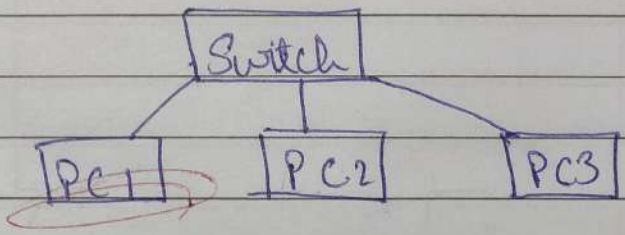
15/8/23

15/6/23 Create a topology and simulate sending a simple PDU from source to destination using hub and switch as connecting devices and demonstrate ping message

① Switch

Aim: Create a topology and simulate sending a simple PDU from source to dest using switch as connecting device. ②

Topology:



Procedure:

Take 3 PC's and connect them to a switch. Configure the IP addresses of the PC. When switch is ready for communication simulate sending a PDU from one PC to another. In real time, ping a PC by using command prompt of of sendess PC.

Result:

Reply from 10.0.0.2 bytes = 32 time = 0ms TTL = 128
Reply from 10.0.0.2 bytes = 32 time = 0ms TTL = 128
Reply from 10.0.0.2 bytes = 32 time = 0ms TTL = 128
Reply from 10.0.0.2 bytes = 32 time = 0ms TTL = 128

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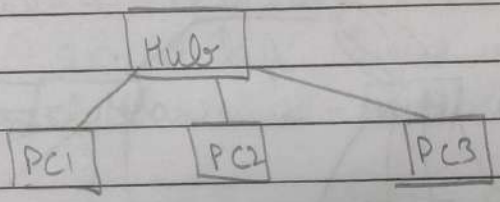
Observation:
The PDU is sent from to switch, it is broadcasted to all the PC's and then the PC's which are not destination PC's rejects PDU. Acknowledgement is sent to switch by the destination PC.

② Hub:

Aim: Create a topology and simulate sending a PDU from source to destination using HUB as connecting device.

Topology:



Procedure:
Take 3 PC's and connect it to a Hub. Configure the IP addresses of all the PC's. When hub is ready for communication, simulate sending a PDU from one PC to another. In real time, ping a PC by using command prompt of sender PC.

Result:
Reply from 10.0.0.3: byte=32 time=5ms 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=4294692698ms
TTL=128

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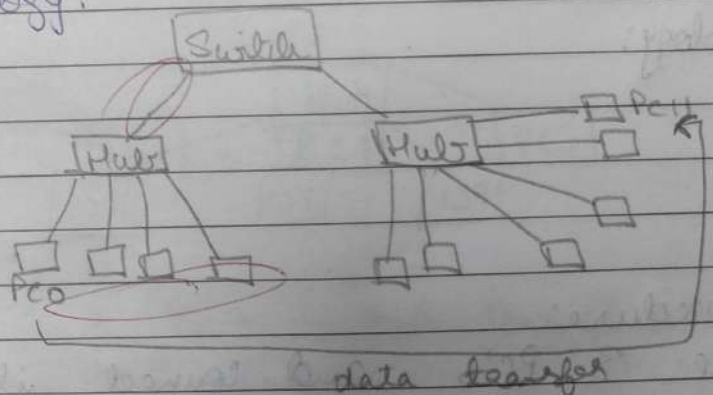
Observation

The PDU is sent to hub.
The hub connecting device recieves data from source PC and broadcasts it to all the connecting devices. The devices not intended for data transfer does not interact with the packet while the destination device sends back an acknowledgement.

(3) Hub and Switch (Hybrid)

Topology:



Procedure:

Take Add about 4 generic PC's to your logical workspace and connect it to the hub using a copper straight through wire. Add another 7 devices and connect it to another hub using a copper straight through wire. Connect the 2 Hubs to a Switch using a copper cross-over wire and the the IP addresses of all the devices.

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Hubs and Switch

Add a simple PDU from one device to another device and switch to simulation mode. Start the simulation.

