to manually connect a network device

To manually connect a device to your network:

Follow the device’s instructions to connect it to your network. Use the connection information available in Linksys Smart Wi-Fi.

After the device connects to your network, log into Linksys Smart Wi-Fi, then click **Network Map** to confirm that your router recognizes the new device.

How to connect a network device using Wi-Fi Protected Setup

To connect a device using Wi-Fi Protected Setup™:

Plug in and turn on the network device.

Under **Wireless**, click the **Wi-Fi Protected Setup** tab.

Use one of the following methods to complete the setup:

If the device has a Wi-Fi Protected Setup button, press that button, then click the **Wi-Fi Protected Setup** button in Linksys Smart Wi-Fi or press the button on the side of your router.

If the device has a Wi-Fi Protected Setup PIN, type that number into the **Device PIN** box in Linksys Smart Wi-Fi, then click **Register**.

If the device’s own setup asks for the router’s Wi-Fi Protected Setup PIN, enter the number that appears under *Router PIN* in Linksys Smart Wi-Fi.

How to view device details

You can use Linksys Smart Wi-Fi to view any network device's network information. Use the *Filter map* drop-down menu to choose device type and connection type you would like displayed in the Device List.

To view network device details:

Log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4

Under **Smart Wi-Fi Tools**, click **Device List**. The *Device List* screen opens.

Click a device.

Information about the device appears on the screen.

Click **OK**.

How to set up parental controls

With your router, you can use parental controls to do the following:

Set the times that Internet access is allowed.

Block websites that you specify, or based on their content.

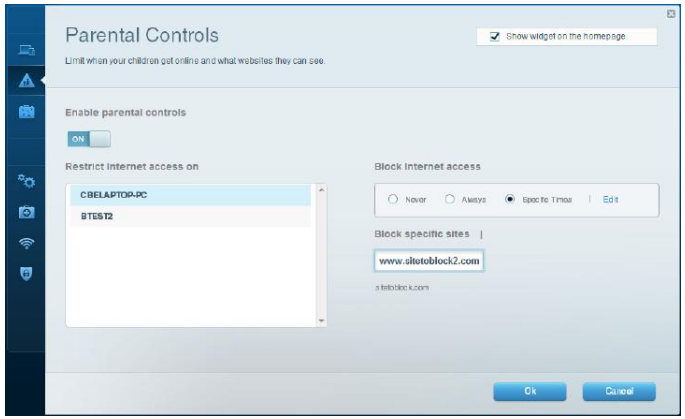
Set the above restrictions for specific computers.

TIP
When someone tries to open a blocked website, a Linksys Smart Wi-Fi login page appears. To view the blocked content, you must log in to your Linksys Smart Wi-Fi account and change the parental control restrictions.

How to set parental controls

Log in to Linksys Smart Wi-Fi. (See “How to connect to Linksys Smart Wi-Fi” on page 4.)

Under **Smart Wi-Fi Tools**, click **Parental Controls**. The *Parental Controls* screen opens.



To turn on parental controls, slide the *Enable parental controls* switch so that "ON" is displayed.

TIP
It’s not necessary to set parental controls over each computer on your home network. You can set the controls on only those computers that children can access.

To select a computer to apply parental controls to, click the name of the computer in the *Restrict Internet access on* list.

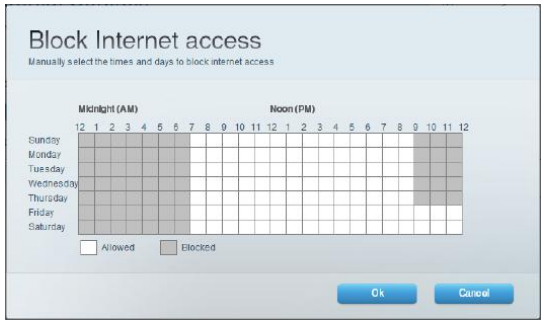
To block Internet access on the selected computer(s), under *Block Internet access*:

Click *Never* to allow Internet access.

Click *Always* to always block Internet access.

Click *Specific Times* to set the times when Internet access is allowed.

Click **Edit** to change the Internet access schedule. You can click and drag to select or deselect a block of time.



To block specific websites:

Under *Block specific sites*, click **Add**.

Type the web address (URL) of the website to block, then click **OK**. You can block up to 10 websites.

TIP
It's easier to copy and paste a web address than it is to type it in. Copy the address from your browser's web address box, then paste it into an available box in the *Block Specific Sites* screen of Linksys Smart Wi-Fi.

Click **OK** to apply any other changes to parental controls.

How to configure your guest networks

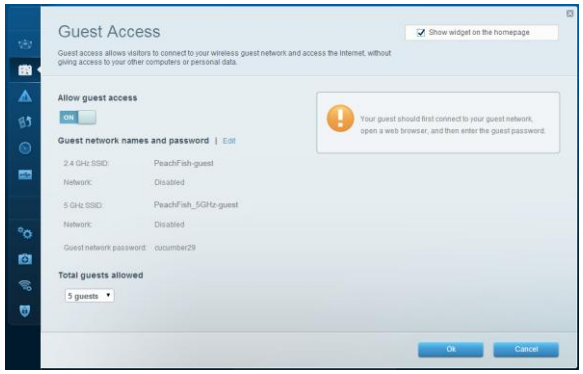
You can use your router's guest networks to provide your guests with access to the Internet, while restricting their access to other resources on your local network. To prevent unauthorized users from using your Internet access, your guest networks require a password be entered for Internet access. The guest networks are enabled by default.

Your wireless network's guest networks and passwords were set when you ran the router's setup software, but you can change them at any time.

To set up guest access to your networks:

Log into Linksys Smart Wi-Fi. (See ““How to connect to Linksys Smart Wi-Fi” on page 4.)

Under **Smart Wi-Fi Tools**, click **Guest Access**. Your guest networks, which were set up during your router installation, are displayed.



To turn guest access on or off, toggle the *Allow guest access* switch.

The guest network names are based on your 2.4 GHz and 5 GHz network names and are automatically generated.

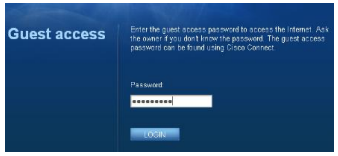
To change the guest network names and passwords, click *Edit* next to *Guest network names and password*. Type the new names and passwords.

To change the number of simultaneous guest network users you want to allow, click the drop-down box under *Total guests allowed*, then click the number that you want.

TIP
To keep your guest networks secure, click change the guest password when the guest no longer needs access to the account.

Click **OK** to apply your changes.

TIP
The first time your guest tries to access the Internet through a web browser, they will see the *Guest access* screen. To continue, they must enter the password you provided in the **Password** field, then click **Login**.



How to back up your router configuration

When you are done setting up your router, you should back up its settings so that you can restore them later if necessary. For instructions, see “How to back up and restore your router configuration” on page 36.

How to customize Linksys Smart Wi-Fi

You can customize your Linksys Smart Wi-Fi home page by adding or removing widgets. Widgets are miniature versions of menus that let you change basic settings or check the status of your network.

Using widgets

To add a widget:

Log into Linksys Smart Wi-Fi. (See “How to connect to Linksys Smart Wi-Fi” on page 7.)

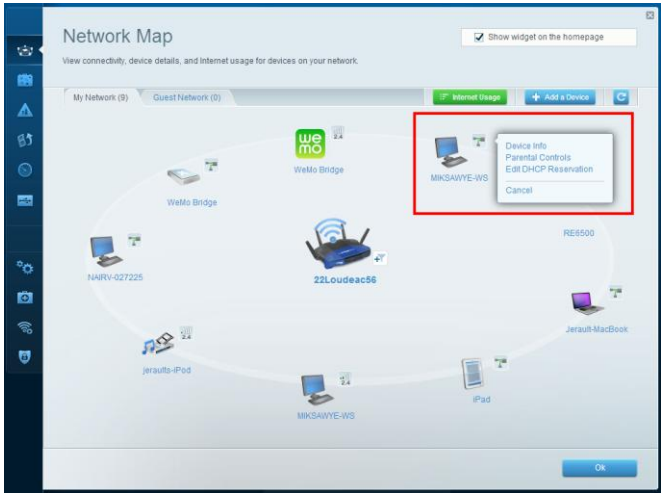
Open a menu, then select **Show widget on the homepage** in the upper-right corner.

To remove a widget:

On the home page, click the × in the upper-right corner of the widget you want to remove, or open a menu, then deselect **Show widget on the homepage** in the upper-right corner.

Customizing the Device List

You can change the icon and name of each device on your network.



1. To change the name
    a. Click on the device.
    b. Click on Edit in the upper right corner
    c. Type in a new name

2. To change the icon
    a. Click on the device
    b. Click on Change under the current icon
    c. Choose a new icon from the available options

Clearing the Device List

The Clear Device List button will clear all device information and reboot the router. This will temporarily disconnect devices from your network as the router reboots. When devices automatically reconnect, they will reappear in the Device List. Linksys Smart Wi-Fi will keep customized names and icons when devices are re-identified on the network.

Using an External Drive

Overview

You can attach most USB drives (including a thumb drive or a high-capacity external drive) to the USB port on your router. You can then use the drive as networked storage, as a media server (for media-enabled devices such as a networked TV), and as an FTP (File Transfer Protocol) server. You can also specify which users can access the content on the drive. Menus are subject to change.

How to attach a USB drive

If a USB drive is already connected to the router, and you want to attach a different drive to that USB port, you should safely disconnect the old drive first.

To safely remove a USB drive from the router:

Log into Linksys Smart Wi-Fi, then click **External Storage** under **Apps**.

In the *Status* tab, click *Safely remove drive*.

Disconnect the old drive from the router.

To attach a USB drive to the router:

Connect the USB drive to an available USB port on the back of your router. Your router will detect the drive.

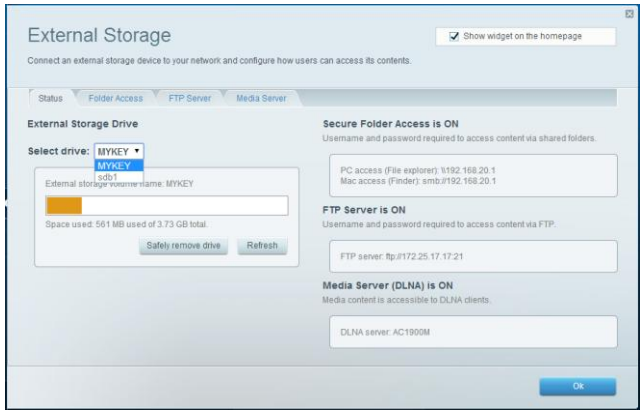
To update the *External Storage* screen, you may need to click **Refresh**.

To view the status and settings of your attached drive:

Log into Linksys Smart Wi-Fi. (See “How to connect to Linksys Smart Wi-Fi” on page 4.)

Click **External Storage** under **Apps**. The *Status* tab displays information such as the following:

- Drive capacity and use
- Secure folder access status
- Addresses for accessing shared folders, the FTP server, and media server



How to use secured folder access

Why would I need to use secured folder access? By default, when you connect a USB drive to your router, the entire contents of the drive are available for read and write access to anyone on your local network (no login credentials are required). However, you can also make the drive and its folders secure, so that only authorized users can access the drive's contents.

