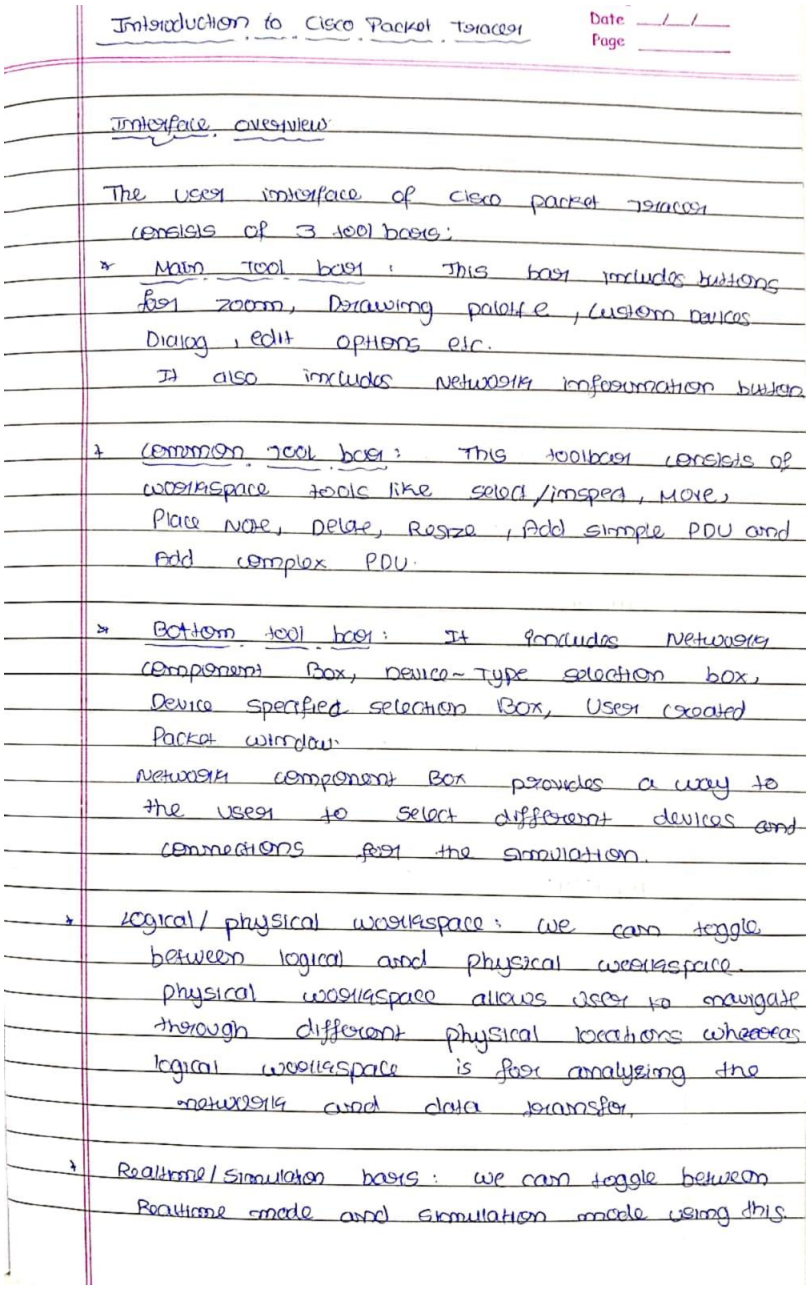
EXPERIMENT-1

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

Observation:



Introduction to Cisco Packet Tracer

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Interface overview

The user interface of cisco packet tracer consists of 3 tool boxs:

* Main Tool box: This box includes buttons for zoom, Drawing palette, Custom Devices Dialog, edit options etc.
  It also includes Network information button

* Common Tool box: This toolbox consists of workspace tools like select/inspect, Move, Place Note, Delete, Resize, Add simple PDU and Add complex PDU.

* Bottom tool box: It includes Network component Box, Device-Type selection box, Device specified selection Box, User created Packet window.
  Network component Box provides a way to the user to select different devices and connections for the simulation.

* Logical/physical workspace: We can toggle between logical and physical workspace. physical workspace allows user to navigate through different physical locations whereas logical workspace is for analysing the network and data transfer.

* Realtime/Simulation bars: We can toggle between Realtime mode and Simulation mode using this.

