

LABORATORY PROGRAM – 6

Configure OSPF routing protocol

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Experiment - 1
OSPF (Open Shortest Path First)

Aim: Demonstrate OSPF routing protocol with several routers and networks

Topology:

Procedure:

- 1) Place three Routers and 2 end devices, connect them as per topology and assign IP addresses.
- 2) Set IP addresses to Routers:

Router 1:

```
Router(Config)# interface serial 0/0
Router(Config-if)# ip address 20.0.0.1 255.0.0.0
Router(Config-if)# encapsulation ppp
Router(Config-if)# clock rate 64000
```

Router 2:

```
Router(Config)# interface serial 0/0
Router(Config)# ip address 30.0.0.2 255.0.0.0
- Here it doesn't have a clock symbol, so no clock rate.
Router(Config)# encapsulation mpp
```

- Similarly set for the other 3 networks

3. OSPF Routing:

Router 1:

Router(Config)# router ospf 1

Router(Config-router)# router-id 1.1.1.1

Router(Config-router)# network 10.0.0.0
0.255.255.255 area 3Router(Config-router)# network 20.0.0.0
0.255.255.255 area 1

- Similarly set for other 2 Routers

2.2.2.2

3.3.3.3

4. Loopback:

Router 1:

Router(Config)# interface loopback 0

Router(Config-if)# ip address 172.16.1.252

255.255.0.0

Router(Config-if)# no shutdown

Similarly for other two Routers:

172.16.1.253

172.16.1.254

5. Ping device 40.0.0.10 from 10.0.0.10

Observations:

1.) Routing Table:

- From Router 3:

Router# show ip route

OTF 10.0.0.0/8 via 30.0.0.1, serial 2/0

OTB 20.0.0.0/8 via 30.0.0.1, Serial 2/0

30.0.0.0/8 is Variably subnetted, 2 subnets, 2 masks

C 30.0.0.0/8 is directly connected, Serial 2/0

C 30.0.0.0/32 is directly connected, Serial 2/0

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

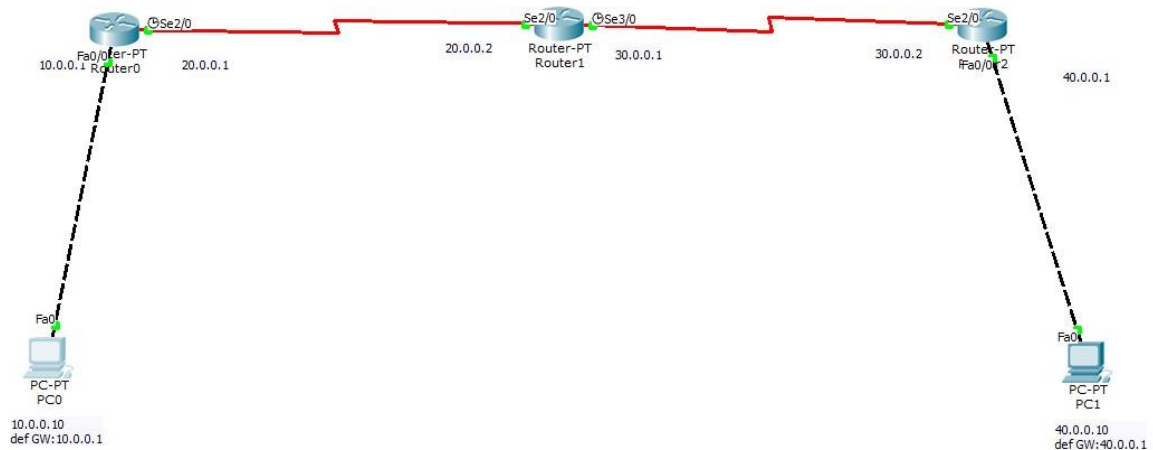
C 172.16.0.0/16 is directly connected, Loop back 0

- All the routers know about each other

- This connection successfully established through OSPF protocol

3) Ping:

- Ping was successful: The data packets were successfully sent from device 10.0.0.10 to 40.0.0.10 as connection was established through OSPF protocol.



PC0

Physical Config Desktop Custom Interface

Command Prompt

```
Pinging 40.0.0.10 with 32 bytes of data:

Request timed out.
Reply from 40.0.0.10: bytes=32 time=7ms TTL=125
Reply from 40.0.0.10: bytes=32 time=7ms TTL=125
Reply from 40.0.0.10: bytes=32 time=8ms 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 = 7ms, Maximum = 8ms, Average = 7ms

PC>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=125
Reply from 40.0.0.10: bytes=32 time=7ms TTL=125
Reply from 40.0.0.10: bytes=32 time=6ms TTL=125
Reply from 40.0.0.10: bytes=32 time=6ms TTL=125

Ping statistics for 40.0.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 6ms, Maximum = 9ms, Average = 7ms

PC>
```