

DCCN Lab - 3

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2018130015

TE Comps

Objectives:

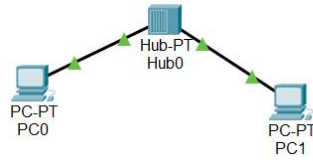
- Install Packet Tracer from <https://www.ciscopods.com/install-packet-tracer-ubuntu/>
 - Develop an understanding of the basic functions of Packet Tracer.
 - Create/model a simple Ethernet network using two hosts and a hub.
 - Observe traffic behavior on the network.
 - Observer data flow of ARP broadcasts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

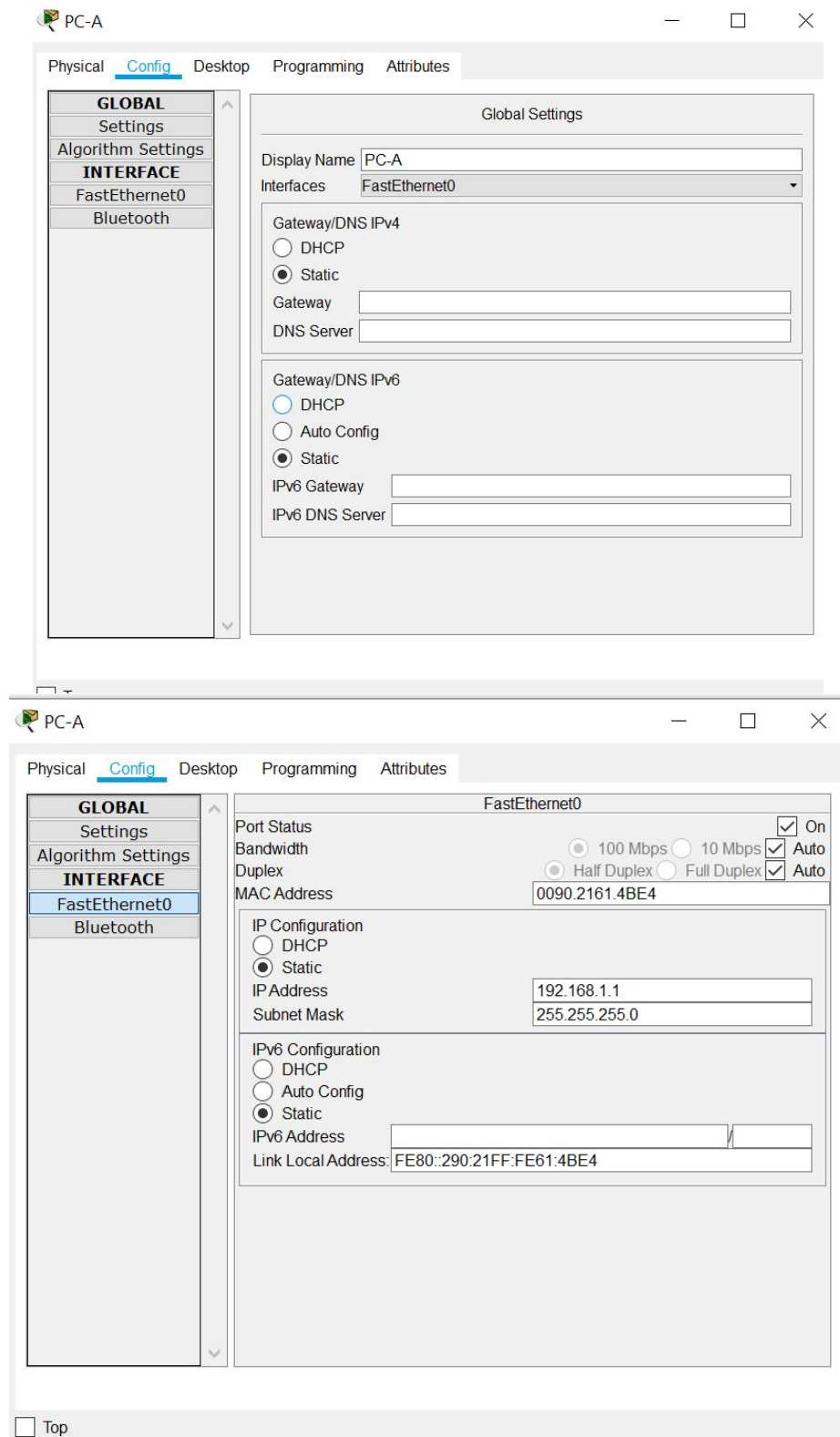
- a) Select **End Devices** from the options in the bottom left-hand corner. Drag and drop two generic PCs onto your design area.
- b) Select **Hubs** from the options in the bottom left-hand corner. Add a hub to the prototype network by dragging and dropping a generic hub onto the design area.
- c) 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.