TIP

When Secure Folder Access is on, the entire USB drive is secured.

How to set up authorized users and shared folders

To enable access to shared folders:

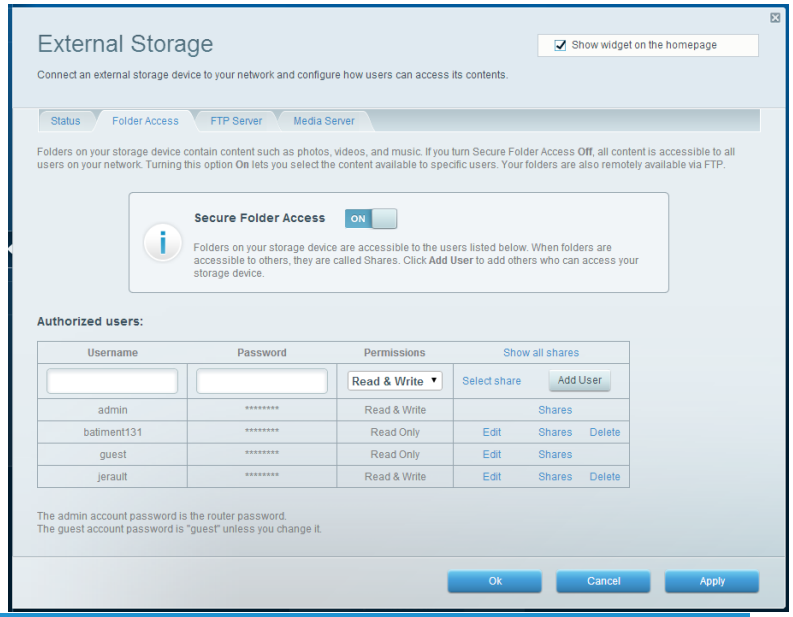
Log in to Linksys Smart Wi-Fi. (See “How to connect to Linksys Smart Wi-Fi” on page 4.)

Click **External Storage** under *Smart Wi-Fi Tools*, then click the *Folder Access* tab.

Click the setting for *Secure Folder Access* to turn it on.

The *Authorized users* list appears.

In the *Authorized users* list, type a Username and Password for each new user.



TIP

Two accounts, *Admin* and *Guest*, are already set up and cannot be deleted.

Select the permissions to give the user.

Read Only lets the user read (open) the file.

Read & Write lets the user read, rename, overwrite, or delete the file. The user can also save new files to the folder.

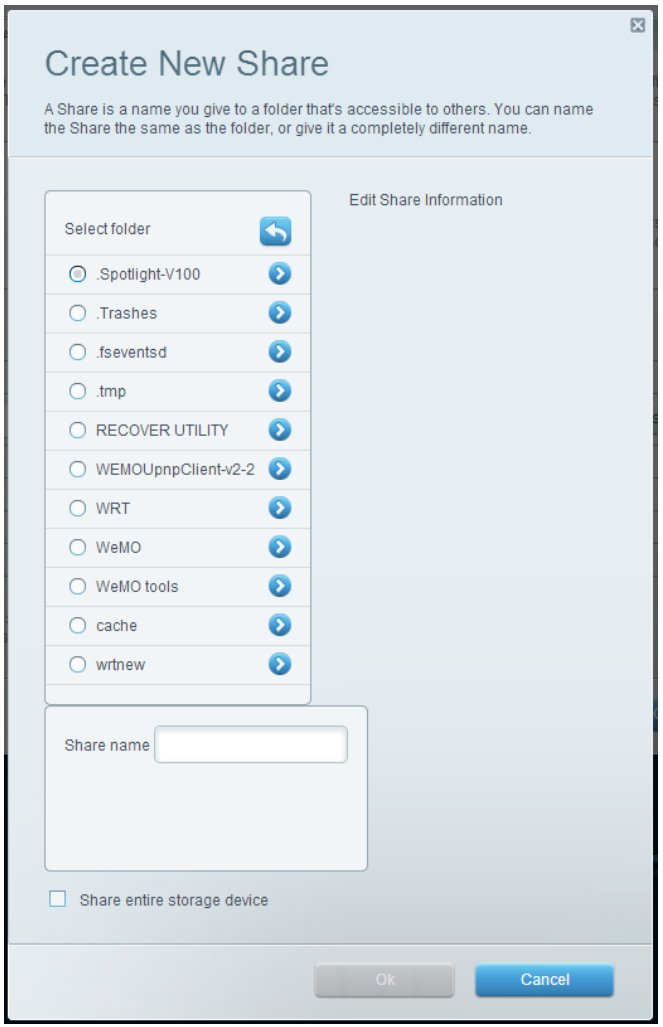
Click **Select Share**. The *Select Existing Share* dialog box opens.

If you already have the shared folder set up:

Select the check box next to each share you want to grant access to, then click **OK**.

If you need to set up the shared folder:

Click the + button next to *Create new share*. The *Create New Share* dialog box opens.



Click the button next to the folder that you want to share.

To view subfolders, click the icon next to the folder name.

To return to a parent folder, click the icon at the top of the list.

To select the entire drive, select *Share entire storage device*.

TIPS

The share name automatically changes to the name of the folder

you selected.
You cannot select more than one folder for each share.

To use a different share name, type the name in the *Share name* field.

Click **OK**.

Select the check box next to each share you want to grant access to, then click **OK**.

Click **Add User**.

In the *Authorized users* list, you can also:

Click **Edit** to change a user's credentials.

Click **Shares** to change the shares that a user can access.

Click **Delete** to delete the user account.

How to access shared folders

To access shared folders while on your network:

While in Linksys Smart Wi-Fi, click **External Storage** under **Apps**.

In the *Status* tab, note the information under *Smart Wi-Fi Tools*. This is the address you will need to access the shared folders from a file manager.

Enter the access address into your file manager.

TIP
You can also usually locate the folder by browsing through your computer's file manager.

Enter your user account name and password. The drive's contents (files and folders) appear in a window.

Use the file manager to open, copy, or view the folder's contents.

TIPS
File managers display content in many ways, but you can usually use these common actions to navigate through folders:

Click or double-click a folder name to open it.

Click, double-click, or right-click a file to open, copy, or view it.
Drag a file from another window and drop it into the shared folder's window to copy it to the shared folder. (To copy a file to the shared folder, your user account must have write access.)

How to set up your router as a media server

A media server lets you share media content across your network. Your router can act as a media server if it has a USB drive attached and if you have UPnP AV (Audio and Video)-enabled or DLNA (Digital Living Network Alliance)-certified devices in your home. Examples of UPnP AV-enabled devices include digital media players, gaming consoles with a built-in media player, and digital picture frames.

For example, if you have a digital media adapter that sends content to your entertainment system, and if your router's set up as a media server, then the digital media adapter can access your router's attached USB drive.

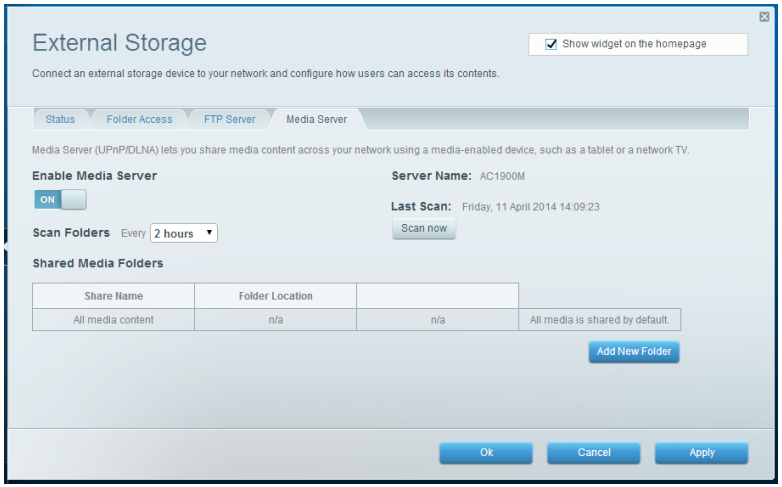
You can specify which folders are used by the media server, add and delete folders, and specify how often the folders are scanned for new content.

To configure your router as a media server:

Log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

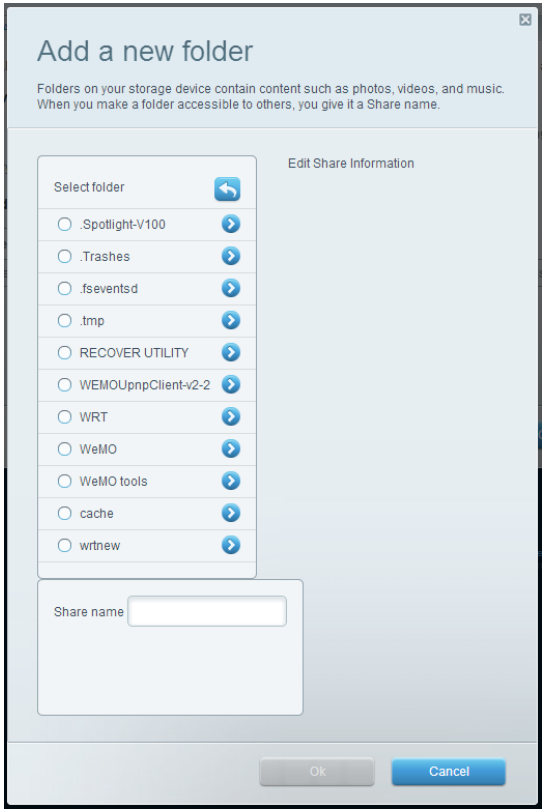
Click **External Storage** under *Smart Wi-Fi Tools*. The *External Storage* screen opens.

Click the *Media Server* tab.



Toggle the switch for *Enable Media Server* to turn it on.

Click **Add New Folder**. The *Add a new folder* dialog box opens.



Click the button next to the folder that you want to share, then click **OK**.

To view subfolders, click the icon next to the folder name.

To return to a parent folder, click the icon at the top of the list.

TIPS

The share name automatically changes to the name of the folder you selected.

You cannot select more than one folder at a time.

Click **OK or Apply** again to save changes.

How to connect your UPnP device to the media server

After you set up your router's media server, you need to connect a UPnP-compatible device (such as a UPnP-compatible game console or digital media player) to the network so that you can play the media server's content.

To connect an UPnP device to your router's media server:

Connect your UPnP device to your home network with wired (Ethernet cable) or wireless networking. If you are connecting wirelessly, you need to know your network's name and password. See your device's documentation for help.

On your UPnP device, change the media source to the media server name you specified on your router. (See "How to set up your router as a media server" on page 15.)

See your UPnP device's documentation for help with playing media on the device.

