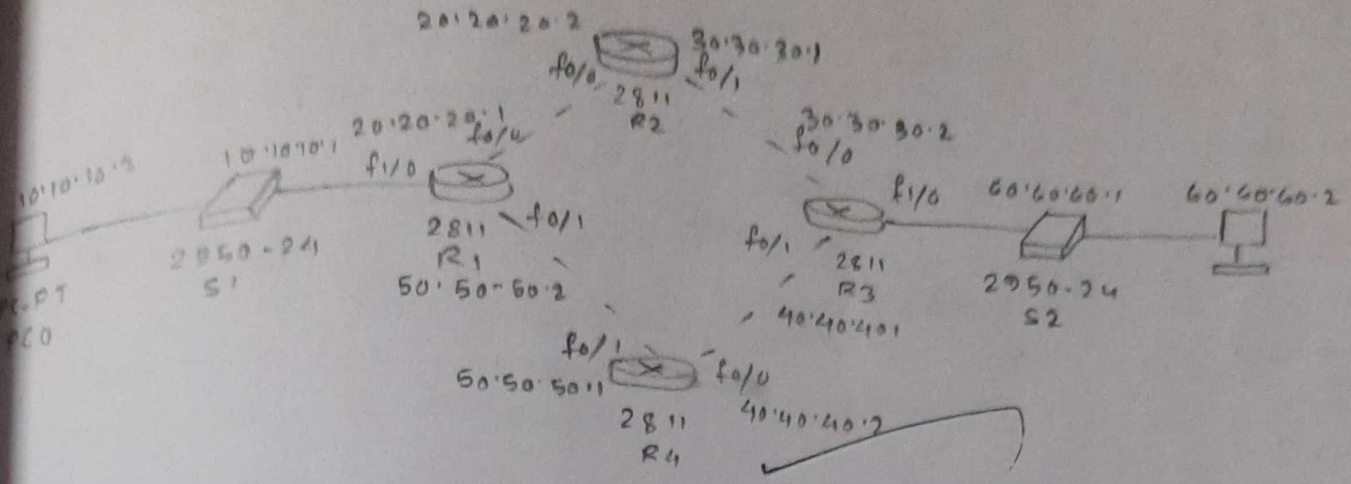
Problem statement:- Implement OSPF Routing Protocol using Cisco Packet Tracer



Steps to configure OSPF Routing Protocol:-

1) A virtual LAN setup of a network topology according to the diagram is correct. It contains Routers, switches and PCs as endpoint of the network.
2) All the devices are connected with the required cable.
3) Configure IP addresses on PCs and router interfaces.

R1 configuration:-

```
en
config t
int fo/0
ip add 20.20.20.1 255.0.0.0
no shut
int fo/1
ip add 50.50.50.1 255.000
no shut
int f1/0
int add 10.10.10.1 255.00.0
no shut
wr
exit
exit
```

R2 configuration:-

```
en
config t
int fo/0
ip add 20.20.20.2 255.0.0.0
no shut
iut fo/1
ip add 30.30.30.1 255.0.0.0
no shut
wr
exit
exit
```

R3 configuration:-

```
en
config t
int fo/0
ip add 30.30.30.2 255.0.0.0
no shut
int fo/1
ip add 40.40.40.1 255.0.0.0
no shut
int fi/0
ip add 60.60.60.1 255.0.0.0
no shut
wr
exit
exit
```

R4 configuration:-

```
en
config t
int fo/0
ip add 40.40.40.2 255.0.0.0
no shut
int fo/1
ip add 50.50.50.1 255.0.0.0
no shut
wr
exit
exit
```

now the IP configurations for the PCs.

PC0 configurations:-

IP add 10.10.10.2 subnet mask 255.0.0.0, Default gateway 10.10

PC1 configurations:-

IP add 60.60.60.2 subnet mask 255.0.0.0 Default gateway 60.60

4) Configure OSPF on the Routers:

i) Enable OSPF on a router using router OSPF PROCESS ID.

ii) Define on which interfaces OSPF will run and what network will be advertising using network IP_ADDRESS WILCARD_MASK AREA command in the OSPF configuration mode.

Commands:-

```
en
config t
router OSPF 1
network 10.0.0.0 0.255.255.255 area 0
network 20.0.0.0 0.255.255.255 area 0
network 30.0.0.0 0.255.255.255 area 0
network 40.0.0.0 0.255.255.255 area 0
network 50.0.0.0 0.255.255.255 area 0
network 60.0.0.0 0.255.255.255 area 0
```

5) To check the connectivity a packet is sent through the network.

6) To verify OSPF the following commands are used:

- show IP route: Displays the routing table of the router.
- show IP route OSPF: Display the OSPF routing table of the router.
- show IP OSPF neighbour: Displays the OSPF neighbours such as router ID, state etc of the router.
- show IP OSPF database: Displays the OSPF link-state database on the routers.

Output:- The OSPF Routing Protocol is configured. A packet is sent successfully from source PC1 to destination PC0. The OSPF routing table is displayed.

Remarks:- The network topology is created and the configurations are made on the routers and the PCs. OSPF Routing Protocol is configured and the routing table is shown.