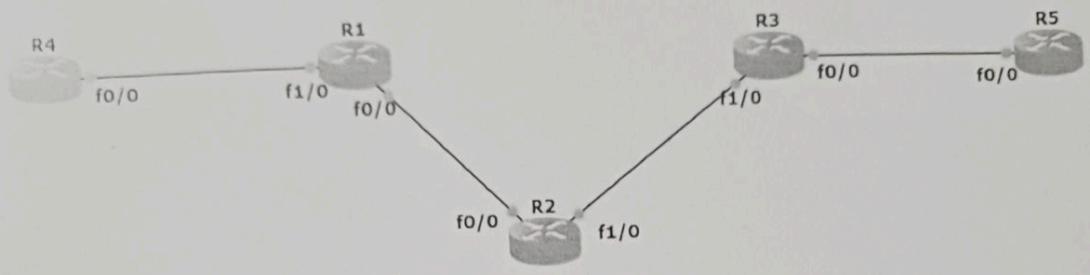
Practical No.10 :
Implement MPLS

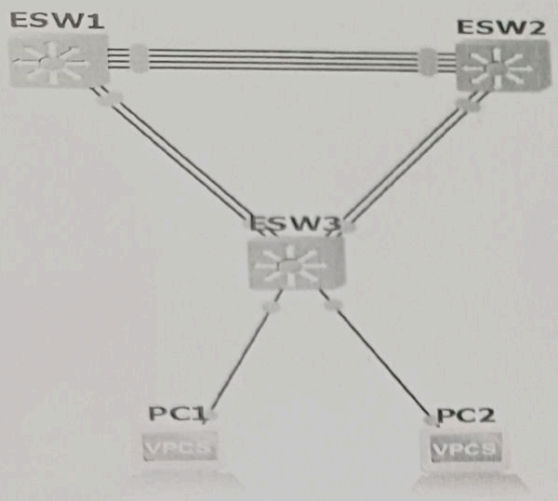
TOPOLOGY:



R1:

```
*Nov 25 09:19:10.451:
R1# %LINK-5-CHANGED: Interface GigabitEthernet5/0, changed state to administrati
vely down
*Nov 25 09:19:10.463: %LINK-5-CHANGED: Interface GigabitEthernet6/0, changed sta
te to administratively down
R1#
R1#
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#hostname R1
R1(config)#int lo0
R1(config-if)#ip a
*Nov 25 09:21:19.287: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0,
 changed state to up
R1(config-if)#ip add 1.1.1.1 255.255.255.255
R1(config-if)#ip ospf 1 area 0
R1(config-if)#
R1(config-if)#int f0/0
R1(config-if)#ip add 10.0.0.1 255.255.255.0
R1(config-if)#no shut
R1(config-if)#no shut
*Nov 25 09:22:14.287: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state t
o up
*Nov 25 09:22:15.287: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthern
et0/0, changed state to up
R1(config-if)#ip ospf 1 area 0
R1(config-if)#exit
R1(config)#exit
```

- **Implement HSRP**



Build the Network and Configure Basic Device Settings and Interface Addressing
Set up the network topology and configure basic settings and interface addressing.

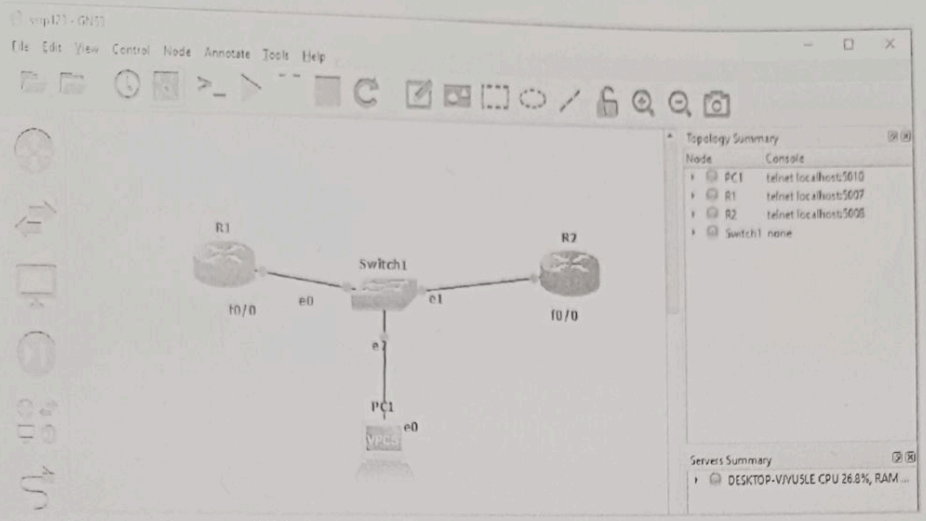
Step 1: Cable the network as shown in the topology.
Attach the devices as shown in the topology diagram, and cable as necessary.

