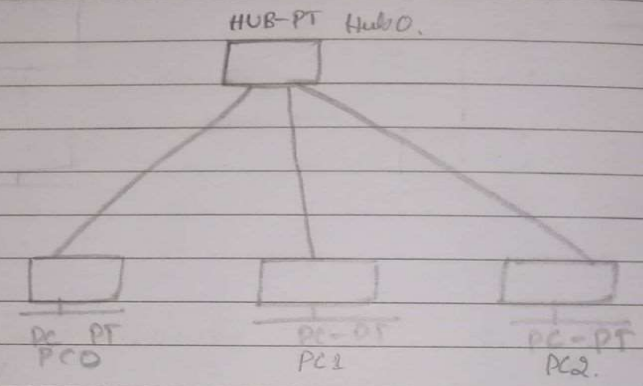
15/06/2023

Q1 Create a topology and simulate sending a simple PDU from source to destination using a simple hub and switch as connecting domains.

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

Hub :-



Step 1 :- Slect end devices and choose generic and choose PC0, PC1, PC2 (PC-PT)

Step 2 :- Go to hubs and select generic hub

Step 3 :- Go-to connection and select coffee straight through wire, then connect all PC's to the hub. (Select port number and PC)

Step 4 :- Click on PC, go to config and select fast ethernet then set IP address for the PC. Do the same for all the PC's
10.0.0.1 10.0.0.2 10.0.0.3.

Step 5 :- Add simple PDU.

Step 6:- click source and destination symbol systems.

Step 7:- Then go to simulation mode, Auto capture/play., Then the packets will start to transfer.

Step 8:- Click on PC, go to desktop and select command prompt. Then type command.
ping 10.0.0.3

PC > ping 10.0.0.3.

Reply from 10.0.0.3: bytes=32 time=4ms TTL=128.
Reply from 10.0.0.3: bytes=32 time=3ms 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.

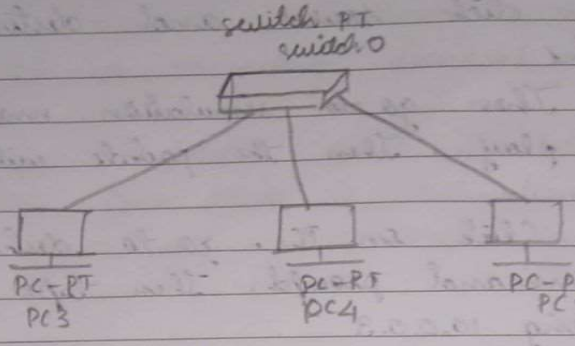
Ping statistics for 10.0.0.3
packets: Sent=4, Received=4, Lost=0. (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 4ms, Average = 2ms

~~Procedure~~ Observation:-

When the source device send a packet to the hub it will broadcast or send the packet to all the devices which are connected to the hub. And the destination device will receive the packet and others will reject the packet.

And destination device will send the acknowledgement and that will be distributed among all device and the source will accept and others will discard.

Switch



Procedure :-

Step 1 :- Select switch and 3 PC's

step 2 :- Set IP address for all the PC's 10.0.0.4 10.0.0.5 10.0.0.6

PC → config → fast ethernet → IP address

step 3 :- Connect PC's to the switch by selecting coffee straight through 10.0.0.0

step 4 :- Add simple PDU

select source and destination

step 5 :- Go to simulation mode and click on Auto capture/play

step 6 :- Click on PC → Desktop → command prompt

Ping message

PC> ping 10.0.0.6

Pinging 10.0.0.6 with 32 bytes of data :

Reply from 10.0.0.6 : bytes=32 time=4ms TTL=128
Reply from 10.0.0.6 : bytes=32 time=4ms TTL=128
Reply from 10.0.0.6 : bytes=32 time=4ms TTL=128
Reply from 10.0.0.6 : bytes=32 time=4ms TTL=128

ping statistics for 10.0.0.6 :

packets : sent = 4, Received = 4 lost = 0 (0% lost),

Approximate round trip time in milli-seconds :

