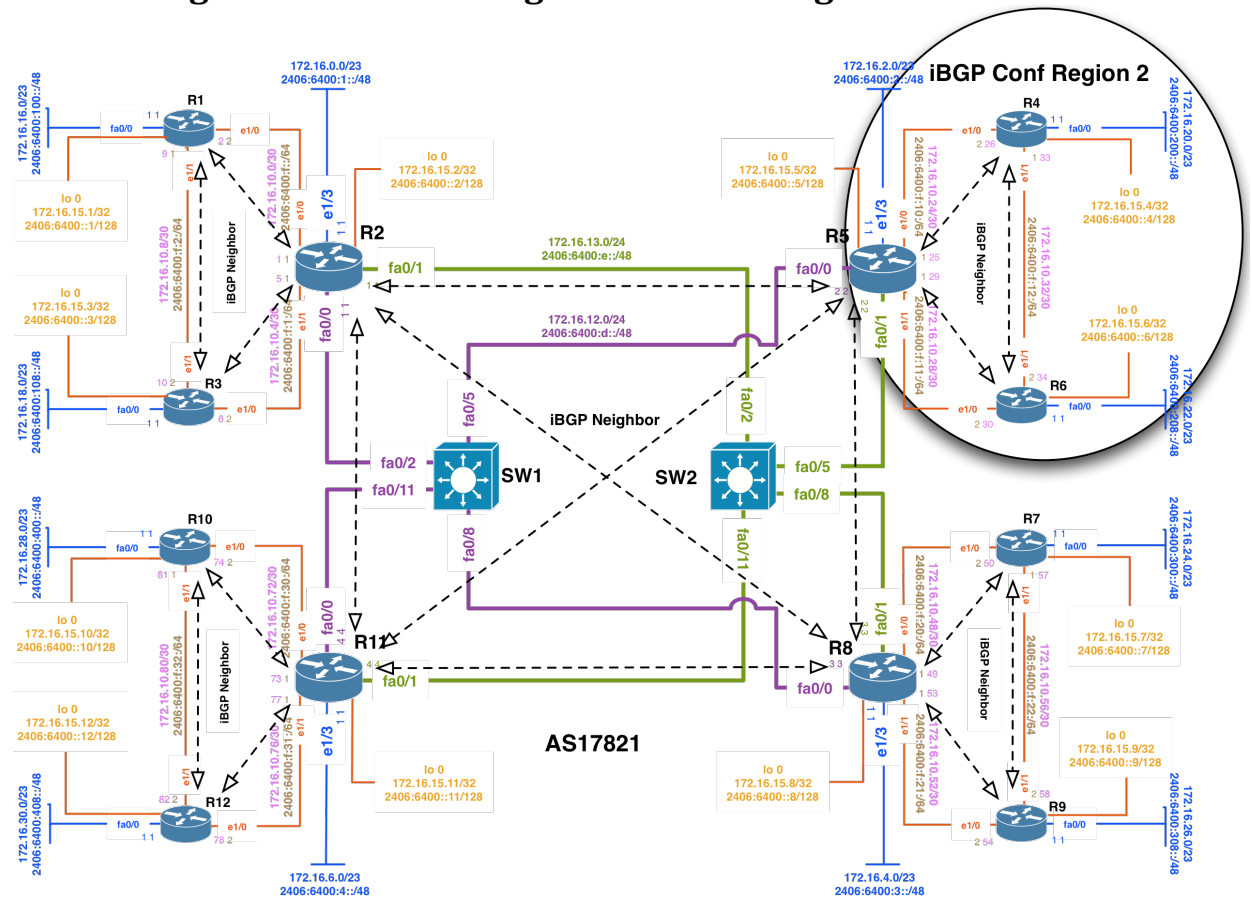


iBGP configuration for training ISP network Region2:



