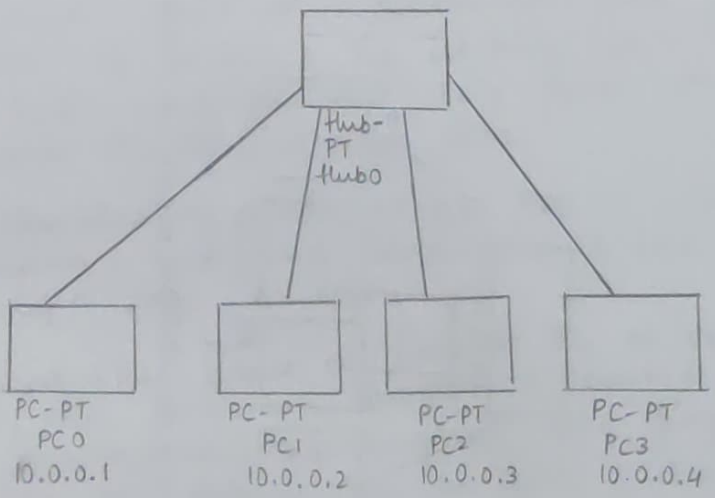
10/11/22

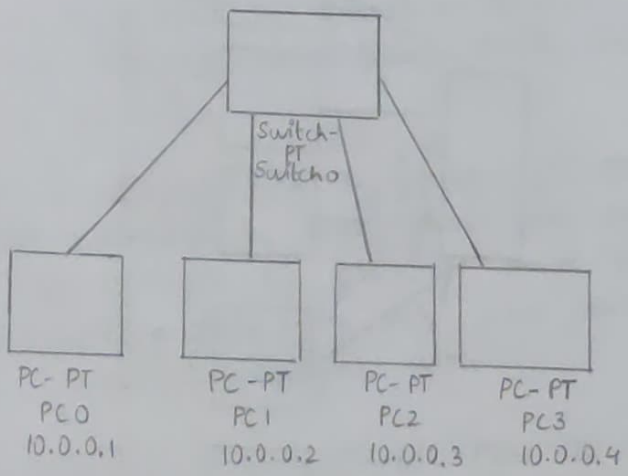
Aim: Creating a topology and stimulate sending a simple PDU from source to destination using hub and switch as connecting devices.

Topology:

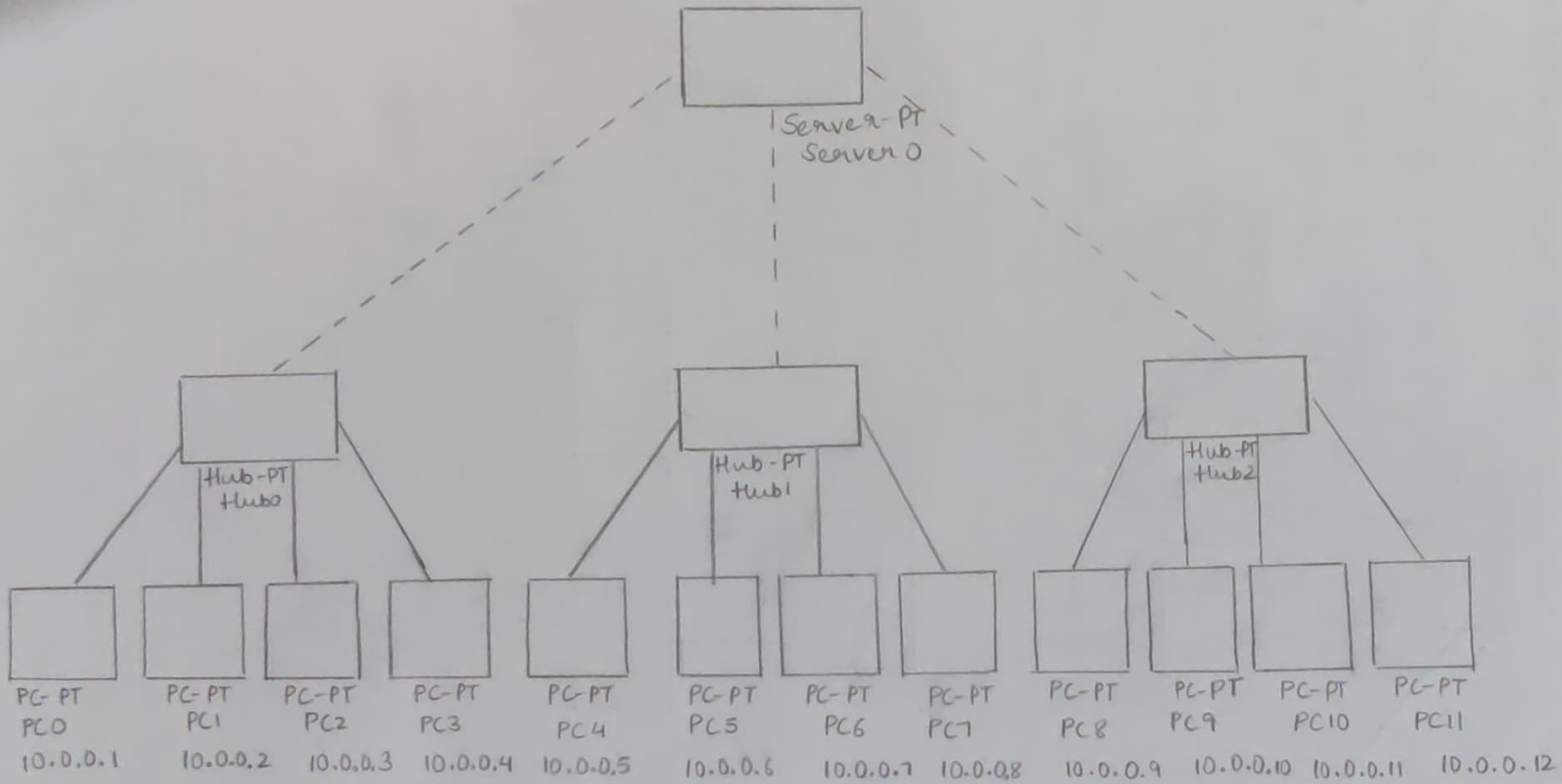
Hub:



Switch:



Hybrid:


Server-PT
Server 0
Hub-PT
Hub0
Hub-PT
Hub1
Hub-PT
Hub2
PC-PT
PC0
10.0.0.1
PC-PT
PC1
10.0.0.2
PC-PT
PC2
10.0.0.3
PC-PT
PC3
10.0.0.4
PC-PT
PC4
10.0.0.5
PC-PT
PC5
10.0.0.6
PC-PT
PC6
10.0.0.7
PC-PT
PC7
10.0.0.8
PC-PT
PC8
10.0.0.9
PC-PT
PC9
10.0.0.10
PC-PT
PC10
10.0.0.11
PC-PT
PC11
10.0.0.12

Procedure:

Hub

→ 7 Generic PC's and a generic hub are inserted into the logical workspace and the nodes for PC's are placed.

→ Each PC is configured by a specific IP address and the IP addresses are given from 10.0.0.1 to 10.0.0.7 by clicking on a specific PC. The hub and all the PC's are connected by copper straight through wire

→ In simulation mode, simple PDU is established between two end devices and the packet transfer can be seen.

→ In real-time mode a certain PC is selected and the command prompt is opened and the ping command can be given like ping IP address and the output can be seen.

Switch

→ 4 Generic PC's and a generic switch are inserted into the logical workspace and the nodes for PC's are placed.

→ Each PC is configured by a specific IP address and the IP addresses are given for the PC's from 10.0.0.1 to 10.0.0.4 by clicking on a specific PC. The Switch and all the PC's are connected by using copper straight wire

→ In simulation mode, simple PDU is established two end devices and auto capture is clicked. The packet transfer can be seen between the Switch and the PC's

→ In real-time mode, a PC is selected and command prompt is opened from the desktop option and the ping command can be given or sent to any other end devices and the output can be seen

Hybrid:

→ 12 generic PC's are inserted on the logical work space where 4 PC's are connected to one hub where there are 3 hubs each with 4PC's and the three hubs are connected to a single switch

→ All the nodes for 12 PC's are placed and the PC's are connected to their respective hub by copper-straight wire and the three hubs are connected to their switch by copper cross-over wire. The IP address are specified for all the 12 PC's from 10.0.0.1 to 10.0.0.12

→ In simulation mode simple PDU is established between two end devices and packet transfer can be seen from the source to the destination

→ In real-time mode, a PC can be selected and the command prompt can be opened for pinging another PC from the present PC and the output can be seen on the command prompt screen.

Observations:

Hub:

Learning outcome:

1) The hub broadcasts the message recieved by the source to all the other end devices but the message is read only by the specified destination and the destination responds back by sending a packet.