Result:

PC> Ping 10.0.0.8

Pinging 10.0.0.8 with 32 bytes of data.

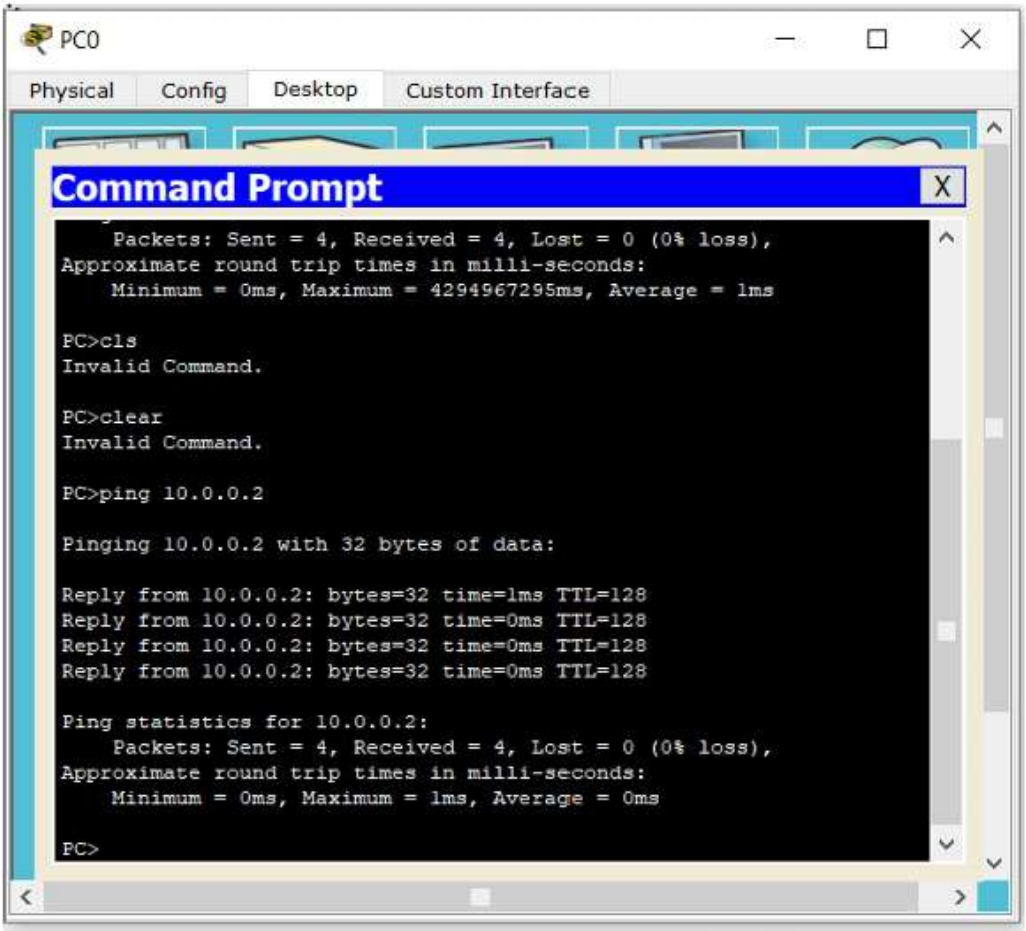
Reply from 10.0.0.8: bytes = 32 time = 1s TTL = 128
Reply from 10.0.0.8: bytes = 32 time = 1s TTL = 128
Reply from 10.0.0.8: bytes = 32 time = 1s TTL = 128
Reply from 10.0.0.8: bytes = 32 time = 1s TTL = 128

