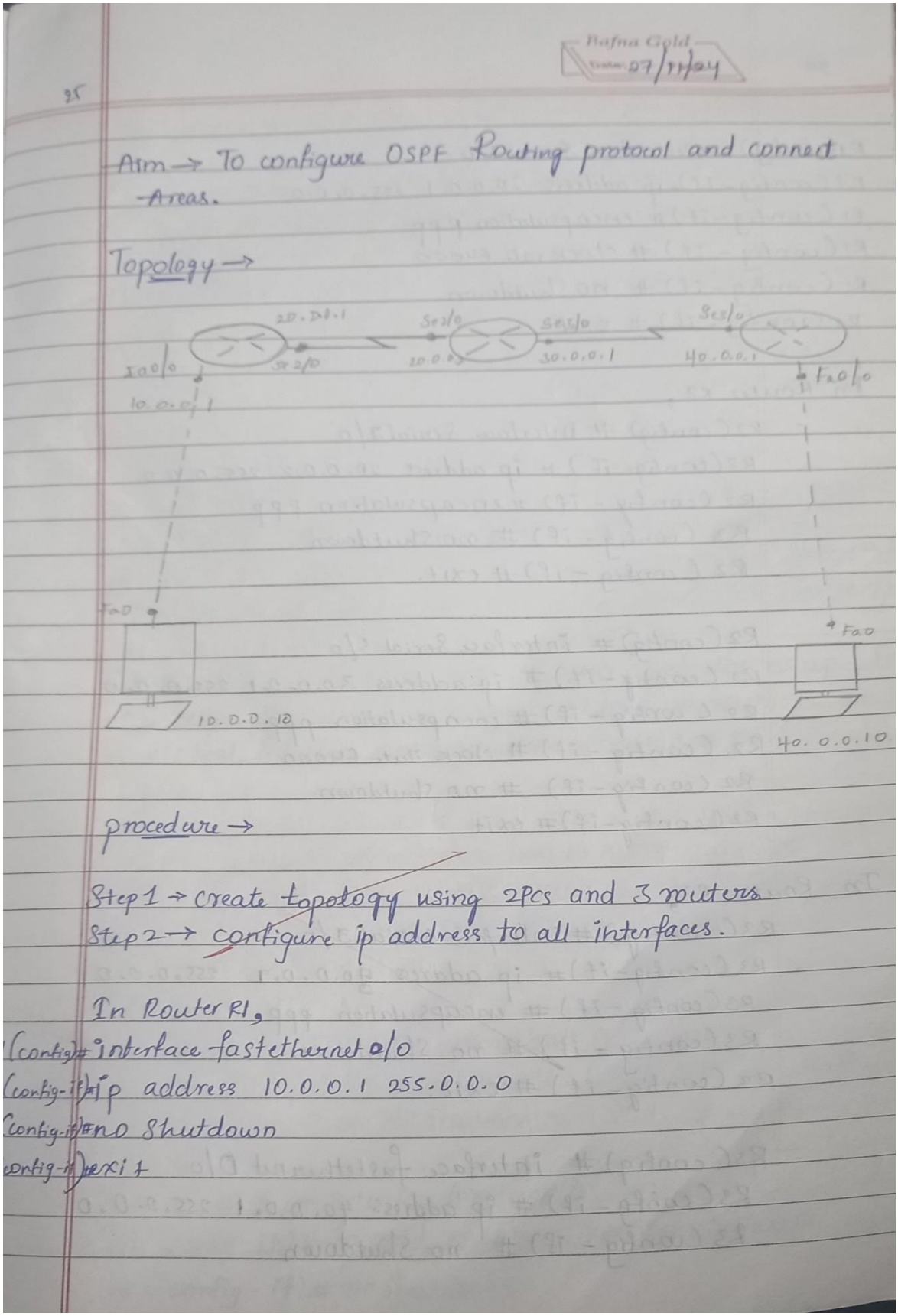
Experiment 6- Configure OSPF routing protocol



R1(config) # interface Serial 2/0
R1(config-if) # ip address 20.0.0.1 255.0.0.0
R1(config-if) # encapsulation ppp
R1(config-if) # clock rate 64000
R1(config-if) # no shutdown
R1(config-if) # exit

In Router R2,

R2(config) # interface Serial 2/0
R2(config-if) # ip address 20.0.0.2 255.0.0.0
R2(config-if) # encapsulation ppp
R2(config-if) # no shutdown
R2(config-if) # exit.

