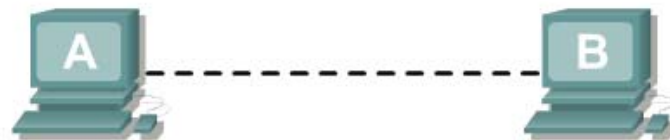


## Lab 5.1.12 Building a Peer-to-Peer Network – Instructor Version



Straight-through cable	—————
Serial cable	————— ⚡
Rollover (console)	.....
Crossover cable	- - - - -

### Objective

- Create a simple peer-to-peer network between two PCs
- Identify the proper cable to connect the two PCs
- Configure workstation IP address information
- Test connectivity using the `ping` command.

### Background / Preparation

This lab focuses on the ability to connect two PCs to create a simple peer-to-peer Ethernet LAN between two workstations. The workstations will be directly connected to each other without using a hub or switch. In addition to the Layer 1 physical and Layer 2 data link connections, the computers must also be configured with the correct IP network settings, which is Layer 3, so that they can communicate. A basic Category 5/5e UTP crossover cable is all that is needed. A crossover cable is the same type that would be used as backbone or vertical cabling to connect switches together. Connecting the PCs in this manner can be very useful for transferring files at high speed and for troubleshooting interconnecting devices between PCs. If the two PCs can be connected with a single cable and are able to communicate, then any networking problems are not with the PCs themselves. Start this lab with the equipment turned off and with cabling disconnected. Work in teams of two with one person per PC. The following resources will be required:

- Two workstations with an Ethernet 10/100 NIC installed
- Several Ethernet cables, which are both straight-through and crossover, to choose from for connecting the two workstations

### Step 1 Identify the proper Ethernet cable and connect the two PCs

- a. The connection between the two PCs will be accomplished using a Category 5 or 5e crossover cable. Locate a cable that is long enough to reach from one PC to the other, and attach one end to the NIC in each of the PCs. Be sure to examine the cable ends carefully and select only a crossover cable.
- b. What kind of cable is required to connect from NIC to NIC? Crossover
- c. What is the category rating of the cable? Category 5 or 5e
- d. What is the AWG wire size designation of the cable? 24 AWG

## Step 2 Verify the physical connection

- a. Plug in and turn on the computers. To verify the computer connections, insure that the link lights on both NICs are lit. Are both link lights lit? They should be otherwise troubleshoot.

## Step 3 Access the IP settings window

**Note:** Be sure to write down the existing IP settings, so that they can be restored at the end of the lab. These include IP address, subnet mask, default gateway, and DNS servers. If the workstation is a DHCP client, it is not necessary to record this information.

Windows 95 / 98 / Me/ users should do the following:

- Click on **Start > Settings > Control Panel** and then click the **Network** icon.
- Select the TCP/IP protocol icon that is associated with the NIC in this PC and click on **Properties**.
- Click on the **IP Address** tab and the **Gateway** tab.

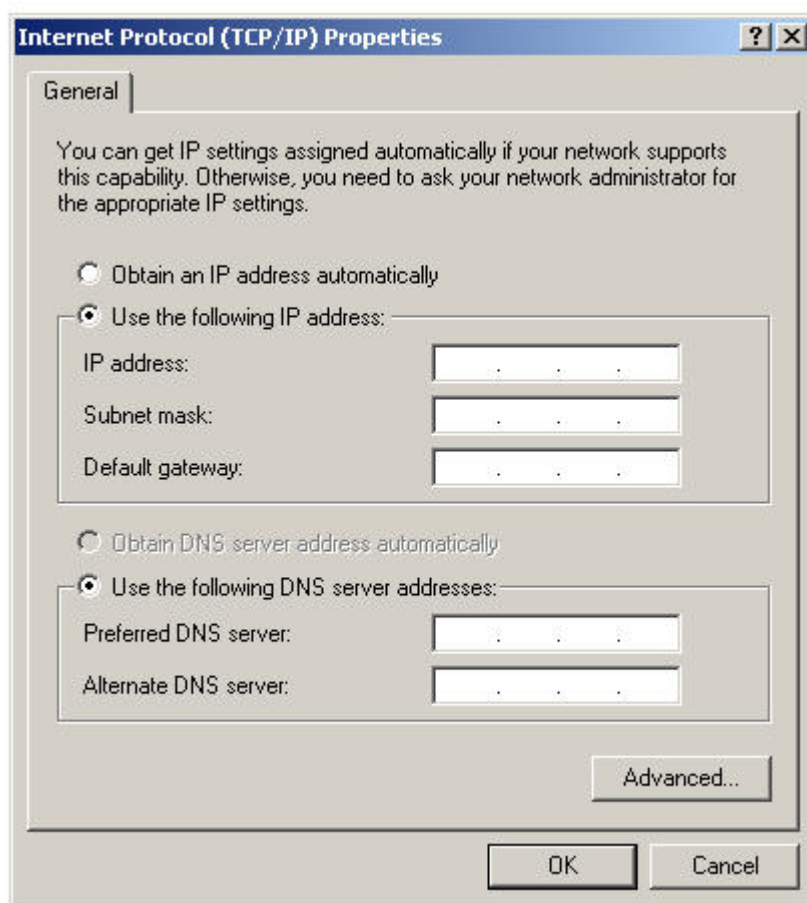
Windows NT / 2000 users should do the following:

- Click on **Start > Settings > Control Panel** and then open the **Network and Dial-up Connections** folder.
- Click and open the **Local Area Connection** icon.
- Select the TCP/IP protocol icon that is associated with the NIC in this PC.
- Click on **Properties** and click on **Use the following IP address**.

