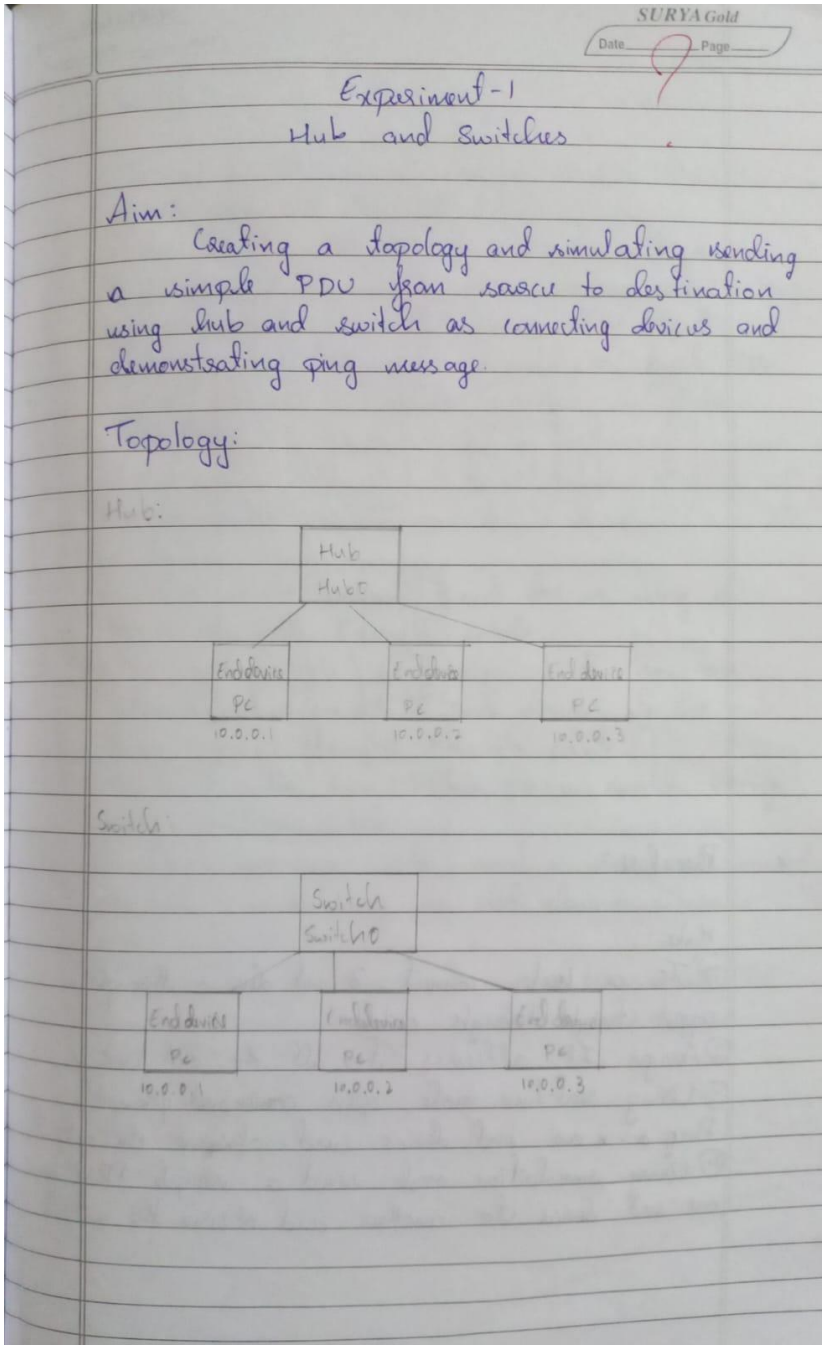
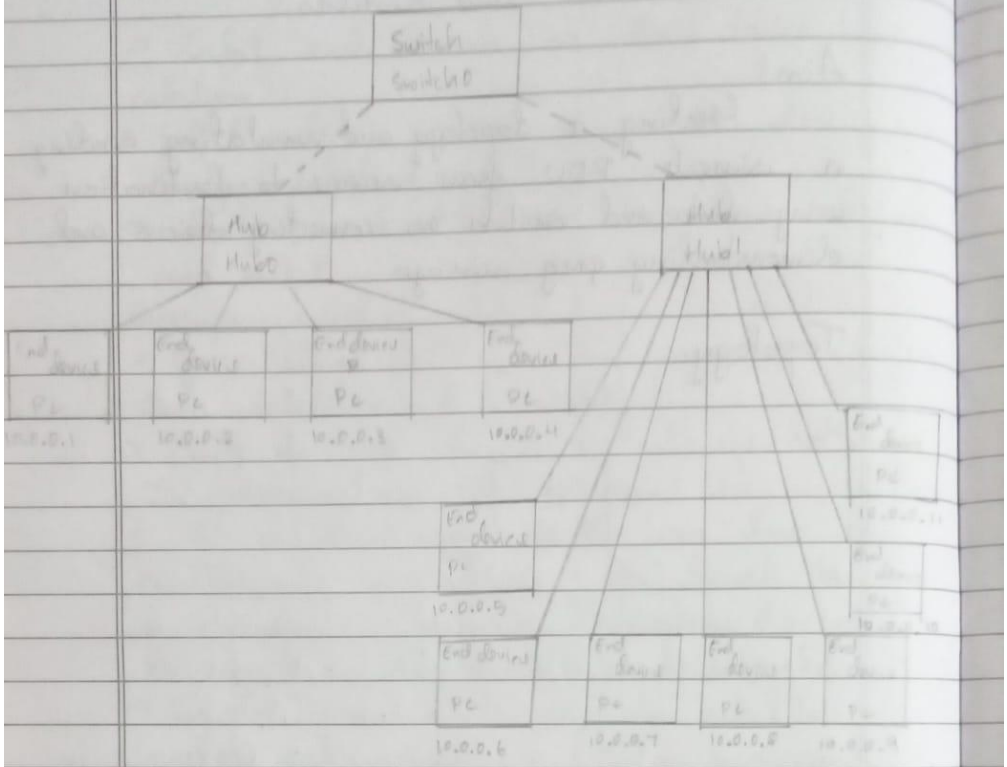
EXPERIMENT-1