How to remotely access storage

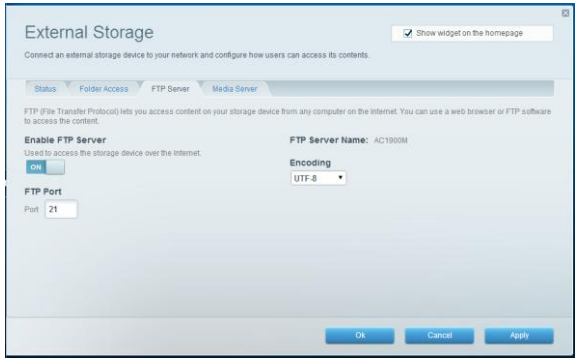
After you enable the router's FTP (File Transfer Protocol) server, you can access the attached drive's files from anywhere by using either a web browser or FTP software.

To set up the FTP server:

Log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4)

Click **External Storage** under *Smart Wi-Fi Tools*. The *External Storage* screen opens.

Click the *FTP Server* tab.



Toggle the switch for *Enable FTP Server* to turn it on.

We recommend that you keep the default settings for *FTP Port* and *Encoding*, unless you are an advanced user and have reason to change them.

Click **Apply**.

Click the *Status* tab.

Note the information under *FTP Server*. This is the information you will need to access the attached storage remotely.

Be sure to use Secure Folder Access with FTP. If left unsecured, users on the Internet may be able to add and delete files on the drive.

To access the attached storage using a web browser:

Open a web browser.

In the browser's address or URL field, type the address that was provided on the *Status* tab above, starting with ftp://... If you have *DDNS* (Dynamic Domain Name Service), you can use your router's domain name instead.

Enter your User Name and Password. This is the same User Name and Password that were set up in the shared folders *Authorized users* list. See "How to set up authorized users and shared folders" on page 13.

The drive's contents (files and folders) appear in a browser window.

Click a file to download it to your computer, or click and drag a file from your computer's file manager to the browser window to upload a file (only if you have read and write access).

To access the attached storage using FTP client software:

Run your FTP client software.

Refer to the software's help to determine how to connect to an FTP site with the following information:

The address that was provided on the *Status* tab above, starting with **ftp://**... If you have *DDNS* (Dynamic Domain Name Service), you can use your router's domain name instead.

The User Name and Password that were set up in the shared folders *Authorized users* list. See "How to set up authorized users and shared folders" on page 13.

The port and encoding specified during your FTP server setup (usually port 21, and UTF-8 encoding)

Refer to the software's help to determine how to download and upload files.

TIPS

FTP software and web browsers display FTP content in many ways, but you can usually use these common actions to navigate through FTP folders:

- Click a folder name to open it.
- Click a double period (..) or **Up to a higher level directory** to open a parent folder.
- Click or right-click a file to download or view it.
- Drag a file from another window and drop it into the FTP window to upload it. (To upload a file, your user account must have write access.)

Setting Up: Advanced

How to manually set up your router

Although running your router's setup software is the easiest way to set up and maintain your router, advanced users may want to manually configure their router. Be careful when changing settings using this method.

To manually set up your router:

Plug in your router.

To connect to your router with a cable:

Connect an Ethernet cable to the computer and to an available numbered **Ethernet** (blue) port on the back of your router.

Type linksyssmartwifi.com into a browser.

Disconnect the cable from the router's **Internet** port.

Click **I have read and accepted the License Terms for using this software**, read the license agreement, then select the checkbox.

Select **I want to skip Setup and configure my router manually**, and click **Next**. (If you do not have an Internet connection, click Login in the bottom-right of the next page and enter "admin" in the Access Router field.

To connect to your router wirelessly:

Make sure that your computer's wireless networking is turned on,

Connect to the secure wireless name shown in the *Quick Start Guide* that came with your router. (You can change the network name and password later.) If you need help connecting to the network, refer to your device documentation.

Open a web browser on the computer and go to 192.168.1.

If you have a Linksys Smart Wi-Fi account, enter your credentials. Create an account if you haven't already done so. Click **Sign In**.

Enter your router admin password. The default is "admin". Click **Sign In** and configure your router settings.

After you finish changing settings, click **Save** and close the browser window.

TIP

For descriptions of the settings, click **Help** at the top of the screen.

How to manually set up your Internet connection

Running Setup configures your router's Internet connection. However, for some *ISPs* (Internet Service Providers), especially those outside of the United States, you may need to manually configure your router's Internet connection.

How to configure basic Internet connection settings

Connect to your router and log in using the instructions under "How to manually set up your router" on this page.

Under *Router Settings*, click **Connectivity**. The *Connectivity* page will open to the *Basic* tab. Choose the *Internet Settings* tab.

IPv6 Internet connection settings

IPv6 is a new IP protocol that uses simplified packet headers and requires IPSec. It also has improved support for mobile IP and computing devices.

NOTE
To use your router's IPv6 Internet connection settings, IPv6 service from your ISP (Internet service provider) is required. For more information on this service, ask your ISP.

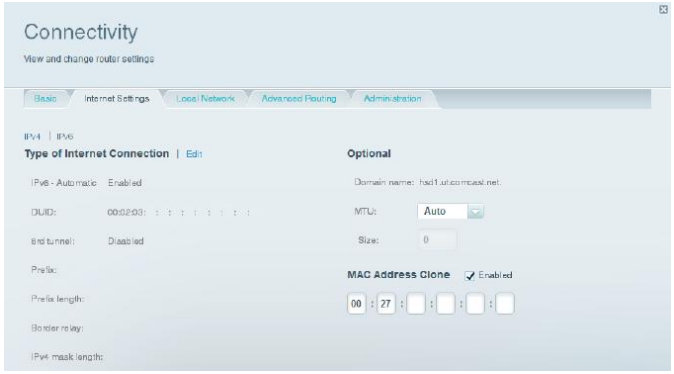
To manually configure your router's IPv6 settings:

Use an Ethernet cable to connect your router to your computer.

Log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

Under *Router Settings*, click **Connectivity**. The *Connectivity* page opens.

Click the *Internet Settings* tab, and click *IPv6*.



Click **Edit**. You can now change the following settings:

IPv6 - Automatic—Select *Enabled* to use IPv6 for all network addressing.

DUID (device user ID)**—**Used by DHCP to identify network clients.

6rd Tunnel—Allows your router to send IPv6 IP addresses over IPv4 networks. To enable this option, IPv6 - Automatic must be unselected. To let your router handle the 6rd Tunnel settings (such as prefixes and address masks), change the 6rd tunnel setting to *Automatic*. Select *Manual* to change these settings manually.

Prefix—Enter the prefix address used for the tunnel provided by your ISP.

Prefix Length—Enter the prefix length used for the tunnel provided by your ISP.

Border Relay—Enter the border relay address used for the tunnel provided by your ISP.

IPv4 mask length—Enter the IPv4 address mask length used for the tunnel provided by your ISP.

Click **Ok**.

How to associate multiple routers with your Linksys Smart Wi-Fi account

To associate an additional router to your Linksys Smart Wi-Fi account:

Run Setup for the additional router. When Setup is complete, you will be prompted to create a new Linksys Smart Wi-Fi account.

Instead of creating a new account, click **Sign In** at the bottom of the screen. You are prompted to enter your account username (e-mail address) and password.

Enter your original Linksys Smart Wi-Fi account username and password, and click **Sign In**. The router will be added to your Linksys Smart Wi-Fi account.

To configure the new router, log in to Linksys Smart Wi-Fi, then select the router's SSID (network name) from the drop-down list at the top of the screen.

How to get the most out of your dual-band router

The most common reason people purchase dual-band routers is to ensure available bandwidth for streaming high-definition video. Users also want to make sure that their video streams won't be interrupted by other wireless network traffic. To get the most out of your dual-band router, you should upgrade your wireless clients and split your traffic.

Upgrade your wireless clients

If you have network adapters that support only legacy wireless network standards such as 802.11b, you should consider upgrading them with Wireless-N (802.11n) network adapters. Wireless-B (802.11b) devices can slow your entire wireless network. For the best performance, all of your wireless devices should support Wireless-N. You can then select *Wireless-N Only* as your Network Mode below.

NOTE
If you select *Wireless-N Only*, you may need to temporarily change your network settings to Mixed to provide access to guests without Wireless-N networking.

Split your traffic

The best way to improve your multimedia wireless performance is to split your wireless traffic between your router's bands (ranges of radio frequencies). Your router supports the 2.4 GHz band and the 5 GHz band, and handles the two bands as two separate wireless networks to manage the traffic.

The most common way to split wireless traffic is to use the 2.4 GHz band for basic Internet tasks such as web browsing, email, and downloads, and use the 5 GHz band for streaming multimedia.

Although the 2.4 GHz band may be more crowded with wireless traffic from your neighbors, it's fine for basic Internet traffic that is not time-sensitive such as e-mail. Even though you are connected to your own wireless network, you are still sharing air time with nearby networks. The 5 GHz band is much less crowded than the 2.4 GHz band, so it's ideal for streaming multimedia. The 5 GHz band has more available channels, so it is more likely that you will have your own, interference-free channel for your wireless network.

By default, your dual-band router uses the same network name on both the 2.4 GHz band and the 5 GHz band. The easiest way to segment your traffic is to rename one of your wireless networks. With a separate, descriptive name, it will be easy to connect to the right network.

How to control access to your network

By default, setup enables industry-standard WPA2 (Wi-Fi Protected Access 2) security.

If you choose not to use the built-in security features of your router, you can still control access to your wireless network using MAC filtering. Every network device has a unique, 12-digit MAC (Media Access Control) address. Using MAC filtering, you can allow only known MAC addresses, and therefore known devices, onto your network. You can also exclude specific MAC addresses, denying them access to your network.

TIP
MAC filtering is not strong security. The best way to secure your network is to use the router's WPA2 security setting.

Example: Because each MAC filtering configuration is unique, this simplified example shows how to set up MAC filtering to allow only one device access to the network.

TIP
It is easier to select **Allow** to permit only known devices than to try to Deny (exclude) unknown devices.

To set up MAC filtering to allow one device access to your network:

Log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

Under *Router Settings*, click *Wireless*. The Wireless page will open.

Click the *MAC Filtering* tab.

Select *Enabled* next to MAC Filters. Click **Yes** when asked whether you want to continue. Select *Allow access for ONLY the listed MAC addresses*.

Click **Add MAC Address**. Enter the MAC address into the *MAC Filter List* and click **Apply**.

How to improve security using the built-in firewall

By default, the firewall settings in your router work well in most home environments. You don't need to make changes. The SPI (Stateful Packet Inspection) firewall is enabled by default, and anonymous Internet requests and IDENT requests are filtered by default. All web filters are disabled, because enabling them may cause problems for sites that depend on ActiveX controls, Java, or cookies.

If you decide to change your firewall settings, log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 7.) Under *Router Settings*, click *Security*. The *Security* page will open to the *Firewall* tab.

You can now change the following settings:

TIP
For more descriptions of each setting, click **Help** at the top of the screen.

Firewall: SPI firewall protection—This helps protect your local network from Internet threats. This option is enabled by default. This setting is separated into IPv6 and IPv4 options so that each can be handled separately.

CAUTION
To help protect your network, you should keep this option enabled.

VPN Passthrough:

IPSec Passthrough – IPSec (Internet Protocol Security) is a suite of protocols used to implement secure exchange of packets at the IP layer. The VPN clients on the local network can establish an IPSec VPN tunnel through the router. This option is enabled by default.