* Types of connections/links:

There are 5 different types of connections. The two major types of connections are:

- Copper - straight - through: This is used to connect devices that operate between different OSI layers.
- Copper Cross - over: This is used to connect devices that operate in the same OSI layers (like PC to PC).

* Simulation Panel in simulation mode:

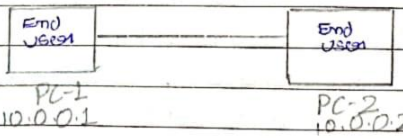
provides information about the transfer of packets.

Experiment:

→ Creating Network: (Connection of devices)

1. ~~Start~~ ~~creating~~ a select end devices and then add them to the workspace.
2. Use copper - straight - through copper cross over to connect between the devices.

Topology:



PC-1
10.0.0.1

PC-2
10.0.0.2.

Experiment - 2

Hubs and Switches

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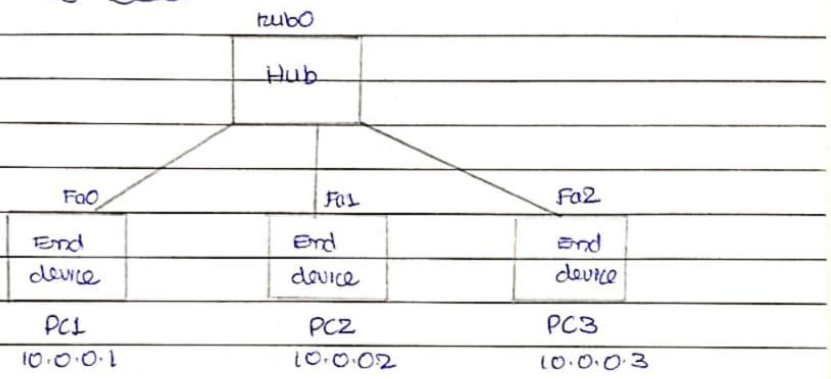
Aim:

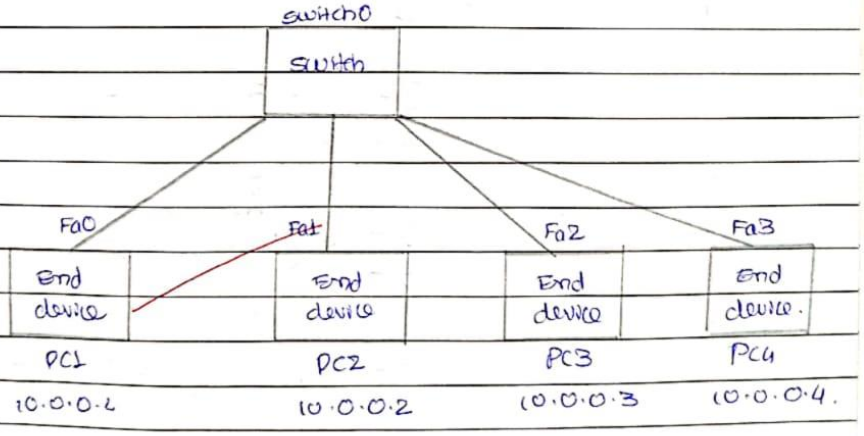
HUB

Aim: creating a topology and simulating sending a simple PDU from source to destination using hub and switch as connecting devices and demonstrating ping message.