R2(config) # interface Serial 3/0
R2(config-if) # ip address 30.0.0.1 255.0.0.0
R2(config-if) # encapsulation ppp
R2(config-if) # clock rate 64000
R2(config-if) # no shutdown
R2(config-if) # exit.

In Router R3,

R3(config) # interface serial 3/0
R3(config-if) # ip address 30.0.0.2 255.0.0.0.
R3(config-if) # encapsulation ppp.
R3(config-if) # no shutdown.
R3(config-if) # exit.

R3(config) # interface fastethernet 0/0
R3(config-if) # ip address 40.0.0.1 255.0.0.0
R3(config-if) # no shutdown

Bafna Gold
Date: Page:

R3(config-if)# exit.

Step4 —> Now check routing table of R1,
Router # Show ip route

Here R2 knows Area 0 Network 20.0.0.0. connected to R2 from R1, so R1 learn network through this network.
R3(config)# router ospf 1, Here 1 is process id, It can be 1-65535 It initializes ospf process.

Gateway of last resort is not set
C 10.0.0.0/8 is directly connected, Fastethernet 0/0
C 20.0.0.0/8 is directly connected, Serial 2/0
O IA 40.0.0.0/8 via 20.0.0.2 00:04:23 Serial 2/0
O IA 30.0.0.0/8 via 20.0.0.2 00:07:29 Serial 2/0

There must be Interface up of Keep ospf process up. So it better to configure loopback address to routers. It is a virtual interface never goes down once we configured.

R1,
R1(config-if)# interface loopback 0
R1(config-if)# ip add 172.16.1.252 255.255.0.0
R1(config-if)# no shutdown

R2,
R2(config-if)# Interface loopback 0
R2(config-if)# ip add 172.16.1.253 255.255.0.0
R2(config-if)# no shutdown

R3(config-if)# interface loopback 0
R3(config-if)# ip add 172.16.1.254 255.255.0.0
R3(config-if)# no shutdown

Steps → Now, check routing table of R3

R3 # show ip route

Step 6 → create virtual link b/w R1, R2 by this we create a virtual link to connect area 3 to area 0

R1,
router ospf 1
area 1 virtual-link 2.2.2.2
exit

R2, area 1 virtual-link 1.1.1.1
exit

Step 7 → R2 and R3 get updates about area 3, Now checking routing table of 3

R3 # Show ip route

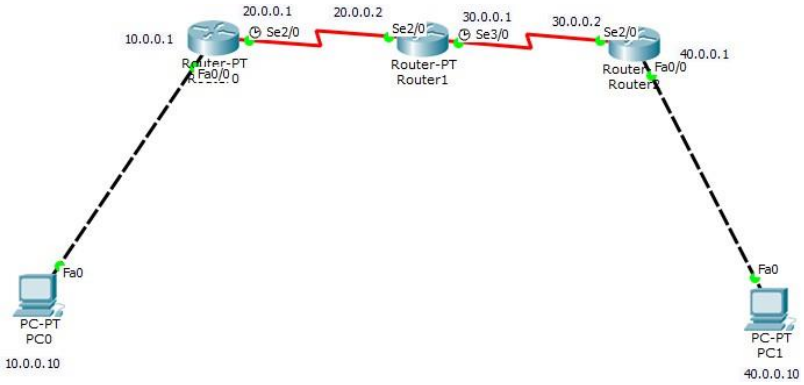
Output → O/P Ping from PC 40.0.0.10

PC > ping 10.0.0.10

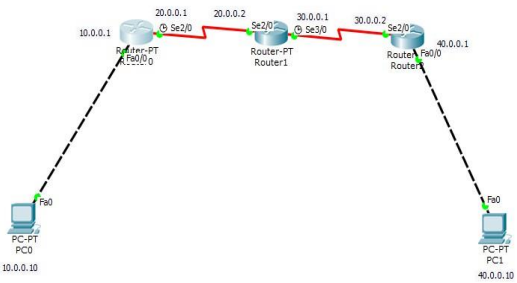
Pinging 10.0.0.10 with 32 bytes of data
Reply from 10.0.0.10: bytes = 32 time = 9ms TTL = 125
Reply from 10.0.0.10: bytes = 32 time = 9ms TTL = 125
Reply from 10.0.0.10: bytes = 32 time = 9ms TTL = 125
Reply from 10.0.0.10: bytes = 32 time = 9ms TTL = 125

