Lab 3.6.4 Connect and Configure Hosts

Objective

- Connect a PC to the switch ports of a multifunction device using a standard Ethernet cable.

- Configure the PC with an appropriate IP address.

- Configure the PC with a NetBIOS computer name.

- Verify the PC configuration using Windows XP and through a command prompt.

Background / Preparation

In order for the PC to participate in the network, it must be connected to a network device. The following resources will be required:
- LinkSys wireless multifunction device (model WRT300n or equivalent Small Office Home Office multifunction device)
- Two computers with Ethernet NICs and Windows XP Professional installed on both (windows 98 or 2000 will work but may require additional steps not listed here)
- Two straight-through cables

Step 1 Identify Ethernet ports

a. On the LinkSys device, locate the Ethernet (Local Area Network) LAN ports or switch ports. The Ethernet LAN ports are used to connect your local network hosts. The four LAN ports are grouped together in the center of the multifunction device as shown below. .

b. On the PC, locate the Ethernet port. The port could be integrated into the motherboard or it could be an adapter. In either case, the port will be an RJ-45 port. The photo that follows shows an Ethernet port on an adapter.
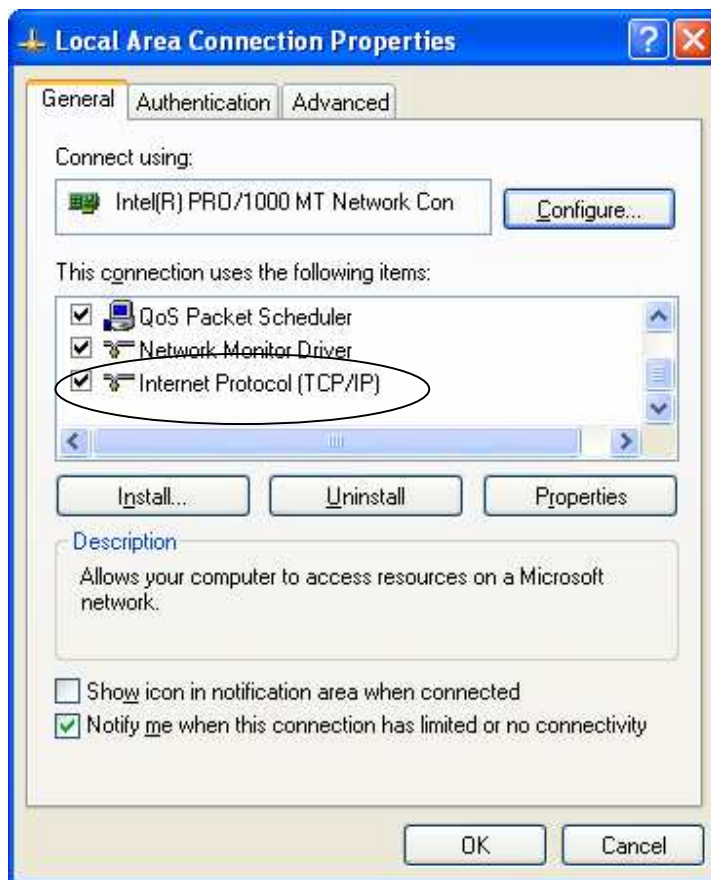
Step 2 Connect the Cable between the PC and the Ethernet Switch ports

a. Connect one end of the straight-through Ethernet cable to an Ethernet LAN port on the Linksys device.