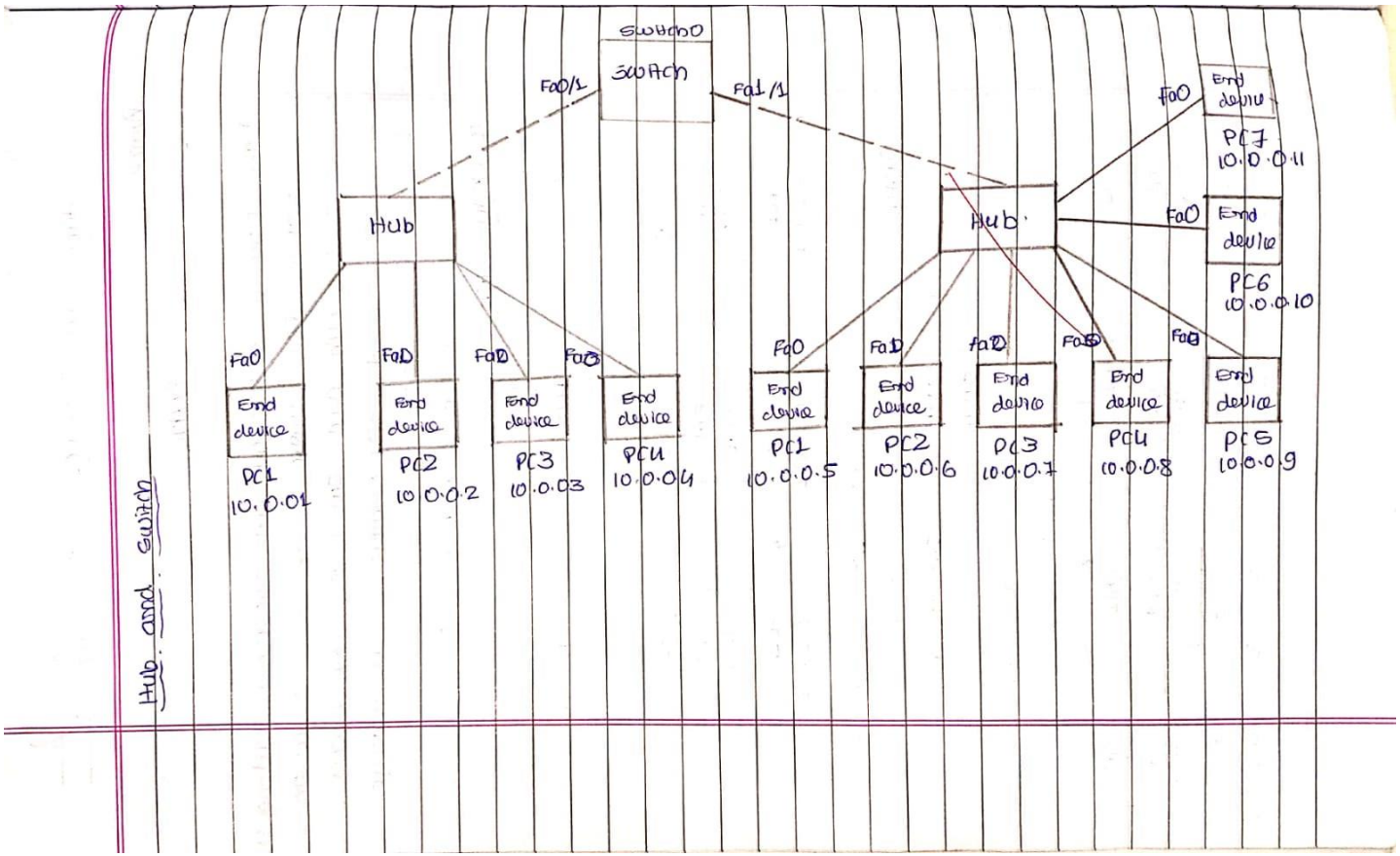
Topology: HUB



Switch



Hub and Switch



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Procedure:

1] Hub:

* Add a hub and 3 end devices into logical workspace.
* Connect the end devices to the hub using copper straight connectors.
* Assign a unique IP address to each end device.
* Send the simple PDU from one device to other.
* Ping a PDU using command prompt in realtime mode.

2] Switch:

* Add a switch and 4 end devices (PCs) into logical workspace.
* Connect the end devices to the switch using copper straight connectors.
* Assign unique IP address to each of the end device.
* Send the simple PDU from one device to other.
* Ping a PDU using command prompt in realtime mode.

3] Switch and hub:

* Add a switch, 2 hubs and 11 end devices into logical workspace.
* Connect 4 end devices to one hub and the remaining to the other.
* Connect these two hubs to a switch, using copper cross-over connection.

* Assign unique IP address for each device.
* Send a simple PDU from the end device of one hub to the end device of other hub.
* In realtime mode ping a message from one end device from hub-1 to other end device in hub-2 using command prompt.

Result:

1] HUB:

command > ping 10.0.0.3.

