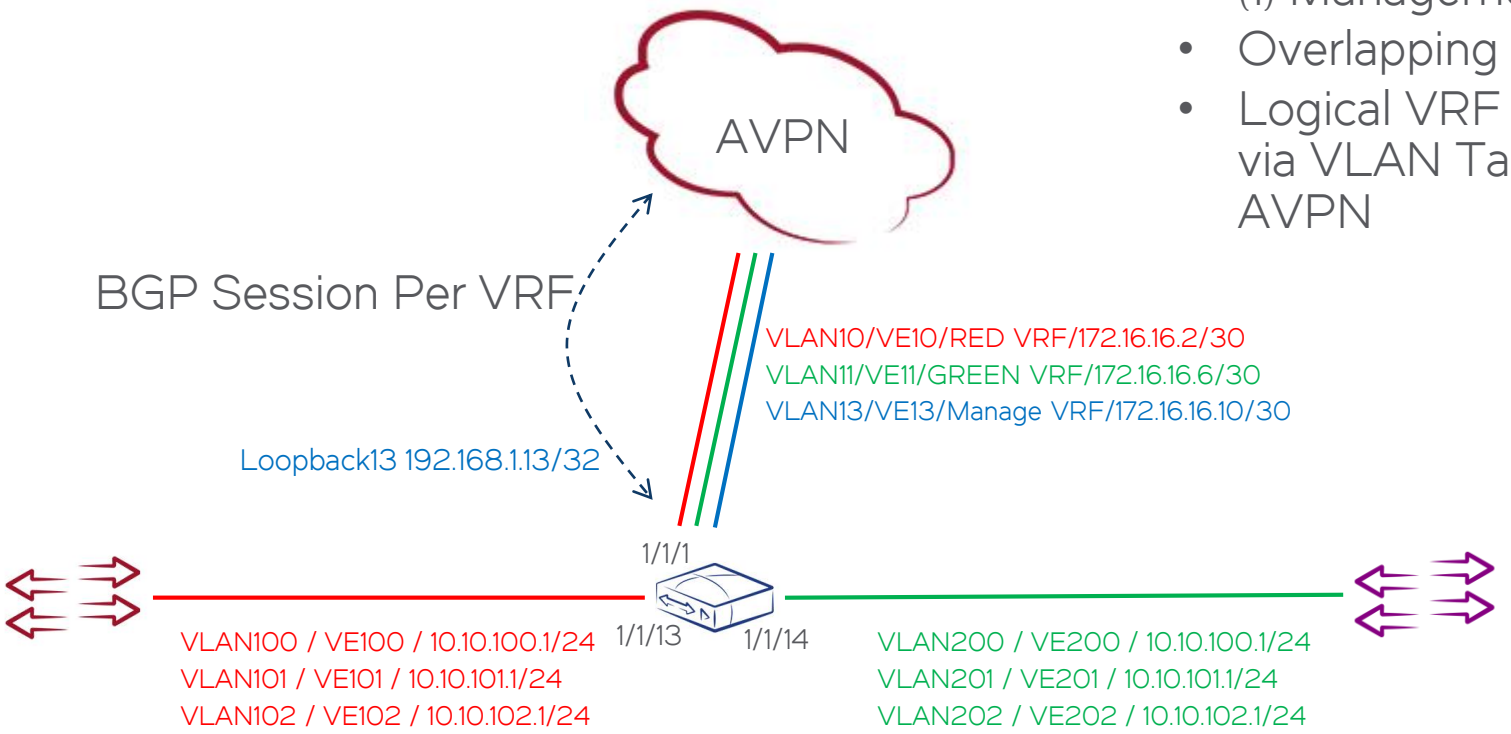
MultiVRF Deployment Example

- (2) Customer VRFs
- (1) Management VRFs
- Overlapping Subnets
- Logical VRF Separation via VLAN Tagging to AVPN



VLAN Configuration

```
vlan 10 name REDAVPN by port
 tagged ethe 1/1/1
 router-interface ve 10
!
vlan 11 name GREENAVPN by port
 tagged ethe 1/1/1
 router-interface ve 11
!
vlan 13 name MANAGE by port
 tagged ethe 1/1/1
 router-interface ve 13
!
vlan 100 by port
 tagged ethe 1/1/13
 router-interface ve 100
!
vlan 101 by port
 tagged ethe 1/1/13
 router-interface ve 101
!
vlan 102 by port
 tagged ethe 1/1/13
 router-interface ve 102
!
```

```
vlan 200 by port
 tagged ethe 1/1/14
 router-interface ve 200
!
vlan 201 by port
 tagged ethe 1/1/14
 router-interface ve 201
!
vlan 202 by port
 tagged ethe 1/1/14
 router-interface ve 202
!
vlan 299 name DEFAULT-VLAN by port
```