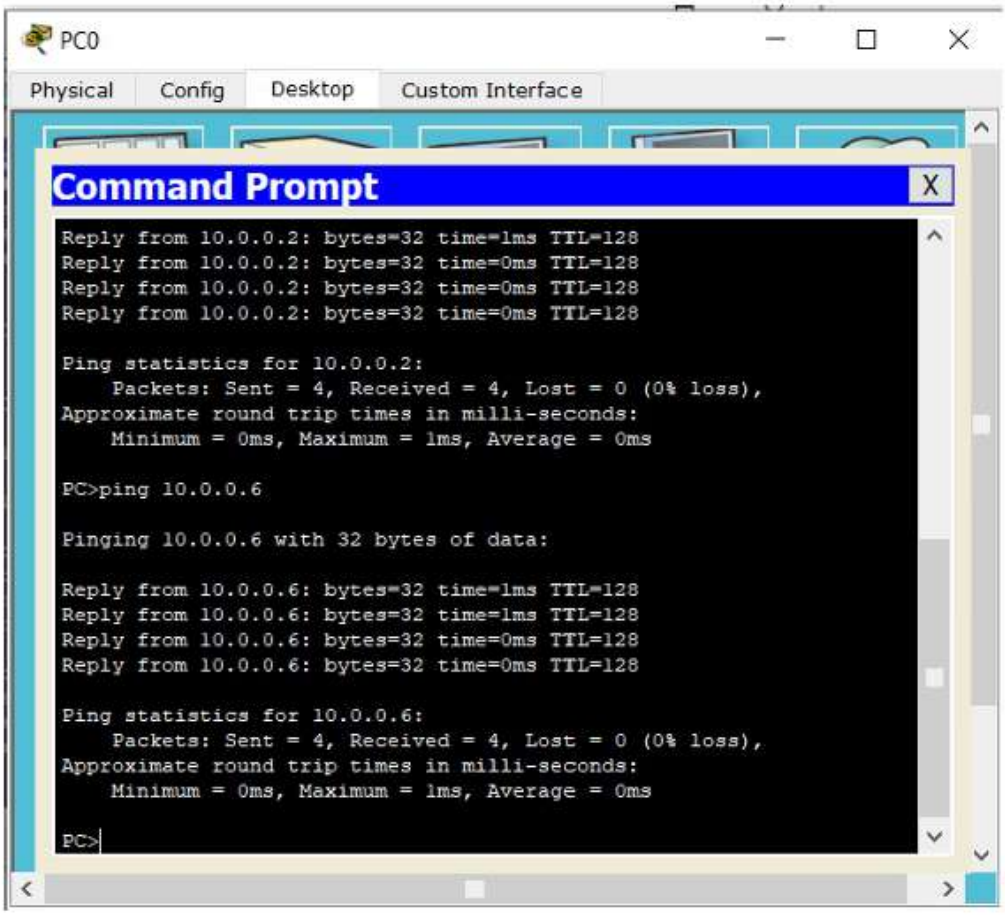
Ping statistics for 10.0.0.8:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds
Minimum = 0ms, Maximum = 4ms, Average = 1ms

Observation:

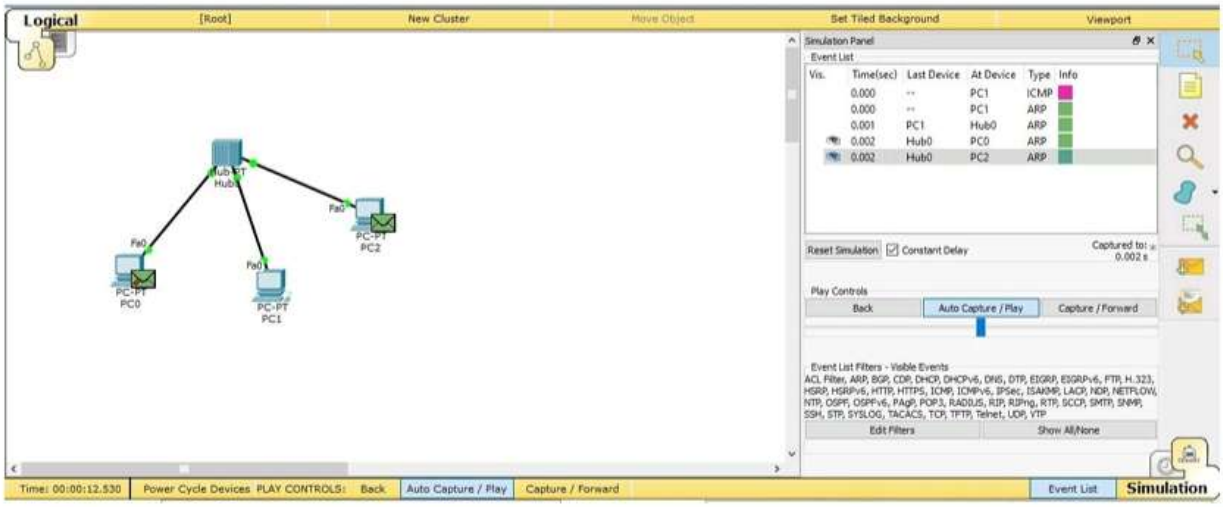
The data packet from PC0 is sent to the Hub which then broadcasts the packet to all the devices in that network and the switch. The switch then transmits the data packet to the second hub which in turn broadcasts the packet to all the devices the hub. The destination device accepts the data packet while the remaining discard the data packet. Finally, the destination device sends an acknowledgment to the source device that data communication is complete.

