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## Lab 3: Learn usage of Packet Tracer

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**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 behaviour 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.

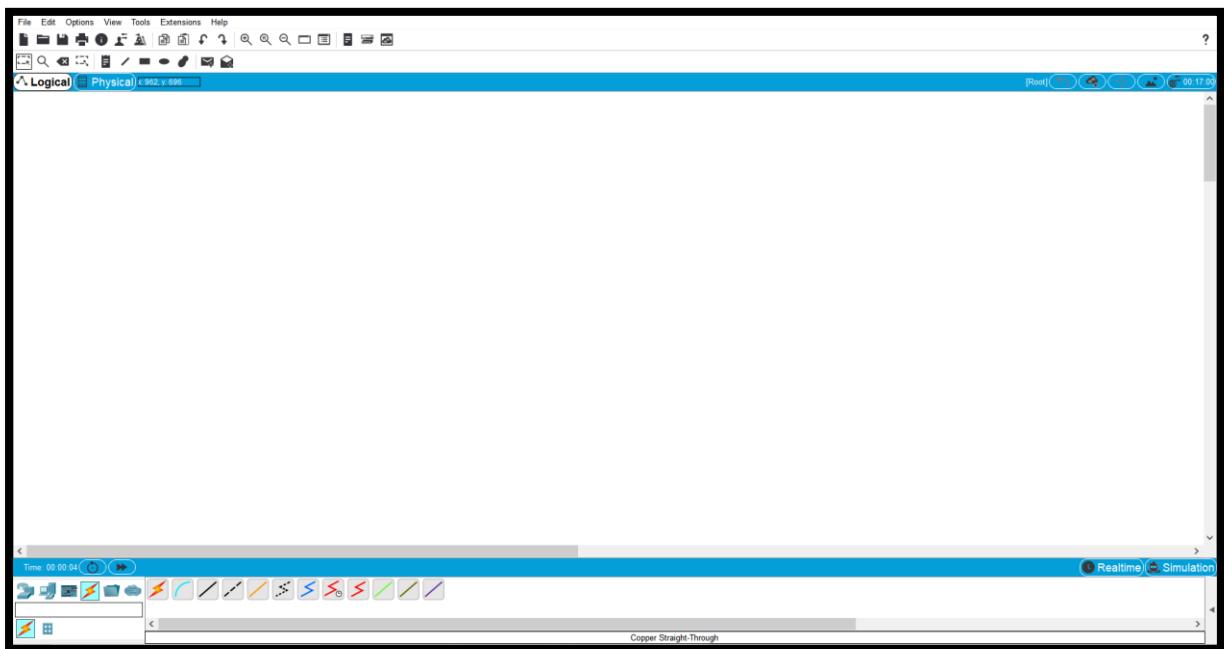
b) Select Hubs from the options in the bottom left-hand corner. Add a hub to the prototype network by dragging and dropping a generic hub onto the design area.

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.

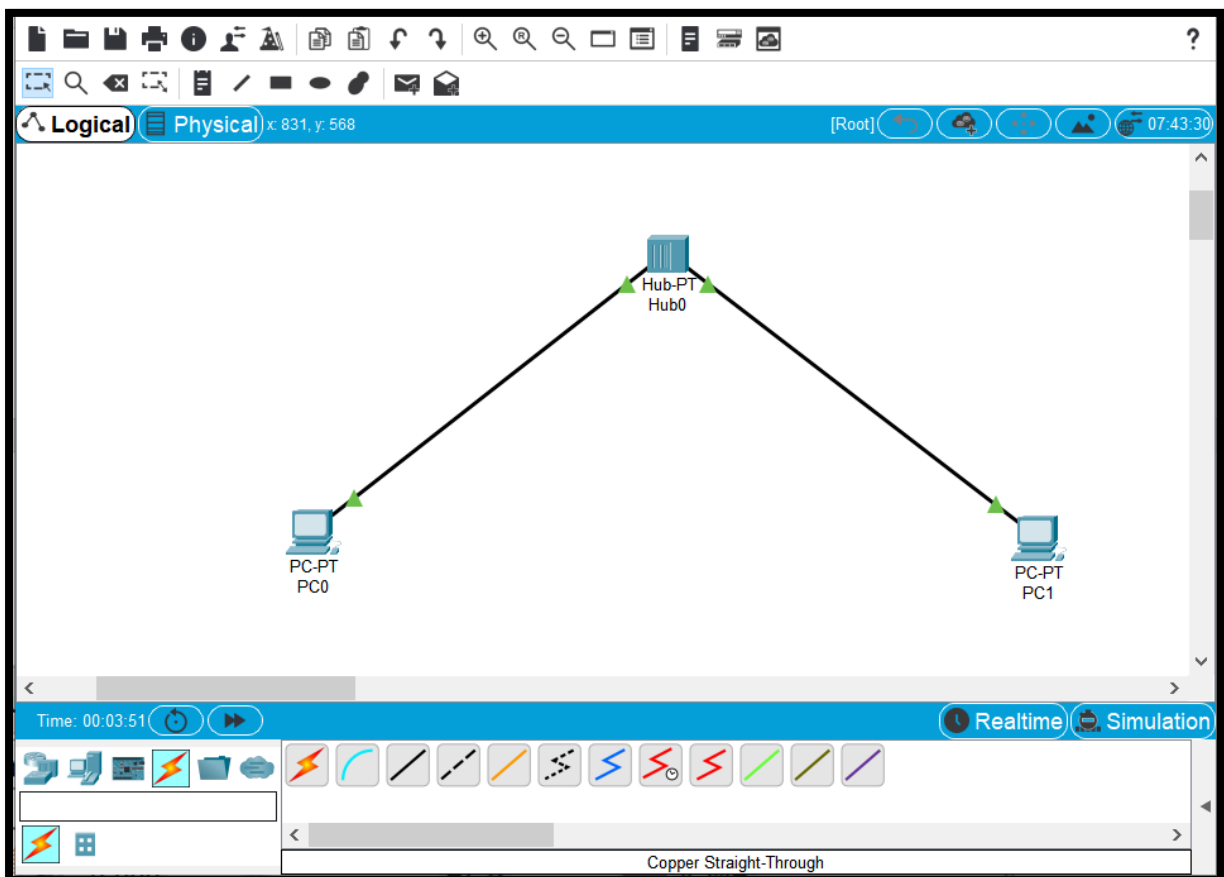
d) Repeat Step c for the second PC, PC1, to connect the PC to Port 1 on the hub.

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

## Initial Blank Project:



## Step 1 Output: Selecting devices, Hub as well as connection.



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

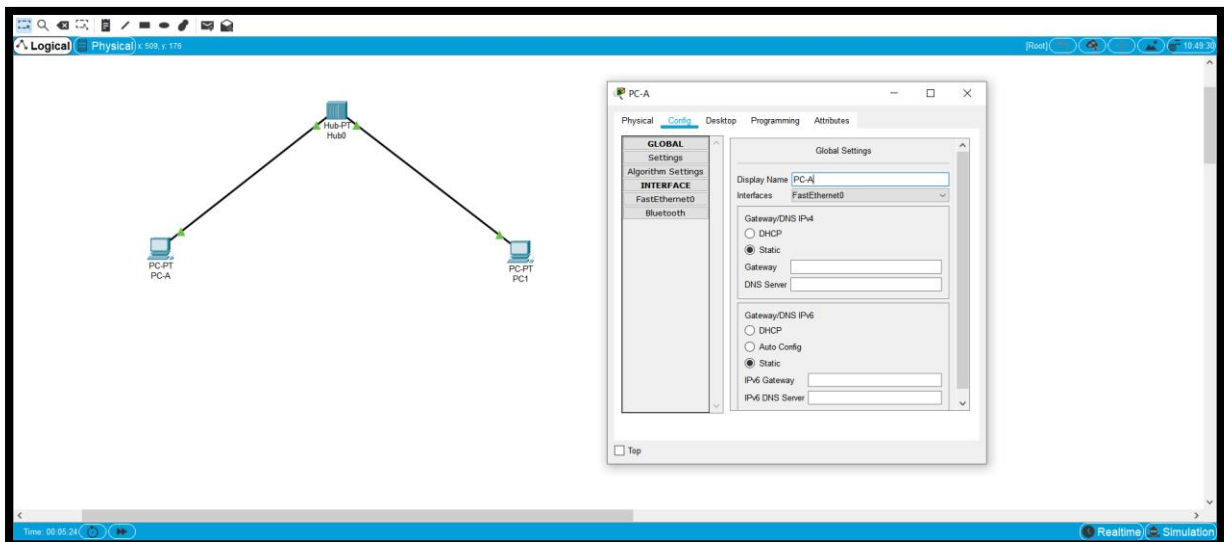
a) Click PC0. A PC0 window will appear.

