Date: 10/11/2022

Lab 2

Cycle 1

~~Task 1~~ ~~making connections using hub;~~ ~~from device type selection box~~

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

Task 1

Using a hub:

→ From device type selection box, select four number of devices by clicking on end devices.

→ Then select hub and connect the devices to the hub. Configure the devices by setting the IP addresses: 10.0.0.1, 10.0.0.2, 10.0.0.3, 10.0.0.4.

→ Next in simulation mode add PDU from source to destination and click on 'auto capture/play'.

We see that the PDU packets are being sent to all the devices but only the correct (the destination) devices accepts it, the others reject them.

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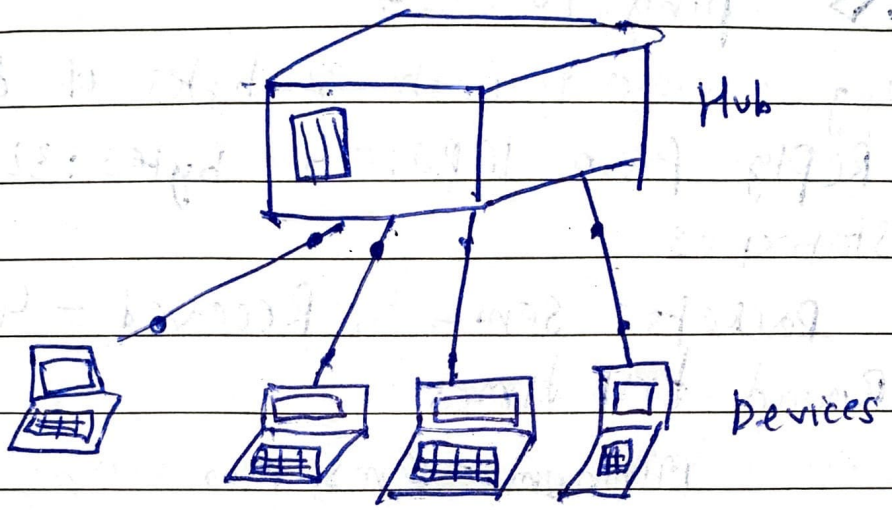
Same can be viewed in command prompt using
⇒ ping IPaddress



Task 2
Using a switch
⇒ from device type & selection box, select 4 devices
⇒ Event list

Time (sec)	Last Device	At Device
0.000	---	PC0
0.001	PC0	Hub0
0.002	Hub0	PC1
0.002	Hub0	PC2
0.002	Hub0	PC3
0.003	PC3	Hub0

Real time (event list)

Fire	Last status	Source	Destination	Time	Periodic
	Successful	PC0	PC3	0.000	N

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Command prompt (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

Round trip times:

Minimum = 0ms, Max = 0ms, Avg = 0ms

Task 2

Using a switch

→ From device type selection box select 4 devices by clicking on end devices.

→ Then select switch and connect all the devices to the switch. Configure the devices by setting the IP address: 10.0.0.5 to 10.0.0.8.

→ Next in simulation mode add PDV from source to destination and click on 'auto capture/Play'

→ We observe that the PDV packets is being sent only to the desired device (destination).

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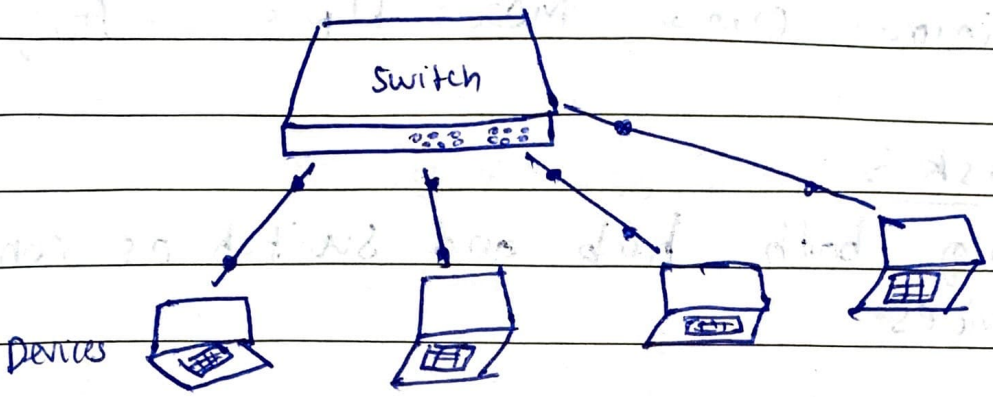

Event list

Time (sec)	Last Device	At device
0.00	---	PC4
0.01	PC4	Switch0
0.02	Switch 0	Laptop1
0.03	Laptop1	switch0
0.04	Switch0	PC4

Real time

Fire	Last Status	Source	Destination	Time	Periodic	Num
	Successful	PC4	Laptop1	0.000	N	1

Ping

C:\> ping 10.0.0.8

Pinging 10.0.0.8 with 32 bytes of data

Reply from 10.0.0.8 bytes: 32 time = 0 ms TTL = 128

Statistics for 10.0.0.8

Packets sent = 4, Received = 4, Lost = 0

Approx. round trip times

Minimum = 0ms, Max = 11ms, Avg. = 4ms

Task 3

Using both hub and 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 (10.0.0.1) and to end-device destination (10.0.0.8) Source connected to Hub and Destination connected to Switch

→ Enter simulation mode and select auto capture/play

→ Real time

Fire	Last Status	Source	Destination	Time	Periodic
	Successful	PC0	PC7	0.000	N

Message moves from source device to hub.

Hub broadcasts the message to devices (10.0.0.2, 10.0.0.3, 10.0.0.4) and to the switch.

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→ The end devices reject the message.
→ The switch receives the message and sends it to destination end device (10.0.0.8) directly and not to any other device.
→ In the next cycle, message sent from device (10.0.0.8) goes to switch then to hub.
→ Hub broadcasts it to devices (10.0.0.1, 10.0.0.2, 10.0.0.3, 10.0.0.4). Source device receives message.

Simulation model

Time	Last device	At device
0.000	- - -	PC0
0.001	PC0	Hub0
0.002	Hub0	Switch 0
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

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Ping

```
C:\> 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
Reply from 10.0.0.8 : bytes=32 time=1ms
Reply from 10.0.0.8 : bytes=32 time=1ms
Reply from 10.0.0.8 : bytes=32 time=1ms
Statistics for 10.0.0.8
    Packets: sent=4, Received=4, Lost=0
Approx. round trips
    Minimum=0ms, Max=1ms, Average=0ms
```

Topology