Redes de Computadores - RECOMP

OSPF

Lab Topology:

The lab network topology is illustrated below:

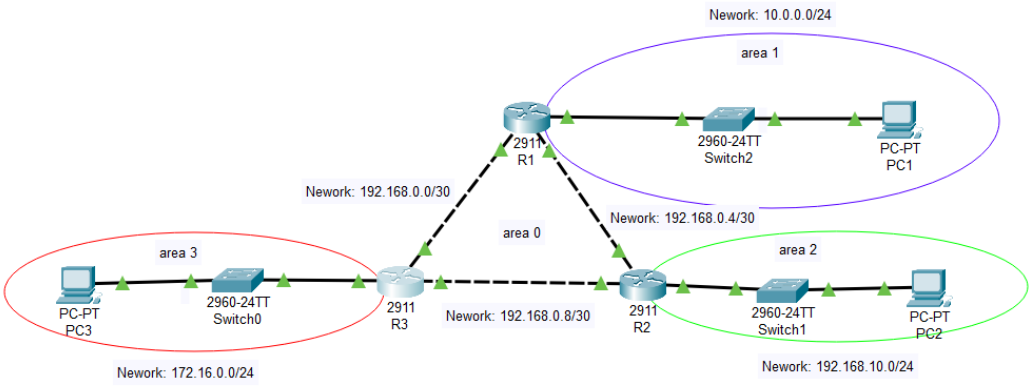

Figure 1- Lab Topology

Device	Interface	Network	IP	Area
R1	Gig0/0	192.168.0.0/30	192.168.0.1	0
R1	Gig0/1	192.168.0.4/30	192.168.0.5	0
R1	Gig0/2	10.0.0.0/24	10.0.0.1	1
R2	Gig0/0	192.168.0.4/30	192.168.0.6	0
R2	Gig0/1	192.168.0.8/30	192.168.0.9	0
R2	Gig0/2	192.168.10.0/24	192.168.10.1	2
R3	Gig0/0	192.168.0.0/30	192.168.0.2	0
R3	Gig0/1	192.168.0.8/30	192.168.0.10	0
R3	Gig0/2	172.16.0.0/24	172.16.0.1	3
PC1	Fa0	10.0.0.0/24	10.0.0.2	
PC2	Fa0	192.168.10.0/24	192.168.10.2	
PC3	Fa0	172.16.0.0/24	172.16.0.2	

Table 1 – Networks, Address and Areas

Objectives

Part 1: Configure and activate interfaces
Part 2: Configure OSPF routing on all routers
Part 3: Verify OSPF routing using show commands

Instructions

Step 1: Configure and activate interfaces.

a. Configure the name of each router.

b. Configure the active interfaces of the three routers and PCs according to Table 1. The PCs will have as the default router the IP of the router in the same network.

R1

```
R1(config)#interface GigabitEthernet0/0
R1(config-if)#no shutdown
R1(config-if)#ip address 192.168.0.1 255.255.255.252
R1(config-if)#
R1(config-if)#interface GigabitEthernet0/1
R1(config-if)#no shutdown
R1(config-if)#ip address 192.168.0.5 255.255.255.252
R1(config-if)#
R1(config-if)#interface GigabitEthernet0/2
R1(config-if)#no shutdown
R1(config-if)#ip address 10.0.0.1 255.255.255.0
```

R2

```
R2(config)#interface GigabitEthernet0/0
R2(config-if)#no shutdown
R2(config-if)#ip address 192.168.0.6 255.255.255.252
R2(config-if)#
R2(config-if)#interface GigabitEthernet0/1
R2(config-if)#no shutdown
R2(config-if)#ip address 192.168.0.9 255.255.255.252
R2(config-if)#
R2(config-if)#interface GigabitEthernet0/2
R2(config-if)#no shutdown
R2(config-if)#ip address 192.168.10.1 255.255.255.0
```

R3

```
R3(config)#interface GigabitEthernet0/0
R3(config-if)#no shutdown
R3(config-if)#ip address 192.168.0.2 255.255.255.252
R3(config-if)#
R3(config-if)#interface GigabitEthernet0/1
R3(config-if)#no shutdown
R3(config-if)#ip address 192.168.0.10 255.255.255.252
R3(config-if)#
R3(config-if)#interface GigabitEthernet0/2
R3(config-if)#no shutdown
R3(config-if)#ip address 172.16.0.1 255.255.255.0
```

c. Verify connectivity between the PCs and routers.

Step 2: Configure OSPF routing on all routers.

a. Verify the existing routing table with the command **show ip route.**

b. Configure OSPF on all routers. Configure OSPF with a process ID number of 1 and advertise all networks. Also, specify the router ID manually. (R1 - 1.1.1.1, R2 – 2.2.2.2 and R3 – 3.3.3.3).

R1

```
R1(config)#router ospf 1
R1(config-router)#router-id 1.1.1.1
R1(config-router)#network 192.168.0.0 0.0.0.3 area 0
R1(config-router)#network 192.168.0.4 0.0.0.3 area 0
R1(config-router)#network 10.0.0.0 0.0.0.255 area 1
```

R2

```
R2(config)#router ospf 1
R2(config-router)#router-id 2.2.2.2
R2(config-router)#network 192.168.0.4 0.0.0.3 area 0
R2(config-router)#network 192.168.0.8 0.0.0.3 area 0
R2(config-router)#network 192.168.10.0 0.0.0.255 area 2
```

R3

```
R3(config)#router ospf 1
R3(config-router)#router-id 3.3.3.3
R3(config-router)#network 192.168.0.0 0.0.0.3 area 0
R3(config-router)#network 192.168.0.8 0.0.0.3 area 0
R3(config-router)#network 172.16.0.0 0.0.0.255 area 3
```

Step 3: Verify OSPF routing using show commands.

a. Use the **show ip route** command to view all learned networks via OSPF.

b. Use also the command **show ip ospf neighbor** to view neighbours and state and **show ip ospf database** to view OSFP database.

a. Test connectivity.