Windows XP users should do the following:

- Click on **Start > Settings > Control Panel** and then click the **Network Connection** icon.
- Select the **Local Area Network Connection** and click on **Change settings of this connection**.
- Select the **TCP/IP protocol** icon that is associated with the NIC in this PC.
- Click on **Properties** and click on **Use the following IP address**.

See the example below:



#### Step 4 Configure TCP/IP settings for the two PCs

- Set the IP address information for each PC according to the information in the table.
- Note that the default gateway IP address is not required, since these computers are directly connected. The default gateway is only required on local area networks that are connected to a router.

Computer	IP Address	Subnet mask	Default Gateway
PC – A	192.168.1.1	255.255.255.0	Not Required
PC – B	192.168.1.2	255.255.255.0	Not Required

#### Step 5 Access the Command or MS-DOS prompt

- Use the Start menu to open the Command Prompt (MS-DOS-like) window:

Windows 95 / 98 / Me users should do the following:

**Start > Programs > MS-DOS Prompt**

Windows NT / 2000 users should do the following:

**Start > Programs > Accessories > Command Prompt**

Windows XP users should do the following:

**Start > Programs > Accessories > Command Prompt**

## Step 6 Verify that the PCs can communicate

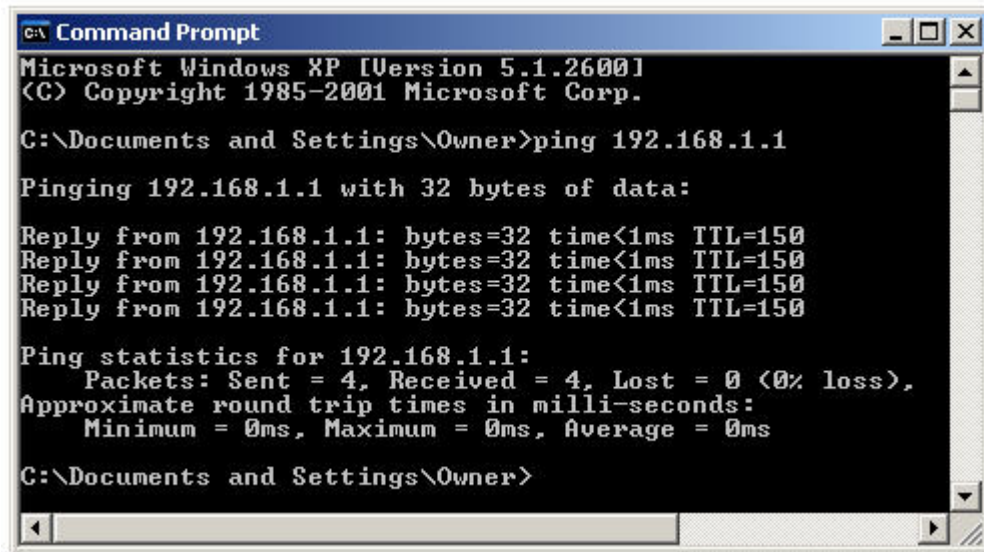
- Test connectivity from one PC to the other by pinging the IP address of the opposite computer. Use the following command at the command prompt.

C:>ping 192.168.1.1 (or 192.168.1.2)

- Look for results similar to those shown below. If not, check the PC connections and TCP/IP settings for both PCs. What was the ping result?

Results could possibly be: Sent=4 Received=3 Lost=1 (this is due to ARP)

Any other results probably indicate an error



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

C:\Documents and Settings\Owner>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time<1ms TTL=150
Reply from 192.168.1.1: bytes=32 time<1ms TTL=150
Reply from 192.168.1.1: bytes=32 time<1ms TTL=150
Reply from 192.168.1.1: bytes=32 time<1ms TTL=150

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Documents and Settings\Owner>
```

## Step 7 Confirm the TCP/IP network settings

Windows 95 / 98 / Me users should do the following:

- Type the **winipcfg** command from the MS-DOS Prompt. Record the results:

Answers will vary depending on if Computer A or B is used.

Examples for Computer A

IP Address: 192.168.1.1

Subnet Mask: 255.255.255.0

Default Gateway:

Windows NT / 2000 / XP users should do the following:

- Type the **ipconfig** command from the Command Prompt. Record the results:

Answers will vary depending on if Computer A or B is used.

Examples for Computer B

IP Address: 192.168.1.2

Subnet Mask: 255.255.255.0

Default Gateway:

## Step 8 Restore the PCs to their original IP settings, disconnect the equipment, and store the cables