Pinging 10.0.0.3 with 32 bytes of data:

Reply from 10.0.0.3: bytes = 32 time=1ms TTL=128
Reply from 10.0.0.3: bytes = 32 time=1ms TTL=128
Reply from 10.0.0.3: bytes = 32 time=0ms TTL=128
Reply from 10.0.0.3: bytes = 32 time=1ms 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 = 1ms, Average = 0ms

2] Switch:

command > ping 10.0.0.3

Pinging 10.0.0.3 with 32 bytes of data:
Reply from 10.0.0.3: bytes = 32 time = 1ms TTL = 128
Reply from 10.0.0.3: bytes = 32 time = 0ms TTL = 128

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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 time in milli-seconds:
Minimum=0ms, Maximum = 1ms, Average =0ms

3] Hub and switch

command > 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
Reply from 10.0.0.8 : bytes=32 time=1ms TTL=128
Reply from 10.0.0.8 : bytes=32 time=0ms TTL=128
Reply from 10.0.0.8 : bytes=32 time=0ms 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=11ms, Average =3ms.

Observation:
Hub: Hub is a networking device which is used to transmit the signal to each port to respond from which the signal was received. It transmits signal to every port except port from which the signal is received.

- Switch: SWITCH is an intelligent device which sends message to selected destination device only. First it examines the destination address and send the message to the corresponding device(s).

observation about the experiment

Hybrid - Pt to Pt WAN & switched WAN.

Internet - backbones
ISPs.

