CYCLE - 1

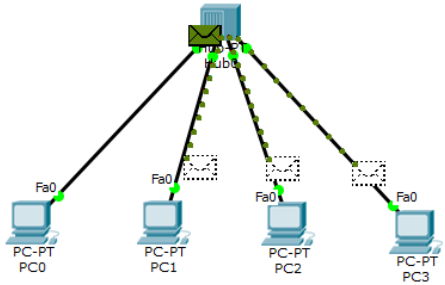
Experiment - 1

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

hub

File Edit Options View Tools Extensions Help

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	--	PC0	ICMP	
	0.001	PC0	Hub0	ICMP	
	0.002	Hub0	PC1	ICMP	
	0.002	Hub0	PC2	ICMP	
	0.002	Hub0	PC3	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

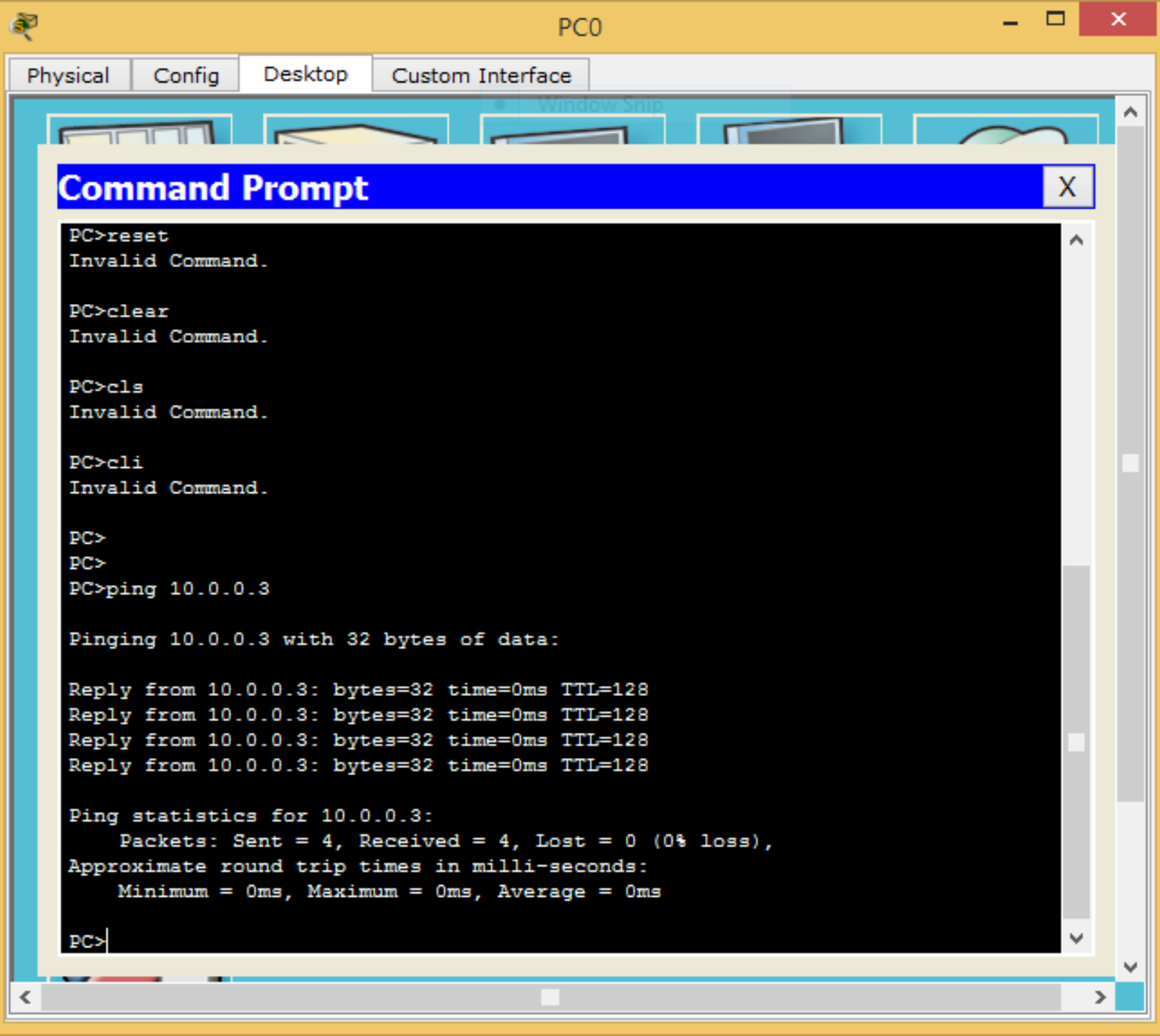
Time: 00:43:46.766 | Power Cycle Devices | PLAY CONTROLS: Back | Auto Capture / Play | Capture / Forward | Event List | Simulation

Connections

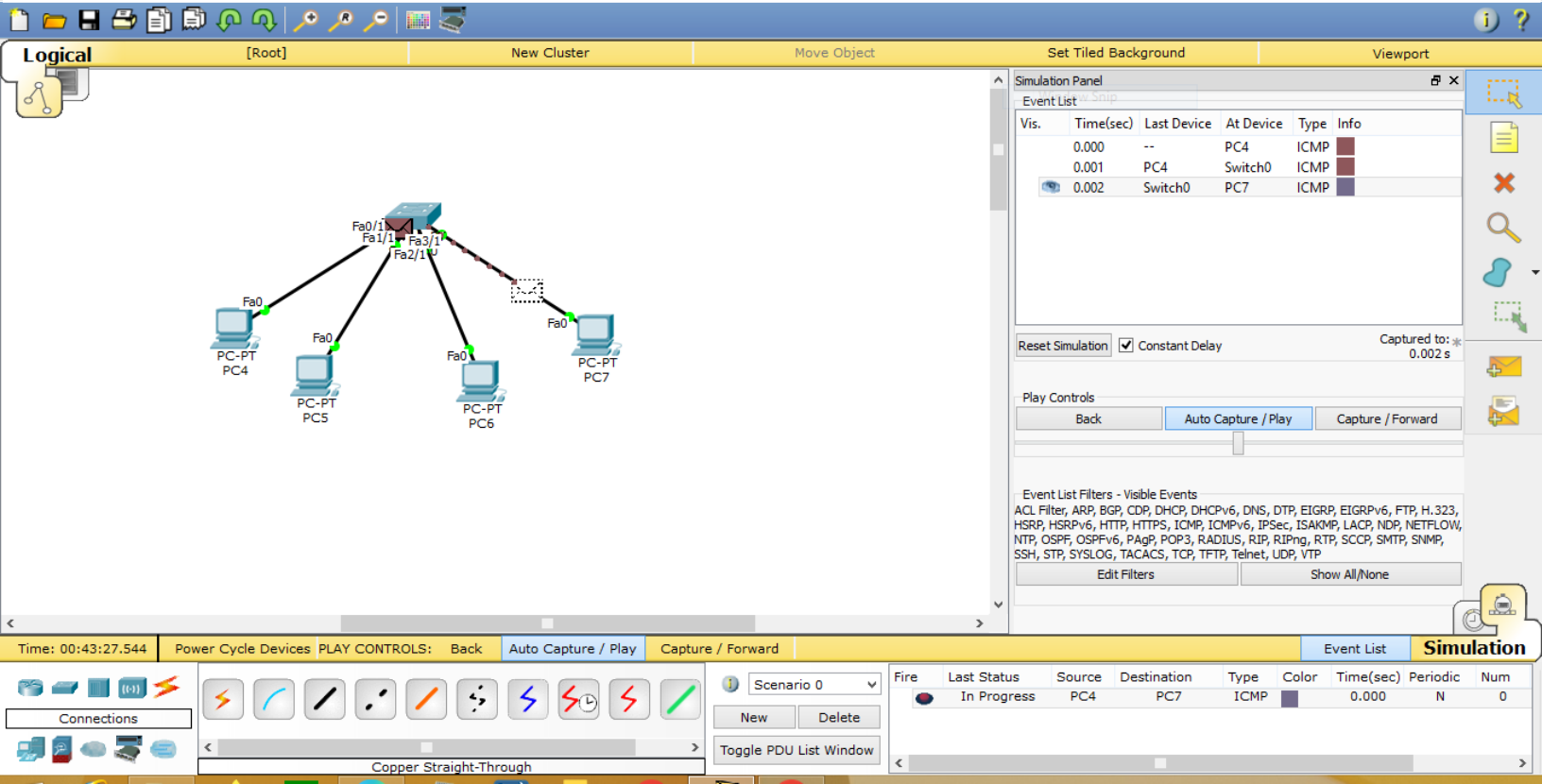
Copper Straight-Through

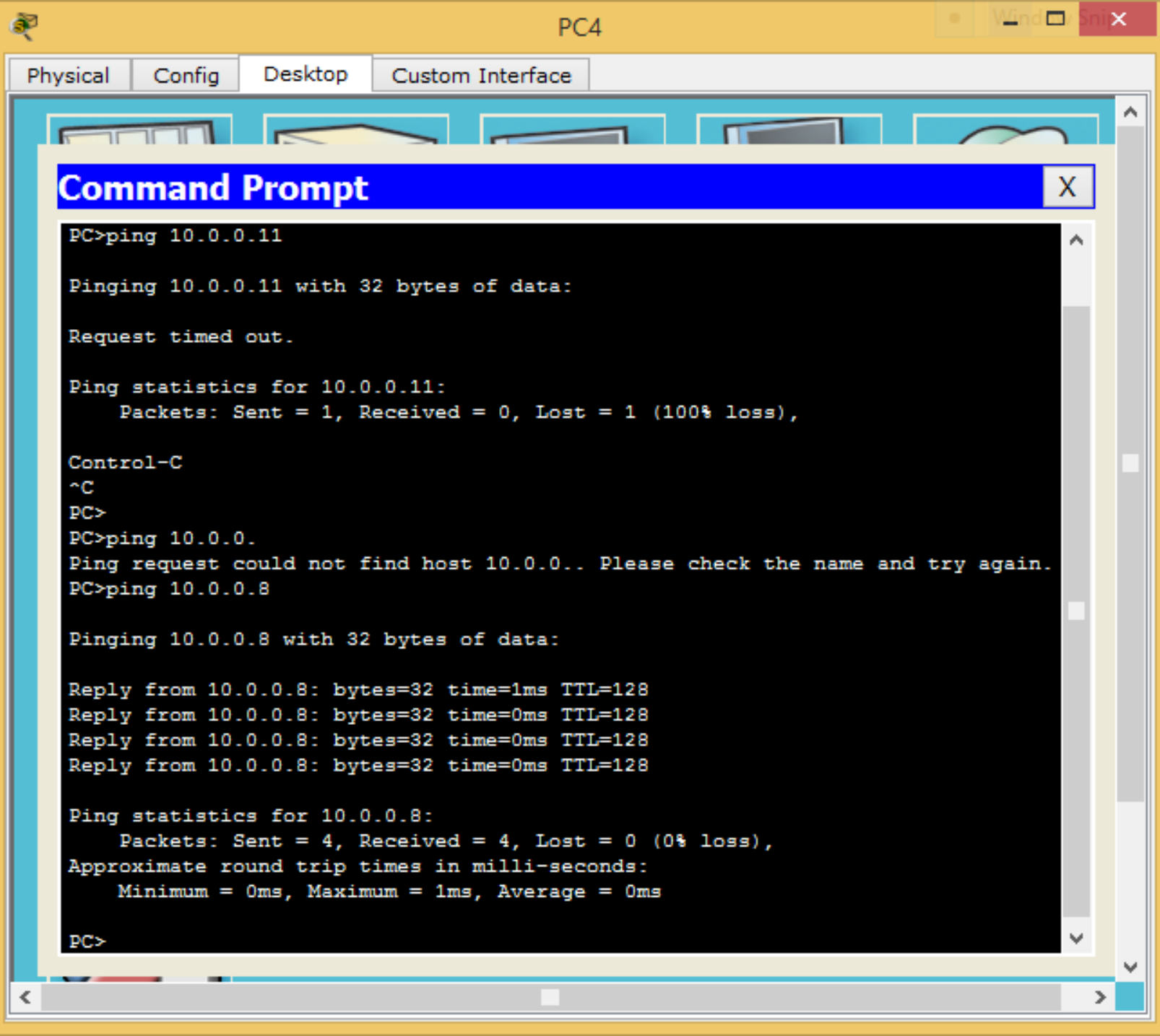
Scenario 0 | New | Delete | Toggle PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num
	In Progress	PC0	PC2	ICMP		0.000	N	0

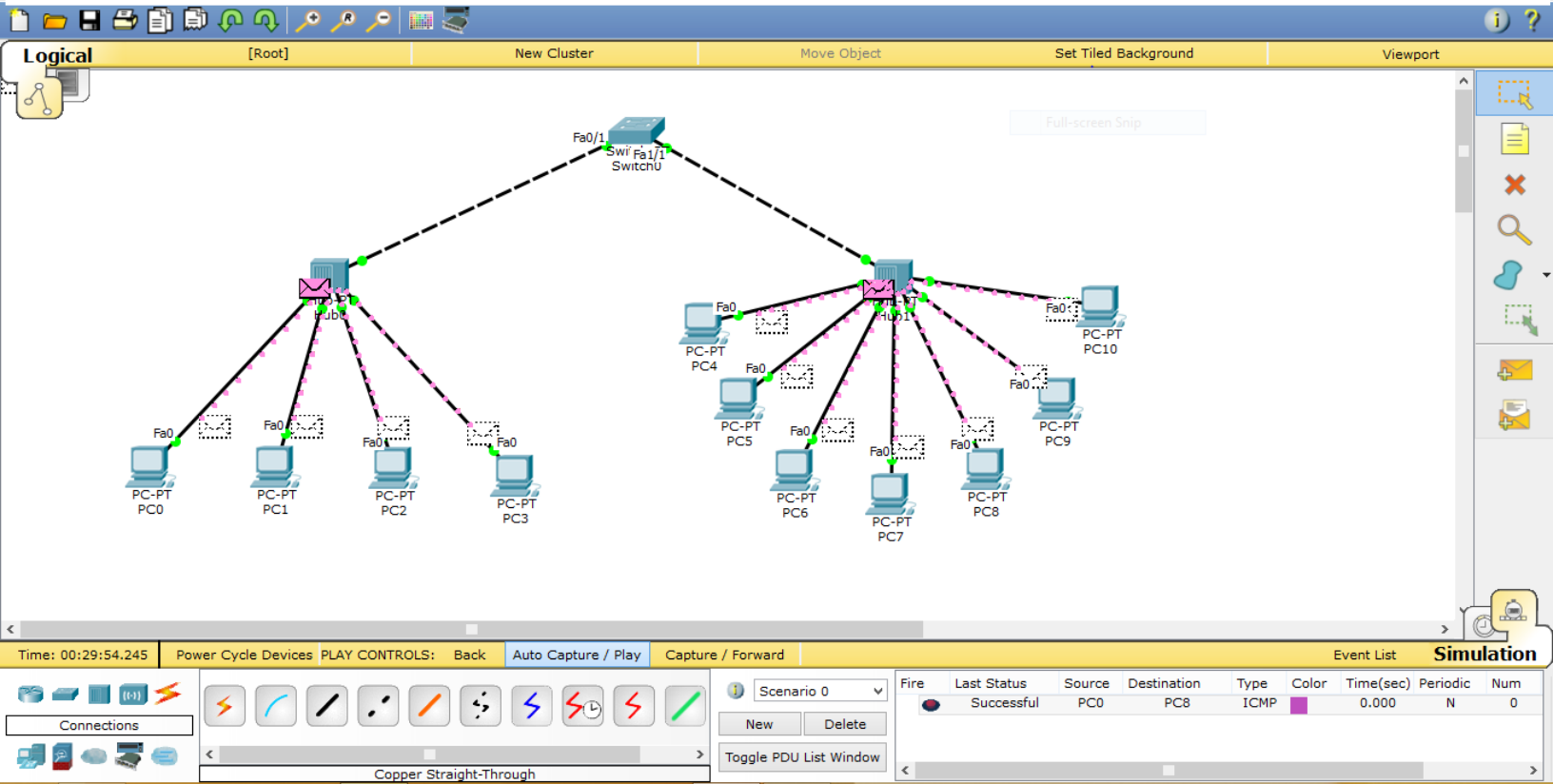

PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
X
PC>reset
Invalid Command.
PC>clear
Invalid Command.
PC>cls
Invalid Command.
PC>cli
Invalid Command.
PC>
PC>
PC>ping 10.0.0.3
Pinging 10.0.0.3 with 32 bytes of data:
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
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 times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
PC>

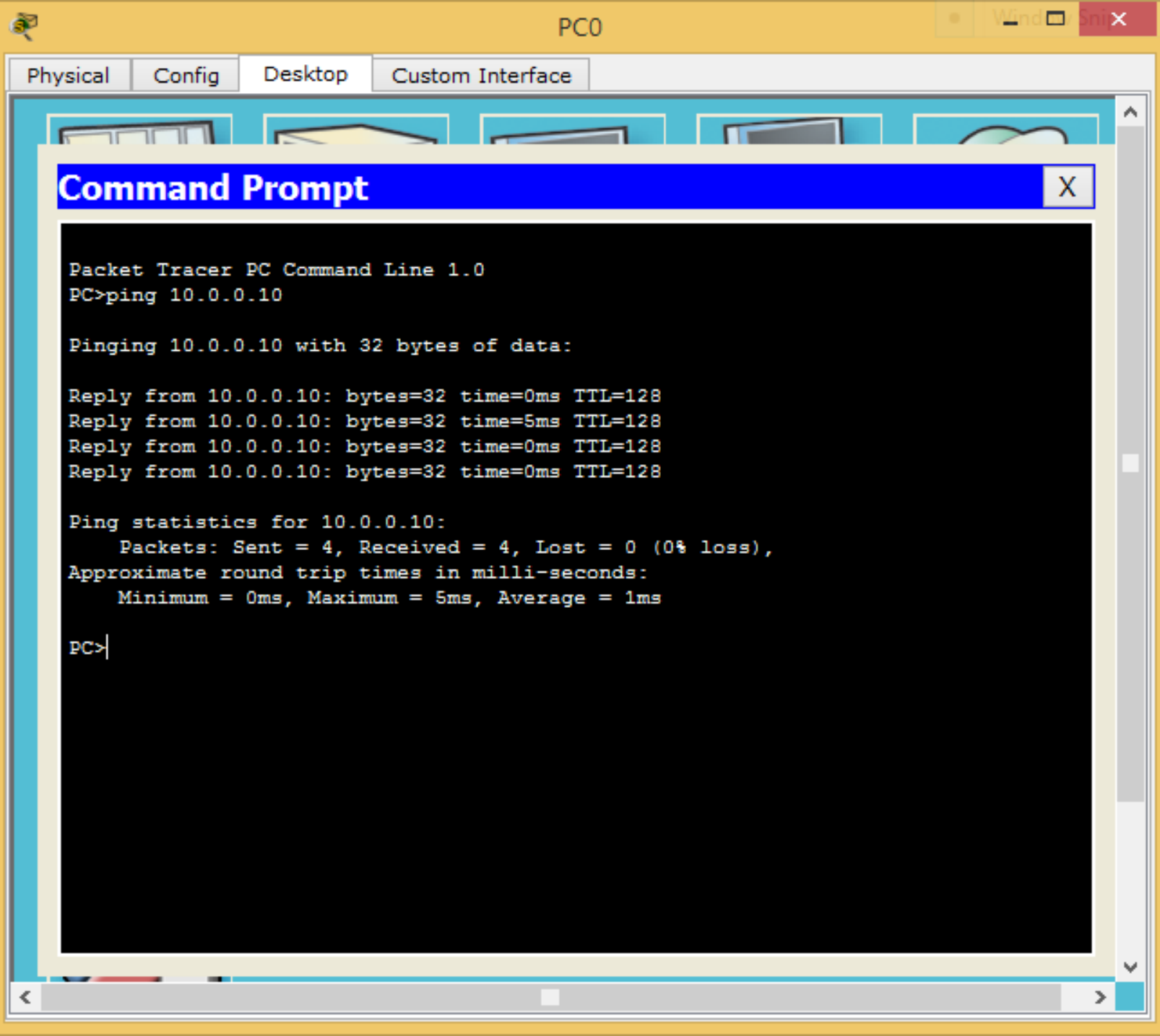
switch:


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Fa0/1
Fa1/1
Fa3/1
Fa2/1
Fa0
PC-PT
PC4
Fa0
PC-PT
PC5
Fa0
PC-PT
PC6
Fa0
PC-PT
PC7
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
At Device
Type
Info
0.000
--
PC4
ICMP
0.001
PC4
Switch0
ICMP
0.002
Switch0
PC7
ICMP
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: 00:43:27.544
Power Cycle Devices
PLAY CONTROLS:
Back
Auto Capture / Play
Capture / Forward
Event List
Simulation
Connections
Copper Straight-Through
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
In Progress
PC4
PC7
ICMP
0.000
N
0


PC4
Physical
Config
Desktop
Custom Interface
Command Prompt
X
PC>ping 10.0.0.11
Pinging 10.0.0.11 with 32 bytes of data:
Request timed out.
Ping statistics for 10.0.0.11:
Packets: Sent = 1, Received = 0, Lost = 1 (100% loss),
Control-C
^C
PC>
PC>ping 10.0.0.
Ping request could not find host 10.0.0.. Please check the name and try again.
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=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
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 = 1ms, Average = 0ms
PC>

Hybrid:


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Fa0/1
Fa1/1
SwitchU
Fa0
PC-PT
PC0
PC1
PC2
PC3
PC4
PC5
PC6
PC7
PC8
PC9
PC10
Time: 00:29:54.245
Power Cycle Devices
PLAY CONTROLS:
Back
Auto Capture / Play
Capture / Forward
Event List
Simulation
Connections
Copper Straight-Through
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Successful
PC0
PC8
ICMP
0.000
N
0
ENG
04:38
15-06-2023


PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.10
Pinging 10.0.0.10 with 32 bytes of data:
Reply from 10.0.0.10: bytes=32 time=0ms TTL=128
Reply from 10.0.0.10: bytes=32 time=5ms TTL=128
Reply from 10.0.0.10: bytes=32 time=0ms TTL=128
Reply from 10.0.0.10: bytes=32 time=0ms TTL=128
Ping statistics for 10.0.0.10:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 5ms, Average = 1ms
PC>

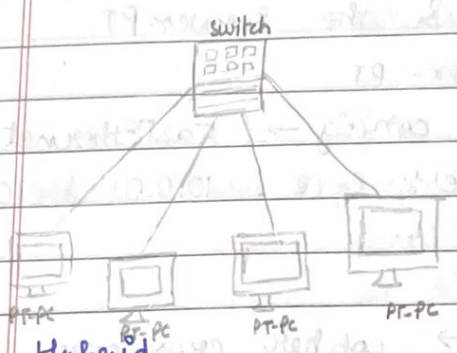
15-6-2023

EXPERIMENT - 2

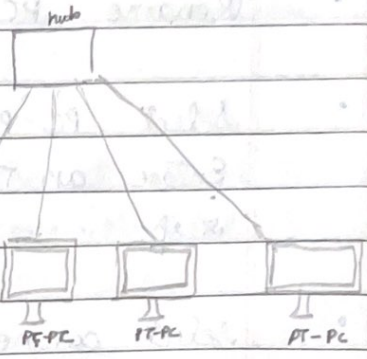
Aim: Create a topology and simulate sending a simple PDU from source to destination using hub and switch as connecting devices and demonstrate ping message.

