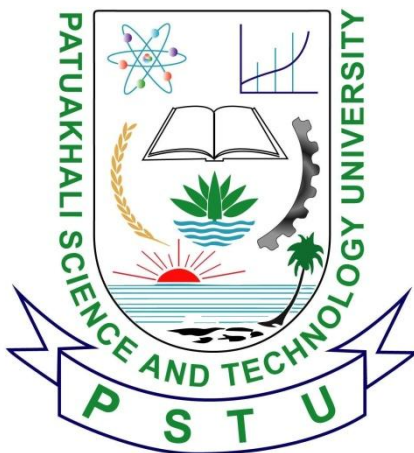# Patuakhali Science and Technology University

CCE 314 :: Problem 02

Faculty of Computer Science and Engineering

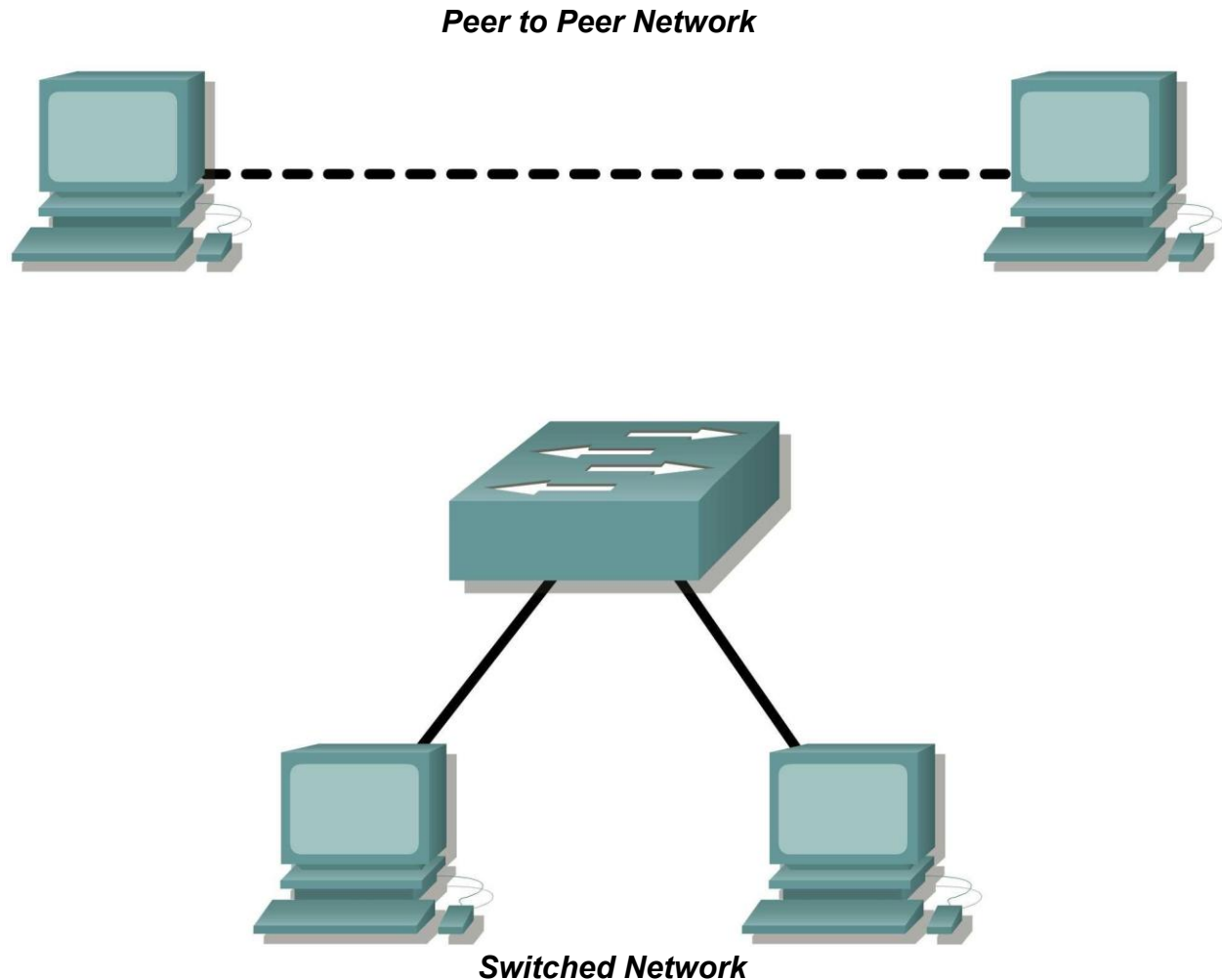| Submitted from:	Submitted to:
Mohammed Sakib Hasan	**Prof. Dr. Md Samsuzzaman**
	Professor,
ID : 2102052	Department of Computer and Communication Engineering,
Reg : 10179	Patuakhali Science and Technology University.
Semester: 5th	.