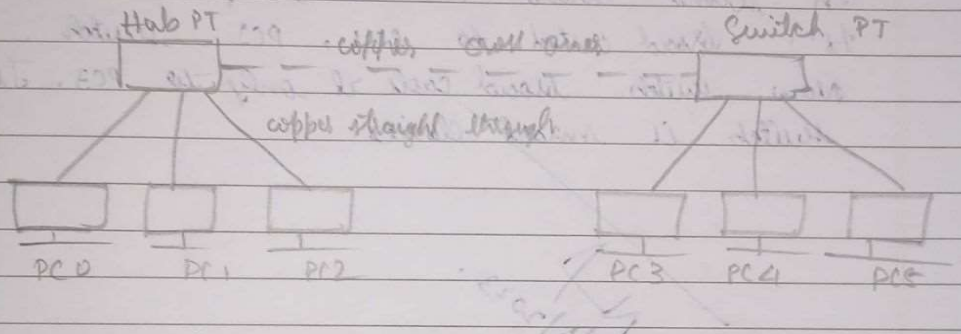
Minimum = 4ms, Maximum = 4ms, Average = 4ms

(Procedure:) Observation:-

When the first time the packet is sent the switch will distribute the packet with all the devices.

Once it learns about the IP address it will only send packet to the destination and send acknowledgement to the source.

Switch - Hub Connection.

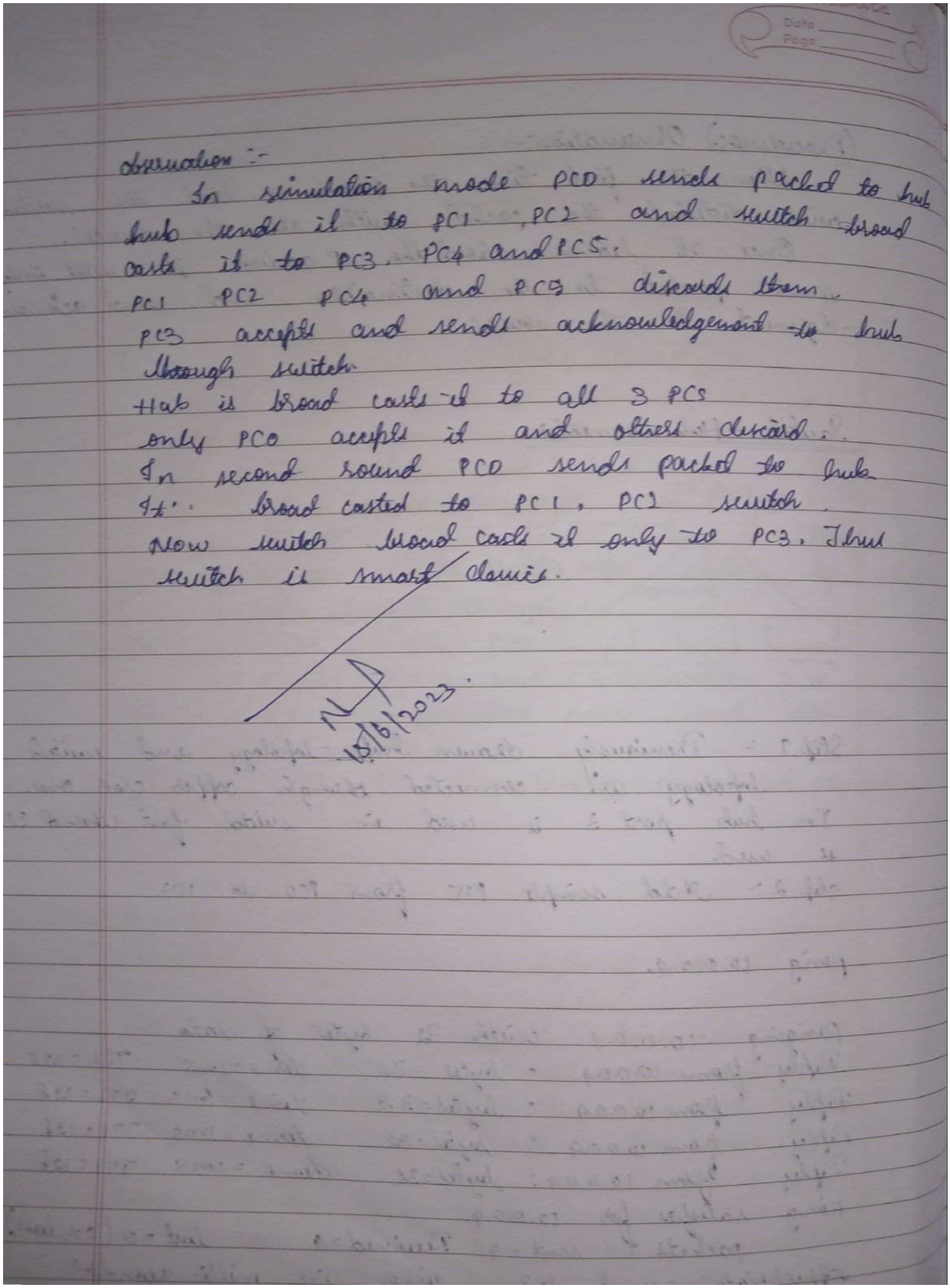


Step 1 :- Previously drawn hub topology and switch topology are connected through copper cross over. In hub port 3 is used in switch fast ethernet 3/1 is used

step 2 :- Add simple PDC from PC0 to PC3

ping 10.0.0.4.

