

Name : Pritam Rao

Branch : TE Computer

Batch : C

UID : 2018130044

CEL 51, DCCN, Monsoon 2020

Lab 3: Learn usage of Packet Tracer

Objectives

- Install Packet Tracer from <https://www.ciscopods.com/install-packet-tracer-ubuntu/>
 - Develop an understanding of the basic functions of Packet Tracer.
 - Create/model a simple Ethernet network using two hosts and a hub.
 - Observe traffic behavior on the network.
 - Observer data flow of ARP broadcasts and pings.
-

Step 1: Create a logical network diagram with two PCs and a hub

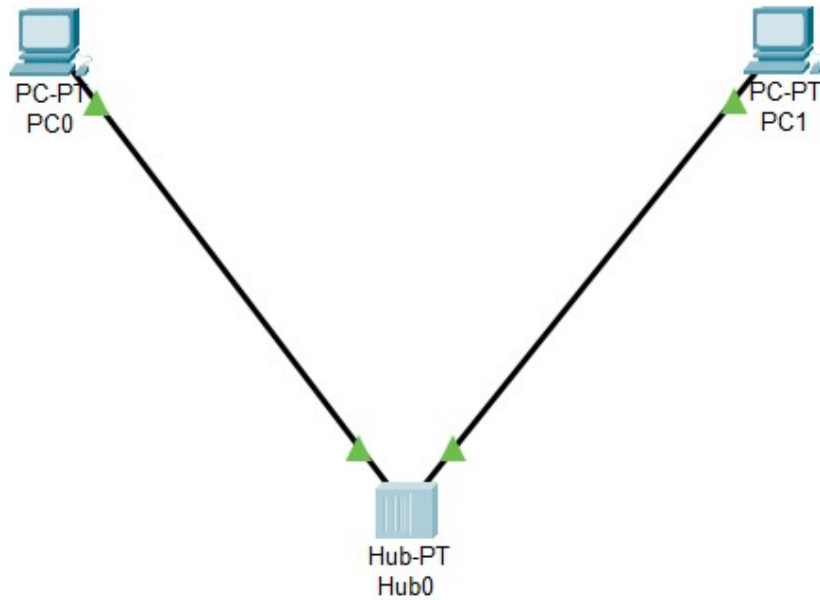
The bottom left-hand corner of the Packet Tracer screen displays eight icons that represent device categories or groups, such as Routers, Switches, or End Devices.

Moving the cursor over the device categories will show the name of the category in the box. To select a device, first select the device category. Once the device category is selected, the options within that category appear in the box next to the category listings. Select the device option that is required.

- a) Select **End Devices** from the options in the bottom left-hand corner. Drag and drop two generic PCs onto your design area.
- b) Select **Hubs** from the options in the bottom left-hand corner. Add a hub to the prototype network by dragging and dropping a generic hub onto the design area.
- c) Select **Connections** from the bottom left-hand corner. Choose a **Copper Straight-through** cable type. Click the first host, **PC0**, and assign the cable to the **FastEthernet** connector. Click the hub, **Hub0**, and select a connection port, **Port 0**, to connect to **PC0**.
- d) Repeat Step c for the second PC, **PC1**, to connect the PC to **Port 1** on the hub.

*There should be green dots at both ends of each cable connection. If not, check the cable type selected.

Outcome :