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.

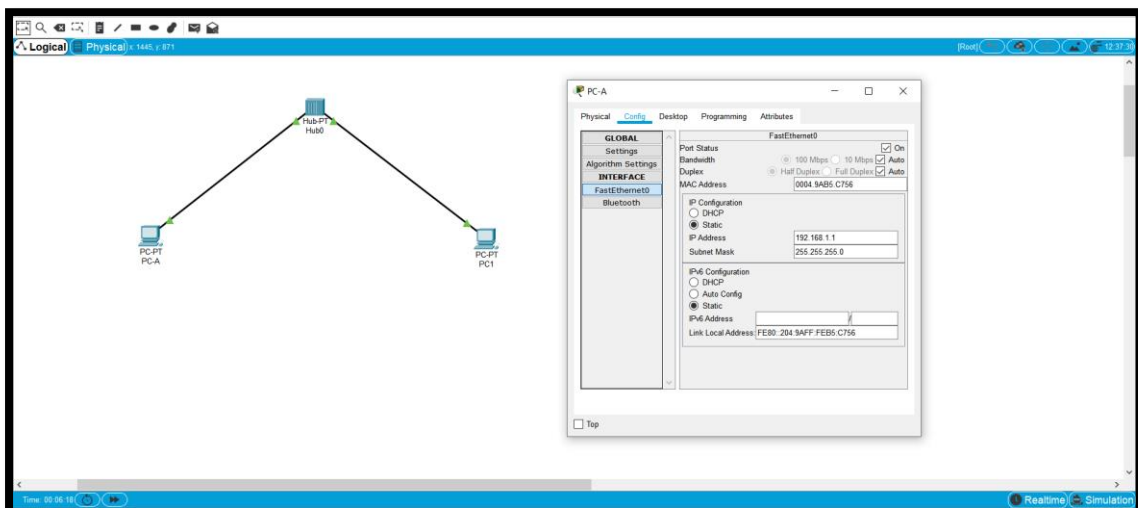
c) Click PC1.

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.

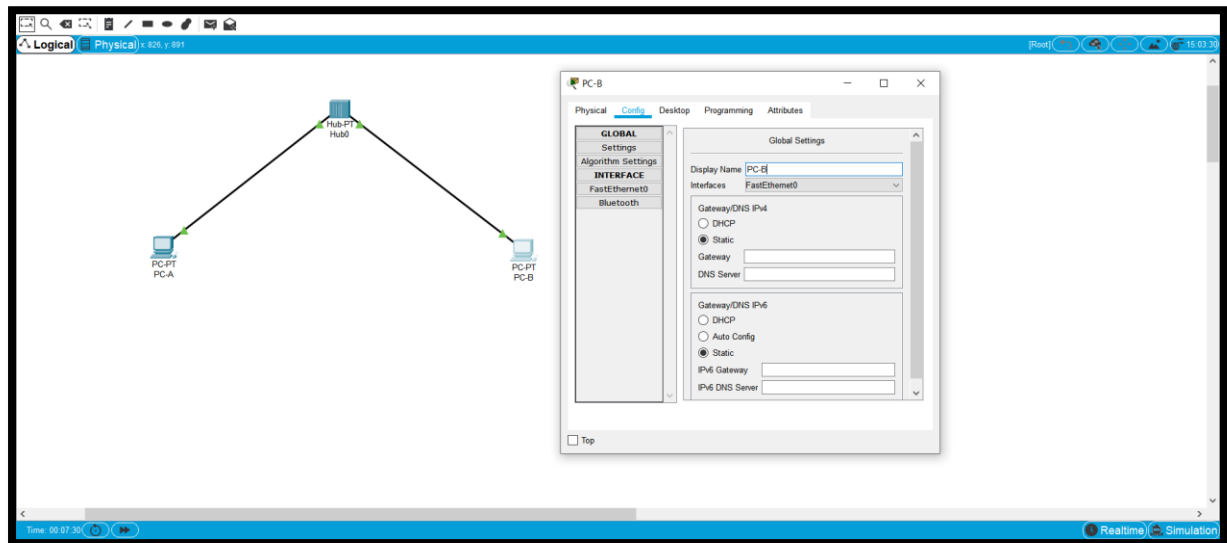
## Changing Name of PC0 TO PC - A



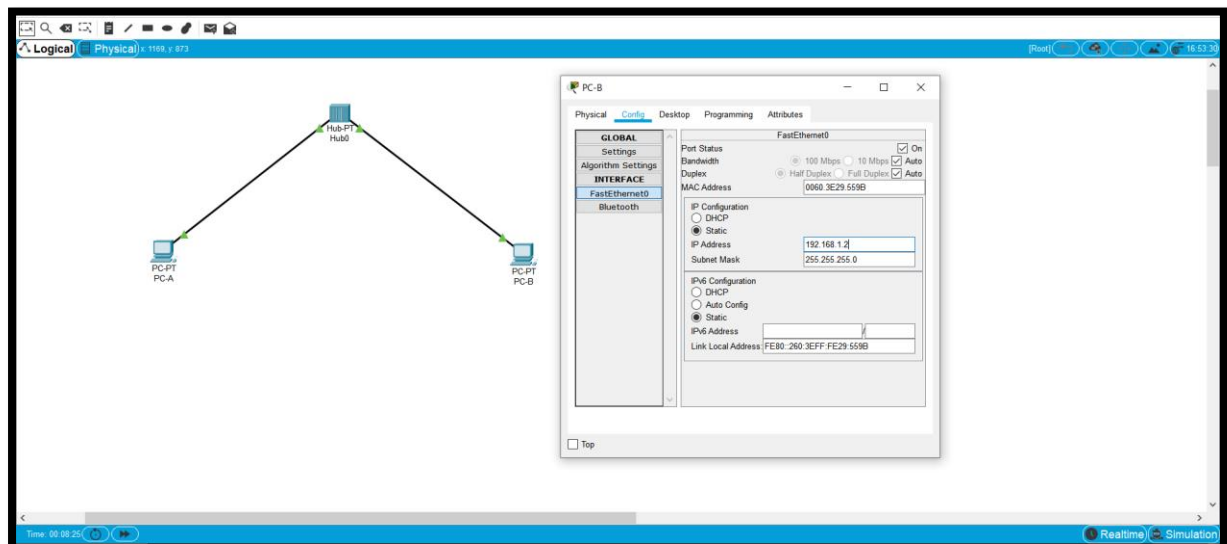
## Add IP address to PC - A



## Changing Name of PC1 TO PC - B



## Add IP address to PC - B



## PC -A Config window: FastEthernet0

PC-A

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status ☒ On

Bandwidth ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☐ Full Duplex ☒ Auto

