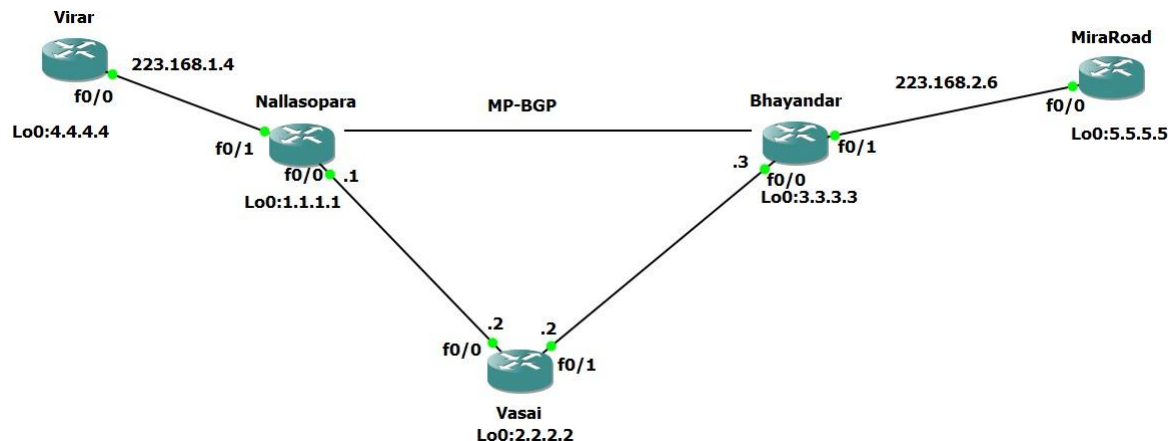## Practical No 6

Aim: Cisco MPLS Configuration

Topology:

Step 1 – IP addressing of MPLS Core and OSPF

First bring 3 routers into your topology R1, R2, R3 position them as below. We are going to address the routers and configure ospf to ensure loopback to loopback connectivity between R1 and R3

```
Nallasopara#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Nallasopara(config)#int lo0
Nallasopara(config-if)#
*Mar  1 00:02:30.835: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0,
 changed state to up
Nallasopara(config-if)#ip add 1.1.1.1 255.255.255.255
Nallasopara(config-if)#ip ospf 1 area 0
Nallasopara(config-if)#
Nallasopara(config-if)#int f0/0
Nallasopara(config-if)#ip add 10.0.0.1 255.255.255.0
Nallasopara(config-if)#no shut
Nallasopara(config-if)#ip ospf
*Mar  1 00:04:00.111: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state t
o up
*Mar  1 00:04:01.111: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthern
et0/0, changed state to up
Nallasopara(config-if)#ip ospf 1 area 0
Nallasopara(config-if)#
```

```
Vasai#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Vasai(config)#int lo0
Vasai(config-if)#
*Mar  1 00:03:11.943: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0,
 changed state to up
Vasai(config-if)#ip add 2.2.2.2 255.255.255.255
Vasai(config-if)#ip ospf 1 area 0
Vasai(config-if)#
Vasai(config-if)#int f0/0
Vasai(config-if)#ip add 10.0.0.2 255.255.255.0
Vasai(config-if)#no shut
Vasai(config-if)#ip
*Mar  1 00:04:28.359: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state t
o up
*Mar  1 00:04:29.359: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthern
et0/0, changed state to up
Vasai(config-if)#ip ospf 1 area 0
Vasai(config-if)#
Vasai(config-if)#int f0/
*Mar  1 00:04:47.391: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on FastEthernet0/0
from LOADING to FULL, Loading Done
Vasai(config-if)#int f0/1
Vasai(config-if)#ip add 10.0.1.2 255.255.255.0
Vasai(config-if)#no shut
Vasai(config-if)#ip ospf
*Mar  1 00:05:32.339: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state t
o up
*Mar  1 00:05:33.339: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthern
et0/1, changed state to up
Vasai(config-if)#ip ospf 1 area 0
```

```
Bhayandar#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Bhayandar(config)#int lo0
Bhayandar(config-if)#
*Mar  1 00:04:46.155: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0,
 changed state to up
Bhayandar(config-if)#ip add 3.3.3.3 255.255.255.255
Bhayandar(config-if)#ip ospf 1 area 0
Bhayandar(config-if)#
Bhayandar(config-if)#int f0/0
Bhayandar(config-if)#ip add 10.0.1.3 255.255.255.0
Bhayandar(config-if)#no shut
Bhayandar(config-if)#ip ospf
*Mar  1 00:06:07.163: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state t
o up
*Mar  1 00:06:08.163: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthern
et0/0, changed state to up
Bhayandar(config-if)#ip ospf 1 area 0
```