b. Connect the other end of the cable to the PC Ethernet port.
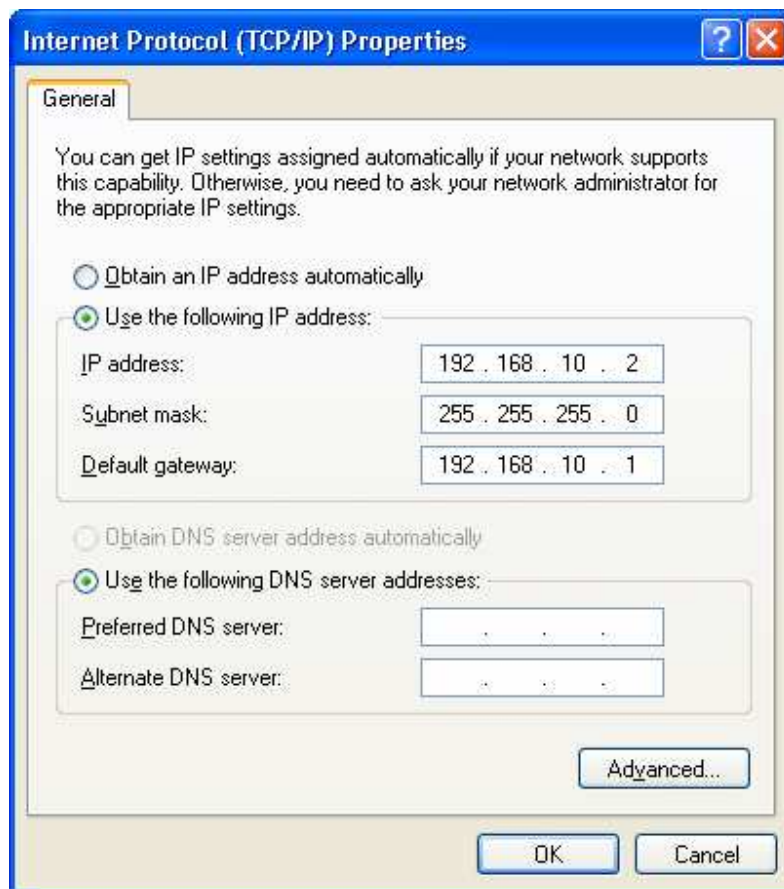
c. Repeat this procedure for the second PC.

Step 3 Assign the PCs an IP address and default gateway

a. The Network control panel is used to assign an IP address and default gateway to a Windows XP host. To access the Network control panel on the first PC, click on the **Start** button and select the **Control Panel** menu option. [If your Windows XP desktop is in classic mode, access Control Panels using **Start>Settings>Control Panel**.]

b. There are two ways to view control panels: classic view and category view. The options available depend on which one of these two views you are using. If you see an option on the left that says *Switch to Category View*, you are currently in the classic view mode. If you see an option on the left that says *Switch to Classic View*, you are currently in category view mode. Ensure that you are in **classic view** mode.

c.   Locate and double-click the **Network Connections** control panel icon.

d. Right-click on the **Local Area Connection** icon that represents your NIC and click on the **Properties** menu option.

e. In the middle window, scroll down until you see and can double-click on the Internet Protocol (TCP/IP) option. The figure that follows shows this option.

f.   From the Internet Protocol (TCP/IP) Properties window, click on the **Use the following IP address** radio button. The IP address, Subnet mask, and Default gateway textboxes are enabled as a result.
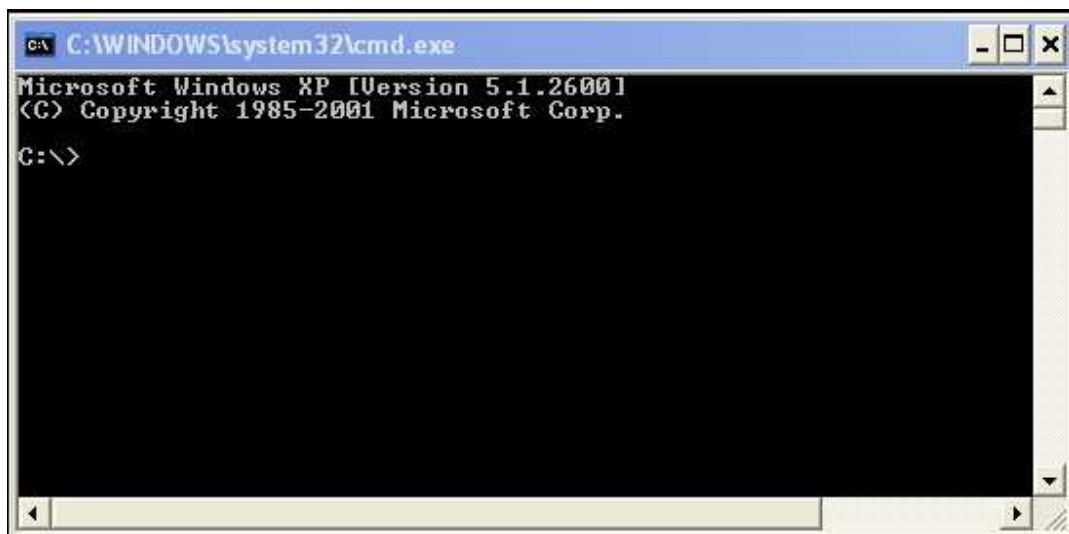
In the IP address field, configure the IP address to **192.168.10.2**. Configure the subnet mask to **255.255.255.0**. Configure the default gateway to **192.168.10.1**. The graphic that follows shows these settings. (DNS server information is not necessary at this time, so the fields under **Use the following DNS server addresses** don't need to be filled out.) When finished, click on the **OK** button.