Step 2: Configure basic settings for each switch.
a. Console into each switch, enter global configuration mode, and apply the basic settings. A command list for each switch is provided below for initial configurations.

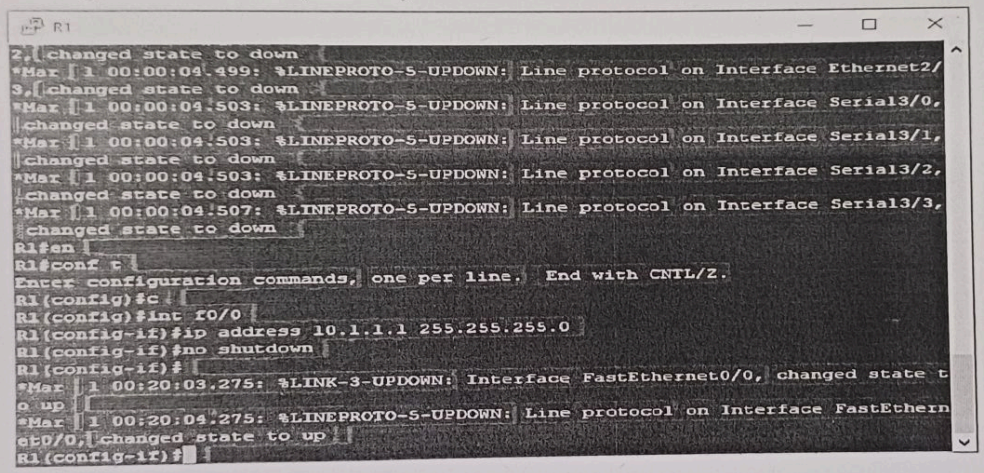
Switch D1

```
*Mar  1 00:44:36.779: %LINEPROTO-5-UPDOWN: Line protocol on Interface
D1(config-vlan)# name FIRST_VLAN
D1(config-vlan)# exit
D1(config)#vlan 21
D1(config-vlan)# name SECOND_VLAN
D1(config-vlan)# exit
D1(config)#interface vlan 11
D1(config-if)# ip address 10.11.0.1 255.255.255.0
D1(config-if)# ipv6 address fe80::d1:1 link-local
D1(config-if)# ipv6 address 2001:db8:acad:11::1/64
D1(config-if)# no shutdown
D1(config-if)# exit
D1(config)#interface vlan 21
D1(config-if)# ip address 10.21.0.1 255.255.255.0
D1(config-if)# ipv6 address fe80::d1:2 link-local
D1(config-if)# ipv6 address 2001:db8:acad:21::1/64
D1(config-if)# no shutdown
D1(config-if)# exit
D1(config)#interface loopback 0
D1(config-if)# ip address 192.168.1.1 255.255.255.0
D1(config-if)# ipv6 address fe80::d1:3 link-local
D1(config-if)# ipv6 address 2001:db8:acad:1000::1/64
D1(config-if)# no shutdown
D1(config-if)# exit
```