2) If the ports are not enough, the hub has to be clicked, the power has to be switched off and extra ports can be kept in the blank spaces and the power is switched on.

Result:

ping 10.0.0.7

pinging 10.0.0.7 with 32 bytes of data:

Reply from 10.0.0.7 : bytes = 32 time = 0 ms TTL = 0.8

Reply from 10.0.0.7 : bytes = 32 time = 0 ms TTL = 128

Reply from 10.0.0.7: bytes = 32 time = 0 ms TTL = 128

Reply from 10.0.0.7 bytes = 32 time = 0 ms TTL = 128

Ping statistics for 10.0.0.7:
Packets : Sent = 4 Recieved = 4, Lost = 0 (0% loss)
Approximate round trip times in milliseconds:
Minimum = 0 ms, Maximum = 0ms, Average = 0ms

Switch

Learning outcome:

1) The switch does not establishes connection immediately, there is a certain time called learning time and message passing cannot be done until the green light connection is established
2) The switch initially broadcasts for all the devices but afterwards the message is sent only to the destination specified.

Result:
ping 10.0.0.3
pinging 10.0.0.3 with 32 bytes of data
Reply time 10.0.0.3 : bytes = 32 time = 0 ms 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

Ping statistics for 10.0.0.3:
Packets Sent = 4, Recieved = 4, Lost = 0 (0% Loss)
Approximate round trip times in millisecond
Minimum = 0ms, Maximum = 0ms, Average = 0ms

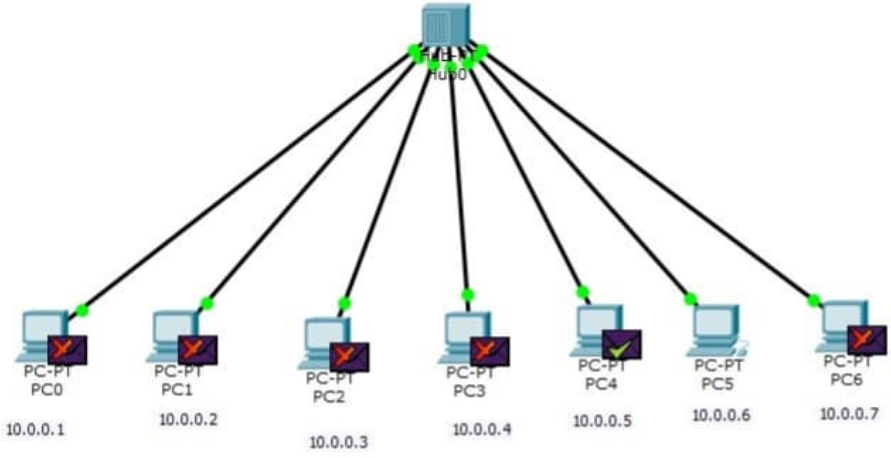
Hybrid

Learning outcomes:

1) The switch sends message to the particular hub which is connected to the destination PC but the hub which receives the message broadcasts to all the end devices of the particular hub while only the destination responds back

Result:
ping 10.0.0.11
Pinging 10.0.0.11 with 32 bytes of data
Reply from 10.0.0.11 : bytes = 32 time = 0ms TTL = 128
Reply from 10.0.0.11 : bytes = 32 time = 0ms TTL = 128
Reply from 10.0.0.11 : bytes = 32 time = 1 ms TTL = 128
Reply from 10.0.0.11 : bytes = 32 time = 0ms TTL = 128

Ping statistics for 10.0.0.11:
Packets : Sent=4, Recieved =4, Last = 0 (0% Loss),
Approximate round trip times in milli seconds
Minimum=0ms, Maximum= 1ms, Average = 0ms



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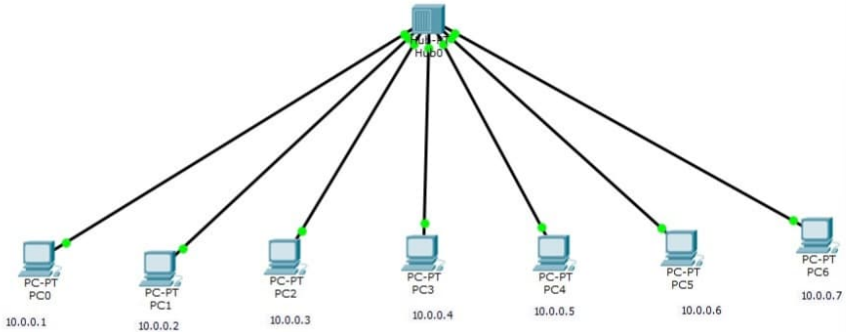