Lab 2.6.1: Topology Orientation and Building a Small Network

Topology Diagram

Peer to Peer Network

Switched Network

Learning Objectives

Upon completion of this lab, you will be able to:

- Correctly identify cables for use in the network.
- Physically cable a peer-to-peer and switched network.
- Verify basic connectivity on each network.

Background

Many network problems can be fixed at the Physical layer of a network. For this reason, it is important to have a clear understanding of which cables to use for your network connections.

At the Physical layer (Layer 1) of the OSI model, end devices must be connected by media (cables). The type of media required depends on the type of device being connected. In the basic portion of this lab, straight–through or patch—cables will be used to connect workstations and switches.

In addition, two or more devices communicate through an address. The Network layer (Layer 3) requires a unique address (also know as a logical address or IP Addresses), which allows the data to reach the appropriate destination device.

Addressing for this lab will be applied to the workstations and will be used to enable communication between the devices.

Scenario

This lab starts with the simplest form of networking (peer-to-peer) and ends with the lab connecting through a switch.

Task 1: Create a Peer-to-Peer Network.

Step 1: Select a lab partner.

Step 2: Obtain equipment and resources for the lab.

Equipment needed:

2 workstations

2 straight through (patch) cables

1 crossover cable

1 switch (or hub)

Task 2: Identify the Cables used in a Network.

Before the devices can be cabled, you will need to identify the types of media you will be using. The cables used in this lab are crossover and straight-through.

Use a **crossover cable** to connect two workstations to each other through their NIC's Ethernet port. This is an Ethernet cable. When you look at the plug you will notice that the orange and green wires are in opposite positions on each end of the cable.

Use a **straight-through cable** to connect the router's Ethernet port to a switch port or a workstation to a switch port. This is also an Ethernet cable. When you look at the plug you will notice that both ends of the cable are exactly the same in each pin position.

Task 3: Cable the Peer-to-peer Network.

Step 1: Connect two workstations.

Using the correct Ethernet cable, connect two workstations together. Connect one end of the cable to the NIC port on PC1 and the other end of the cable to PC2.

Which cable did you use? __Copper Cross Over_____

### Step 2: Apply a Layer 3 address to the workstations.

To complete this task, you will need to follow the step-by-step instructions below.

Note: These steps must be completed on *each* workstation. The instructions are for Windows XP—steps may differ slightly if you are using a different operating system.

1. On your computer, click **Start**, right-click **My Network Places**, and then click **Properties.** The Network Connections window should appear, with icons showing the different network connections.
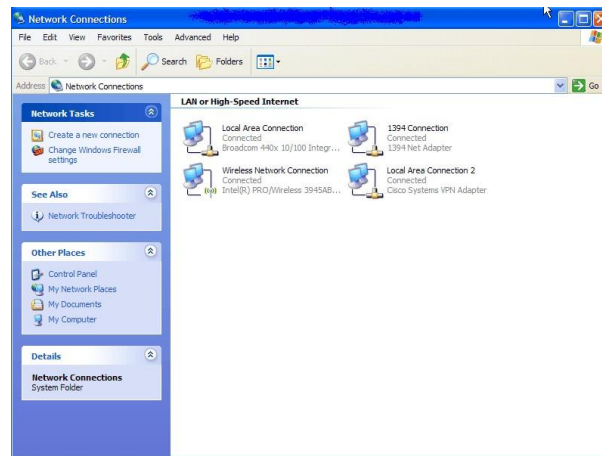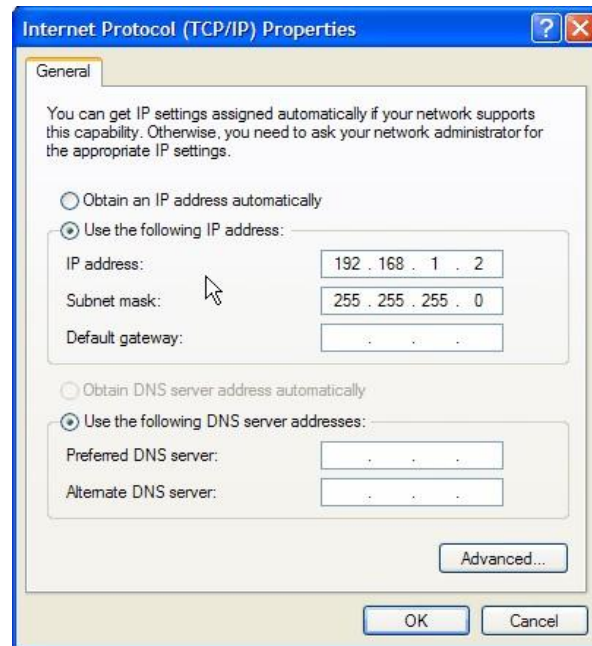

