

## **Routers**

Routers are essentially switchboard operators. They take a single internet connection and allow more than one computer to use it. A wireless router will let you to connect computers ie: a notebook without needing a cable to access the internet from anywhere in the house.

While wireless can be very convenient, it often can cause issues with accesibility and security. We suggest using an internet cable to connect a computer to the internet where possible, using wireless only when necessary. For instance, if you have two desktops and a notebook, we suggest using a cable for both desktops and wireless for the notebook. That way, if there is a problem with your wireless, your desktops are still able to use the internet. This applies to printers as well, some printers let you connect them wirelessly, but it's easier to plug it into the network with an internet cable.

Most new routers come with a CD that will walk you through the process of setting up your router. You should use the CD instead of this document - this document assumes the CD is not available.

These reference materials were developed using a Linksys WRT54G router. Other brands and models of router will differ but should be similar enough for this document to assist you. If you are unable to find the settings discussed here, please check the manufacturer's website or contact them directly.

## **Buying a Router**

Routers can be found in any computer or electronics store, and are relatively inexpensive. While all routers provide the same basic functions, there are variations in advanced features (which most home owners won't use) and in quality. We recommend discussing which router best suits your needs with the staff of the store before purchasing. Due to power fluctuations common in rural areas, routers tend to have short life spans; so we also suggest purchasing extended in-store warranty on routers. It's far better to spend \$10 now than to pay \$100 for a new router a year and a half from now.

In most cases you are better off buying an inexpensive router from a quality brand than an expensive router from a poor one. We recommend the ASUS brand in particular as they are easier to set up than most and are good value for money. For most households, a basic model like the RT-N12 is sufficient. Particularly large homes may need a more powerful router.

Wireless coverage may also be extended through the use of wireless repeaters. Many of the ASUS routers can be used as repeaters, making them both versatile and less expensive than dedicated wireless repeaters by other brands.

## **Common Router Manufacturers**

Asus – <http://www.asus.com/>, Tech support: 1 (888) 678-3688

Belkin – <http://www.belkin.com/>, Tech support: 1 (800) 223-5546

Dlink – <http://www.dlink.ca/>, Tech support: 1 (800) 361-5265

Linksys/Cisco – <http://www.linksys.com/>, Tech support: 1 (800) 326-7114

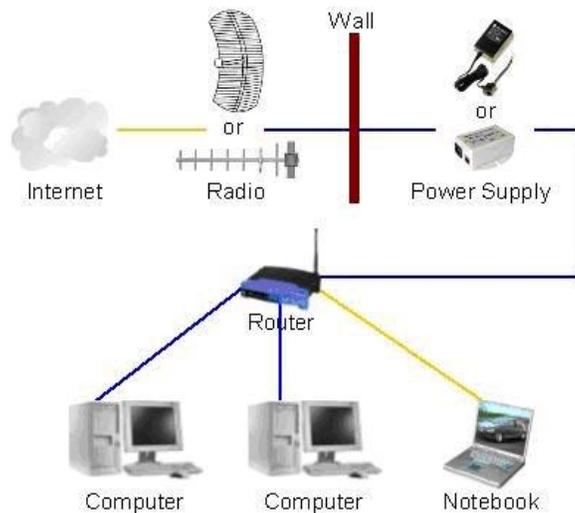
Netgear – <http://www.netgear.com/>, Tech support: 1 (888) NET-GEAR (638-4327)

## Restarting your Router

Like your computer, your router will need to be restarted from time to time as the first step when troubleshooting a router. This fixes the majority of problems. To restart your router, follow the power cord from the router to the power outlet, and unplug it for thirty seconds before plugging it back in.

