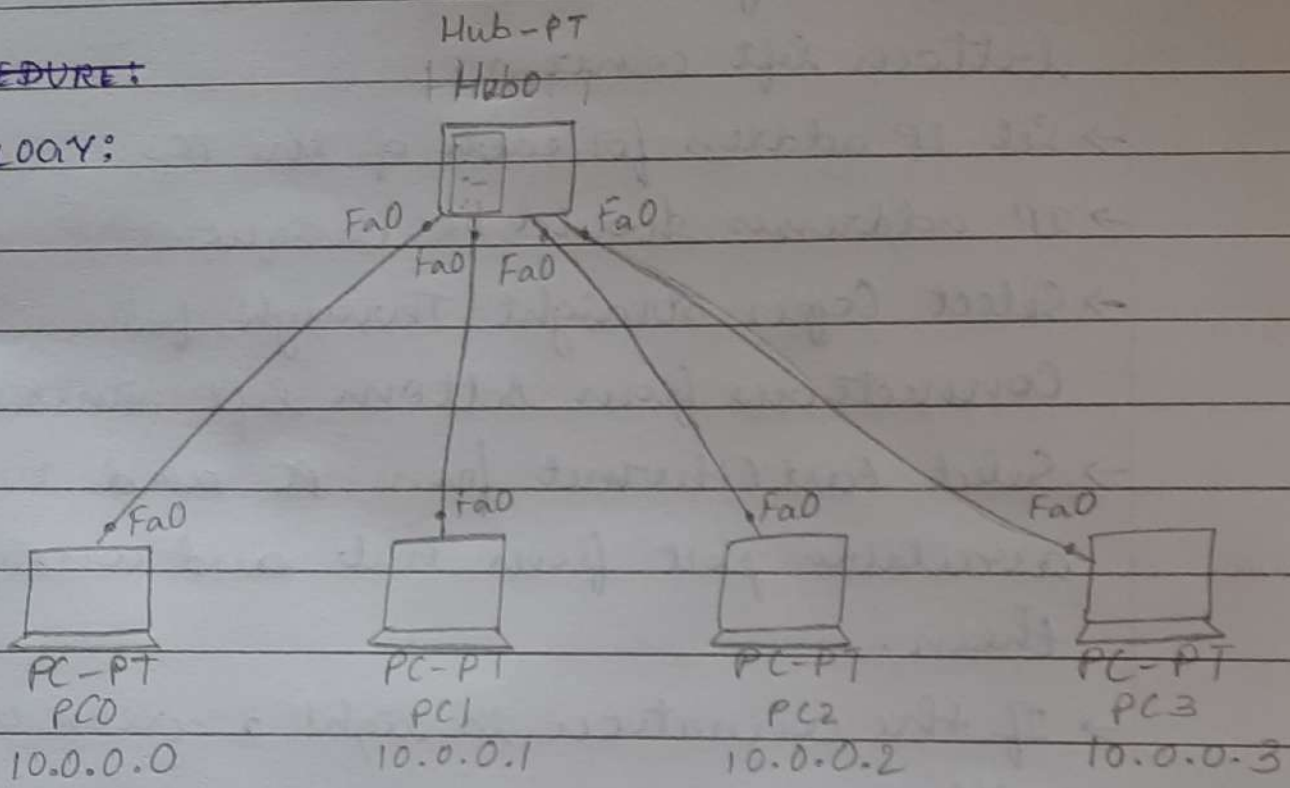
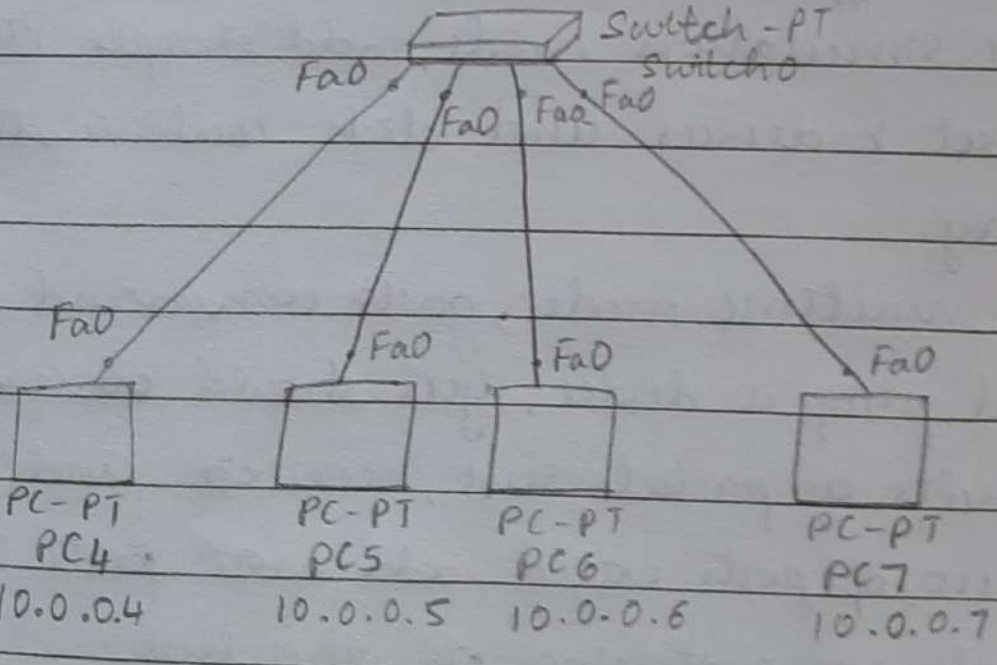
Experiments on Hubs and Switches