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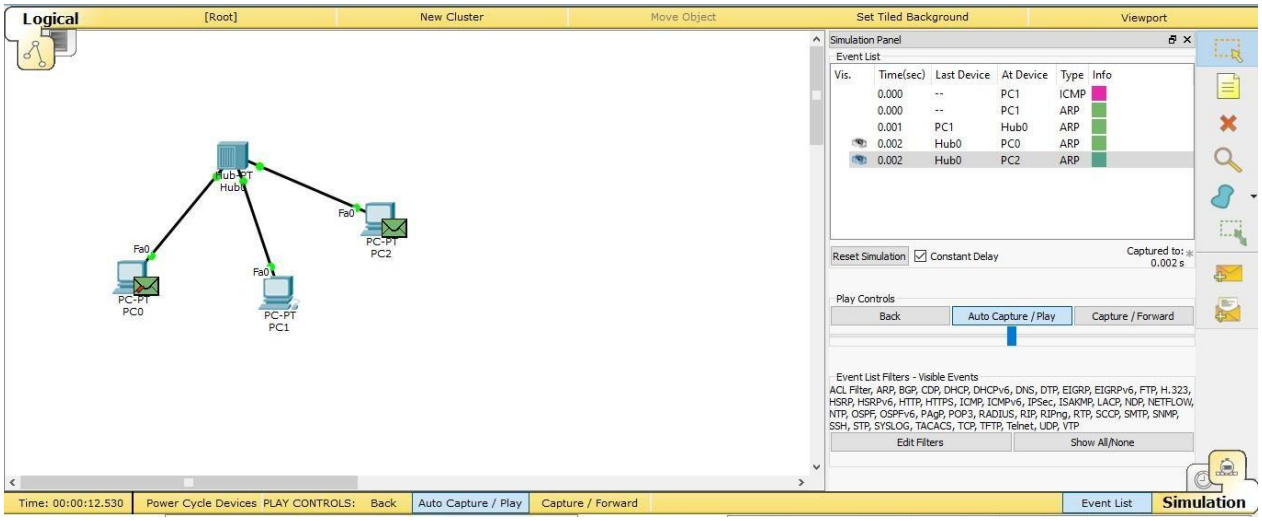
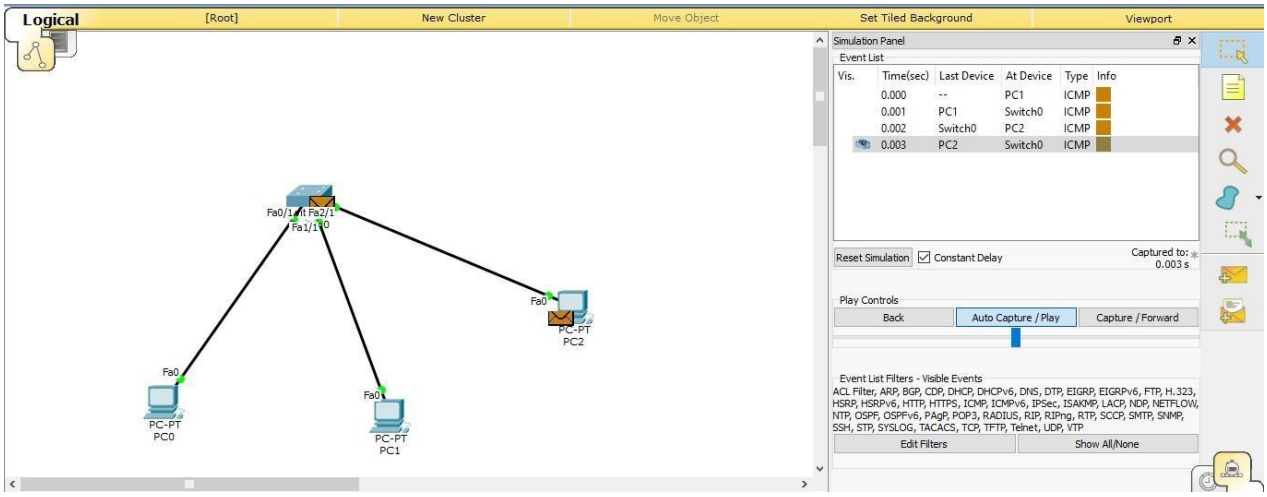
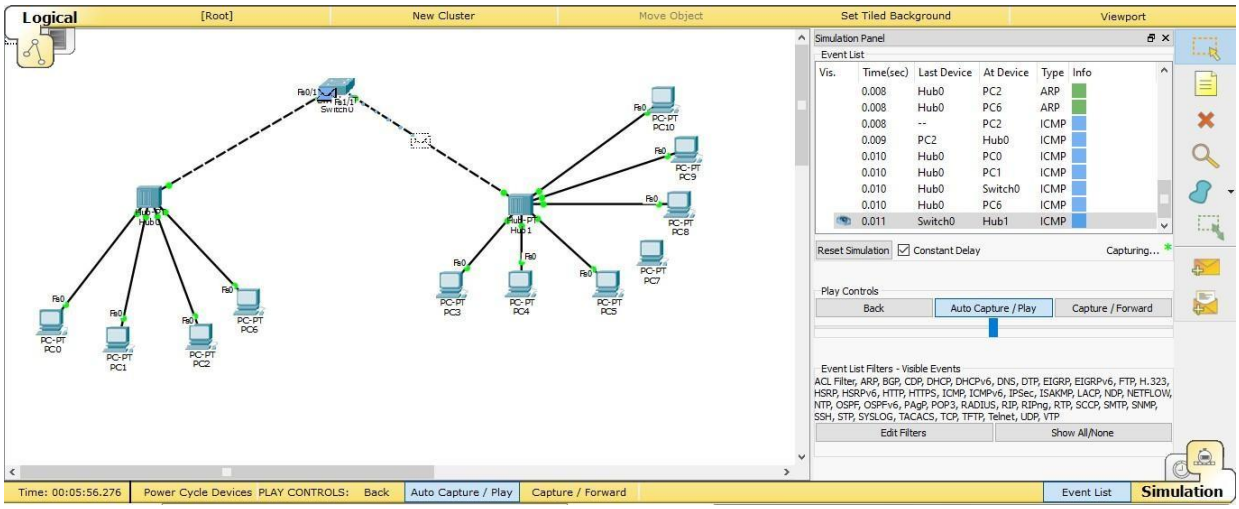
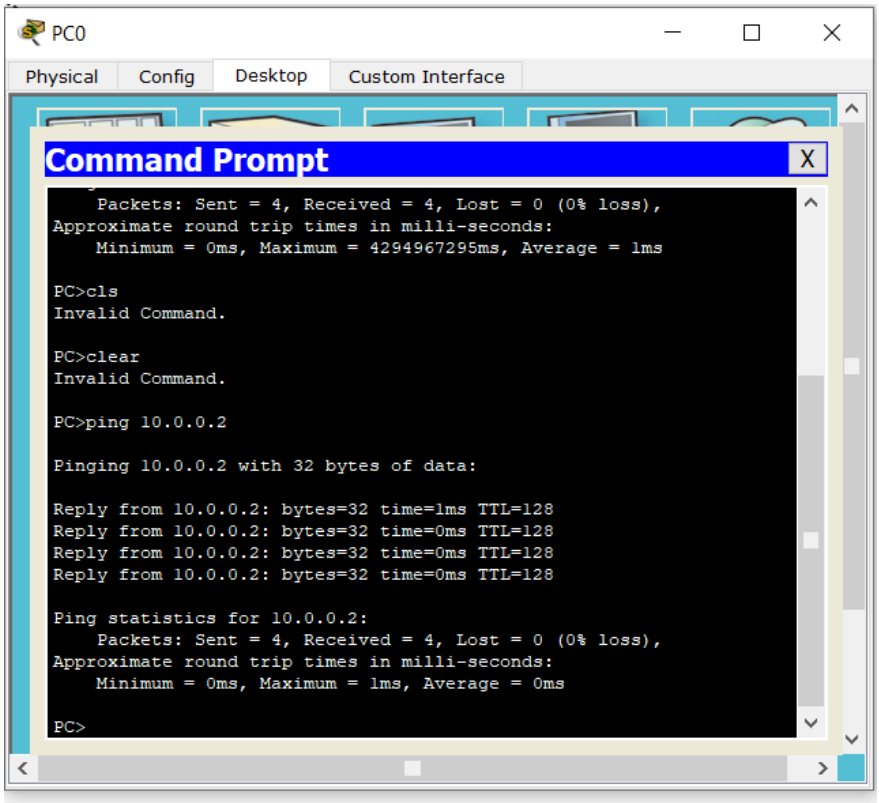
Topology:

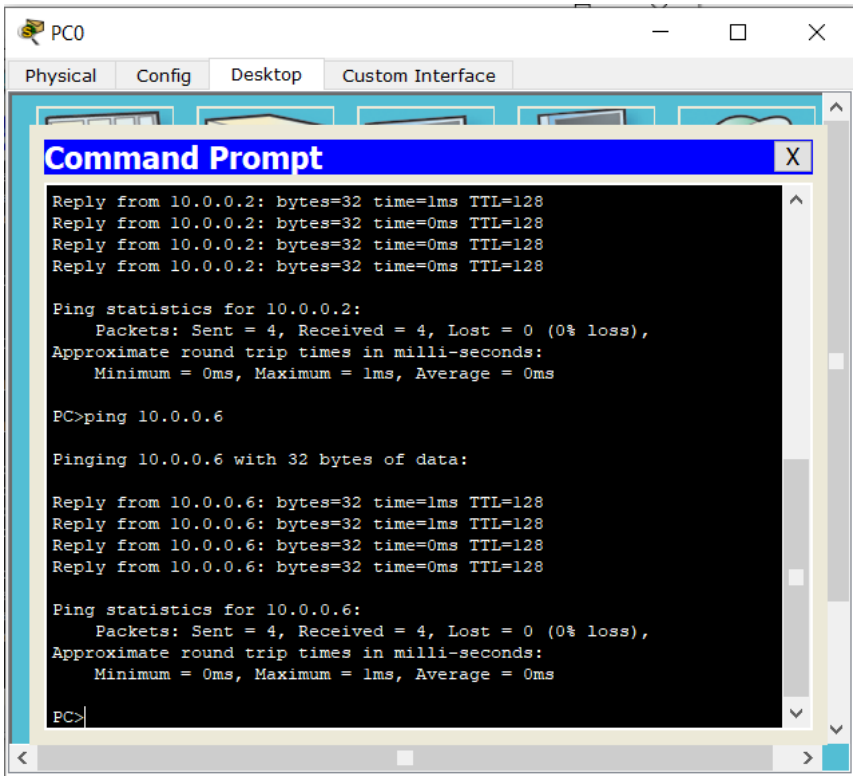

Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Hub-PT Hub0
PC-PT PC0
PC-PT PC1
PC-PT PC2
Fa0
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type Info
0.000 -- PC1 ICMP
0.000 -- PC1 ARP
0.001 PC1 Hub0 ARP
0.002 Hub0 PC0 ARP
0.002 Hub0 PC2 ARP
Reset Simulation
Constant 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
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
Fa0/1
Fa2/1
Fa1/1
PC-PT PC0
PC-PT PC1
PC-PT PC2
Fa0
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
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


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Switch0
Hub-PT Hub0
Hub-PT Hub1
PC-PT PC0
PC-PT PC1
PC-PT PC2
PC-PT PC3
PC-PT PC4
PC-PT PC5
PC-PT PC6
PC-PT PC7
PC-PT PC8
PC-PT PC9
PC-PT PC10
Fa0
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
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
Time: 00:05:56.276
Power Cycle Devices
PLAY CONTROLS:
Back
Auto Capture / Play
Capture / Forward
Event List
Simulation

Result:


PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
X
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
X
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>