You should now have full ip connectivity between R1, R2, R3 to verify this we need to see if we can ping between the loopbacks of R1 and R3

```
Nallasopara#ping 3.3.3.3 source lo0

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 3.3.3.3, timeout is 2 seconds:
Packet sent with a source address of 1.1.1.1
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 48/60/84 ms
```

Step 2 – Configure LDP on all the interfaces in the MPLS Core In order to run MPLS you need to enable it, there are two ways to do this.

  At each interface enter the mpls ip command

Under the ospf process use the mpls ldp autoconfig command.

```
Nallasopara(config)#router ospf 1
Nallasopara(config-router)#mpls ldp autoconfig
Nallasopara(config-router)#
```

```
Vasai(config)#router ospf 1
Vasai(config-router)#mpls ldp autoconfig
Vasai(config-router)#router
*Mar  1 00:11:28.635: %LDP-5-NBRCHG: LDP Neighbor 1.1.1.1:0 (1) is UP
Vasai(config-router)#
*Mar  1 00:12:49.523: %LDP-5-NBRCHG: LDP Neighbor 3.3.3.3:0 (2) is UP
```

You should see log messages coming up showing the LDP neighbors are up.

To verify the mpls interfaces the command is very simple – sh mpls interface

```
Bhayandar(config)#router ospf 1
Bhayandar(config-router)#mpls ldp autoconfig
Bhayandar(config-router)#
```

This is done on R2 and you can see that both interfaces are running mpls and using LDP.

```
Vasai#sh mpls int
Interface              IP           Tunnel    Operational
FastEthernet0/0        Yes (ldp)    No        Yes
FastEthernet0/1        Yes (ldp)    No        Yes
```

You can also verify the LDP neighbors with the sh mpls ldp neighbors command.

```
Vasai#sh mpls ldp neigh
    Peer LDP Ident: 1.1.1.1:0; Local LDP Ident 2.2.2.2:0
        TCP connection: 1.1.1.1.646 - 2.2.2.2.24585
        State: Oper; Msgs sent/rcvd: 11/11; Downstream
        Up time: 00:03:06
        LDP discovery sources:
          FastEthernet0/0, Src IP addr: 10.0.0.1
        Addresses bound to peer LDP Ident:
          10.0.0.1          1.1.1.1
    Peer LDP Ident: 3.3.3.3:0; Local LDP Ident 2.2.2.2:0
        TCP connection: 3.3.3.3.42628 - 2.2.2.2.646
        State: Oper; Msgs sent/rcvd: 10/10; Downstream
        Up time: 00:01:46
        LDP discovery sources:
          FastEthernet0/1, Src IP addr: 10.0.1.3
        Addresses bound to peer LDP Ident:
          10.0.1.3          3.3.3.3
```

One more verification to confirm LDP is running ok is to do a trace between R1 and R3 and verify if you get MPLS Labels show up in the trace.

```
Nallasopara#trace 3.3.3.3

Type escape sequence to abort.
Tracing the route to 3.3.3.3

  1 10.0.0.2 [MPLS: Label 17 Exp 0] 44 msec 76 msec 60 msec
  2 10.0.1.3 64 msec 72 msec 28 msec
```