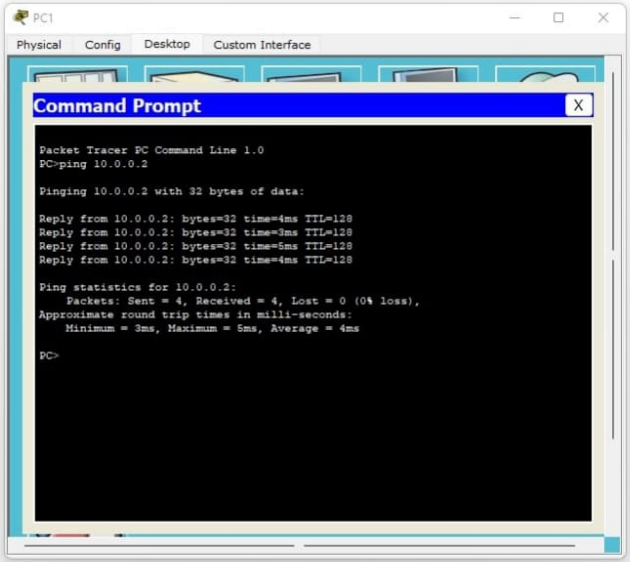

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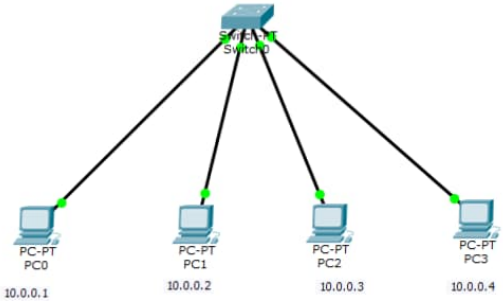

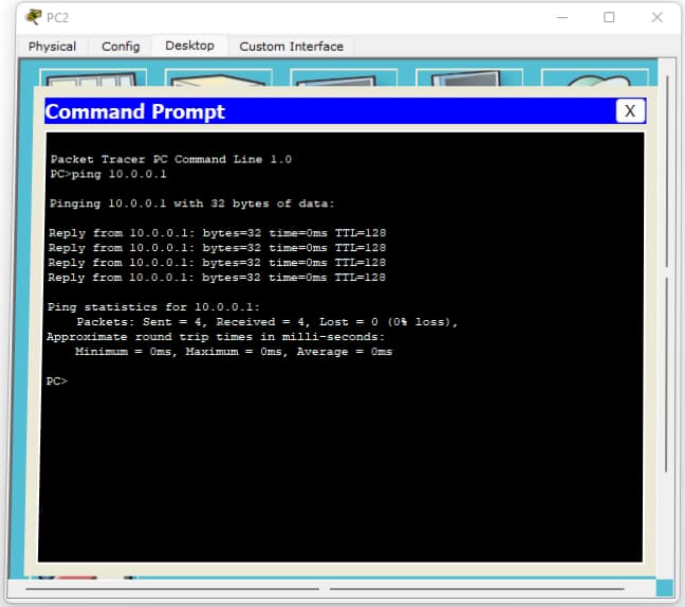

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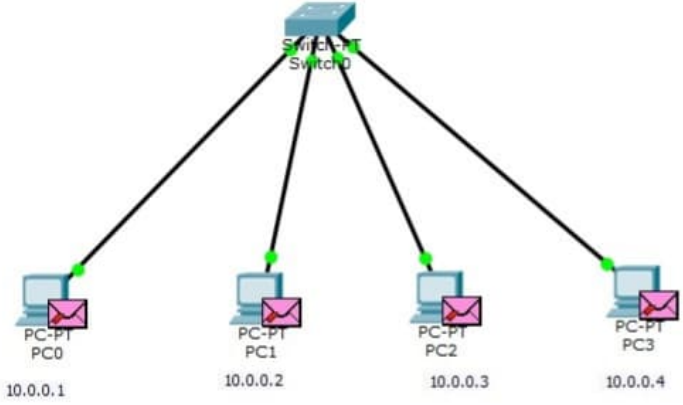