Topology:

switch:



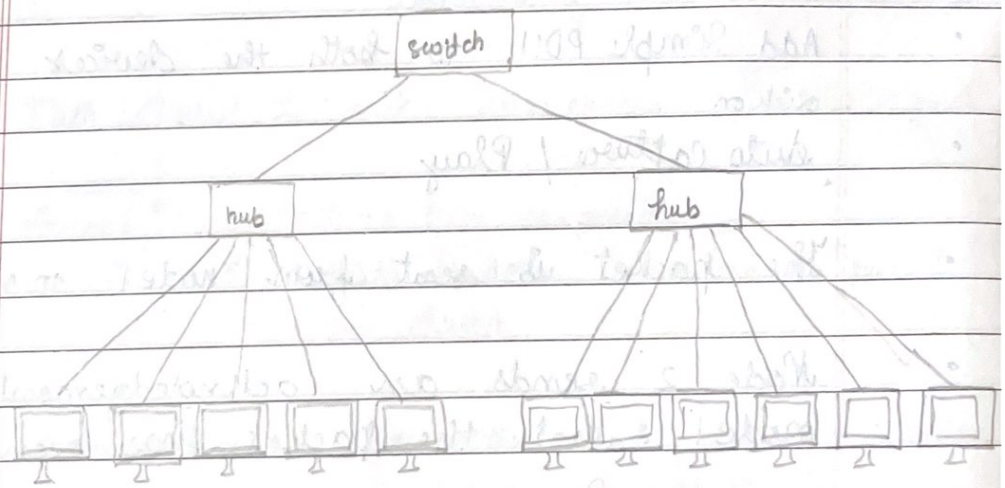
hub:



Hybrid:

?

?



?

Procedure for hub:

- Select a hub from the bottom toolbar.
- select 3 generic PC-PT and insert them into the logical interface
- Add IP Address for each of them.
- Connections, copper straight-through is used to connect the hub and the generic PC-PT.
- Simple PDU's are added to the source and to the destination.
- And the simulation is started.
- Finally an acknoledgement is recived by the

for Realtime

PC > ping 10.0.0.3

Pinging 10.0.0.3 with 32 bytes of data:

Reply from 10.0.0.3: bytes = 32 time = 0ms TTL=12
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 milli-seconds:
Minimum = 0ms, Maximum=0ms, Average = 0ms

PC>.

Procedure for switch.

- Consider a generic switch.
- Place upto 10 generic PT-PC's on the logical interface.
- Add an IP address for each of them.
- connect the PT-PC's to the switch. using copper straight-through.
- Simple PDU's are added the source and to the destination devices
- And simulation is started
- It initially broadcasts, after it identifies which node it must send the information so its unicasted
- Finally an acknolodgement is ~~send~~ recived by the node.

realtime :-

PC> ping 10.0.0.11
Pinging 10.0.0.11 with 32 bytes of data:

Request timed out.
Ping statistics for 10.0.0.11:
Packets : Send = 1, Received = 0, host = 1 (100% loss)

Control - C
^C
PC>
PC> ping 10.0.0.8

Bafna Gold
Date: Page:

Pinging 10.0.0.8 with 32 byter of data:

Reply from 10.0.0.8 : byter = 32 time = 1ms TTL=128
Reply from 10.0.0.8 : byter = 32 time = 0 ms TTL=128
Reply from 10.0.0.8 : byter = 32 time = 0 ms TTL=128
Reply from 10.0.0.8 : byter = 32 time = 0 ms TTL=128

Ping statistics for 10.0.0.8 :.
Packets : Sent = 4, recieved = 4, lost = 0 (0% loss).
Approximate round trip times in milli-seconds:
Minimum = 0 ms, Maximum = 1ms, Average = 0ms

⇒ Procedure for switch and hubs:-

- consider two hubs.
- Place PT-PC's on to the logical interface.
- Add an IP address for each of them.
- connect the PT-PC's to the hubs using copper straight through.
- Then these two hubs will be connected to a switch.
- Simple PDU's are added to the source and to the destination devices.
- Simulation is started
- Finally the acknoledgement is recived by the node 1.

real time :-

Packet Tracer PC command line 1.0
PC > ping 10.0.0.10
Pinging 10.0.0.10 with 32 bytes of data :

Replying from 10.0.0.10: bytes=32 time=0ms TTL=
Reply from 10.0.0.10 bytes= 32 time= 5ms TTL=
Reply from 10.0.0.10: bytes= 32 time= 0ms TTL=
Reply from 10.0.0.10: bytes = 32 times= 0ms TTL=

Ping statistics for 10.0.0.10:
Packets: Sent= 4, Recieved = 4, host= 0 (0
Approximate round trip times in milli-second
Minimum = 0ms, Maximum = 5ms, Average = 1

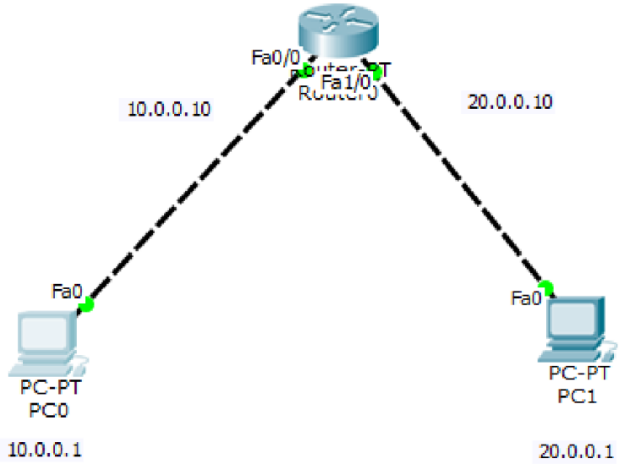
9/10

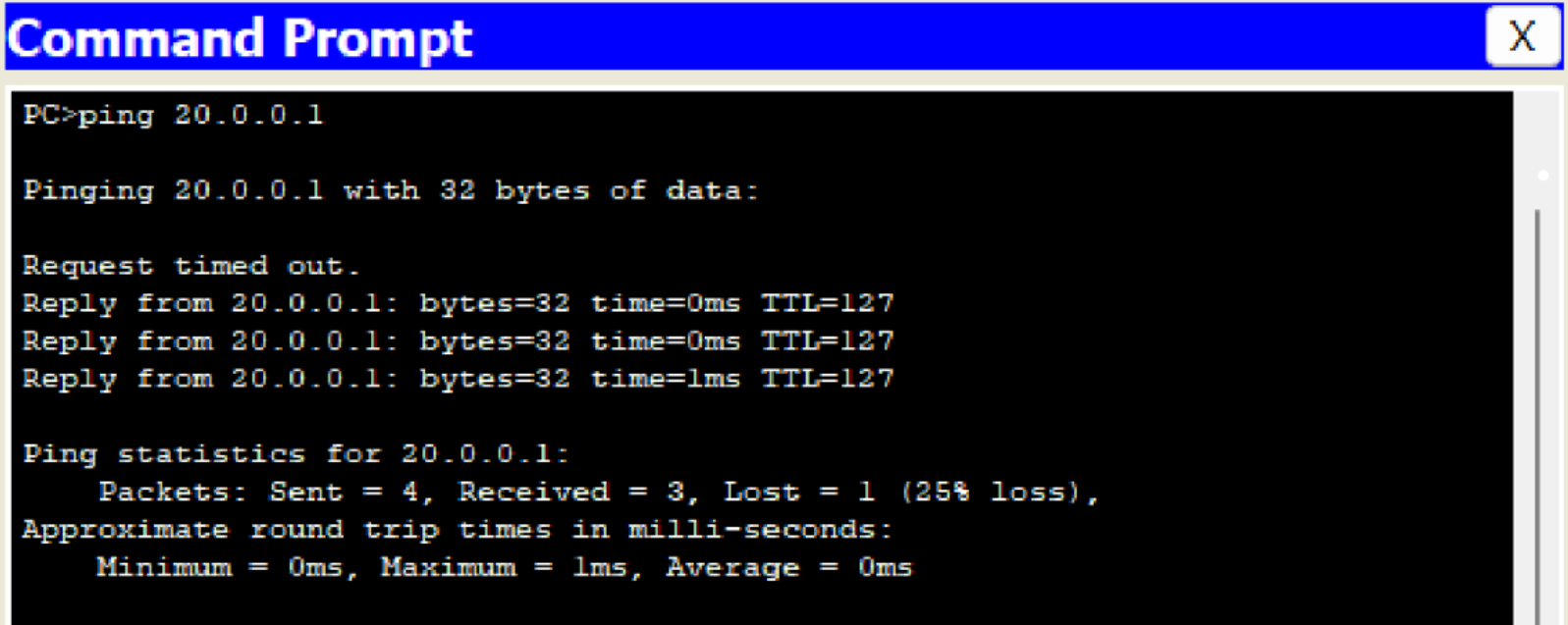
PC>

N
22/6/23

Experiment - 2

Aim:
Configure IP address to routers in packet tracer. Explore the following messages: ping responses, destination unreachable, request timed out, reply

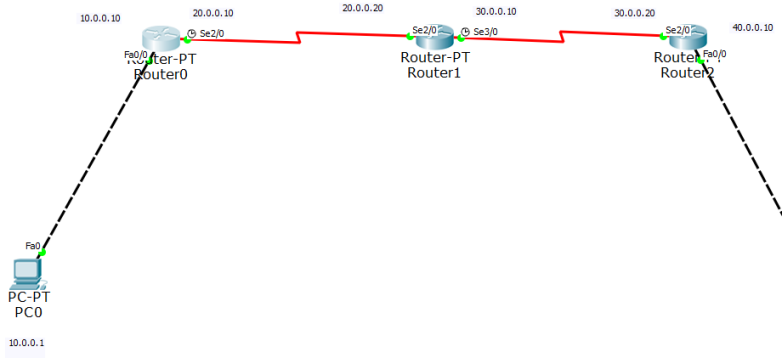

Fa0/0
Fa1/0
10.0.0.10
20.0.0.10
Fa0
Fa0
PC-PT
PC0
PC-PT
PC1
10.0.0.1
20.0.0.1


Command Prompt
X
PC>ping 20.0.0.1
Pinging 20.0.0.1 with 32 bytes of data:
Request timed out.
Reply from 20.0.0.1: bytes=32 time=0ms TTL=127
Reply from 20.0.0.1: bytes=32 time=0ms TTL=127
Reply from 20.0.0.1: bytes=32 time=1ms TTL=127
Ping statistics for 20.0.0.1:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to up
exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    10.0.0.0/8 is directly connected, FastEthernet0/0
C    20.0.0.0/8 is directly connected, FastEthernet1/0
Router#
```

File Edit Options View Tools Extensions Help

Logical | [Root] | New Cluster | Move Object | Set Tiled Background | Viewport



Time: 00:28:37 | Power Cycle Devices | Fast Forward Time | Realtime

Connections

Automatically Choose Connection Type

Scenario 0 | New | Delete | Toggle PDU List Window

Fire | Last Statu | Sourc | Destinatic | Type | Colo | Time(s | Period | Num | Edit | Delete

Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ping 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data:

Reply from 10.0.0.10: Destination host unreachable.
Reply from 10.0.0.10: Destination host unreachable.
Reply from 10.0.0.10: Destination host unreachable.
Reply from 10.0.0.10: Destination host unreachable.

Ping statistics for 40.0.0.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

```
Router(config)#ip route 10.0.0.0 255.0.0.0 20.0.0.10
Router(config)#ip route 40.0.0.0 255.0.0.0 30.0.0.20
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

S    10.0.0.0/8 [1/0] via 20.0.0.10
C    20.0.0.0/8 is directly connected, Serial2/0
C    30.0.0.0/8 is directly connected, Serial3/0
S    40.0.0.0/8 [1/0] via 30.0.0.20
Router#
```

```
Router(config)#ip route 20.0.0.0 255.0.0.0 30.0.0.10
Router(config)#ip route 10.0.0.0 255.0.0.0 30.0.0.10
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

S    10.0.0.0/8 [1/0] via 30.0.0.10
S    20.0.0.0/8 [1/0] via 30.0.0.10
C    30.0.0.0/8 is directly connected, Serial2/0
C    40.0.0.0/8 is directly connected, FastEthernet0/0
Router#
```

```
Router(config)#ip route 30.0.0.0 255.0.0.0 20.0.0.20
Router(config)#ip route 40.0.0.0 255.0.0.0 20.0.0.20
Router(config)#show ip route
                ^
% Invalid input detected at '^' marker.

Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    10.0.0.0/8 is directly connected, FastEthernet0/0
C    20.0.0.0/8 is directly connected, Serial2/0
S    30.0.0.0/8 [1/0] via 20.0.0.20
S    40.0.0.0/8 [1/0] via 20.0.0.20
Router#
```

```
PC>ping 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data:

Reply from 40.0.0.1: bytes=32 time=16ms TTL=125
Reply from 40.0.0.1: bytes=32 time=2ms TTL=125
Reply from 40.0.0.1: bytes=32 time=12ms TTL=125
Reply from 40.0.0.1: bytes=32 time=23ms TTL=125

Ping statistics for 40.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 23ms, Average = 13ms
```

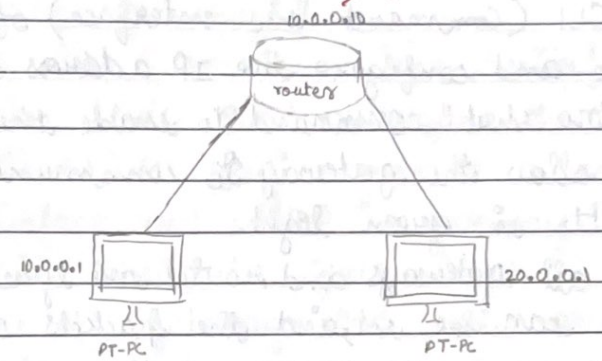
Bafna Gold
Year: 22-~~June~~-23

EXPERIMENT-3

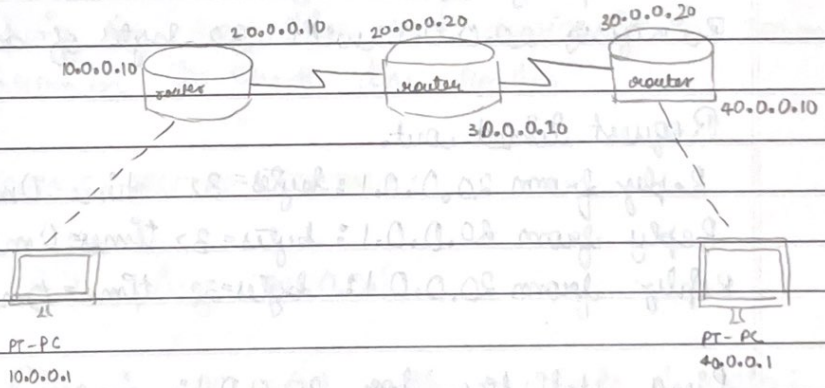
AIM: ~~Configure default route, Static route To the Router.~~ To create a network with multiple routers and two pieces.

Topology

single router



multiple routers.



Procedure for single router

22-06-23

- Place 2 PC-PT & 1 router-PT onto the logical interface.
- Connect them with appropriate cable. Use copper crossover to connect PC-PT to router
- Type the IP address & Gateway to the devices in config.
- In CLI (Command line interface) of each device and configure the IP address as well as "no shut" command to enable the interface and allow the gateway to communicate which results in green light.
- Once all gateways and routes are green, the route can be set, and the packets can be from one PC-PT to another.

OUTPUT:

```
PC> ping 20.0.0.1
Pinging 20.0.0.1 with 32 bytes of data:

Request timed out.
Reply from 20.0.0.1: bytes=32 time=0ms TTL=127
Reply from 20.0.0.1: bytes=32 time=0ms TTL=127
Reply from 20.0.0.1: bytes=32 time=0ms TTL=127