PPTP Passthrough – PPTP (Point-to-Point Tunneling Protocol) allows the PPP (Point-to-Point Protocol) to be tunneled through an IP network. The VPN clients on the local network can establish a PPTP VPN tunnel through the router. This option is enabled by default.

L2TP Passthrough – *L2TP* (Layer 2 Tunneling Protocol) enables point-to-point sessions using the Internet on the Layer 2 level. The VPN clients on the local network can establish an L2TP VPN tunnel through the router. This option is enabled by default.

Internet filters:

Filter anonymous Internet requests—This filter blocks Internet requests from unknown sources such as ping requests. This option is enabled by default.

Filter multicast—Multicasting allows a single transmission to simultaneously reach specific recipients within your local network. Select this option to block multicasting. This option is disabled by default.

Filter Internet NAT redirection—This filter prevents a local computer from using a URL or Internet IP address to access the local server. Select this option to enable the filter. This option is disabled by default. On some router models, this setting applies to IPv4 Internet only.

Filter ident (Port 133)—This filter prevents port 133 from being scanned by devices from the Internet. This option is enabled by default.

Click **Save**.

Changing IPv6 firewall settings

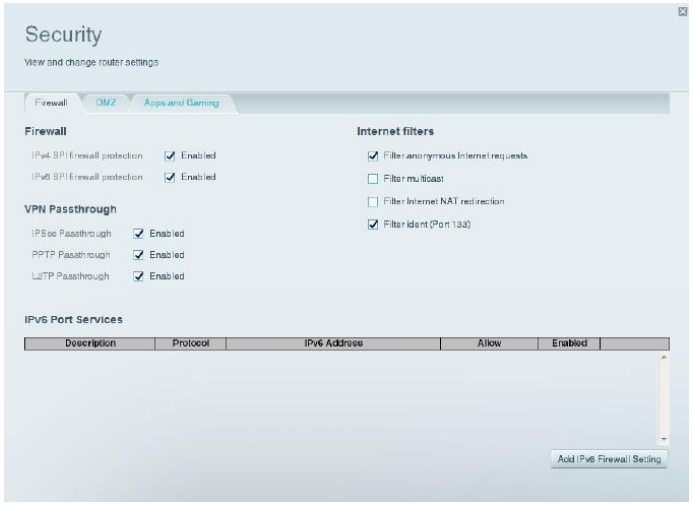
The IPv6 firewall lets you customize IPv6 port services for applications. When users send these types of requests to your network via the Internet, the router will allow those requests to the appropriate computers.

NOTE
To use your router's IPv6 Internet connection settings, IPv6 service from your ISP (Internet service provider) is required. For more information on this service, ask your ISP.

To set IPv6 firewall settings, do the following:

Log in to Linksys Smart Wi-Fi. (See “How to connect to Linksys Smart Wi-Fi” on page 4.)

Under *Router Settings*, click *Security*. The *Security* page opens to the *Firewall* tab.



Click **Add IPv6 Firewall Setting**. You can now change the following fields:

Description—Enter a description of the application.

Protocol—Select *TCP*, *UDP*, or *Both* (default).

IPv6 Address—Enter the IPv6 address of the computer that should receive the traffic.

Allow—Select the range of port(s) used by incoming traffic.

Enable--Select to enable IPv6 Port Services

Click **Save**. The list will update to show the new settings.

To change a saved setting, click **Edit** next to the setting.

To delete a saved setting, click **Delete** next to the setting.

Click **Apply** before leaving the page to be sure the changes are saved.

How to set up the DHCP server on your router

Your router can be used as a DHCP (Dynamic Host Configuration Protocol) server to automatically assign an IP address to each computer or device on your network. The DHCP server is enabled by default. If you already have a DHCP server on your network, or if you do not want to use your router as a DHCP server, you should disable this setting.

To configure your router's DHCP server settings do the following:

Log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

Under *Router Settings*, click *Connectivity*.

Click the *Local Network* tab.

To disable the DHCP server, deselect the *Enabled* checkbox.

Leave the *Enabled* checkbox selected to edit the following settings:

- Start IP address
- Maximum number of users
- IP address range (not editable)
- Client lease time
- Static DNS values
- WINS

Click **Apply**.

How to set up DHCP reservations

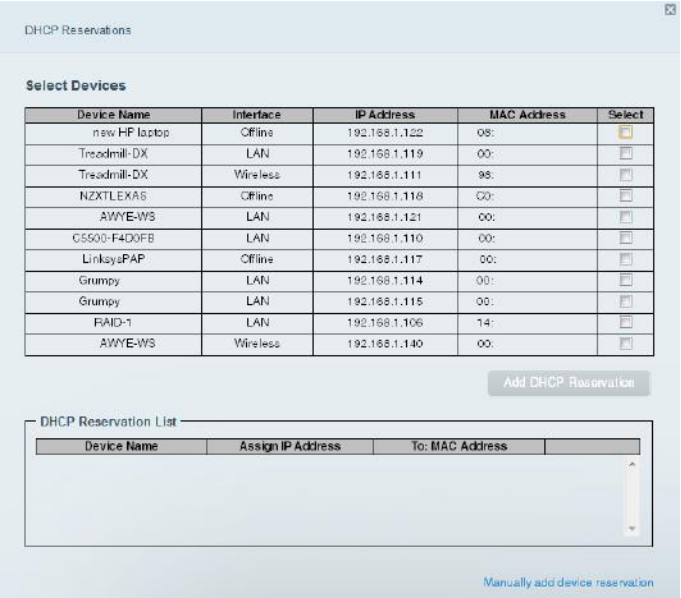
DHCP reservations allows you to assign a unique, fixed IP address to a specific device on your network. Assigning a fixed IP address is a good way to manage devices such as print servers, web cameras, network printers, and game consoles. A fixed IP address is also recommended if you want to use port forwarding for devices that need to receive inbound traffic from the Internet ("How to set up port forwarding" on page 33).

To configure DHCP reservations do the following:

Log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

Under *Router Settings*, click *Connectivity*.

Click the *Local Network* tab, and click **DHCP Reservations**. The *DHCP Reservations* list opens, which lists attached network devices and current DHCP reservations.



Click the Select checkbox next to the device you want to reserve, and click **Add DHCP Reservation**.

Click **Edit** to change the reservation details, or click **Delete** to delete the reservation.

Click **Ok**.

TIP
For field descriptions, click **Help** at the top of the screen.

How to access your network on the Internet

If you want to remotely access a drive attached to your router or view a web camera on your home network, you need to be able to easily enter your network's address into a web browser.

Working with a DDNS (Dynamic Domain Name System) service provider, your router's DDNS feature lets you configure a domain name for your network, which you can then use to easily find your network on the Internet. If your ISP changes your network's IP address (which can happen frequently), the DDNS service providers detect the address change and continue to route your domain name to that address.

TIP
Before you configure DDNS on your router, you must sign up for DDNS service from a DDNS service provider that's supported by your

router.

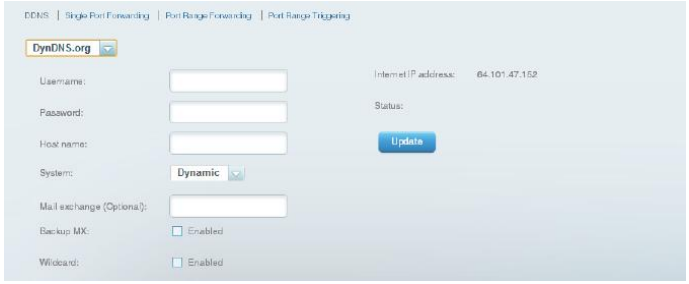
To set up DDNS:

Sign up for DDNS service at either **www.dyndns.org** or **www.tzo.com**. Note all of the information provided to you by the DDNS provider.

Log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

Under *Router Settings*, click *Security*, then click the *Apps and Gaming* tab. The *DDNS* screen opens.

In the *Select a* provider drop-down list under the *DDNS* header, select your DDNS service provider.



Complete the fields with information provided by your DDNS provider, then click **Ok**.

To access the network from the Internet, enter the domain name provided by the DDNS service provider.

To access one of your network devices on the Internet, do the following:

Configure the router to use port forwarding for the device (see "How to set up port forwarding for a single port" on page 33). Note the port number used for the device.

Enter the domain name for your network followed by a colon and the port number. Using a network camera as an example, if the domain name registered with your DDNS provider is *HappyBunny.linksysnet.com*, and your Internet camera has been configured to use port 1024, you would enter: **HappyBunny.linksysnet.com:1024**

How to clone a MAC address

On any home network, each network device has a unique MAC (Media Access Control) address. Some ISPs register the MAC address of the device (usually a router or a computer) connected directly to the modem. If your computer's MAC address is registered with your ISP and you do not want to re-register the MAC address, then you can clone the address (assign the registered MAC address of your previous device to your new router). If you want to use the MAC address from an old router that you are replacing with your new router, you should first determine the MAC address of your old router, then manually enter it into your new router.

NOTE

For many ISPs that provide dynamic IP addresses automatically, the stored MAC address in the modem is reset each time you reset the

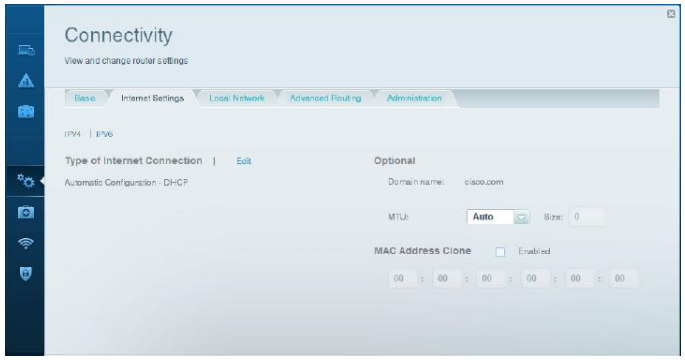
modem. If you are installing this router for the first time, reset your modem before connecting the router to your modem. To reset your modem, disconnect power for about one minute, and reconnect power.

To clone a MAC address from your computer, do the following:

Log into Linksys Smart Wi-Fi. (See “How to connect to Linksys Smart Wi-Fi” on page 4.)

Under *Router Settings*, click *Connectivity*. The *Connectivity* page opens.

Click the *Internet Settings* tab.



Beside *MAC Address Clone*, click **Enabled**.

Enter the 12-digit MAC address of your old router, then click **Ok**.

How to connect to your corporate office using a VPN

A VPN (Virtual Private Network) uses a public network such as the Internet to provide secure communications between a remote computer and another network. Corporations often provide VPN access to their networks to enable employees to work from remote offices or while traveling. Most corporate VPNs use the Internet.

For a typical VPN, the corporation installs a VPN gateway on their corporate network. Employees authorized to work remotely connect to the VPN gateway through the Internet using VPN software and security methods provided by their employers. Security and authentication requirements ensure a secure connection and access by only authorized users.

The default VPN settings in your router have been configured to pass through (allow) the most common types of VPN protocols. Usually, no changes are needed.