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:



Switch hub



Procedure:

Hub:

① To a hub, connect 3 end devices through a copper straight-through cable.
② Assign IP addresses to all the end devices.
③ Using real-time mode, open 'command prompt'. Ping a n an end device and observe the output.
④ Using simulation mode, send a simple PDU from one end device to another and observe the output.

SURYA Gold
Date Page

Switch:

① To a switch, connect 3 end devices through a copper-straight through cable.
② Assign IP addresses to all the end devices.
③ Using real time mode, open 'command prompt'. Ping an end device and observe the output.
④ Using simulation mode, send a simple PDU from one end device to another and observe output.

Switch-hub:

① To a hub, connect 4 end devices using a copper-straight through cable.
② To another hub, customize it to have an extra port. Connect 7 end devices to the hub using copper-straight through cable.
③ Connect the two hubs to a switch using copper-crossover cable.
④ Using real-time mode, open 'command prompt' and ping an end device. Observe the output.
⑤ Using simulation mode, send a simple PDU from one end device to another and observe output.

Result:

Hub:

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, Recieved=4, Lost=0 (0% Loss),
Approximate round trip times in milli-seconds:
Minimum=0ms, Maximum=1ms, Average=0ms

Switch:

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=1ms TTL=128
Reply from 10.0.0.2: bytes=32 time=0ms TTL=128
Reply from 10.0.0.2: bytes=32 time=5ms TTL=128

Ping statistics for 10.0.0.2:
Packets: Sent=4, Recieved=4, Lost=0 (0% Loss)

Approximate round trip times in milli-seconds:
Minimum=0ms, Maximum=5ms, Average=1ms.

