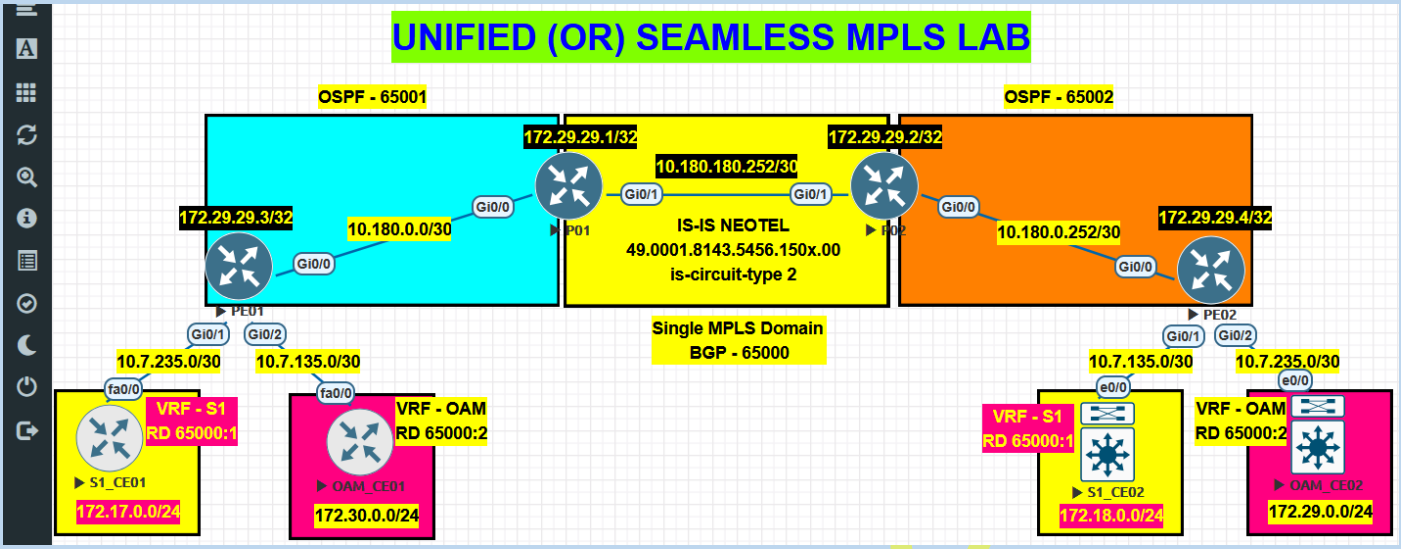
Seamless (or) Unified MPLS Basic LAB



Lab Requirements

1. Make single MPLS Domain From 3 different MPLS domains with different IGPs.
2. Make reachability for VRF S1 and VRF OAM.

Configuring IGP

PE01

```
router ospf 65001
 router-id 172.29.29.3
 auto-cost reference-bandwidth 10000
 passive-interface default
 no passive-interface GigabitEthernet0/0
 network 10.180.0.2 0.0.0.0 area 0
 network 172.29.29.3 0.0.0.0 area 0
!
```

P01

```
router ospf 65001
 router-id 172.29.29.1
 auto-cost reference-bandwidth 10000
```

```
 passive-interface default
 no passive-interface GigabitEthernet0/0
 network 10.180.0.1 0.0.0.0 area 0
 network 172.29.29.1 0.0.0.0 area 0
!
router isis NEOTEL
 net 49.0001.8143.5456.1501.00
 is-type level-2-only
 advertise passive-only
 metric-style wide
 passive-interface Loopback0
!
```

P02

```
router ospf 65002
 router-id 172.29.29.2
 auto-cost reference-bandwidth 10000
 passive-interface default
 no passive-interface GigabitEthernet0/0
 network 10.180.0.253 0.0.0.0 area 0
 network 172.29.29.2 0.0.0.0 area 0
!
router isis NEOTEL
 net 49.0001.8143.5456.1502.00
 is-type level-2-only
 advertise passive-only
 metric-style wide
 passive-interface Loopback0
!
```

PE02

```
router ospf 65002
 router-id 172.29.29.4
 auto-cost reference-bandwidth 10000
 passive-interface default
 no passive-interface GigabitEthernet0/0
 network 10.180.0.254 0.0.0.0 area 0
 network 172.29.29.4 0.0.0.0 area 0
!
```

Configure MPLS in Respective Interfaces

```
!
```

Configure BGP

PE01

```
router bgp 65000
 bgp router-id 172.29.29.3
 neighbor 172.29.29.1 remote-as 65000
 neighbor 172.29.29.1 password !@#$
 neighbor 172.29.29.1 update-source Loopback0
!
 address-family ipv4
  neighbor 172.29.29.1 activate
  neighbor 172.29.29.1 send-label
exit-address-family
 !
 address-family vpnv4
  neighbor 172.29.29.1 activate
  neighbor 172.29.29.1 send-community extended
 exit-address-family
 !
```

```
 address-family ipv4 vrf OAM
  redistribute static
 exit-address-family
 !
 address-family ipv4 vrf S1
  redistribute static
 exit-address-family
!
```