VRF Configuration

```
system-max ip-route-default-vrf 10000
!
vrf RED
 rd 192.168.1.1:1
 address-family ipv4 max-route 128
 exit-address-family
exit-vrf
!
vrf GREEN
 rd 192.168.1.1:2
 address-family ipv4 max-route 128
 exit-address-family
exit-vrf
!
vrf manage
 rd 192.168.1.1:3
 address-family ipv4 max-route 128
 exit-address-family
exit-vrf
!
management-vrf manage
```

Layer 3 Interface Configuration

```
interface loopback 1
 ip address 192.168.1.1 255.255.255.255
!
interface loopback 13
 vrf forwarding manage
 ip address 192.168.1.13 255.255.255.255
!
interface ve 10
 vrf forwarding RED
 ip address 172.16.16.2 255.255.255.252
!
interface ve 11
 vrf forwarding GREEN
 ip address 172.16.16.6 255.255.255.252
!
interface ve 13
 vrf forwarding manage
 ip address 172.16.16.10 255.255.255.252
!
interface ve 100
 vrf forwarding RED
 ip address 10.10.100.1 255.255.255.0
!
```

```
interface ve 101
 vrf forwarding RED
 ip address 10.10.101.1 255.255.255.0
!
interface ve 102
 vrf forwarding RED
 ip address 10.10.102.1 255.255.255.0
!
interface ve 200
 vrf forwarding GREEN
 ip address 10.10.100.1 255.255.255.0
!
interface ve 201
 vrf forwarding GREEN
 ip address 10.10.101.1 255.255.255.0
!
interface ve 202
 vrf forwarding GREEN
 ip address 10.10.102.1 255.255.255.0
!
```

BGP Configuration

```
router bgp
 local-as 65000

 address-family ipv4 unicast
 exit-address-family

 address-family ipv6 unicast
 exit-address-family

 address-family ipv4 unicast vrf RED
 neighbor 172.16.16.1 remote-as 100
 network 10.10.100.0/24
 network 10.10.101.0/24
 network 10.10.102.0/24
 exit-address-family

 address-family ipv4 unicast vrf GREEN
 neighbor 172.16.16.5 remote-as 100
 network 10.10.100.0/24
 network 10.10.101.0/24
 network 10.10.102.0/24
 exit-address-family

 address-family ipv4 unicast vrf manage
 neighbor 172.16.16.9 remote-as 100
 network 192.168.1.13/32
 exit-address-family
```

BGP Output

```
remote#show ip bgp vrf RED sum
  BGP4 Summary
  Router ID: 10.10.100.1   Local AS Number: 65000
  Confederation Identifier: not configured
  Confederation Peers:
  Maximum Number of IP ECMP Paths Supported for Load Sharing: 1
  Number of Neighbors Configured: 1, UP: 1
  Number of Routes Installed: 6, Uses 516 bytes
  Number of Routes Advertising to All Neighbors: 3 (3 entries), Uses 144 bytes
  Number of Attribute Entries Installed: 3, Uses 270 bytes
  Neighbor Address  AS#         State   Time          Rt:Accepted Filtered Sent     ToSend
  172.16.16.1       100         ESTAB   0h59m41s      3           0        3        0
remote#show ip bgp vrf GREEN sum
  BGP4 Summary
  Router ID: 10.10.100.1   Local AS Number: 65000
  Confederation Identifier: not configured
  Confederation Peers:
  Maximum Number of IP ECMP Paths Supported for Load Sharing: 1
  Number of Neighbors Configured: 1, UP: 1
  Number of Routes Installed: 3, Uses 258 bytes
  Number of Routes Advertising to All Neighbors: 0 (0 entries)
  Number of Attribute Entries Installed: 2, Uses 180 bytes
  Neighbor Address  AS#         State   Time          Rt:Accepted Filtered Sent     ToSend
  172.16.16.5       100         ESTAB   0h59m55s      3           0        0        0
```