Switch-hub:

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=0ms 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

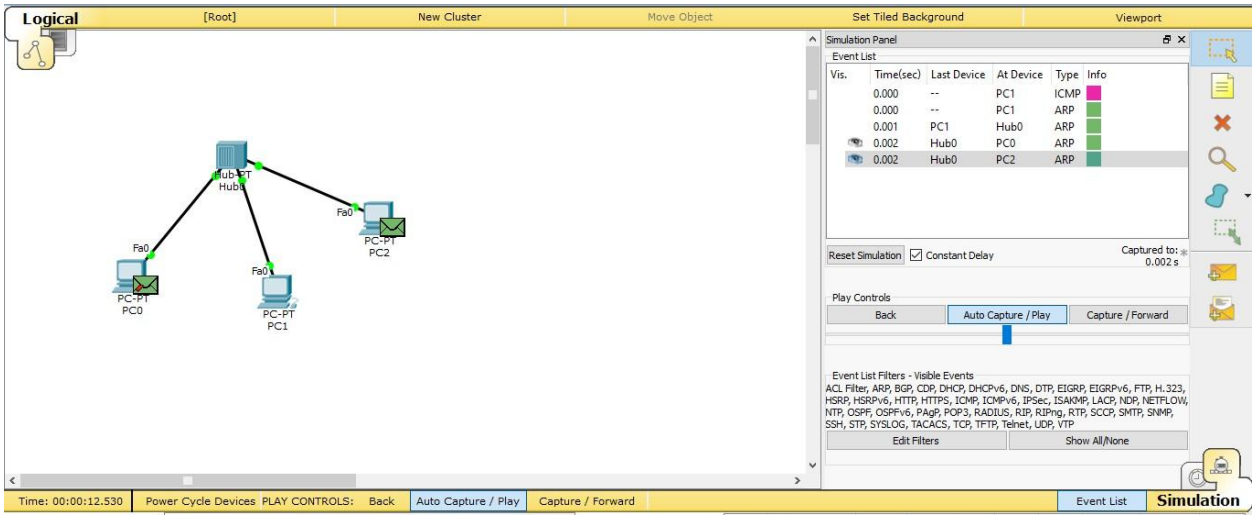
Ping statistics from 10.0.0.6:
Packets: Sent=4, Received=4, Lost=0 (0% loss)
Approximate round trip times in milli-seconds:
Minimum=0ms, Maximum=1ms, Average=0ms

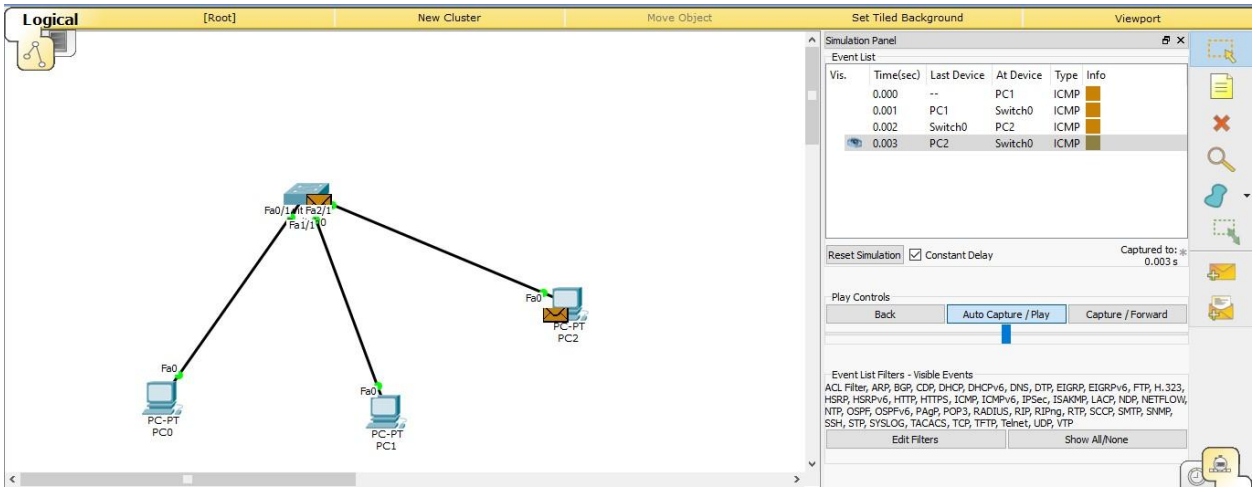
Observation:

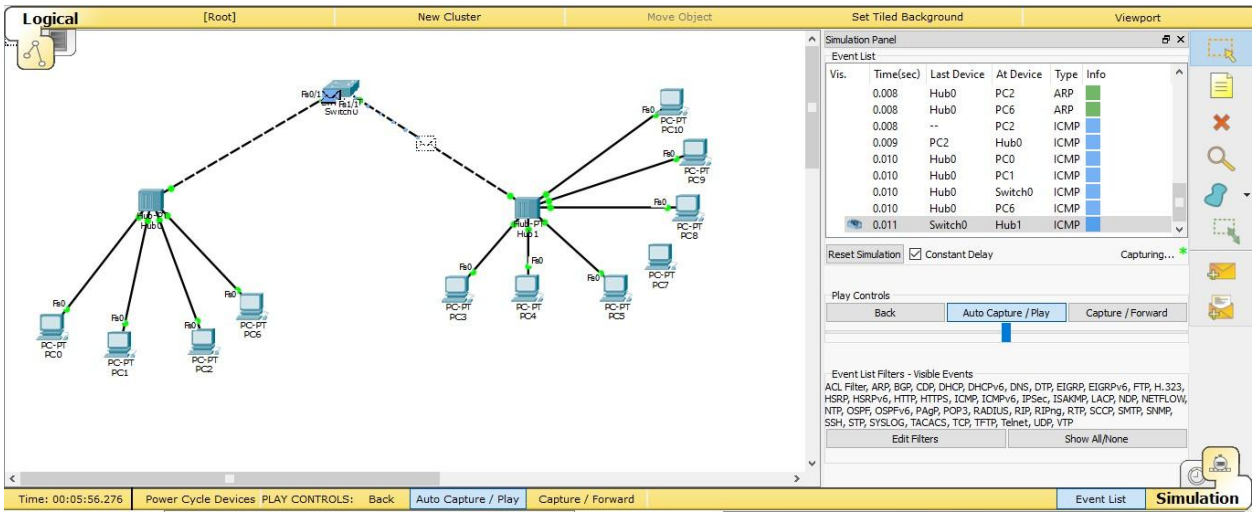
Hub:
Networking device which is used to transmit the signal to each port to respond from which the signal was received. It transmits signal to every port except the port from which the signal is received.

Switch:
Switch is an intelligent device which sends message to selected destination device only. First it examine the destination address and send the message to corresponding devices.