Ping statistics for 20.0.0.1:
    Packets: Sent=4, Recvie=3, Lost=1 (25% loss)
Approximate round trip times in milli-seconds:
    Minimum=0ms, Maximum=0ms, Average=0ms
```

Bafna Gold
Date: 22-06-23 Page:

Procedure for multiple routers

1. Place 2 PC-PT and 3 router-PT's onto the logical interface
   - Connect them with appropriate cable. Use copper Crossover to connect PC-PT to routers and the serial DCE to connect the routers.
   - Type the IP address & Gateway to all the devices in config.
   - In CLI (command line interface) of each device and configure the IP address as well as "no shut" command to enable the interface and allow the gateway to communicate which results in green light.
   - Once all Gateways and router are green, the route can be set in each route to configure the unknown network ID's which will help in routing the packets. This can be easily monitored or checked using the "show ip route" command.
   - Ping the respective end device in the command prompt to check the routes.

OUTPUT BEFORE ROUTING:

PC> ping 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data:

Reply from 10.0.0.10: Destination host unreachable.
Reply from 10.0.0.10: Destination host unreachable.
Reply from 10.0.0.10: Destination host unreachable.
Reply from 10.0.0.10: Destination host unreachable.

22-06-23

Ping statistics for 40.0.0.1:
Packets: Sent 4, Recieved 0, Lost = 4 (100% loss).

AFTER ROUTING:

PC > Ping 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data:

Reply from 40.0.0.1: bytes = 32 time = 16ms TTL = 125
Reply from 40.0.0.1: bytes = 32 time = 2ms TTL = 125
Reply from 40.0.0.1: bytes = 32 time = 12ms TTL = 125
Reply from 40.0.0.1: bytes = 32 time = 23ms TTL = 125

show IP route

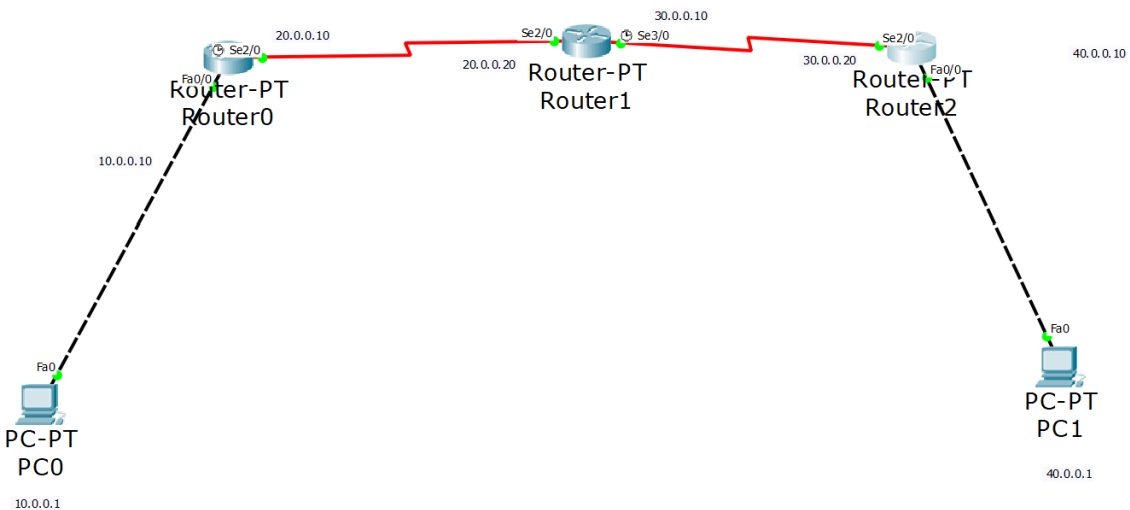
Ping statistics for 40.0.0.1
Packets: Sent = 4, Recived = 4, Lost = 0 (0% loss),
Approximate routed trip times in milli-seconds:
Minimum = 2ms, Maximum = 23ms, Average = 13ms

9/6

23/6/23

Experiment - 3

Aim: Configure default route, static route to the Router


20.0.0.10
Se2/0
Fa0/0
Router-PT
Router0
10.0.0.10
Fa0
PC-PT
PC0
10.0.0.1
Se2/0
20.0.0.20
30.0.0.10
Se3/0
Router-PT
Router1
Se2/0
30.0.0.20
Fa0/0
Router-PT
Router2
40.0.0.10
Fa0
PC-PT
PC1
40.0.0.1

Router0

Physical | Config | CLI

IOS Command Line Interface

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 10.0.0.10 255.0.0.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#ip address 20.0.0.10 255.0.0.0
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial2/0, changed state to down
Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#ip address 0.0.0.0 0.0.0.0 20.0.0.20
          ^
% Invalid input detected at '^' marker.

Router#enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#ip address 0.0.0.0 0.0.0.0 20.0.0.20
                   ^
% Invalid input detected at '^' marker.

Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#exit
```

Copy | Paste

Router1

Physical | Config | CLI

IOS Command Line Interface

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#no ip address
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#ip address 20.0.0.20 255.0.0.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#ip address 30.0.0.10 255.0.0.0
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial3/0, changed state to down
Router(config-if)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up

Router(config-if)#ip route 10.0.0.0 255.0.0.0 20.0.0.0
Router(config)#ip route 40.0.0.0 255.0.0.0 30.0.0.0
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#ip route 10.0.0.0 255.0.0.0 20.0.0.10
Router(config)#ip route 40.0.0.0 255.0.0.0 30.0.0.20
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

Copy | Paste

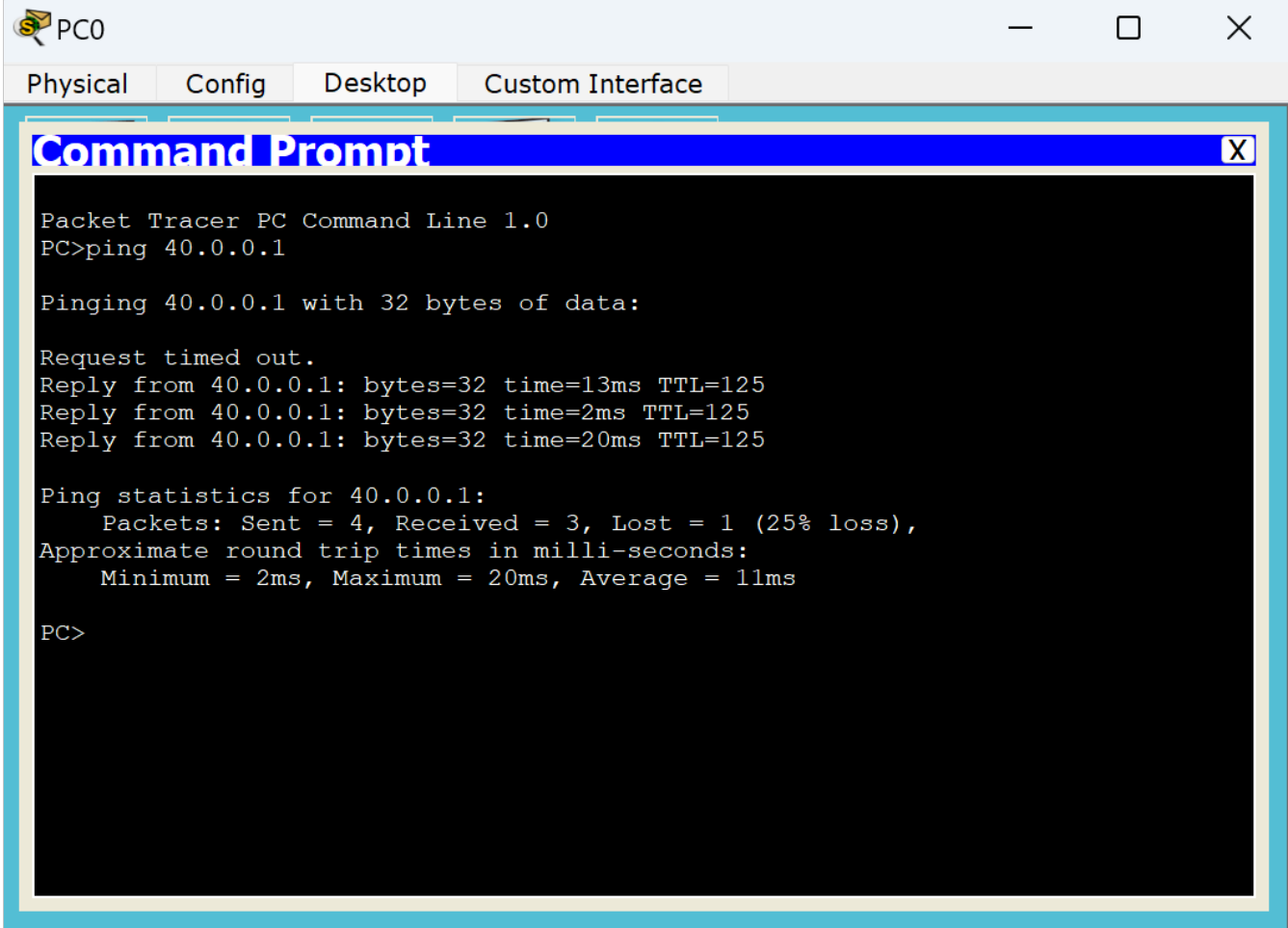
Router2

Physical | Config | CLI

IOS Command Line Interface

```
        --- System Configuration Dialog ---

Continue with configuration dialog? [yes/no]: n


Press RETURN to get started!



Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#ip address 30.0.0.20 255.0.0.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
ip address 40.0.0.10 255.0.0.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#ip route 0.0.0.0 0.0.0.0 30.0.0.10
```

Copy | Paste

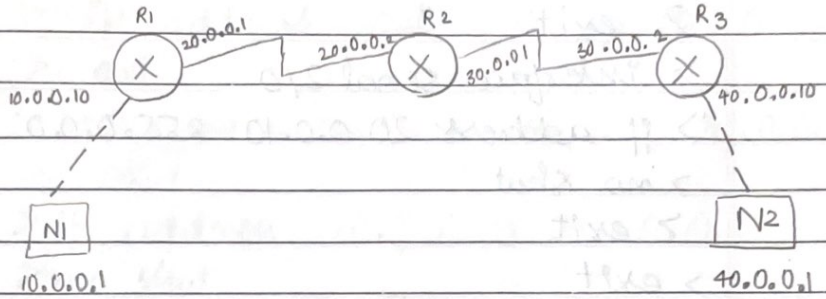

PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Packet Tracer PC Command Line 1.0
PC>ping 40.0.0.1
Pinging 40.0.0.1 with 32 bytes of data:
Request timed out.
Reply from 40.0.0.1: bytes=32 time=13ms TTL=125
Reply from 40.0.0.1: bytes=32 time=2ms TTL=125
Reply from 40.0.0.1: bytes=32 time=20ms TTL=125
Ping statistics for 40.0.0.1:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 20ms, Average = 11ms
PC>

Bafna Gold
Date: Page:

DEFAULT ROUTER.

Aim : Configure default route, static route to the Router.

Topology:
Configuration of default route



Procedure :

- Place 2 PC-PT and 3 router - PT's on the logical interface
- connect them with appropriate cable. use copper crossover to connect PC-PT to routers and the serial DCE to connect the routers
- Type the IP address & Gateway to all the devices in config.
- In CLI of each device and configure the IP address as well as " no shut " command to enable the interface and allow the gateway to communicate which results in green light.

Once all Gateways and routes are green, the route can be set in each route to config the unknown network ID's which will help in routing the packets. This can be

easily nominating or checked using the "show ip address route"

> enable
> config t
> interface fastethernet 0/0
> ip address 10.0.0.10
> no shut
> exit
> interface serial 2/0
> ip address 20.0.0.10 255.0.0.0
> no shut
> exit
> exit
> ip route 0.0.0.0 0.0.0.0 20.0.0.20

Commands for router 1

> enable
> config t
> interface serial 2/0
> ip address 20.0.0.20 255.0.0.0
> no shut
> exit
> interface serial 3/0
> ip address 30.0.0.10 255.00.0
> no shut
> exit
> exit
> ip route 10.0.0.0 255.0.0.0 20.0.0
> ip route 40.0.0.0 2550.0.0 30.0.0
> exit

Bafna Gold
Date: Page:

Commands for Router 2

> enable
> config t
> interface fastethernet 0/0
> ip address 40.0.0.10 255.0.0.0
> exit
> interface serial 2/0
> ip address 30.0.0.20 255.0.0.0
> exit
> ip route 0.0.0.0 0.0.0.0 30.0.0.10
> exit
> ip address 20.0.0.10 255.0.0.0
> no shut
> exit
~~> exit~~
~~> ip address 20.0.0.10 255.0.0.0~~
~~> no shut~~
~~> exit~~
~~> exit~~
~~> ip route 0.0.0.0~~

Output :

Ping 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data

Request timed out.
Reply from 40.0.0.1 : bytes = 32 time = 20ms TTL=125
Reply from 40.0.0.1 : bytes = 32 time = 9ms TTL=125
Reply from 40.0.0.1 bytes = 32 time = 21ms TTL=125

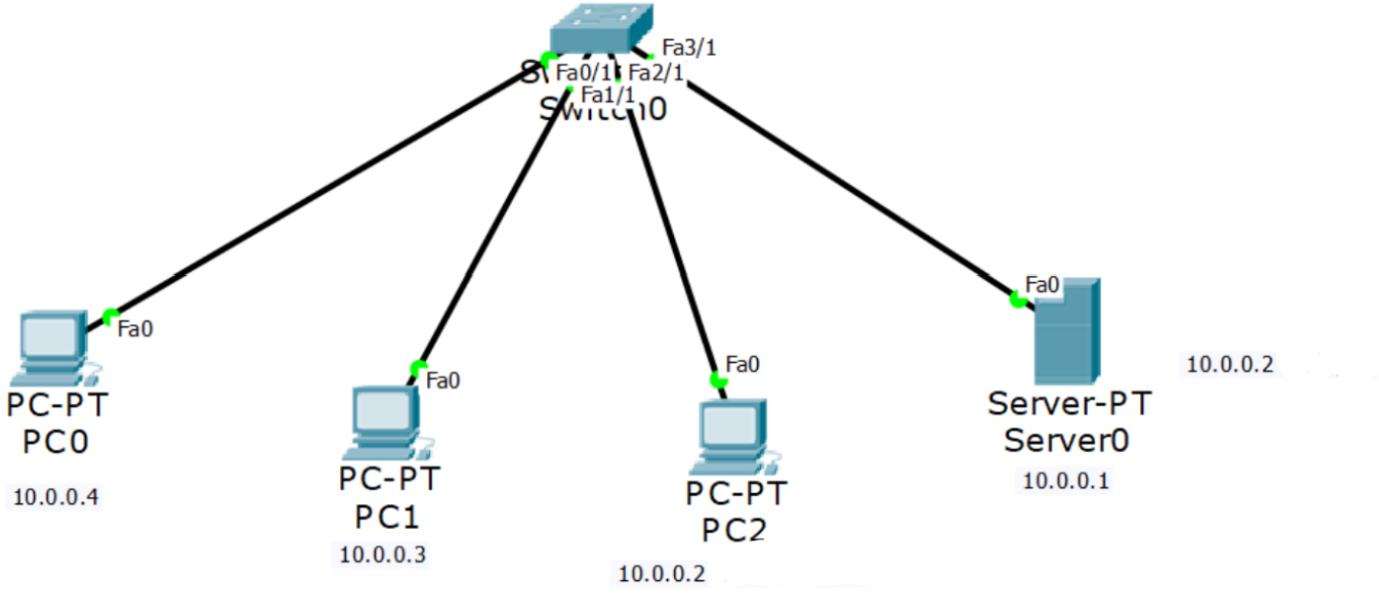
Ping statistics for 40.0.0.1:
Packets sent = 4 received = 3, lost = 1 (25% loss)
Approximate round trip times in milliseconds:
min = 9ms, max = 21 ms, Avg = 16 ms

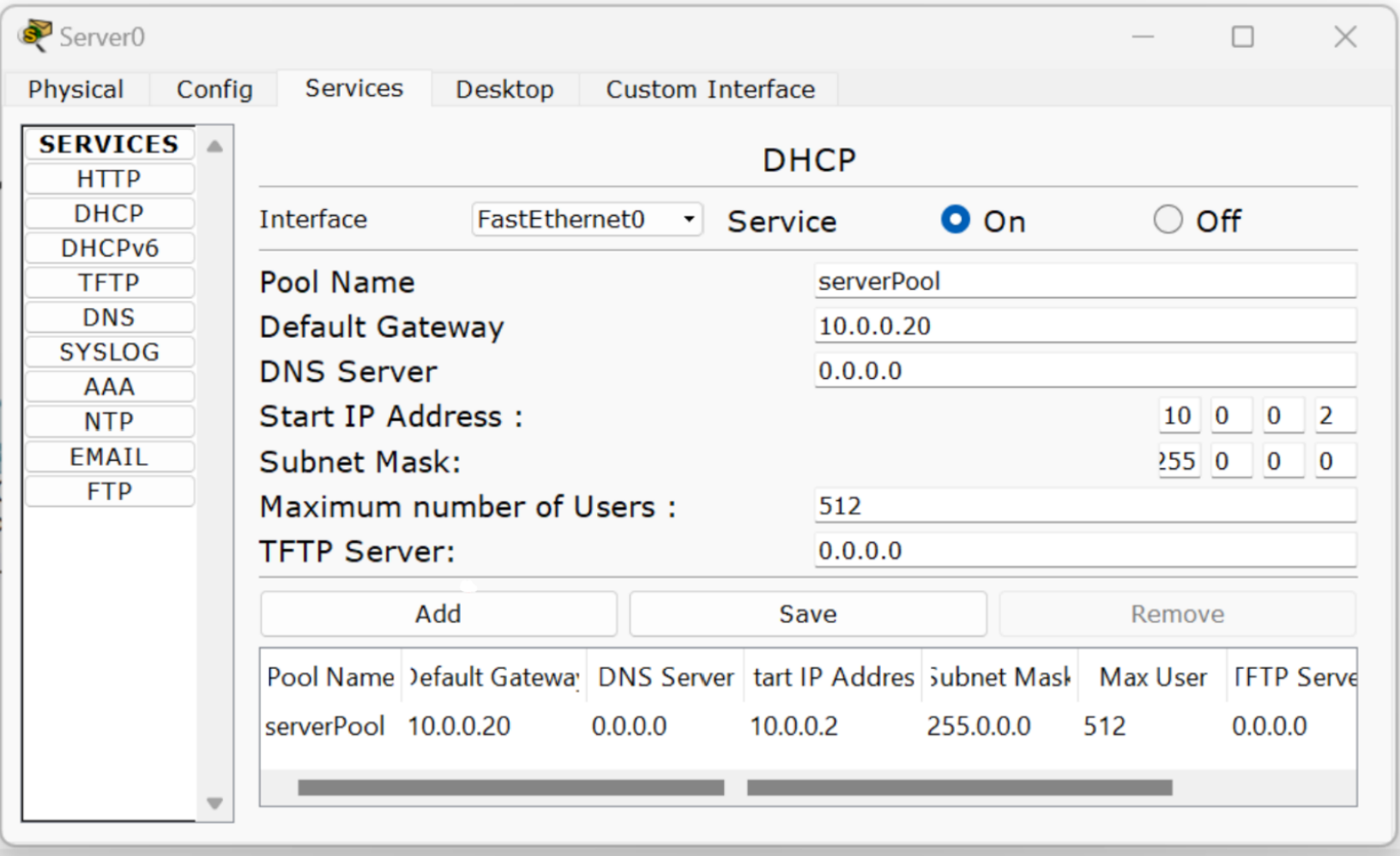
10 | 13

15 | 7 | 23

Experiment - 4

Aim: Configure DHCP within a LAN and outside LAN.