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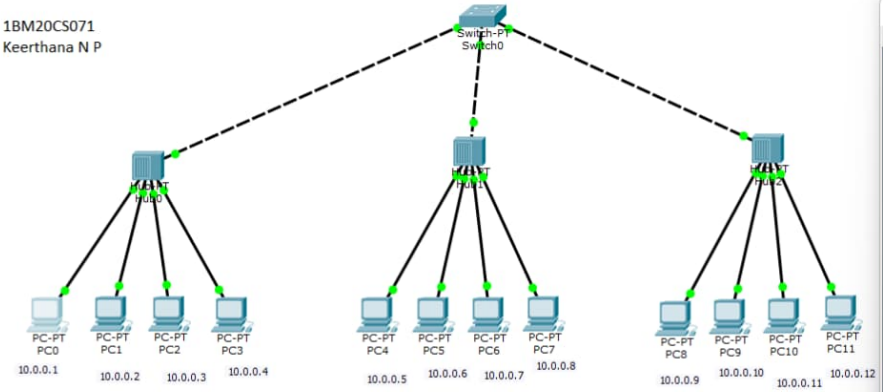

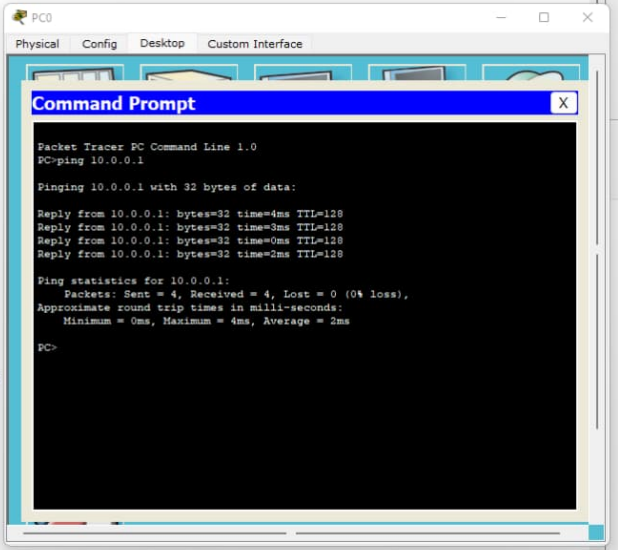

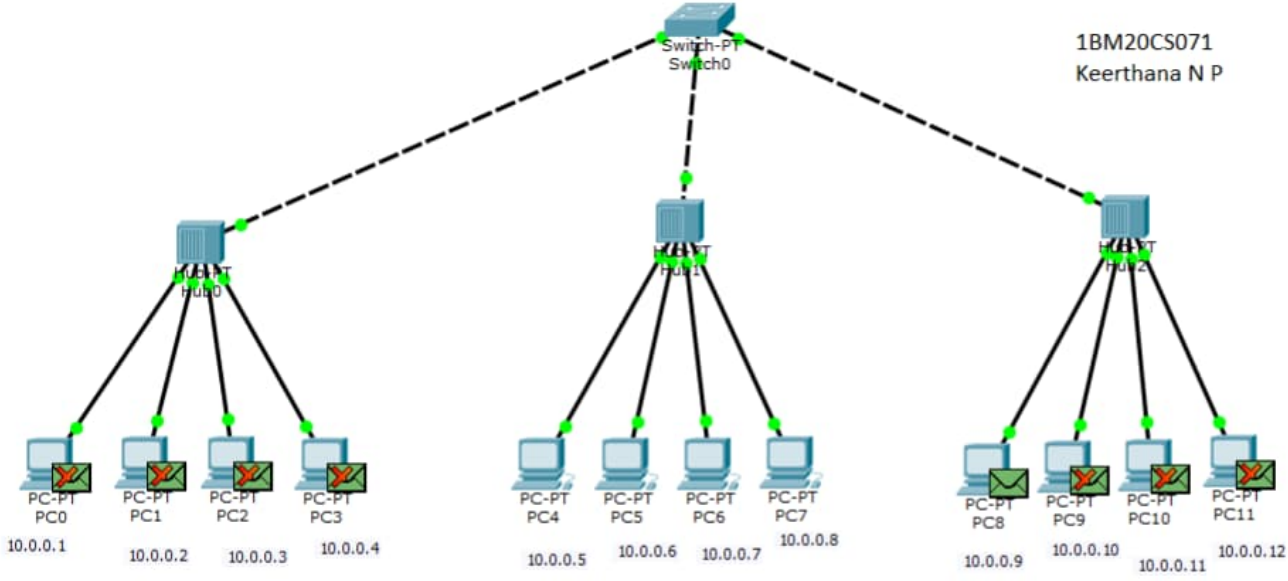
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Switch-PT
Switch0
Hub-PT
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Hub2
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PC0
10.0.0.1
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