Understanding the Components of a Home Network

by: Jeff Heaton

Home networks are becoming more common. People want to be able to share a single broadband Internet connection to several computers in the house. There are many different devices that you can use to make up your home network. If you have never heard network terminology device names like router, hub, etc may seem confusing.

The purpose of most of these devices are to control how the network passes around information. This information is sent in the form of "packets". I will refer to the term packet several times in this article. It simply means the data that the network is transporting. I will now explain the purpose of the major components of a home network.

What is a Hub

A hub is a device that has several Ethernet ports on the back of the device. One of these ports will likely be labeled “Uplink”. This port allows you to connect multiple hubs together, if you run out of ports on your hub. If you do not have an uplink port on your hub, the hub can not be easily extended if you run out of ports.

A hub is a device that attaches multiple computers on an Ethernet network. If you have a number different computers that you want to connect together, you could connect each to the hub. Any packet that is sent out by any computer on the network will immediately be transmitted to the other computers. Each computer will determine if the packet was really intended for it, and filter out packets that were intended for other computers.

You really should not use a hub in a modern home network. You should always use a switch in place of a hub. Switches will be discussed in the next section.

What is a Switch

A switch is a device that has several Ethernet ports on the back of the device. One of these ports will likely be labeled “Uplink”. This port allows you to connect multiple switches together, if you run out of ports on your switch. If you do not have an uplink port on your switch, the switch can not be easily extended if you run out of ports.

A switch serves the same function as a hub. It allows you to connect multiple computers together, so that they can exchange packets. However, a switch is much more efficient than a hub. A switch will only send Ethernet packets to the computer that the packet was intended for. Because of this you should always use a switch in place of a hub.

What is a Router

A router is a device that has several Ethernet ports on the back of the device. One of the connectors will be labeled WAN. You should connect the WAN port to the Ethernet connection on a broadband source, such as a cable or DSL modem. The other ports on the router can be connected other computers or switches/hubs that will share the WAN connection.

Routers allow you to share your broadband connection with multiple computers in your house. Rather than connecting your computer directly into your cable or DSL modem you connect the router to the cable or DSL modem. Now any computer that you connect to the router will have access to the Internet.

If you run out of ports on your router you can always connect an additional switch to the router. To

connect a switch to a router simply connect the switch's "uplink" port to one of the routers Ethernet ports. Of course, don't connect to the router's WAN port. The WAN port should only be connected to something such as a cable or DSL router.

Some routers come with additional features installed. Most routers also include a firewall. Firewalls are discussed in the next section. Some routers will also include a wireless access point (WAP). The WAP allows you to use wireless devices, such as wireless laptops, with the Internet.

What is a Firewall

A firewall controls traffic flow between your network and the Internet. A firewall can be either hardware or software. Windows XP SP2 or higher includes a software firewall. A hardware firewall is included with most routers.

A firewall is a very good idea. It can protect you from inbound virus attempts. By inbound virus attempt I mean other computers that will connect to your computer and attempt to infect your computer. You do not want to run a computer directly connected to the Internet, without a firewall. There are just too many other computers out there that can connect and infect you without you even noticing.

What is a Network Attached Storage (NAS)

A network attached storage device is s device that allows a hard drive to be shared across the network. This hard drive is NOT attached to any of your computers. It is simply made available by the NAS. This can be a convent way to add a hard drive that can be accessed by several computers on your network. The other common way to add a network hard drive is to simply share a folder on one of your computers. However, with the NAS, you do not need to keep one of your computers on at all times.

There are two types of NAS commonly available. The first type comes with a build in hard drive. The second accepts a USB or Firewire external hard drive. The advantage to using a USB or Firewire hard drive is that you can upgrade the hard drive if it ever were to become too small.

What is a Print Server

Just like you can buy a device to allow you to share a hard drive, you can do the same with a printer. A print server connects directly to your printer. Your printer is then shared to all of your computers on the network. This is convent because you do not need to leave the printer hooked to a computer, which must be turned on to print.

Conclusions :

As you can see there are many different components. Perhaps the final component that I have yet to mention is the cable. These components are connected together with CAT5 Ethernet cable.

You are now ready to pick out the components for your home network!

About the author:
Jeff Heaton (http://www.jeffheaton.com) is author, consultant and college instructor. Jeff maintains the "Heaton Research"(http://www.heatonresearch.com) website that contains many Java tutorials and other computer programming information.