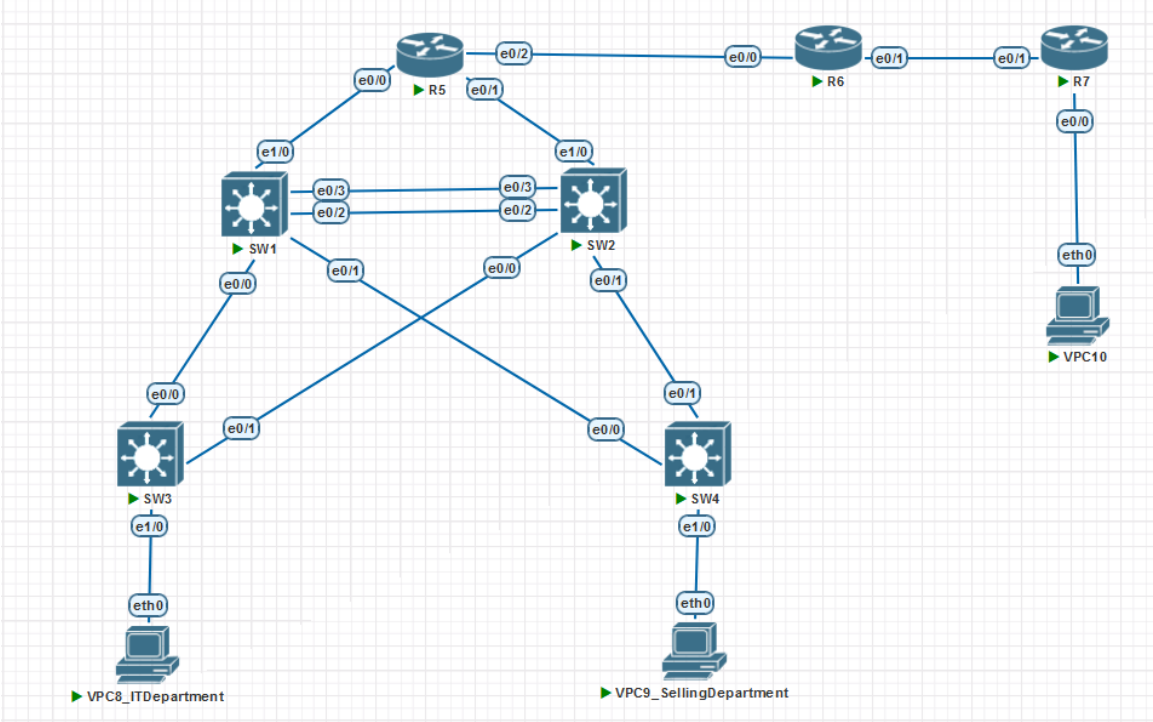
SVI_VRRP_PROJECT

Gateway is designated by SW1 and SW2 convergence switches

Switch VLAN Interface(SVI), one VLAN maps one SVI, SVI is a logical interface, and must in the same subnet with this VLAN PCs

VRRP, in one network, existing two gateways, and these two gateways are not in the same subnet, if one switch is down, this VLAN will be broken, so set VRRP on interfaces based on same group, to create neighbor, choose master and backup, they share same IP address(virtual IP) and MAC(virtual mac), need to configure virtual ip, but virtual mac will be generated automatically.



Config SW

switchport nonegotiate ---for closing the dtp dynamic trunking protocol

SW1

SW1(config)#interface range ethernet 0/0 - 3

SW1(config-if-range)#switchport trunk encapsulation dot1q

SW1(config-if-range)#switchport mode trunk

SW1(config-if-range)#switchport nonegotiate

SW1(config-if-range)#shutdown

SW2

Switch>en

Switch#conf t

Switch(config)#hostname SW2

SW2(config)#interface range ethernet 0/0 - 3

SW2(config-if-range)#shutdown

SW2(config-if-range)#switchport trunk encapsulation dot1q

SW2(config-if-range)#switchport mode trunk

SW2(config-if-range)#switchport nonegotiate

SW3

Switch>en

Switch#conf t

Switch(config)#hostname SW3

SW3(config)#interface range ethernet 0/0 - 1

SW3(config-if-range)#switchport trunk encapsulation dot1q

SW3(config-if-range)#switchport mode trunk

SW3(config-if-range)#switchport nonegotiate

SW3(config-if-range)#shutdown

SW4

Switch>en

Switch#conf t

Switch(config)#interface range ethernet 0/0 - 1

Switch(config-if-range)#switchport trunk encapsulation dot1q

Switch(config-if-range)#switchport mode trunk

Switch(config-if-range)#switchport nonegotiate

Switch(config-if-range)#shutdown

No shutdown

And then input no shutdown at the same time to active links.

