Tutorial 2

1. With reference to Figure 2-1 and Figure 2-2, all the routers had been configured with Open Shortest Path First (OSPF) configurations and the routers have reached the convergence state.

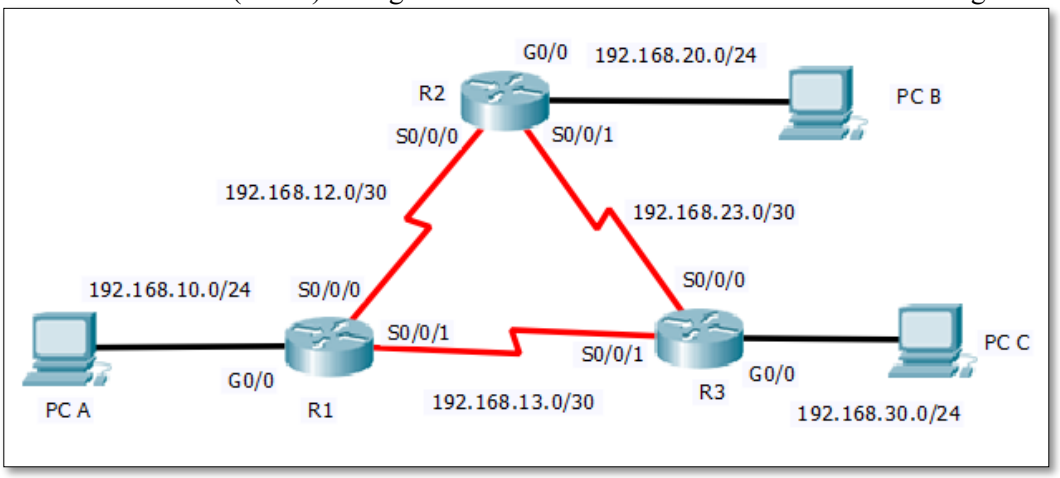

Figure 2-1: A network topology

```
R1#show ip int brief
Interface      IP-Address      OK?  Method  Status                    Protocol
Gigabit0/0     192.168.10.1    YES  NVRAM   up                        up
Gigabit0/1     unassigned      YES  unset   administratively down     down
Serial0/0/0    192.168.12.1    YES  NVRAM   up                        up
Serial0/0/1    192.168.13.1    YES  NVRAM   up                        up
```

```
R2#show ip int brief
Interface      IP-Address      OK?  Method Status                    Protocol
Gigabit0/0     192.168.20.1    YES  NVRAM   up                        up
Gigabit0/1     unassigned      YES  unset   administratively down     down
Loopback0      50.50.50.1      YES  NVRAM   up                        up
Loopback1      60.60.60.1      YES  NVRAM   up                        up
Serial0/0/0    192.168.12.2    YES  NVRAM   up                        up
Serial0/0/1    192.168.23.1    YES  NVRAM   up                        up
```

```
R3#show ip int brief
Interface      IP-Address      OK?  Method Status                    Protocol
Gigabit0/0     192.168.30.1    YES  NVRAM   up                        up
Gigabit0/1     unassigned      YES  unset   administratively down     down
Loopback0      200.10.10.1     YES  NVRAM   up                        up
Loopback1      200.10.10.10    YES  NVRAM   up                        up
Serial0/0/0    192.168.23.2    YES  NVRAM   up                        up
Serial0/0/1    192.168.13.2    YES  NVRAM   up                        up
```

```
R3# show ip protocols
Routing Protocol is "ospf 1"
    Router ID 10.10.10.1
        Number of areas in this router is 1. 1 normal 0 stub 0 nssa
        Maximum path: 4
      Routing for Networks:
         192.168.30.0 0.0.0.255 area 0
         192.168.13.0 0.0.0.3 area 0
         192.168.23.0 0.0.0.3 area 0
   -  Output omitted -
```