To change your VPN passthrough settings, do the following:

Log into Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

Under *Router Settings*, click *Security*. The *Security* page opens to the *Firewall* tab.

Enable each setting that you want to change.

IPSec Passthrough – *IPSec* (Internet Protocol Security) is a suite of protocols used to implement secure exchange of packets at the IP layer. The VPN clients on the local network can establish an IPSec VPN tunnel through the router. This option is enabled by default.

PPTP Passthrough – *PPTP* (Point-to-Point Tunneling Protocol) allows the *PPP* (Point-to-Point Protocol) to be tunneled through an IP network. The VPN clients on the local network can establish a PPTP VPN tunnel through the router. This option is enabled by default.

L2TP Passthrough – *L2TP* (Layer 2 Tunneling Protocol) enables point-to-point sessions using the Internet on the Layer 2 level. The VPN clients on the local network can establish an L2TP VPN tunnel through the router. This option is enabled by default.

Click **Ok** to save your changes.

How to optimize your router for gaming and voice

Your router can prioritize traffic between your network and the Internet. Performance for demanding, real-time applications, such as online gaming, VoIP calls, video streaming, and videoconferencing, can be improved by configuring media prioritization.

Prioritization settings are applied only to traffic that is uploaded to the Internet. The router cannot control the quality of the traffic after it reaches the Internet.

TIP
For more information on optimizing your router for online gaming, see "Port Forwarding and Port Triggering" on page 33.

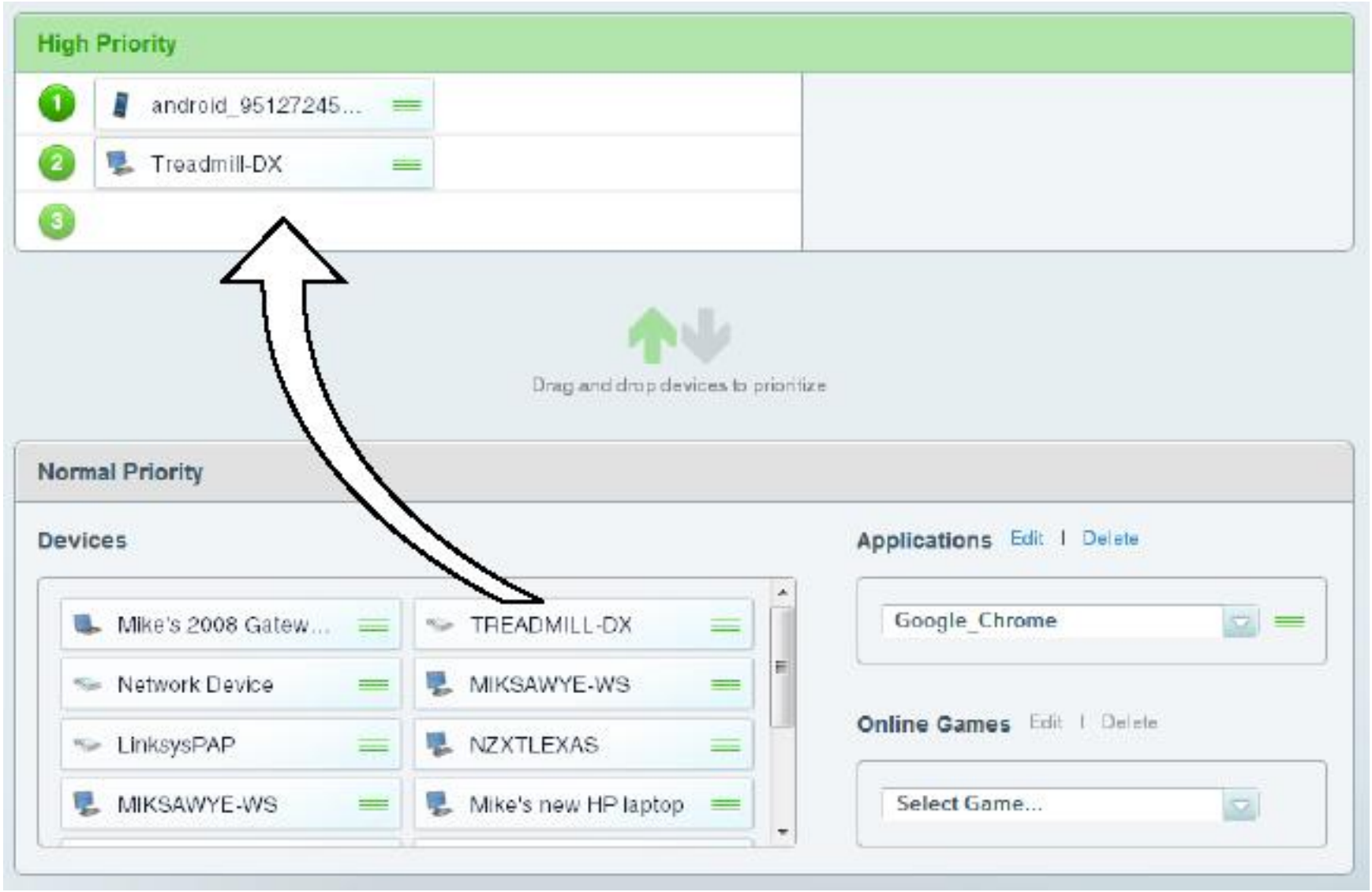
To configure media prioritization, do the following:

Log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

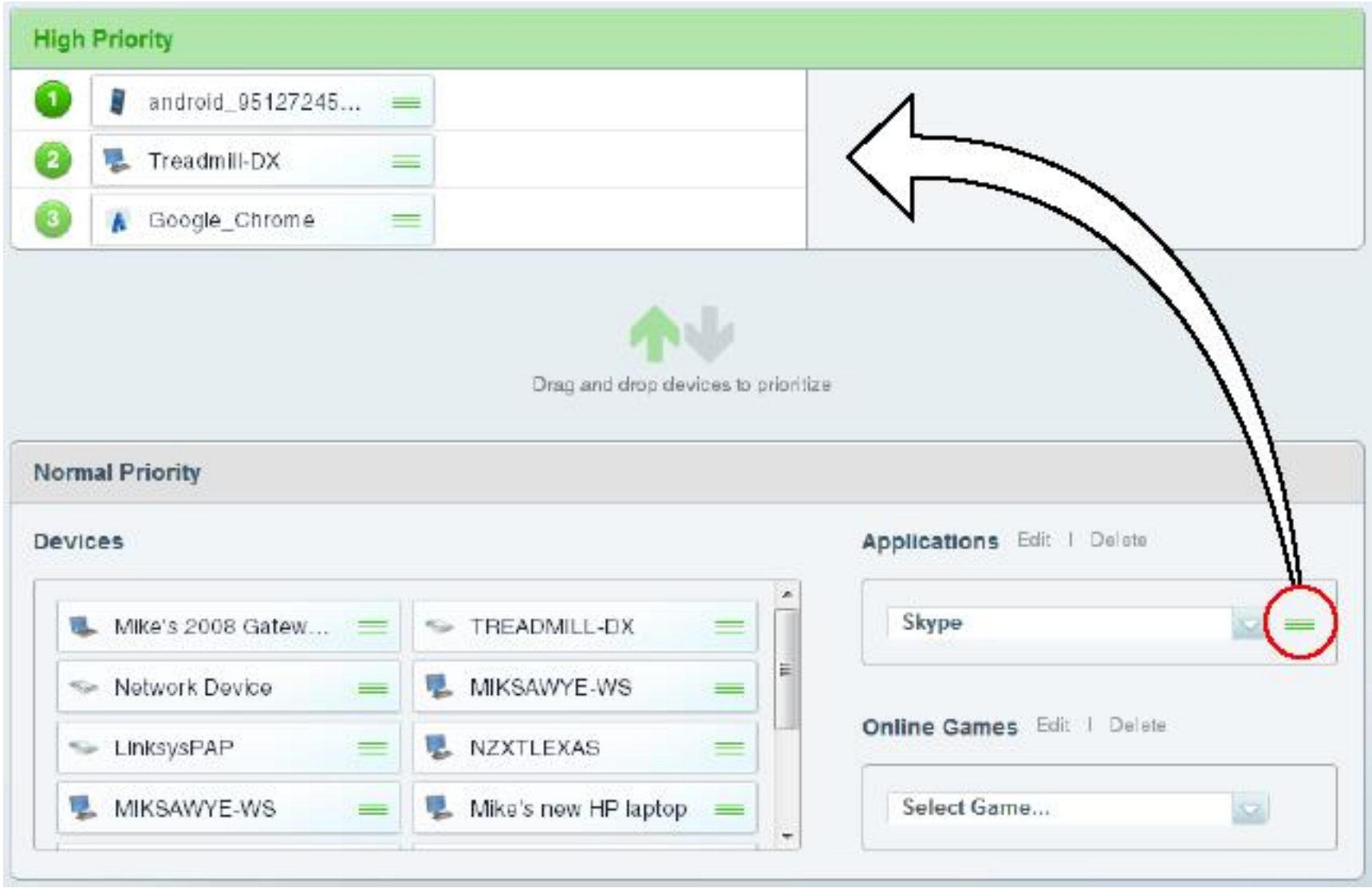
Under *Smart Wi-Fi Tools*, click *Media Prioritization*. The *Media Prioritization* screen opens.

Turn on **Prioritization** if it is not already on.

Click and drag high-priority devices from the *Normal Priority* list to the *High Priority* list.



To prioritize an application or game, select the name in the drop-down list, then click and drag the icon next to the name to the **High Priority** list.



If the application name isn't listed, click **Add a New Application…** at the bottom of the drop-down menu, and add the name.

TIP
If you want to add a new application or game, you need to know its port and protocol information (see the application or game's documentation for help).

Click *Settings*. The *Settings* screen opens.

Set the maximum Downstream Bandwidth. If you set the bandwidth lower than the actual bandwidth of your router, performance may be limited.

Set the maximum Upstream Bandwidth.

To help manage traffic priority with devices that support WMM, turn on WMM Support.

TIP
WMM (Wi-Fi MultiMedia) Support is a wireless feature based on the IEEE 802.11e standard. WMM improves quality for audio, video, and voice applications by prioritizing wireless traffic. This feature requires that the wireless client devices in your network also support WMM.

To have the router resend data if an error occurs, turn off No Acknowledgement**.**

CAUTION
If you specify a maximum bandwidth that is too high, the router cannot apply priorities correctly, and prioritization problems may result.

Click **Ok**.

How to enable Voice over IP on your network

VoIP (Voice over Internet Protocol) is a technology for using the Internet as an interface for telephone communications. To use VoIP, you need to get an account with a VoIP service provider. The VoIP service provider typically provides you with a telephone adapter that connects to your network. If you do not use your network to make phone calls, you don’t need to change the default settings.

The Application Layer Gateway SIP (Session Initiation Protocol) allows SIP packets, used by some VOIP service providers, to get through your router’s firewall.

To configure the router for VoIP, do the following:

Log in to Linksys Smart Wi-Fi. (See “How to connect to Linksys Smart Wi-Fi” on page 4.)