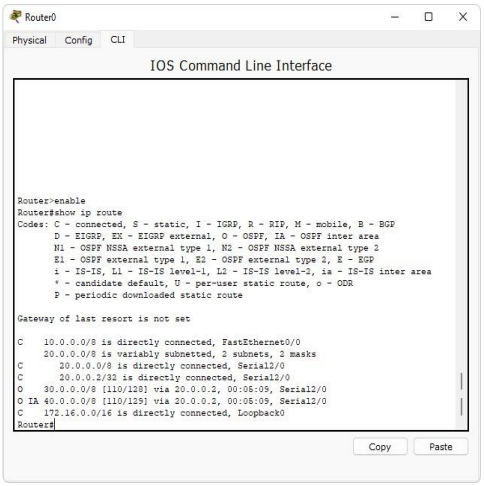
Ping Statistics for 10.0.0.10:
Packets: Sent = 4 Recieved = 4 lost = 0 (0% loss),
Approximate round trip times in Mili-seconds:
Minimum = 7ms, Maximum = 9ms, Average = 8ms.

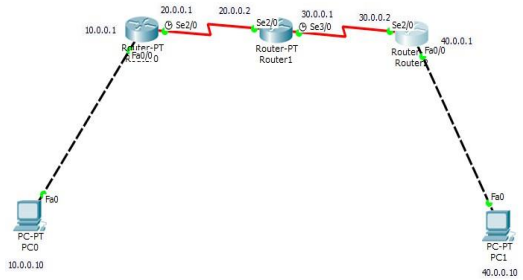
Topology:

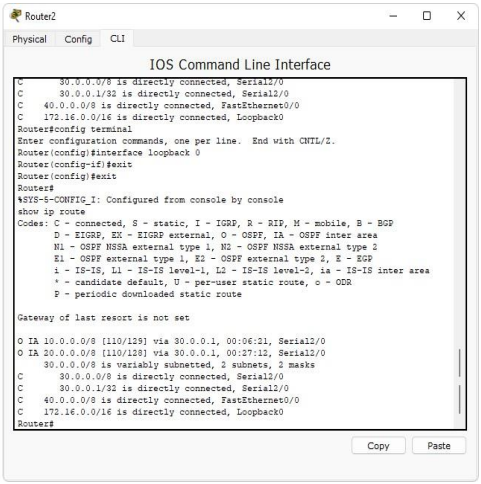

20.0.0.1
20.0.0.2
30.0.0.1
30.0.0.2
10.0.0.1
Se2/0
Se2/0
Se3/0
Se2/0
Fa0/0
40.0.0.1
Router-PT
Router1
Fa0
Fa0
PC-PT
PC0
10.0.0.10
PC-PT
PC1
40.0.0.10

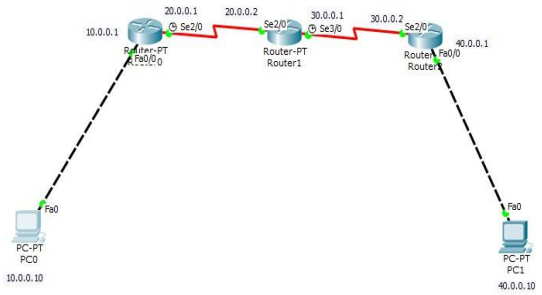
Output:

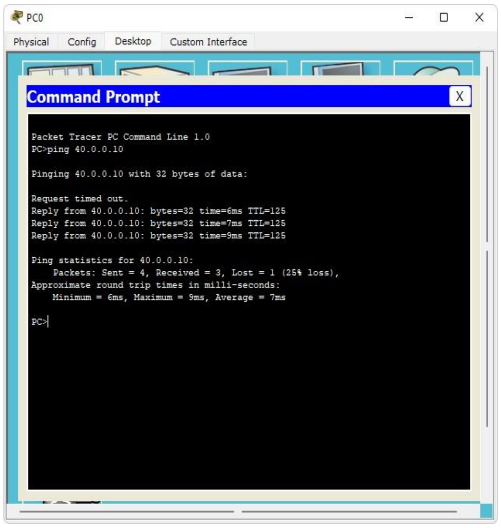

20.0.0.1
20.0.0.2
30.0.0.1
30.0.0.2
10.0.0.1
Se2/0
Se3/0
Fa0/0
40.0.0.1
Router-PT
Router1
Router2
Fa0
PC-PT
PC0
PC1
10.0.0.10
40.0.0.10