MAC Address

IP Configuration

☐ DHCP

☒ Static

IP Address

Subnet Mask

IPv6 Configuration

☐ DHCP

☐ Auto Config

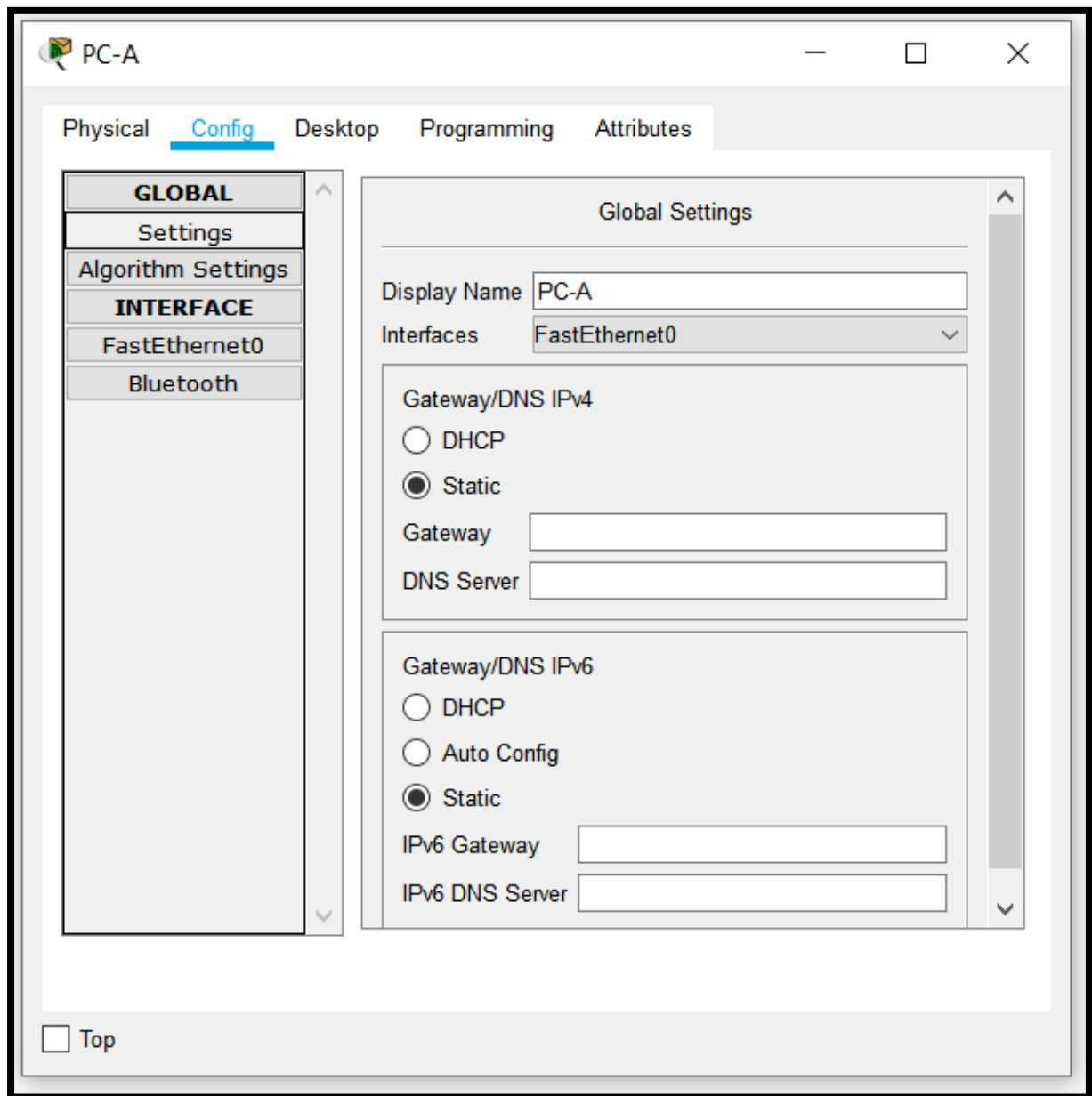
☒ Static

IPv6 Address

Link Local Address:

☐ Top

### Display Name PC- A



### 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.**

d) 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 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.

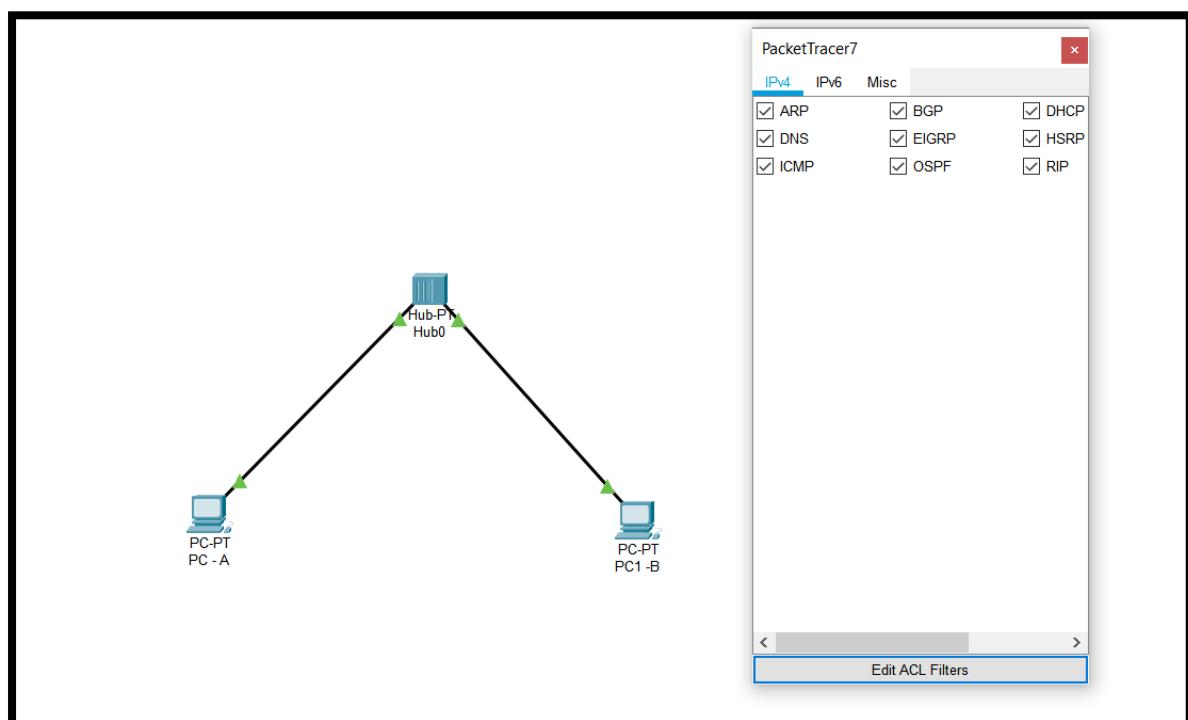
f) Choose the Reset Simulation button in the Simulation Panel. Notice that the ARP envelope is no longer present. This has reset the simulation but has not cleared any configuration changes or dynamic table entries, such as ARP table entries. The ARP request is not necessary to complete the ping command because PC-A already has the MAC address in the ARP table.