Under *Router Settings*, click *Connectivity*, then click the *Administration* tab.

If your VoIP service uses SIP, select the SIP checkbox under *Application Layer Gateway*.

– OR –

If your VoIP service uses other NAT traversal solutions such as STUN (Session Traversal Utilities for NAT), TURN (Traversal Using Relay NAT), or ICE (Interactive Connectivity Establishment), deselect the SIP checkbox.

NOTE
You may need to contact your VoIP service provider to determine the type of NAT traversal configuration they use.

How to configure UPnP

UPnP (Universal Plug and Play) allows devices connected to a network to discover each other and automatically create working configurations. Examples of UPnP-capable devices include web cameras, online gaming applications, and VoIP devices. UPnP is enabled by default.

To configure UPnP, do the following:

Log in to Linksys Smart Wi-Fi. (See “How to connect to Linksys Smart Wi-Fi” on page 4.)

Under *Router Settings*, click *Connectivity*, then click the *Administration* tab.

To use UPnP, select **Enabled** (default) next to *UPnP*.

To allow changing router settings while using UPnP, select *Allow Users to Configure*.

To prevent local network users from disabling your Internet connection through UPnP, deselect the *Allow users to disable Internet access* checkbox.

Click **Ok**.

How to use a router as an access point

If you have a large area to cover with your wireless signal, or if part of your home has weak signals due to interference, you can use this router to extend the range of your old router's wireless network.

To set up your new router as an access point, do the following:

Use a network cable to connect this router's Internet port to the Ethernet or LAN port on the router that is connected to your modem.

Log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

Under *Router Settings*, click *Connectivity*, then click the *Internet Settings* tab.

Click *IPv4*.

For **Type of Internet Connection**, select *Bridge Mode*.

Click **Obtain an IPv4 address automatically**, then click **Ok**. The new router's LAN IP address will be changed and obtained from the router that is connected to your modem.

You can also use your old router to extend the range of your wireless network. This is a complex process, so this procedure assumes that you have some networking knowledge.

TIP
Check the documentation for your old router. Some brands of routers include either a switch on the outside of the case or a software option to convert it to an access point. If either of these options is available, follow your old router's instructions to convert it to an access point.

You need to take note of your new router's settings, and apply some of those settings to the old router so it can work as an access point.

To view your new router's settings, do the following:

Make sure that your new router is connected to the Internet.

Log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

Under *Router Settings* click *Wireless.* Take note of the *Network name (SSID)*, *Password*, *Security mode*, and *Channel*.

Under *Router Settings*, click *Connectivity*, then click the *Local Network* tab. Take note of the DHCP server's IP address range (192.168.1.100 to 192.168.1.149 by default).

To use your old router as an access point, do the following:

With your computer connected to your old router, log into its browser-based administration utility.

NOTE
Save your changes by clicking Apply after finishing each step below.

Open the setup page for the local network (LAN).

In the *Router IP address* field, enter an unused IP address for the LAN network of your new router.

For example, if your new router has an IP address of 192.168.1.1, you should choose an IP address on the 192.168.1.0 network. You can choose any address within the range of 192.168.1.2 to 192.168.1.254. You should exclude addresses in the range that will be used by the DHCP Server of your new router (192.168.1.100 to 192.168.1.149). A safe choice might be 192.168.1.250. Take note of this address, because this will be the address that you will use to manage your old router in the future.

In the *Subnet Mask* field, enter "255.255.255.0" or, if available, select that subnet mask from a drop-down list.

Disable the DHCP server on your old router. (Because your old router will be operating as an access point instead of a router, you don't want it to distribute IP addresses. There should be only one active DHCP server on your network, and that should be your new router.)

To reconfigure the wireless network on your old router, do the following:

Open the wireless network setup page.

Change the network name (SSID) to match the name of your new network. Having the same network name and security settings enables you to seamlessly roam between your new router and your old router.

Change the security mode to match the security mode on your new router.

Change the password (sometimes called the pre-shared key) on your old router to match the password on your new router.

Change the wireless channel to a non-conflicting channel. Some manufacturers have an Auto function for channel selection that automatically selects a wireless channel that does not interfere with other nearby wireless networks. If your old router supports an Auto function, select that. Otherwise, you may need to manually select the wireless operating channel on your old router. In the 2.4 GHz wireless spectrum, there are only three non-overlapping channels: 1, 6, and 11. Pick a channel that does not overlap the operating channel of your new router. For example, if your new router is operating on channel 11, configure your old router for either channel 1 or channel 6.

Connect an Ethernet network cable to one of the LAN/Ethernet ports on your old router and an Ethernet port on your new router.

CAUTION
Do **not** connect the cable to the Internet port on your old router. If you do, you may not be able to set up the router as an access point on the current network.

How to put your new router behind an existing router

There are several reasons you might want to use your new router behind another router:

- You might be in an environment that shares the landlord's Internet connection with all tenants. In this case, you should put your own router behind the landlord's router in order to create your own private network and to isolate computers on your network from the rest of the building.
- You are sharing an office building Internet connection, and you want to control Internet access or the content viewed by your employees.
- You already have an existing network and you want to extend the network's range or add wireless capabilities to your network.
- You want to separate older, less secure network devices from the rest of the network.

To add your router to an existing router or gateway

In most cases, you can easily add your router to an existing wireless network by running Linksys Smart Wi-Fi. If you are unable to set up the additional router using the instructions below, see "To share an Internet connection" on page 29 or "To extend your network" on page 30.

To add your router to your existing wireless network, do the following:

1. Connect your router's Internet port to the LAN/Ethernet port on your existing (upstream) router or gateway.
2. Connect to the secure wireless name shown in the *Quick Start Guide* that came with your router. (You can change the network name and password later during router setup.) If you need help connecting to the network, refer to your device documentation. **Note**: You will not have Internet access until router setup is complete.
3. Open a web browser and follow the instructions to complete your router's setup. If instructions do not appear in the web browser, enter **linksyssmartwifi.com** in the browser's address bar.
4. At the end of setup, follow the on-screen instructions to set up your Linksys Smart Wi-Fi account.

NOTE:
As part of the router setup process, you will be sent a verification e-mail. From your home network, click the link in the e-mail to associate your router with the Linksys Smart Wi-Fi account. Make sure that the link opens in a supported web browser, such as Internet Explorer 8 or higher, Firefox 8 or higher, Google Chrome 10 or higher, and Safari 5 (for Mac) or higher.

To share an Internet connection

NOTE
This is a complex process, so this procedure assumes that you have some networking knowledge.

To add another router to share an Internet connection, do the following:

This topic covers cases one and two above

Determine the IP address range for your upstream (office or building) network.

To determine the address range by using a Windows computer:

Connect your computer to your upstream network's router.

Click **Start**, **Run**, type **CMD**, then click **OK**. The command prompt window appears.

Type "ipconfig," then press **Enter**.

TIP
Although you can determine your computer's IP address in many ways, this method is quick and relatively easy.

Take note of the IP address. In this example, the IP address is 192.168.100.192.

To determine the address range by using a Mac computer:

Connect your computer to your upstream network's router.

From the Dock, click **System preferences**, click **Network**, then click **Ethernet** in the window to the left. A network status window opens.

Take note of the IP address. In this example, the IP address is 192.168.100.139.

Example: The above examples show that upstream IP addresses are on the 192.168.100.0 network. (The "0" indicates the entire network.) Your upstream network's address may be different. The default address of your new Linksys router is 192.168.1.1. In setting up one router behind another, you must make sure that the local network on your new router is different than the network of your upstream router. In the above example, because the default local network on your Linksys router 192.168.1.0 is on a different subnet than the office network's 192.168.100.0, you will be able to place your Linksys router behind the other router.

Connect an Ethernet network cable to a LAN/Ethernet port on your upstream network to the yellow Internet port on your router.

CAUTION
Connect the upstream network to your router's yellow Internet port, **not** one of the blue Ethernet ports. If you connect to an Ethernet port, you create IP addressing problems for the office network.

TIPS

An office network often has a wall plate with an Ethernet port that you can connect to.

If you are doing this in a home environment (without wall ports), connect an Ethernet network cable between a LAN port on your upstream router and the Internet port on your Linksys router.

Run your router's browser-based setup on each computer that you want to connect to the Linksys router. Each computer needs either a wired or wireless connection to the Linksys router. For more information, see "How to connect a computer to your network" on page 7

The computers that are connected to the Linksys router are now on the same network, and are isolated from the upstream network. However, you will still have access to the Internet through the upstream router (by way of your Linksys router). Because two routers are between your computer and the Internet, Internet traffic undergoes two network address translations. This is sometimes referred to as Double NAT.

Your computers can also use the built-in capabilities of your Linksys router, such as parental controls. If you need further control over the type of content your employees or family access, you can create an account with an Internet filtering site such as **www.opendns.com** or **www.bsecure.com**. After you create an account with them, use their DNS in place of your ISP's DNS.

To use an outside DNS:

Log into Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4)

Under *Router Settings*, click *Connectivity*.

Click the *Local Network* tab.

Complete the *Static DNS* fields with the information provided by your content filtering provider.

Click **Ok**.

To extend your network

This topic covers cases three and four above.

NOTE
This is a complex process, so this procedure assumes that you have some networking knowledge.

To extend your network or add wireless capabilities, do the following:

If you want to extend your network, you may also follow the instructions above. One example of this might be to provide a separate wireless network for your children to keep their wireless network traffic separate from your wireless network. You might also want to isolate one network from another network so that network shares aren't visible across networks. In this case, use an Ethernet cable to connect the Internet port of the downstream router to one of the LAN ports of the upstream router. Make sure that the local network subnets on the two routers are different.

- OR -

You can extend your network by turning the downstream router into an access point. (See "How to use a router as an access point" on page 27.) When you use a router as an access point, computers connected to the access point are on the same IP subnet as all other devices connected to the router. File, printer, and media sharing is much easier if all devices are on the same subnet.

How to expose a device to the Internet

If you are operating a web server, a mail server, or a web camera, you may want to expose that device to the Internet so anybody can access it. Your router includes a DMZ (Demilitarized Zone) feature that forwards all inbound ports presented on the WAN interface, except those that are specifically forwarded, to an individual IP address or MAC address. This feature is normally not used, because it presents significant security risks to the device that you designate for the DMZ. The DMZ device is not protected by the built-in firewalls, Internet filters, or router web filters, and is open to attacks from hackers.

A much safer way of exposing devices to the Internet would be to use port forwarding. See “How to set up port forwarding” on page 33.

To set up a device in the DMZ, do the following:

Configure your device with a static IP address. See your device’s documentation for help with setting a static IP address or use DHCP reservation (see “How to set up the DHCP server on your router” on page 22).

Log in to Linksys Smart Wi-Fi. (See “How to connect to Linksys Smart Wi-Fi” on page 4.)

Under *Router Settings*, click *Security*, then click the *DMZ* tab.

Click the setting for **DMZ** to turn it on.

In the *Source IP Address* section, select *Any IP Address* to allow access to your DMZ device from the entire Internet, or select the alternate button and enter a range of allowed source addresses.

In the *Destination IP Address* section, enter the last three digits of the IP address of the device that will be in the DMZ. The rest of the IP address is already completed.