SW1(config-if-range)#no shutdown

SW2(config-if-range)#no shutdown

SW3(config-if-range)#no shutdown

SW4(config-if-range)#no shutdown

Check trunk

Show interfaces truck to check the status of four switches

```
SW1#show interfaces trunk

Port        Mode             Encapsulation  Status        Native vlan
Et0/0       on               802.1q         trunking      1
Et0/1       on               802.1q         trunking      1
Et0/2       on               802.1q         trunking      1
Et0/3       on               802.1q         trunking      1

Port        Vlans allowed on trunk
Et0/0       1-4094
Et0/1       1-4094
Et0/2       1-4094
Et0/3       1-4094
```

```
SW3#show interfaces trunk

Port        Mode             Encapsulation  Status        Native vlan
Et0/0       on               802.1q         trunking      1
Et0/1       on               802.1q         trunking      1
```

Create VLAN

Must create VLAN first, so that the packages will not be abandoned by switches, if the vlan is not in switch, switch will abandon the data.

SW1(config)#vlan 10

SW1(config-vlan)#name IT

SW1(config-vlan)#vlan 20

SW1(config-vlan)#name Sell

SW2(config)#vlan 10

SW2(config-vlan)#name IT

SW2(config-vlan)#vlan 20

SW2(config-vlan)#name Sell

SW3(config)#vlan 10

SW3(config-vlan)#name IT

SW3(config-vlan)#vlan 20

SW3(config-vlan)#name Sell

Switch(config)#vlan 10

Switch(config-vlan)#name IT

Switch(config-vlan)#vlan 20

Switch(config-vlan)#name Sell

Switch(config-vlan)#exit

Switch(config)#hostname SW4

```
SW1#show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Et1/0, Et1/1, Et1/2, Et1/3
10   IT                               active
20   Sell                             active
1002 fddi-default                     act/unsup
1003 token-ring-default               act/unsup
1004 fddinet-default                  act/unsup
1005 trnet-default                    act/unsup
```

Show vlan brief --- check vlan status

SW3 and 4, mode access with PCs

SW3

SW3(config)#interface ethernet 1/0

SW3(config-if)#switchport mode access

SW3(config-if)#switchport access vlan 10

SW3(config-if)#spanning-tree portfast edge

SW3(config-if)#exit

SW3(config)#end

SW3#show vlan brief

```
SW3#show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Et0/2, Et0/3, Et1/1, Et1/2
                                                Et1/3
10   IT                               active    Et1/0
20   Sell                             active
1002 fddi-default                     act/unsup
1003 token-ring-default               act/unsup
1004 fddinet-default                  act/unsup
1005 trnet-default                    act/unsup
```

SW4

SW4(config)#interface ethernet 1/0

SW4(config-if)#switchport mode access

SW4(config-if)#switchport access vlan 20

SW4(config-if)#spanning-tree portfast edge

SW4(config-if)#exit

SW4(config)#end

SW4#show vlan brief

```
SW4#show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Et0/2, Et0/3, Et1/1, Et1/2
                                                Et1/3
10   IT                               active
20   Sell                             active    Et1/0
1002 fddi-default                     act/unsup
1003 token-ring-default               act/unsup
1004 fddinet-default                  act/unsup
1005 trnet-default                    act/unsup
```

Set root bridge

Set SW1 as root bridge of VLAN 10, set SW2 as root bridge of VLAN 20, load balancing, let performance better. And will not waste resources and bandwidth.

802.1S is the 3rd generation spanning tree protocol, MSTP

spanning-tree mode mst -------- start 802.1S

SW1

SW1(config)#spanning-tree mode mst

SW1(config)#spanning-tree mst configuration

SW1(config-mst)#name Qiuwen

SW1(config-mst)#revision 1234

SW1(config-mst)#instance 10 vlan 10

SW1(config-mst)#instance 20 vlan 20

SW1(config-mst)#exit

SW1(config)#end

SW1#show run | section span

```
SW1#show run | section span
spanning-tree mode mst
spanning-tree extend system-id
spanning-tree mst configuration
 name Qiuwen
 revision 1234
 instance 10 vlan 10
 instance 20 vlan 20
```

SW2

SW2(config)#spanning-tree mode mst

SW2(config)#spanning-tree mst configuration

SW2(config-mst)#name Qiuwen

SW2(config-mst)#revision 1234

SW2(config-mst)#instance 10 vlan 10

SW2(config-mst)#instance 20 vlan 20

SW2(config-mst)#exit

SW2(config)#end

SW2#show run | section span

```
SW2#show run | section span
spanning-tree mode mst
spanning-tree extend system-id
spanning-tree mst configuration
 name Qiuwen
 revision 1234
 instance 10 vlan 10
 instance 20 vlan 20
```

