10/11/22

CYCLE 1

EXPERIMENT 1 :

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

a) Using Hub as connecting device.

Hub is an unintelligent device. It operates in the physical layer. No signal processing / regeneration occurs.

Procedure :

- We open Cisco packet tracer in logical mode. At the left-hand side bottom corner we select End devices from Device-type selection box.
- We select 4 generic end devices and enter the following IP addresses : 10.0.0.1, 10.0.0.2, 10.0.0.3, 10.0.0.4. They have a common subnet mask of 255.0.0.0.
- We select a generic Hub and make connections to the end devices using Copper - Straight - Through connections.
- We add a PDU to source End device (IP: 10.0.0.1) and destination End device (IP: 10.0.0.4).
- We switch to simulation mode and select auto capture / play.

- Message moves from Device (10.0.0.1) to Hub.
- The Hub transmits the message to the remaining devices.
- Only Device (10.0.0.4) receives it correctly. The other 2 devices reject it.

eg) Event list.

Time	Last Device	At Device
0.000	- - -	PC0
0.001	PC0	Hub 0
0.002	Hub 0	PC 1
0.003	Hub 0	PC 2
0.002	Hub 0	PC 3
0.003	PC 3	Hub 0

- Real Time (Event list)

Fire	Last Status	Source	Destination	Time (Sec)	Periodic	Num
	Successful	PC0	PC 3	0.000	N	0

- Ping. PC> ping 10.0.0.4

Pinging 10.0.0.4 with 32 bytes of data:

Reply from 10.0.0.4: bytes=32 time=0ms TTL=128.

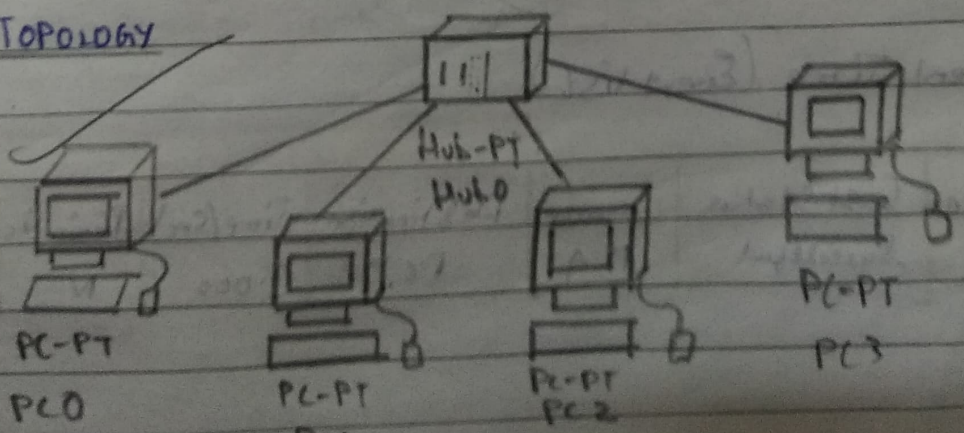
Statistics:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss).

Round trip times:

Minimum = 0ms, Maximum = 0ms, Average = 0ms

TOPOLOGY



b) Using Switch as Connecting Device.

Switch is a point to point communication device. It operates at data link layer. It uses switching table to obtain correct address.

Procedure:

- We select 4 end devices from the Device-type selection box. We enter 10.0.0.5, 10.0.0.6, 10.0.0.7, 10.0.0.8 as their IP addresses respectively. They have common Sub-net mask 255.0.0.0.
- We select a generic Switch and make connections to the end devices using Copper-Straight-through connections.
- We add a PDU to source End device (IP: 10.0.0.5) and destination End device (IP: 10.0.0.8).
- We enter simulation mode and select auto capture/play.
- Message moves from end device (10.0.0.5) to Switch.
- The Switch upon receiving the message sends it to destination end device (10.0.0.8) without broadcasting the message to other devices. Point-to-point communication is present.

- Real Time (Event list)

Fire	Last Status	Source	Destination	Time(Sec)	Periodic	Num	Edit
	Successful	PC4	PC7	0.000	N	0	(edit)

Simulation Model (Event List)

Time (Sec)	Last Device	At Device
0.000	---	PC4
0.001	PC4	Switch0
0.002	Switch0	PC7
0.003	PC7	Switch0
0.004	Switch0	PC4

- Ping PC > ping 10.0.0.8.