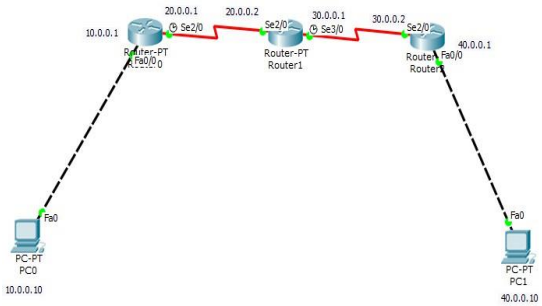

Router0
Physical
Config
CLI
IOS Command Line Interface
Router>enable
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external 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
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 20.0.0.2/32 is directly connected, Serial2/0
O 30.0.0.0/8 [110/128] via 20.0.0.2, 00:06:09, Serial2/0
O IA 40.0.0.0/8 [110/129] via 20.0.0.2, 00:06:09, Serial2/0
C 172.16.0.0/16 is directly connected, Loopback0
Router#
Copy
Paste

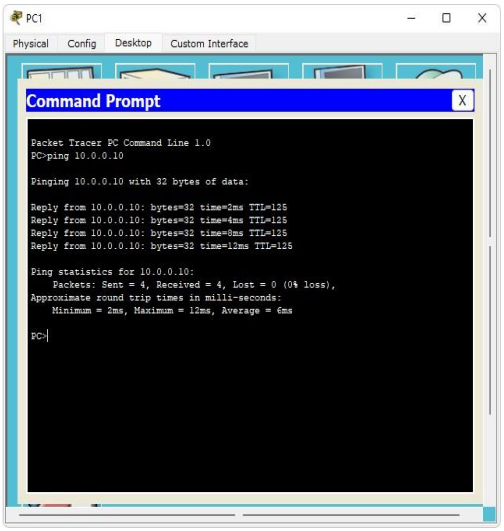

20.0.0.1
20.0.0.2
30.0.0.1
30.0.0.2
10.0.0.1
Se2/0
Se3/0
Fa0/0
40.0.0.1
Router-PT
Router1
Router2
Fa0
PC-PT
PC0
PC1
10.0.0.10
40.0.0.10


Router2
Physical
Config
CLI
IOS Command Line Interface
C 30.0.0.0/8 is directly connected, Serial2/0
C 30.0.0.1/32 is directly connected, Serial2/0
C 40.0.0.0/8 is directly connected, FastEthernet0/0
C 172.16.0.0/16 is directly connected, Loopback0
Router#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface loopback 0
Router(config-if)#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
O IA 10.0.0.0/8 [110/129] via 30.0.0.1, 00:06:21, Serial2/0
O IA 20.0.0.0/8 [110/128] via 30.0.0.1, 00:27:12, 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 30.0.0.1/32 is directly connected, Serial2/0
C 40.0.0.0/8 is directly connected, FastEthernet0/0
C 172.16.0.0/16 is directly connected, Loopback0
Router#
Copy
Paste


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


PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Packet Tracer PC Command Line 1.0
PC>ping 40.0.0.10
Pinging 40.0.0.10 with 32 bytes of data:
Request timed out.
Reply from 40.0.0.10: bytes=32 time=6ms TTL=125
Reply from 40.0.0.10: bytes=32 time=7ms TTL=125
Reply from 40.0.0.10: bytes=32 time=9ms TTL=125
Ping statistics for 40.0.0.10:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 6ms, Maximum = 9ms, Average = 7ms
PC>


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


PC1
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=2ms TTL=125
Reply from 10.0.0.10: bytes=32 time=4ms TTL=125
Reply from 10.0.0.10: bytes=32 time=8ms TTL=125
Reply from 10.0.0.10: bytes=32 time=12ms TTL=125
Ping statistics for 10.0.0.10:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 12ms, Average = 6ms
PC>