## Plugging in Your Router

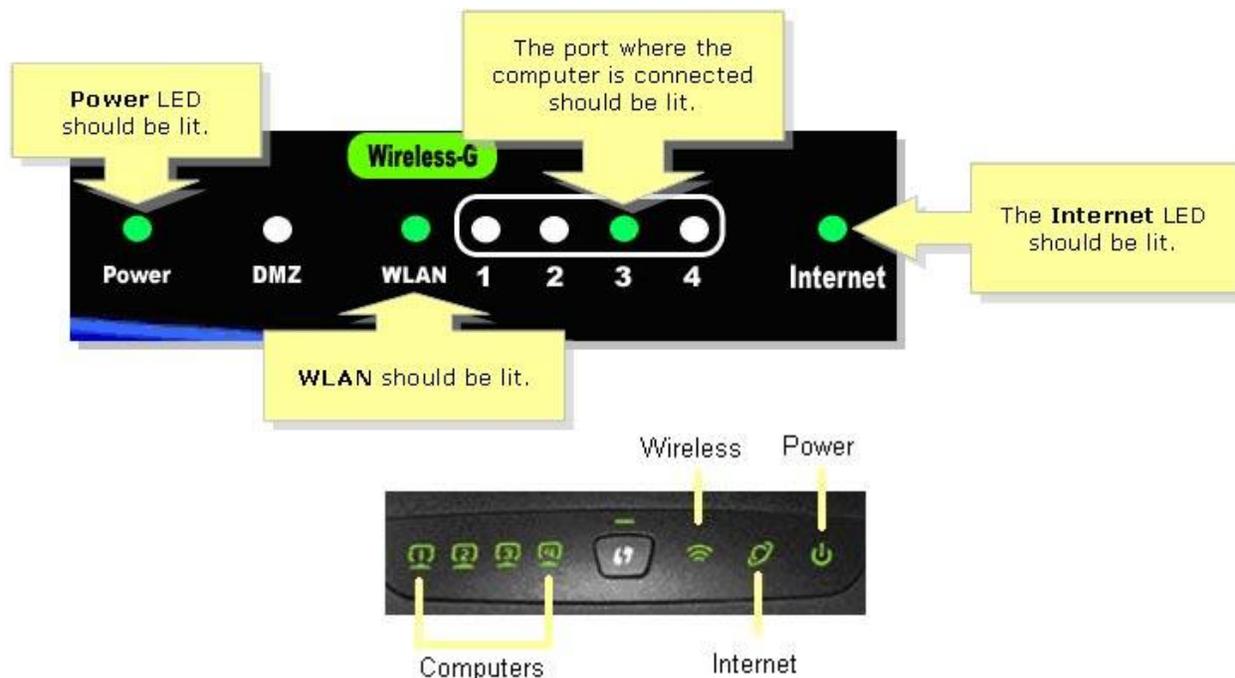
The diagram below gives an idea of how your home network should be set up. The internet cable coming from the wall should go to the power supply, then to the router, and lastly to any computers plugged in using an internet cable.



If you look at the back of your router, you should see a port for the power cable and five receptacles for internet cables. Four of these receptacles are right next to one another and are usually numbered one to four – these receptacles allow you to plug in computers. The last receptacle is usually labeled WAN or Internet, and should be plugged into your internet connection. Once the internet, computers, and power are plugged in, the lights on the front of the router should turn on.



The lights will differ on other models and brands of routers, but should resemble one of the two photos below. If the internet light is turned off, there is no internet connection to the router. Make sure the internet cable in the internet/WAN port of the router and the internet cables in the power supply are all firmly in place. If the light is still not lit, there is likely a problem with the internet, please look at our guide to troubleshooting the internet



## Securing & Configuring Your Router

While most of the default settings in the router work with our service, default wireless settings cause security issues and allow access to others to your computer and connection. **Do not leave a wireless router unsecured.** If your router does not support wireless, you likely do not have to worry about configuring it. If you are not certain if your router supports wireless, check it's settings to be certain.

The first step when configuring a router is to connect to it with an internet cable. While you can configure a router over wireless, you will have to reconnect to the wireless network each time you change a setting. It's far easier to connect with a wire instead.

In order to program or configure your router you will need to input the IP address of your router into the address bar on your internet browser.

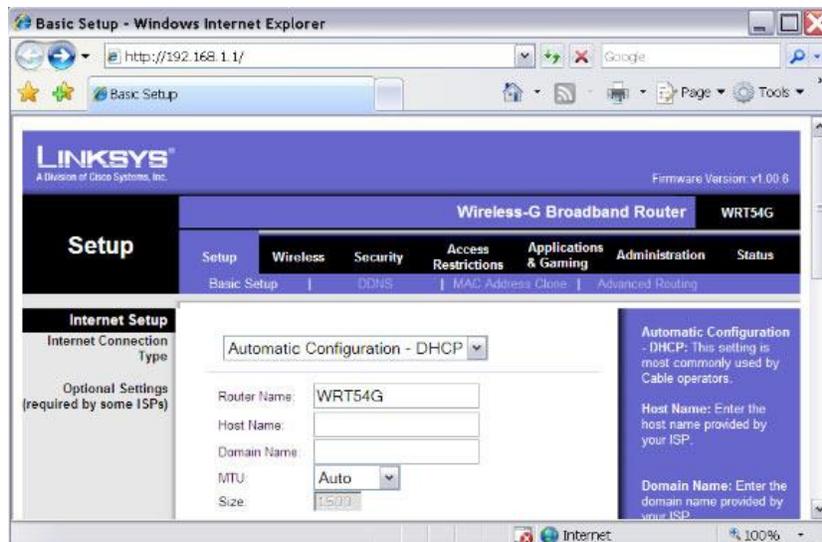
For most manufacturers, the IP address and login information are as follows:

- Asus – 192.168.1.1, user: admin, password: admin
- Belkin – 192.168.2.1, user: (blank), password: (blank) or admin
- Dlink – 192.168.0.1, user: admin, password: (blank)
- Linksys/Cisco – 192.168.1.1, user: (blank), password: admin
- Netgear – 192.168.0.1 or 192.168.1.1, user: admin, password: password



Enter the user name and password. Unless you have changed the password yourself, it should be the default for your router. In nearly all cases, the user name is “admin” and the password is empty, or the user name is empty and the password is “admin.” In some rare cases, both the user name and password are “admin”.

