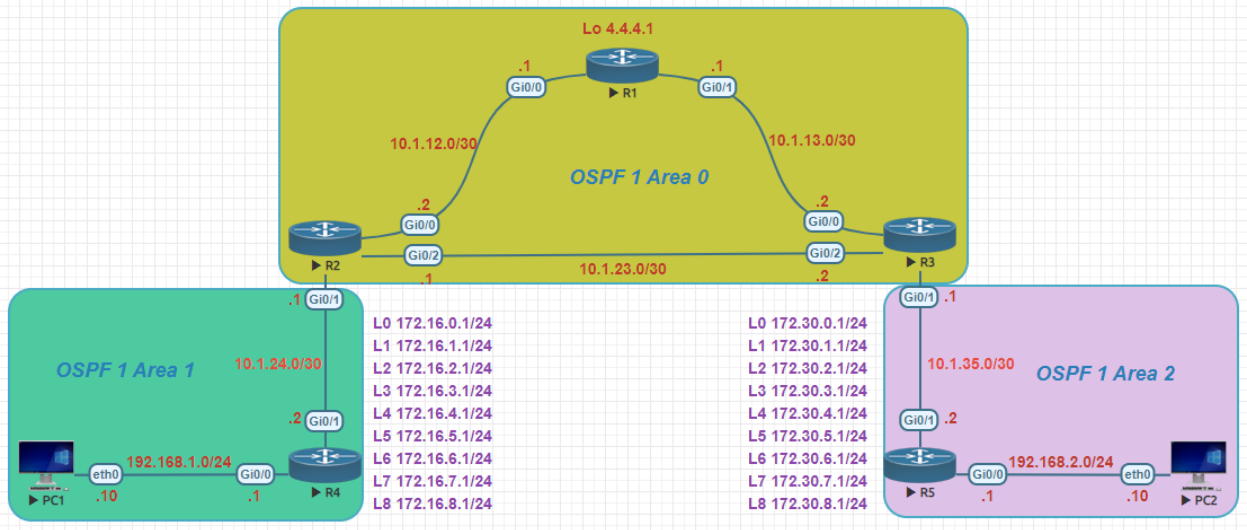
OSPF Route Filter Lab:



Router Images	vios-adventerprisek9-m.spa.159-3.m2
Client PC	VPCS
Testing	OSPF
OSPF Process ID	1

R1 Basic Configuration
R1(config)#hostname R1 R1(config)#no ip domain lookup R1(config)#line con 0 R1(config-line)#exec-timeout 0 0 R1(config-line)#logging synchronous R1(config-line)#exit R1(config)#interface Loopback0 R1(config-if)#ip address 4.4.4.1 255.255.255.255 R1(config-if)#exit R1(config)#interface GigabitEthernet0/0 R1(config-if)#ip address 10.1.12.1 255.255.255.252 R1(config-if)#no shutdown R1(config-if)#exit R1(config)#interface GigabitEthernet0/1 R1(config-if)#ip address 10.1.13.1 255.255.255.252 R1(config-if)#no shutdown R1(config-if)#exit

R2 Basic Configuration
R2(config)#hostname R2 R2(config)#no ip domain lookup R2(config)#line con 0 R2(config-line)#exec-timeout 0 0 R2(config-line)#logging synchronous R2(config-line)#exit R2(config)#interface GigabitEthernet0/0 R2(config-if)#ip address 10.1.12.2 255.255.255.252 R2(config-if)#no shutdown R2(config-if)#exit R2(config)#interface GigabitEthernet0/1 R2(config-if)#ip address 10.1.24.1 255.255.255.252 R2(config-if)#no shutdown R2(config-if)#exit R2(config)#interface GigabitEthernet0/2 R2(config-if)#ip address 10.1.23.1 255.255.255.252 R2(config-if)#no shutdown R2(config-if)#exit