- OR -

If you want to specify the 12-digit MAC address of the device instead of setting up a DHCP address reservation, you can replace Step 6 with the following steps:

In the *Destination IP Address* section, select *MAC Address*, then click *View DHCP Client Table*. The *DHCP Client Table* screen opens.

Click **Select** next to the device that you want to place in the DMZ, then click **Close**. The corresponding MAC address is copied into the *MAC Address* field.

Click **Ok**.

Port Forwarding and Port Triggering

How to set up port forwarding

Port forwarding is a feature that forwards inbound traffic from the Internet on a specific port or ports to a specific device or port on your local network. You can set up port forwarding for the following:

A single port (see “How to set up port forwarding for a single port” below)

Multiple ports (see “How to set up port forwarding for multiple ports” on page 33)

A range of ports (see “How to set up port forwarding for a range of ports” on page 33)

How to set up port forwarding for a single port

Single port forwarding forwards inbound traffic from the Internet on a specific port to a single device on your local network. An example of single port forwarding would be sending inbound web requests, typically on port 80, to a web server.

TIP
See the device’s documentation for port and protocol information.

To set up single port forwarding, do the following:

Follow your device’s instructions for configuring it with a static IP address or use DHCP reservation to assign it a permanent address (see “How to set up the DHCP server on your router” on page 22).

Log in to Linksys Smart Wi-Fi. (See “How to connect to Linksys Smart Wi-Fi” on page 4.)

Under *Router Settings*, click *Security*.

Click the *Apps and Gaming* tab.

Click *Single Port Forwarding*. The *Single Port Forwarding* screen opens.

Click **Add a new Single Port Forwarding**.

In the *Application name* field, enter a descriptive name.

In the *External Port* field, type the external port number (not always required).

In the *Internal Port* field, type the internal port number (not always required).

In the *Protocol* drop-down list, select *TCP*, *UDP*, or *Both* (default).

In the *Device IP#* field, enter the last three digits of the IP address you have reserved for the computer you want to forward Internet traffic to. The rest of the IP address has already been completed for you.

Select *Enabled*, then click **Save**. If you don't want to use port forwarding but want to keep the information in the table, unselect the checkbox.

How to set up port forwarding for multiple ports

Some applications require forwarding of multiple ports. VNC (Virtual Network Computing) software that allows you to operate your computer remotely from anywhere on the Internet is an example of an application that requires multiple ports to be forwarded. To forward to multiple ports, create additional entries to forward additional ports to the same IP address.

Example: You want to set up your computer so you can remotely access it using VNC software. By default, VNC uses TCP ports 5800 and 5900.

To set up single port forwarding for multiple ports, do the following:

Make sure that the software you want to use has been installed on a networked computer.

Log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

Set up DHCP reservation for the IP address of the computer on which you installed the software. (See "How to set up the DHCP server on your router" on page 22.)

Under *Router Settings*, click *Security*.

Click the *Apps and Gaming* tab.

Click *Single Port Forwarding*. The *Single Port Forwarding* screen opens.

Click **Add a new Single Port Forwarding**.

In the *Application name* field, enter a descriptive name.

Enter in the same port number for the *External Port* and the *Internal Port*.

In the *Protocol* drop-down list, select *TCP*, *UDP*, or *Both* (default).

In the *Device IP#* field, enter the last three digits of the IP address you have reserved for the computer you want to forward Internet traffic to. The rest of the IP address has already been completed for you.

Select *Enabled*, then click **Save**. If you don't want to use port forwarding but want to keep the information in the table, deselect the checkbox.

NOTE
If you want to use software such as VNC on multiple computers, you will need to reconfigure the default ports that VNC uses on each additional computer. Then, create additional port forwarding entries for each additional computer. See your software's documentation for help.

How to set up port forwarding for a range of ports

Some applications require forwarding to a range of ports.

Example: You want to set up your computer so you can use BitTorrent, a popular peer-to-peer file sharing application. BitTorrent uses port 6881 by default. If that port is busy, the requesting BitTorrent client tries the next port in sequence. The most common configuration for home routers with a single BitTorrent computer is to set up port forwarding using a range of ports starting with 6881 and ending with port 6889.

To set up port range forwarding, do the following:

Log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

Set up a DHCP reservation for the IP address of the computer on which you installed the software. (See "How to set up the DHCP server on your router" on page 22.) In this example, the IP address of the desktop computer with a BitTorrent client installed is 192.168.1.140.

Under *Router Settings*, click *Security*.

Click the *Apps and Gaming* tab.

Click *Port Range Forwarding*. The *Port Range Forwarding* screen opens.

Click **Add a new Port Range Forwarding**.

In the *Application name* field, enter a descriptive name.

In the *Start ~ End Port* fields, enter the range or ports. In this example, the range is "6881 - 6889"**.**

Select *TCP* as the protocol.

In the *Device IP#* field, enter the last 3 digits of the IP address of the device running the software. The rest of the IP address fields already completed. In this example, you would enter "140"**.**

Select *Enabled*, then click **Save**. If you don't want to use port range forwarding but want to keep the information in the table, deselect the checkbox.

TIPS

To use software like BitTorrent on multiple computers on your network, create additional entries with a unique range of ports as shown above. BitTorrent works only with ports between 6881 and 6999.

Depending on your computer's firewall software, you may need to open a range of ports in your firewall to enable software that uses port range forwarding.

How to set up port range triggering for online gaming

Port range triggering 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 routed back to the proper device. An example of port range triggering would be to enable a USB or Bluetooth headset for online chat and gaming.

To set up port range triggering for multiple entries, do the following:

See your device documentation for information on the ports that the device uses.

Log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

Under *Router Settings*, click *Security*.

Click the *Apps and Gaming* tab.

Click *Port Range Triggering*. The *Port Range Triggering* screen opens.

Click **Add a new Port Range Triggering**.

In the *Device or Application* field, enter a descriptive name (such as "PS3 Headset").

For single ports, enter the same port number in each *Triggered range* and *Forwarded range* field.

For port ranges, enter the same number ranges in each set of *Triggered Range* and *Forwarded Range* fields.

Select *Enabled*, then click **Save**. If you don’t want to use port range triggering but want to keep the information in the table, deselect the checkbox.

Maintaining and Monitoring

How to back up and restore your router configuration

As with any valuable data, you should back up your router configuration. Your router might contain many customized settings. Those settings would be lost if you reset your router to its factory defaults, and you would need to re-enter all of them manually. If you back up your router configuration, restoring settings is easy.

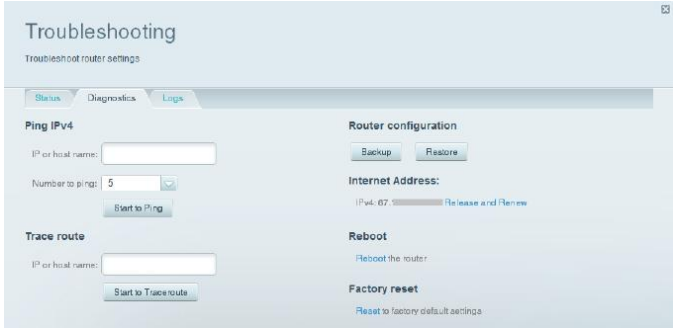
NOTE
You can only back up the router configuration locally (not remotely).

To back up your router configuration, do the following:

Log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

Under *Router Settings*, click *Troubleshooting*.

Click the *Diagnostics* tab.



Under *Router configuration*, click **Backup**. You are prompted to save the file.

Specify a file location, then click **Save**.

TIP
For save multiple backup files, include the backup date in the filename as you save.

To restore your router configuration:

Log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

Under *Router Settings*, click *Troubleshooting*.

Click the *Diagnostics* tab.

Under *Router configuration*, click **Restore**. The *Restore Router Configuration* dialog box opens.

Click **Choose File** to navigate to the location of your configuration file, then select the file and click **Open**.

To restore the configuration, click **Start to Restore**.

How to upgrade the router's firmware

Linksys may periodically publish a firmware upgrade either to fix a problem or to add features to your router.

IMPORTANT
Do not interrupt the upgrade process. You should not turn off the router or press the Reset button during the upgrade. Doing so may permanently disable the router.

TIPS
Your router automatically checks for available updates and installs them by default. Use the following instructions only if the automatic firmware update has been turned off.

To upgrade the router's firmware, do the following:

Log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4)

Under *Router Settings*, click *Connectivity*.

Click the *Basic* tab.

Under *Firmware Update*, click **Check for Updates**.

If an available update is found, follow the on-screen instructions to install it.

TIP
To have your router automatically check for updates and install them, select *Automatic* under *Firmware Update*.

How to restore factory defaults

If you've tried previous troubleshooting steps and your network still doesn't work, you may need to restore your router's factory defaults. To restore your router to factory defaults, you can use the *Reset* button on the router or use Linksys Smart Wi-Fi.

To reset your router using the reset button:

CAUTION
Whenever you restart the router, all logs that are not saved will be lost.

With your router connected to power and turned on, press and hold the Reset button on the back of your router for about 10 seconds (until the power indicator flashes).

To reset your router to factory defaults using Linksys Smart Wi-Fi, do the following:

Log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

Under *Router Settings*, click *Troubleshooting*.

Click the *Diagnostics* tab.

Under *Factory reset*, click **Reset**.

A confirmation screen opens.

Click **Yes** to confirm. All settings and logs will be deleted, and your router will return to its factory default settings.

How to check the status of your router

Your router status tells you whether you have a secure Internet connection and informs you about the status of your network-connected devices.

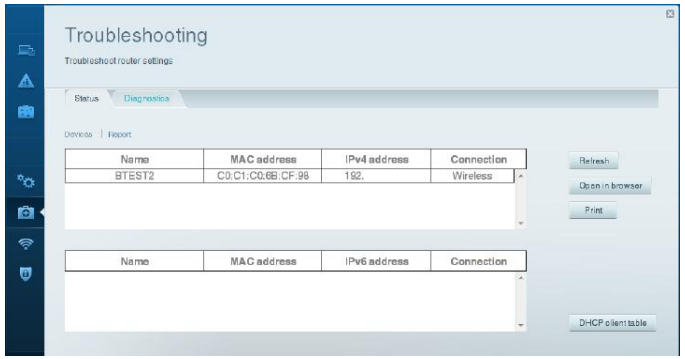
To check your router status, do the following:

Log in to Linksys Smart Wi-Fi. (See “How to connect to Linksys Smart Wi-Fi” on page 4.)

Under *Router Settings*, click *Troubleshooting*.

Click the *Status* tab. Detailed information about your router status is displayed.

TIP
For field descriptions, click **Help** at the top of the screen.



To view a list of connected network devices, click *Devices*. To view a full report of your router status, click *Report*.

Click **Ok** to close the screen.

How to disable the Ethernet port status lights

Depending on the placement of the router in a home, you might find the lights distracting. You can easily disable the lights using Linksys Smart Wi-Fi.

To disable the lights, do the following:

Log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

Under *Router Settings*, click *Connectivity*.

Click the *Basic* tab.

Under *Activity Lights*, click the **ON**/**OFF** button.

