

Home networking essentials: How to set up a small computer network while retaining your sanity

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Over the past several years, a number of products aimed at helping home computer users set up their own networks have come onto the market.

You, yourself, may have been considering setting up your own computer network. On the other hand, you may be wondering what a network is and why you might want one.

In its simplest form, a computer network is essentially two computers that are able to share data (“talk” to each other). One computer may be a desktop while the other is a laptop.

In addition to sharing data, computers on a network can share printers scanners and even Internet connections.

During the Elkhart PC Users Group general membership meeting on Thursday, June 24, I will be putting on a networking clinic. We will see how to do four basic networking tasks:

- 1) Connect the computers together and get them to talk to each other.
- 2) Share a network drive.
- 3) We will also look at accessing a shared network drive (i.e. drive mapping)
- 4) Lastly, we will see how to share and access a printer between networked computers.

The purpose of this article is to give you a written guide that you can refer to in the future when you decide to set up your own network.

BASIC NETWORKING KNOW-HOW

There are two types of computer networks in use today: client-server and peer-to-peer.

Client-server networks are most commonly seen in large corporations where dozens, even hundreds, of desktop workstations (or clients) hook into a central server. In some cases, there may be more than one server.

A server’s function can range from simple file storage to managing tasks like printing, Internet access and E-mail.

Peer-to-peer networking, on the other hand, is more often seen in smaller network setups. In a peer-to-peer network, any computer on the network can be either a client, a server or both. In client-server networks, on the other hand, each computer is either a client or a server but none can be both.

In most home-networking setups, peer-to-peer networking is the preferred choice.

In addition to the two main networking types, there are also different ways to connect the various computers together. The most common methods include network cable, phone line and wireless connections.

In addition to the connection method, each computer on the network must have some way to get data from the network into the computer and to send data out over the network.

This is most commonly done through a network Interface card, or NIC.

Though there are a number of network cable flavors, Ethernet is the form most commonly used. Ethernet cables, known in the trade as RJ45 cable or Category 5 (CAT 5), have four pairs (eight total) of wires. Each pair of wires is twisted together inside the cable sheath. The connectors on Ethernet cables resemble oversized telephone connectors.

Phone line networks, as the name suggests, use conventional telephone lines to connect together.

Wireless networks abandon the cables altogether using radio waves to connect the different computers together.

Which of these different network choices is the best? That depends on your individual situation.

Personally, I prefer using Ethernet cables to connect computers to a network. You tend to get better performance and run into fewer problems going this route.

On the other hand, if stringing cables all over the place might be a problem, you might want to consider a phone line or wireless network.

Regardless of which network type you choose, there are some basic components all networks require:

- 1) A NIC (network card).
- 2) A way to connect (cables or antennae).

In addition to the above, if your network will have more than two computers, you will need some sort of hub, switch or router. Think of these as a junction box where your networked computers connect to each other.

A hub is just the junction box and nothing more. Network traffic comes into it and goes out to other computers on the network.

One step up from a hub is a switch. Though a switch looks much like a hub, it has one important feature.

With a hub, the network bandwidth (the amount of data that can move on the network at any given time) is divided by the computers connected to the network. Thus, the more computers on the network, the slower the network will be.

With a switch, each computer on the network is able to use the full bandwidth of the network to move its data. The switch does this through the electronic circuitry built into it.

Moving up yet another step is a router. A router has some specialized computing circuitry built into it. This allows use of features that can't be had on a hub or switch.

For example, many broadband routers have firewalls built in. The Internet sees only the router and anyone on the outside cannot get to the computers on the network connected to the router.

Another advantage of a router is any computer on the network can access the Internet through the router. Without a router, the computer connected to the Internet must be on at all times or other computers on the network will not be able to get to the Internet.

HOOKING IT ALL TOGETHER

The very first step in building a network, obviously, is to have all the computers that will be part of the network properly equipped. At the very least, each computer must have a network card or NIC, the card must be properly installed with the appropriate drivers and the computer must be properly configured for networking.

Next, you must have a way to connect the computers together. For a traditional Ethernet network using network cables, you must have the cables in hand, the cables must be run between the computers and the cables must be connected to each computer's network card.

For purposes of this demonstration, I am going to assume you already have a computer with a working NIC and have figured out how to make the physical connections.

What I would like to concentrate on is the fun stuff. The things you really want to use a network for. If one computer in your home contains your digitized music collection but you want to listen to those songs on another computer, you will need something call "drive sharing."

Another good use of a home network is to share a printer. Dad may have a high-end laser printer connected to the computer in his den. A network can be a handy way for Junior to print out his science paper on Dad's printer from the computer in Junior's bedroom.

But before we get into drive and printer sharing, we have to attend to some network setup duties.

NETWORK CONFIGURATION

For each of the tasks described in this article, it is very important to remember that each must be done on each and every computer on your network. Forget to perform all these steps on one of your computers and it will not be able to access the network.

The first item to attend to is to assign each computer a unique name and give your computer network a name (known as "workgroup" in geek terms).

Under Windows networking rules, each computer MUST have a unique name. No two computers on a network can have the same name. Violate this rule and your network will not work.

The same rules also dictate all computers on the network MUST be part of the same workgroup. Violate this rule and your computers won't be able to find each other.