R3 Basic Configuration
R3(config)#hostname R3 R3(config)#no ip domain lookup R3(config)#line con 0 R3(config-line)#exec-timeout 0 0 R3(config-line)#logging synchronous R3(config-line)#exit R3(config)#interface GigabitEthernet0/0 R3(config-if)#ip address 10.1.13.2 255.255.255.252 R3(config-if)#no shutdown R3(config-if)#exit R3(config)#interface GigabitEthernet0/1 R3(config-if)#ip address 10.1.35.1 255.255.255.252 R3(config-if)#no shutdown R3(config-if)#exit R3(config)#interface GigabitEthernet0/2 R3(config-if)#ip address 10.1.23.2 255.255.255.252 R3(config-if)#no shutdown R3(config-if)#exit

R4 Basic Configuration

```
R4(config)#hostname R4
R4(config)#no ip domain lookup
R4(config)#line con 0
R4(config-line)#exec-timeout 0 0
R4(config-line)#logging synchronous
R4(config-line)#exit
R4(config)#interface Loopback0
R4(config-if)#ip address 172.16.0.1 255.255.255.0
R4(config-if)#exit
R4(config)#interface Loopback1
R4(config-if)#ip address 172.16.1.1 255.255.255.0
R4(config-if)#exit
R4(config)#interface Loopback2
R4(config-if)#ip address 172.16.2.1 255.255.255.0
R4(config-if)#exit
R4(config)#interface Loopback3
R4(config-if)#ip address 172.16.3.1 255.255.255.0
R4(config-if)#exit
R4(config)#interface Loopback4
R4(config-if)#ip address 172.16.4.1 255.255.255.0
R4(config-if)#exit
R4(config)#interface Loopback5
R4(config-if)#ip address 172.16.5.1 255.255.255.0
R4(config-if)#exit
R4(config)#interface Loopback6
R4(config-if)#ip address 172.16.6.1 255.255.255.0
R4(config-if)#exit
R4(config)#interface Loopback7
R4(config-if)#ip address 172.16.7.1 255.255.255.0
R4(config-if)#exit
R4(config)#interface Loopback8
R4(config-if)#ip address 172.16.8.1 255.255.255.0
R4(config-if)#exit
R4(config)#interface GigabitEthernet0/0
R4(config-if)#ip address 192.168.1.1 255.255.255.0
R4(config-if)#no shutdown
R4(config-if)#exit
R4(config)#interface GigabitEthernet0/1
R4(config-if)#ip address 10.1.24.2 255.255.255.252
R4(config-if)#no shutdown
R4(config-if)#exit
```

R5 Basic Configuration

```
R5(config)#hostname R5
R5(config)#no ip domain lookup
R5(config)#line con 0
R5(config-line)#exec-timeout 0 0
R5(config-line)#logging synchronous
R5(config-line)#exit
R5(config)#interface Loopback0
R5(config-if)#ip address 172.30.0.1 255.255.255.0
R5(config-if)#exit
R5(config)#interface Loopback1
R5(config-if)#ip address 172.30.1.1 255.255.255.0
R5(config-if)#exit
R5(config)#interface Loopback2
R5(config-if)#ip address 172.30.2.1 255.255.255.0
R5(config-if)#exit
R5(config)#interface Loopback3
R5(config-if)#ip address 172.30.3.1 255.255.255.0
R5(config-if)#exit
R5(config)#interface Loopback4
R5(config-if)#ip address 172.30.4.1 255.255.255.0
R5(config-if)#exit
R5(config)#interface Loopback5
R5(config-if)#ip address 172.30.5.1 255.255.255.0
R5(config-if)#exit
R5(config)#interface Loopback6
R5(config-if)#ip address 172.30.6.1 255.255.255.0
R5(config-if)#exit
R5(config)#interface Loopback7
R5(config-if)#ip address 172.30.7.1 255.255.255.0
R5(config-if)#exit
R5(config)#interface Loopback8
R5(config-if)#ip address 172.30.8.1 255.255.255.0
R5(config-if)#exit
R5(config)#interface GigabitEthernet0/0
R5(config-if)#ip address 192.168.2.1 255.255.255.0
R5(config-if)#no shutdown
R5(config-if)#exit
R5(config)#interface GigabitEthernet0/1
R5(config-if)#ip address 10.1.35.2 255.255.255.252
R5(config-if)#no shutdown
R5(config-if)#exit
```

