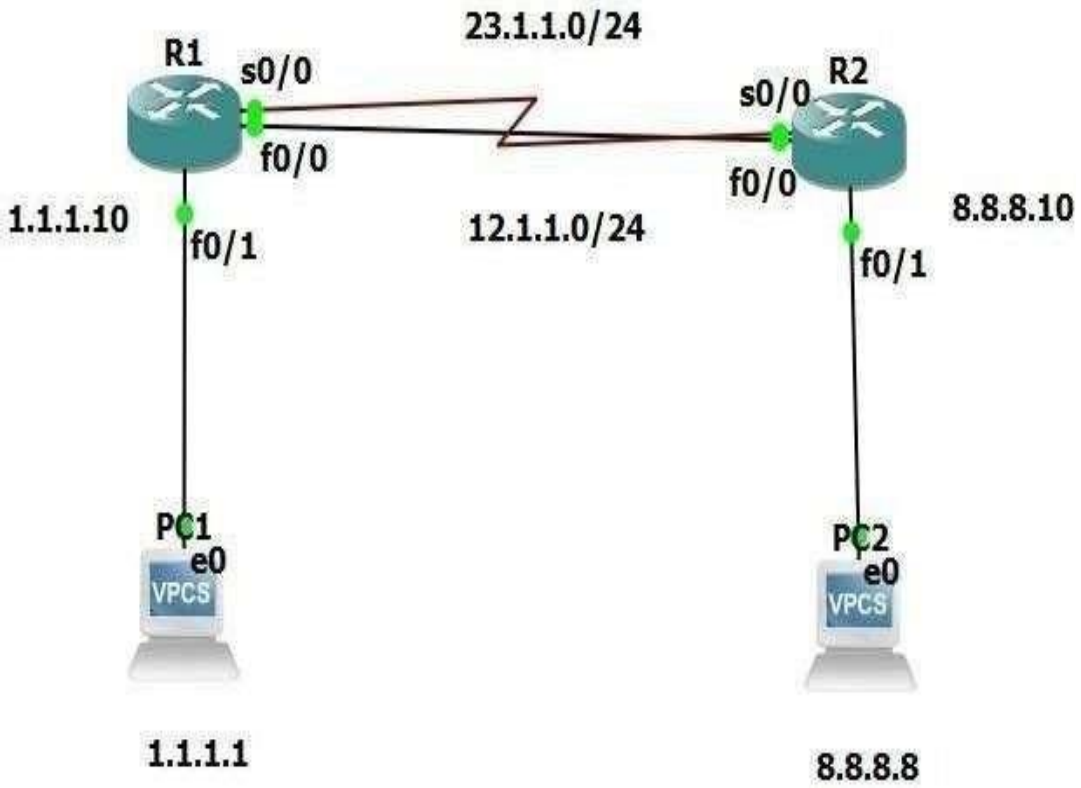
Practical 5:

Aim: configuring PBR (on GNS3)



Configure R1:

```
R1#conf t
R1(config)#int fa0/0
R1(config-if)#ip add 12.1.1.1 255.255.255.0
R1(config-if)#no shut
R1(config-if)#exit R1(config)#int s2/0
R1(config-if)#ip add 23.1.1.1 255.255.255.0
R1(config-if)#no shut
R1(config-if)#exit
R1(config)#int f1/0
R1(config-if)#ip add 1.1.1.10 255.255.255.0
R1(config-if)#no shut
R1(config)#exit
```

Configure R2:

```
R2#conf t
R2(config)#int fa0/0
R2(config-if)#ip add 12.1.1.2 255.255.255.0
R2(config-if)#no shut
R2(config-if)#exit
R2(config)#int se2/0
R2(config-if)#ip add 23.1.1.2 255.255.255.0
R2(config-if)#no shut
R2(config-if)#exit
R2(config)#int fa1/0
R2(config-if)#ip add 8.8.8.10 255.255.255.0
R2(config-if)#no shut
R2(config-if)#exit
```

Configure OSPF ON R1

```
R1#conf t
R1(config)#router ospf 100
R1(config-router)#network 12.1.1.0 0.0.0.255 area 1
R1(config-router)#network 23.1.1.0 0.0.0.255 area 1
R1(config-router)#network 1.1.1.0 0.0.0.255 area 1
R1(config-router)#exit R1(config)#
```

Configure OSPF ON R2

```
R2#conf t
R2(config)#router ospf 100
R2(config-router)#network 12.1.1.0 0.0.0.255 area 1
R2(config-router)#network 12.1.1.0 0.0.0.255 area 1 R2(config-router)#network 23.1.1.0
0.0.0.255 area 1
R2(config-router)#network 23.1.1.0 0.0.0.255 area 1
```

R2(config-router)#network 8.8.8.0 0.0.0.255 area 1
R2(config-router)#exit
R2(config)#exit