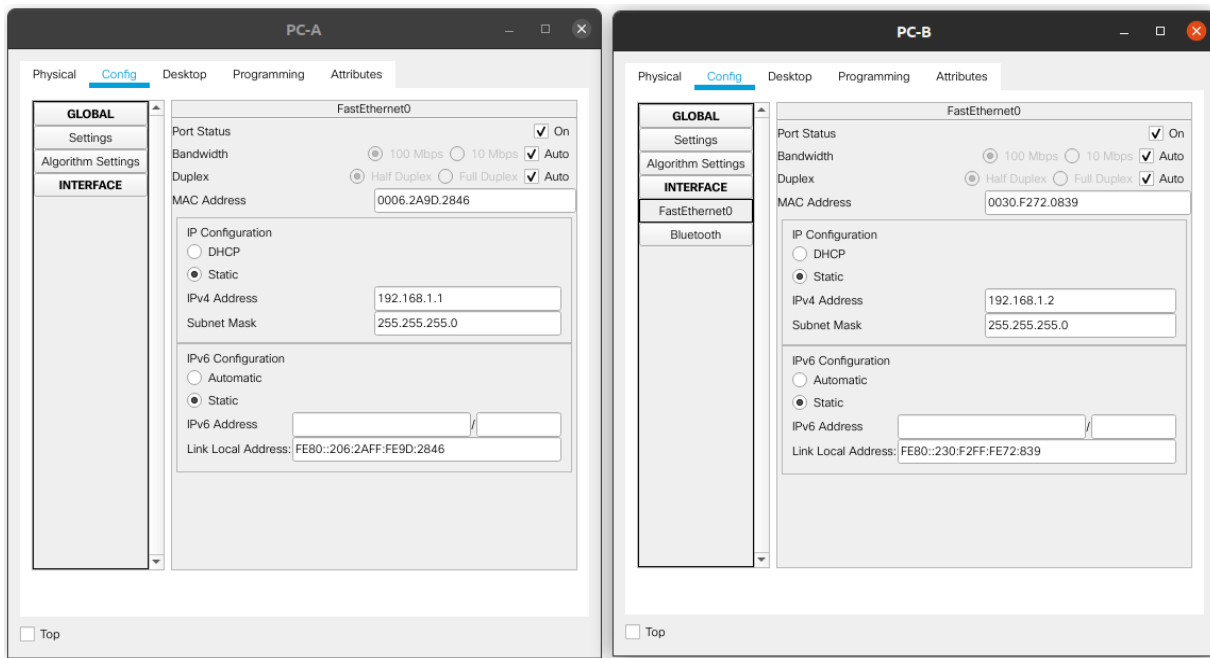


The image shows the outcome of step 1. In this step, a network of two generic personal computers and a generic hub is created and the computers are connected to the hub by means of a Copper straight-through cable.

Step 2: Configure host names and IP addresses on the PCs

- a) Click PC0. A PC0 window will appear.
- b) From the PC0 window, select the **Config** tab. Change the PC **Display Name** to **PC-A**. (An error message window will appear warning that changing the device name may affect scoring of the activity. Ignore this error message.) Select the **FastEthernet** tab on the left and add the IP address of **192.168.1.1** and subnet mask of **255.255.255.0**. Close the PC-A configuration window by selecting the **x** in the upper righthand corner.
- c) Click PC1.
- d) Select the **Config** tab. Change the PC **Display Name** to **PC-B**. Select the **FastEthernet** tab on the left and add the IP address of **192.168.1.2** and subnet mask of **255.255.255.0**. Close the PC-B configuration window.

Outcome :



The above images show the configuration of both the personal computers (PC-A and PC-B). The IP addresses and subnet masks assigned to each PC is also shown.

Step 3: Observe the flow of data from PC-A to PC-B by creating network traffic

- Switch to **Simulation** mode by selecting the tab that is partially hidden behind the **Realtime** tab in the bottom right-hand corner. The tab has the icon of a stopwatch on it.
- Click the **Edit Filters** button in the **Edit List Filters** area. Clicking the **Edit Filters** button will create a pop-up window. In the pop-up window, click the **Show All/None** box to deselect every filter. Select just the **ARP** and **ICMP** filters.
- Select a **Simple PDU** by clicking the closed envelope on the right vertical toolbar. Move your cursor to the display area of your screen. Click **PC-A** to establish the source. Move your cursor to **PC-B** and click to establish the destination.

