Building a Small Network in Packet Tracer

Introduction to Packet Tracer

Packet Tracer is a protocol simulator developed at Cisco Systems. Packet Tracer (PT) is a powerful and dynamic tool that displays the various protocols used in networking, in either Real Time or Simulation mode. This includes layer 2 protocols such as Ethernet and PPP, layer 3 protocols such as IP, ICMP, and ARP, and layer 4 protocols such as TCP and UDP. Routing protocols can also be traced. Packet Tracer is a supplement to and not a replacement for experience with real equipment.

The purpose of this lab is to become familiar with the Packet Tracer interface. Download the Packettracer file from Moodle and install on your PC/Laptop. Launch Packet Tracer and you should see the screen below.

Several types of devices and network connections can be used. For this lab we will keep it simple by using End Devices, Switches, Hubs, and Connections.
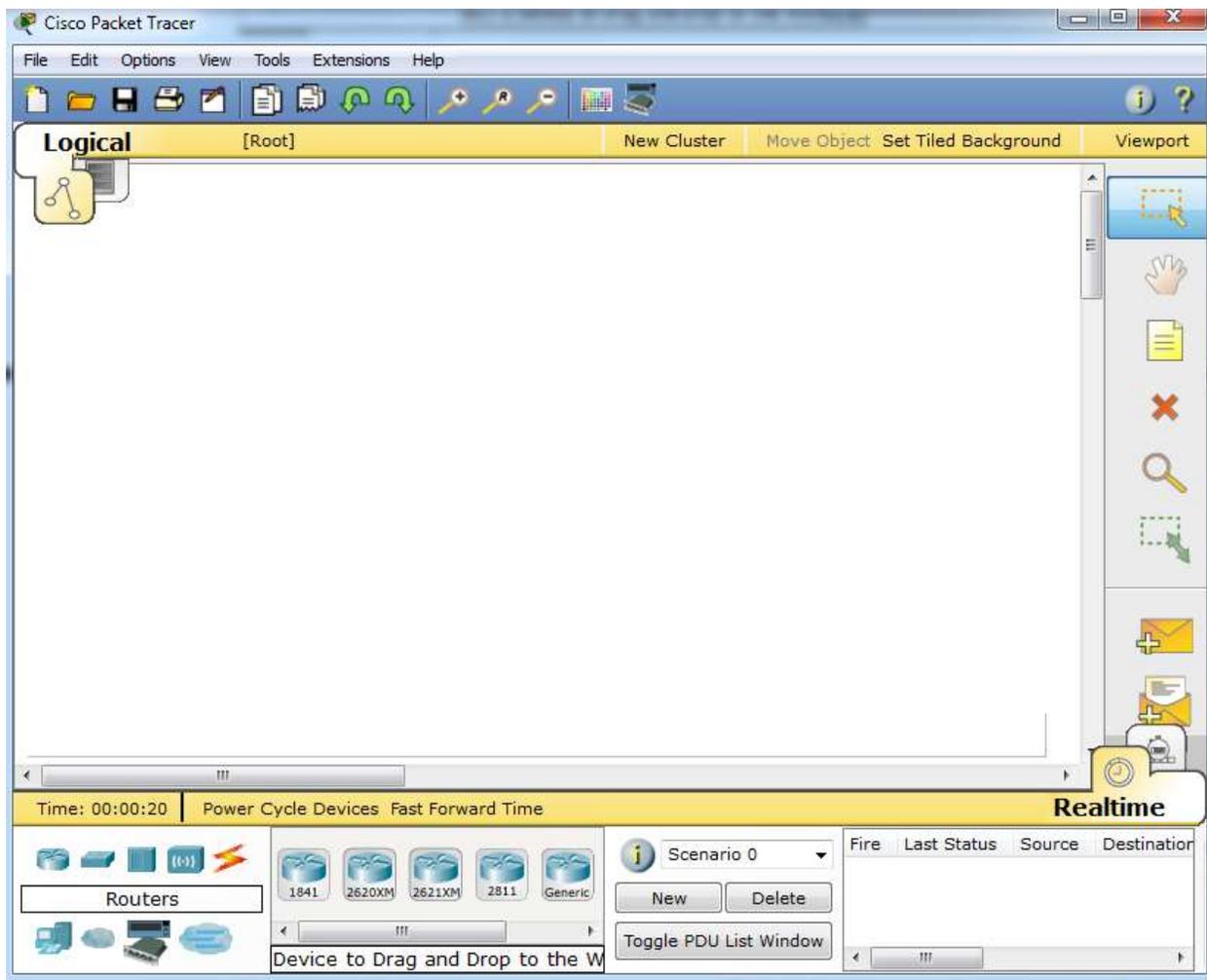
Topology Diagrams