IPv4 iBGP Conf Router4:

```

config t
router bgp 17821
address-family ipv4
no auto-summary
no synchronization
neighbor 172.16.15.5 remote-as 17821
neighbor 172.16.15.5 update-source loopback 0
neighbor 172.16.15.5 activate
neighbor 172.16.15.6 remote-as 17821
neighbor 172.16.15.6 update-source loopback 0
neighbor 172.16.15.6 activate
network 172.16.20.0 mask 255.255.254.0
exit
exit
ip route 172.16.20.0 255.255.254.0 null 0 permanent
exit
wr
  
```

Verify IPV4 iBGP Configuration:

```
sh bgp ipv4 unicast summary
sh bgp ipv4 unicast
sh ip route bgp
sh bgp ipv4 unicast neighbors [router 1.....router12 loopback] advertised-
routes
sh bgp ipv4 unicast neighbors [router 1.....router12 loopback] received-
routes
sh ip route [R2, R5, R8, R11 datacenter prefix]
```

IPv6 iBGP Conf Router4:

```
config t
router bgp 17821
address-family ipv6
no synchronization
neighbor 2406:6400:0000:0000::5 remote-as 17821
neighbor 2406:6400:0000:0000::5 update-source loopback 0
neighbor 2406:6400:0000:0000::5 activate
neighbor 2406:6400:0000:0000::6 remote-as 17821
neighbor 2406:6400:0000:0000::6 update-source loopback 0
neighbor 2406:6400:0000:0000::6 activate
network 2406:6400:0200:0000::/45
exit
exit
ipv6 route 2406:6400:0200:0000::/45 null 0
exit
wr
```

Verify IPV6 iBGP Configuration:

```
sh bgp ipv6 unicast summary
sh bgp ipv6 unicast
sh ipv6 route bgp
sh bgp ipv6 unicast neighbors [router 1.....router12 loopback] advertised-
routes
sh bgp ipv6 unicast neighbors [router 1.....router12 loopback] received-
routes
sh ipv6 route [R2, R5, R8, R11 datacenter prefix]
```

IPv4 iBGP Conf Router5:

```
config t
router bgp 17821
address-family ipv4
no auto-summary
no synchronization
```

```
neighbor 172.16.15.4 remote-as 17821
neighbor 172.16.15.4 update-source loopback 0
neighbor 172.16.15.4 activate
neighbor 172.16.15.6 remote-as 17821
neighbor 172.16.15.6 update-source loopback 0
neighbor 172.16.15.6 activate
neighbor 172.16.15.2 remote-as 17821
neighbor 172.16.15.2 update-source loopback 0
neighbor 172.16.15.2 activate
neighbor 172.16.15.8 remote-as 17821
neighbor 172.16.15.8 update-source loopback 0
neighbor 172.16.15.8 activate
neighbor 172.16.15.11 remote-as 17821
neighbor 172.16.15.11 update-source loopback 0
neighbor 172.16.15.11 activate
network 172.16.2.0 mask 255.255.254.0
exit
exit
ip route 172.16.2.0 255.255.254.0 null 0 permanent
exit
wr
```

Verify IPV4 iBGP Configuration:

```
sh bgp ipv4 unicast summary
sh bgp ipv4 unicast
sh ip route bgp
sh bgp ipv4 unicast neighbors [router 1.....router12 loopback] advertised-
routes
sh bgp ipv4 unicast neighbors [router 1.....router12 loopback] received-
routes
sh ip route [R2, R5, R8, R11 datacenter prefix]
```

IPv6 iBGP Conf Router5:

```
config t
router bgp 17821
address-family ipv6
no synchronization
neighbor 2406:6400:0000:0000::4 remote-as 17821
neighbor 2406:6400:0000:0000::4 update-source loopback 0
neighbor 2406:6400:0000:0000::4 activate
neighbor 2406:6400:0000:0000::6 remote-as 17821
neighbor 2406:6400:0000:0000::6 update-source loopback 0
neighbor 2406:6400:0000:0000::6 activate
neighbor 2406:6400:0000:0000::2 remote-as 17821
neighbor 2406:6400:0000:0000::2 update-source loopback 0
neighbor 2406:6400:0000:0000::2 activate
```

```

neighbor 2406:6400:0000:0000::8 remote-as 17821
neighbor 2406:6400:0000:0000::8 update-source loopback 0
neighbor 2406:6400:0000:0000::8 activate
neighbor 2406:6400:0000:0000::11 remote-as 17821
neighbor 2406:6400:0000:0000::11 update-source loopback 0
neighbor 2406:6400:0000:0000::11 activate
network 2406:6400:0002:0000::/48
exit
exit
ipv6 route 2406:6400:0002:0000::/48 null 0
exit
wr