PC1 Basic Configuration
VPCS> set pcname PC1 PC1> ip 192.168.1.10 /24 192.168.1.1

PC2 Basic Configuration
VPCS> set pcname PC2 PC2> ip 192.168.2.10 /24 192.168.2.10

R1 OSPF Configuration
R1(config)#router ospf 1 R1(config-router)#router-id 1.1.1.1 R1(config-router)#network 10.1.12.0 0.0.0.3 area 0 R1(config-router)#network 10.1.13.0 0.0.0.3 area 0 R1(config-router)#network 4.4.4.4 0.0.0.0 area 0

R2 OSPF Configuration
R2(config)#router ospf 1 R2(config-router)#router-id 2.2.2.2 R2(config-router)#network 10.1.12.0 0.0.0.3 area 0 R2(config-router)#network 10.1.23.0 0.0.0.3 area 0 R2(config-router)#network 10.1.24.0 0.0.0.3 area 1

R3 OSPF Configuration
R3(config)#router ospf 1 R3(config-router)#router-id 3.3.3.3 R3(config-router)#network 10.1.13.0 0.0.0.3 area 0 R3(config-router)#network 10.1.23.0 0.0.0.3 area 0 R3(config-router)#network 10.1.35.0 0.0.0.3 area 2

R4 OSPF Configuration
R4(config)#router ospf 1 R4(config-router)#router-id 4.4.4.4 R4(config-router)#network 10.1.24.0 0.0.0.3 area 1 R4(config-router)#network 192.168.1.0 0.0.0.255 area 1 R4(config-router)#network 172.16.0.0 0.0.255.255 area 1

R5 OSPF Configuration
R5(config)#router ospf 1 R5(config-router)#router-id 5.5.5.5 R5(config-router)#network 10.1.35.0 0.0.0.3 area 2 R5(config-router)#network 192.168.2.0 0.0.0.255 area 2 R5(config-router)#network 172.30.0.0 0.0.255.255 area 2

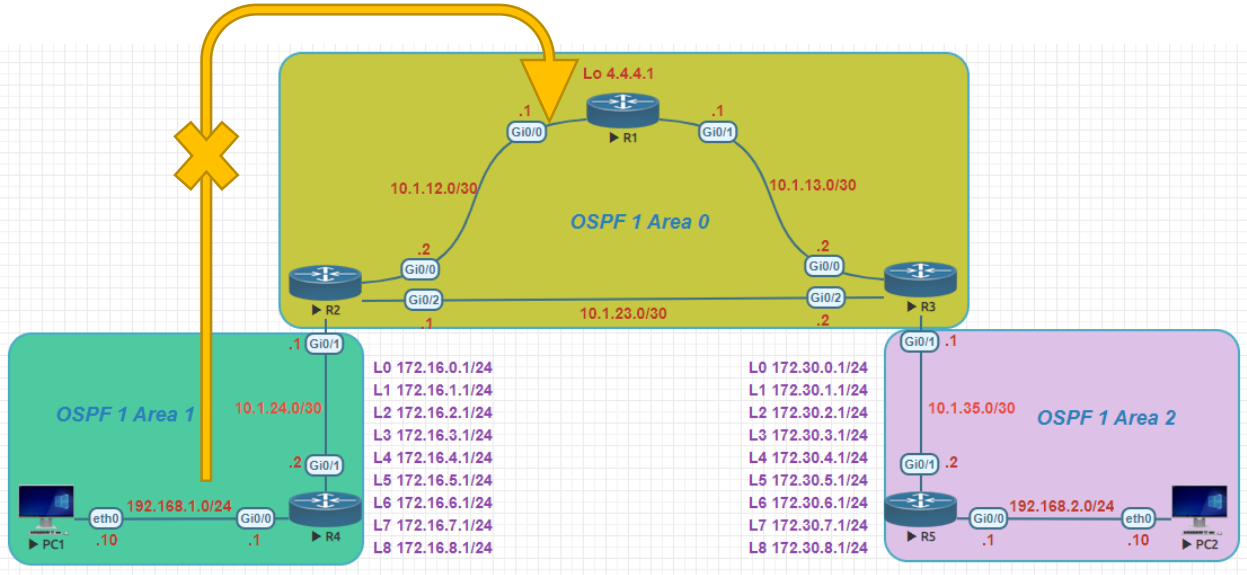
Show Commands
R1#show ip route ospf R1#show ip ospf neighbor
R2#show ip ospf neighbor R2#show ip route ospf
R3#show ip ospf neighbor
R4#show ip ospf neighbor R5#show ip ospf neighbor
R5#show ip ospf neighbor R5#show ip route ospf
PC1> ping 192.168.2.10
PC2> ping 192.168.1.10