Peer to Peer Network
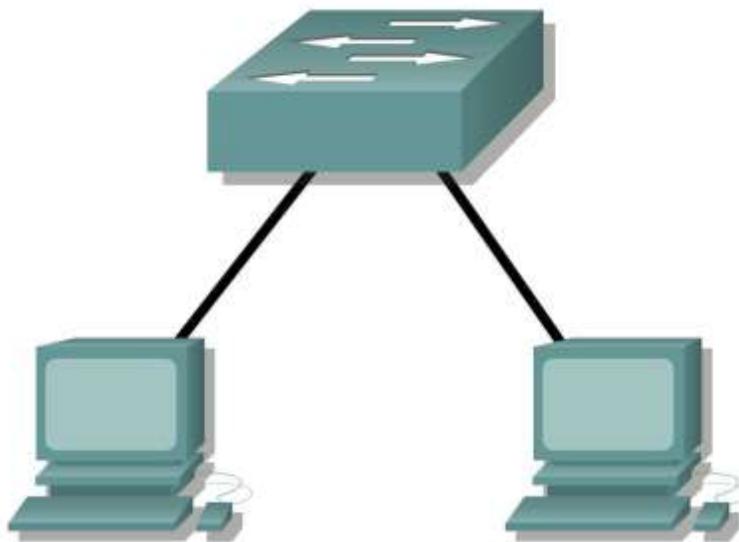
Switched Network

Learning Objectives

Upon completion of this lab, you will be:

- Familiar with the PacketTracer Interface
- Able to configure your own topology
- Able to configure IP settings on PC Network Interface Cards (NICs)
- Verify basic connectivity using ping

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. Straight–through or patch cables are 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 workstation NICs and will be used to enable communication between the devices.

Create a Peer-to-Peer Network.

1. Single click on each group of devices and connections to display the various choices.
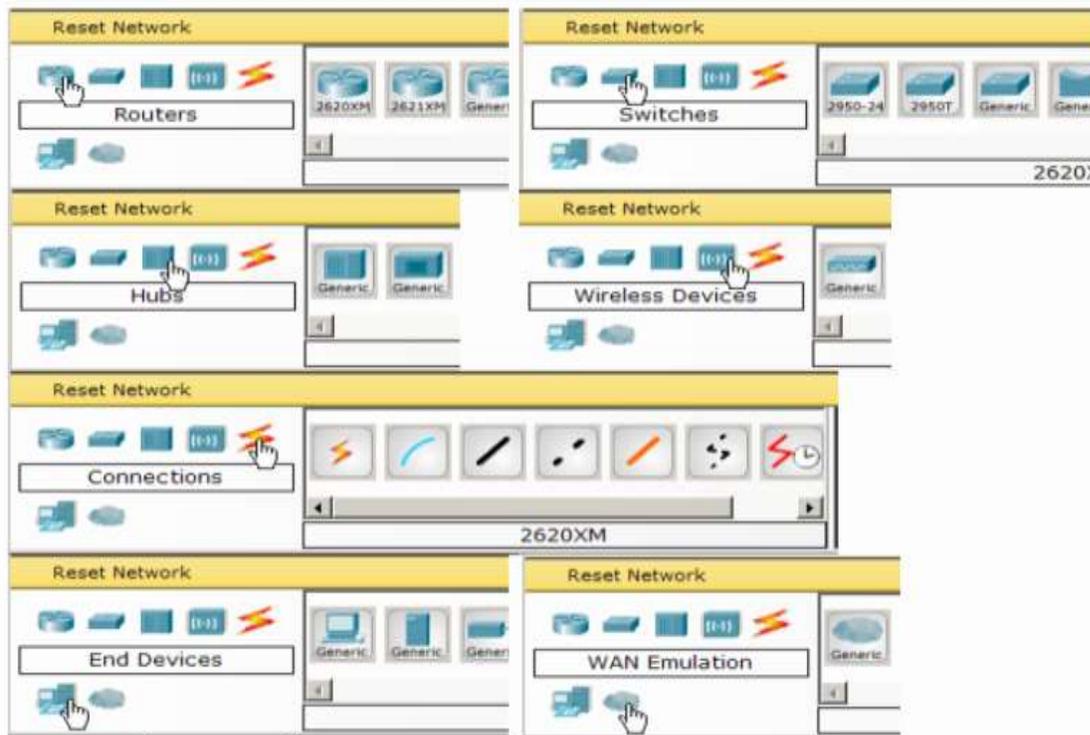
2. Drag and drop 2 PCs into your topology.

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. If 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. If you look at the plug you will notice that both ends of the cable are exactly the same in each pin position.

3. 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?