Pinging 10.0.0.8 with 32 bytes of data:

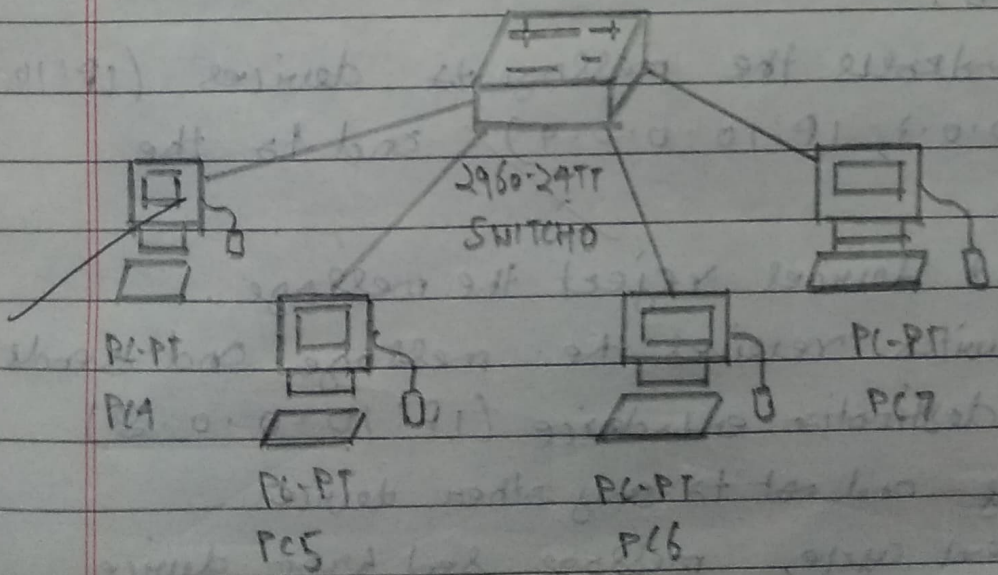
Reply from 10.0.0.8: bytes=32 time=11ms TTL=128

Statistics for 10.0.0.8:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss)

Approximate round trip times in milli-seconds:

Minimum = 0ms, Maximum = 11ms, Average = 4ms.



TOPOLOGY

c) Using both Hub & Switch as connecting devices.

Procedure:

- We form an interconnected LAN by making a connection between the Hub & Switch established previously using a Copper-Cross-over connection.
- We add a PDU to End Device - Source (IP 10.0.0.1) and to End Device - Destination (IP: 10.0.0.8). Source connected to Hub & ~~Source~~ Destination connected to Switch.
- We enter Simulation mode & Select auto capture/play.
- Real time (Event list)

Fire	Last Status	Source	Destination	Time(sec)	Periodic	Num
	Successful	PC0	PC7	0.000	N	0

- Message moves from Source end device (IP: 10.0.0.1) to Hub.
- Hub broadcasts the message to devices (IP: 10.0.0.2, IP: 10.0.0.3, IP: 10.0.0.4) and to the Switch.
- The end devices reject the message.
- The Switch receives the message and sends it to destination end device (IP: 10.0.0.8) directly and not to any other device.
- In the next cycle, message sent from device (IP: 10.0.0.8) goes to Switch & then to Hub directly.
- Hub broadcasts it to device (IP: 10.0.0.1, 10.0.0.2, 10.0.0.3, 10.0.0.4). Source device (IP: 10.0.0.1) receives message.

- Simulation Model (Event List)

Time (Sec)	Old Device	At Device
0.000	- - -	PC0
0.001	PC0	Hub0
0.002	Hub0	Switch0
0.003	Switch0	PC7
0.004	PC7	Switch0
0.005	Switch0	Hub0
0.006	Hub0	PC4
0.006	Hub0	PC3
0.006	Hub0	PC2
0.006	Hub0	PC1