Step 3 – MPLS BGP Configuration between R1 and R3

We need to establish a Multi Protocol BGP session between R1 and R3 this is done by configuring the vpnv4 address family as below.

```
Nallasopara#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Nallasopara(config)#router bgp 1
Nallasopara(config-router)#neighbor 3.3.3.3 remote-as 1
Nallasopara(config-router)#neighbor 3.3.3.3 update-source Loopback0
Nallasopara(config-router)#no auto-summary
Nallasopara(config-router)#address-family vpnv4
Nallasopara(config-router-af)#neighbor 3.3.3.3 activate
```

```
Bhayandar(config)#router bgp 1
Bhayandar(config-router)#neighbor 1.1.1.1 remote-as 1
Bhayandar(config-router)#neighbor 1.1.1.1
% Incomplete command.

Bhayandar(config-router)#
*Mar  1 00:18:56.079: %BGP-5-ADJCHANGE: neighbor 1.1.1.1 Up
Bhayandar(config-router)#neighbor 1.1.1.1 update-source loopback 0
Bhayandar(config-router)#no auto-summary
Bhayandar(config-router)#address-family vpnv4
Bhayandar(config-router-af)#neighbor 1.1.1.1 activate
```

To verify the BGP session between R1 and R3 issue the command sh bgp vpnv4 unicast all summary.

```
Nallasopara#sh bgp vpnv4 unicast all summary
BGP router identifier 1.1.1.1, local AS number 1
BGP table version is 1, main routing table version 1

Neighbor        V     AS MsgRcvd MsgSent   TblVer  InQ OutQ Up/Down  State/PfxRcd
3.3.3.3         4      1       8       8        1    0    0 00:00:59          0
Nallasopara#
```

Step 4 – Add two more routers, create VRFs

We will add two more routers into the topology so it now looks like the final topology.

```
Virar#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Virar(config)#int lo0
Virar(config-if)#
*Mar  1 00:11:25.043: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0,
 changed state to up
Virar(config-if)#ip address 4.4.4.4 255.255.255.255
Virar(config-if)#ip ospf 2 area 2
Virar(config-if)#int f0/0
Virar(config-if)#ip address 223.168.1.4 255.255.255.0
Virar(config-if)#ip ospf 2 area 2
Virar(config-if)#no shut
```

```
Nallasopara#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Nallasopara(config)#int f0/1
Nallasopara(config-if)#no shut
Nallasopara(config-if)#
*Mar  1 00:29:01.831: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state t
o up
*Mar  1 00:29:02.831: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthern
et0/1, changed state to up
Nallasopara(config-if)#ip address 223.168.1.1 255.255.255.0
```

```
Nallasopara(config)#ip vrf RED
Nallasopara(config-vrf)#rd 4:4
Nallasopara(config-vrf)#route-target both 4:4
Nallasopara(config-vrf)#
Nallasopara(config-vrf)#
Nallasopara(config-vrf)#int f0/1
Nallasopara(config-if)#ip vrf forwarding RED
% Interface FastEthernet0/1 IP address 223.168.1.1 removed due to enabling VRF R
ED
Nallasopara(config-if)#ip add 223.168.1.1 255.255.255.0
Nallasopara(config-if)#
```

```
Nallasopara#sh run int f0/1
Building configuration...

Current configuration : 119 bytes
!
interface FastEthernet0/1
 ip vrf forwarding RED
 ip address 223.168.1.1 255.255.255.0
 duplex auto
 speed auto
end
```

If you issue the command sh ip route this shows the routes in the global table and you will notice that you do not see 192.168.1.0/24.

```
Nallasopara#sh ip  route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

     1.0.0.0/32 is subnetted, 1 subnets
C       1.1.1.1 is directly connected, Loopback0
     2.0.0.0/32 is subnetted, 1 subnets
O       2.2.2.2 [110/11] via 10.0.0.2, 00:30:41, FastEthernet0/0
     3.0.0.0/32 is subnetted, 1 subnets
O       3.3.3.3 [110/21] via 10.0.0.2, 00:26:56, FastEthernet0/0
     10.0.0.0/24 is subnetted, 2 subnets
C       10.0.0.0 is directly connected, FastEthernet0/0
O       10.0.1.0 [110/20] via 10.0.0.2, 00:29:46, FastEthernet0/0
Nallasopara#
```

```
Nallasopara(config)#ip vrf RED
Nallasopara(config-vrf)#rd 4:4
Nallasopara(config-vrf)#route-target both 4:4
Nallasopara(config-vrf)#
Nallasopara(config-vrf)#
Nallasopara(config-vrf)#int f0/1
Nallasopara(config-if)#ip vrf forwarding RED
% Interface FastEthernet0/1 IP address 223.168.1.1 removed due to enabling VRF R
ED
Nallasopara(config-if)#ip add 223.168.1.1 255.255.255.0
Nallasopara(config-if)#
```