How to test your Internet connection

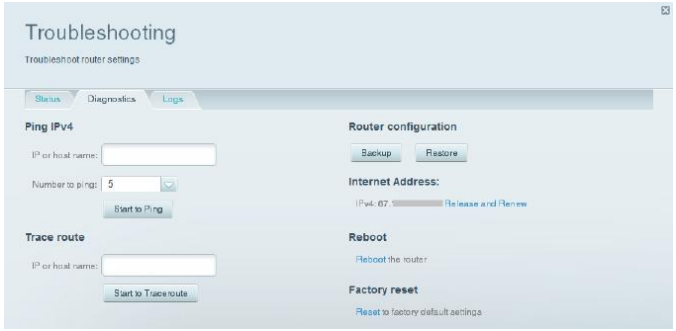
Your router includes two diagnostic tests, Ping and Trace route, that let you check network connections, including network devices and your Internet connection.

To diagnose your Internet connection, do the following:

Log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

Under *Router Settings*, click *Troubleshooting*.

Click the *Diagnostics* tab.



To check whether an address can be reached:

Under *Ping IPv4*, enter an IP address or URL into the *IP or host name* field.

Select a number of times to ping from the *Number to ping* drop-down list.

Click **Start to Ping**. A window will open showing the ping test results. You will see a response for each successful ping.

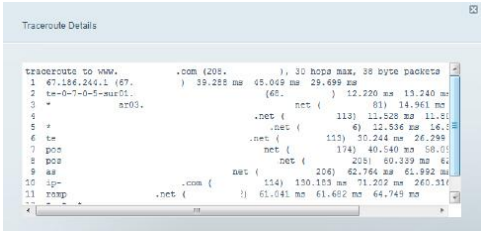
NOTE
If an Internet URL fails to respond to ping, it doesn't necessarily mean

that the site is down. For security reasons, some sites are configured to not respond to ping requests.

To trace the route that packets take between your router and a specific address:

Under *Trace route*, enter an address in the *IP or host name* field.

Click **Start to Traceroute**. A window will open with the test results.



How to configure and use logs

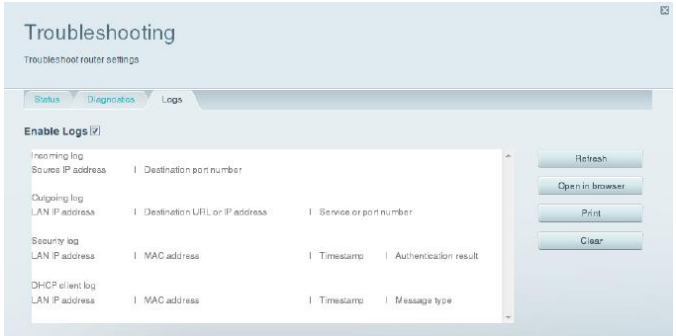
Your router can track all traffic for your Internet connection and record that information in a log.

To enable and view logs, do the following:

Log in to Linksys Smart Wi-Fi. (See “How to connect to Linksys Smart Wi-Fi” on page 4.)

Under *Router Settings*, click *Troubleshooting*.

Click the *Logs* tab.



To enable logs, click the button next to **Enable Logs** to turn them ON.

You can view the logs directly in the list, open the logs in a separate browser window, or print the logs.

Troubleshooting

This chapter can help you solve common setup issues and connect to the Internet. You can find more help from our award-winning customer support at **linksys.com/support/EA4500 V3**.

Your router was not successfully set up

If Linksys Smart Wi-Fi did not complete the setup, you can try the following:

1. Press and hold the Reset button on your router with a paperclip or pin until the LED starts blinking (about 10 seconds). Install the router again.

   insert diagram

2. Temporarily disable your computer's firewall (see the security software's instructions for help). Install the router again.
3. If you have another computer, use that computer to install the router again.

Your Internet cable is not plugged in message

If you get a “Your Internet cable is not plugged in” message when trying to set up your router, follow these troubleshooting steps.

To fix the problem:

Make sure that an Ethernet or Internet cable (or a cable like the one supplied with your router) is securely connected to the yellow Internet port on the back of the router and to the appropriate port on your modem. This port on the modem is usually labeled Ethernet, but may be named Internet or WAN.

Back view of router

Back view of cable modem

Back view of DSL modem

Make sure that your modem is connected to power and is turned on. If it has a power switch, make sure that it is set to the ON or l (as opposed to O) position.

If your Internet service is cable, verify that the cable modem’s CABLE port is connected to the coaxial cable provided by your ISP.

Or, if your Internet service is DSL, make sure that the DSL phone line is connected to the modem’s DSL port.

If your computer was previously connected to your modem with a USB cable, disconnect the USB cable.

Install the router again.

Cannot access your router message

If you cannot access your router because your computer is not connected to your network, follow these steps.

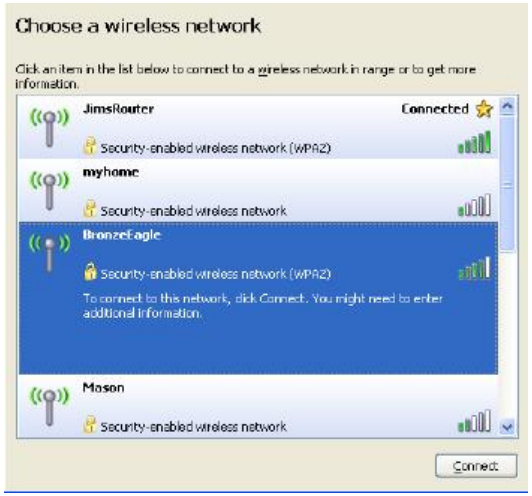
To access your router, you must be connected to your own network. If you currently have wireless Internet access, the problem may be that you have accidentally connected to a different wireless network.

To fix the problem on Windows computers, do the following*:

On your Windows desktop right-click the wireless icon in the system tray.

Click **View Available Wireless Networks**. A list of available networks will appear.

Click your own network name. Click **Connect**. In the example below, the computer was connected to another wireless network named *JimsRouter*. The wireless network name of the Linksys EA4500 V3 router, *BronzeEagle* in this example, is shown selected.



If you are prompted to enter a network key, type your password (Security Key) into the Network key and Confirm network key fields. Click **Connect**.

Your computer connects to the network, and you should now be able to access the router.

**Depending on your version of Windows, there could be some differences in wording or icons in these steps.*

To fix the problem on Mac computers, do the following:

In the menu bar across the top of the screen, click the **Wi-Fi** icon. A list of wireless networks will appear. Linksys Smart Wi-Fi has automatically assigned your network a name.

In the example below, the computer was connected to another wireless network named *JimsRouter*. The wireless network name of the Linksys EA9200 router, *BronzeEagle* in this example, is shown selected.

Click the wireless network name of your Linksys EA4500 V3 router (*BronzeEagle* in the example).

Type your wireless network password (Security Key) into the Password field. Click **OK**.

After setup

The Internet appears to be unavailable

If the Internet has difficulty communicating with your router, the problem may appear as a "Cannot find [Internet address]" message in your Web browser. If you know that the Internet address is correct, and if you've tried several valid Internet addresses with the same result, the message could mean that there's a problem with your ISP or modem communicating with your router.

Try the following:

Make sure that the network and power cables are securely connected.

Make sure that the power outlet that your router is connected to has power.

Reboot your router.

Contact your ISP and ask about outages in your area.

The most common method of troubleshooting your router is to turn it off, then back on again. Your router can then reload its custom settings, and other devices (such as the modem) will be able to rediscover the router and communicate with it. This process is called rebooting.

Rebooting your router

To reboot your router using the power cord, do the following:

Disconnect the power cord from the router and the modem.

Wait 10 seconds, and reconnect the power cord to the modem. Make sure it has power.

Wait until the modem's online indicator has stopped blinking, or two minutes. Reconnect the power cord to the router.

Wait until the power indicator stops blinking. Wait two minutes before trying to connect to the Internet from a computer.

To reboot your router using Linksys Smart Wi-Fi, do the following:

Log in to Linksys Smart Wi-Fi. (See "How to connect to Linksys Smart Wi-Fi" on page 4.)

Under *Router Settings*, click *Troubleshooting*.

Click the *Diagnostics* tab.

Under *Reboot*, click **Reboot**.

A confirmation screen opens.

Click **Yes**. The router will reboot. While the router is rebooting, all connected devices will lose their Internet connection, and will automatically reconnect when the router is ready again.

Linksys Smart Wi-Fi does not open in your web browser

The latest versions of the most common Web browsers work with Linksys Smart Wi-Fi.

- Internet Explorer 8 or higher
- Firefox 8 or higher
- Google Chrome 35 or higher
- Safari 5 (for Mac) or higher

You cannot access Linksys Smart Wi-Fi

To access your router directly, see “How to manually set up your router” on page 18.

All other troubleshooting has been unsuccessful

If you tried previous troubleshooting steps and your network still doesn’t work, you may need to restore your router’s factory defaults.

When all other troubleshooting has failed, you may want to restore the router to its basic factory settings, which are the most common settings used in home networks. Resetting the router erases your custom settings, so you must restore the settings after. We recommend that you back up your configuration before resetting your router to factory defaults. See “How to back up and restore your router configuration” on page 36

To restore your router to factory defaults, you can use the Reset button on the router or use Linksys Smart Wi-Fi. For instructions, see “How to restore factory defaults” on page 37.

Specifications

Linksys EA4500 V3

Model Name	Linksys Smart Wi-Fi Router N900
Description	Dual-Band N Router with gigabit and 1×USB
Model Number	EA4500 V3
Switch Port Speed	10/100/1000 Mbps (gigabit Ethernet)
Radio Frequency	2.4 GHz and 5 GHz
# of Antennas	6 internal PIFA antennas
Ports	Power, 1 x USB 2.0, Internet, Ethernet (1-4),
Buttons	Reset, Wi-Fi Protected Setup, Power
Back Panel Indicators	, , Ethernet (1-4), INTERNET, Wi-Fi Protected Setup, USB,, Power,
UPnP	Supported
Security Features	WEP, WPA2, RADIUS
Security Key Bits	Up to 128-bit encryption
Storage File System Support	FAT, NTFS, and HFS+
Browser Support	Internet Explorer 8 or higher, Firefox 4 or higher, Google Chrome 10 or higher, and Safari 4 or higher

Environmental

Dimensions	8.87" x 6.22" x 1.29" without antennas ((225.5 x 158 x 32.75 mm))
Unit Weight	12.35 oz (0.35 Kg)
Power	12V, 2A
Certifications	FCC, IC, CE, Wi-Fi a/b/g/n, Windows 7, Windows 8, DLNA
Operating Temp.	32 to 104°F (0 to 40°C)
Storage Temp.	-4 to 140°F (-20 to 60°C)
Operating Humidity	10 to 80% relative humidity, non-condensing
Storage Humidity	5 to 90% non-condensing

NOTES

For regulatory, warranty, and safety information, see the CD that came with your router or go to **Linksys.com/support**.

Specifications are subject to change without notice.

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

BACK COVER

Visit **linksys.com/support/EA4500 V3** for award-winning technical support.