g. From the Local Area Network Connection Properties window, click on the **OK** button to apply the changes. Be patient, since this step may take some time. After the changes are applied, you will be returned to the Network Connections window.

h. Since the two computers are on the same network, their IP addresses will be similar, their subnet masks will be identical, and their default gateways will be identical. Perform the same procedures on the second PC to assign an IP address, subnet mask, and default gateway using the following information:

IP address: **192.168.10.3**
Subnet mask: **255.255.255.0**
Default gateway: **192.168.10.1**

i. Why do you think the IP addresses are different, but the subnet masks and default gateways are the same?

_____
_____

Step 4 Verify the IP address configuration

a. From the Windows XP desktop, click on the **Start** button.

b. Select the **Run** menu option.

c. In the **Open:** textbox, type **cmd** and press Enter. A command prompt appears. The graphic that follows shows this process.

d. From the command line prompt, type **ipconfig /all**. Verify the IP address and the default gateway are the values you entered in the earlier steps. If they are incorrect, redo Steps 3 and 4.

e. Are the IP address, subnet mask, and default gateway correct for the first PC? _____

f. Perform the same configuration check on the second PC. If the values are incorrect, redo Steps 3 and 4.

g. Are the IP address, subnet mask, and default gateway correct for the second PC? _____

Step 5 Test connectivity between PCs

In order to test TCP/IP connectivity between the PCs, the Windows Firewall must be disabled temporarily on both PCs. The Windows Firewall should be re-enabled after the tests have been completed.

a. On PC1, click on the **Start** button, click on **Control Panel**, and open the **Network Connections** control panel.

b. Right-click on the Ethernet network connection icon and select **Properties**. Click on the **Advanced** tab. Locate and click on the **Settings** button.

c. Make a note of whether the firewall settings are ENABLED (ON) for the Ethernet port or DISABLED (OFF) for the Ethernet port. _____

d. If the firewall settings are enabled, click on the **Off (not recommended)** radio button to disable the firewall. The setting will be re-enabled in a later step. Click the **OK** button on this window and the window that follows to apply this setting.

e. From the same command prompt on the first PC, type the following command to test connectivity with the second PC:

ping 192.168.10.3

if the ping is successful you will see results similar to the exhibit below. If the ping is not successful, perform the appropriate troubleshooting steps such as checking the cabling and checking your IP address, subnet mask, and default gateway assignments.

```
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\>ping 192.168.10.3.3

Pinging 192.168.10.3 with 32 bytes of data:

Reply from 192.168.10.3: bytes=32 time<1ms TTL=64
Reply from 192.168.10.3: bytes=32 time<1ms TTL=64
Reply from 192.168.10.3: bytes=32 time<1ms TTL=64
Reply from 192.168.10.3: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

f. From the command prompt on the second PC, check connectivity to the first PC:
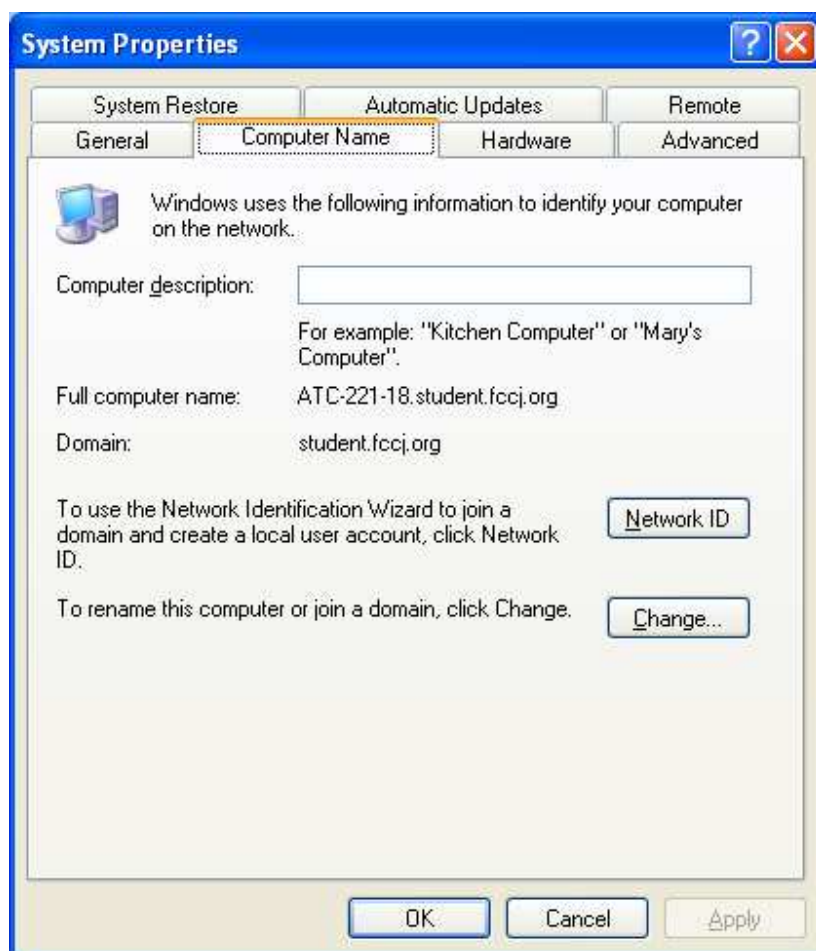
ping 192.168.10.2

The ping should succeed.

Step 6 Configure the NetBIOS name

a. Right-click on the **Start** button and select the **Explore** option.

b. How many drive letters are shown in the window that appears?
    _____
    _____

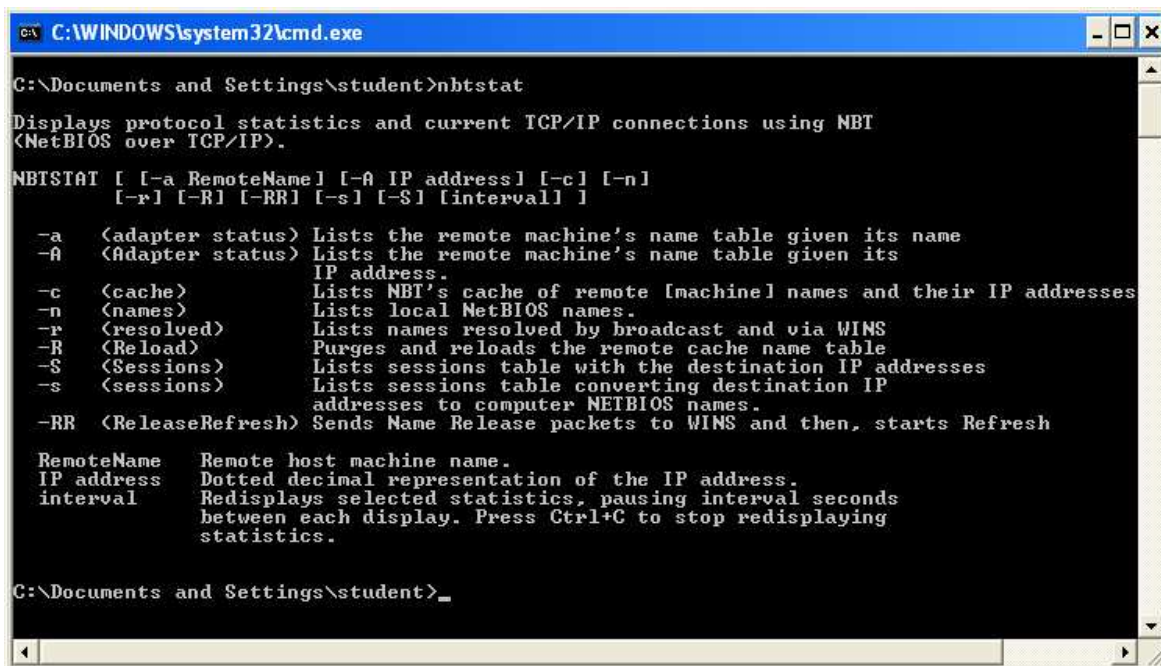c. Which drive letters are shown?
    _____
    _____

d. Right-click on the **My Computer** icon on your Windows XP desktop and select the **Properties** option. The System Properties window appears.

    Note: If the **My Computer** icon does not appear on the desktop, click **Start** then right-click **My Computer**.

e. Click on the **Computer Name** tab. An example of the window that appears follows:

f. Click on the **Change** button. In the Computer Name textbox, type **PC1**. Ensure the **Member of** radio button is set to **Workgroup**.

g. Make a note of the Workgroup name. _____

h. Click on the **OK** button. If prompted to restart the computer, click **OK** to restart and follow the directions on the screen.

i. Use the same process to name the second computer **PC3.** Also ensure that the Workgroup name is set to the same value as **PC1**.

Step 6 Verify configuration

a. To verify the new configuration, open a command prompt on each computer. If you forgot how, refer to Steps 4a, b, and c.

b. Use the **nbtstat** command to view and gather information about remote computers. From the command prompt, type **nbtstat** and press Enter. Help for the command displays as shown:

```
C:\WINDOWS\system32\cmd.exe

C:\Documents and Settings\student>nbtstat

Displays protocol statistics and current TCP/IP connections using NBT
(NetBIOS over TCP/IP).

NBTSTAT [ [-a RemoteName] [-A IP address] [-c] [-n]
         [-r] [-R] [-RR] [-s] [-S] [interval] ]

  -a   (adapter status) Lists the remote machine's name table given its name
  -A   (Adapter status) Lists the remote machine's name table given its
                        IP address.
  -c   (cache)          Lists NBT's cache of remote [machine] names and their IP addresses
  -n   (names)          Lists local NetBIOS names.
  -r   (resolved)       Lists names resolved by broadcast and via WINS
  -R   (Reload)         Purges and reloads the remote cache name table
  -S   (Sessions)       Lists sessions table with the destination IP addresses
  -s   (sessions)       Lists sessions table converting destination IP
                        addresses to computer NETBIOS names.
  -RR  (ReleaseRefresh) Sends Name Release packets to WINS and then, starts Refresh

  RemoteName   Remote host machine name.
  IP address   Dotted decimal representation of the IP address.
  interval     Redisplays selected statistics, pausing interval seconds
               between each display. Press Ctrl+C to stop redisplaying
               statistics.

C:\Documents and Settings\student>_
```

The letters shown are options called switches that you can use with the **nbtstat** command.

c. On PC1, type **nbtstat –n** and press Enter to see the local NetBIOS name of PC1.

d. On PC2, type the same command to verify the NetBIOS name is set to PC2.

e. The **nbtstat –a** command can be used to look at a remote computer's name table. Type **nbtstat** again from the command prompt. Notice in the output that when you use the **–a** switch, you have to put a space and then type a remote computer's name (RemoteName).

From PC1, type **nbtstat –a PC2** and press Enter. The **nbtstat** information for PC2 shows on PC1's monitor.

f. What command would be used from the command prompt on PC2 to view information about PC1? _____

g. From PC2, type the appropriate command to view PC1's **nbtstat** information.

h. The **nbtstat –A** (notice that the switch is a capital A this time) can be used to view the same information using an IP address rather than a name. If you type **nbtstat** again, you can see that the command syntax tells us that we use **–A** followed by an IP address. The IP address is that of the remote computer.

From PC1, type **nbtstat –A 192.168.10.3** to see the same information that was returned by the **nbtstat –a PC2** command..

i. Write the command that would be typed on PC2 to view information about PC1, using the IP address of PC1 instead of the NetBIOS name. _____

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j.   From PC1, you can use the ping command to verify connectivity. However, instead of using an IP address, you can use the NetBIOS name. From the PC1 command prompt, type **ping PC2** (notice the capitalization). The result should be successful.

k.   From PC1, type **ping pc2** (notice the capitalization).

l.   Does the ping succeed using lower case letters? _____

m.   You can use the **nbtstat –r** command to see NetBIOS names that have been resolved (they are known). From the PC1 and PC2 command prompt, type **nbtstat –r** to see that the remote computer is known using NetBIOS.

n.   Close the command prompt window.

Step 7 (Optional – Use only if the Firewall was originally ENABLED) Re-enable the firewall

a.   If the answer to Step 5c was OFF or ENABLED on PC1, click on the **Start** button, click on **Control Panel**, and open the **Network Connections** control panel.

b.   Right-click on the Ethernet network connection icon and select **Properties**. Click on the **Advanced** tab. Locate and click on the **Settings** button.

c.   If the firewall settings are disabled (and they were enabled BEFORE THIS LAB BEGAN), click on the **On** radio button to disable the firewall. Click the **OK** button on this window and the window that follows to apply this setting.

Step 8 Reflection of this process

a.   Write down two things that stick in your mind when you think back over the steps you just completed.

_____

_____

b.   Either with a classmate assigned to you or by choosing one yourself, share this information with them and listen to their two important things. In your own words describe what you found in common or as differences. Be prepared to share this information with others.

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