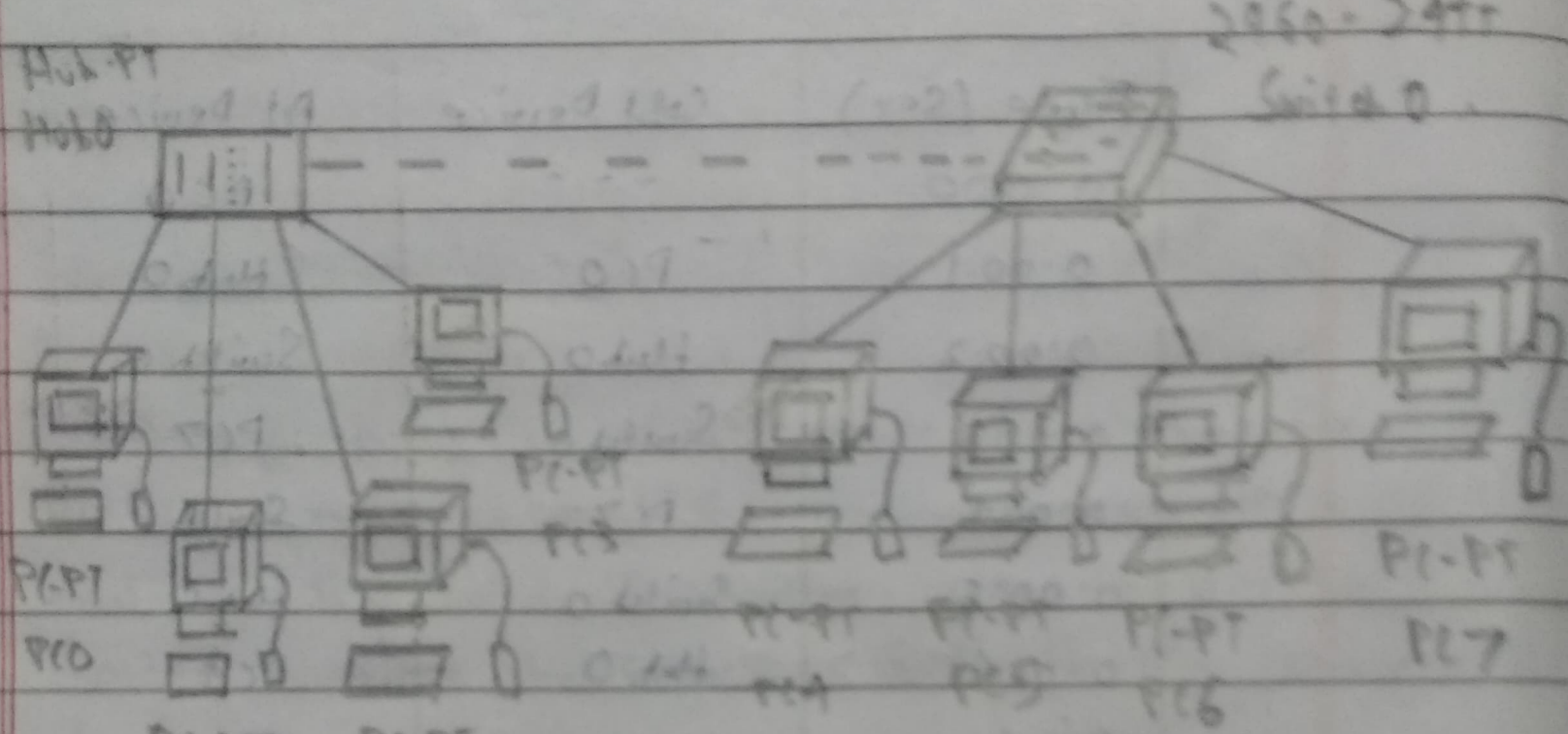
- Ping PC> ping 10.0.0.8

Pinging 10.0.0.8 with 32 bytes of data.

Reply from 10.0.0.8: bytes=32 time<1ms TTL=128
Reply from 10.0.0.8: bytes=32 time<1ms TTL=128
Reply from 10.0.0.8: bytes=32 time<1ms TTL=128
Reply from 10.0.0.8: bytes=32 time=1ms TTL=128.

Ping Statistics for 10.0.0.8:
Packets: Sent=4, Received=4, Lost=0 (0% loss),
Approximate round trip times in milli-seconds
Minimum=0ms, Maximum=1ms, Average=0ms

TOPOLOGY :



Lee
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