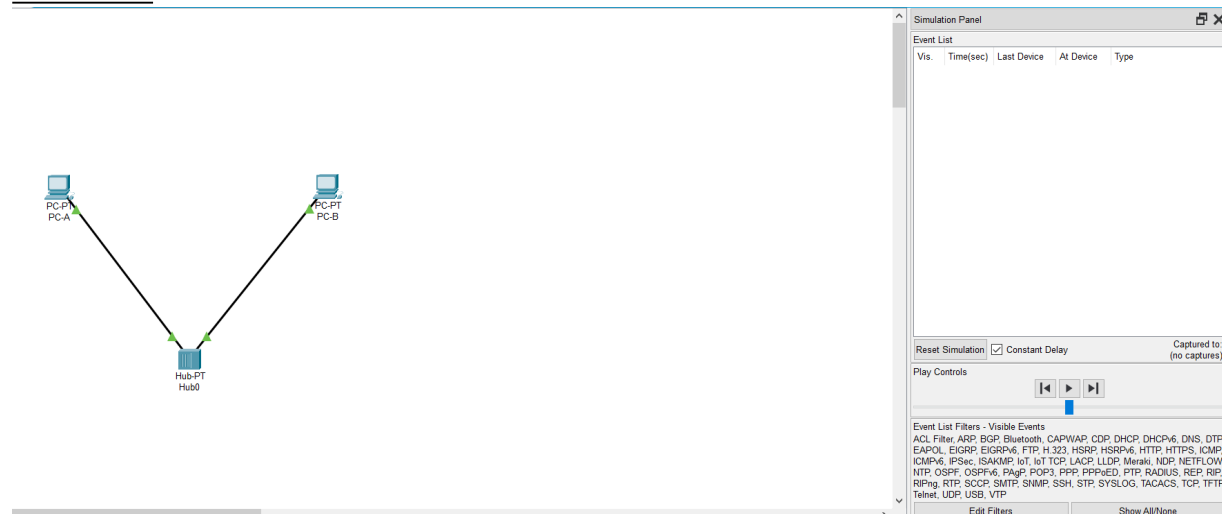
****Notice that two envelopes are now positioned beside PC-A. One envelope is ICMP, while the other is ARP. The Event List in the Simulation Panel will identify exactly which envelope represents ICMP and which represents ARP.**

- Select **Auto Capture / Play** from the **Play Controls** area of the Simulation Panel. Below the **Auto Capture / Play** button is a horizontal bar, with a vertical button that controls the speed of the

simulation. Dragging the button to the right will speed up the simulation, while dragging is to the left will slow down the simulation.

- e) The animation will run until the message window *No More Events* appears. All requested events have been completed. Select OK to close the message box.
- f) Choose the **Reset Simulation** button in the Simulation Panel. Notice that the ARP envelope is no longer present. This has reset the simulation but has not cleared any configuration changes or dynamic table entries, such as ARP table entries. The ARP request is not necessary to complete the **ping** command because PC-A already has the MAC address in the ARP table.
- g) Choose the **Capture / Forward** button. The ICMP envelope will move from the source to the hub and stop. The **Capture / Forward** button allows you to run the simulation one step at a time. Continue selecting the **Capture / Forward** button until you complete the event.
- h) Choose the **Power Cycle Devices** button on the bottom left, above the device icons.
- i) An error message will appear asking you to confirm reset. Choose **Yes**. Now both the ICMP and ARP envelopes are present again. The **Reset Network** button will clear any configuration changes not saved and will clear all dynamic table entries, such as the ARP and MAC table entries.