AIM: To create a topology and simulate sending a simple PDU from source to destination, using hubs and switch as connecting devices

~~PROCEDURE:~~

TOPOLOGY:





PROCEDURE:

Hub:

→ Select a generic hub from the bottom left corner.

→ Select PCs from end devices in the bottom left corner.

→ Set IP address for each of the PCs.

→ IP addresses should be unique.

→ Select Copper Straight-Through from Connections from Bottom left corner.

→ Select FastEthernet from PC and available port from hub and connect them.

→ If the connection is right a green color will appear.

→ In simulation mode, add simple PDU, select 2 devices and click auto capture/play.

→ In realtime mode, go to command prompt and ping a device, you should observe the results of packets sent, received and lost.

→ If no. of ports exceed, add more ports to the hub by switching off the hub.

Switch:

→ Select a generic switch from the bottom-left corner.

→ Select PCs from the end devices in bottom left corner.

→ Set unique IP address for each of the devices

→ Select Copper Straight-Through from Connections in bottom left corner.

→ Select FastEthernet 2/1 for eg. from switch and FastEthernet from devices and connect them.

→ First we observe an Amber color.

→ After sometime the color turns to Green.

→ In simulation mode, add simple PDU, select 2 devices and click auto capture/play.

→ In realtime mode, go to command prompt and ping a device, you should observe the results of packets sent, recived and lost.

OBSERVATION:

Hub:

→ Hub is not intelligent, It gives information to all devices.

→ Initially 6 ports are available, then if we want to add more devices, will have to add

more ports by switching it off.

Switch:
→ Initially when the connection is made, we see an amber color.
→ Then after some time we see the green color.
→ Amber color means that the switch is not ready for communication.

Learning:
→ Hub and switch are on the higher layer than end devices. Hence for connection between hub/switch and end devices use copper cross-over connection.
→ Hub and switch belong to same layer, hence can use ~~cross~~ copper straight through.
→ Hub and switch do not have IP addresses.
→ The pink package seen is STP - Spanning Tree Protocol
→ Hub sends messages to all ports.
→ Switch only sends messages to selected destination.

Result:

Hub:

Pinging 10.0.0.3 with 32 bytes of data:
Reply from 10.0.0.3: bytes = 32 time = 0ms TTL = 128
Reply from 10.0.0.3: bytes = 32 time = 0ms TTL = 128
Reply from 10.0.0.3: bytes = 32 time = 0ms TTL = 128
Reply from 10.0.0.3: Bytes = 32 time = 0ms TTL = 128
Sent = 4, Received = 4, Lost = 0

Switch:

Pinging 10.0.0.6 with 32 bytes of data:
Reply from 10.0.0.6: bytes = 32 time = 0ms TTL = 128
Reply from 10.0.0.6: bytes = 32 time = 0ms TTL = 128
Reply from 10.0.0.6: bytes = 32 time = 0ms TTL = 128
Reply from 10.0.0.6: bytes = 32 time = 0ms TTL = 128
Sent = 4, Received = 4, Lost = 0