Check connectivity on R1

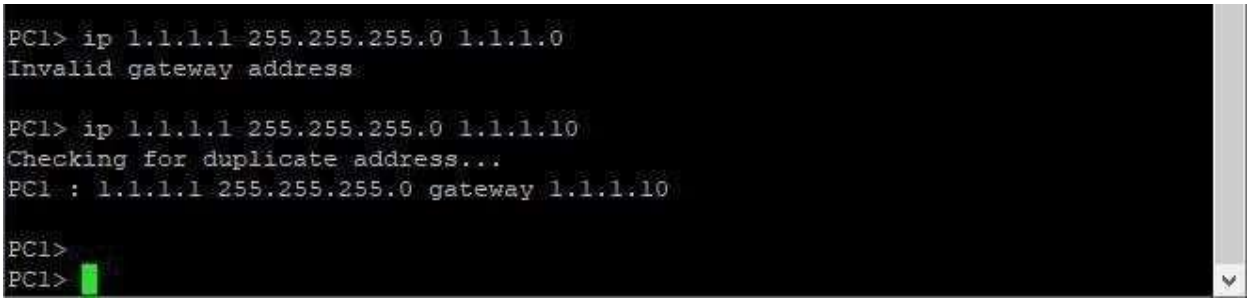
```
R1#sh ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - 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

     1.0.0.0/24 is subnetted, 1 subnets
C       1.1.1.0 is directly connected, FastEthernet1/0
     23.0.0.0/24 is subnetted, 1 subnets
C       23.1.1.0 is directly connected, Serial2/0
     8.0.0.0/24 is subnetted, 1 subnets
O       8.8.8.0 [110/2] via 12.1.1.2, 00:00:32, FastEthernet0/0
     12.0.0.0/24 is subnetted, 1 subnets
C       12.1.1.0 is directly connected, FastEthernet0/0
R1#
```

Check connectivity on R2

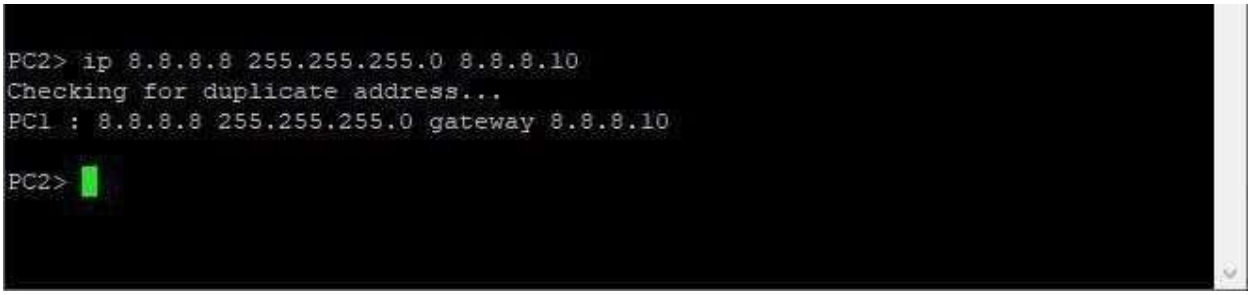
R2

```
R2(config)#exit
R2#
*Apr 29 12:21:22.347: %SYS-5-CONFIG_I: Configured from console by console
R2#
R2#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

     1.0.0.0/24 is subnetted, 1 subnets
O       1.1.1.0 [110/2] via 12.1.1.1, 00:01:30, FastEthernet0/0
     23.0.0.0/24 is subnetted, 1 subnets
C       23.1.1.0 is directly connected, Serial2/0
     8.0.0.0/24 is subnetted, 1 subnets
C       8.8.8.0 is directly connected, FastEthernet1/0
     12.0.0.0/24 is subnetted, 1 subnets
C       12.1.1.0 is directly connected, FastEthernet0/0
R2#
```

Configure PC1



Configure PC2



PC1> ping 8.8.8.8
8.8.8.8 icmp_seq=1 timeout
84 bytes from 8.8.8.8 icmp_seq=2 ttl=62 time=72.629 ms
84 bytes from 8.8.8.8 icmp_seq=3 ttl=62 time=44.246 ms
84 bytes from 8.8.8.8 icmp_seq=4 ttl=62 time=76.415 ms
84 bytes from 8.8.8.8 icmp_seq=5 ttl=62 time=55.456 ms

