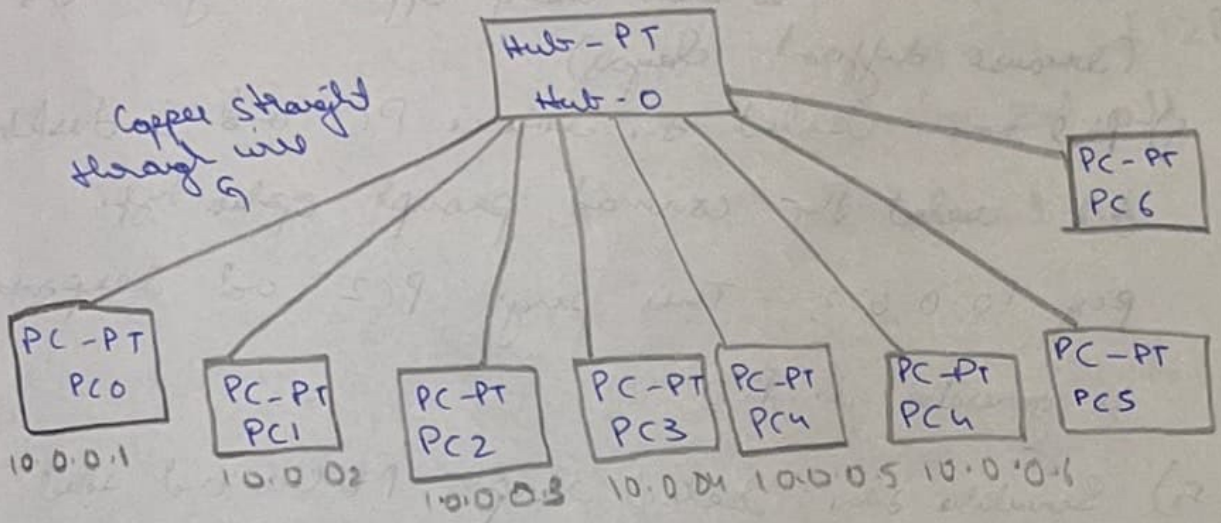
Lab - Week 1

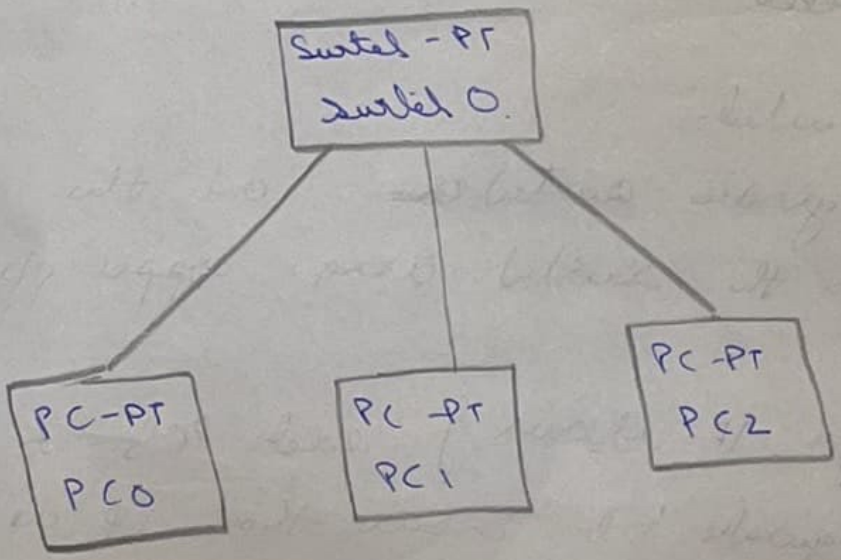
AIM: Creating a topology and simulate sending a simple PDU from source to destination using simple hub and switch as connecting domain.

Topology:

Using Hub



Using Switch



Procedure

Hub

1) 7 generic PC's and a generic hub are inserted into the logical workspace.

2) Each PC is configured by a specific IP address and IP address is given by clicking

3) Connect all PC's to hub using copper straight cable (because different layers)

4) Real time - Select the source PC and in desktop tab select the command prompt option type ping 10.0.0.3 - This pings PC2 and response is generated in PC0

5) Simulation time: Select single PDU and select the source and destination click on auto complete start simulation and start the transfer of Packets.

Using Switch:

1) Add generic switches and then connect PC's to the switch using copper straight cable.

2) Configure IP address of each PC's in the configuration tab. Ensure that IP is different for every PC starting from 10.0.0.1 to 10.0.0.7

3) If no of switch are insufficient then add ports by clicking on switch.

Routing: Select source PC and in the desktop select command prompt option. In command line ping destination PC by specifying its IP.

Simulation: Select the simple PDU and select the source & destination computer clicking on auto capture allows us to see packet transfer.

Hybrid mode:

i) Add a switch and three hubs and 12 PCs

ii) Connect switch and three hubs and will copper cross over wire because it is in the same layer.

iii) Connect the 12 PC's in group of 4 to the three hubs respectively using copper straight wire.

iv) Configure the IP of each of the PC and add a note below each PC displaying the IP addresses.

Routing mode: Select PC you want to set packet tracer and open its command prompt specify the destination PC by specifying its IP address. A response is sent by destination PC to source PC.

Procedure: Add a simple PDU by selecting the pair of PC and click on auto capture from right panel.

Observation:

→ Hub:

Learning about:

i) Connection between hub and device is established through copper straight through wire as they belong to different layer

ii) Hub broadcasts the packets to all the connected devices and the packet is only accepted by matching with IP address.

Result: PC > ping 10.0.0.7

ping 10.0.0.7 with 32 bytes of data.

Reply from 10.0.0.7 bytes=32
time=0ms

Reply from 10.0.0.7 bytes=32
time=0ms

ping statistics for 10.0.0.7
packet sent = 2 received 2 bytes

Switch

→ Learning outcomes:

- When source device sends a message to switch it only sends the message to the destination which hub which broadcasts over the entire network.

- No of ports can be added if needed by clicking or drive and adding the necessary ports.

Hybrid node:

Learning outcomes:

- Switch and hub are connected through copper crossover cable and the devices and hubs are connected using cable copper straight through as they are different networks.

- Switch after receiving the packet sends it to the hub which broadcasts the destination PC.