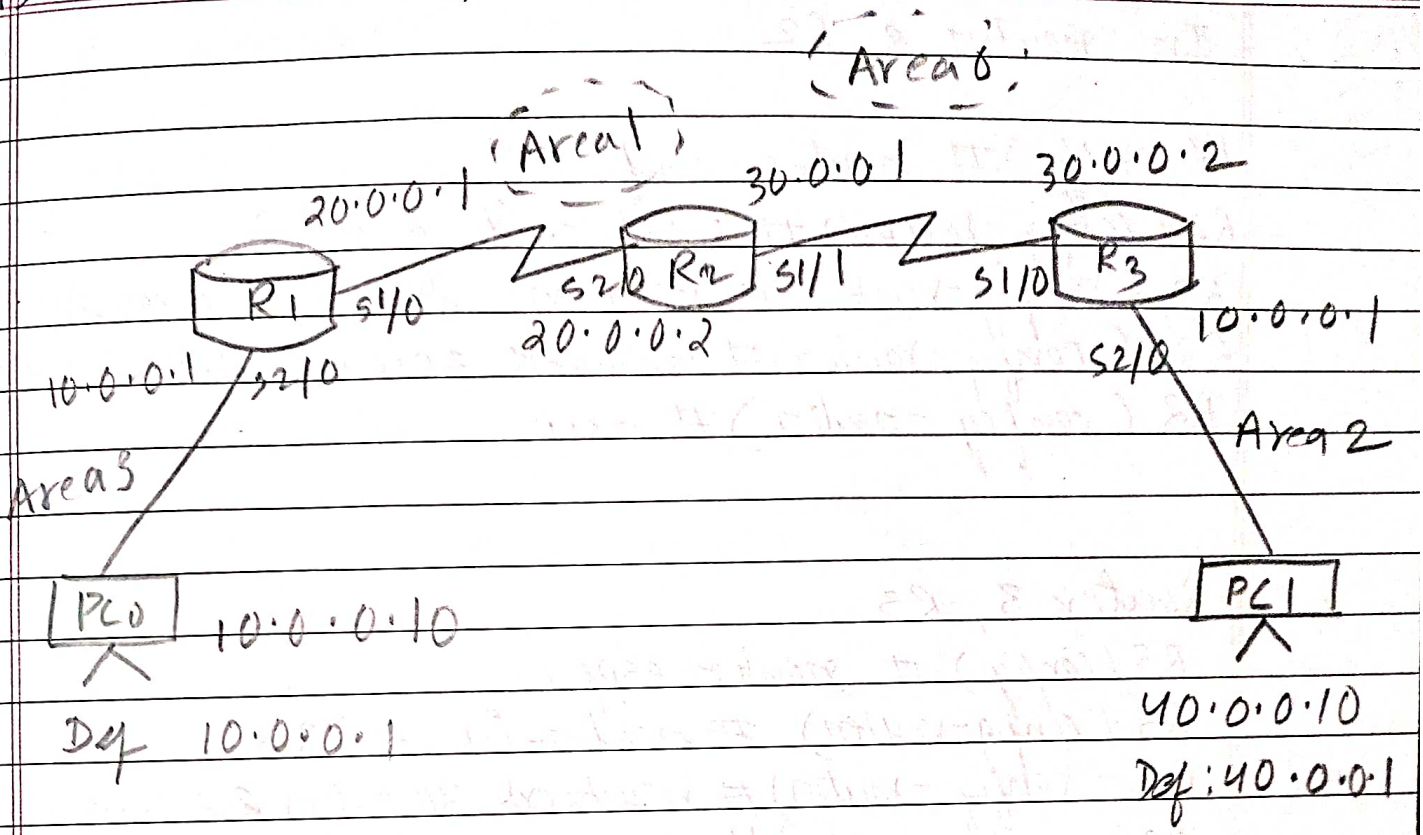
27/4/23

Experiment-7



Procedure:

→ Configure the PC ; IP and gateway as seen in topology
→ configure each of router according to each ip address given in topology
→ Encapsulation ppp and clock rate need to set as done in rip protocol experiment

In router 1

```
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
```

In router 2, 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
R2(config-router)# network 30.0.0.0 0.255.255.255 area
R2(config-router)# exit

Router 3, 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
R3(config-router)# network 40.0.0.0 0.255.255.255 area
R3(config-router)# exit

R1(config-if)# interface loopback 0
R1(config-if)# ip address 172.16.1.252 255.255.255.0
R1(config-if)# no shutdown

R2(config-if)# interface loopback 0
R2(config-if)# ip address 172.16.1.253 255.255.255.0
R2(config-if)# no shutdown

R3(config-if)# interface loopback 0
R3(config-if)# ip address 172.16.1.254 255.255.255.0
R3(config-if)# no shutdown.