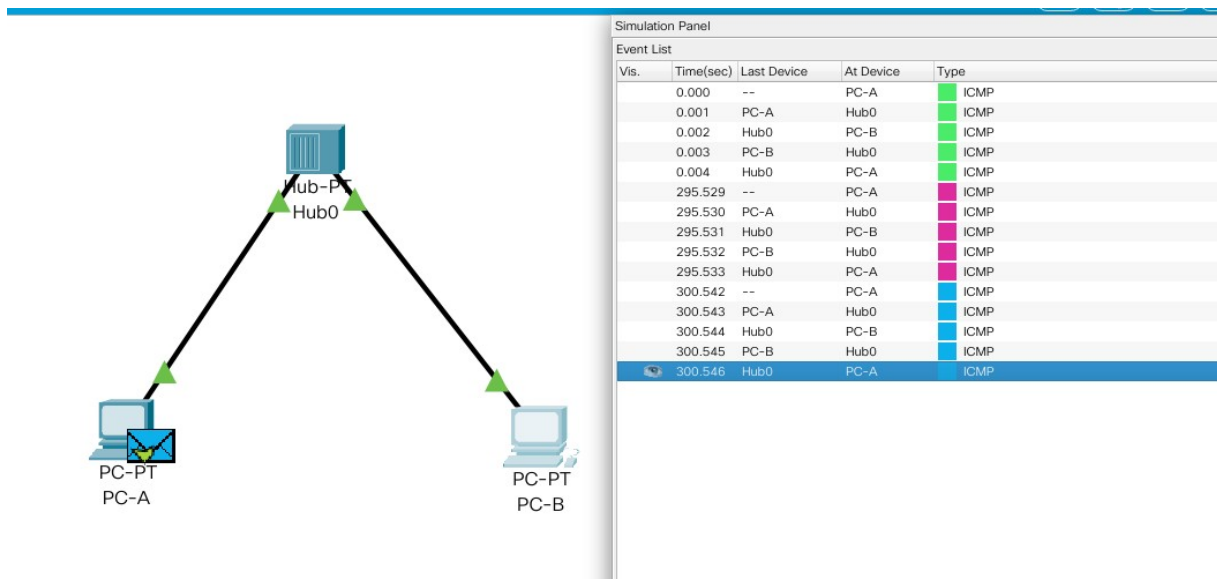
Outcome :



The simulation panel is shown beside the Ethernet network. It shows all the event list filters that are available with the packet tracer and also provides some basic simulation settings like editing filters and resetting the simulation and to play the simulation in a customized manner.

Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC-A	ICMP
	0.000	--	PC-A	ARP
	0.001	PC-A	Hub0	ARP
	0.002	Hub0	PC-B	ARP
	0.003	PC-B	Hub0	ARP
	0.004	Hub0	PC-A	ARP
	0.004	--	PC-A	ICMP
	0.005	PC-A	Hub0	ICMP
	0.006	Hub0	PC-B	ICMP
	0.007	PC-B	Hub0	ICMP
	0.008	Hub0	PC-A	ICMP
	295.529	--	PC-A	ICMP
	295.530	PC-A	Hub0	ICMP
	295.531	Hub0	PC-B	ICMP
	295.532	PC-B	Hub0	ICMP
	295.533	Hub0	PC-A	ICMP
	300.542	--	PC-A	ICMP
	300.543	PC-A	Hub0	ICMP
	300.544	Hub0	PC-B	ICMP
	300.545	PC-B	Hub0	ICMP
	300.546	Hub0	PC-A	ICMP

The image shows the steps of the completed simulation and also explains how the ICMP and ARP data packets are transferred between the hub and the personal computers.



The image depicts the scenario after resetting the simulation. The ARP filter is set to visible but the ARP packet is not visible since both the PCs have their MAC addresses stored in the ARP tables.

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC-A	ARP
	0.000	--	PC-B	ARP
	0.000	--	PC-A	ICMP
	0.000	--	PC-A	ARP

After clicking the **Power Cycle Devices** button, all the dynamic cached entries are cleared and the ARP packets are visible again as shown in the image above.