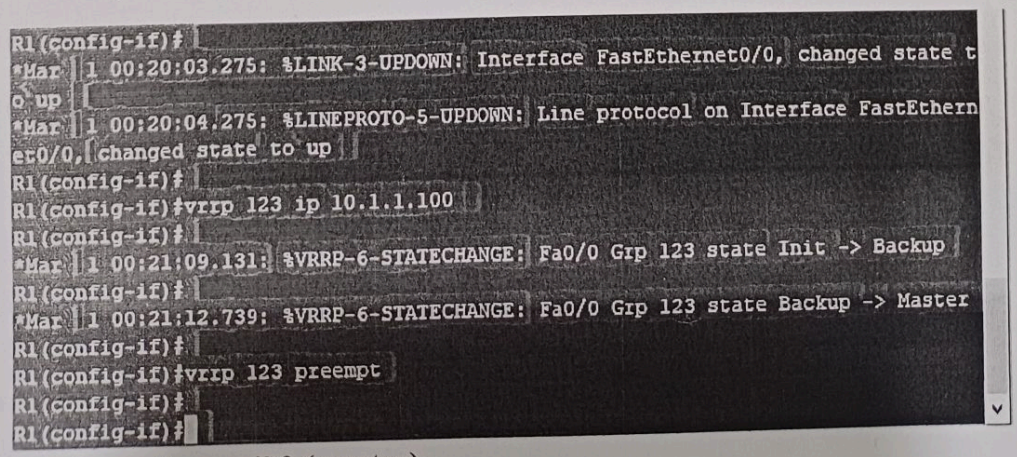
- # Implement VRRP



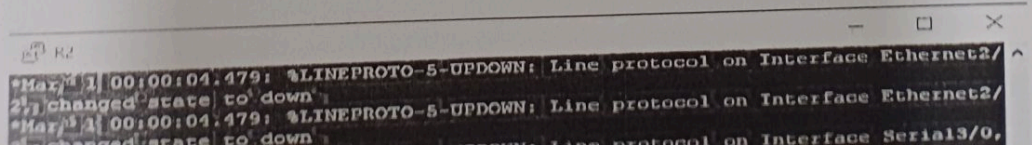
Configuration on R1 (master)



Enable preemption on R1 so it will reclaim its role as the master when it is restored from a fa



Configuration on R2 (master)



Practical No.9

- ## Implement GLBP

Build the Network and Configure Basic Device Settings and Interface Addressing

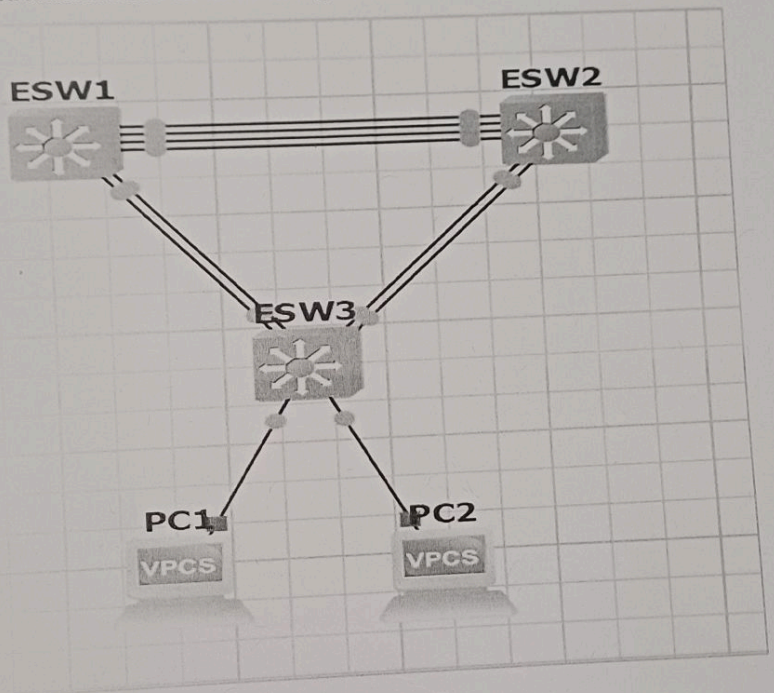
In Part 1, you will set up the network topology and configure basic settings and interface addressing.

Step 1: Cable the network as shown in the topology.

Attach the devices as shown in the topology diagram, and cable as necessary.

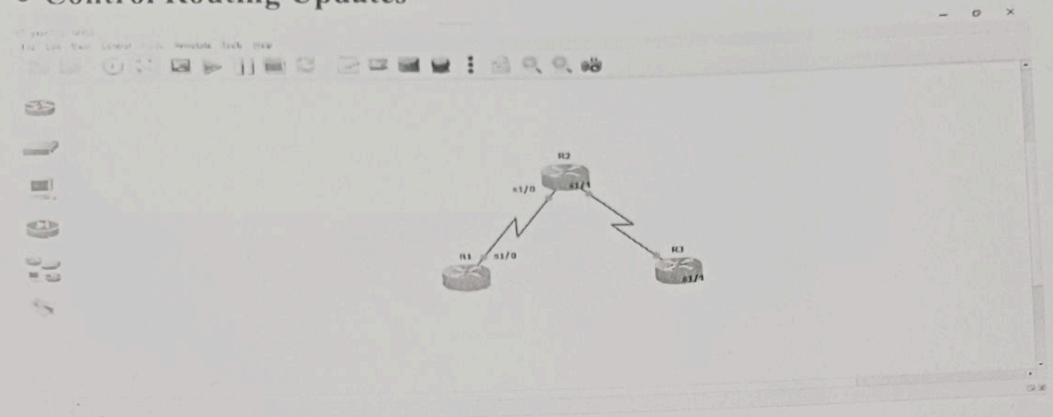
Step 2: Configure basic settings for each switch.