Fa3/1
Fa0/1
Fa2/1
Fa1/1
Fa0
PC-PT
PC0
10.0.0.4
Fa0
PC-PT
PC1
10.0.0.3
Fa0
PC-PT
PC2
10.0.0.2
Fa0
Server-PT
Server0
10.0.0.1
10.0.0.2


Server0
Physical
Config
Services
Desktop
Custom Interface
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
DHCP
Interface
FastEthernet0
Service
On
Off
Pool Name
serverPool
Default Gateway
10.0.0.20
DNS Server
0.0.0.0
Start IP Address :
10 0 0 2
Subnet Mask:
255 0 0 0
Maximum number of Users :
512
TFTP Server:
0.0.0.0
Add
Save
Remove
Pool Name
Default Gatewa
DNS Server
tart IP Addres
Subnet Mask
Max User
TFTP Serve
serverPool
10.0.0.20
0.0.0.0
10.0.0.2
255.0.0.0
512
0.0.0.0

PC0

Physical | Config | Desktop | Custom Interface

Command Prompt

```
Packet Tracer PC Command Line 1.0
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=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

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 10.0.0.3

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=12ms 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, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 12ms, Average = 3ms
```

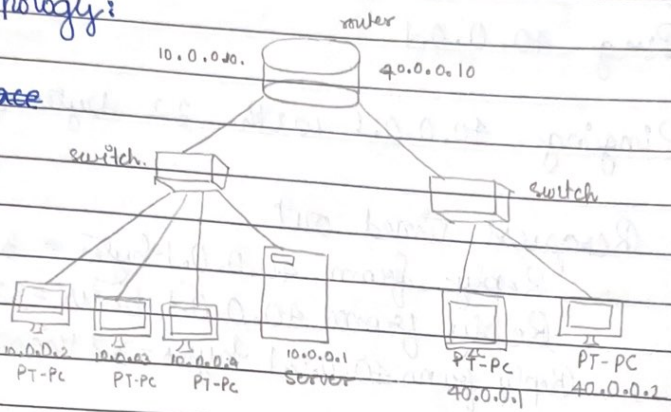
Ex -4

Bafna Gold
Date: Page:

DYNAMIC HOST CONFIGURATION PROTOCOL

Aim: To configure DHCP within a LAN and outside LAN

Topology:



Procedure:

- Place 3 PT-PC's and a server under a switch onto the logical interface.
- Place 2 PT-PC's under another switch
- Place a router and connect the switches to it.
- configure ip address for the router.
- In the server open the services tab and DHCP services, then add two server pools with respective gateways and starting ip address
- Open CLI of the router to which the server is not connected and type as mentioned below:

  > ip helper-address 10.0.0.10

- Use copper straigh through wire to connect the devices
- Configure gateways on end devices
- Ping message from PC0 to PC1

Output :

Ping 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data

Resquest timed out.
Reply from 40.0.0.1 bytes = 32 time = 20ms 125
Reply from 40.0.0.1 bytes = 32 time = 9ms 125
Reply from 40.0.0.1 bytes = 32 times = 21ms TTL=125

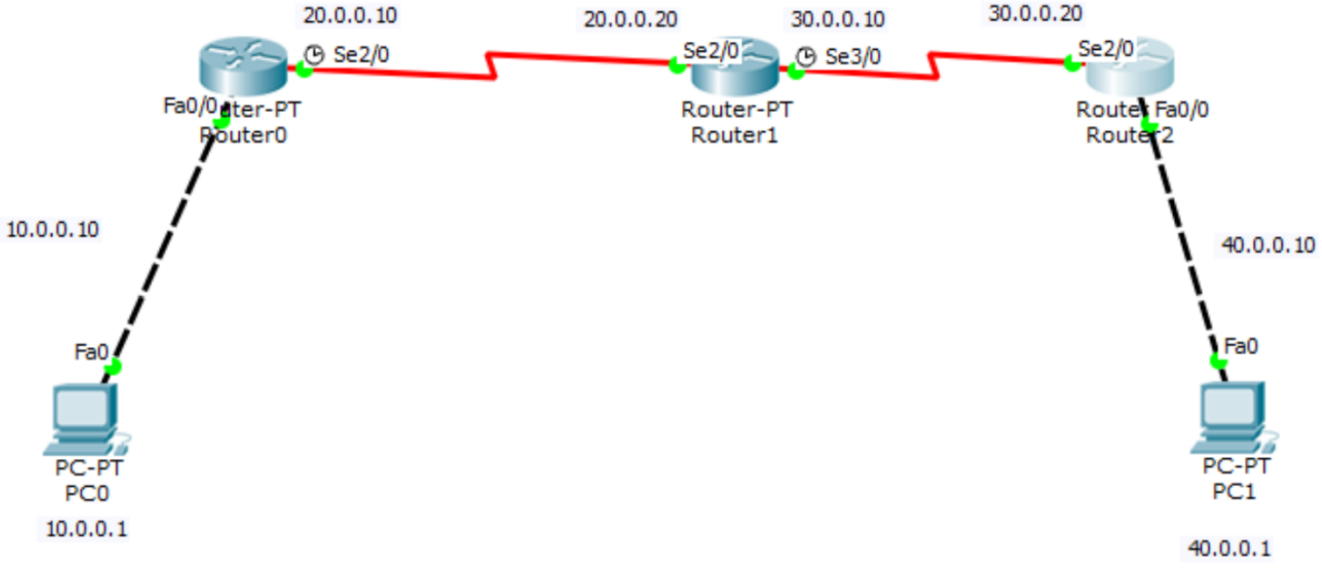
Ping statistics for 40.0.0.1:
Packets sent = 4, recieved = 3, Lost = 1 (25%)
Approx round trip Times in milliseconds
min = 9ms, Max = 21, Avg = 16ms

9/10

18/7/23

Experiment - 5

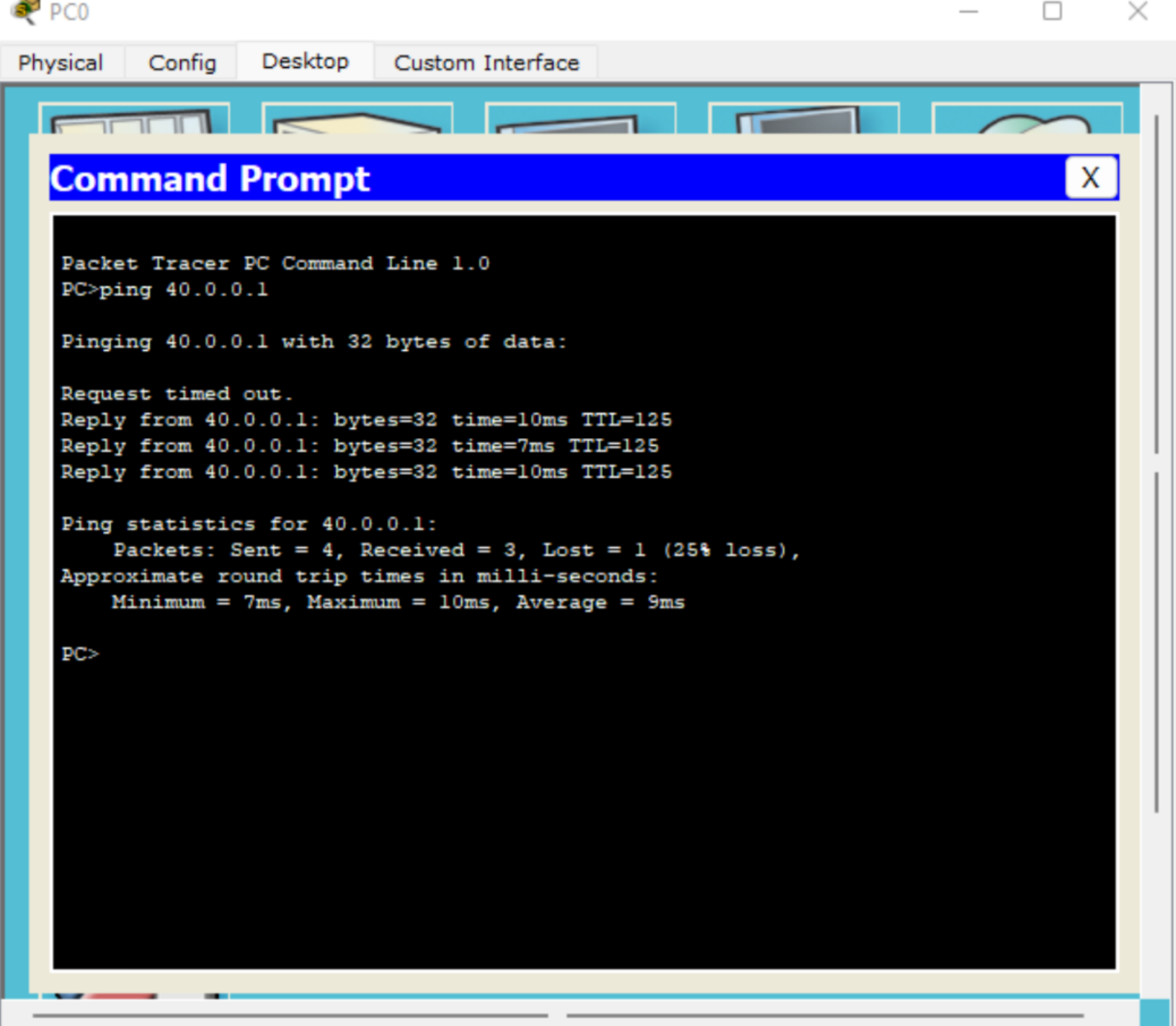
Aim: Configure RIP routing Protocol in Routers


20.0.0.10
Se2/0
20.0.0.20
Se2/0
30.0.0.10
Se3/0
30.0.0.20
Se2/0
Fa0/0
Router-PT
Router0
Router-PT
Router1
Router-PT
Router2
Fa0/0
10.0.0.10
40.0.0.10
Fa0
Fa0
PC-PT
PC0
PC-PT
PC1
10.0.0.1
40.0.0.1

```
Router#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router rip
Router(config-router)#network 10.0.0.0
Router(config-router)#network 20.0.0.0
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    10.0.0.0/8 is directly connected, FastEthernet0/0
     20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       20.0.0.0/8 is directly connected, Serial2/0
C       20.0.0.20/32 is directly connected, Serial2/0
R    30.0.0.0/8 [120/1] via 20.0.0.20, 00:00:18, Serial2/0
R    40.0.0.0/8 [120/2] via 20.0.0.20, 00:00:18, Serial2/0
Router#
```

```
Router#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router rip
Router(config-router)#network 20.0.0.0
Router(config-router)#network 30.0.0.0
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

R    10.0.0.0/8 [120/1] via 20.0.0.10, 00:00:20, Serial2/0
     20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       20.0.0.0/8 is directly connected, Serial2/0
C       20.0.0.10/32 is directly connected, Serial2/0
     30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       30.0.0.0/8 is directly connected, Serial3/0
C       30.0.0.20/32 is directly connected, Serial3/0
R    40.0.0.0/8 [120/1] via 30.0.0.20, 00:00:19, Serial3/0
Router#
```

```
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#network 30.0.0.0
                   ^
% Invalid input detected at '^' marker.

Router(config)#router rip
Router(config-router)#network 30.0.0.0
Router(config-router)#network 40.0.0.0
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

R    10.0.0.0/8 [120/2] via 30.0.0.10, 00:00:14, Serial2/0
R    20.0.0.0/8 [120/1] via 30.0.0.10, 00:00:14, Serial2/0
     30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       30.0.0.0/8 is directly connected, Serial2/0
C       30.0.0.10/32 is directly connected, Serial2/0
C    40.0.0.0/8 is directly connected, FastEthernet0/0
Router#
```

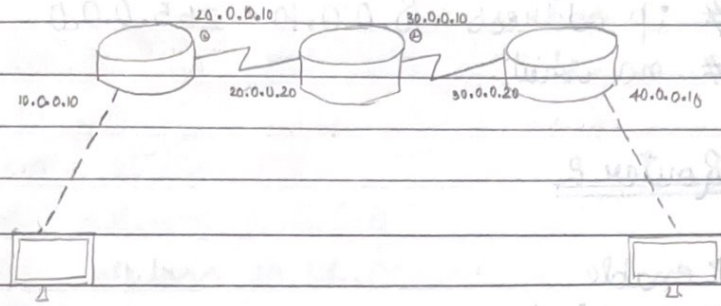

PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Packet Tracer PC Command Line 1.0
PC>ping 40.0.0.1
Pinging 40.0.0.1 with 32 bytes of data:
Request timed out.
Reply from 40.0.0.1: bytes=32 time=10ms TTL=125
Reply from 40.0.0.1: bytes=32 time=7ms TTL=125
Reply from 40.0.0.1: bytes=32 time=10ms TTL=125
Ping statistics for 40.0.0.1:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 7ms, Maximum = 10ms, Average = 9ms
PC>

Bafna Gold
Date: Page:

ROUTING INFORMATION PROTOCOL

AIM: Configure RIP routing Protocol in Routers

Topology:



Procedure:

- Place 2 PT-PC's and three routers onto the logical interface.
- Connect the router to one another using serial DCE.
- Connect the routers to PT-PC's using copper cross over.
- set ip address and gateways on PT-PC's.
  10.0.0.1 10.0.0.10

Setting router 1
Router > enable
Router # configure t
interface Fast Ethernet 0/0
ip address 10.0.0.10 255.0.0.0
exit
interface serial 2/0
ip adress 20.0.0.10 255.0.0.0
exit
interface serial 2/0

ip address 20.0.0.10 255.0.0.0
encapsulation ppp
clock rate 64000
no shut.
interface fastethernet 0/0
ip address 10.0.0.10 255.0.0.0
no shut.

Router 2

> enable
config t.
interface serial 2/0
~~exit~~ # exit ip address 20.0.0.20 255.0.0.0
interface serial 3/0
ip address 30.0.0.10 255.0.0.0
encapsulation ppp
clock rate 64000
no shut
exit.
interface serial 2/0
ip address 20.0.0.20 255.0.0.0
encapsulation ppp
no shut.

Router 3
interface Serial 3/0
~~exit~~ ip address 30.0.0.20 255.0.0.0
exit
interface Fast Ethernet 0/0
ip address 40.0.0.10 255.0.0.0
no shut.

exit
interface serial 3/0
ip address 30.0.0.20 255.0.0.0
encapsulation ppp
no shut

Router rip for Router 1
exit
router rip
network 10.0.0.0
network 20.00.0
exit.

Router rip for Router 2
exit
router rip
network 20.0.0.0
network 30.0.0.0
exit.

Router rip for Router 3
exit
router rip
network 30.0.0.0
network 40.0.0.0
exit.
exit

Router route for Router 3
show ip route
Gateway of last resort is not set
R 10.0.0.0/8 [120/2] via

PC> Ping 10.0.0.1

Pinging 10.0.0.1 with 32 bytes of data

Reply from 10.0.0.1 : bytes = 32 time=14 ms TTL=125
Reply from 10.0.0.1 : bytes = 32 time=14ms TTL=125
Reply from 10.0.0.1 : bytes = 32 time= 11ms TTL=125
Reply from 10.0.0.1 : bytes = 32 time = 9ms TTL=125

Ping statistics. for 10.0.0.1:
Packets : sent = 4, Recieved = 4, Lost = 0(0% loss)
Approximate round trip times in milliseconds:
Minimum = 9ms, Max = 14ms, Avg = 12ms

Router route for Router3
show ip route

Gateway of last resort is not set.

R 10.0.0.0/8 [120/2] via 3.0.0.10, 00:00:05, Serial 3/0
R 20.0.0.0/8 [120/1] via 30.0.0.10. 00:00:05, serial 3/0
30:0.0.0/8 is directly variably subnetted subnets, 2 masks

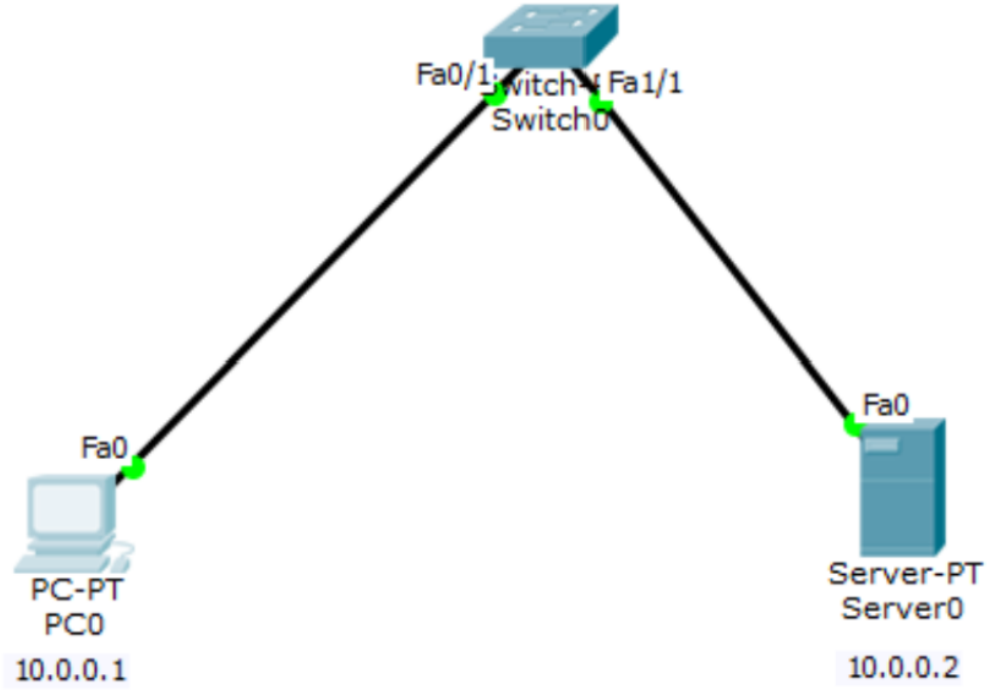
10/0
N
25/7/23

C 30.0.0.0/8 is directly connected, to serial 3/0
C 30.0.0.10/32 is directly connected, serial 3/0
C 40.0.0.0/8 is directly connected, FastEthernet 0/0.

Experiment - 6

Aim: Configure Web Server, DNS within a LAN.

Topology :


Fa0/1
Switch1
Fa1/1
Switch0
Fa0
PC-PT
PC0
10.0.0.1
Fa0
Server-PT
Server0
10.0.0.2

Server0

Physical | Config | Services | Desktop | Custom Interface

SERVICES

- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP

HTTP

HTTP

(•) On ( ) Off

HTTPS

(•) On ( ) Off

File Manager

	File Name	Edit	Delete
1	copyrights.html	(edit)	(delete)
2	cscoptlogo177x...		(delete)
3	helloworld.html	(edit)	(delete)
4	image.html	(edit)	(delete)
5	index.html	(edit)	(delete)
6	profile.jpg		(delete)

New File | Import

PC0

Physical | Config | Desktop | Custom Interface

Web Browser

X

< > URL http://google.com Go Stop

RESUME

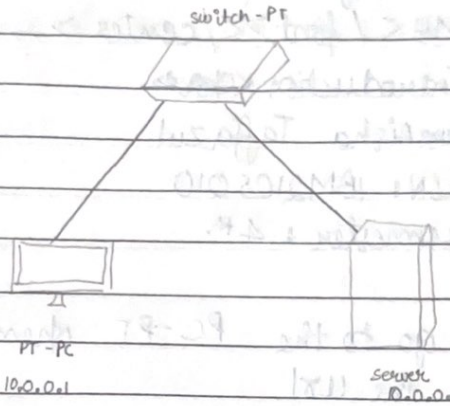
Welcome to BMS college of engineering. Opening doors to new opportunities.

INTRODUCTION:
NAME: Aisha Taffazul
USN:1BM21CS010
SEMESTER:4th
SECTION: A

Bafna Gold
Date: Page:

DNS

Aim: Domain Name System.



Procedure:

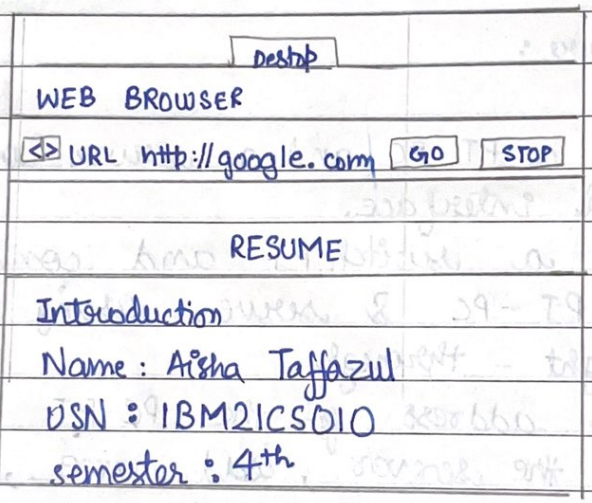
- Place a PT-PC and a server on the logical interface.
- Place a switch PT and connect it to the PT-PC & server using copper straight-through
- set ip address for the PC-PT and server
- go to the server, add name, address eg 10.0.0.1 and then add
- go to PC add the URL
- to make changes go to server → services → HTTP make changes in the index

To make changes
- Turn HTTP on.
- ~~In File Manager~~
- Go to DNS
- add Name, & address.

- then go to HTTP
- click on edit ~~copyright~~ index

```
<html>
<center><font size='+2' color='Green'>
RESUME</font></center>
<hr> Introduction <br>
<br>Name:Aisha Taffazul
<br> USN: 1BM21CS010
<br> semester : 4th
```

- then go to the PC-PT open web browser search the url.