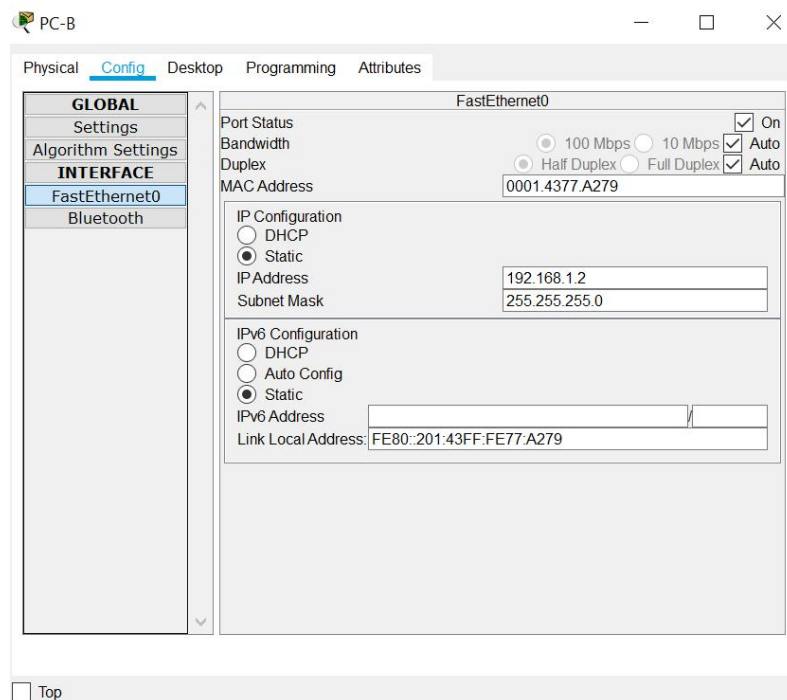
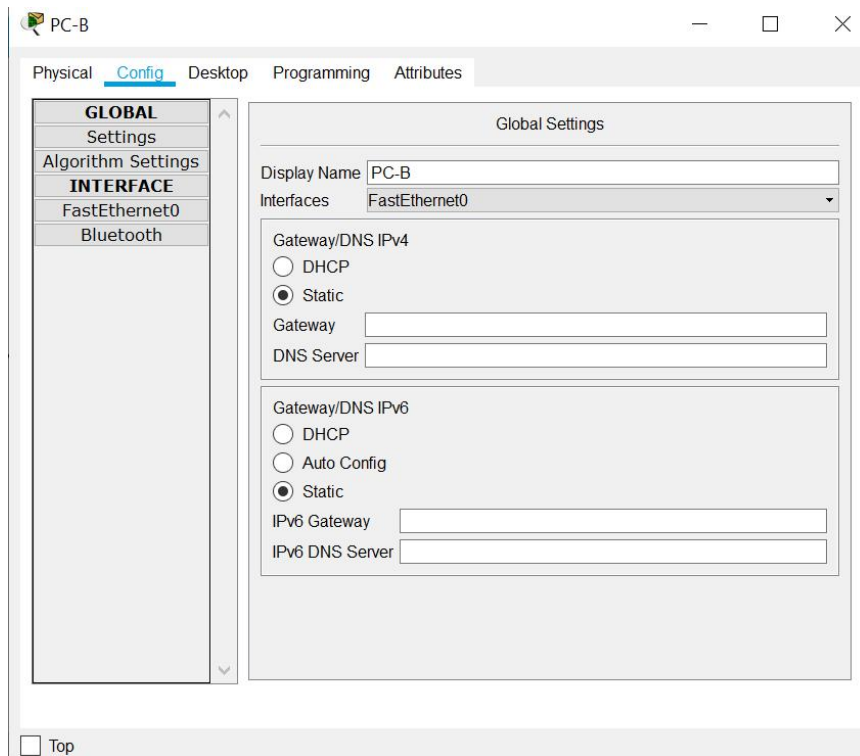
*There should be green dots at both ends of each cable connection. If not, check the cable type selected.