```

Verify IPV6 iBGP Configuration:

```

sh bgp ipv6 unicast summary
sh bgp ipv6 unicast
sh ipv6 route bgp
sh bgp ipv6 unicast neighbors [router 1.....router12 loopback] advertised-
routes
sh bgp ipv6 unicast neighbors [router 1.....router12 loopback] received-
routes
sh ipv6 route [R2, R5, R8, R11 datacenter prefix]

```

IPv4 iBGP Conf Router6:

```

config t
router bgp 17821
address-family ipv4
no auto-summary
no synchronization
neighbor 172.16.15.5 remote-as 17821
neighbor 172.16.15.5 update-source loopback 0
neighbor 172.16.15.5 activate
neighbor 172.16.15.4 remote-as 17821
neighbor 172.16.15.4 update-source loopback 0
neighbor 172.16.15.4 activate
network 172.16.22.0 mask 255.255.254.0
exit
exit
ip route 172.16.22.0 255.255.254.0 null 0 permanent
exit
wr

```

Verify IPV4 iBGP Configuration:

```
sh bgp ipv4 unicast summary
sh bgp ipv4 unicast
sh ip route bgp
sh bgp ipv4 unicast neighbors [router 1.....router12 loopback] advertised-
routes
sh bgp ipv4 unicast neighbors [router 1.....router12 loopback] received-
routes
sh ip route [R2, R5, R8, R11 datacenter prefix]
```

IPV6 iBGP Conf Router6:

```
config t
router bgp 17821
address-family ipv6
no synchronization
neighbor 2406:6400:0000:0000::5 remote-as 17821
neighbor 2406:6400:0000:0000::5 update-source loopback 0
neighbor 2406:6400:0000:0000::5 activate
neighbor 2406:6400:0000:0000::4 remote-as 17821
neighbor 2406:6400:0000:0000::4 update-source loopback 0
neighbor 2406:6400:0000:0000::4 activate
network 2406:6400:0208:0000::/45
exit
exit
ipv6 route 2406:6400:0208:0000::/45 null 0
exit
wr
```

Verify IPV6 iBGP Configuration:

```
sh bgp ipv6 unicast summary
sh bgp ipv6 unicast
sh ipv6 route bgp
sh bgp ipv6 unicast neighbors [router 1.....router12 loopback] advertised-
routes
sh bgp ipv6 unicast neighbors [router 1.....router12 loopback] received-
routes
sh ipv6 route [R2, R5, R8, R11 datacenter prefix]
```

The diagram illustrates the internal network structure of AS17821. It features 12 routers (R1-R12) and two switches (SW1, SW2). The network is organized into several regions, with a circular inset providing a detailed view of the iBGP configuration for Region 2, involving routers R4, R5, and R6.

Key Network Details:

- AS17821:** The central Autonomous System, with a loopback address of 172.16.12.0/24 (2406:6400:d::/48).
- Internal Connections:**
 - Routers R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, and R12 are interconnected via various interfaces (fa0/0, fa0/1, fa0/2, fa0/5, fa0/8, fa0/11, fa0/12, fa0/13, fa0/14, fa0/15, fa0/16, fa0/17, fa0/18, fa0/19, fa0/20, fa0/21, fa0/22, fa0/23, fa0/24, fa0/25, fa0/26, fa0/27, fa0/28, fa0/29, fa0/30, fa0/31, fa0/32, fa0/33, fa0/34, fa0/35, fa0/36, fa0/37, fa0/38, fa0/39, fa0/40, fa0/41, fa0/42, fa0/43, fa0/44, fa0/45, fa0/46, fa0/47, fa0/48).
 - Switches SW1 and SW2 are connected to routers R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, and R12.
- iBGP Neighbor Relationships:**
 - R1 and R2 are iBGP neighbors.
 - R2 and R3 are iBGP neighbors.
 - R3 and R4 are iBGP neighbors.
 - R4 and R5 are iBGP neighbors.
 - R5 and R6 are iBGP neighbors.
 - R6 and R7 are iBGP neighbors.
 - R7 and R8 are iBGP neighbors.
 - R8 and R9 are iBGP neighbors.
 - R9 and R10 are iBGP neighbors.
 - R10 and R11 are iBGP neighbors.
 - R11 and R12 are iBGP neighbors.
 - R12 and R1 are iBGP neighbors.
- IP Addressing:**
 - Loopback addresses (lo 0) are assigned to each router, typically in the 172.16.15.x/32 range.
 - Interface addresses are assigned to various interfaces, typically in the 172.16.x.x/24 range.

The circular inset, titled "iBGP Conf Region 2", provides a detailed view of the iBGP configuration for routers R4, R5, and R6. It shows the following details:

- R4:**
 - fa0/0: 172.16.20.0/23 (2406:6400:200::/48)
 - fa0/1: 172.16.15.4/32 (2406:6400::4/128)
 - fa0/2: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/3: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/4: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/5: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/6: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/7: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/8: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/9: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/10: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/11: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/12: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/13: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/14: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/15: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/16: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/17: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/18: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/19: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/20: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/21: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/22: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/23: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/24: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/25: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/26: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/27: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/28: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/29: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/30: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/31: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/32: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/33: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/34: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/35: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/36: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/37: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/38: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/39: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/40: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/41: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/42: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/43: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/44: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/45: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/46: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/47: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/48: 172.16.10.2/20 (2406:6400:10::/64)
- R5:**
 - fa0/0: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/1: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/2: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/3: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/4: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/5: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/6: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/7: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/8: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/9: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/10: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/11: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/12: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/13: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/14: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/15: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/16: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/17: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/18: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/19: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/20: 172.16.10.2/20 (2406:6400:10::/64)
 - fa0/21: 172.16.10

```
config t
router bgp 17821
address-family ipv4
neighbor 172.16.15.4 route-reflector-client
neighbor 172.16.15.6 route-reflector-client
exit
exit
exit
wr
```

```
sh bgp ipv4 unicast summary
sh bgp ipv4 unicast
sh ip route bgp
sh bgp ipv4 unicast neighbors [router 1.....router12 loopback] advertised-
routes
```

```
sh bgp ipv4 unicast neighbors [router 1.....router12 loopback] received-  
routes  
sh ip route [R2, R5, R8, R11 datacenter prefix]
```