We just need to enable OSPF on this interface and get the loopback address for
R4 in the VRF RED routing table before proceeding.

```
Nallasopara(config)#int f0/1
Nallasopara(config-if)#ip ospf 2 area 2
Nallasopara(config-if)#
```

```
Nallasopara#sh ip route vrf RED

Routing Table: RED
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

C    223.168.1.0/24 is directly connected, FastEthernet0/1
     4.0.0.0/32 is subnetted, 1 subnets
O       4.4.4.4 [110/11] via 223.168.1.4, 00:00:20, FastEthernet0/1
```

We now need to repeat this process for R3 & R6 Router 6 will peer OSPF using process number 2 to a VRF configured on R3. It will use the local site addressing to 223.168.2.0/24.

```
Nallasopara#sh ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

     1.0.0.0/32 is subnetted, 1 subnets
C       1.1.1.1 is directly connected, Loopback0
     2.0.0.0/32 is subnetted, 1 subnets
O       2.2.2.2 [110/11] via 10.0.0.2, 00:33:12, FastEthernet0/0
     3.0.0.0/32 is subnetted, 1 subnets
O       3.3.3.3 [110/21] via 10.0.0.2, 00:29:27, FastEthernet0/0
     10.0.0.0/24 is subnetted, 2 subnets
C       10.0.0.0 is directly connected, FastEthernet0/0
O       10.0.1.0 [110/20] via 10.0.0.2, 00:32:17, FastEthernet0/0
Nallasopara#
```

```
MiraRoad#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
MiraRoad(config)#int lo0
MiraRoad(config-if)#ip
*Mar  1 00:17:16.419: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0,
 changed state to up
MiraRoad(config-if)#ip add 6.6.6.6 255.255.255.255
MiraRoad(config-if)#ip ospf 2 area 2
MiraRoad(config-if)#int f0/0
MiraRoad(config-if)#ip address 223.168.2.6 255.255.255.0
MiraRoad(config-if)#ip ospf 2 area 2
MiraRoad(config-if)#no shut
```

```
Bhayandar(config)#int f0/1
Bhayandar(config-if)#no shut
Bhayandar(config-if)#
Bhayandar(config-if)#ip add
*Mar  1 00:43:46.895: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state t
o up
*Mar  1 00:43:47.895: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthern
et0/1, changed state to up
Bhayandar(config-if)#ip add 223.168.2.3 255.255.255.0
```

We also need to configure a VRF onto R3 as well.

Check the Router in VRF RED

```
Bhayandar(config-vrf)#int f0/1
Bhayandar(config-if)#ip vrf forwarding RED
% Interface FastEthernet0/1 IP address 223.168.2.3 removed due to enabling VRF R
ED
Bhayandar(config-if)#ip add 223.168.2.1 255.255.255.0
```

```
Bhayandar(config-if)#ip vrf RED
Bhayandar(config-vrf)#rd 4:4
Bhayandar(config-vrf)#route-target both 4:4
Bhayandar(config-vrf)#
```

```
Bhayandar#sh run int f0/1
Building configuration...

Current configuration : 119 bytes
!
interface FastEthernet0/1
 ip vrf forwarding RED
 ip address 223.168.2.1 255.255.255.0
 duplex auto
 speed auto
end
```

```
Bhayandar#sh ip route vrf RED

Routing Table: RED
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

C    223.168.2.0/24 is directly connected, FastEthernet0/1
```

```
Virar#sh ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

C    223.168.1.0/24 is directly connected, FastEthernet0/0
     4.0.0.0/32 is subnetted, 1 subnets
C       4.4.4.4 is directly connected, Loopback0
```