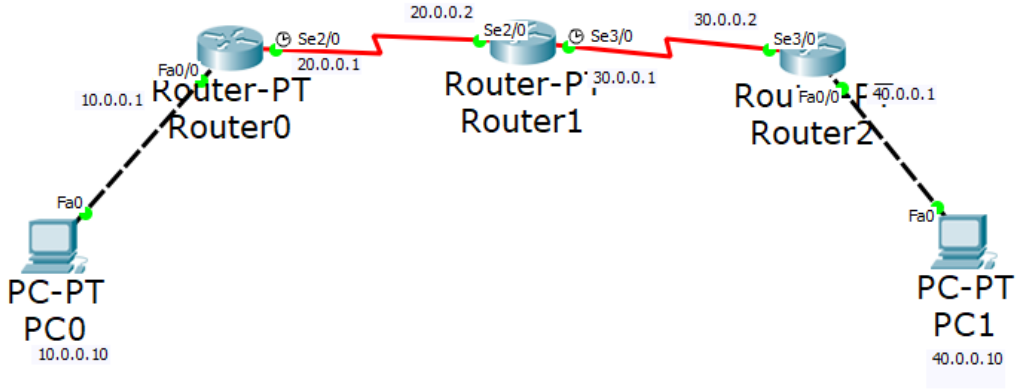
10/10

25/2/23

Experiment- 7

Aim: Configure OSPF routing protocol

Topology


20.0.0.2
Se2/0
Se2/0
Se3/0
30.0.0.2
Se3/0
20.0.0.1
30.0.0.1
Fa0/0
Fa0/0
40.0.0.1
10.0.0.1
Router-PT
Router0
Router-PT
Router1
Rou
Router2
Fa0
Fa0
PC-PT
PC0
10.0.0.10
PC-PT
PC1
40.0.0.10

Router2

Physical | Config | CLI

IOS Command Line Interface

```
Loading Done


Router>enable
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

O IA 10.0.0.0/8 [110/129] via 30.0.0.1, 00:00:33, Serial3/0
O IA 20.0.0.0/8 [110/128] via 30.0.0.1, 00:00:43, Serial3/0
     30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       30.0.0.0/8 is directly connected, Serial3/0
C       30.0.0.1/32 is directly connected, Serial3/0
C    40.0.0.0/8 is directly connected, FastEthernet0/0
C    172.16.0.0/16 is directly connected, Loopback0
Router#
```

Copy | Paste

PC0

Physical | Config | Desktop | Custom Interface

Command Prompt

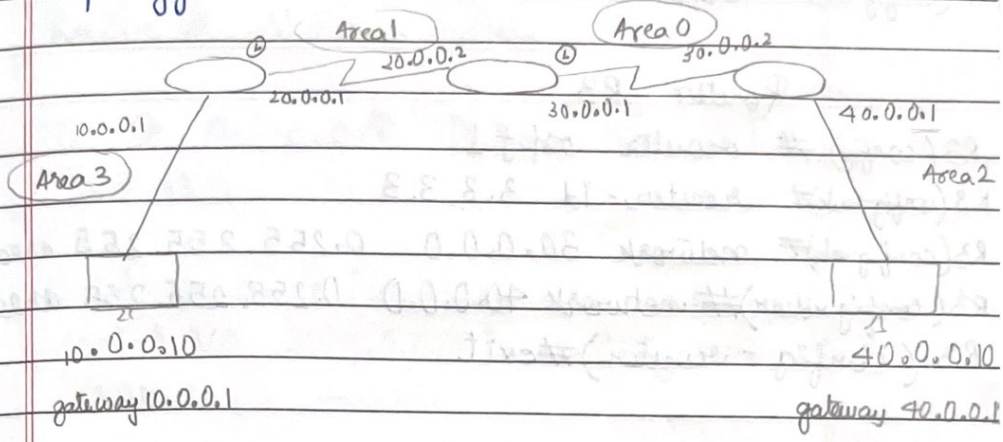
```
Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.10

Pinging 10.0.0.10 with 32 bytes of data:

Reply from 10.0.0.10: bytes=32 time=4ms TTL=128
Reply from 10.0.0.10: bytes=32 time=7ms TTL=128
Reply from 10.0.0.10: bytes=32 time=7ms TTL=128
Reply from 10.0.0.10: bytes=32 time=8ms TTL=128

Ping statistics for 10.0.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 4ms, Maximum = 8ms, Average = 6ms

PC>
```

OSPF

open shortest path first - Link state algo.

Aim: Configure OSPF routing protocol

Topology:



area 0 = backbone network

Procedure:

- Configure the PC's with the IP address & gateway
- Configure each of the routers acc to the ip address as shown in the topology
- Encapsulation ppp and clock rate need to be set as done in rip protocol.

Router 1 ospf

R1(config)# router ospf 1

R1(config-router)# router id 1.1.1.1

R1(config-router)# network 10.0.0.0 0.255.255.255 area 3

R1(config-router)# network 20.0.0.0 0.255.255.255 area 1

R1(config-router)# exit

loopback 0 → software interface
virtual interface

Router R2

```
R2(config)# router ospf 1
R2(config-router)# router-id 2.2.2.2
R2(config-router)# network 20.0.0.0 0.255.255.255 area 1
R2(config-router)# network 30.0.0.0 0.255.255.255 area 0
R2(config-router)# exit
```

Router R3

```
R3(config)# router ospf 1
R3(config-router)# router-id 3.3.3.3
R3(config-router)# network 30.0.0.0 0.255.255.255 area 0
R3(config-router)# network 40.0.0.0 0.255.255.255 area 2
R3(config-router)#exit.
```

interface loopback → config copy

```
R1(config-if)# interface loopback 0
R1(config-if)# ip address 172.16.1.252 255.255.
R1(config-if)# no shutdown
```

```
R2(config-if)# interface loopback 0
R2(config-if)# ip address 172.16.1.253 255.255.0.0
R2(config-if)# no shut.
```

```
R3(config-if)# interface loopback 0
R3(config-if)# ip address 172.16.1.254 255.255.
R3(config-if)# no shut.
```

virtual link b/w R1, R2

```
R1(config)# router ospf 1
R1(config-router)# area 1 virtual-link 2.2.2.2
```

Router 2

R2(config)# router ospf 1
R2(config-router)# area 1 virtual-link 1.1.
R2(config-router)# exit

Finally show ip route

Router # show ip route

O IA 10.0.0.0/8 [110/129] via 30.0.0.1, 00:00:33, serial 3/0

O IA 20.0.0/8 [110/128] via 30.0.0.1, 00:00:4
serial 3/0 30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks

C 30.0.0.0/8 is directly connected, Serial 3/0

C 30.0.0.1/32 is directly connected, Serial 3/0

C 40.0.0.0/8 is directly connected, Fast Ethernet 0/0

C 192.16.0.0/16 is directly connected, Loopback0

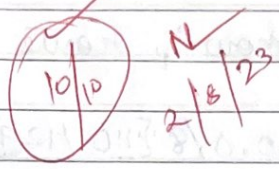
PC> Ping 10.0.0.10

Pinging 10.0.0.10 with 32 bytes of data:

Reply from 10:0.0.10: bytes=32 time=4ms TTL=128
Reply from 10.0.0.10: bytes=32 time=4ms TTL=128
Reply from 10.0.0.10: bytes=32 time=8ms TTL=128

Reply from 10.0.0.10: bytes = 32 time = 8ms TTL-

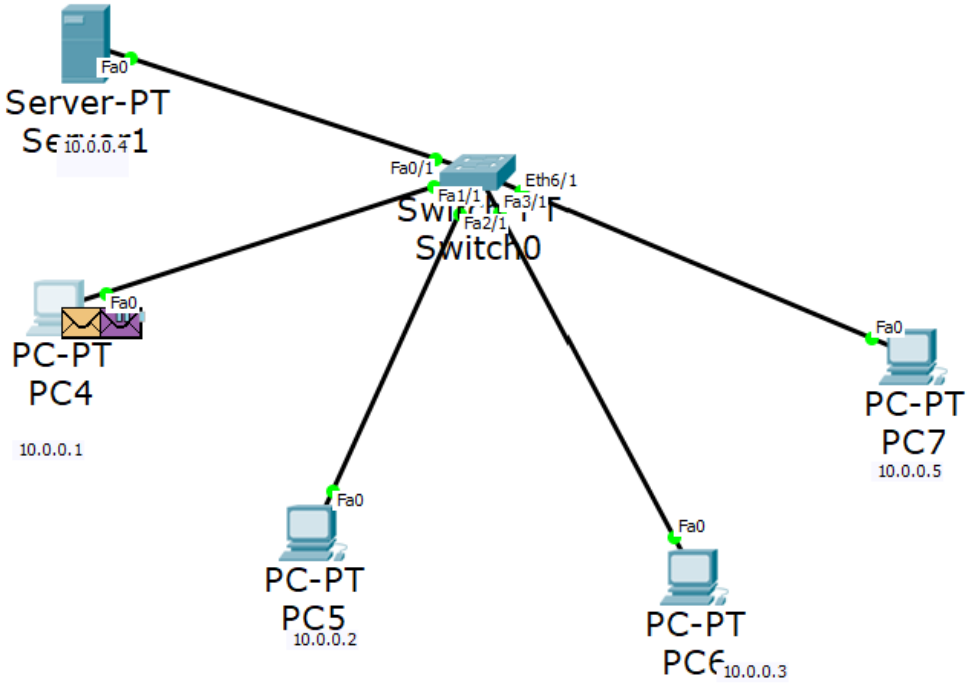
Ping statistics for 10.0.0.10:
Packets: Sent = 4, Recieved = 4, Lost = 0 (0% loss)
Approximate round trip times in milli-seconds:
Minimum = 4ms, Maximum = 8ms, Average = 6ms



Experiment - 8

Aim:To construct simple LAN and understand the concept

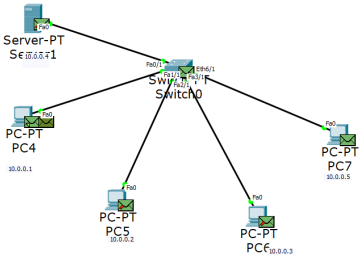
Topology


Fa0
Server-PT
10.0.0.4
Fa0/1
Fa1/1
Fa2/1
Eth6/1
Fa3/1
Switch0
Fa0
PC-PT
PC4
10.0.0.1
Fa0
PC-PT
PC7
10.0.0.5
Fa0
PC-PT
PC5
10.0.0.2
Fa0
PC-PT
10.0.0.3

Cisco Packet Tracer Student

File Edit Options View Tools Extensions Help

Logical [Root] New Cluster Set Tiled Background Viewport



ARP Table for PC5

Address	Hardware Addr	Interface
10.0.0.1	0003.E49D...	FastEthern...

ARP Table for PC4

Address	Hardware Addr	Interface
10.0.0.2	0005.5E6A...	FastEthern...
10.0.0.4	0001.6383....	FastEthern...

ARP Table for PC6

Address	Hardware Addr	Interface
10.0.0.1	0003.E49D...	FastEthern...

ARP Table for PC7

Address	Hardware Addr	Interface
10.0.0.1	0003.E49D...	FastEthern...

ARP Table for Server1

Address	Hardware Addr	Interface
10.0.0.1	0003.E49D...	FastEthern...

Simulation Panel

Event List

Vis.	Time(sec)	Last D	At D	Type	Info
	0.005	Swit...	PC5	ARP	
	0.005	Swit...	PC6	ARP	
	0.005	Swit...	PC7	ARP	
	0.005	--	PC4	ICMP	

Reset Simulation | Constant Delay | Captured to: 0.005 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: 00:17:53.673 | Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture

Event List | Simulation

Connections

Automatically Choose Connection Type

Scenario 0 | New | Delete | Toggle PDU List Window

Fire	Last Sta	Sou	Destina	Typ	Col	Time	Perio	Nu	Edi	Delete
	Succe...	PC4	Server1	I...		0.0...	N	0	(e...	(delete)
	In Pro...	PC4	PC5	I...		0.0...	N	1	(e...	(delete)

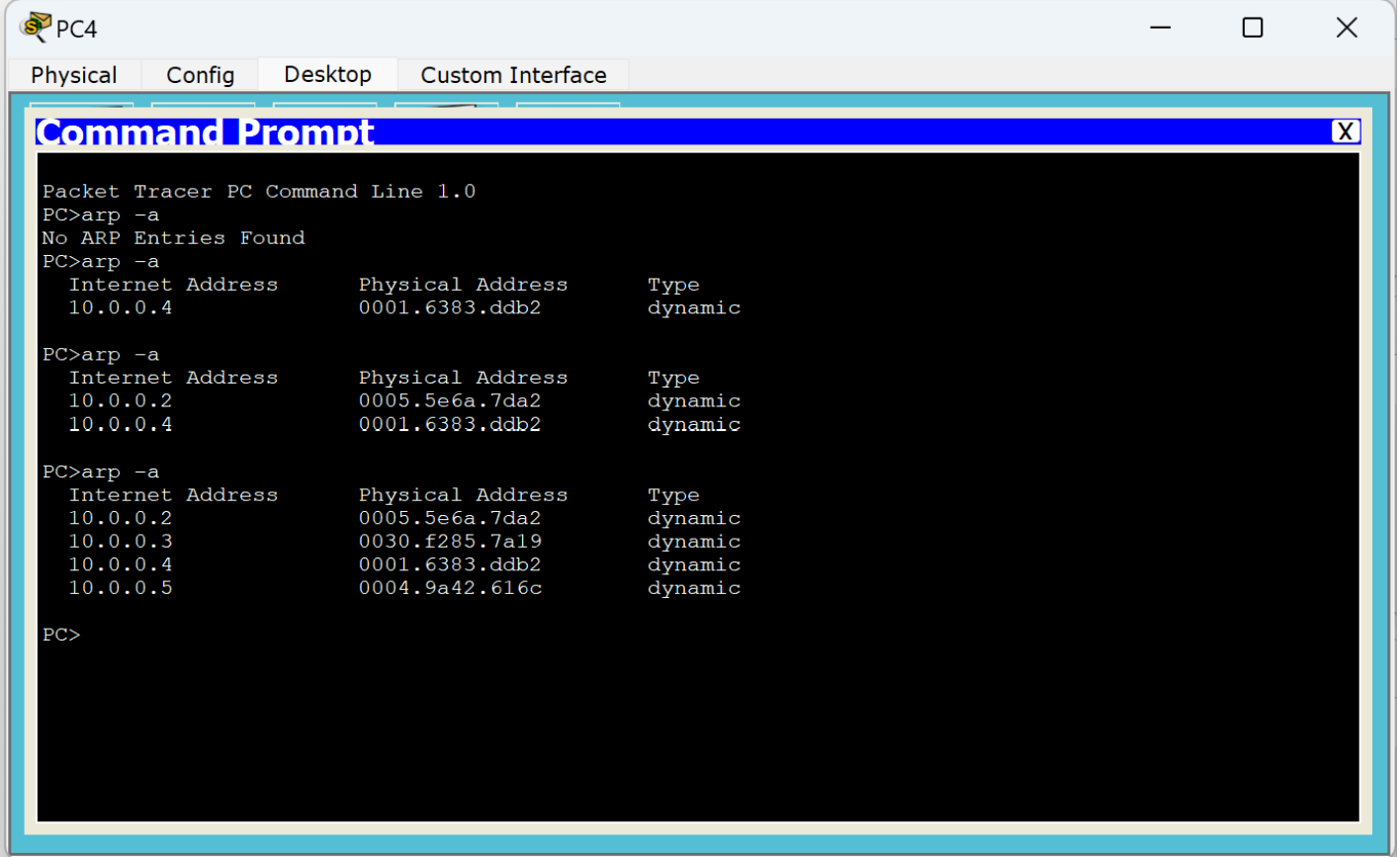
Switch0

Physical | Config | CLI

IOS Command Line Interface

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to
up

%LINK-5-CHANGED: Interface FastEthernet1/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/1, changed state to
up

%LINK-5-CHANGED: Interface FastEthernet2/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet2/1, changed state to
up

%LINK-5-CHANGED: Interface FastEthernet3/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/1, changed state to
up

%LINK-5-CHANGED: Interface Ethernet6/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet6/1, changed state to up

Switch(config)#show mac address-table
               ^
% Invalid input detected at '^' marker.

Switch(config)#exit
Switch#show mac address-table
          Mac Address Table
-------------------------------------------

Vlan    Mac Address       Type        Ports
----    -----------       --------    -----

   1    0001.6383.ddb2    DYNAMIC     Fa0/1
   1    0003.e49d.b2d9    DYNAMIC     Fa1/1
   1    0004.9a42.616c    DYNAMIC     Eth6/1
   1    0005.5e6a.7da2    DYNAMIC     Fa2/1
   1    0030.f285.7a19    DYNAMIC     Fa3/1
Switch#
```

Copy | Paste

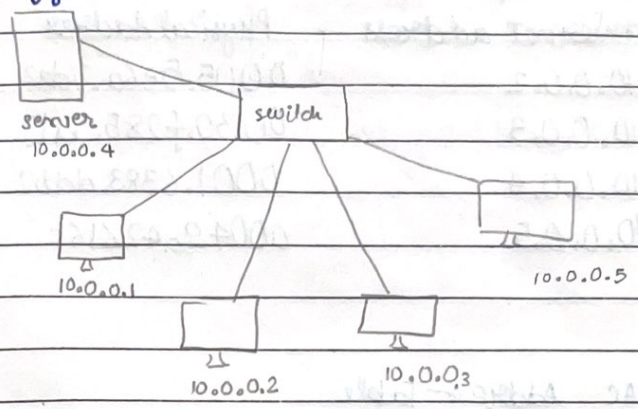

PC4
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Packet Tracer PC Command Line 1.0
PC>arp -a
No ARP Entries Found
PC>arp -a
Internet Address Physical Address Type
10.0.0.4 0001.6383.ddb2 dynamic
PC>arp -a
Internet Address Physical Address Type
10.0.0.2 0005.5e6a.7da2 dynamic
10.0.0.4 0001.6383.ddb2 dynamic
PC>arp -a
Internet Address Physical Address Type
10.0.0.2 0005.5e6a.7da2 dynamic
10.0.0.3 0030.f285.7a19 dynamic
10.0.0.4 0001.6383.ddb2 dynamic
10.0.0.5 0004.9a42.616c dynamic
PC>

Bafna Gold
Date: Page:

Experiment 8

Aim: To construct simple LAN and understand the concept and operation of address Resolution Protocol (ARP).

Topology:



Procedure:

- Create a topology of 4 PC's and a server.
- IP address assigned to all
- Connect them through a switch.
- Use the inspect tool to click on PC to see the ARP Table
- Command in command prompt of the PC for arp-a
- Initially ARP Table is empty
- Also in CLI of switch, the command - show mac address-table can be given on every transaction to see how the switch learns from transactions and built the address-table.
- Use capture button in the simulation panel to go step by step so that the changes in

ARP can be clearly noted

- Nodes and switches get updated in the ARP table and new connections start.

command prompt