BGP Output

```
remote#show ip bgp vrf RED
Total number of BGP Routes: 6
Status codes: s suppressed, d damped, h history, * valid, > best, i internal, S stale
Origin codes: i - IGP, e - EGP, ? - incomplete
    Network            Next Hop        RD         MED    LocPrf     Weight Path
*>  0.0.0.0/0          172.16.16.1                0      100        0      100 i
*>  4.4.4.4/32         172.16.16.1                0      100        0      100 ?
*>  10.10.100.0/24     0.0.0.0                    0      100        32768  i
*>  10.10.101.0/24     0.0.0.0                    0      100        32768  i
*>  10.10.102.0/24     0.0.0.0                    0      100        32768  i
*>  172.16.16.0/30     172.16.16.1                0      100        0      100 ?
remote#show ip bgp vrf GREEN
Total number of BGP Routes: 6
Status codes: s suppressed, d damped, h history, * valid, > best, i internal, S stale
Origin codes: i - IGP, e - EGP, ? - incomplete
    Network            Next Hop        RD         MED    LocPrf     Weight Path
*>  0.0.0.0/0          172.16.16.5                0      100        0      100 i
*>  5.5.5.5/32         172.16.16.5                0      100        0      100 ?
*>  10.10.100.0/24     0.0.0.0                    0      100        32768  i
*>  10.10.101.0/24     0.0.0.0                    0      100        32768  i
*>  10.10.102.0/24     0.0.0.0                    0      100        32768  i
*>  172.16.16.4/30     172.16.16.5                0      100        0      100 ?
```

Routing Table Output

```
remote#show ip route vrf RED
Total number of IP routes: 6
Type Codes - B:BGP D:Connected O:OSPF R:RIP S:Static; Cost - Dist/Metric
BGP  Codes - i:iBGP e:eBGP
OSPF Codes - i:Inter Area 1:External Type 1 2:External Type 2
        Destination        Gateway         Port          Cost          Type Uptime
1       0.0.0.0/0          172.16.16.1     ve 10         20/0          Be   1h3m
2       4.4.4.4/32         172.16.16.1     ve 10         20/0          Be   1h3m
3       10.10.100.0/24     DIRECT          ve 100        0/0           D    49m4s
4       10.10.101.0/24     DIRECT          ve 101        0/0           D    49m4s
5       10.10.102.0/24     DIRECT          ve 102        0/0           D    49m4s
6       172.16.16.0/30     DIRECT          ve 10         0/0           D    1h3m
remote#show ip route vrf GREEN
Total number of IP routes: 6
Type Codes - B:BGP D:Connected O:OSPF R:RIP S:Static; Cost - Dist/Metric
BGP  Codes - i:iBGP e:eBGP
OSPF Codes - i:Inter Area 1:External Type 1 2:External Type 2
        Destination        Gateway         Port          Cost          Type Uptime
1       0.0.0.0/0          172.16.16.5     ve 11         20/0          Be   1h3m
2       5.5.5.5/32         172.16.16.5     ve 11         20/0          Be   1h3m
3       10.10.100.0/24     DIRECT          ve 200        0/0           D    1m16s
4       10.10.101.0/24     DIRECT          ve 201        0/0           D    1m16s
5       10.10.102.0/24     DIRECT          ve 202        0/0           D    1m16s
6       172.16.16.4/30     DIRECT          ve 11         0/0           D    1h3m
```

Ping Output

```
remote#ping vrf RED 4.4.4.4 source 10.10.100.1
Sending 1, 16-byte ICMP Echo to 4.4.4.4, timeout 5000 msec, TTL 64
Type Control-c to abort
Reply from 4.4.4.4         : bytes=16 time<1ms TTL=64
Success rate is 100 percent (1/1), round-trip min/avg/max=0/0/0 ms.


remote#ping vrf RED 5.5.5.5 source 10.10.100.1
Sending 1, 16-byte ICMP Echo to 5.5.5.5, timeout 5000 msec, TTL 64
Type Control-c to abort
Request timed out.
No reply from remote host.
```

Ping Output

```
remote#ping vrf GREEN 5.5.5.5 source 10.10.100.1
Sending 1, 16-byte ICMP Echo to 5.5.5.5, timeout 5000 msec, TTL 64
Type Control-c to abort
Reply from 5.5.5.5         : bytes=16 time<1ms TTL=64
Success rate is 100 percent (1/1), round-trip min/avg/max=0/0/0 ms.

remote#ping vrf GREEN 4.4.4.4 source 10.10.100.1
Sending 1, 16-byte ICMP Echo to 4.4.4.4, timeout 5000 msec, TTL 64
Type Control-c to abort
Request timed out.
No reply from remote host.
```