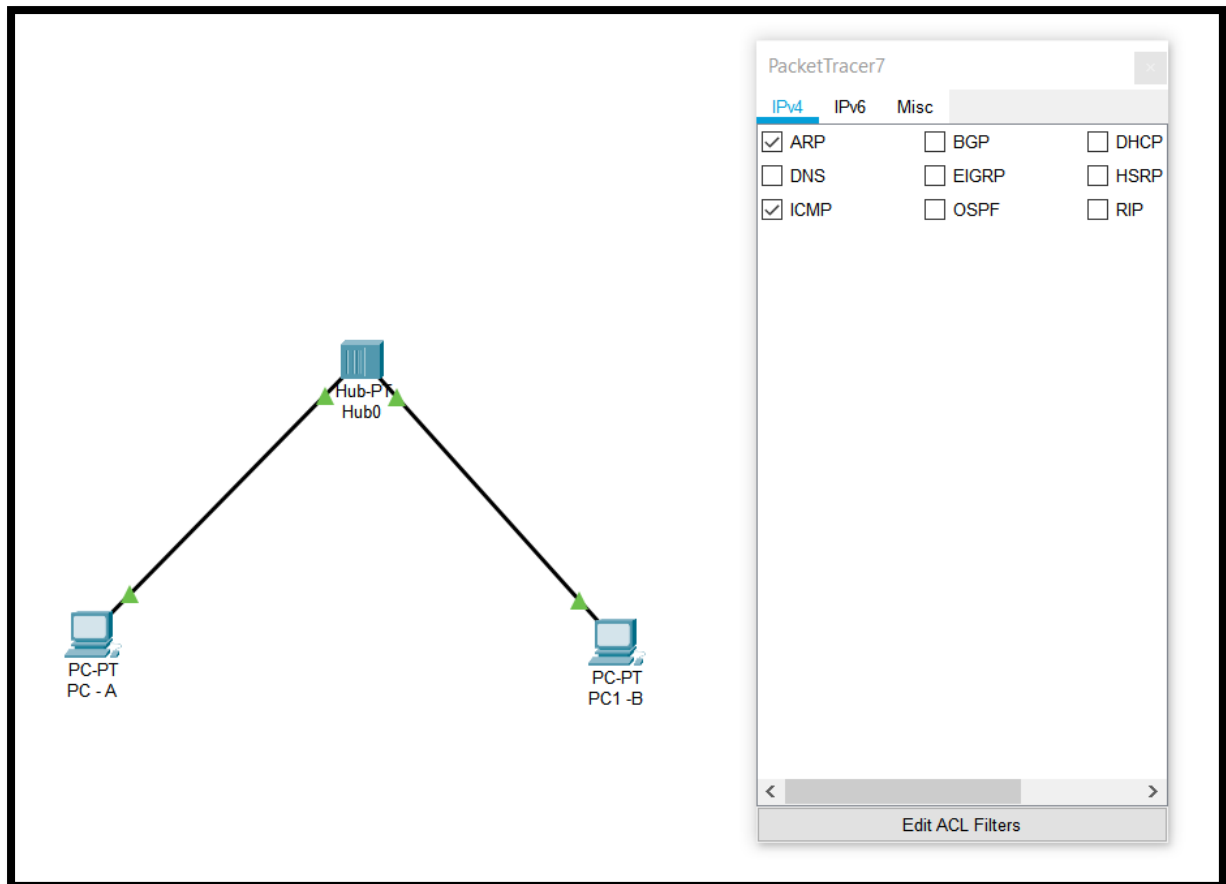
g) Choose the Capture / Forward button. The ICMP envelope will move from the source to the hub and stop. The Capture / Forward button allows you to run the simulation one step at a time. Continue selecting the Capture / Forward button until you complete the event.

h) Choose the Power Cycle Devices button on the bottom left, above the device icons.

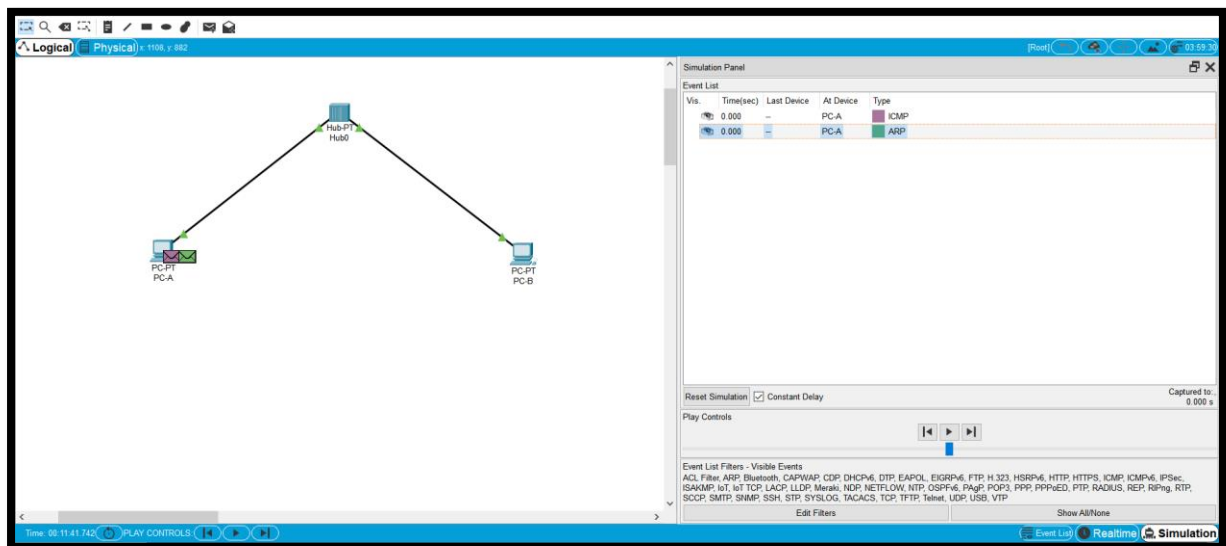
i) An error message will appear asking you to confirm reset. Choose Yes. Now both the ICMP and ARP envelopes are present again. The Reset Network button will clear any configuration changes not saved and will clear all dynamic table entries, such as the ARP and MAC table entries.

**Select just the ARP and ICMP filters.**





## Beginning of simulation



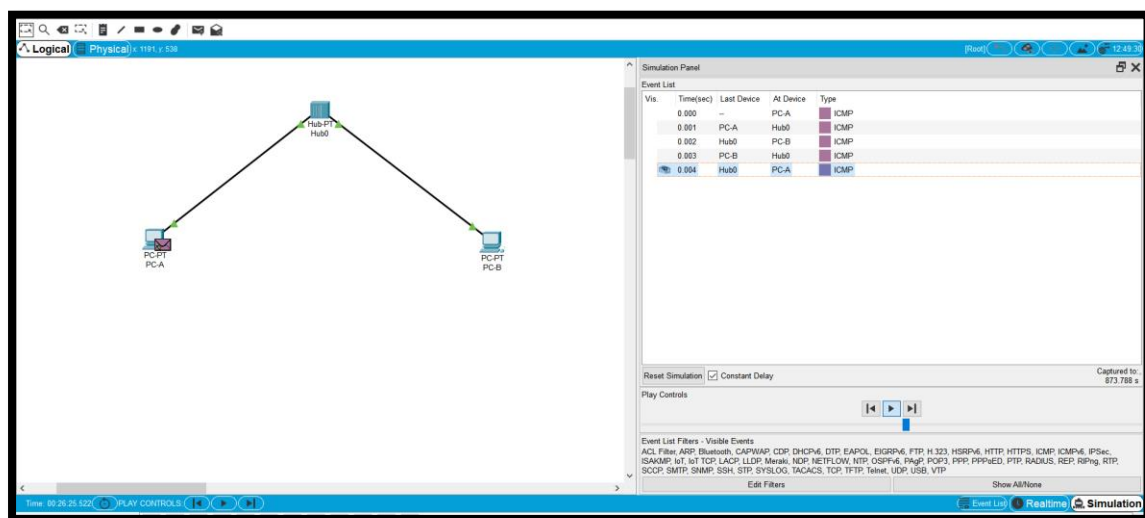


The screenshot displays the Cisco Packet Tracer interface. On the left, a network topology is shown with a central 'Hub-PT Hub0' connected to two PCs: 'PC-PT PC-A' and 'PC-PT PC-B'. The interface is set to 'Physical' mode. On the right, the 'Simulation Panel' is open, showing an 'Event List' table. The table has columns for 'Vis.', 'Time(sec)', 'Last Device', 'At Device', and 'Type'. The events listed are ICMP and ARP packets between the devices. Below the table, there are controls for 'Reset Simulation' (with a checked 'Constant Delay' option) and 'Play Controls' (with a play button). At the bottom, there are filters for 'Event List' and 'Realtime' simulation, and a 'Simulation' button.