```
PC> arp -a
```

Internet address	Physical Address	Type
10.0.0.2	0005.5e6a.7da2	dynamic
10.0.0.3	0030.f285.7a19	dynamic
10.0.0.4	0001.6383.ddb2	dynamic
10.0.0.5	0004.9a42.616c	dynamic

show MAC Address-Table

Vlan	Mac Address	Type	Ports
1	0001.6383.ddb2	DYNAMIC	Fa0/1
1	0003.e49d.b2d9	DYNAMIC	Fa1/1
1	0004.9a42.616c	DYNAMIC	Eth 6/1
1	0005.5e60.7da2	DYNAMIC	Fa 2/1
1	0030.f285.7a19	DYNAMIC	Fa 3/1

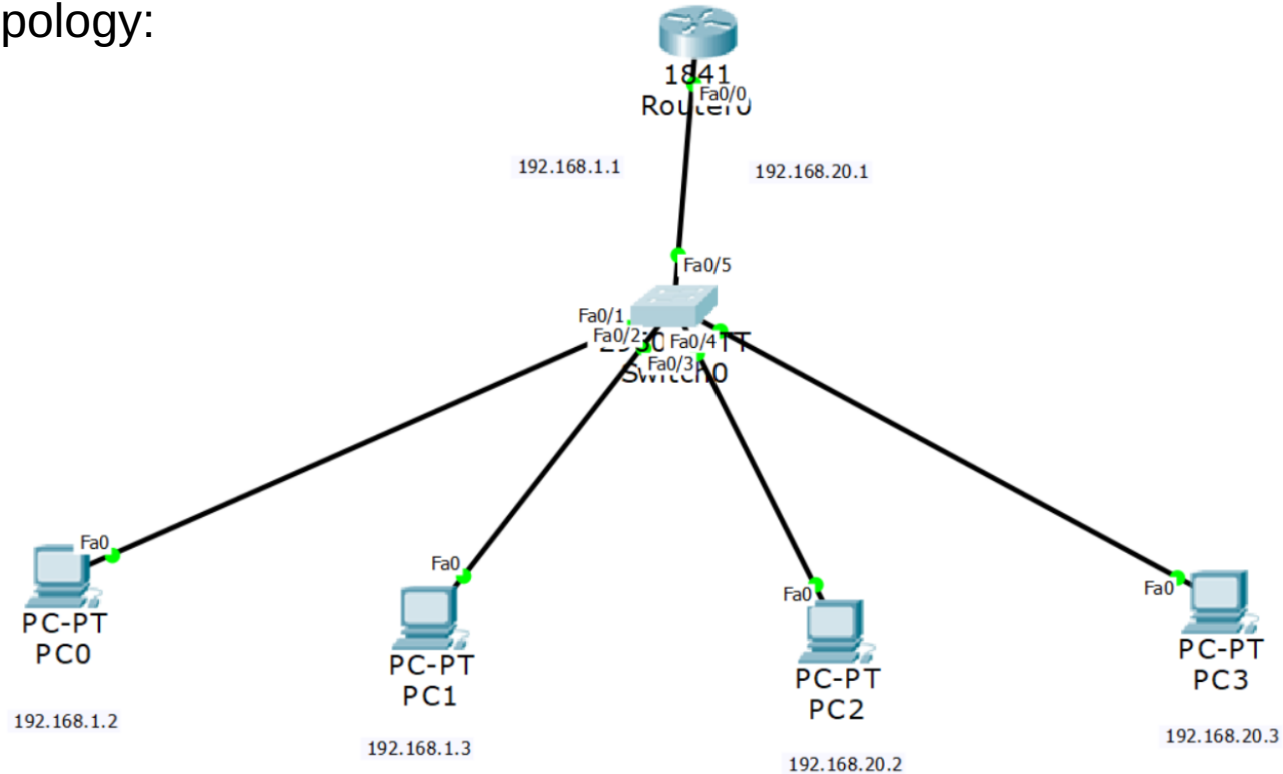
9/10

4/8/23

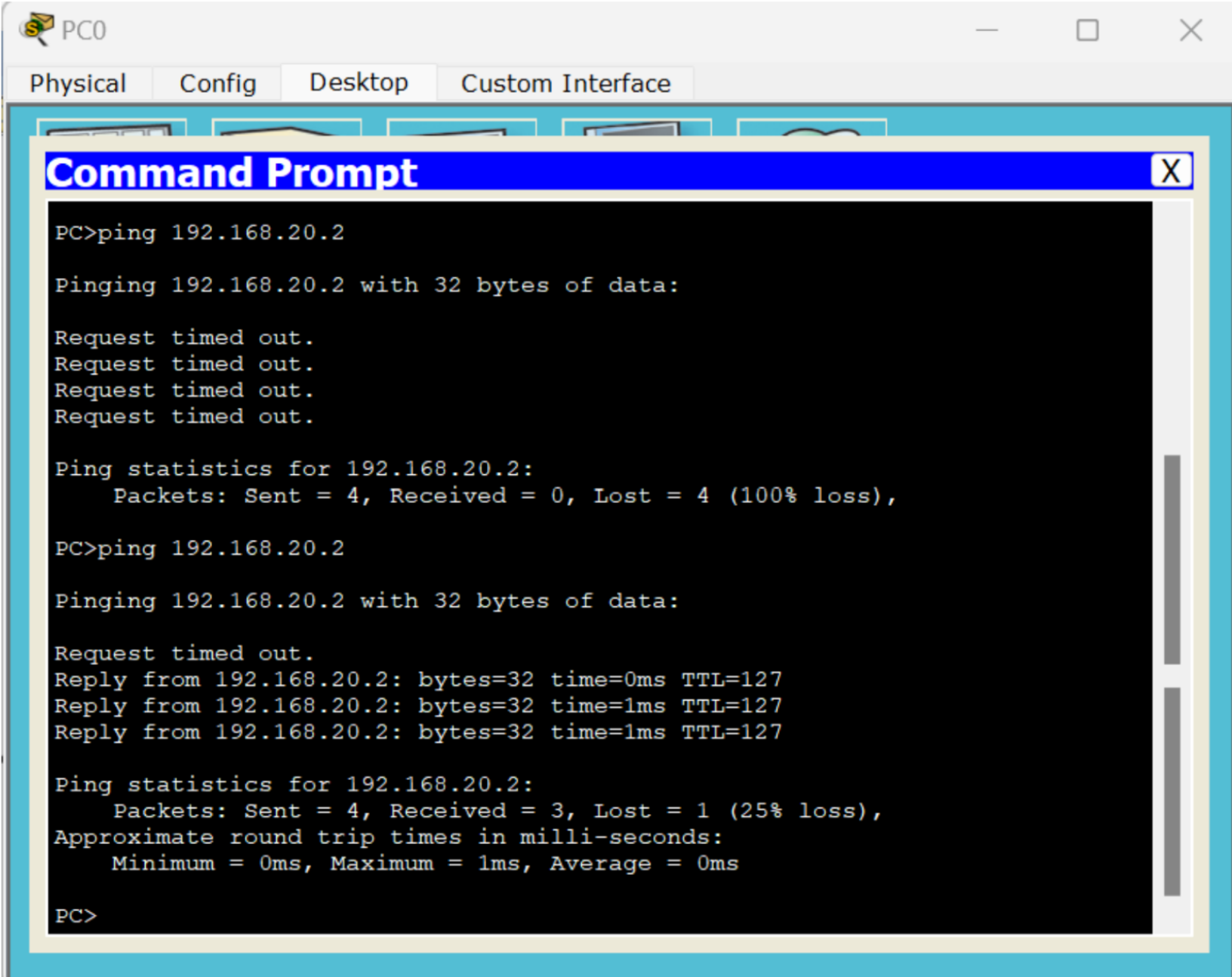
Experiment - 9

Aim: To construct a VLAN and make the PC’s communicate

Topology:


1841
Router0
Fa0/0
192.168.1.1
192.168.20.1
Fa0/5
Fa0/1
Fa0/2
Fa0/4
Fa0/3
Switch0
Fa0
PC-PT
PC0
192.168.1.2
Fa0
PC-PT
PC1
192.168.1.3
Fa0
PC-PT
PC2
192.168.20.2
Fa0
PC-PT
PC3
192.168.20.3

```
         --- System Configuration Dialog ---

Continue with configuration dialog? [yes/no]: n


Press RETURN to get started!



Router>enable
Router#vlan database
% Warning: It is recommended to configure VLAN from config mode,
  as VLAN database mode is being deprecated. Please consult user
  documentation for configuring VTP/VLAN in config mode.

Router(vlan)#vlan 20 name NEWVLAN
VLAN 20 modified:
    Name: NEWVLAN
Router(vlan)#exit
APPLY completed.
Exiting....
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int fa0/5
%Invalid interface type and number
Router(config)#int fa0/0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
exit
Router(config)#int fa 0/0.1
Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.1, changed state to up

Router(config-subif)#encapsulation dot1q 20
Router(config-subif)#ip address 192.168.20.1 255.255.255.0
Router(config-subif)#no shut
Router(config-subif)#exit
Router(config)#
```

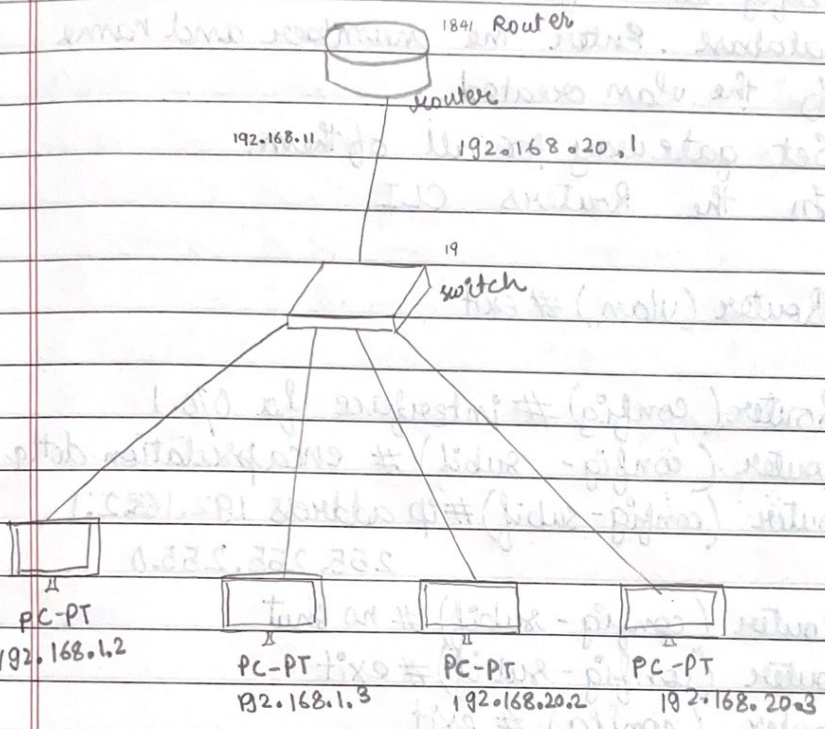

PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
X
PC>ping 192.168.20.2
Pinging 192.168.20.2 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 192.168.20.2:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
PC>ping 192.168.20.2
Pinging 192.168.20.2 with 32 bytes of data:
Request timed out.
Reply from 192.168.20.2: bytes=32 time=0ms TTL=127
Reply from 192.168.20.2: bytes=32 time=1ms TTL=127
Reply from 192.168.20.2: bytes=32 time=1ms TTL=127
Ping statistics for 192.168.20.2:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
PC>

Bafna Gold
Date: 10-8-23

VIRTUAL LAN

Aim: To create a VLAN using class C type addresses.

Topology:



Procedure:

- Create a topology of a 1841 router, a switch, and 4 PT-PC's.
- IP address is assigned to all the devices.
- In switch, go to config tab and select VLAN Database.
- Give any VLAN number say 2 here & include any name.
- Then add.
- Select the interface near the switch from router and make it Trunk.

10-8-21

- VLAN trunking allows switchs to forward frames from different VLAN's over a single link called trunk.
- This makes the switch understand NEWVLAN
- Next the router is to understand NEWVLAN
- Config tab of router select VLAN database. Enter the number and name of the vlan created
- Set gateway for all of them.
- In the Routers CLI

```
Router (vlan) # exit

Router (config) # interface fa 0/0.1
Router (config-subif) # encapsulation dot1q 2
Router (config-subif) # ip address 192.168.2.1
                                255.255.255.0
Router (config-subif) # no shut
Router (config-subif) # exit
Router (config) # exit
```

Ping message from PC to another VLAN PC

Ping Output.