With a few conditions, you can pretty much name your computers anything you want. Under Windows 2000 and XP, computer names can be up to 32 characters long and can include spaces. For compatibility with older operating systems, it is suggested you keep computer names to eight characters or less with no spaces.

For the simple two-computer network I will be demonstrating, one computer is called "den" the other is called "bed."

For the workgroup name, I am being very unoriginal and am calling my workgroup "workgroup."

To set the computer and workgroup name go open Network in Control Panel. Click on the ID tab. This will open a dialog where you can type in the name for your computer and work group.

Remember, each computer must have a unique name and the workgroup must be the same for all computers on the network.

Next, we need to install the Windows networking protocols. A protocol is a method computers use to talk to each other. There are three protocols which should be installed:

- 1) TCP/IP
- 2) IPX/SPX
- 3) NetBEUI

Though you may be able to get by with just TCP/IP, I would suggest you install all three protocols.

To install a network protocol, open Network in Control Panel. Click on the Add button. Next, select the Protocol item and click the Add button. In the select network protocol dialog, select Microsoft in the left-hand pane and in the right-hand pane select one of the protocols listed above and click the OK button.

Follow these same steps for the other two network protocols. When you have installed all three protocols, click OK to close the Network control panel. If you are prompted to restart your computer, do so and then continue.

Next, each computer needs to be assigned an IP address. The IP address along with the computer name is how each computer identifies itself on the network. Like computer names, each IP address must be unique. Fail to follow this rule and your network will not work.

There are a number of flavors of IP addresses from which you can choose. For this demonstration, I am using 192.168.0.xxx. This is a particular class of IP address. Other computers on the same network should also use the same class of IP addresses.

The part that changes between computers where the three Xs appear. This value can be any number between 0 and 255. For my demonstration, one computer will use the address 192.168.0.100 and the other will use 192.168.0.101.

To set the IP address, open Network in Control Panel. Select the TCP/IP item that is associated with your NIC and click Properties. In the TCP/IP dialog that appears, click on the radio button that says Specify an IP address. Type in the IP address you have selected for this computer.

Below where you typed in the IP address, note the area labeled Subnet mask. The subnet mask should be set to 255.255.255.0 for all computers on the network. Get this wrong and your network will not work. When you are finished, click OK to close the dialog.

Also in network properties, click the button that says File and Print Sharing. If you want to share files or folders over your network, click the checkbox that says "I want to give others access to my files." If you want to share a printer, click on the checkbox that says "I want to allow others to print to my printer." If you want to share both the printer and files or folders, click both checkboxes. Click OK when you are finished.

Lastly, under Primary Network Logon, make sure "Client for Microsoft Networks is displayed." If this is not showing, click the down arrow box to reveal Client for Microsoft Networks.

Next, click OK and restart your computer.

Remember, each of these steps must be performed on each computer.

SHARE NETWORK DRIVES AND PRINTERS

Now that we have the networking set up and configured, it is time to share network drives and printers. Sharing a drive or a printer is what allows other computers on the network to access the resource in question.

When sharing a drive, an important security note is it is considered very dangerous to share an entire drive on the network. This is because once the drive is shared, every folder, subfolder and file can be accessed by anyone on the network. Further, because many viruses and worms are network savvy, they would also have access to those same files and folders.

A better approach would be to share a single folder. In this demonstration, we are going to share the My Documents folder on each computer.

Here are the steps to share a folder:

- 1) Open My Computer.
- 2) Double-click on the C: drive icon.
- 3) Right-click on the My Documents folder and select Sharing.
- 4) In the sharing dialog, click on the radio button labeled Share this folder.

- 5) In the box labeled Share name, type in a name that will appear with this folder. Share names can be no more than 12 characters.

When you have entered the information and made the appropriate choices, click OK to close the sharing dialog.

The steps to share a printer are the same. One difference is you start in the Printers folder rather than My Computer.

Now that we have shared the drives and folders, it is time to go to the other computers to map those network resources.

Here's how to map a network drive:

- 1) Open Windows Explorer in Windows 9x. In Windows 2000 or XP, My Computer will do.
- 2) Click on Tools and select Map Network Drive.
- 3) In the map network drive dialog, select a drive letter.
- 4) In Windows 9x, you must type the correct path of the shared network drive. This includes the name of the computer and the name of the shared folder. The path for a network drive looks something like this: [\\den\my documents](#). In Windows 2000 and XP, you get a browse button that makes the mapping process easier. You browse for the shared drive much like you would navigate through My Computer.

When you are finished mapping the network drive, click OK to close the dialog. Now go to My Computer to see if you can find that drive.

To set up a network printer, open the Printers folder and double-click on Add printer. In the section where Windows asks if you are installing a local or network printer, make sure you select network printer. You may need your printer's installation CD to complete the installation.

When the network printer's installation is complete, try to print something on the printer.

AND IN CONCLUSION...

In this article, we have gone through the process of configuring a personal computer for networking, installing the networking protocols, sharing network drives and printers.

This can seem fairly complex and daunting. If so, don't feel ashamed. Remember, there was once a time when I set up my first computer network and didn't have a clue what I was doing.

I like to say, "If I can figure this stuff out, you can too!"

ABOUT THE AUTHOR: Bruce Von Deylen is employed as a personal computer and network repair technician providing IT services to small and medium sized businesses. Bruce previously worked for Gateway computers and owned and operated a computer repair business. Before plunging into computers, Bruce spent nearly 20 years in journalism, working most recently for the

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