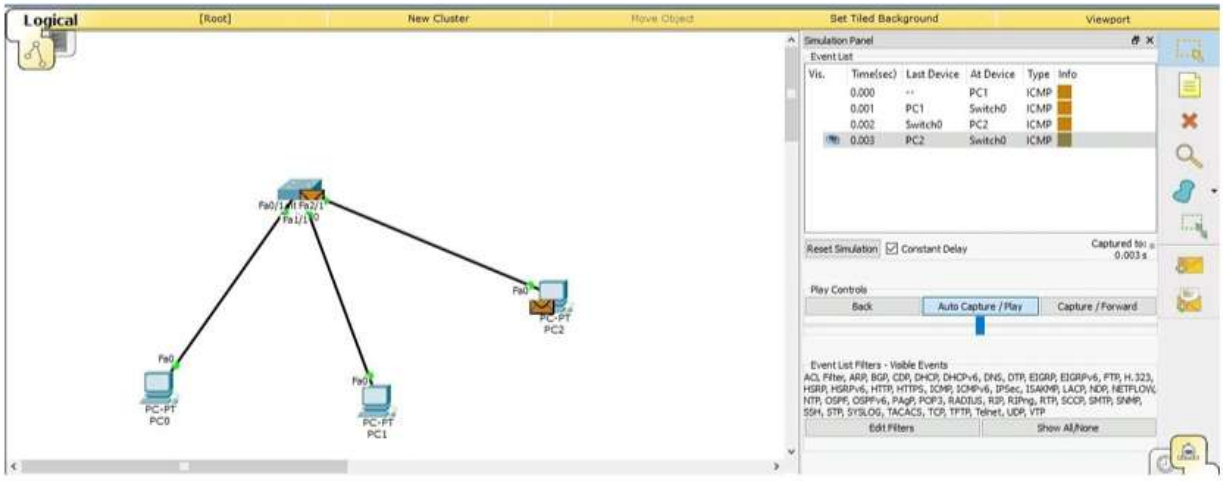
Result:

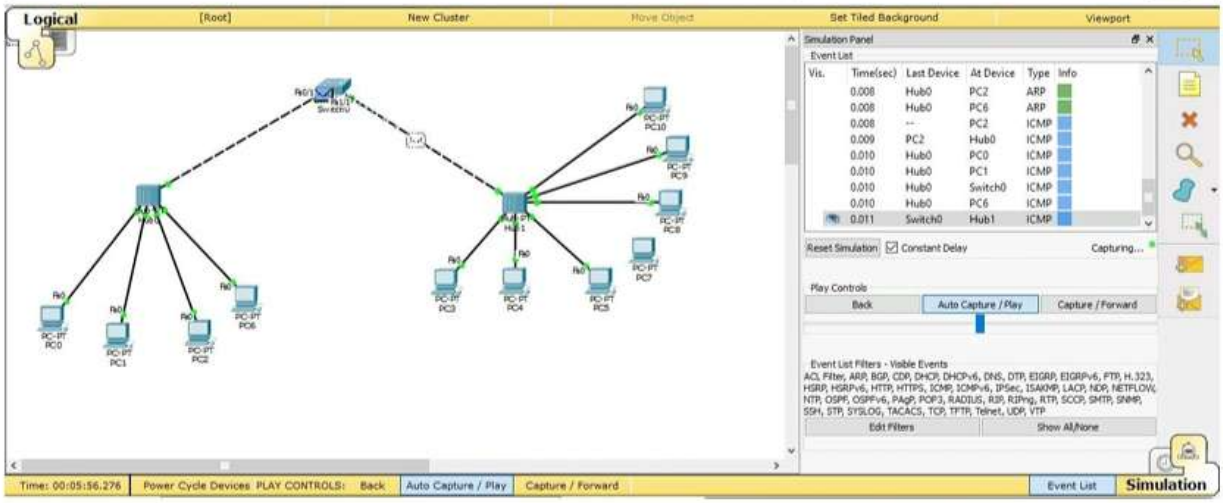

PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 4294967295ms, Average = 1ms
PC>cls
Invalid Command.
PC>clear
Invalid Command.
PC>ping 10.0.0.2
Pinging 10.0.0.2 with 32 bytes of data:
Reply from 10.0.0.2: bytes=32 time=1ms TTL=128
Reply from 10.0.0.2: bytes=32 time=0ms TTL=128
Reply from 10.0.0.2: bytes=32 time=0ms TTL=128
Reply from 10.0.0.2: bytes=32 time=0ms TTL=128
Ping statistics for 10.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
PC>


PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
Reply from 10.0.0.2: bytes=32 time=1ms TTL=128
Reply from 10.0.0.2: bytes=32 time=0ms TTL=128
Reply from 10.0.0.2: bytes=32 time=0ms TTL=128
Reply from 10.0.0.2: bytes=32 time=0ms TTL=128
Ping statistics for 10.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
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=1ms TTL=128
Reply from 10.0.0.6: bytes=32 time=1ms TTL=128
Reply from 10.0.0.6: bytes=32 time=0ms TTL=128
Reply from 10.0.0.6: bytes=32 time=0ms TTL=128
Ping statistics for 10.0.0.6:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
PC>

Topology:


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type Info
0.000 -- PC1 ICMP
0.000 -- PC1 ARP
0.001 PC1 Hub0 ARP
0.002 Hub0 PC0 ARP
0.002 Hub0 PC2 ARP
Reset Simulation
Constant Delay
Captured to: 0.002 s
Play Controls
Back
Auto Capture / Play
Capture / Forward
Event List Filters - Visible Events
ACL Filter, ARP, BGP, CDP, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, RADIUS, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP
Edit Filters
Show All/None
Hub-PT Hub0
PC-PT PC0
PC-PT PC1
PC-PT PC2
Time: 00:00:12.530
Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward
Event List
Simulation


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type Info
0.000 -- PC1 ICMP
0.001 PC1 Switch0 ICMP
0.002 Switch0 PC2 ICMP
0.003 PC2 Switch0 ICMP
Reset Simulation
Constant Delay
Captured to: 0.003 s
Play Controls
Back
Auto Capture / Play
Capture / Forward
Event List Filters - Visible Events
Edit Filters
Show All/None
PC-PT PC0
PC-PT PC1
PC-PT PC2


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type Info
0.008 Hub0 PC2 ARP
0.008 Hub0 PC6 ARP
0.008 -- PC2 ICMP
0.009 PC2 Hub0 ICMP
0.010 Hub0 PC0 ICMP
0.010 Hub0 PC1 ICMP
0.010 Hub0 Switch0 ICMP
0.010 Hub0 PC6 ICMP
0.011 Switch0 Hub1 ICMP
Reset Simulation
Constant Delay
Capturing...
Play Controls
Back
Auto Capture / Play
Capture / Forward
Event List Filters - Visible Events
Edit Filters
Show All/None
Time: 00:05:56.276
Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward
Event List
Simulation