```
Packet Tracer PC command line 1.0
PC > Ping 192.168.20.3
Pinging 192.168.20.3 with 32 bytes of data
Request timed out.
Reply from 192.168.20.3: bytes=32 time=0ms TTL=
Reply from 192.168.20.3: bytes=32 time=5ms TTL=127
```

10-8-23

Bafna Gold
Date: Page:

Reply from 192.168.20.3: bytes=32 time: 0ms TTL=127
Ping statistics for 192.168.20.3.
Packets: sent=4, Recieved=3, lost=1 (25% loss)
Approximate round trip times in milliseconds:
minimum=0ms, Maximum=5ms, Average=1ms

Observation:

VLAN is a custom network which is created from one or more local area networks. It enables a group of devices availible in multiple networks to be combined into one logical network. The result becomes a virtual LAN this is administered exactly like a physical VLAN It is a virtual extension of LAN

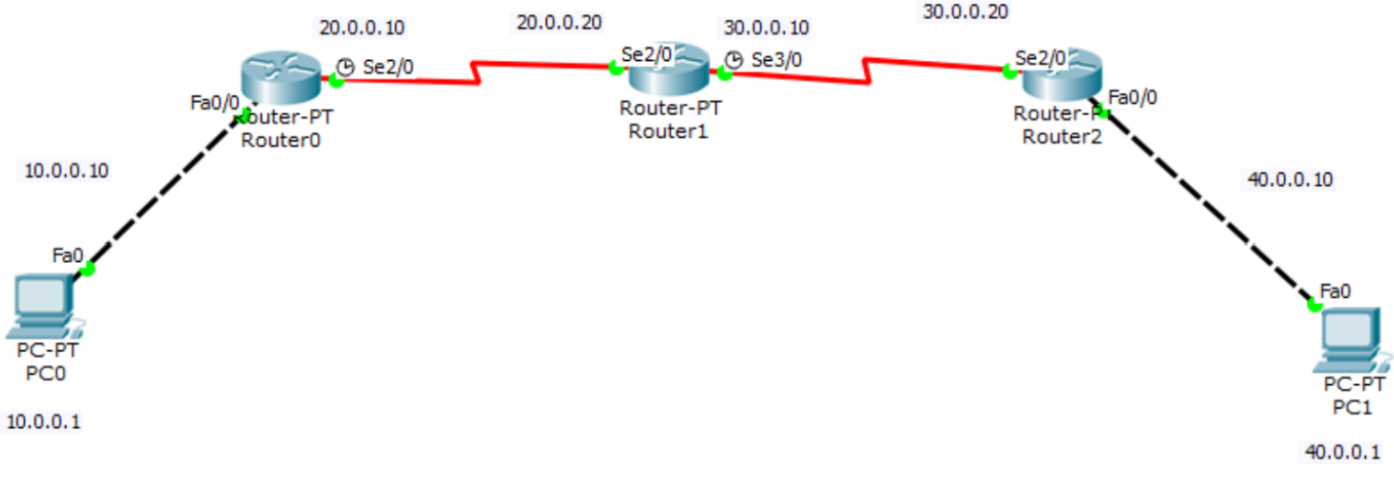
10/10

17/8/23

Experiment - 10

Aim: Demonstrate the TTL/ Life of a Packet

Topology

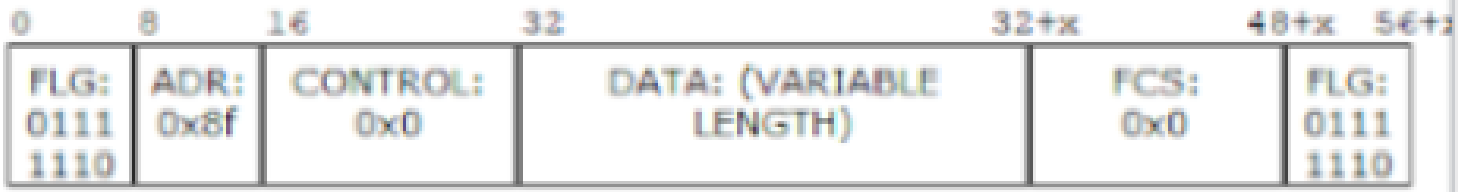

20.0.0.10
20.0.0.20
30.0.0.10
30.0.0.20
Se2/0
Se2/0
Se3/0
Se2/0
Fa0/0
Fa0/0
Router-PT
Router0
Router-PT
Router1
Router-PT
Router2
10.0.0.10
40.0.0.10
Fa0
Fa0
PC-PT
PC0
PC-PT
PC1
10.0.0.1
40.0.0.1

PDU Information at Device: Router0

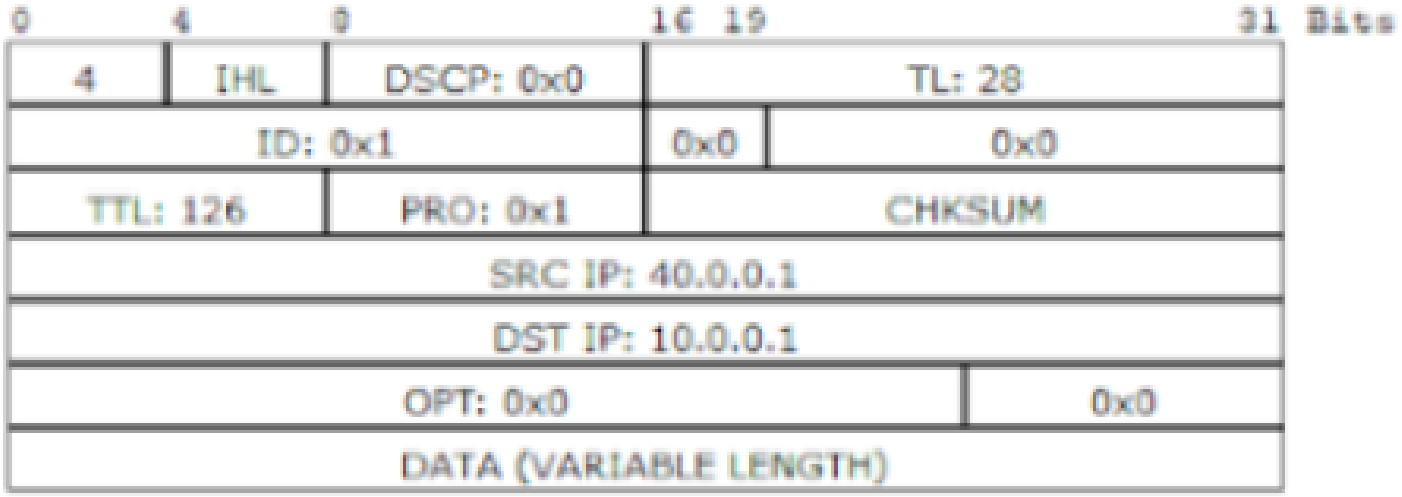
OSI Model | Inbound PDU Details | Outbound PDU Details

PDU Formats

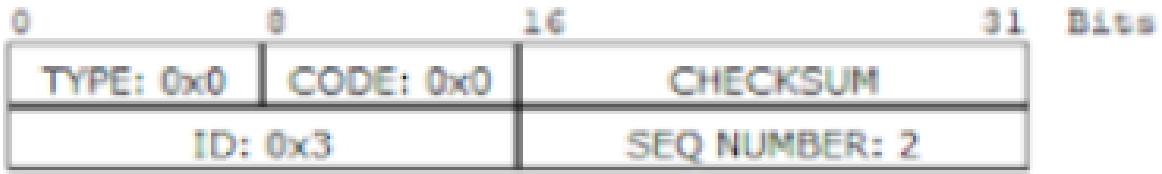
HDLC



IP



ICMP

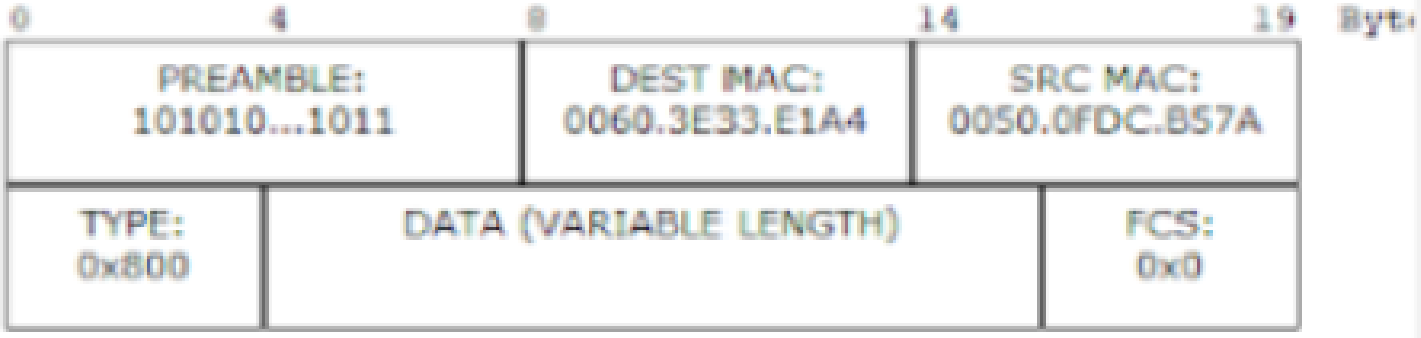


PDU Information at Device: Router0

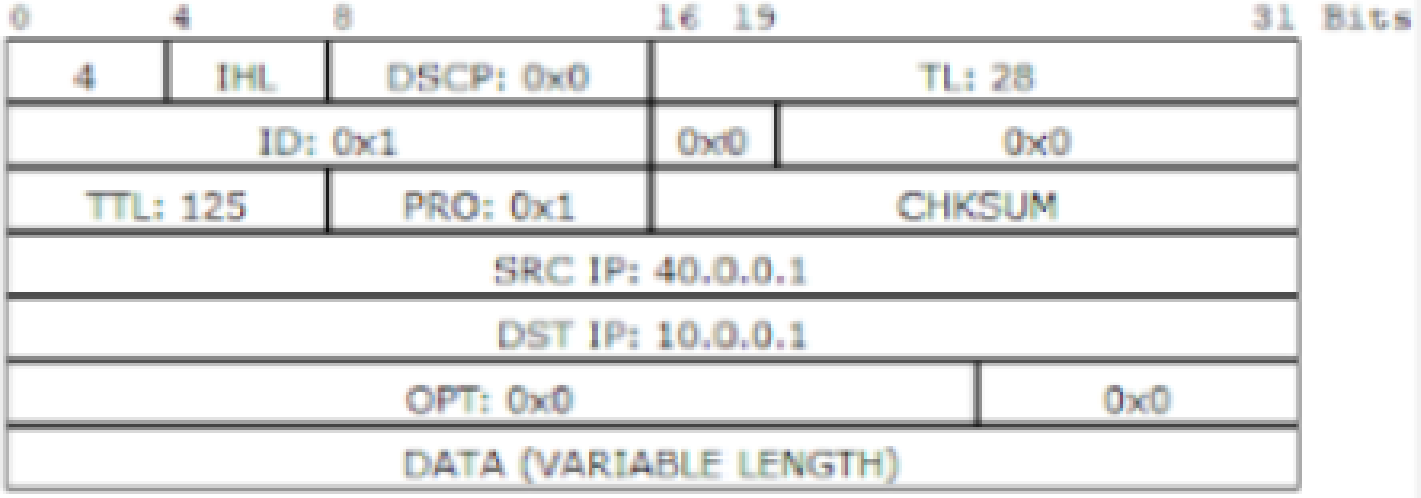
OSI Model | Inbound PDU Details | Outbound PDU Details

PDU Formats

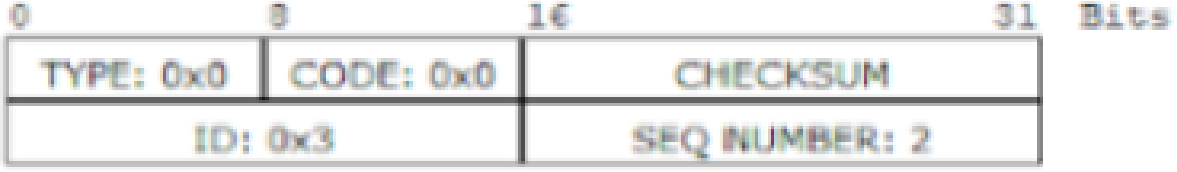
Ethernet II



IP



ICMP



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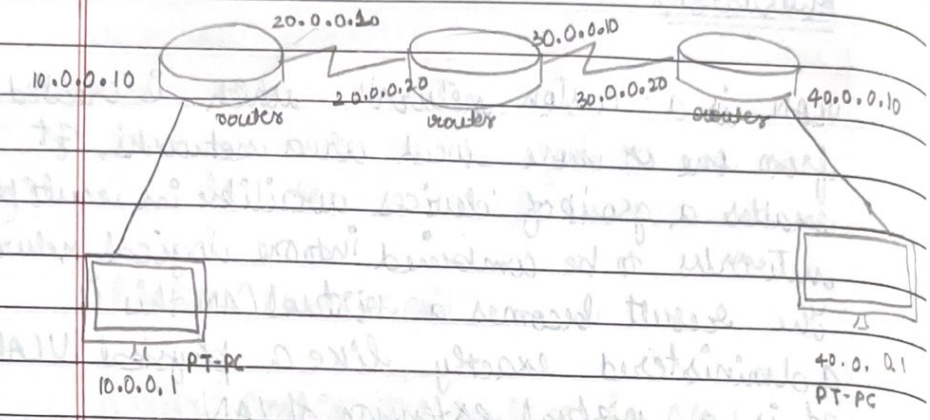
LIFE OF A PACKET

Aim : Demonstrate the time to live TTL

Topology:



Procedure:

- Create a topology where there are 3 routers and two PT - PC's.
- Configure the devices
- In simulation mode, send a simple PDU from one PC to another.
- Use capture button to capure every transfer.
- Click on the PDU during every transfer to check the Inbound and outbound PDU details. Observe that there is a difference of 1 in TTL when it crosses every router

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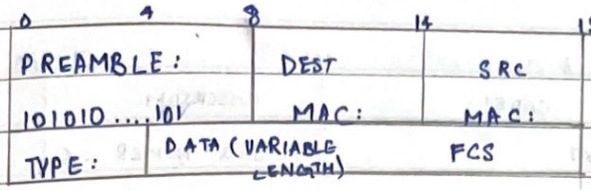
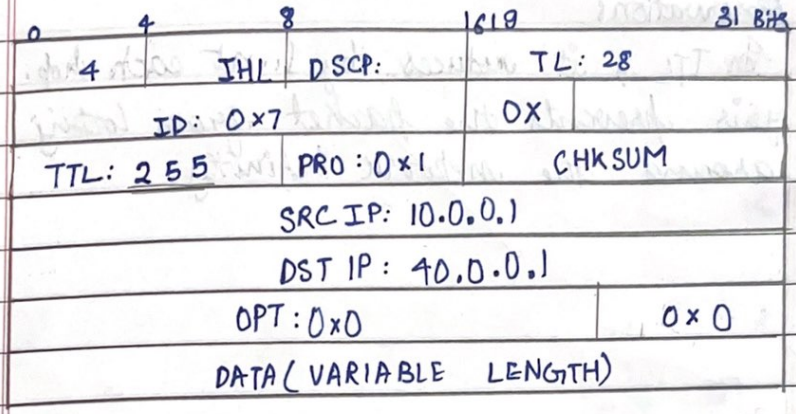
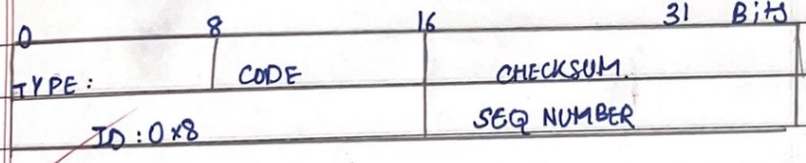
Ethernet II



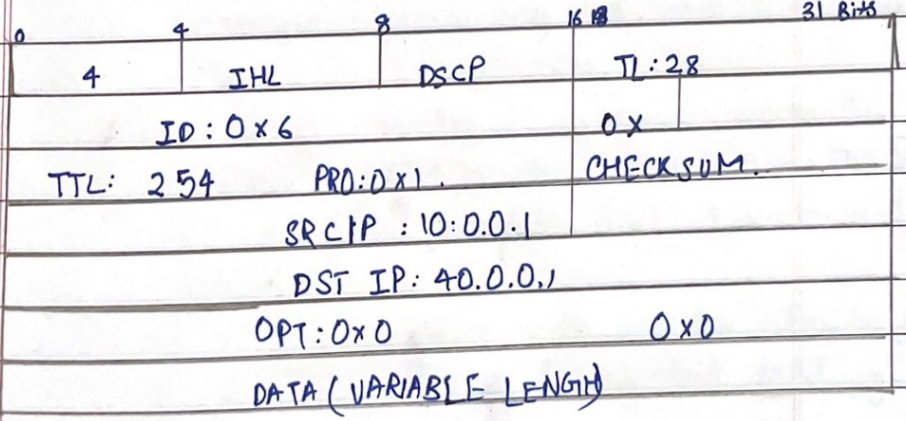
IP



ICMP



IP



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ICMP

0	8	16	31 Bits
TYPE:	CODE:	CHECKSUM	
ID: 0x7		SEQ NUMER : 6	

Observation:
In TTL, it reduces by 1 at each hop. This prevents the packet from looping around the network infinitely

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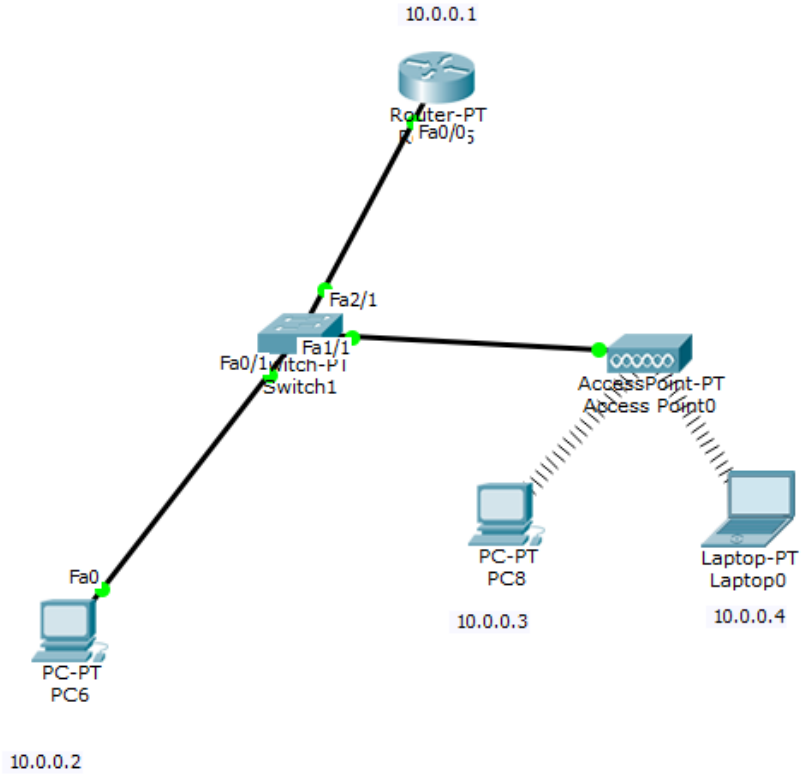
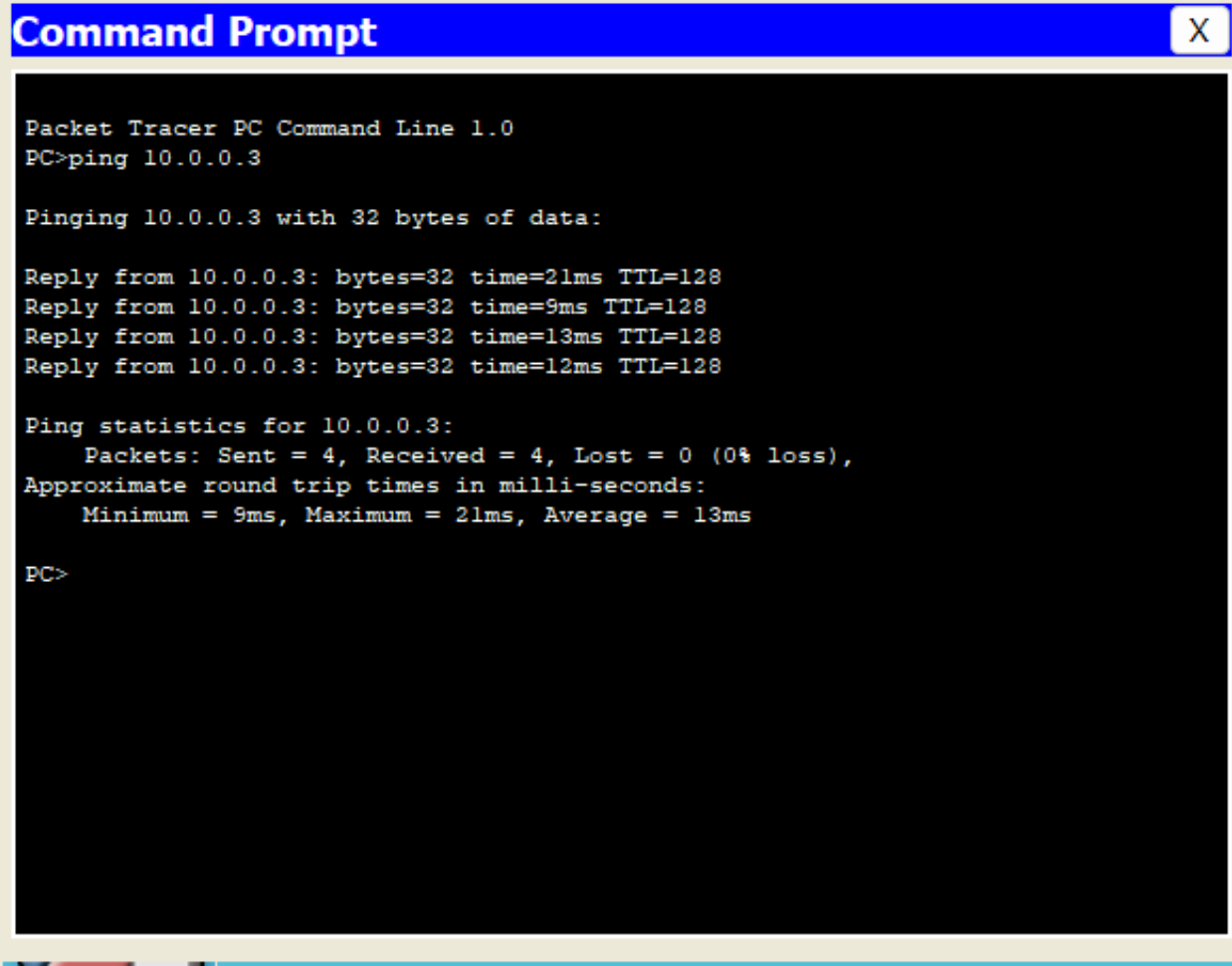
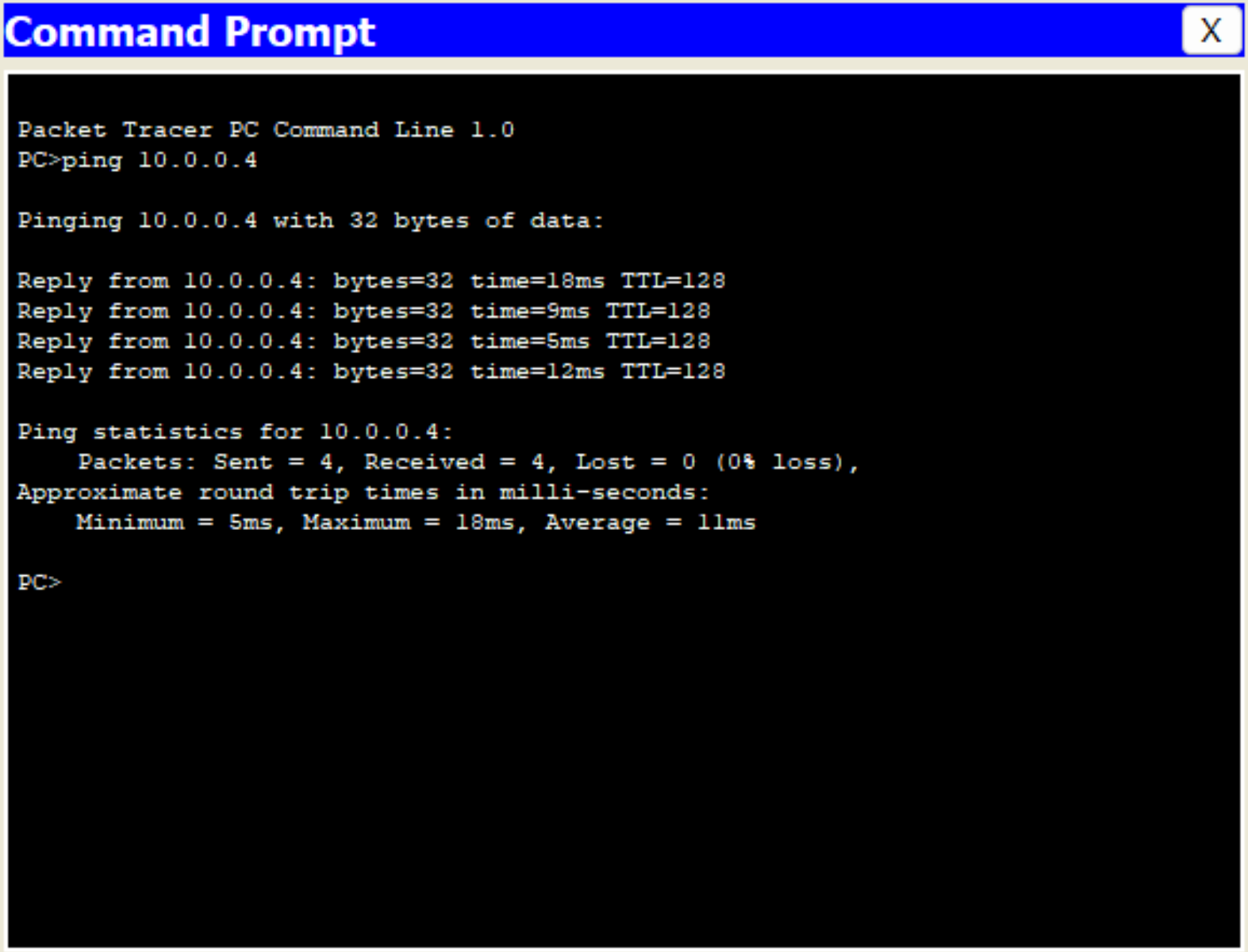
Experiment -11

Aim: To construct a WLAN and make the nodes communicate


10.0.0.1
Router-PT
Fa0/0
Fa2/1
Fa1/1
Fa0/1
Switch1
AccessPoint-PT
Access Point0
PC-PT
PC8
10.0.0.3
Laptop-PT
Laptop0
10.0.0.4
Fa0
PC-PT
PC6
10.0.0.2


Command Prompt
X
Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.3
Pinging 10.0.0.3 with 32 bytes of data:
Reply from 10.0.0.3: bytes=32 time=21ms TTL=128
Reply from 10.0.0.3: bytes=32 time=9ms TTL=128
Reply from 10.0.0.3: bytes=32 time=13ms TTL=128
Reply from 10.0.0.3: bytes=32 time=12ms 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 = 9ms, Maximum = 21ms, Average = 13ms
PC>


Command Prompt
X
Packet Tracer PC Command Line 1.0
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=18ms TTL=128
Reply from 10.0.0.4: bytes=32 time=9ms TTL=128
Reply from 10.0.0.4: bytes=32 time=5ms TTL=128
Reply from 10.0.0.4: bytes=32 time=12ms TTL=128
Ping statistics for 10.0.0.4:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 5ms, Maximum = 18ms, Average = 11ms
PC>

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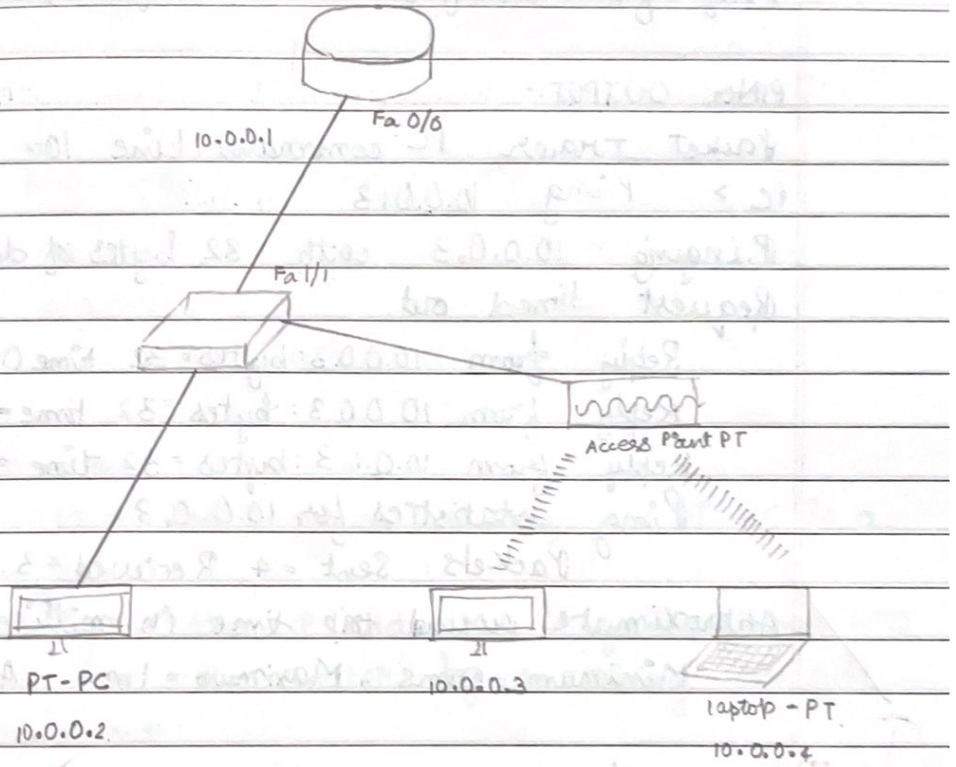
WLAN

Aim: To construct a WLAN and make nodes communicate wirelessly.

Topology:



Procedure:

- Construct a topology with a router, switch, an access point, and two PT-PC's and a laptop PT
- configure PC & router 0 as done normally
- configure Access point 1 - port 1 → SSID Name - WLAN.
- Select WEP & give any 10 digit hexadecimal key - 1234567890
- configure PT-PC & laptop with wireless standards
- switch off the device. Drag that existing

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PT- HOST - NM - 1AM to the component listed in the left hand side. Drag WMP 300N wireless interface to the empty port. Switch on the device. In the config tab a new wireless interface would have been added. Now configure SSID, WEP, WEP Key, IP address and gateway to the device.
- Ping from every device to every other device

PING OUTPUT:-

Packet Tracer PC command line 10

PC > Ping 10.0.0.3

Pinging 10.0.0.3 with 32 bytes of data:

Request timed out.

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 = 2ms TTL=128

Ping statistics for 10.0.0.3

Packets: Sent = 4, Recieved = 3, Lost = 1 (25% loss)

Approximate round trip time in milliseconds:

Minimum = 0ms, Maximum = 1ms, Average = 0ms

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Observation:

→ A NLAN is a group of devices that form a network based on radio transmissions.

→ Data sent in packets contain layers with labels & instructions, MAC address to end pts. for routing.

→ The access point is the base station that serves as a hub to which other devices connect

→ with one access point we can connect to multiple devices wirelessly & transmit data.

Experiment - 12

Aim: To understand the operation of TELNET by accessing the


Fa0
Fa0/0
PC-PT
PC0
Router-PT
Router0
10.0.0.2
10.0.0.1

Router0

Physical | Config | CLI

IOS Command Line Interface

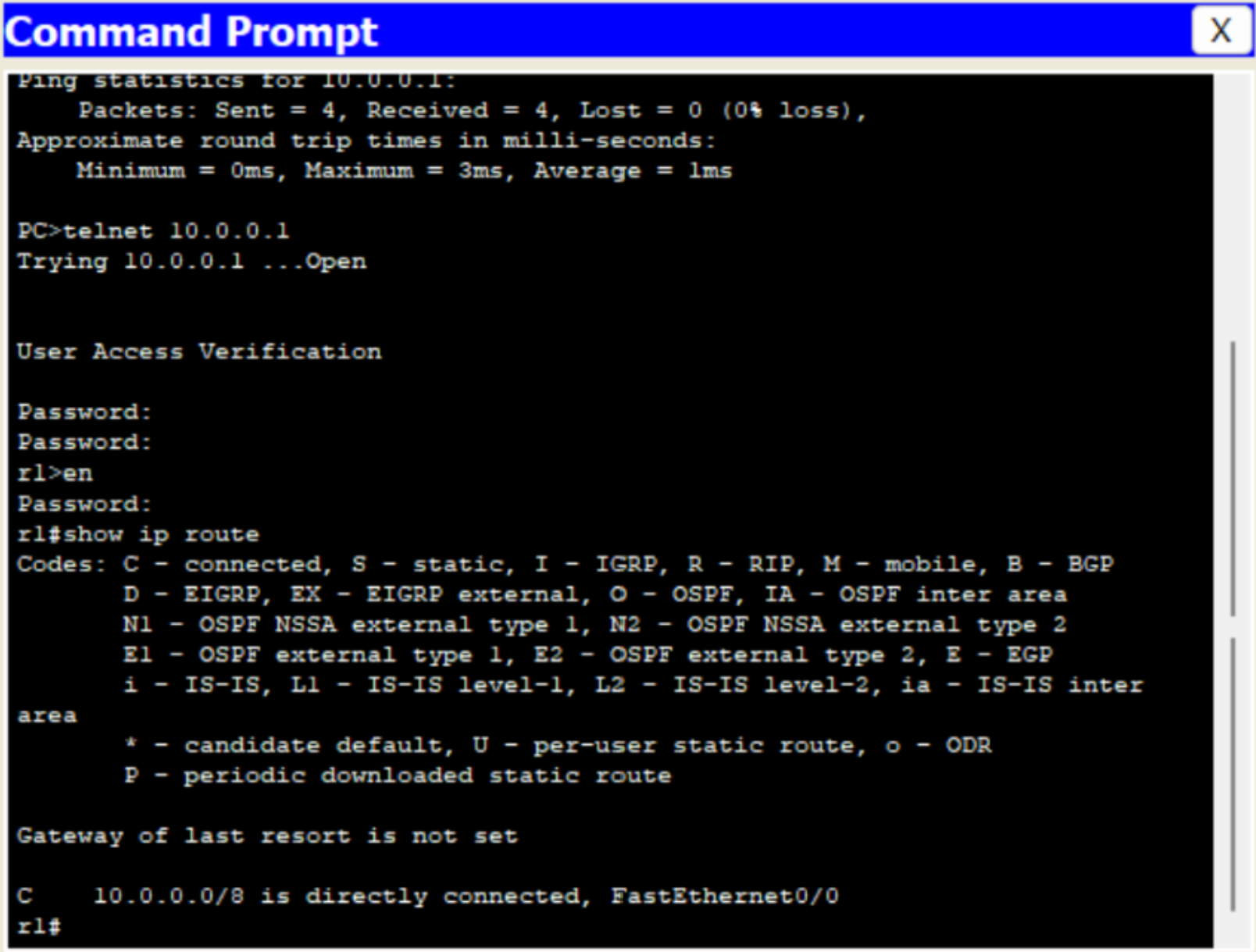
```
Router>en
Router#cong t
          ^
% Invalid input detected at '^' marker.

Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname r1
r1(config)#enable secret p1
r1(config)#interface fa0/0
r1(config-if)#ip address 10.0.0.1 255.0.0.0
r1(config-if)#no shut

r1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to
up

r1(config-if)#line vty 0 5
r1(config-line)#login
% Login disabled on line 132, until 'password' is set
% Login disabled on line 133, until 'password' is set
% Login disabled on line 134, until 'password' is set
% Login disabled on line 135, until 'password' is set
% Login disabled on line 136, until 'password' is set
% Login disabled on line 137, until 'password' is set
r1(config-line)#password p0
r1(config-line)#
r1(config-line)#exit
r1(config)#exit
r1#
```


Command Prompt
X
Ping statistics for 10.0.0.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 3ms, Average = 1ms
PC>telnet 10.0.0.1
Trying 10.0.0.1 ...Open
User Access Verification
Password:
Password:
r1>en
Password:
r1#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter
area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
Gateway of last resort is not set
C 10.0.0.0/8 is directly connected, FastEthernet0/0
r1#

Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.1

Pinging 10.0.0.1 with 32 bytes of data:

Reply from 10.0.0.1: bytes=32 time=1ms TTL=255
Reply from 10.0.0.1: bytes=32 time=0ms TTL=255
Reply from 10.0.0.1: bytes=32 time=0ms TTL=255
Reply from 10.0.0.1: bytes=32 time=3ms TTL=255

Ping statistics for 10.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 3ms, Average = 1ms
```

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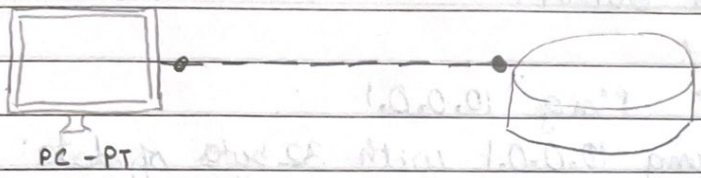
TELNET

Aim:- To understand the operation of TELNET by accessing the router in server room from a PC in IT office.

Topology:



Procedure:

- Create a topology as shown, a PT-PC & a router
- Configure the IP address & gateway for PC0
- Configure the router by executing the following commands:

Step 1: enable.
step 2: config T
step 3: host name p1
step 4: enable secret p1
step 5: interface fa 0/0
step 6: ip address 10.0.0.1 255.0.0.0
step 7: No shut
step 8: line vty 0 5
step 9: log in
step 10: password po
step 11: exit, exit

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Step 12: CLI

Ping message to routes
Password for user Access Verification is p0
password for enable is p1
Accessing router CLI from PC
Show ip route

PING OUTPUT:

PC > Ping 10.0.0.1
Pinging 10.0.0.1 with 32 bytes of data:
Reply from 10.0.0.1: bytes = 32 time = 0ms TTL = 255
Reply from 10.0.0.1: bytes = 32 time = 0ms TTL = 255
Reply from 10.0.0.1: bytes = 32 time = 0ms TTL = 255
Reply from 10.0.0.1: bytes = 32 time = 0ms TTL = 255

Ping statistics for 10.0.0.1
Packets sent = 4 Recieved = 4 Loss = 0 (0% loss)
Approximate round trip times in milliseconds:
minimum = 0ms, Maximum = 0ms, Average = 0ms

PC > telnet 10.0.0.1
Typing 10.0.0.1 ... open
user access verification
Password: P0
P1 > enable
Password: P1
r1 # show ip route

C 10.0.0.0/8 is directly connected, FastEthernet0/0

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Observation:

→ TELNET stands for Teletype Network. It is a type of protocol that enables one computer to connect to the local computer.

→ It is used as a standard TCP/IP protocol for virtual terminal service provided by ISO.

→ TELNET operates on a client/server principle.

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CYCLE - 2

Experiment - 13

Aim: Write a program for error detecting code using CRCCCITT (16-bits).

CRC - 16

```
#include <stdio.h>
#include <string.h>

void binaryXOR (char *result, const char *a,
                const char *b) {
    for (int i = 0; i < 16; i++) {
        result[i] = (a[i] == b[i]) ? '0' : '1';
    }
    result[16] = '\0';
}

void calculateCRC (const char *data, int length,
                   char *checksum)
{
    char crc[17];
    for (int i = 0; i < 16; i++) {
        crc[i] = '0';
    }
    crc[16] = '\0';

    for (int i = 0; i < length; i++) {
        for (int j = 0; j < 8; j++) {
            char msb = crc[0];
            for (int k = 0; k < 16; k++) {
                crc[k] = crc[k+1];
            }
            crc[15] = '0';

            if (msb == '1') {
                char temp[17];
```

```
            binaryXOR(temp, crc, "10001000001000001");
            strcpy(crc, temp);
        }
    }
    crc[15] = (data[i] == '1') ? '1' : '0';
  }
  strcpy(checksum, crc);
}

int main() {
  char data[100];
  printf("Enter data in binary: ");
  scanf("%s", data);

  int dataLength = strlen(data);
  char checksum[17];
  calculateCRC(data, dataLength, checksum);

  printf("Calculated CRC: %s\n", checksum);
  char receivedChecksum[17];
  printf("Enter recieved CRC: ");
  scanf("%s", recievedChecksum);

  if (strcmp(recievedChecksum, checksum)
                                  == 0) {
    printf("Data is error-free.\n");
  }
  else {
    printf("Data contains errors");
  }
  return 0;
}
```

Output:

Enter data in Binary : 10001
Calculated CRC - 0111001001000001
Enter recieved CRC : 1011100100111100
Data contains error

Enter Data in Binary
Calculated CRC 0111001001000000
Enter recieved CRC : 0111001001000000
Data is error-free.

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```
Enter data to be transmitted: 1010101111

 Enter the Divisor: 10101


 Data padded with n-1 zeros : 101010111100000000000000000

CRC or Check value is : 1100
 rem strlen is : 4
 101010111100000000000000000
 101010111100000000000000100
 101010111100000000000000110

 Final data to be sent : 101010111100000000000000110

Enter the received data: 101010111100000000000000110


Data received: 101010111100000000000000110
Error detected


Process returned 0 (0x0)   execution time : 38.224 s
Press any key to continue.
```

```
Enter data to be transmitted: 100011100011

 Enter the Divisor: 1001


 Data padded with n-1 zeros : 1000111000110000000000000000


CRC or Check value is : 000

 rem strlen is : 4
 1000111000110000000000000000

 1000111000110000000000000000

 1000111000110000000000000000


 Final data to be sent : 1000111000110000000000000000


Enter the received data: 1000111000110000000000000000


Data received: 1000111000110000000000000000
No error detected


Process returned 0 (0x0)   execution time : 20.893 s
Press any key to continue.
```

Experiment - 14

Aim: Write a program for congestion control using Leaky
bucket algorithm.

leaky bucket

Aim: Write a program for congestion control using Leaky bucket algorithm.

```
# include< stdio.h>
# include <conio.h>
 void main ()
{
    int bucket_size;
    int dr;
    printf ("Enter the bucket size &
                    data rate \n");
    scanf ("%d", & bucket_size);
    scanf ("%d", & dr);
    int emp = bucket_size ;
    while (1)
    {
      int ch;
      int ps;
      printf ("Enter the packet size: \n");
      scanf ("%d", &ps);
      if ( ps <= bucket size)
      {
          if ( ps <= emp)
            printf ("packet of size
                  %d transmitted
                  \n");
        else
          printf ("packet dropped \n");
      emp = emp ps+dr;
    }
```

```
else
    printf("packed dropped");

    printf("Want to continue transmitting dat
    scanf("%d", &ch);
    if(ch == 0)
        break;
    }
}
```

output:

Enter bucket size and data rate
5000
200
Enter the packet size :
6000
packet dropped
Want to continue transmitting dat ?
1 or 0? :1
Enter the packet size :
3000
packet of size 2000 transmitted.
Do you Want to continue transmitting data?
1 or 0? : 1.
Enter size of packet:
2000
packet of size 2000 transmitted.
Want to continue transmitting data?
1 or 0? : 0

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```
Enter bucket size and data rate
1000
200
Enter the packet size :
 600
remaning empty size 1000
packet of size 600 transmitted :
Do you want to continue transmitting data?
 1 or 0? :1
Enter the packet size :
 100
remaning empty size 600
packet of size 100 transmitted :
Do you want to continue transmitting data?
 1 or 0? :1
Enter the packet size :
 700
remaning empty size 700
packet of size 700 transmitted :
Do you want to continue transmitting data?
 1 or 0? :1
Enter the packet size :
 100
remaning empty size 200
packet of size 100 transmitted :
Do you want to continue transmitting data?
 1 or 0? :
```

Experiment - 15

Aim: Using TCP/IP sockets, write a client-server program to make client sending the file name and the server to send back the contents of the requested file if present.

Experiment - 15.

Aim: Using TCP/IP sockets, write a client - server program to make client-server program to make client sending the file name and the server to send back contents of file.

Solution:

Client TCP.py

```
from socket import *
serverName = '127.0.0.1'
serverPort = 12000
clientSocket = socket(AF_INET, SOCK_STREAM)
clientSocket.connect((serverName, serverPort))
sentence = input("\n Enter file name :")

clientSocket.send(sentence.encode())
filecontents = clientSocket.recv(1024).decode()
print('\n From server: \n')
print(filecontents)
clientSocket.close()
```

Server TCP.py

```
from socket import *
serverName = "127.0.0.1"
serverPort = 12000
serverSocket = socket(AF_INET, SOCK_STREAM)
serverSocket.listen(1)
while 1:
    print("The server is ready to recieve")
```

```
connectionSocket, addr = serverSocket.accept()
sentence = connectionSocket.recv(1024).decode()

file = open(sentence, "r")

l = file.read(1024)

connectionSocket.send(l.encode())
print('\n Sent contents of ' + sentence)
file.close()
connectionSocket.close()
```

Output:

Server side:

The server is ready to recieve

client side:

Enter file name: ServerTCP.py

From Server:

from socket import:

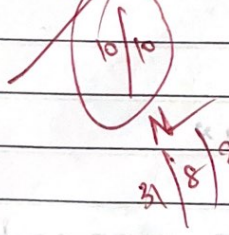
:

server side: (The code above of serverTCP.py is printed)

The server is ready to recieve

Sent contents of ServerTCP.py

The server is ready to recieve.



IDLE Shell 3.11.2

File Edit Shell Debug Options Window Help

```
Python 3.11.2 (tags/v3.11.2:878ead1, Feb  7 2023, 16:38:35) [MSC v.1934 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
========== RESTART: F:/CN/cycle2/ServerTCP.py ==========
The server is ready to receive

Sent contents ofServerTCP.py
The server is ready to receive
```

IDLE Shell 3.11.2

File Edit Shell Debug Options Window Help

```
Python 3.11.2 (tags/v3.11.2:878ead1, Feb  7 2023, 16:38:35) [MSC v.1934 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
========== RESTART: F:/CN/cycle2/ClientTCP.py ==========

Enter the file name: ServerTCP.py

From sever:

from socket import *
serverName="127.0.0.1"
serverPort = 12000
serverSocket=socket(AF_INET,SOCK_STREAM)
serverSocket.bind((serverName,serverPort))
serverSocket.listen(1)
while 1:
    print("The server is ready to receive ")
    connectionSocket,addr=serverSocket.accept()
    sentence = connectionSocket.recv(1024).decode()

    file=open(sentence,"r")
    l=file.read(1024)

    connectionSocket.send(l.encode())
    print('\nSent contents of'+sentence)
    file.close()
    connectionSocket.close()
```

Experiment - 16

Aim: Using UDP sockets, write a client-server program to make client sending the file name and the server to send back the contents of the requested file if present.

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UDP

Using UDP sockets, write a client server program to make client sending the file name and the server to send back the contents of the requested file if present.

SOLUTION:

ClientUDP.py

```
from socket import *
serverName = "127.0.0.1"
serverPort = 12000
clientSocket = socket(AF_INET, SOCK_DGRAM
sentence = input("\n Enter file name : ")
clientSocket.sendto(bytes(sentence, "utf-8"),
        (serverName, serverPort))
fileContents, serverAddress = clientSocket.recvfrom
                                        (2048)
print('\n Reply from Server: \n')
print(fileContents.decode("utf-8"))
# for i in fileContents:
#     print(str(i), end = '')
clientSocket.close()
ClientSocket.close()
```

ServerUDP.py

```
from socket import *
serverPort = 12000
serverSocket = socket(AF_INET, SOCK_DGRAM)
serverSocket.bind(("127.0.0.1", serverPort))
print("The server is ready to recieve")
while 1:
    sentence, clientAddress = serverSocket.recvfrom(2048)
    sentence = sentence.decode("utf-8")
    file = open(sentence, "r")
    con = file.read(2048)
    serverSocket.sendto(bytes(con, "utf-8"),
                        clientAddress)
    print('\nSent content of ', end = '')
    print(sentence)
    file.close()
```

SOLUTION:

Server side

The server is ready to recieve

Sent contents of server UDP.py
The server is ready to recieve.

Client side

Enter file name : serverUDP.py

Reply from server:
from socket import *
:
(Code of serverUDP.py written above is printed)

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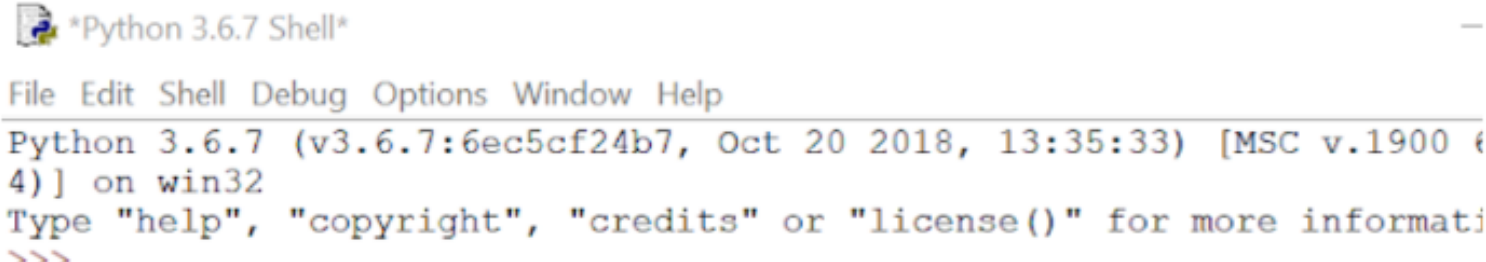
Python 3.6.7 Shell
File Edit Shell Debug Options Window Help
Python 3.6.7 (v3.6.7:6ec5cf24b7, Oct 20 2018, 13:35:33) [MSC v.1900 6
4)] on win32
Type "help", "copyright", "credits" or "license()" for more informati
>>>
========== RESTART: D:\AUG_DEC 2021\CN\LAB\cycle 3\ServerUDP.py ===
The server is ready to receive
Sent contents of ServerUDP.py
The server is ready to receive

Python 3.6.7 Shell

File Edit Shell Debug Options Window Help

```
Python 3.6.7 (v3.6.7:6ec5cf24b7, Oct 20 2018, 13:35:33) [MSC v.1900 64 bit (AMD6
4)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
============ RESTART: D:\AUG_DEC 2021\CN\LAB\cycle 3\ClientUDP.py ============

Enter file name:  ServerUDP.py

Reply from Server:

from socket import *
serverPort = 12000
serverSocket = socket(AF_INET, SOCK_DGRAM)
serverSocket.bind(("127.0.0.1", serverPort))

while 1:
     print ("The server is ready to receive")
     sentence, clientAddress = serverSocket.recvfrom(2048)
     sentence = sentence.decode("utf-8")
     file=open(sentence,"r")
     l=file.read(2048)

     serverSocket.sendto(bytes(l,"utf-8"),clientAddress)

     print ('\nSent contents of ', end = ' ')
     print (sentence)
    #  for i in sentence:
        #  print (str(i), end = '')
     file.close()
```

Experiment - 17

Tool Exploration -Wireshark

31-8-23

Wireshark

Originally known as Ethereal. Wireshark displays data from hundreds of different protocols on all major network types. Data packets can be viewed in Real-time or analyzed offline. Wireshark supports dozens of capture / trace file formats, including CAP and ERF. Integrated decryption tools display the encrypted packets for several common protocols including WEP & WPA/WPA2

Packet List:

The packet list pane, located at the top of the window, shows all packets found in active capture file. Each packet has its own row & corresponding number assigned to it; along with each of these data points

No:
This field indicates which packets are part of same conversation

Time: stamp of
The timestamp of when the packet was captured is displayed in that column.

Source: This column contains the address (IP or other) where the packet originated.

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Date: Page:

Destination: This column contains the address that the packet is being sent to

- Protocol:
The packet's protocol name, such as TCP, can be found in this column.

- Length.
The packet length, in bytes, is displayed in this column.

Info:
Additional details about packet are presented in this column. The contents of this column are vary greatly depending on packet contents.

Packet Details

The details pane, found in the middle presents the protocol and protocol fields of the selected packet in a collapsible format. In addition to expanding each section, one can apply individual Wireshark filters based on specific details and follow streams of data based on protocol type by right clicking the desired item

Wireshark is free and opensource packet analyzer. It is used to track, filter and view packets that are exchanged in

a network.

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