Configure PBR on R2

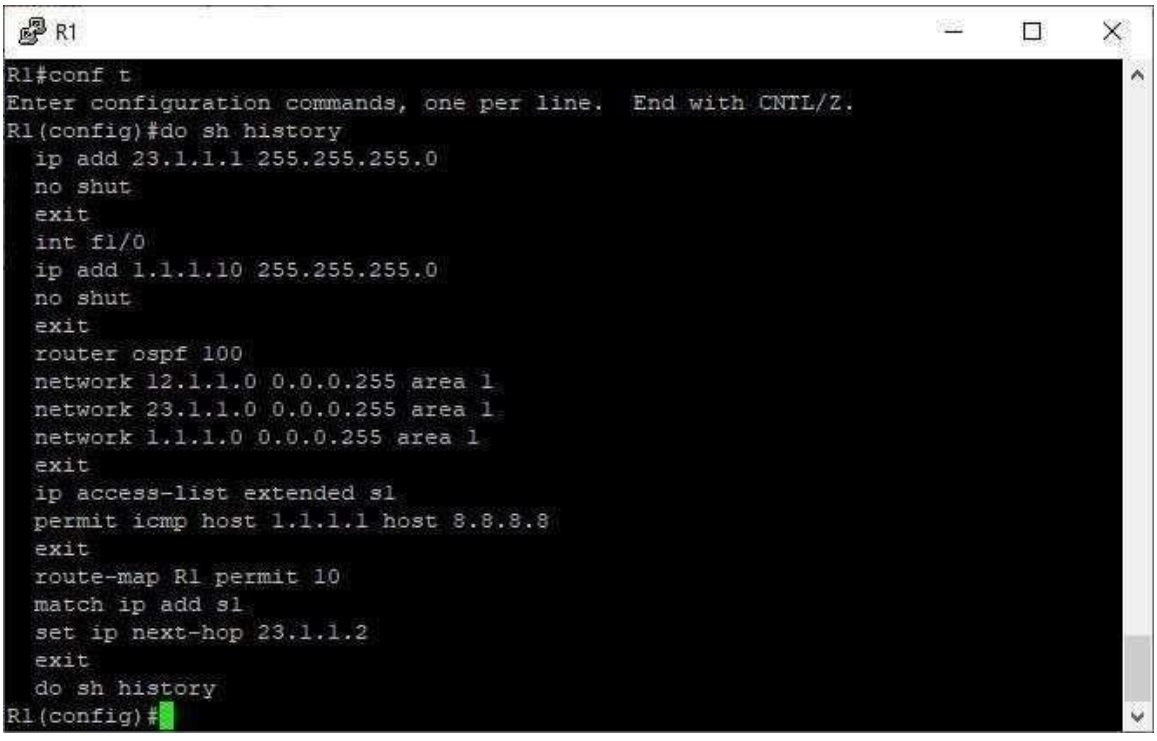
R2#conf t
R2(config)#access-list 100 permit icmp host 1.1.1.1 host 8.8.8.8
R2(config)#access-list 100 permit ip any any
R2(config)#access-list 101 permit icmp host 1.1.1.1 host 8.8.8.8
R2(config)#access-list 101 permit ip any any
R2(config)#int s2/0
R2(config-if)#ip access-group 100 in
R2(config-if)#exit
R2(config)#int fa0/0
R2(config-if)#ip access-group 101 in
R2(config-if)#exit
R2(config)#exit

Check access-list on R2

```
R2#sh ip access-list
Extended IP access list 100
    10 permit icmp host 1.1.1.1 host 8.8.8.8
    20 permit ip any any (13 matches)
Extended IP access list 101
    10 permit icmp host 1.1.1.1 host 8.8.8.8
    20 permit ip any any (10 matches)
R2#
```

Configure PBR on R1

R1#conf t
R1(config)#ip access-list extended s1
R1(config-ext-nacl)#permit icmp host 1.1.1.1 host 8.8.8.8
R1(config-ext-nacl)#exit
R1(config)#route-map R1 permit 10
R1(config-route-map)#match ip add s1
R1(config-route-map)#set ip next-hop 23.1.1.2
R1(config-route-map)#exit
R1(config)#



R1(config)#int f1/0
R1(config-if)#ip policy route-map R1
R1(config-if)#do sh history

```
R1#sh route-map
route-map R1, permit, sequence 10
  Match clauses:
    ip address (access-lists): s1
  Set clauses:
    ip next-hop 23.1.1.2
  Policy routing matches: 0 packets, 0 bytes
R1#sh ip policy
Interface      Route map
Fa1/0          R1
R1#
```

```
R1#sh ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
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       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
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Gateway of last resort is not set

     1.0.0.0/24 is subnetted, 1 subnets
C       1.1.1.0 is directly connected, FastEthernet1/0
     23.0.0.0/24 is subnetted, 1 subnets
C       23.1.1.0 is directly connected, Serial2/0
     8.0.0.0/24 is subnetted, 1 subnets
O       8.8.8.0 [110/2] via 12.1.1.2, 00:29:26, FastEthernet0/0
     12.0.0.0/24 is subnetted, 1 subnets
C       12.1.1.0 is directly connected, FastEthernet0/0
R1#
```

```
R2#sh ip access-list
Extended IP access list 100
    10 permit icmp host 1.1.1.1 host 8.8.8.8
    20 permit ip any any (13 matches)
Extended IP access list 101
    10 permit icmp host 1.1.1.1 host 8.8.8.8
    20 permit ip any any (10 matches)
R2#sh ip access-list
Extended IP access list 100
    10 permit icmp host 1.1.1.1 host 8.8.8.8
    20 permit ip any any (132 matches)
Extended IP access list 101
    10 permit icmp host 1.1.1.1 host 8.8.8.8
    20 permit ip any any (129 matches)
R2#
```