OSPF

open shortest path first - Link state algo

aim : Configure OSPF routing protocol

Topology:

area 0 — backbone network
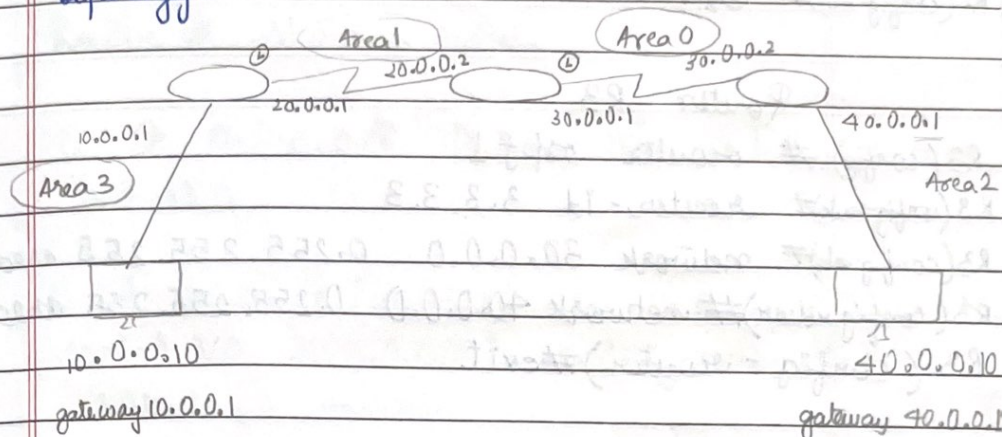
Procedure:

- 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 id 1.1.1.1
R1(config-router)# network 10.0.0.0 0.255.255 area 3
R1(config-rtr)# network 20.0.0.0 0.255.255.255 area 1
R1(config-rtr)# 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 loop back → creating copy

R1(config-if) # interface loopback 0
R1(config-if) # ip address 172.16.1.252 255.255.0
R1(config-if) # no shutdown

R2(config-if) # interface loopback 0
R2(config-if) # ip address 172.16.1.253 255.0.0.0
R2(config-if) # no shut.

R3(config-if)# interface loopback 0
R3(config-if)# ip address 172.16.1.254 255.255.0
R3(config-if)# no shut.

virtual link b/w R10, 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) # area1 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 20.0.0.0/8 [110/128] via 30.0.0.1 , 00:00:4:
serial 3/0   30.0.0.0/8 is variably subnetted ; 2
subnets , 2 marks

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 142.16.0.0/16 is directly connected, loopback 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 times =4ms TTL = 128
Reply from 10.0.0.10: bytes =32 time =8ms TTL= 128

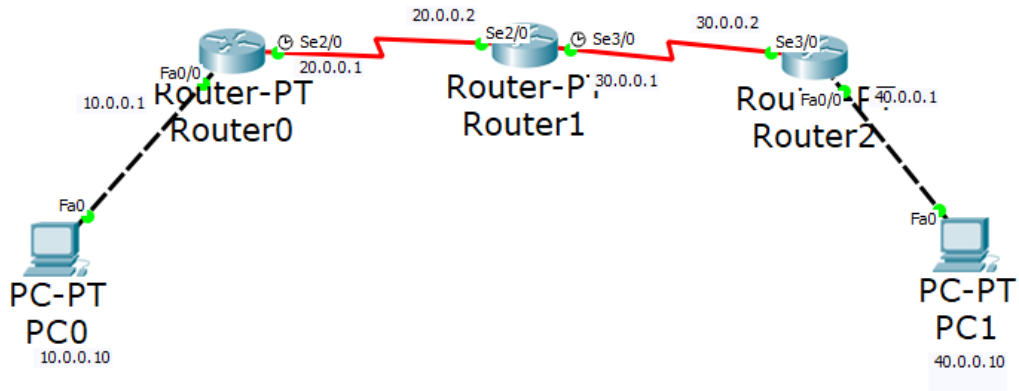Reply from 10.0.0.10: bytes=32 time=8ms TTL=r̄g̈

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 = 6m

10/10 N 2/8/23

20.0.0.2

Se2/0 Se3/0   30.0.0.2

Se2/0   Se3/0

Fa0/0

10.0.0.1   Router-PT   Router-P; 30.0.0.1   Rou   Fa0/0 40.0.0.1
           Router0   Router1   Router2

Fa0   Fa0

PC-PT   PC-PT
PC0   PC1

10.0.0.10   40.0.0.10

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   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=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>
```