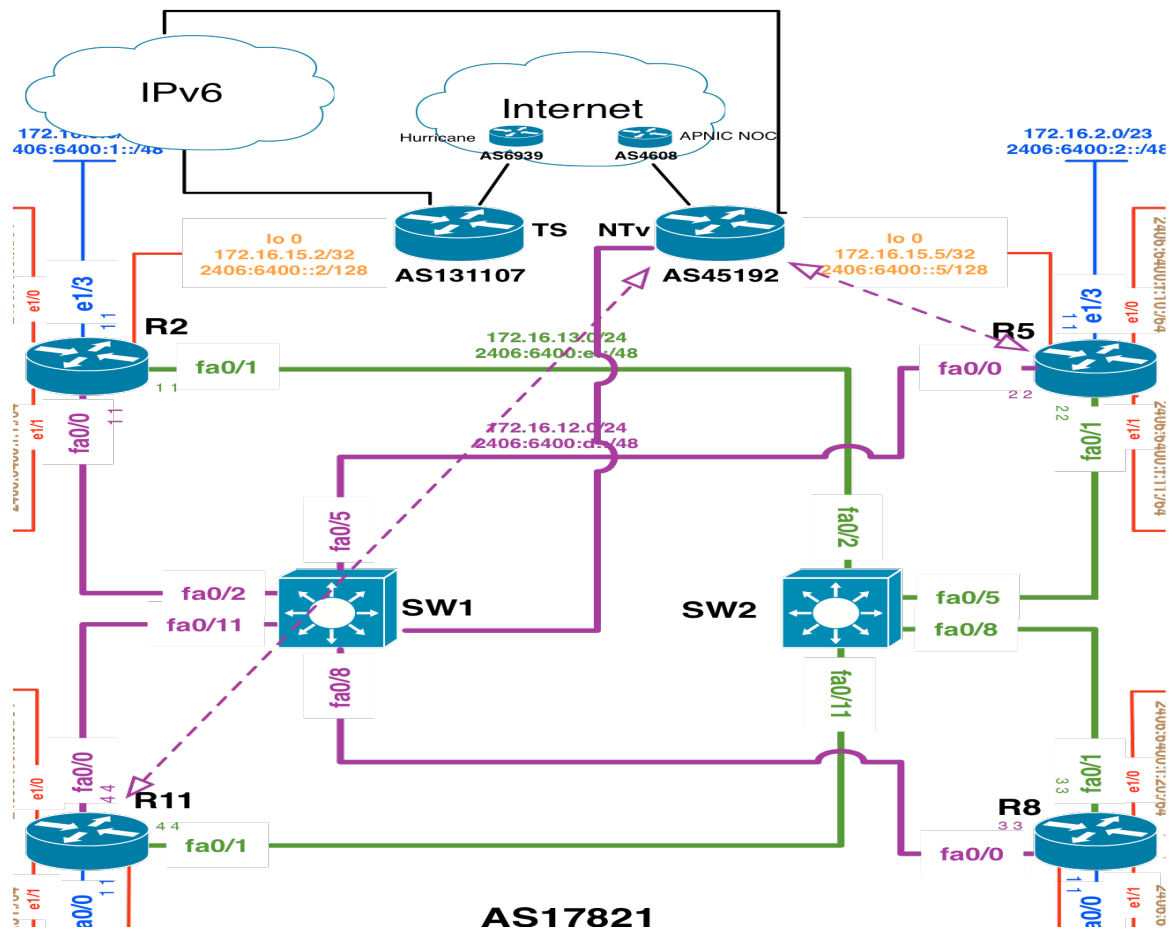
IPv6 RR Configuration on Router5 (One RR Server per region):

```
config t  
router bgp 17821  
address-family ipv6  
neighbor 2406:6400:0000:0000::4 route-reflector-client  
neighbor 2406:6400:0000:0000::6 route-reflector-client  
exit  
exit  
exit  
wr
```

Verify IPV6 RR Configuration:

```
sh bgp ipv6 unicast summary  
sh bgp ipv6 unicast  
sh ipv6 route bgp  
sh bgp ipv6 unicast neighbors [router 1.....router12 loopback] advertised-  
routes  
sh bgp ipv6 unicast neighbors [router 1.....router12 loopback] received-  
routes  
sh ipv6 route [R2, R5, R8, R11 datacenter prefix]
```

IPv6 eBGP Native Transit Conf Region 2 (Only Region Core Router):



IPv6 eBGP Peering Conf Router5:

```

config t
router bgp 17821
address-family ipv6
neighbor 2406:6400:000D:0000::5 remote-as 45192
neighbor 2406:6400:000D:0000::5 activate
neighbor 2406:6400:000E:0000::5 remote-as 45192
neighbor 2406:6400:000E:0000::5 activate
exit
exit
exit
exit
wr

```


Verify eBGP Peering:

sh bgp ipv6 unicast summary

sh bgp ipv6 unicast

sh ipv6 route bgp

sh bgp ipv6 unicast neighbors 2406:6400:000D:0000::5 advertised-routes

sh bgp ipv6 unicast neighbors 2406:6400:000D:0000::5 received-routes

sh ipv6 route [All global prefix]