In router R1,

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

In router R2,

R2 (config-router) # router ospf 1
R2 (config-router) # area 1 virtual-link 1.1.1.1
R2 (config-router) #exit

Result

> ping 40.0.0.10
Pinging 40.0.0.10 with 32 bytes of data

Reply from 40.0.0.10 bytes=32 time = 9ms TTL = 120
Reply from 40.0.0.10 bytes=32 time =9ms TTL = 120
Reply from 40.0.0.10 bytes=32 time =9ms TTL=120
Reply from 40.0.0.10 bytes=32 time=9ms TTL=120

Ping statistics from 40.0.0.10
Packets sent 4, Received 4, Lost = 0
Approximate round trip time in milliseconds
Minimum = 2 ms, Maximum = 11 ms, Average = 8 ms

10/10
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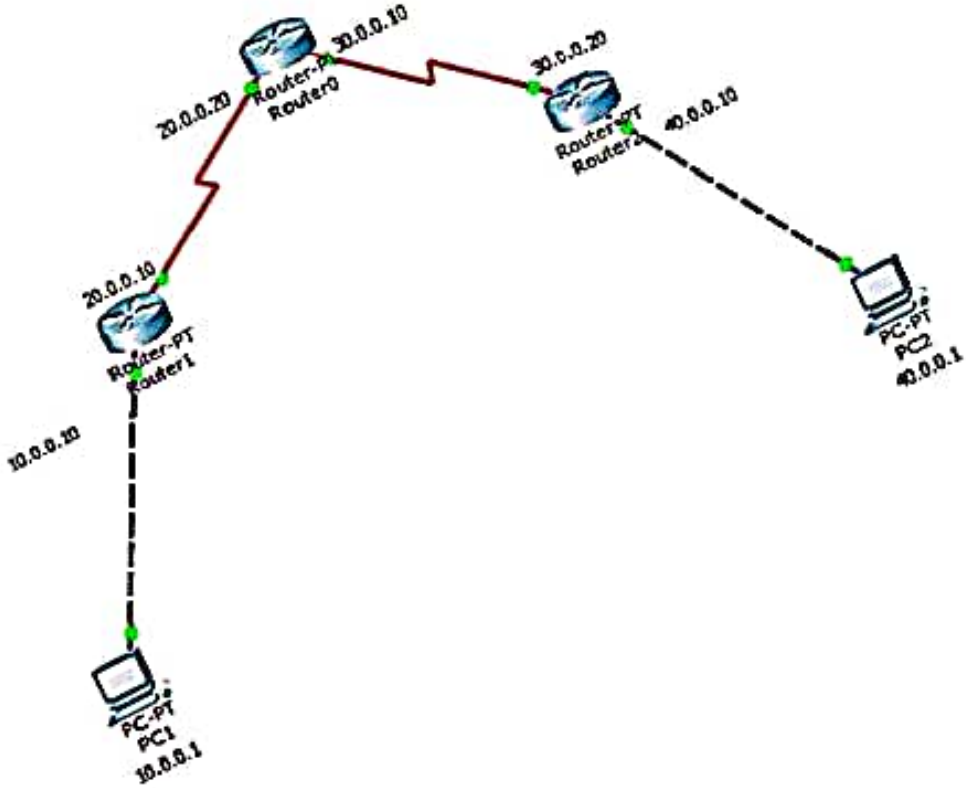
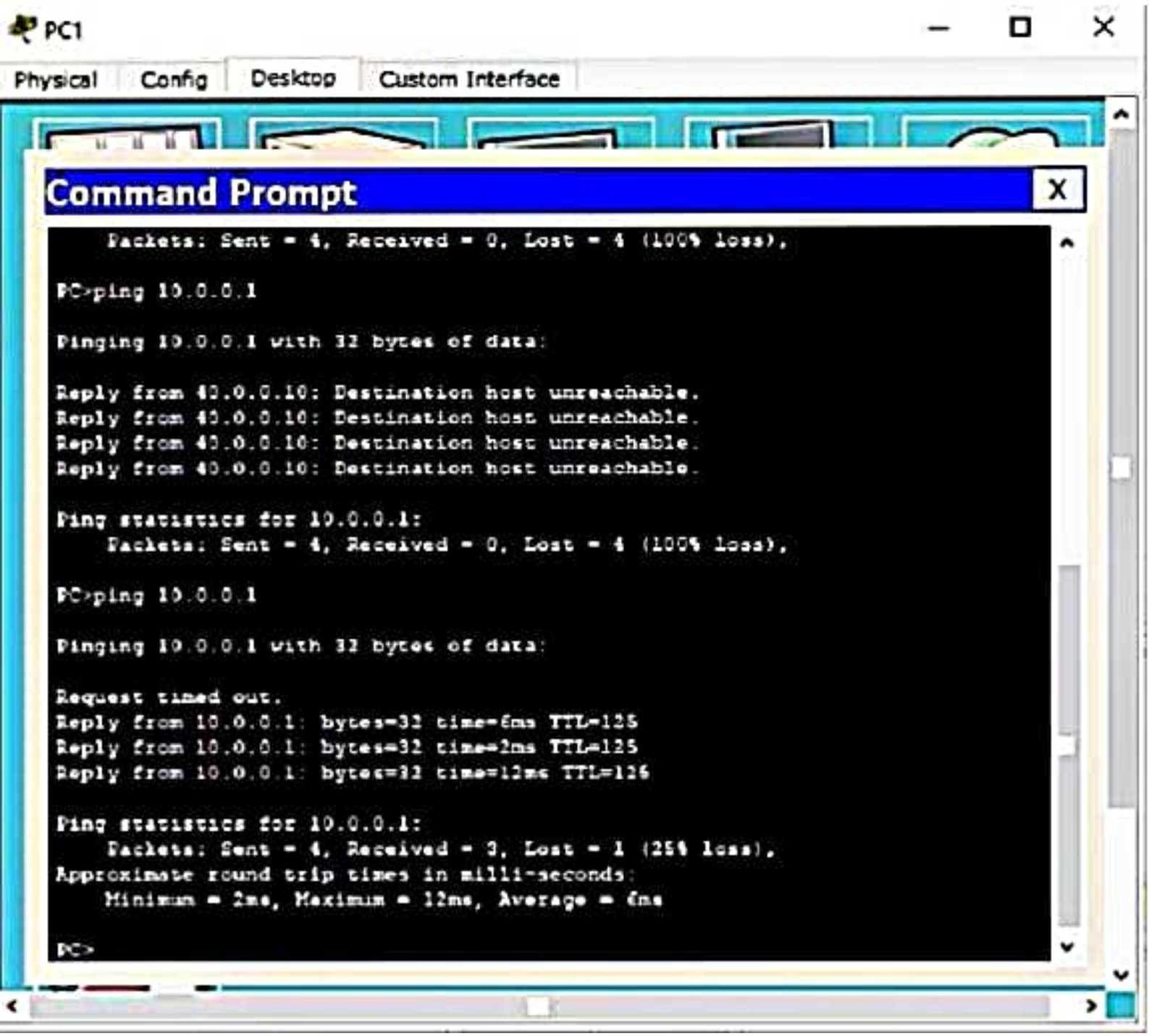
Observation

