DATE :25 October,2024

LAB- 1

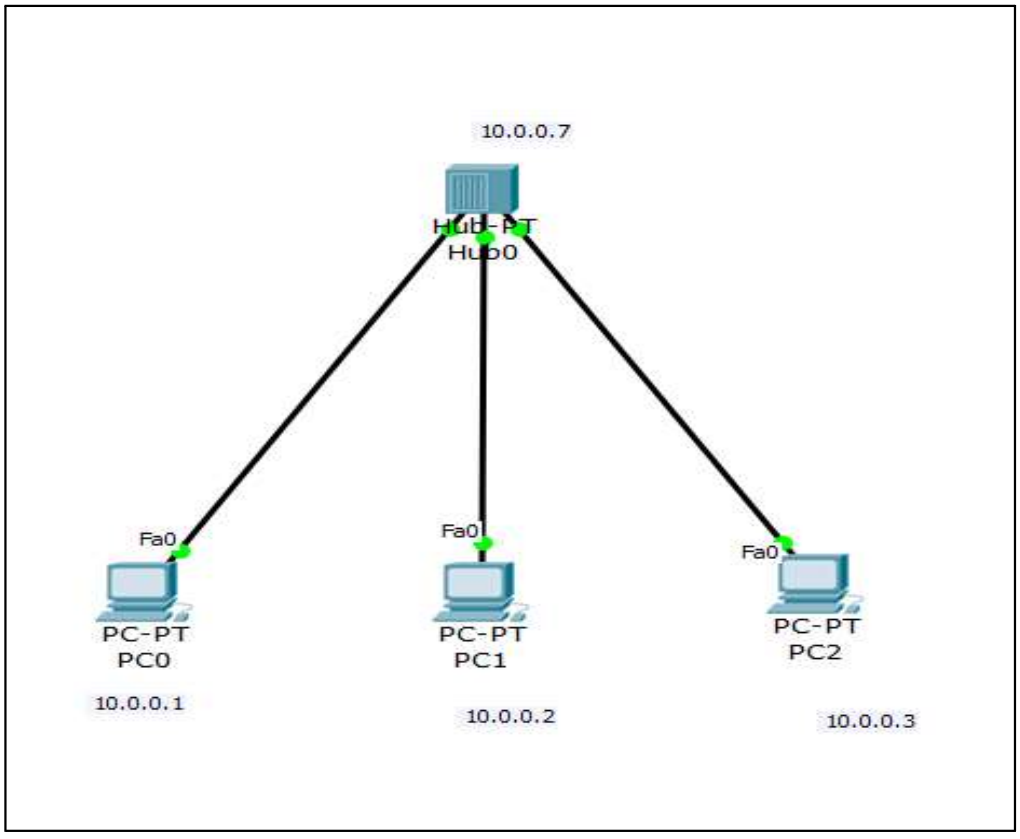
Question:

Create a topology and simulate sending a simple PDU from source to destination using hub and switch as connecting devices and demonstrate ping message.