Some routers use a different user name/password combination entirely; refer to the manufacturer's web page for the default user name and password for your router. Once you enter the correct user name and password, you should be taken to the router configuration screen similar to the one shown below. Different brands of routers will have different looking configuration screens, but they should be similar enough to navigate.



The most important part of this screen is the menu across the top (Setup, Wireless, Security, etc). Some routers will display a similar menu on the left hand side. We want to click on Wireless to display the wireless settings.



There are two settings on this screen that you need to change. The first is the SSID or wireless network name. When you try to connect a computer wirelessly, this name will appear in the list of detected networks. By default, this Linksys router uses an SSID of "linksys". If a neighbour is also using a Linksys router with the same name there would be a serious problem as the computer can't tell which router it should be talking to if they have the same name. Change the network name to something unique that recognize as yours when you pick it out of the list. Record your network name on your desktop or a small piece of paper and tape it to the bottom of the router.

You will need to change the Wireless Channel as Channel 6 is usually the default, and is also the default used by cordless phones, baby monitors, and just about everything else. Changing it to channel 1 or channel 11 will usually avoid these sources of noise/interference and make your wireless signal stronger. Here is the screen above with the network name and channel changed to "Example" and 11, respectively. Remember to hit the "Save Settings" button at the bottom of the page.

Newer routers will often give an option to change Channel Width. We strongly recommend using 20 MHz channel widths only rather than 20/40, as it is less likely to cause interference between the router and other wireless devices. The additional speed from wider channels is almost never needed in a residential environment.



Next, we need to change wireless security. Some routers have the wireless security settings on the same page as the network name and channel, but this router has a separate page for it. Hit “Wireless Security” in the menu to get to the security page.

The picture belows shows that the default setting for this router is to disable all security. This allows anyone in range of your wireless network to access your home network. There are two risks leaving your wireless network unsecured. First, someone might use your internet connection to do something illegal or fraudulent which would be traced back to you. Second, they can connect directly to your computers, possibly giving them access to sensitive personal, financial, and business information. For these reasons, you always want to put a password on your wireless network.

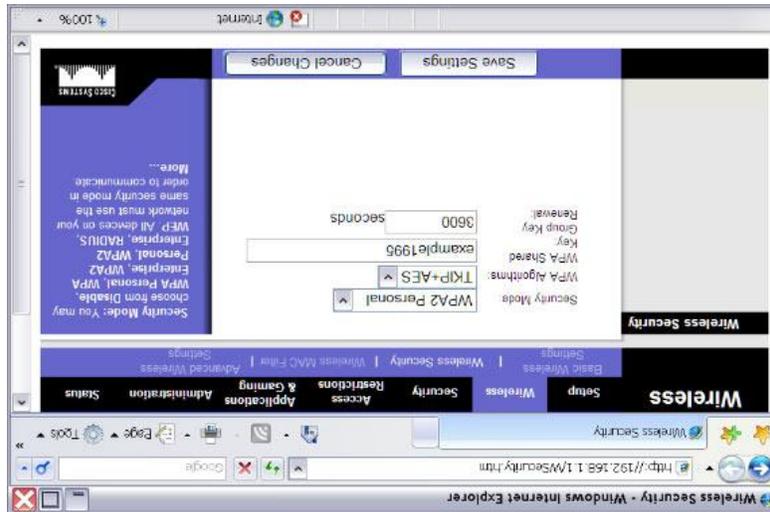


There are several types of wireless security.

The most secure type available to home users is WPA2 Personal. Look for an algorithm or key type property. It is usually set to TKIP, AES, or both. Use both if it is available, or TKIP otherwise. Some older computers do not support the AES key type, so TKIP is usually the best choice.

Next we want to enter a password or shared key. The password can be any combination of numbers and letters, and is case sensitive. It must be at least eight characters. In this example, I used “example1995” as our password. We recommend writing down both the

wireless network name and password on a small sheet of paper or sticky note, and taping it directly onto the router. That way, if you need to connect another computer, the password is someplace easy to find. Remember to hit the “Save Settings” button once you are finished.



Congratulations! Your wireless network is now secured. There are many other settings in your router, but in most cases the defaults are fine, so we don't need to examine them.