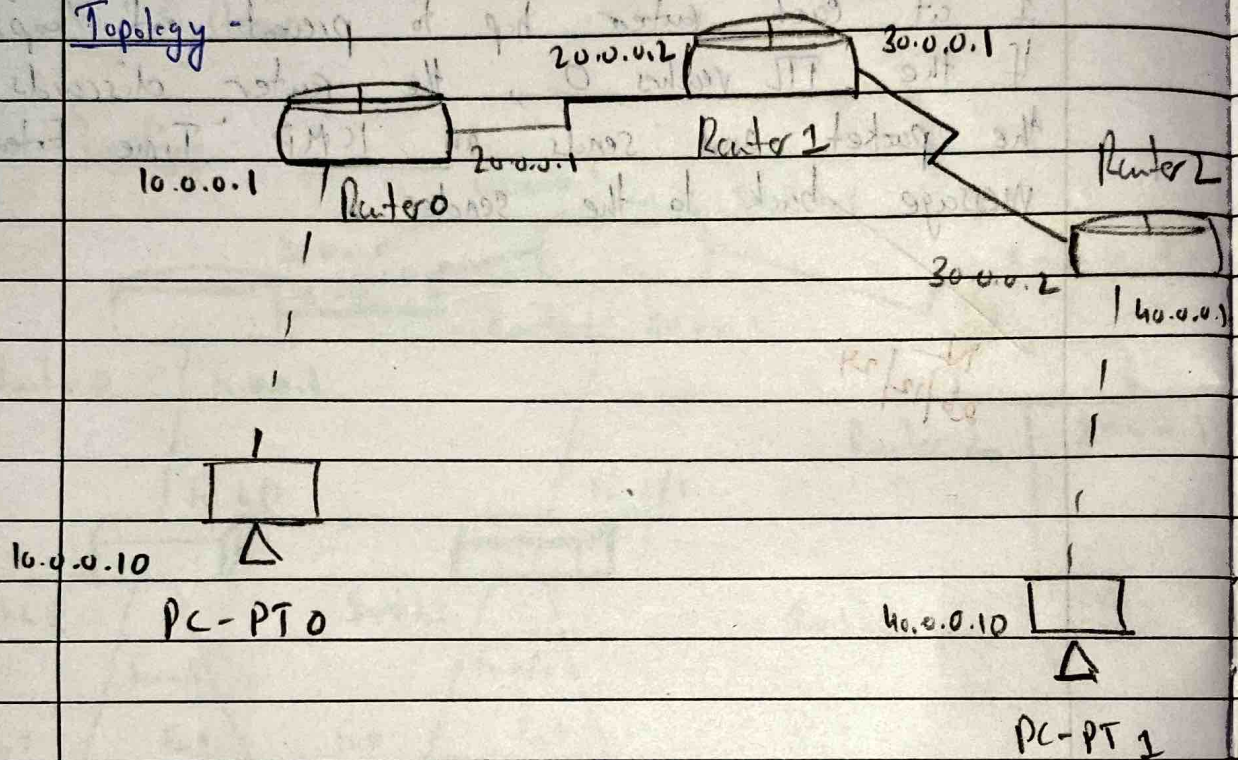## Experiment 7 - Configure OSPF routing protocol

Aim - Configuring OSPF routing for given topology.

Topology -

1. Router 1 connected to Router0 and Router 2 through interfaces Se #2/0 and Se 3/0.

2. PC0 connected to Router0 via cross cable through Fa 0/0 interface, with IP address 10.0.0.10.

3. PC1 connected to Router2 via cross cable through Fa 0/0 interface, with IP address 40.0.0.10.

Procedure

Open cisco packet tracer and drag the following:

Router: Place 3 routers in the middle.

PC: Place 2 PC's each connected to

Router 0 and Router 1 via Fa 0/0 interface.

Configure all 3 routers:

Router 0:

Router > enable

Router (config) # > config terminal

Router (config) > interface fastethernet 0/0

Router (config-if) > ip address 10.0.0.1 255.0.0.0

Router (config - if) > no shut

Router (config) > interface serial 2/0

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 (config-if) > no shut

· Router 1:

Router (config) > interface serial 2/0

Router (config-if) > encapsulation ppp

Router (config-if) > ip address 20.0.0.2 255.0.0.0

Router (config) > interface serial 3/0

Router (config-if) > ip address 30.0.0.1 255.0.0.0

Router (config-if) > encapsulation ppp

Router (config-if) > clock rate 64000

Router (config-if) > no shut

- **Router 2**

  Router (config) > interface serial 2/0
  Router (config-if) > ip address 80.0.0.2 255.0.0.0
  Router (config-if) > encapsulation PPP
  Router (config-if) > clock rate 64000
  Router (config-if) > no shut

  Router (config) > interface fastethernet 0/0
  Router (config-if) > ip address 40.0.0.1 255.0.0.0
  Router (config-if) > no shut
  Router (config) > exit

- **PC1**

  Set ip address = 10.0.0.10
  Subnet mask = 255.0.0.0
  Gateway = 10.0.0.1

- **PC2**

  Set ip address = 40.0.0.10
  Subnet mask = 255.0.0.0
  Gateway = 40.0.0.1

  Enable ip routing for configuring ospf routing
  protocol in all routers -

  Router 0

  R0 (config) # router ospf 1
  " # route-id 1.1.1.1
  " # network 10.0.0.0 0.255.255.255 area 3
  " # network 20.0.0.0 0.255.255.255 area 1
  " # exit

Router 1 -

R1 (config) # router ospf 1
" # router-id 2.2.2.2
" # network 20.0.0.0 0.255.255.255 area 1
" # network 30.0.0.0 0.255.255.255 area 0
" # exit

Router 2 -

R2 (config) # router ospf 1
" # router-id 3.3.3.3
" # network 30.0.0.0 0.255.255.255 area 0
" # network 40.0.0.0 0.255.255.255 area 2
" # exit

→ Configure loopback address to routers
R0(config)# interface loopback 0
R0 " " ip add 172.16.1.252 255.255.0
" " no shut

R1 (config) # interface loopback 0
" # ip addr 172.16.1.253 255.255.0.0
" # no shut

R2 (config) # interface loopback 0
R2 (config) # ip add 172.16.1.254 255-255.0.0
R2 (config) # ip add 172.16.1.25 no shut

→ Create virtual link b/w R0, R1.

Router 0
R0 (config) # router ospf 1
R0 (config) # area 1 virtual-link 2.2.2.2

Router 1

```
R1 (config) # router ospf 1
R1 (config) # area 1 virtual-link 1.1.1.1
R1 (config) # exit
```

Observation

The experiment demonstrates how OSPF dynamically learns and advertises routes, enabling efficient and scalable routing across multiple areas.

Routing tables on all routers must display networks from all areas with O IA indicating inter-area routes.

26/12/24