Pinging 10.0.0.4 with 32 bytes of data :
Reply from 10.0.0.4 : bytes = 32 time = 1ms TTL = 128
Reply from 10.0.0.4 : bytes = 32 time = 1ms TTL = 128
Reply from 10.0.0.4 : bytes = 32 time = 1ms TTL = 128
Reply from 10.0.0.4 : bytes = 32 time = 1ms TTL = 128
ping statistics for 10.0.0.4.
packets : sent = 4 Received = 4 lost = 0 (0% loss)
Approximate round trip times in milli-seconds :
Minimum = 4ms Maximum = 4 ms Average = 4ms



observation :-

In simulation mode PC0 sends packet to hub hub sends it to PC1, PC2 and switch broad casts it to PC3, PC4 and PC5.
PC1 PC2 PC4 and PC5 discards them.
PC3 accepts and sends acknowledgement to hub through switch.
Hub is broad casts it to all 3 PCs
only PC0 accepts it and others discard.
In second round PC0 sends packet to hub it broad casted to PC1, PC2 switch.
Now switch broad casts it only to PC3. Thus switch is smart device.

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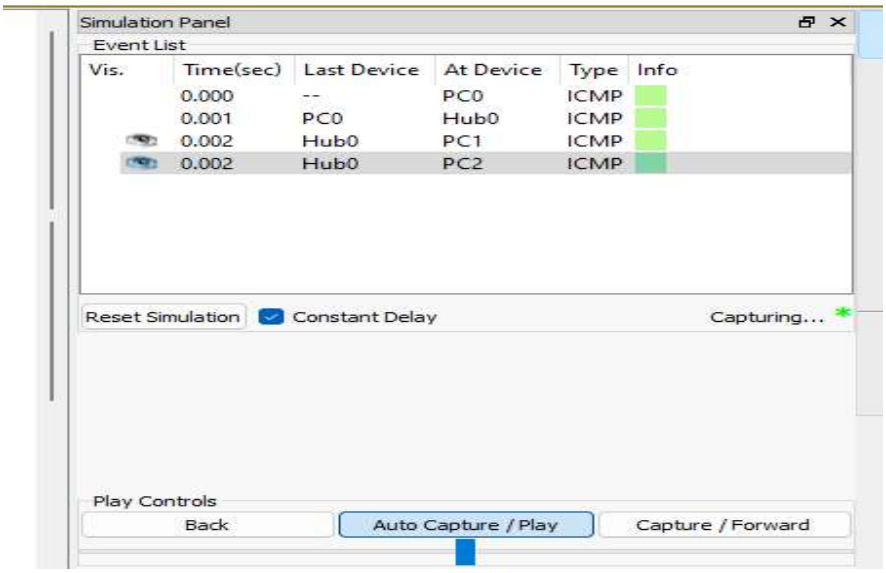
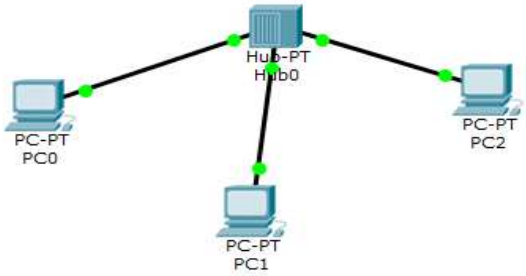
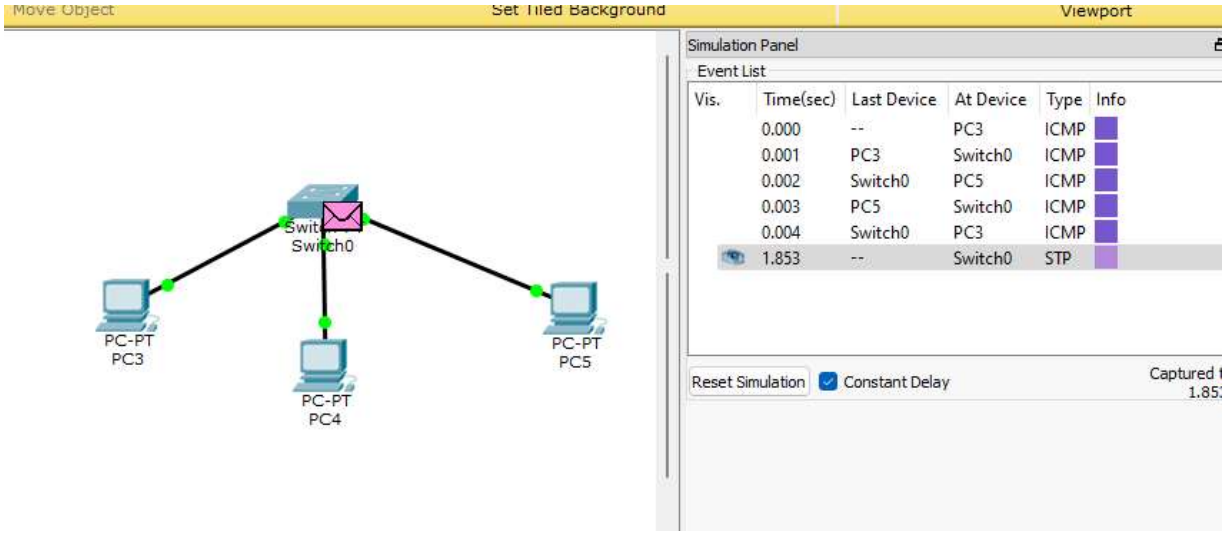
OUTPUT SCREENS