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

The screenshot displays the Packet Tracer software interface. The main workspace shows a network topology with a central 'Hub-PT Hub0' connected to two PCs, 'PC-PT PCA' and 'PC-PT PC-B'. The interface is divided into several panels:

- Top Bar:** Includes icons for Logical and Physical views, a clock showing 12:10, and a status bar with '99.613'.
- Simulation Panel (Right):**
  - Event List:** A table with columns: Vis., Time(sec), Last Device, At Device, and Type. It shows a single event at 0.000 seconds from PC-A to PC-B of type ICMP.
  - Reset Simulation:** A button with a checked 'Constant Delay' option.
  - Play Controls:** Includes play, pause, and stop buttons, along with a progress bar.
  - Event List Filters:** A list of visible events including ACL Filter, ARP, Bluetooth, CAPWAP, CDP, DHCPv6, DTP, EAPOL, EIGRPv6, FTP, H.323, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPsec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPFv6, PaGp, POP3, PPP, PPPoE, PTP, RADIUS, REP, RPPing, RTP, SCOP, SMTP, SNMP, SSH, SIP, SYSLOG, TAGACS, TCP, TFTP, Telnet, UDP, USB, VTP.
  - Edit Filters:** A button to modify the event list filters.
  - Show AllNone:** A button to toggle the visibility of all events.
  - Simulation Mode:** Indicated by the 'Realtime' button being active, with 'Event Log' and 'Simulation' buttons also visible.
- Bottom Bar:** Shows the time 'Time: 00:11:51:734' and 'PLAY CONTROLS' with navigation buttons.



Logical Physical x: 1192, y: 467

Simulation Panel

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	-	PC-A	ICMP
	0.001	PC-A	Hub0	ICMP
	0.002	Hub0	PC-B	ICMP
	0.003	PC-B	Hub0	ICMP
	0.004	Hub0	PC-A	ICMP

Reset Simulation ☒ Constant Delay Captured to: 5763.424 s

Play Controls

Event List Filters - Visible Events

ACL, Filter, ARP, Bluetooth, CAPWAP, CDP, DHCPv6, DTP, EAPOL, EIGRPv6, FTP, H.323, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, Iot, Iot TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPFv6, PAgP, POP3, PPP, PPPoE, PTP, RADIUS, REP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP

Time: 01:47:55.156 PLAY CONTROLS

Logical Physical x: 1192, y: 467

Simulation Panel

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	-	PC-A	ICMP
	0.001	PC-A	Hub0	ICMP
	0.002	Hub0	PC-B	ICMP
	0.003	PC-B	Hub0	ICMP
	0.004	Hub0	PC-A	ICMP

Reset Simulation ☒ Constant Delay Captured to: 6767.677 s

Play Controls

Event List Filters - Visible Events

ACL, Filter, ARP, Bluetooth, CAPWAP, CDP, DHCPv6, DTP, EAPOL, EIGRPv6, FTP, H.323, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, Iot, Iot TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPFv6, PAgP, POP3, PPP, PPPoE, PTP, RADIUS, REP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP

Time: 02:54:39.411 PLAY CONTROLS

Logical Physical x: 1210, y: 661

Simulation Panel

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	-	PC-A	ICMP
	0.001	PC-A	Hub0	ICMP
	0.002	Hub0	PC-B	ICMP
	0.003	PC-B	Hub0	ICMP
	0.004	Hub0	PC-A	ICMP

Reset Simulation ☒ Constant Delay Captured to: 7772.594 s

Play Controls

Event List Filters - Visible Events

ACL, Filter, ARP, Bluetooth, CAPWAP, CDP, DHCPv6, DTP, EAPOL, EIGRPv6, FTP, H.323, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, Iot, Iot TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPFv6, PAgP, POP3, PPP, PPPoE, PTP, RADIUS, REP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP

Time: 02:21:24.329 PLAY CONTROLS

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC-A	ICMP
	0.001	PC-A	Hub0	ICMP
	0.002	Hub0	PC-B	ICMP
	0.003	PC-B	Hub0	ICMP
	0.004	Hub0	PC-A	ICMP

Reset Simulation

☒ Constant Delay

Capturing...

Play Controls

⏮

▶

⏭

Event List Filters - Visible Events

ACL Filter, ARP, Bluetooth, CAPWAP, CDP, DHCPv6, DTP, EAPOL, EIGRPv6, FTP, H.323, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPFv6, PAgP, POP3, PPP, PPPoE, PTP, RADIUS, REP, RIPv2, RIPv3, RIPv6, RSTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP

Edit Filters

Show All/None

Event List

Realtime

Simulation

An error message will appear asking you to confirm reset. Choose Yes.

Logical

Physical

Hub-P1

Hub0

PC-P1

PC-A

Reset Network? -- Packet Tracer

Configurations not in the startup configuration will be lost. Reset the network?

Yes No

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC-A	ICMP
	0.001	PC-A	Hub0	ICMP
	0.002	Hub0	PC-B	ICMP
	0.003	PC-B	Hub0	ICMP
	0.004	Hub0	PC-A	ICMP

Reset Simulation

☒ Constant Delay

Captured to: 9770.350 s

Play Controls

⏮

▶

⏭

Event List Filters - Visible Events

ACL Filter, ARP, Bluetooth, CAPWAP, CDP, DHCPv6, DTP, EAPOL, EIGRPv6, FTP, H.323, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPFv6, PAgP, POP3, PPP, PPPoE, PTP, RADIUS, REP, RIPv2, RIPv3, RIPv6, RSTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP

Edit Filters

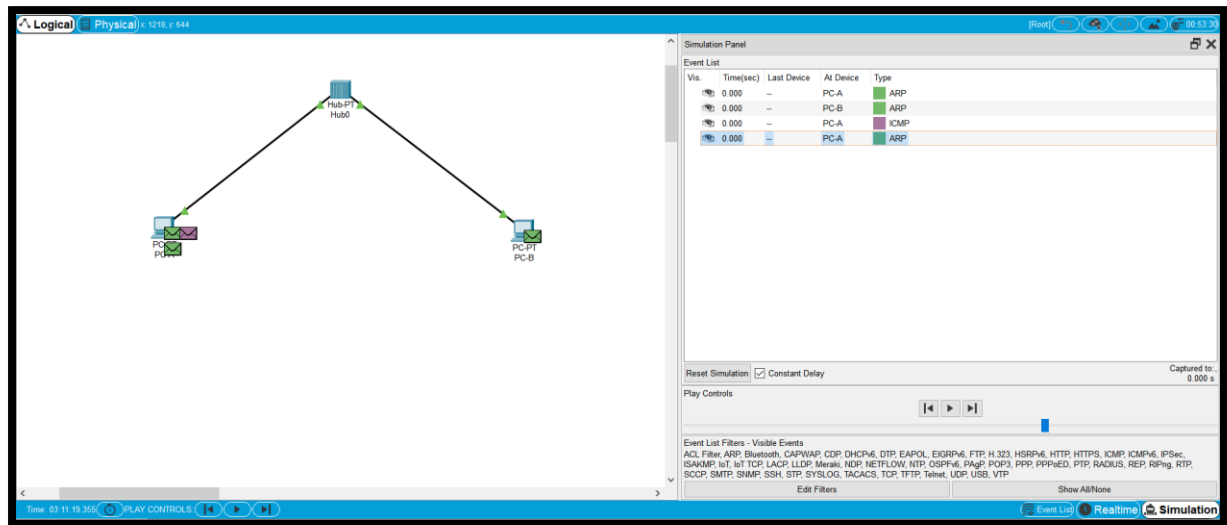
Show All/None

Event List

Realtime

Simulation

## End of simulation



Simulation Panel

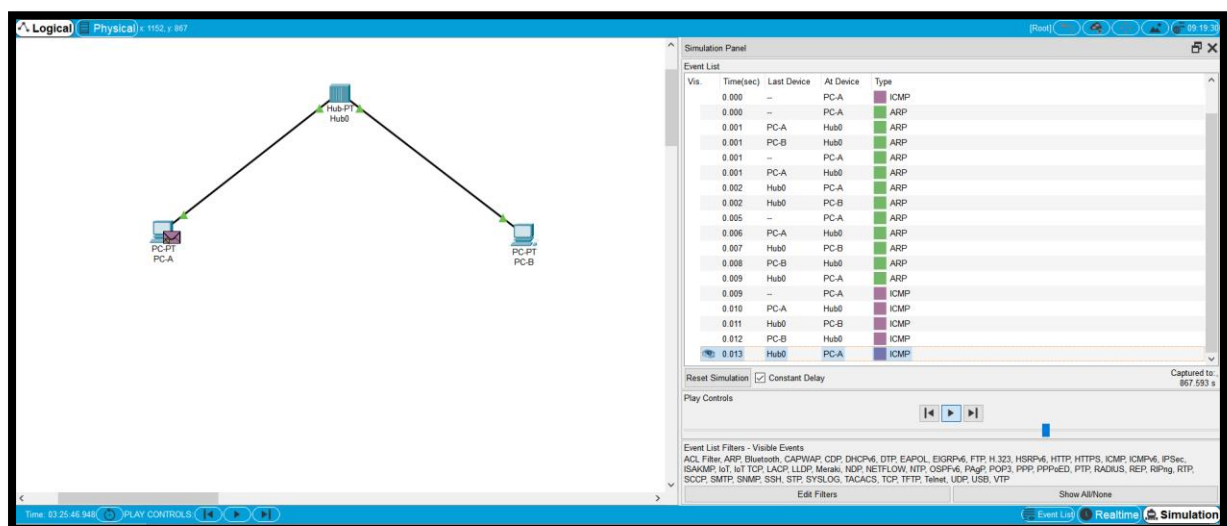
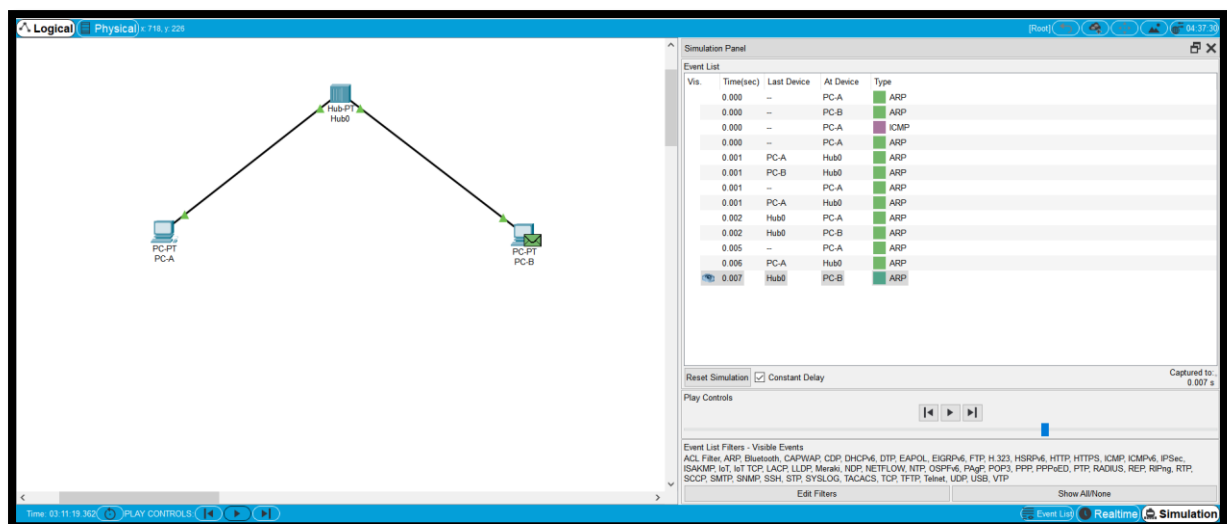
Event List

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

Reset Simulation ☒ Constant Delay

Captured to: 0.000 s

Play Controls



#### 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 tool bar.
- Click PC-A. The ARP table for PC-A will appear. Notice that PC-A does have an ARP entry for PC-C. View the ARP tables for PC-B and PC-C as well. Close all ARP table windows.
- Click the Select Tool on the right vertical tool bar. (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.

g) Examine the ARP table for PC-B.

h) Close the PC-B configuration window.

i) Click the Check Results button at the bottom of the instruction window to verify that the topology is correct.

### ARP table for PC-A

The screenshot displays a network simulation interface. On the left, a topology diagram shows a PC labeled 'PC-A' connected to a central hub labeled 'Hub0'. A window titled 'ARP Table for PC-A' is open, showing the following data:

IP Address	Hardware Address	Interface
192.168.1.2	0000.3E29.559D	FastEthernet0

The background interface includes a 'Simulation Panel' with an 'Event List' table and various control buttons at the bottom.

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	-	PC-A	ICMP
	0.000	-	PC-A	ARP
	0.001	PC-A	Hub0	ARP
	0.001	PC-B	Hub0	ARP
	0.001	-	PC-A	ARP