2. Right-click the **Local Area Connection** and click **Properties**.

3. Select the **Internet Protocol (TCP/IP)** item and then click the **Properties** button.
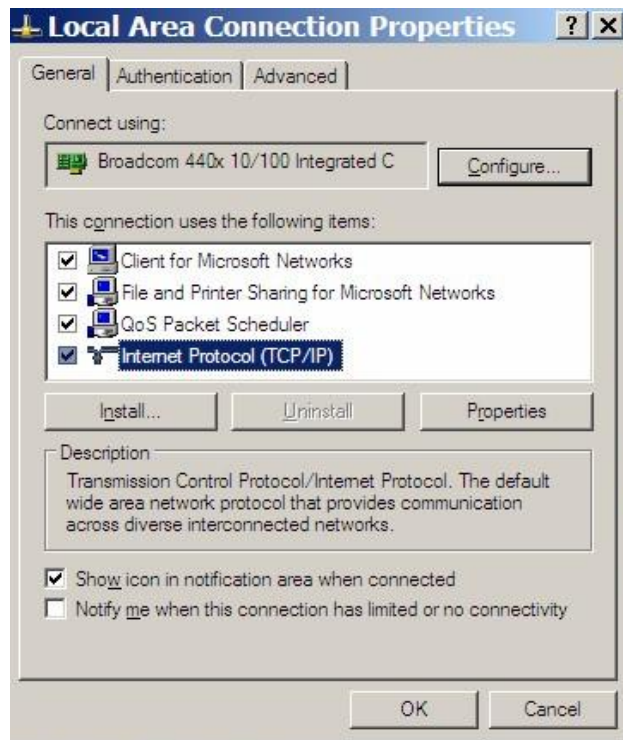
4. On the General tab of the Internet Protocol (TCP/IP) Properties window, select the **Use the following IP address** option.

5. In the **IP address** box, enter the IP address 192.168.1.2 for PC1. (Enter the IP address 192.168.1.3 for PC2.)
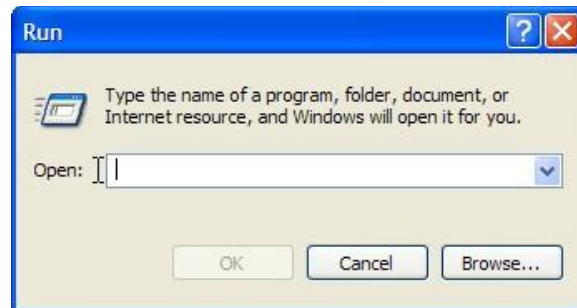
6. Press the tab key and the Subnet mask is automatically entered. The subnet address should be 255.255.255.0. If this address is not automatically entered, enter this address manually.

7. Click **OK**.


8. Close the Local Area Connection Properties window.

Step 3: Verify connectivity.

1. On your computer, click **Start**, and then click **Run**.

2. Type **cmd** in the Open box and then click **OK**.

The DOS command (cmd.exe) window will appear. You can enter DOS commands using this window. For the purposes of this lab, basic network commands will be entered to allow you to test you computer connections.
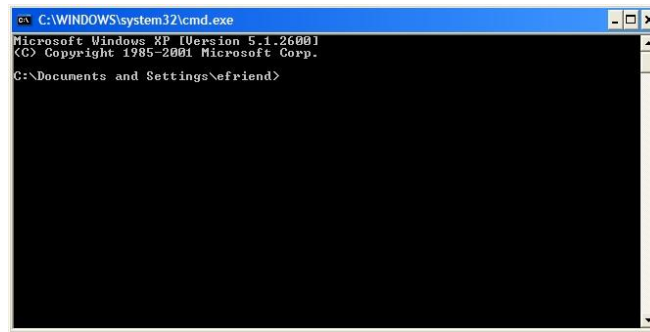
The `ping` command is a computer network tool used to test whether a host (workstation, router, server, etc.) is reachable across an IP network.

3. Use the `ping` command to verify that PC1 can reach PC2 and PC2 can reach PC1. From the PC1 DOS command prompt, type `ping 192.168.1.3`. From the PC2 DOS command prompt, type `ping 192.168.1.2`.

    What is the output of the `ping` command?