1) OSPF - open shortest path first is a routing protocol for Internet protocol network
2) It uses a link state routing algorithm and falls into group of gateway protocols, operating within single autonomous system.


20.0.0.20
30.0.0.10
30.0.0.20
40.0.0.10
20.0.0.10
10.0.0.10
PC-PT
PC2
40.0.0.1
PC-PT
PC1
10.0.0.1


PC1
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
PC>ping 10.0.0.1
Pinging 10.0.0.1 with 32 bytes of data:
Reply from 40.0.0.10: Destination host unreachable.
Reply from 40.0.0.10: Destination host unreachable.
Reply from 40.0.0.10: Destination host unreachable.
Reply from 40.0.0.10: Destination host unreachable.
Ping statistics for 10.0.0.1:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
PC>ping 10.0.0.1
Pinging 10.0.0.1 with 32 bytes of data:
Request timed out.
Reply from 10.0.0.1: bytes=32 time=6ms TTL=125
Reply from 10.0.0.1: bytes=32 time=2ms TTL=125
Reply from 10.0.0.1: bytes=32 time=12ms TTL=126
Ping statistics for 10.0.0.1:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 12ms, Average = 6ms
PC>

TOCommandLineInterface

```
Router(config-router)#area 3 virtual-link 1.1.1.1
Router(config-router)#e
00:28:15: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on OSPF_VL0 from LOADING to FULL,
Loading Done
xit
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

O IA 10.0.0.0/8 [110/65] via 20.0.0.1, 00:00:01, 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       20.0.0.1/32 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       30.0.0.2/32 is directly connected, Serial3/0
O IA 40.0.0.0/8 [110/65] via 30.0.0.1, 00:06:40, Serial3/0
C    172.16.0.0/16 is directly connected, Loopback0
Router#
```

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