P01

```
router bgp 65000
 bgp router-id 172.29.29.1
 neighbor 172.29.29.2 remote-as 65000
 neighbor 172.29.29.2 password !@#$
 neighbor 172.29.29.2 update-source Loopback0
 neighbor 172.29.29.3 remote-as 65000
 neighbor 172.29.29.3 password !@#$
 neighbor 172.29.29.3 update-source Loopback0
 !
 address-family ipv4
  neighbor 172.29.29.2 activate
  neighbor 172.29.29.2 route-reflector-client
  neighbor 172.29.29.2 next-hop-self all
  neighbor 172.29.29.2 send-label
  neighbor 172.29.29.3 activate
  neighbor 172.29.29.3 route-reflector-client
  neighbor 172.29.29.3 next-hop-self all
  neighbor 172.29.29.3 send-label
 exit-address-family
 !
 address-family vpnv4
```

```
 neighbor 172.29.29.2 activate
 neighbor 172.29.29.2 send-community extended
 neighbor 172.29.29.2 route-reflector-client
 neighbor 172.29.29.2 next-hop-self all
 neighbor 172.29.29.3 activate
 neighbor 172.29.29.3 send-community extended
 neighbor 172.29.29.3 route-reflector-client
 neighbor 172.29.29.3 next-hop-self all
exit-address-family
!
```

P02

```
router bgp 65000
 bgp router-id 172.29.29.2
 neighbor 172.29.29.1 remote-as 65000
 neighbor 172.29.29.1 password !@#$
 neighbor 172.29.29.1 update-source Loopback0
 neighbor 172.29.29.4 remote-as 65000
 neighbor 172.29.29.4 password !@#$
 neighbor 172.29.29.4 update-source Loopback0
 !
 address-family ipv4
  neighbor 172.29.29.1 activate
  neighbor 172.29.29.1 route-reflector-client
  neighbor 172.29.29.1 next-hop-self all
  neighbor 172.29.29.1 send-label
  neighbor 172.29.29.4 activate
  neighbor 172.29.29.4 route-reflector-client
  neighbor 172.29.29.4 next-hop-self all
  neighbor 172.29.29.4 send-label
 exit-address-family
```

```
 !
 address-family vpnv4
  neighbor 172.29.29.1 activate
  neighbor 172.29.29.1 send-community extended
  neighbor 172.29.29.1 route-reflector-client
  neighbor 172.29.29.1 next-hop-self all
  neighbor 172.29.29.4 activate
  neighbor 172.29.29.4 send-community extended
  neighbor 172.29.29.4 route-reflector-client
  neighbor 172.29.29.4 next-hop-self all
 exit-address-family
!
```

PE02

```
router bgp 65000
 bgp router-id 172.29.29.4
 neighbor 172.29.29.2 remote-as 65000
 neighbor 172.29.29.2 password !@#$
 neighbor 172.29.29.2 update-source Loopback0
!
 address-family ipv4
  neighbor 172.29.29.2 activate
  neighbor 172.29.29.2 send-label
 exit-address-family
 !
 address-family vpnv4
  neighbor 172.29.29.2 activate
  neighbor 172.29.29.2 send-community extended
 exit-address-family
 !
 address-family ipv4 vrf OAM
```

redistribute static

exit–address–family

!

address–family ipv4 vrf S1

redistribute static

exit–address–family

!

Verification For VRF S1 and VRF OAM

PE01

```
     Network          Next Hop            Metric LocPrf Weight Path
Route Distinguisher: 65000:1 (default for vrf S1)
 *>  172.17.0.0/24    10.7.235.2               0             32768 ?
 *>i 172.18.0.0/24    172.29.29.1              0    100        0 ?
Route Distinguisher: 65000:2 (default for vrf OAM)
 *>i 172.29.0.0/24    172.29.29.1              0    100        0 ?
 *>  172.30.0.0/24    10.7.135.2               0             32768 ?
PE01#
```

PE02

```
     Network          Next Hop            Metric LocPrf Weight Path
Route Distinguisher: 65000:1 (default for vrf S1)
 *>i 172.17.0.0/24    172.29.29.2              0    100        0 ?
 *>  172.18.0.0/24    10.7.135.2               0             32768 ?
Route Distinguisher: 65000:2 (default for vrf OAM)
 *>  172.29.0.0/24    10.7.235.2               0             32768 ?
 *>i 172.30.0.0/24    172.29.29.2              0    100        0 ?
PE02#
```

Unified MPLS or Seamless MPLS

Seamless MPLS provides a highly flexible and scalable architecture to integrate multiple networks into a single MPLS domain.