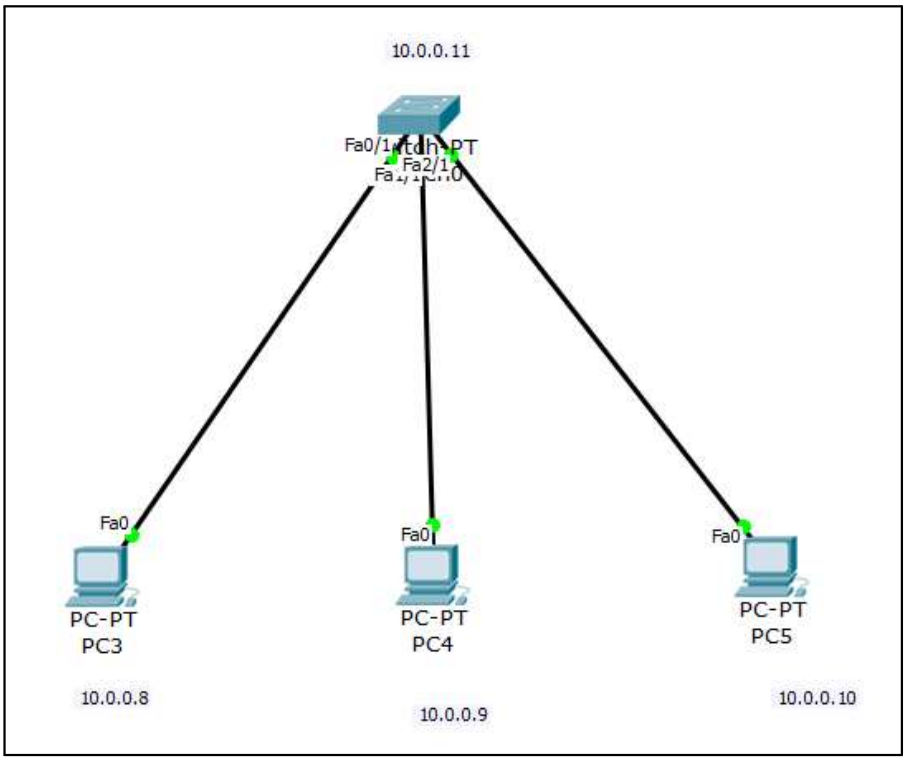
Aim:

To set up a point - to -point network between a PC & a server,facilitating between a PC and a server ,facilitating direct communication to observe data exchange.

Topology:



HUBS fig (1.1)



SWITCH fig (1.2)

Topology Description:

1. Switch Network: Switch's IP address: 10.0.0.11

- Switch (Switch0) is connected to three PCs:
  - PC3: IP: 10.0.0.8
  - PC4: IP: 10.0.0.9
  - PC5: IP: 10.0.0.10

All devices are in the same subnet 10.0.0.0 and connected to a switch, which facilitates communication between them at the data link layer.

2. Hub Network: Hub's IP address: 10.0.0.7

- Hub (Hub0) is connected to three PCs:
  - PC0: IP: 10.0.0.1 Subnet Mask: 255.0.0.0
  - PC1: IP: 10.0.0.2 Subnet Mask: 255.0.0.0
  - PC2: IP: 10.0.0.3 Subnet Mask: 255.0.0.0

PROCEDURE:

A. Connecting the Hub Network (PC0, PC1, PC2)

1. Connect PCs to the Hub:

- Use Copper Straight-Through cables to connect each PC to the hub's ports.
  - PC0 → Hub port Fa0/0
  - PC1 → Hub port Fa0/1
  - PC2 → Hub port Fa0/2

2. Assign IP Addresses to PCs:

- Open IP Configuration for each PC (under the Desktop tab), and assign the following IP addresses and Subnet Masks:
  - PC0: IP: `10.0.0.1`
  - PC1: IP: `10.0.0.2`
  - PC2: IP: `10.0.0.3`

3. Send a Simple PDU (Test Packet) Between PCs:

- In Packet Tracer, use the Add Simple PDU tool:
  - Click on the Add Simple PDU tool (envelope icon).
  - Click on PC0 (source device).
  - Click on PC2 (destination device).
  - This will send a PDU (message) from PC0 to PC2.