4. Apply a Layer 3 address to the workstations - Before we can communicate between the hosts we need to configure IP Addresses and Subnet Masks on the devices.
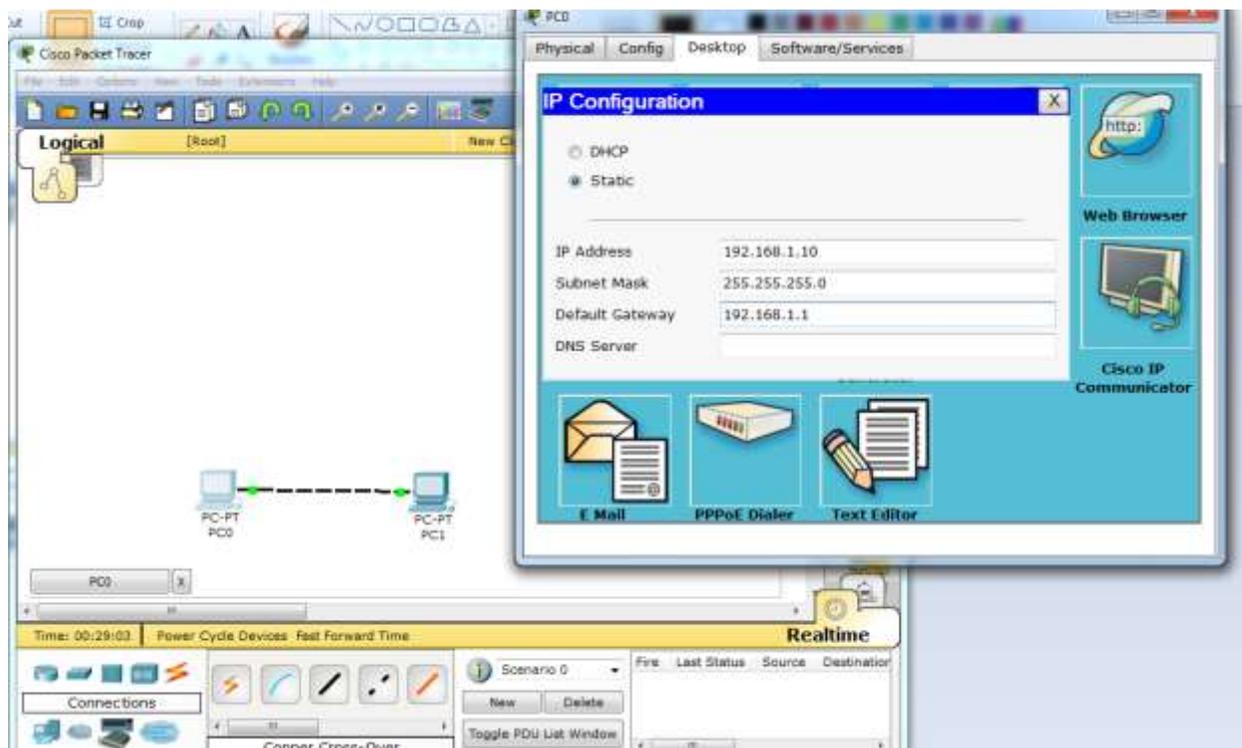
- Click on PC0; go to the Desktop tab and choose IP configuration - enter the IP address 192.168.1.10 and subnet make 255.255.255.0 and defaulat gateway 192.168.1.1 for PC0. (Enter the IP address 192.168.1.11 for PC1.)

5. Verify connectivity – go to the Command prompt on PC0 Desktop. Make sure the IP configuration settings have been saved using the ipconfig command. Now send a ping from PC0 to PC1 using *ping 192.168.1.11*.

- What is the output of the **ping** command?

- 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:

    o Verifying the correct IP addresses on both workstations

- o Ensuring that the correct type of cable is used between the workstations

- What is the output of the **ping** command if you delete the network cable and ping the other workstation?

Connect Your Workstations to an Ethernet Switch
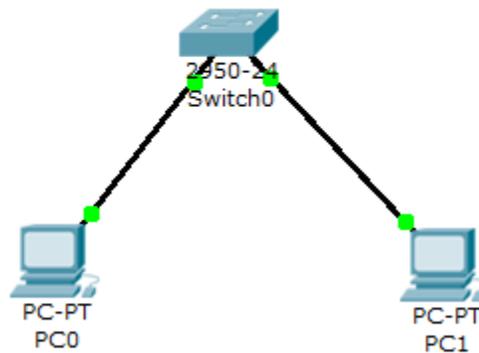
1. Delete the cable between the 2 PCs and drag an Ethernet switch into the topology.Using the correct cable, connect one end of the cable to the NIC port on the workstation and the other end to a port on the switch.
2. Verify network connectivity by using the **ping** command to reach the other workstation attached to the switch.

Help/Tutorials

Under the Help menu option you will find an index and also a list of tutorials that will help you become more familiar with the PacketTracer environment.

Reflection

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

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