Step 4: View ARP Tables on each PC

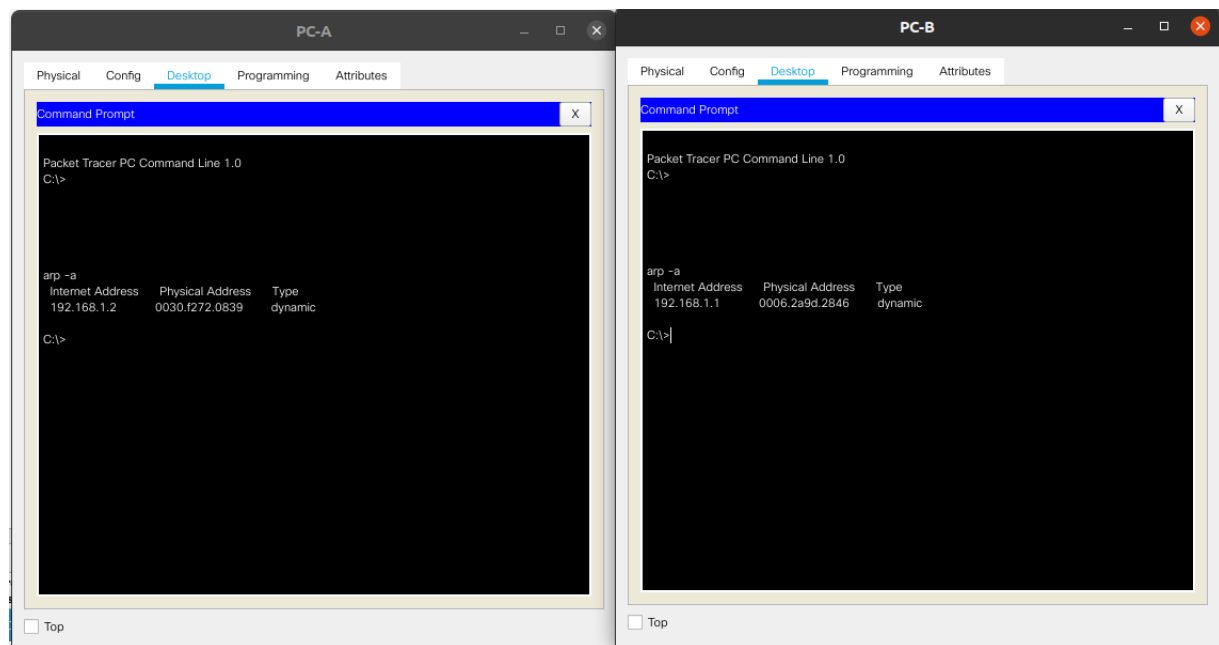
- Choose the **Auto Capture / Play** button to repopulate the ARP table on the PCs. Click **OK** when the *No More Events* message appears.
- Select the magnifying glass on the right vertical toolbar.
- Click **PC-A**. The ARP table for PC-A will appear. Notice that PC-A does have an ARP entry for PC-B. View the ARP table for PC-B as well. Close all ARP table windows.
- Click the **Select Tool** on the right vertical toolbar. (This is the first icon present in the toolbar.)
- Click **PC-A** and select the **Desktop** tab.
- Select the **Command Prompt** and type the command **arp -a** and press *enter* to view the ARP table from the desktop view. Close the PC-A configuration window.
- Examine the ARP table for **PC-B**.
- Close the PC-B configuration window.
- Click the **Check Results** button at the bottom of the instruction window to verify that the topology is correct.

Outcome :

ARP Table for PC-A		
IP Address	Hardware Address	Interface
192.168.1.2	0030.F272.0839	FastEthernet0

ARP Table for PC-B		
IP Address	Hardware Address	Interface
192.168.1.1	0006.2A9D.2846	FastEthernet0

The above image shows ARP table of PC-A and PC-B respectively which stores the IP addresses and mac addresses of other devices connected on the network.



The above images show the cached arp table entries in a Graphical User Interface for PC-A and PC-B.

The above images show the Command Line Interface of the dynamic cached storage of PC-A which shows the IP and MAC (Physical) addresses of PC-B and that of PC-B which has the IP and MAC addresses of PC-A cached in its ARP table.

Deliverables:

Submit model schematic view along proper notations and the outcome of all steps you followed for this experiment, with proper description.