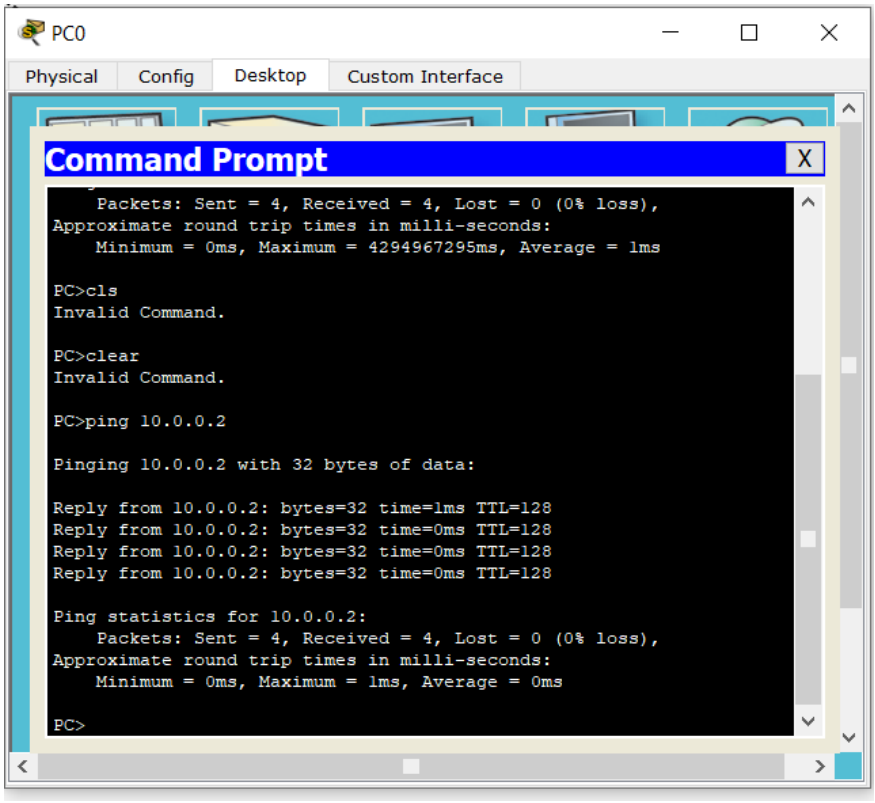
Topology:

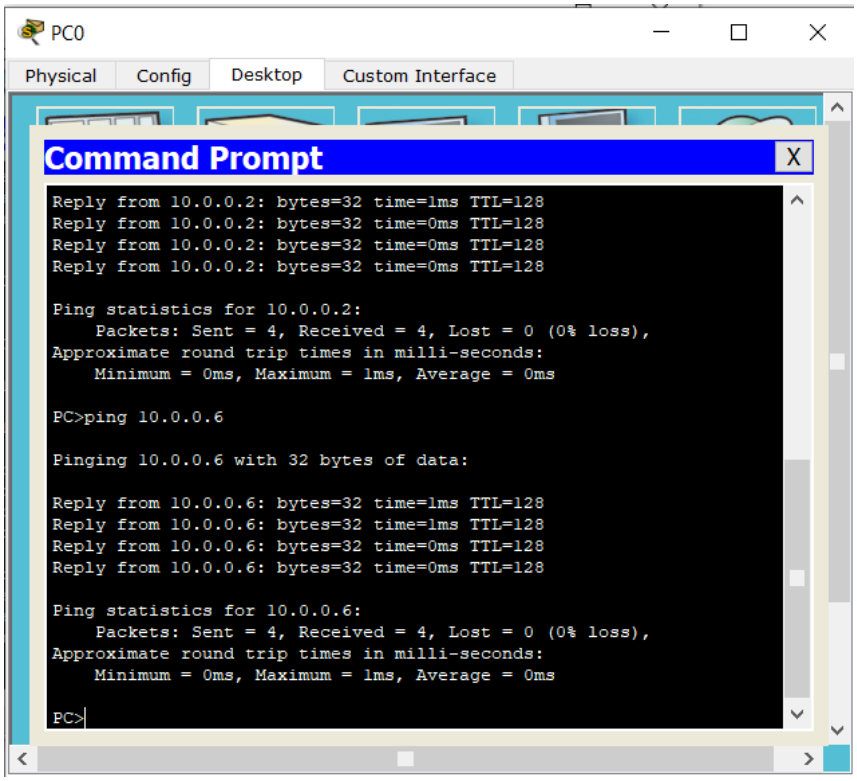

Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Hub-PT
Hub0
Fa0
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type Info
0.000 -- PC1 ICMP
0.000 -- PC1 ARP
0.001 PC1 Hub0 ARP
0.002 Hub0 PC0 ARP
0.002 Hub0 PC2 ARP
Reset Simulation
Constant 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
Fa0
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
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
Hub-PT
Hub0
Hub-PT
Hub1
Fa0
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
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>