Figure 2-2: Status of R1, R2 and R3 interfaces

(i) Describes the order of precedence on how a router derives the router ID. (6 marks)

(ii) Identify the router ID for R1, R2 and R3. Justify your answer. (9 marks)

(iii) Refer to the network topology shown in Figure 2-1, will a Designated Router (DR) and a Backup Designated Router (BDR) be elected? Justify your answer. (4 marks)

2. Refer to the OSPF configuration shown in Figure 3-1 and the network topology shown in Figure 3-2, answer the following questions:

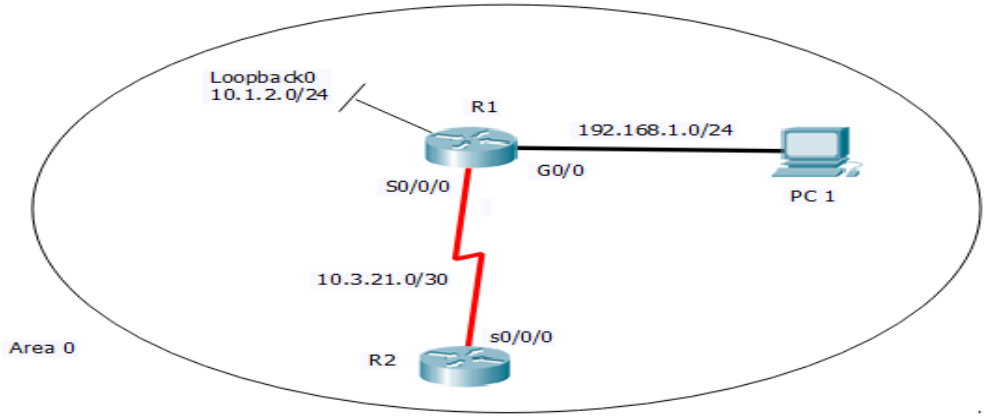

Figure 3-2: A network topology

```
R1#  show running-config
<output omitted>
interface loopback0
ip address 10.1.2.1  255.255.255.0
!
interface GigabitEthernet0/0
ip address 192.168.1.1  255.255.255.0
!
interface Serial0/0/0
ip address 10.3.21.1  255.255.255.252
clock rate 2000000
!
router ospf 1
  network 10.1.2.0 0.0.0.255 area 0
  network 192.168.1.0 0.0.0.255 area 0
  network 10.3.2.0 0.0.0.255 area 0
!
```

Figure 3-1: OSPF configuration

a. Determine the router ID for R1 in Figure 3-1. Justify your answer.

b. Refer to both Figure 3-1 and Figure 3-2, identify and rectify any OSPF configuration error(s).

c. (i) Refer to the network topology shown in Figure 3-1, which router interfaces are recommended to set passive interface.

(ii) Provide **TWO (2)** reasons why it is recommended to implement passive interfaces