As expected we have the local interface and the loopback address. When we are done we want to see 6.6.6.6 in there so we can ping across the MPLS Check the routes on R1.

```
Nallasopara#sh ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

     1.0.0.0/32 is subnetted, 1 subnets
C       1.1.1.1 is directly connected, Loopback0
     2.0.0.0/32 is subnetted, 1 subnets
O       2.2.2.2 [110/11] via 10.0.0.2, 00:33:12, FastEthernet0/0
     3.0.0.0/32 is subnetted, 1 subnets
O       3.3.3.3 [110/21] via 10.0.0.2, 00:29:27, FastEthernet0/0
     10.0.0.0/24 is subnetted, 2 subnets
C       10.0.0.0 is directly connected, FastEthernet0/0
O       10.0.1.0 [110/20] via 10.0.0.2, 00:32:17, FastEthernet0/0
```

```
Nallasopara#sh ip route vrf RED

Routing Table: RED
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

C    223.168.1.0/24 is directly connected, FastEthernet0/1
     4.0.0.0/32 is subnetted, 1 subnets
O       4.4.4.4 [110/11] via 223.168.1.4, 00:13:07, FastEthernet0/1
```

```
Nallasopara#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Nallasopara(config)#
Nallasopara(config)#router bgp 1
Nallasopara(config-router)#address-family ipv4 vrf RED
Nallasopara(config-router-af)#redistribute ospf 2
Nallasopara(config-router-af)#exit
Nallasopara(config-router)#end
```

```
Bhayandar(config)#
Bhayandar(config)#router bgp 1
Bhayandar(config-router)#address-family ipv4 vrf RED
Bhayandar(config-router-af)#redistribute ospf 2
Bhayandar(config-router-af)#end
Bhayandar#
```

```
Nallasopara#sh ip bgp vpnv4 vrf RED
BGP table version is 5, local router ID is 1.1.1.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
              r RIB-failure, S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete

   Network          Next Hop            Metric LocPrf Weight Path
Route Distinguisher: 4:4 (default for vrf RED)
*> 4.4.4.4/32       223.168.1.4              11         32768 ?
*> 223.168.1.0      0.0.0.0                   0         32768 ?
```

```
Bhayandar#sh ip bgp vpnv4 vrf RED
BGP table version is 5, local router ID is 3.3.3.3
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
              r RIB-failure, S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete

   Network          Next Hop            Metric LocPrf Weight Path
Route Distinguisher: 4:4 (default for vrf RED)
*>i4.4.4.4/32       1.1.1.1                  11    100     0 ?
*>i223.168.1.0      1.1.1.1                   0    100     0 ?
```

Which it is! 6.6.6.6 is now in the BGP table in VRF RED on R3 with a next hop
of 192.168.2.6 (R6) and also 4.4.4 is in there as well with a next hop of 1.1.1.1
(which is the loopback of R1 – showing that it is going over the MPLS and R2
is not in the picture).

```
Nallasopara(config)#int f0/1
Nallasopara(config-if)#ip ospf 2 area 2
Nallasopara(config-if)#
```

```
Bhayandar#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Bhayandar(config)#router ospf 2
Bhayandar(config-router)#redistribute bgp 1 subnets
Bhayandar(config-router)#
```

Before we do let's see what the routing table look like on R.

```
Virar#sh ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

C    223.168.1.0/24 is directly connected, FastEthernet0/0
     4.0.0.0/32 is subnetted, 1 subnets
C       4.4.4.4 is directly connected, Loopback0
```

```
Bhayandar#show ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

     1.0.0.0/32 is subnetted, 1 subnets
O       1.1.1.1 [110/21] via 10.0.1.2, 04:33:27, FastEthernet0/0
     2.0.0.0/32 is subnetted, 1 subnets
O       2.2.2.2 [110/11] via 10.0.1.2, 04:33:27, FastEthernet0/0
     3.0.0.0/32 is subnetted, 1 subnets
C       3.3.3.3 is directly connected, Loopback0
     10.0.0.0/24 is subnetted, 2 subnets
O       10.0.0.0 [110/20] via 10.0.1.2, 04:33:27, FastEthernet0/0
C       10.0.1.0 is directly connected, FastEthernet0/0
Bhayandar#
```

Do the Same Step in R6.

```
MiraRoad#sh ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

C    223.168.2.0/24 is directly connected, FastEthernet0/0
     6.0.0.0/32 is subnetted, 1 subnets
C       6.6.6.6 is directly connected, Loopback0
```

```
Nallasopara#ping 3.3.3.3 source lo0

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 3.3.3.3, timeout is 2 seconds:
Packet sent with a source address of 1.1.1.1
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 48/60/84 ms
```