    Pinging 192.168.1.3 with 32 bytes of data:

    Reply from 192.168.1.3: bytes=32 time<1ms TTL-128

    Reply from 192.168.1.3: bytes=32 time=1ms TTL-128

    Reply from 192.168.1.3: bytes=32 time<1ms TTL-128

    Reply from 192.168.1.3: bytes=32 time<1ms TTL=128

    Ping statistics for 192.168.1.3:

    Packets: Sent 4, Received = 4, Lost = 0 (0% loss),

    Approximate round trip times in milli-seconds: Minimum = Oms, Maximum = Ims, Average Oms

    If the `ping` command displays an error message or doesn't receive a reply from the other workstation, troubleshoot as necessary. Possible areas to troubleshoot include:

    *   Verifying the correct IP addresses on both workstations
    *   Ensuring that the correct type of cable is used between the workstations

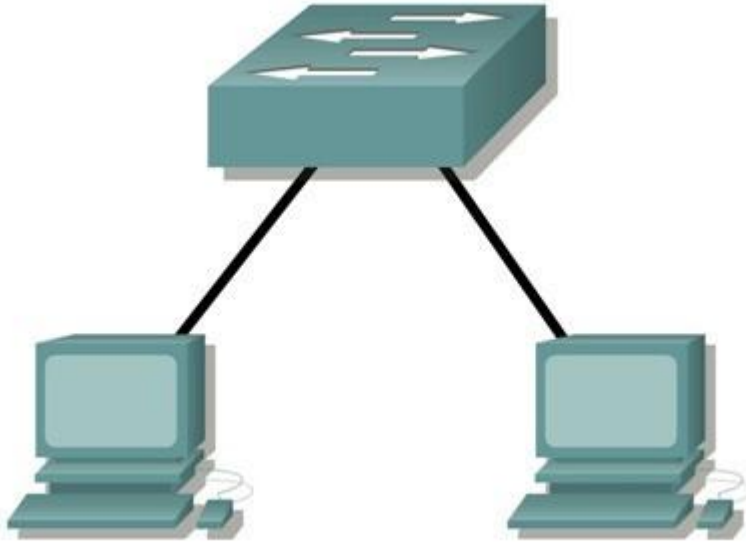   What is the output of the `ping` command if you unplug the network cable and ping the other workstation?

<u>Request timed out.</u>

<u>Request timed out.</u>

<u>Request timed out.</u>

<u>Request timed out.</u>

Task 4: Connect Your Workstations to the Classroom Lab Switch.

Step 1: Connect workstation to switch.

Using the correct cable, connect one end of the cable to the NIC port on the workstation and the other end to a port on the switch.

Step 2: Repeat this process for each workstation on your network.

Which cable did you use? _____Copper Straight-Through_____

Step 3: Verify connectivity.

Verify network connectivity by using the `ping` command to reach the other workstations attached to the switch.

What is the output of the `ping` command?

<u>Pinging 192.168.1.2 with 32 bytes of data:</u>

<u>Reply from 192.168.1.2: bytes=32 time=5ms TTL=128</u>

<u>Reply from 192.168.1.2: bytes=32 time=5ms TTL=128</u>

<u>Reply from 192.168.1.2: bytes=32 time=4ms TTL=128</u>

Reply from 192.168.1.2: bytes=32 time=6ms TTL=128

Ping statistics for 192.168.1.2:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 4ms, Maximum = 6ms, Average = 5ms

What is the output of the `ping` command if you ping an address that is not connected to this network? Pinging 192.168.1.5 with 32 bytes of data:

Request timed out.

Request timed out.

Request timed out.

Request timed out.

Ping statistics for 192.168.1.5:

Packets: Sent = 4, Received = 0, Lost = 4 (100% loss)

Step 4: Share a document between PCs.
1. On your desktop, create a new folder and name it **test**.
2. Right-click the folder and click File sharing. **Note:** A hand will be placed under the icon.
3. Place a file in the folder.
4. On the desktop, double-click **My Network Places** and then **Computers Near Me**.
5. Double-click the workstation icon. The **test** folder should appear. You will be able to access this folder across the network. Once you are able to see it and work with the file, you have access through all 7 layers of the OSI model.

Task 5: Reflection

What could prevent a ping from being sent between the workstations when they are directly connected?

_Wrong__Cable__Type,__Incorrect_IP__Address_configuration,___Disconnected__NIC,___Loose_____

___or___unplugged__Cable,____Firewall____Block_____

_____

_____

What could prevent the ping from being sent to the workstations when they are connected through the switch?

___Switch__Port__Problem_____

___NIC_Disabled_____

___No__Power__to____switch_____

_____