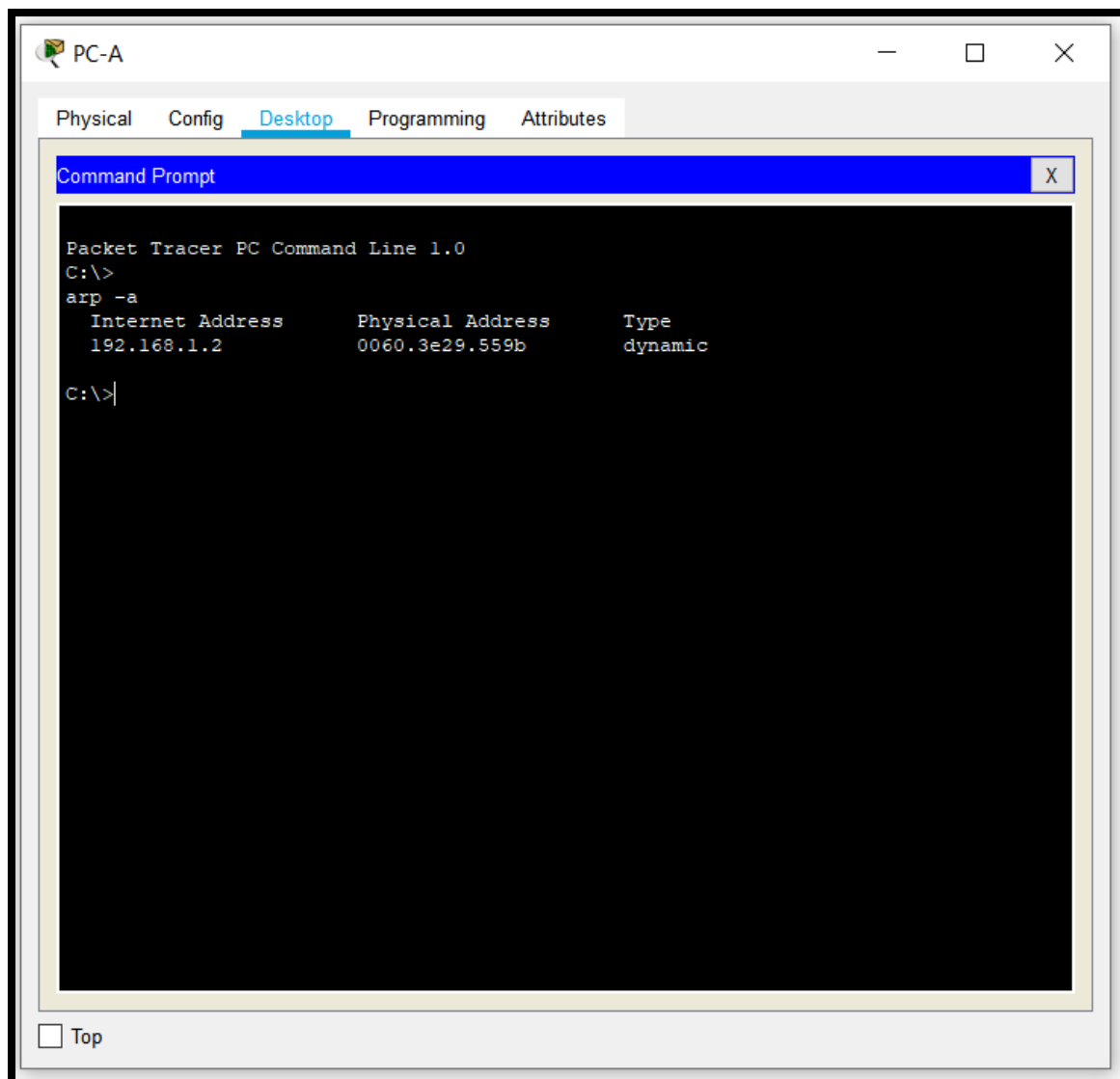
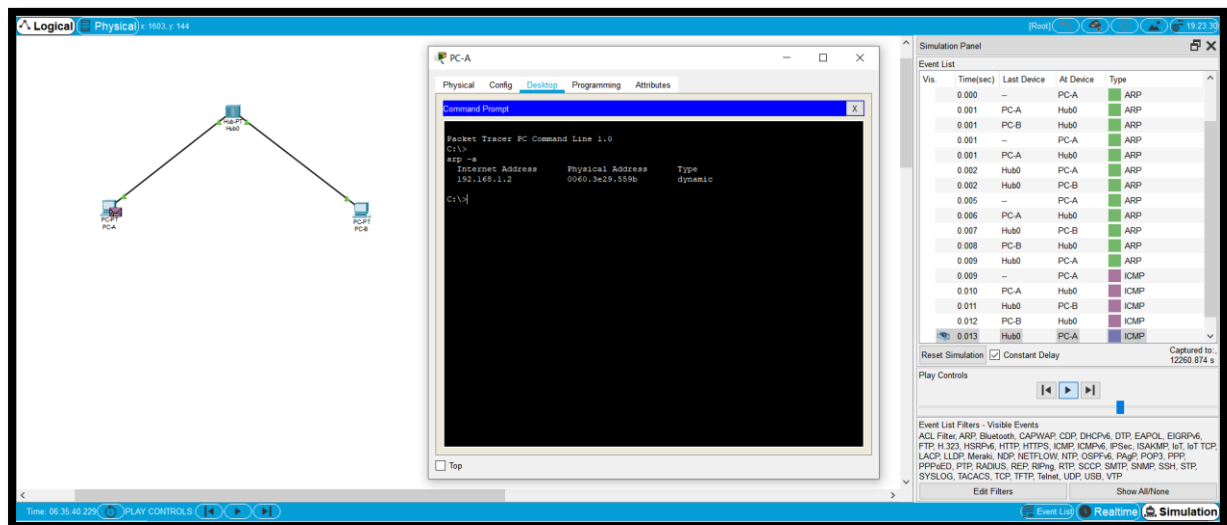
### ARP table for PC-B

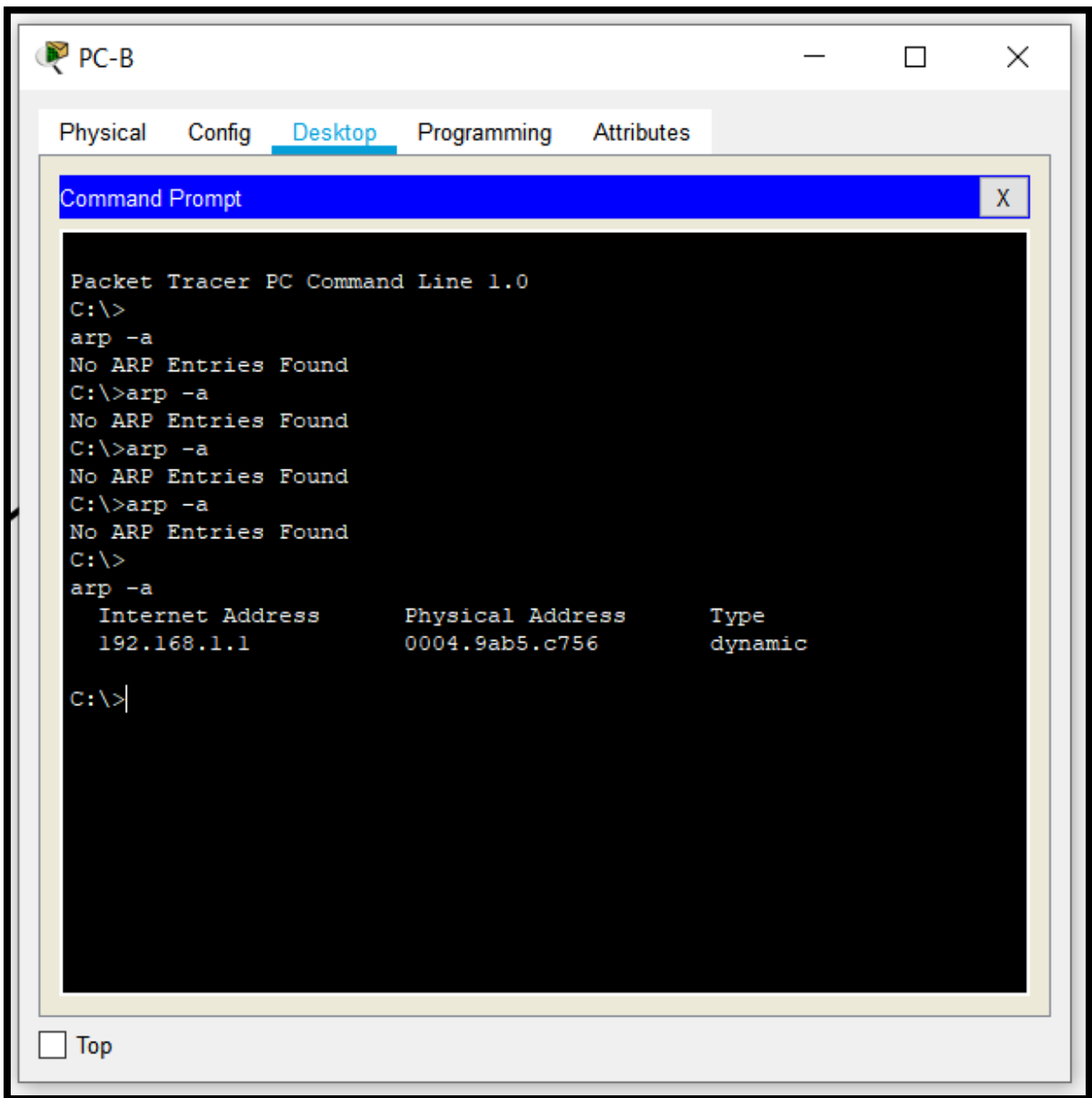
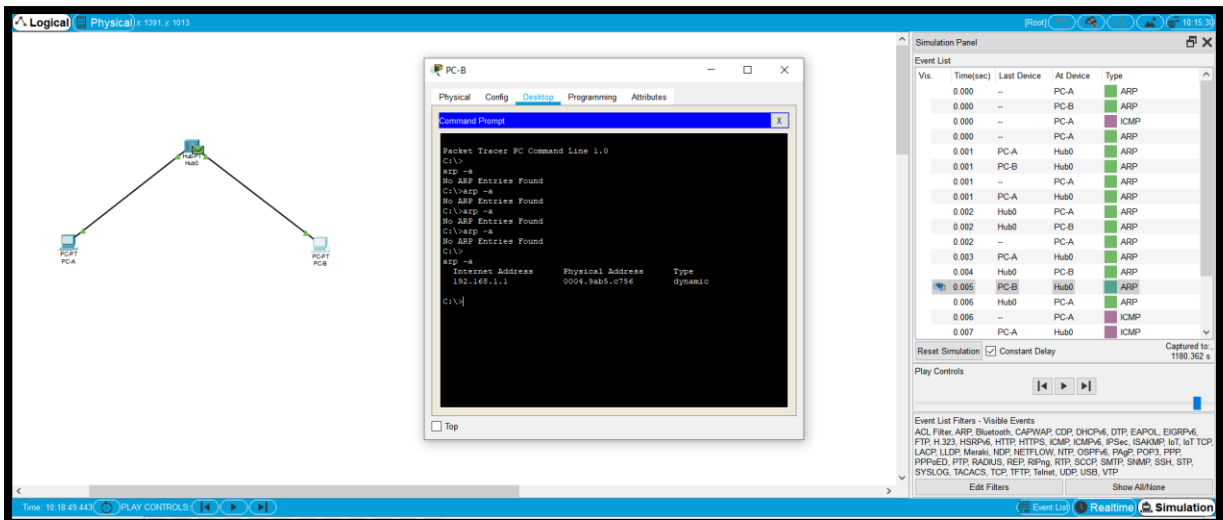
The screenshot displays the same network simulation interface as above. The 'ARP Table for PC-B' window is open, showing the following data:

IP Address	Hardware Address	Interface
192.168.1.1	0004.9AB5.C756	FastEthernet0

The background interface is identical to the previous screenshot, showing the topology and the 'Simulation Panel'.

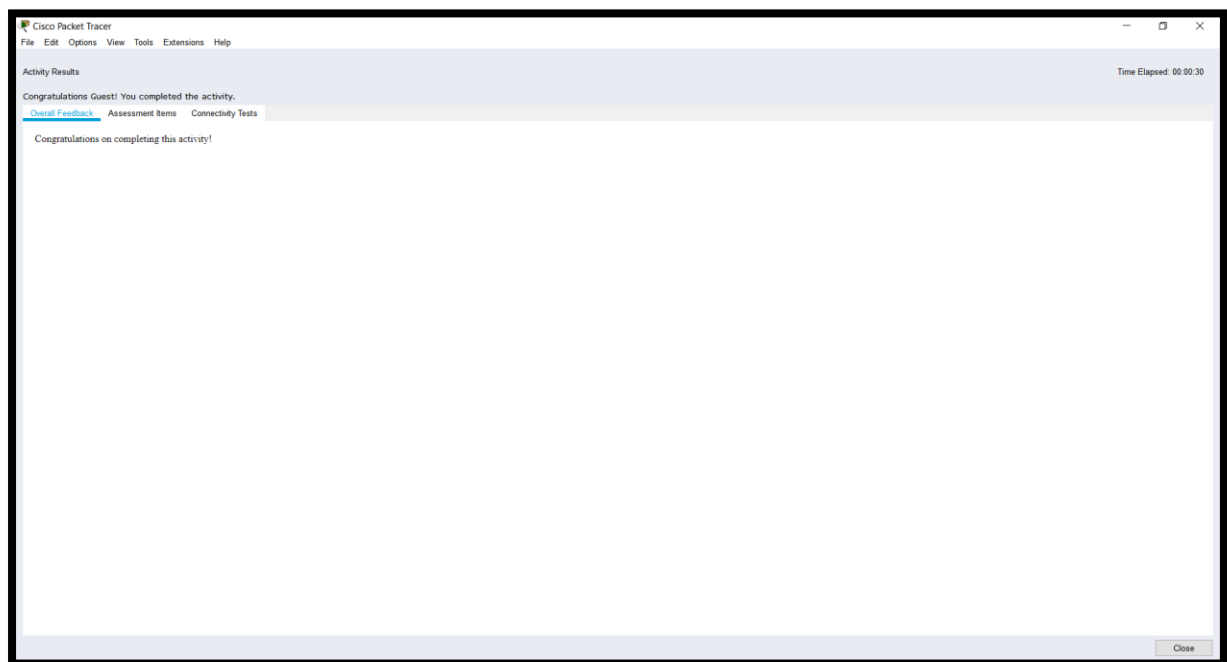
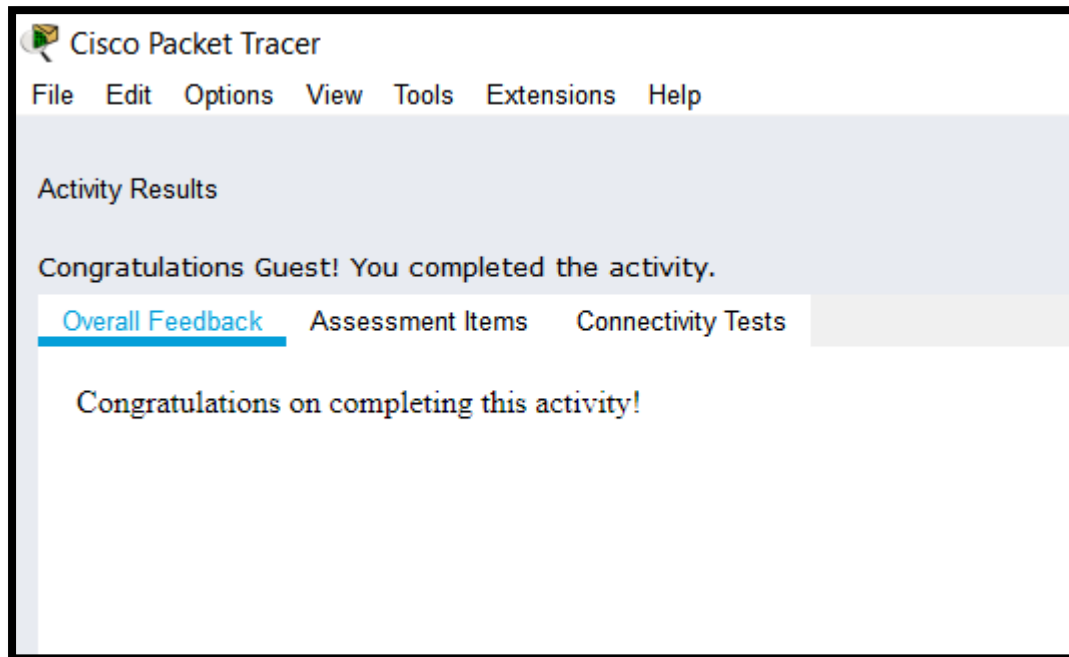
Select the Command Prompt and type the command `arp -a` and press enter to view the ARP table from the desktop view.







## Check Result



## Deliverables:

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