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.



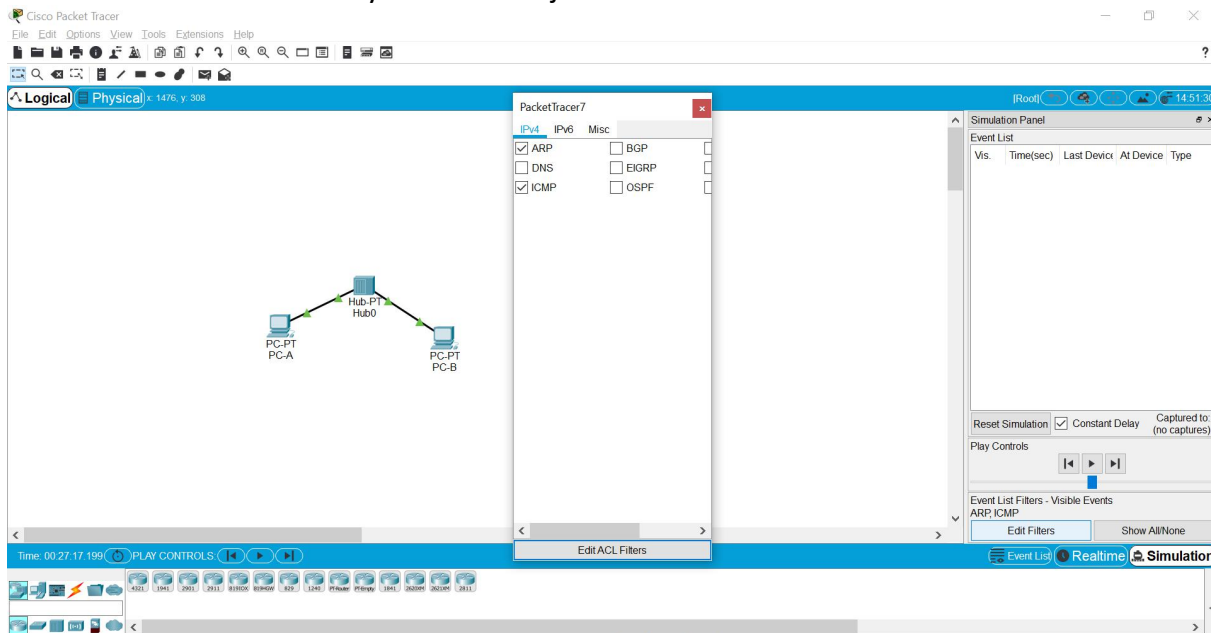
- c) Click PC1.
- d) Select the **Config** tab. Change the PC **Display Name** to **PC-B**. Select the **FastEthernet** tab on the left and add the IP address of **192.168.1.2** and subnet mask of **255.255.255.0**. Close the PC-B configuration window.