Console into each switch, enter global configuration mode, and apply the basic settings. A command list for each switch is listed below for initial configurations.



Practical No.7 :

- **Control Routing Updates**



Configure loopbacks and assign addresses.

a) Configure all loopback interfaces on the three routers in the diagram. Configure the serial interfaces with the IP addresses, bring them up, and set a DCE clock rate where appropriate

R1

```
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#
R1(config)#interface Loopback0
R1(config-if)#ip address 172.16.1.1 255.255.255.0
R1(config-if)#exit
R1(config)#
R1(config)#interface Loopback48
R1(config-if)#ip address 192.168.48.1 255.255.255.0
R1(config-if)#exit
R1(config)#
R1(config)#interface Loopback49
R1(config-if)#ip address 192.168.49.1 255.255.255.0
R1(config-if)#exit
R1(config)#
R1(config)#interface Loopback50
R1(config-if)#ip address 192.168.50.1 255.255.255.0
R1(config-if)#exit
R1(config)#
R1(config)#interface Loopback51
R1(config-if)#ip address 192.168.51.1 255.255.255.0
R1(config-if)#exit
R1(config)#
R1(config)#interface Loopback70
R1(config-if)#ip address 192.168.70.1 255.255.255.0
R1(config-if)#exit
R1(config)#
R1(config)#interface Serial1/0
R1(config-if)#ip address 172.16.12.1 255.255.255.0
R1(config-if)#clock rate 64000
R1(config-if)#bandwidth 64
R1(config-if)#no shutdown
R1(config-if)#
```

R2

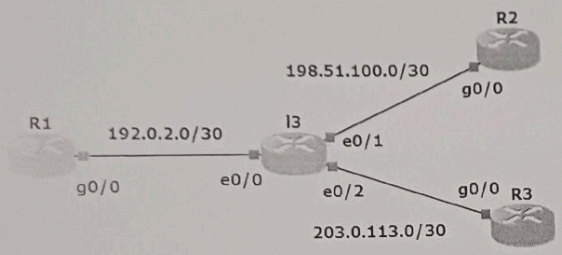
```
R2(config)#
R2(config)#interface Loopback0
R2(config-if)#ip address 172.16.2.1 255.255.255.0
R2(config-if)#exit
R2(config)#
R2(config)#interface Loopback100
R2(config-if)#ip address 172.16.100.1 255.255.255.0
R2(config-if)#ip ospf network point-to-point
R2(config-if)#exit
```

Practical No.5 :

- **Configure Secure DMVPN Tunnels**
- **Implement a DMVPN Phase 1 Hub-to-Spoke Topology**
- **Implement a DMVPN Phase 3 Spoke-to-Spoke Topology**

DMVPN is a Cisco IOS Software solution for building scalable IPsec Virtual Private Networks (VPNs). Cisco DMVPN uses a centralized architecture to provide easier implementation and management for deployments that require granular access controls for diverse user communities, including mobile workers, telecommuters, and extranet users. The centralized architecture involves designating one or more routers as multipoint GRE hub routers that are used to connect spoke, or branch, routers to VPN services.

- **Implement a DMVPN Phase 1 Hub-to-Spoke Topology**



Step 1: Cable the network as shown in the topology.

Attach the devices as shown in the topology diagram, and cable as necessary.

Step 2: Configure initial settings for each router and the Layer 3 switch.

a. Console into each device, enter global configuration mode, and apply the initial settings for the lab. Initial configurations for each device are provided below.

This command specifies the message that is displayed as the **Message Of The Day**, the very first message displayed to an incoming connection. This command defines only the message; the **motd-banner command** enables or disables the display. The delimiter marks the beginning and the end of the message; it may be any character that isn't used in the message.

The **logging synchronous command** is used to synchronize unsolicited messages and debug output with solicited Cisco IOS Software output.

The term "**vty**" stands for Virtual teletype. **VTY** is a virtual port and used to get Telnet or SSH access to the device.VTY is solely used for inbound connections to the device. These connections are all virtual with no hardware associated with them.

Privilege levels let you define what commands users can issue after they have logged into a network device.

Cisco '**exec-timeout**' command sets a specific time to disconnect idle EXEC sessions.

The loopback interface is a logical interface internal to the router. The loopback interface is useful in testing and managing a Cisco IOS device because it ensures that at least one interface will always be available. A loopback interface can provide a stable interface on which you can assign a Layer 3 address.

ip route. To establish static routes, use the ip route command in switch configuration mode. To remove static routes, use the no form of this command.