4. Use Simulation Mode to Track the Packet:

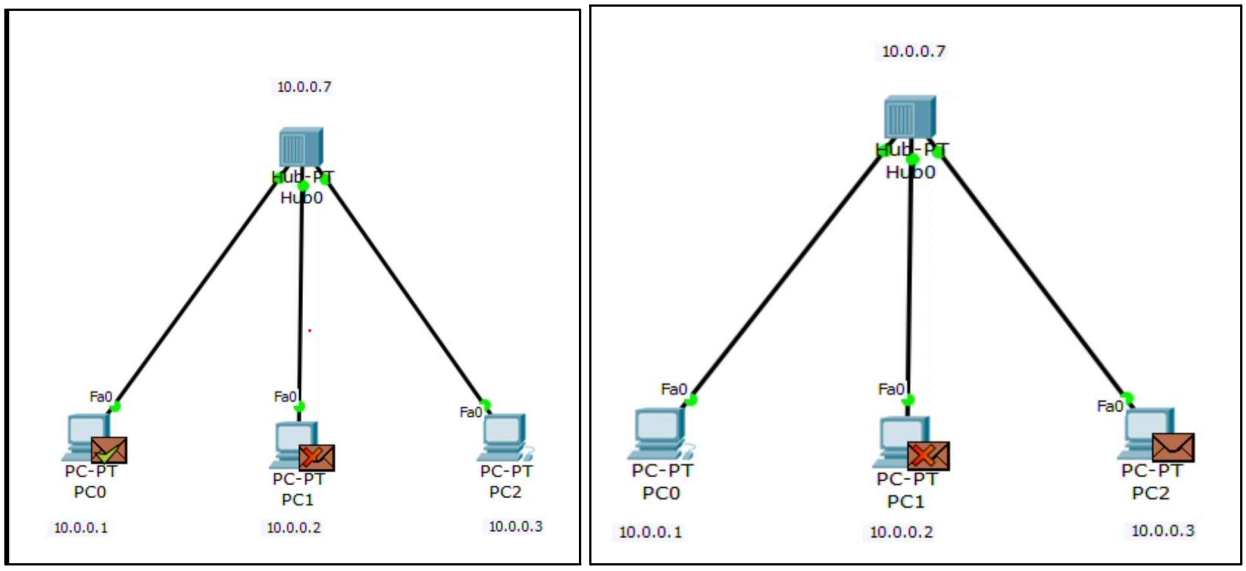
- Switch to Simulation Mode (bottom-right corner).
- Press Play to start the packet movement simulation.
  - You will observe the packet being broadcasted by the hub to all connected devices, even though the destination is only PC2.
  - The packet will travel to PC2 successfully, but it will also be visible to PC1 due to the hub's broadcast nature.

Fire	Last Status	Source	Destination	Type	Color	Time(se	Periodic	Num	Edit	Delete
	Successful	PC0	PC2	ICMP		0.000	N	0	(edit)	(delete)

Simulation Panel

Event List

Vis.	Time(sec)	Last Devi	At Devi	Type	Info
	0.000	--	PC0	ICMP	
	0.001	PC0	Hub0	ICMP	
	0.002	Hub0	PC1	ICMP	
	0.002	Hub0	PC2	ICMP	
	0.003	PC2	Hub0	ICMP	
	0.004	Hub0	PC0	ICMP	
	0.004	Hub0	PC1	ICMP	



Hubs connection (fig 1.1.1)

B. Connecting the Switch Network (PC3, PC4, PC5)

1. Connect PCs to the Switch:
    - Use Copper Straight-Through cables.
    - Connect each PC's Fa0 port to the switch's Fa0/1, Fa0/2, and Fa0/3 ports.
2. Assign IP Addresses to PCs:
    - Go to PC3, PC4, and PC5.
    - Open the IP Configuration under the Desktop tab.
    - Set the following IP addresses and Subnet Masks:

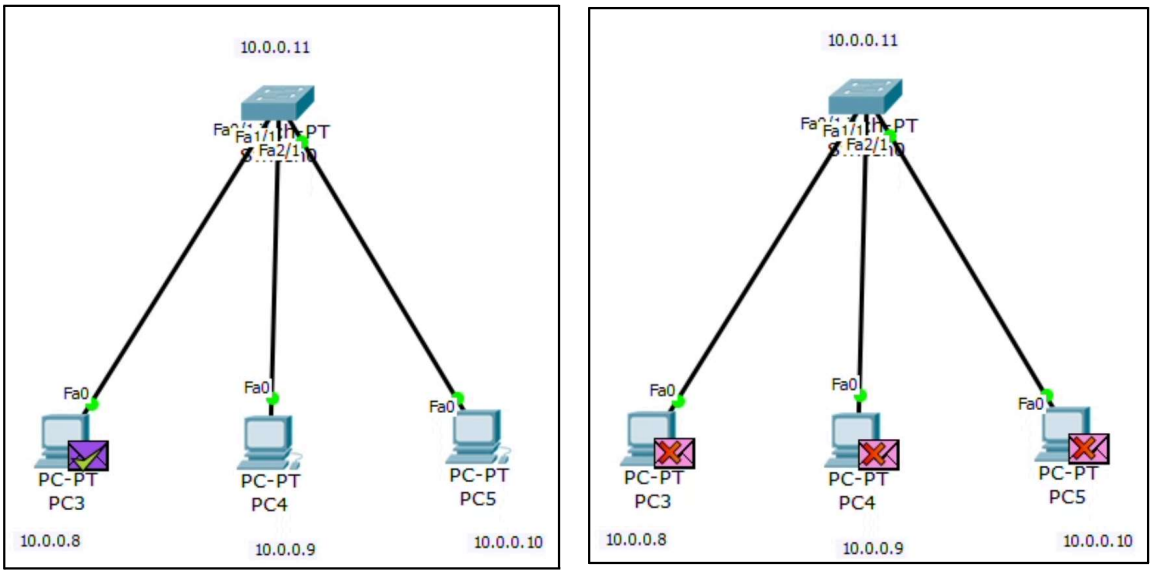
- Switch (Switch0) is connected to three PCs:
  - PC3: IP: 10.0.0.8
  - PC4: IP: 10.0.0.9
  - PC5: IP: 10.0.0.10

3.Click the Add Simple PDU tool (it looks like an envelope) from the bottom right.

- Click on the source device (e.g., PC3).
- Then click on the destination device (e.g., PC5).
- A message (PDU) will be sent from PC3 to PC5.

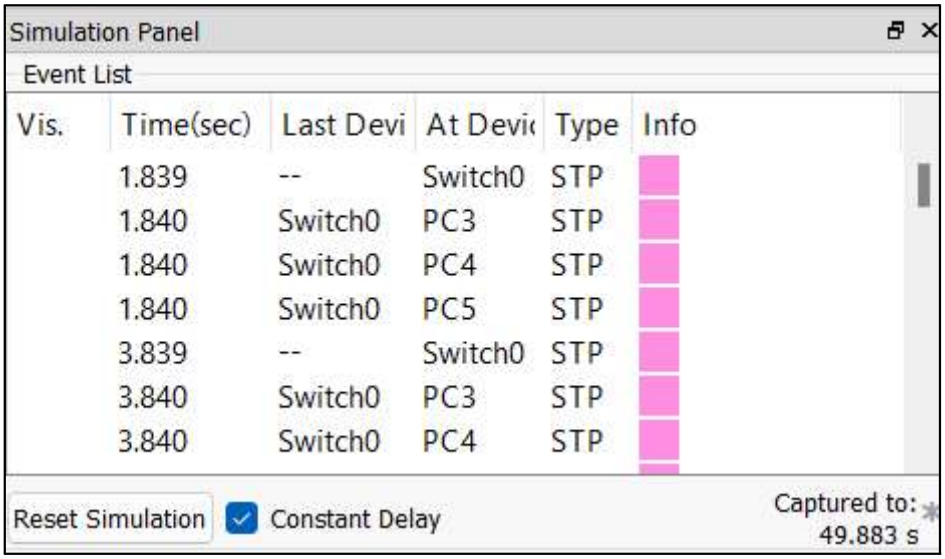
4. Use Simulation Mode:

- Click on Simulation Mode (bottom-right corner).
- Press the Play button to simulate the packet movement.
- You will see the packet traveling through the network from one PC to another.
- You can track the packet's path and see if it successfully reaches the destination or encounters issues.



Switch connection (fig 1.1.2)

Fire	Last Status	Source	Destination	Type	Color	Time(se	Periodic	Num	Edit	Delete
	Successful	PC0	PC2	ICMP		0.000	N	0	(edit)	(delete)
	Successful	PC3	PC5	ICMP		0.000	N	1	(edit)	(delete)



Observation:

- The hub broadcasts packers to all devices,which may cause unnecessary traffic
- The switch forwards packers only to the appropriate device by learning MAC addresses making it more efficient in reducing traffic.