3. Multiaccess networks can create two challenges for OSPF regarding the flooding of LSAs. What are these challenges?

4. With reference to the Figure 5-1, answer the following questions.

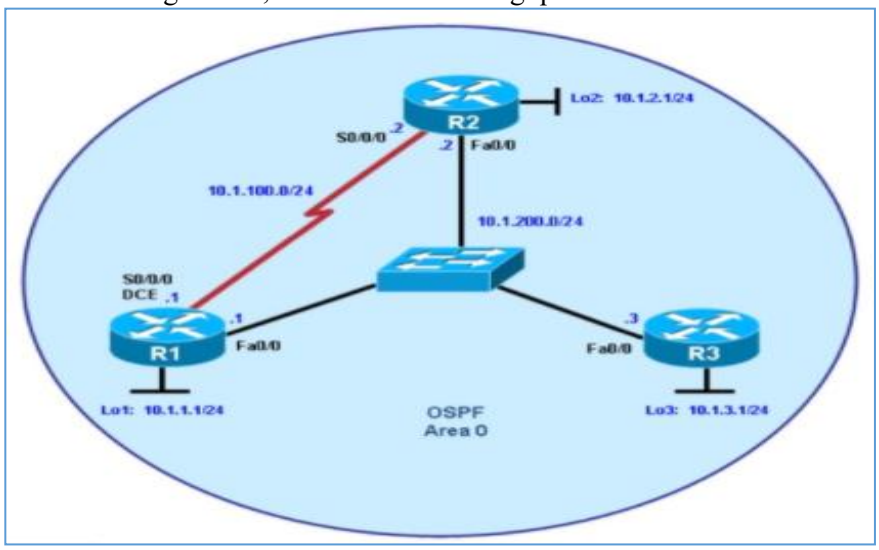

Figure 5-1: An OSPF network

(i) What is the default interface priority for R1, R2 and R3?
(ii) What is the router ID for R1, R2 and R3?
(iii) Which router are DR, BDR and DRothers?
(iv) Modify the interface priorities to make R1 a DR and R3 a BDR.

5. A network topology in Figure 1-2 was pre-configured with a **default static route** in **CORE** to forward traffic to the **ISP** and the **Internet**. The **ISP** is already using static routing. Configure **Open Shortest Path First (OSPF)** on **CORE** and **RIDGE** only as **VALLEY** is already OSPF-enabled in **area 0**. Use the network command with wildcard masks based on the subnet masks. Propagate the default route in **CORE** to **RIDGE** and **VALLEY** so that these routers can forward traffic to the **ISP** and the **Internet**. Use OSPF **process-id 88** and **area-id 0**. Use Table 1-1 to document your answer.

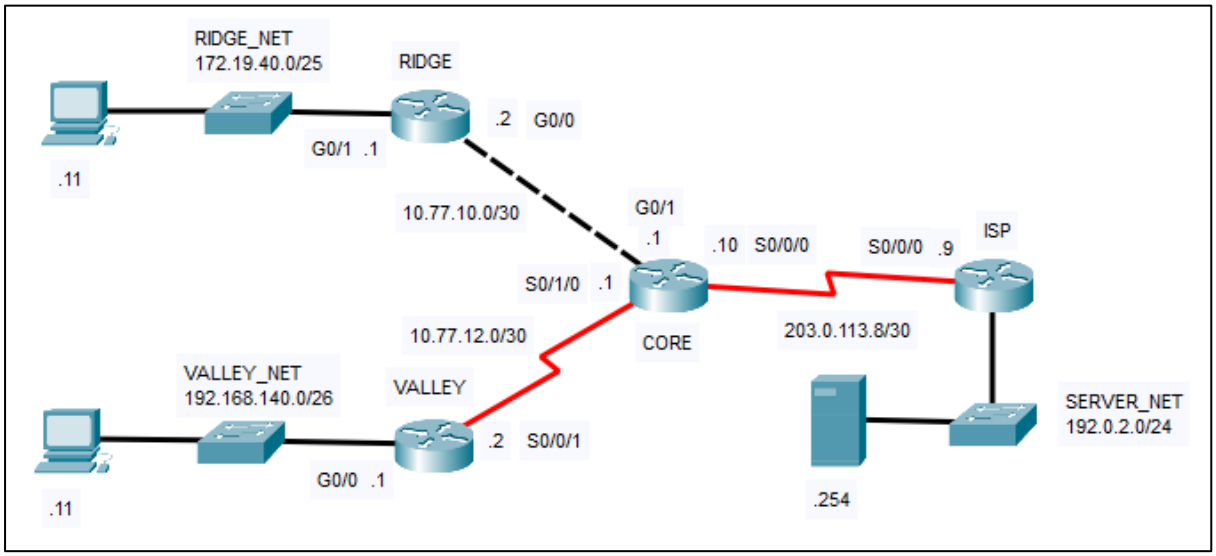

Figure 1-2: A Network Topology

Table 1-1: Documentation Table

Router name	Configurations