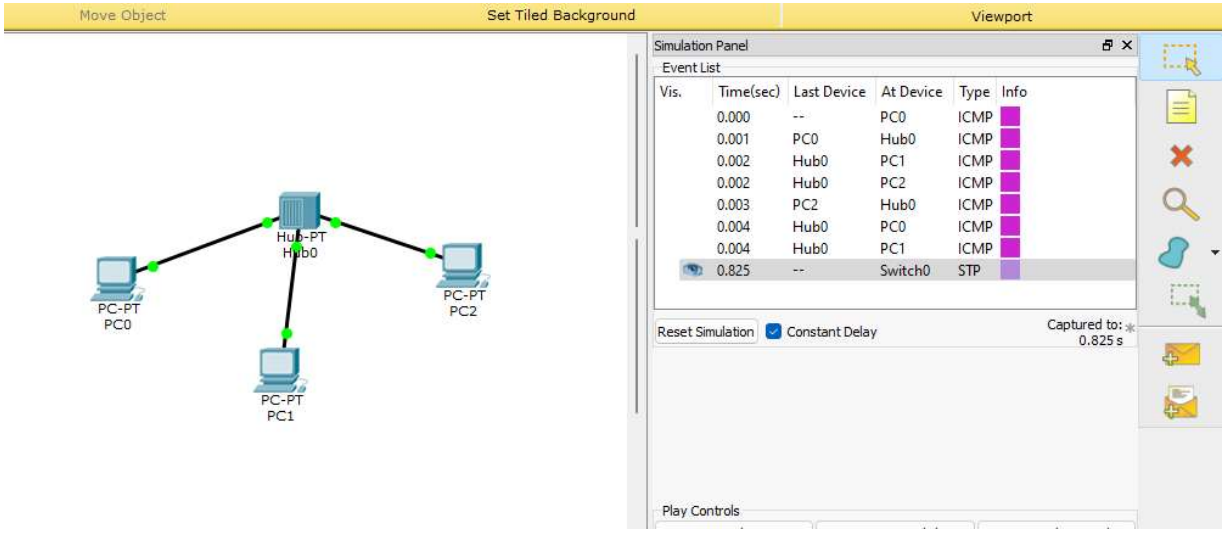


HUB



SWITCH


Move Object
Set Tiled Background
Viewport
Switch0
PC-PT PC3
PC-PT PC4
PC-PT PC5
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type Info
0.000 -- PC3 ICMP
0.001 PC3 Switch0 ICMP
0.002 Switch0 PC5 ICMP
0.003 PC5 Switch0 ICMP
0.004 Switch0 PC3 ICMP
1.853 -- Switch0 STP
Reset Simulation
Constant Delay


Move Object
Set Tiled Background
Viewport
Hub-PT Hub0
PC-PT PC0
PC-PT PC1
PC-PT PC2
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device 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
0.825 -- Switch0 STP
Reset Simulation
Constant Delay
Captured to: 0.825 s
Play Controls