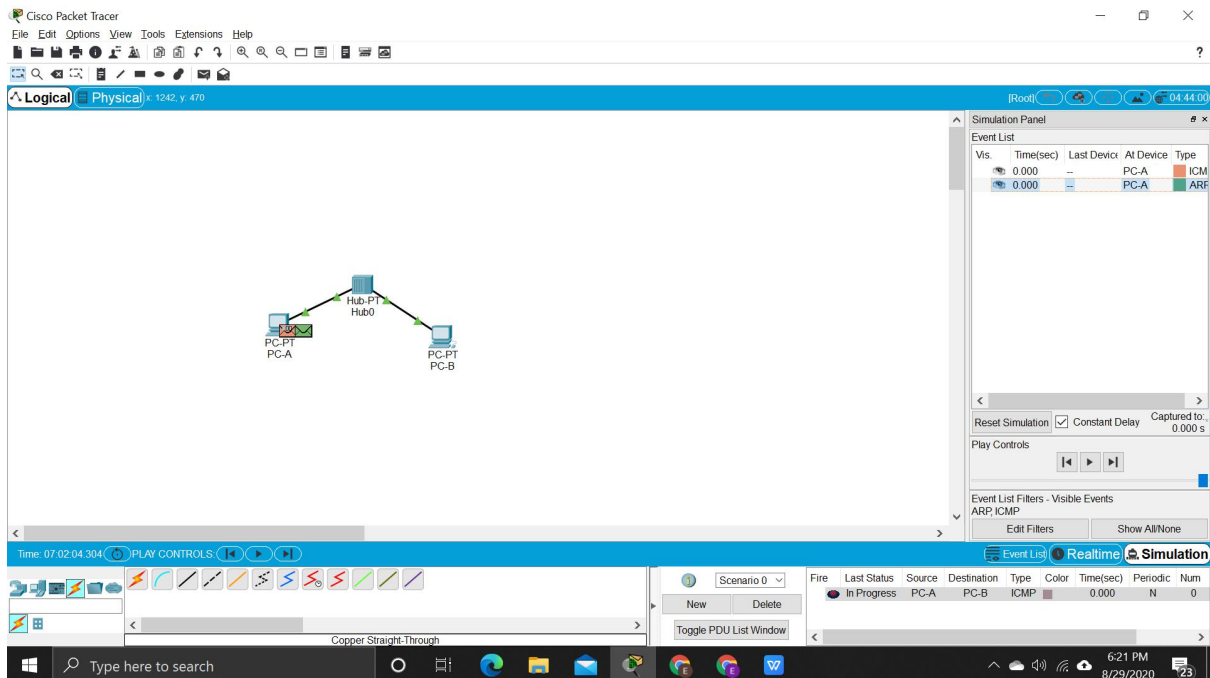
Step 3: Observe the flow of data from PC-A to PC-B by creating network traffic

- 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.

- b) 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.



- c) 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 is to the left will slow down the simulation.

The image displays two screenshots of the Cisco Packet Tracer interface, illustrating the simulation process.

Top Screenshot: The interface shows a network topology with a central Hub-PT (Hub0) connected to two PCs (PC-A and PC-B). The Simulation Panel is open on the right, showing the Event List with a single entry: ARP, PC-A, 0.000. The Play Controls section includes a horizontal bar for speed control and a vertical button for simulation speed. The bottom status bar shows the time as 07:02:04.304.

Bottom Screenshot: The simulation is running. The Event List is updated to show three entries: ARP, PC-A, 0.000; ICMP, PC-A, 0.000; and ARP, Hub0, 0.001. The Play Controls section shows the simulation speed control bar. The bottom status bar shows the time as 07:02:04.305.

Cisco Packet Tracer

File Edit Options View Tools Extensions Help

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Simulation Panel

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

Reset Simulation ☒ Constant Delay Capturing...

Play Controls

Event List Filters - Visible Events
ARP ICMP

Screenshot saved
The screenshot was added to your OneDrive.

Cisco Packet Tracer

File Edit Options View Tools Extensions Help

Logical Physical 1478, y: 494

Simulation Panel

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

Reset Simulation ☒ Constant Delay Capturing...

Play Controls

Event List Filters - Visible Events
ARP ICMP

Screenshot saved
The screenshot was added to your OneDrive.

Cisco Packet Tracer

File Edit Options View Tools Extensions Help

Logical Physical 1478, y 494

Simulation Panel

Event List

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

Reset Simulation ☒ Constant Delay Capturing...

Play Controls

Event List Filters - Visible Events
ARP, ICMP

Time: 07:02:04.308

PLAY CONTROLS

Scenario 0

New Delete

Toggle PDU List Window

Screenshot saved
The screenshot was added to your OneDrive.

Cisco Packet Tracer

File Edit Options View Tools Extensions Help

Logical Physical 1478, y 494

Simulation Panel

Event List

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

Reset Simulation ☒ Constant Delay Capturing...

Play Controls

Event List Filters - Visible Events
ARP, ICMP

Time: 07:02:04.309

PLAY CONTROLS

Scenario 0

New Delete

Toggle PDU List Window

Screenshot saved
The screenshot was added to your OneDrive.

Cisco Packet Tracer

File Edit Options View Tools Extensions Help

Logical Physical 1478, y 494

Simulation Panel

Event List

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

Reset Simulation ☒ Constant Delay Capturing...

