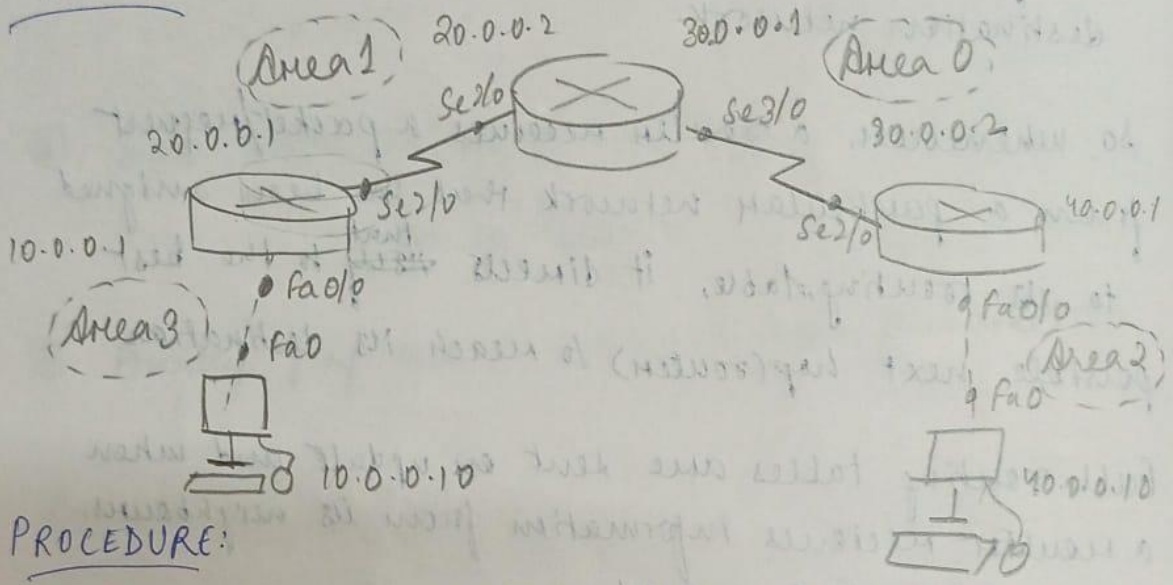
Experiment 6

AIM: Configure OSPF routing protocol

TOPOLOGY:



PROCEDURE:

- Configure the PCs with ip address and gateway, according to the topology seen above. Configure each of the routers accordingly to the above topology
- Encapsulation ppp and clock rate need to be set as done in RIP protocol experiment
- Now enable ip routing by configuring ospf routing protocol

In Router R1

```
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 R2

```
R2(config)# router ospf 1
R2(config-router)# router 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 3

R3(config)# Router ospf 1
R3(config-r)# Router 3.3.3.3
R3(config-router)# network 30.0.0.0 area 0
R3(config-router)# network 40.0.0.0 area 2
exit

- set up loopback

R1(config-if)# interface loopback0
R1(config-if)# ip add 172.16.1.252 255.255.0.0
R1(config-if)# no shut

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 add 172.16.1.254 255.255.0.0
R3(config-if)# no shut

- Create virtual link between the routers

In R1

R1(config)# router ospf 1
R1(config-router)# area1 virtual-link 2.2.2.2

In R2

R2(config-router)# router ospf 2
R2(config-router)# area2 virtual-link 1.1.1.1

R2(config-router)# area 0 virtual-link 3.3.3.3
R2(config-router)# exit

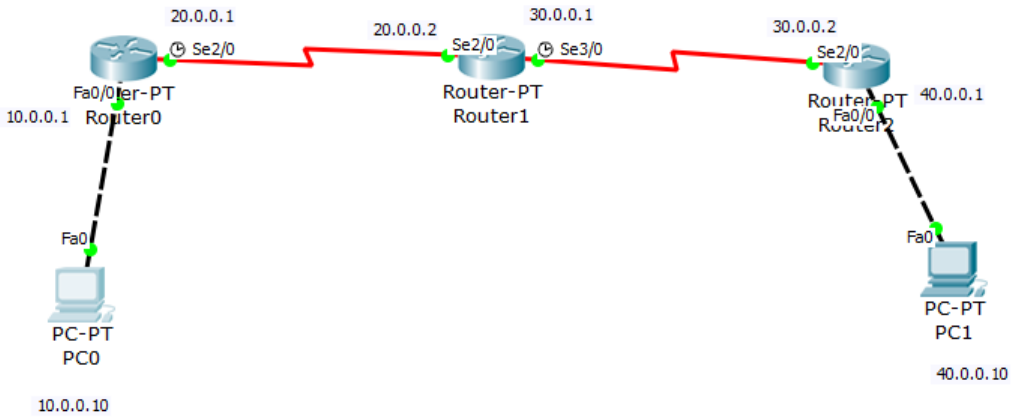
In R3

R3(config-router) router ospf 3
R3(config-router) area 0 virtual-link 2.2.2.2

R1 & R2 get updated about area 1 &
R2 & R3 get updated about area 0

- Now check connectivity between the 2 stations by pinging each other.

OUTPUT :



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=9ms TTL=125
Reply from 40.0.0.10: bytes=32 time=10ms TTL=125
Reply from 40.0.0.10: bytes=32 time=13ms 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 = 9ms, Maximum = 13ms, Average = 10ms

PC>
```

OBSERVATION:

Observation

- OSPF stands for Open Shortest path first, a link-state protocol and as the name suggests, it is used to find the best and the optimal pathway between the starting point and the destination target routers using its own shortest path first algorithm.
- OSPF works on port no. 89
- OSPF generates a topological map of the network from available routers; each network-to-network connection is designated as an area. (Area 3, 1, 0, 2)
- After the virtual-links are made between areas, which is connected to the backbone area, we can ping messages successfully.

3/8/23