Let's checkout R1 Routing Table Before apply route filtering 192.168.1.0/24 is there.

```
R1#show ip route ospf
Codes: L - local, 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, H - NHRP, l - LISP
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR

Gateway of last resort is not set

      10.0.0.0/8 is variably subnetted, 7 subnets, 2 masks
O        10.1.23.0/30 [110/2] via 10.1.13.2, 00:00:19, GigabitEthernet0/1
                      [110/2] via 10.1.12.2, 00:00:19, GigabitEthernet0/0
O IA     10.1.24.0/30 [110/2] via 10.1.12.2, 00:00:19, GigabitEthernet0/0
O IA     10.1.35.0/30 [110/2] via 10.1.13.2, 00:00:19, GigabitEthernet0/1
      172.8.0.0/16 is variably subnetted, 17 subnets, 3 masks
O        172.8.0.0/20 is a summary, 00:00:18, Null0
      172.16.0.0/16 is variably subnetted, 3 subnets, 3 masks
O IA     172.16.0.0/20 [110/3] via 10.1.12.2, 00:00:19, GigabitEthernet0/0
      172.30.0.0/20 is subnetted, 1 subnets
O IA     172.30.0.0 [110/3] via 10.1.13.2, 00:00:19, GigabitEthernet0/1
O IA  192.168.1.0/24 [110/3] via 10.1.12.2, 00:00:19, GigabitEthernet0/0
O IA  192.168.2.0/24 [110/3] via 10.1.13.2, 00:00:19, GigabitEthernet0/1
```



R1 Route Filtering Configuration
R1(config)#ip access-list standard block R1(config-std-nacl)#deny 192.168.1.0 0.0.0.255 R1(config-std-nacl)#permit any
R1(config)#router ospf 1 R1(config-router)#distribute-list block in
R1#show ip route ospf R1#show ip access-lists

After apply the Route Filter 192.168.1.0/24 Network is not there in R1 Routing Table.

```
R1#show ip route ospf
Codes: L - local, 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, H - NHRP, l - LISP
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR

Gateway of last resort is not set

      10.0.0.0/8 is variably subnetted, 7 subnets, 2 masks
O        10.1.23.0/30 [110/2] via 10.1.13.2, 00:00:16, GigabitEthernet0/1
                      [110/2] via 10.1.12.2, 00:00:16, GigabitEthernet0/0
O IA     10.1.24.0/30 [110/2] via 10.1.12.2, 00:00:16, GigabitEthernet0/0
O IA     10.1.35.0/30 [110/2] via 10.1.13.2, 00:00:16, GigabitEthernet0/1
      172.8.0.0/16 is variably subnetted, 17 subnets, 3 masks
O        172.8.0.0/20 is a summary, 00:00:15, Null0
      172.16.0.0/16 is variably subnetted, 3 subnets, 3 masks
O IA     172.16.0.0/20 [110/3] via 10.1.12.2, 00:00:16, GigabitEthernet0/0
      172.30.0.0/20 is subnetted, 1 subnets
O IA     172.30.0.0 [110/3] via 10.1.13.2, 00:00:16, GigabitEthernet0/1
O IA  192.168.2.0/24 [110/3] via 10.1.13.2, 00:00:16, GigabitEthernet0/1
```