Play Controls

Event List Filters - Visible Events
ARP, ICMP

Time: 07:02:04.310

Scenario 0

New Delete

Toggle PDU List Window

Screenshot saved
The screenshot was added to your OneDrive.

Cisco Packet Tracer

File Edit Options View Tools Extensions Help

Logical Physical 1478, y 494

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
0.000	--	PC-A	ICA	ICA
0.000	--	PC-A	Hub0	AR
0.001	PC-A	Hub0	AR	AR
0.002	Hub0	PC-B	AR	AR
0.003	PC-B	Hub0	AR	AR
0.004	Hub0	PC-A	AR	AR
0.004	--	PC-A	ICA	ICA
0.005	PC-A	Hub0	ICA	ICA
0.006	Hub0	PC-B	ICA	ICA
0.007	PC-B	Hub0	ICA	ICA

Reset Simulation ☒ Constant Delay Capturing...

Play Controls

Event List Filters - Visible Events
ARP, ICMP

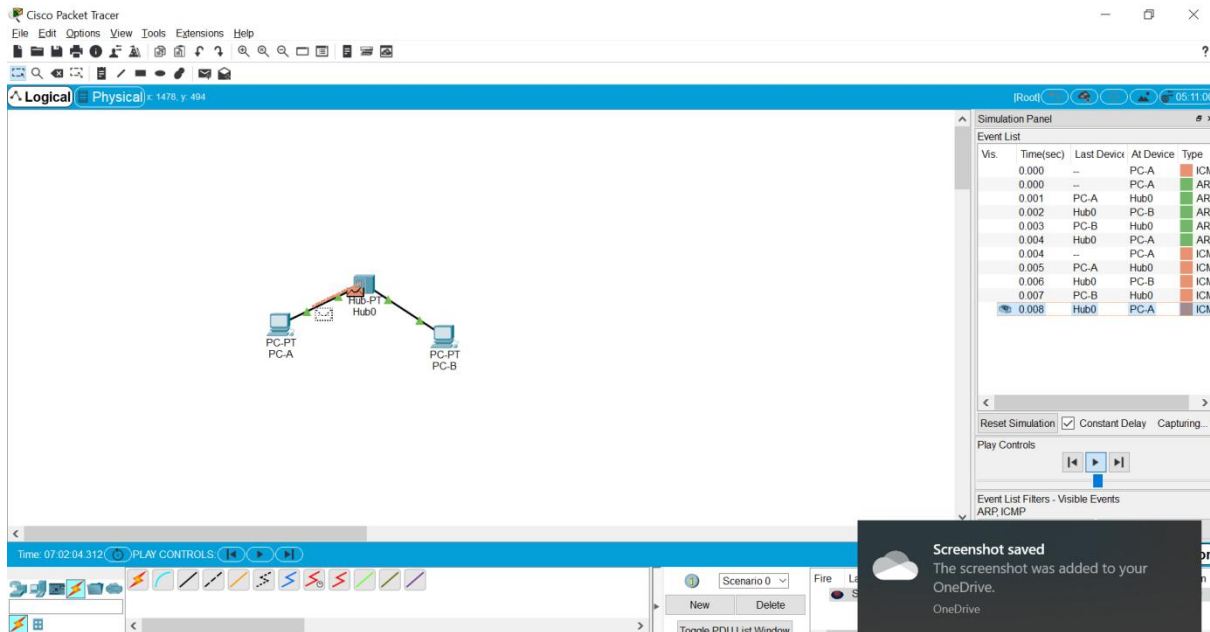
Time: 07:02:04.311

Scenario 0

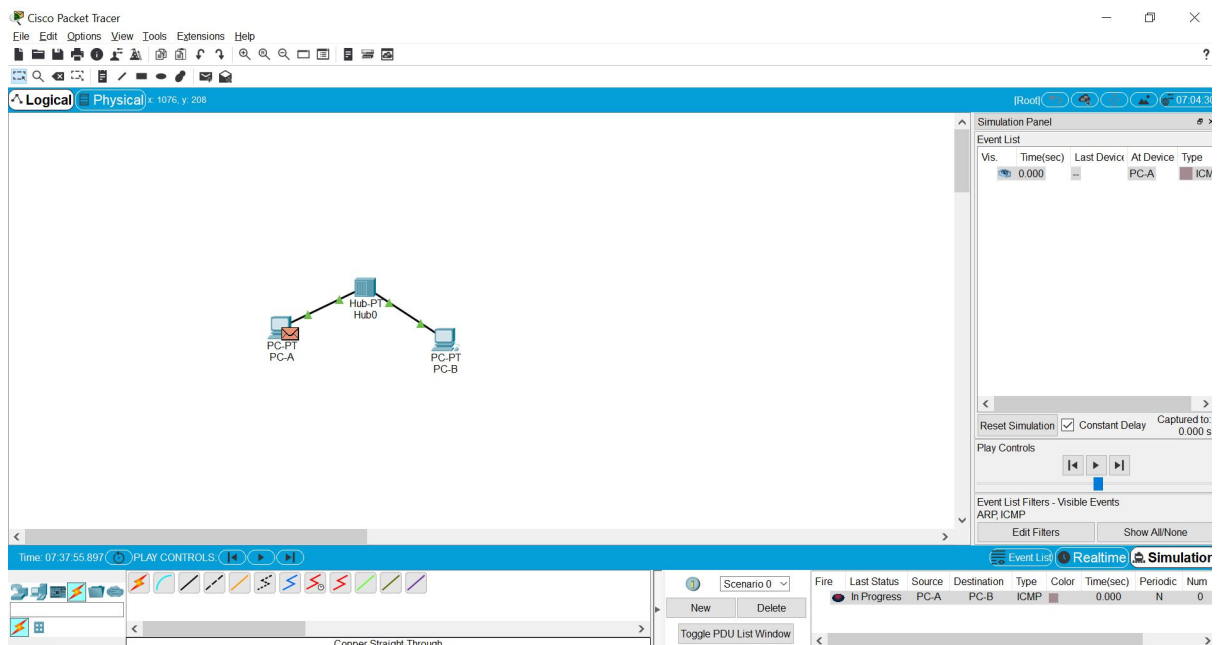
New Delete

Toggle PDU List Window

Screenshot saved
The screenshot was added to your OneDrive.



- 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.

The image displays two sequential screenshots of the Cisco Packet Tracer interface, illustrating the step-by-step simulation of an ICMP event. Both screenshots show a network topology with a central Hub (Hub0) connected to two PCs (PC-A and PC-B).

Top Screenshot:

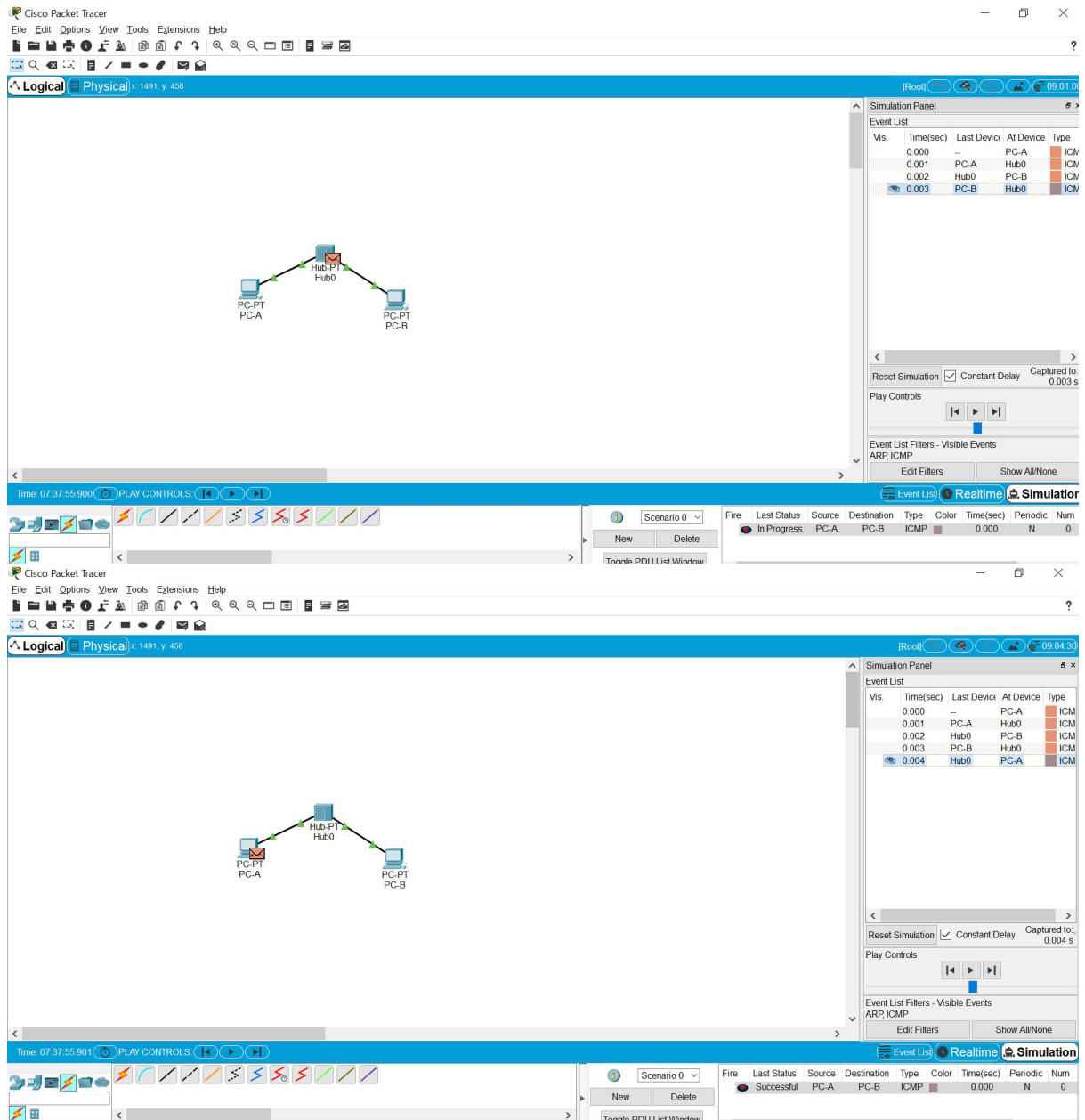
- Time:** 07:37:55.898
- Simulation Panel:** The Event List shows a single event at 0.001 seconds from PC-A to Hub0 of type ICM. The "Capture to" value is 0.001 s.
- Event List Table:**

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

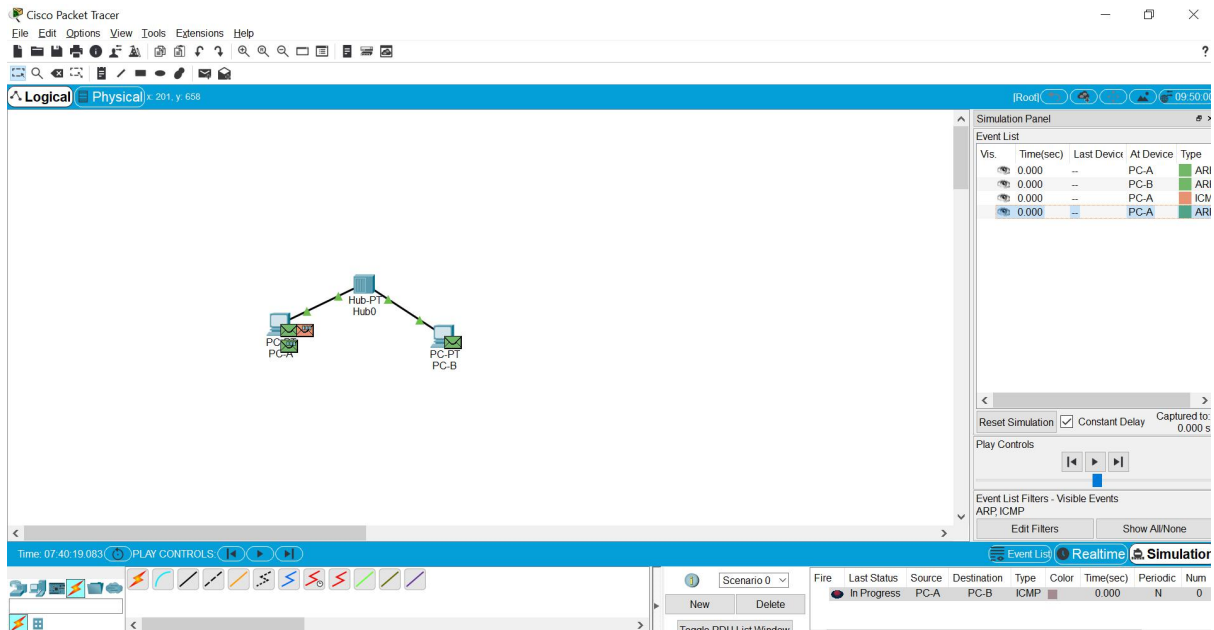
Bottom Screenshot:

- Time:** 07:37:55.899
- Simulation Panel:** The Event List shows three events. The "Capture to" value is 0.002 s.
- Event List Table:**

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

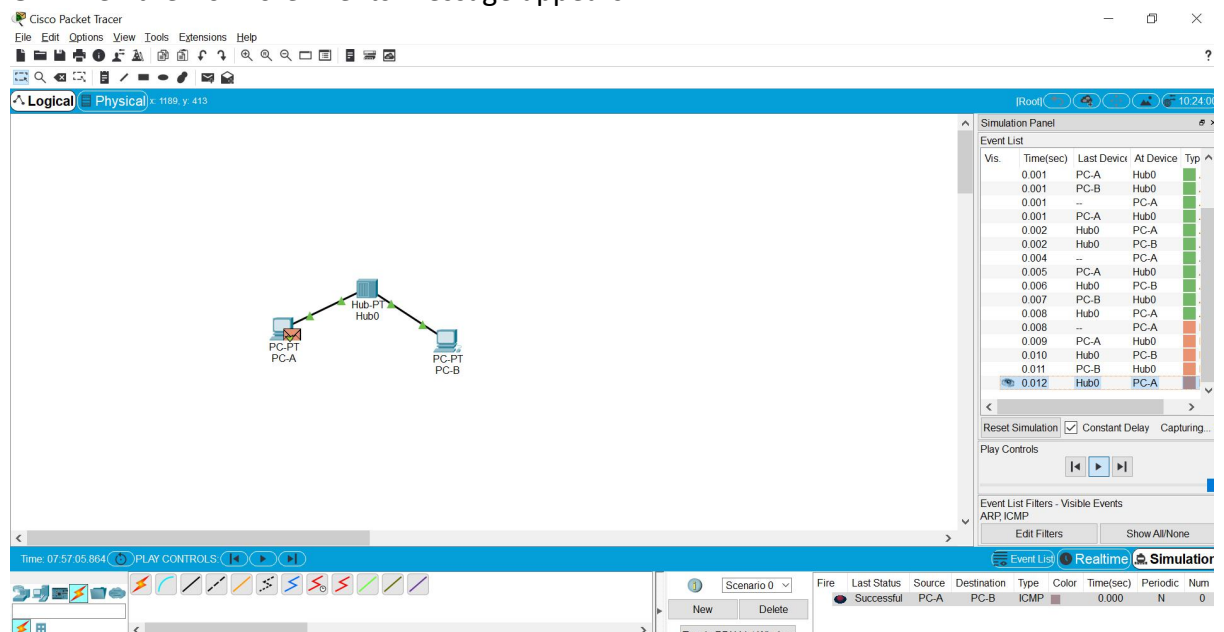


- h) Choose the **Power Cycle Devices** button on the bottom left, above the device icons.
- i) An error message will appear asking you to confirm reset. Choose **Yes**. Now both the ICMP and ARP envelopes are present again. The **Reset Network** button will clear any configuration changes not saved and will clear all dynamic table entries, such as the ARP and MAC table entries.



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.

ARP Table for PC-A

IP Address	Hardware Address	Interface
192.168.1.2	0001.4377.A279	FastEthernet0

ARP Table for PC-B

IP Address	Hardware Address	Interface
192.168.1.1	0090.2161.4BE4	FastEthernet0

d) Click the **Select Tool** on the right vertical tool bar. (This is the first icon present in the toolbar.)

e) Click **PC-A** and select the **Desktop** tab.

```
C:\>arp -a
Internet Address      Physical Address      Type
192.168.1.2           0001.4377.a279        dynamic
```

f) 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**.

```
C:\>arp -a
Internet Address      Physical Address      Type
192.168.1.1           0090.2161.4be4        dynamic
```

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.

Conclusion:

Created a simple network in Packet Tracer.

Learned the basic functionalities of Packet Tracer.