SW3

SW3(config)#spanning-tree mode mst

SW3(config)#spanning-tree mst configuration

SW3(config-mst)#name Qiuwen

SW3(config-mst)#revision 1234

SW3(config-mst)#instance 10 vlan 10

SW3(config-mst)#instance 20 vlan 20

SW3(config-mst)#exi

SW3(config)#end

SW3#show run | section span

```
SW3#show run | section span
spanning-tree mode mst
spanning-tree extend system-id
spanning-tree mst configuration
 name Qiuwen
 revision 1234
 instance 10 vlan 10
 instance 20 vlan 20
 spanning-tree portfast edge
```

SW4

SW4(config)#spanning-tree mode mst

SW4(config)#spanning-tree mst configuration

SW4(config-mst)#name Qiuwen

SW4(config-mst)#revision 1234

SW4(config-mst)#instance 10 vlan 10

SW4(config-mst)#instance 20 vlan 20

SW4(config-mst)#exit

SW4(config)#end

SW4#show run | section span

```
SW4#show run | section span
spanning-tree mode mst
spanning-tree extend system-id
spanning-tree mst configuration
 name Qiuwen
 revision 1234
 instance 10 vlan 10
 instance 20 vlan 20
 spanning-tree portfast edge
```

Set main root of instance

Instance 10(SW1)

Change the priority of instance

SW1(config)#spanning-tree mst 10 root primary

SW1(config)#spanning-tree mst 20 root secondary

```
SW1#show spanning-tree mst 10

##### MST10    vlans mapped:   10
Bridge         address aabb.cc00.0100  priority      24586 (24576 sysid 10)
Root           this switch for MST10

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Et0/0            Desg FWD 2000000   128.1    P2p
Et0/1            Desg FWD 2000000   128.2    P2p
Et0/2            Desg FWD 2000000   128.3    P2p
Et0/3            Desg FWD 2000000   128.4    P2p
```

```
SW1#show spanning-tree mst 20

##### MST20    vlans mapped:   20
Bridge         address aabb.cc00.0100  priority      28692 (28672 sysid 20)
Root           address aabb.cc00.0200  priority      24596 (24576 sysid 20)
               port    Et0/2           cost          2000000   rem hops 19

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Et0/0            Desg FWD 2000000   128.1    P2p
Et0/1            Desg FWD 2000000   128.2    P2p
Et0/2            Root FWD 2000000   128.3    P2p
Et0/3            Altn BLK 2000000   128.4    P2p
```

Instance 20(SW2)

Change the priority of instance

SW2(config)#spanning-tree mst 20 root primary

SW2(config)#spanning-tree mst 10 root secondary

```
SW2#show spanning-tree mst 10

##### MST10    vlans mapped:   10
Bridge         address aabb.cc00.0200  priority      28682 (28672 sysid 10)
Root           address aabb.cc00.0100  priority      24586 (24576 sysid 10)
               port    Et0/2           cost          2000000   rem hops 19

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Et0/0            Desg FWD 2000000   128.1    P2p
Et0/1            Desg FWD 2000000   128.2    P2p
Et0/2            Root FWD 2000000   128.3    P2p
Et0/3            Altn BLK 2000000   128.4    P2p
```

```
SW2#show spanning-tree mst 20

##### MST20    vlans mapped:   20
Bridge         address aabb.cc00.0200  priority      24596 (24576 sysid 20)
Root           this switch for MST20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Et0/0            Desg FWD 2000000   128.1    P2p
Et0/1            Desg FWD 2000000   128.2    P2p
Et0/2            Desg FWD 2000000   128.3    P2p
Et0/3            Desg FWD 2000000   128.4    P2p
```

Etherchannel group-channel

SW1

SW1(config)#interface range ethernet 0/2 - 3

SW1(config-if-range)#channel-group 12 mode on

SW1(config-if-range)#end

SW1#conf t

SW1(config)#interface port-channel 12

SW1(config-if)#shutdown

SW1(config-if)#switchport trunk encapsulation dot1q

SW1(config-if)#switchport mode trunk

SW1(config-if)#switchport nonegotiate

SW2

SW2(config)#interface range ethernet 0/2 - 3

SW2(config-if-range)#channel-group 12 mode on

SW2(config-if-range)#end

SW2#conf t

SW2(config)#interface port-channel 12

SW2(config-if)#shutdown

SW2(config-if)#switchport trunk encapsulation dot1q

SW2(config-if)#switchport mode trunk

SW2(config-if)#switchport nonegotiate

Activate link at same time

SW1(config-if)#no shutdown

SW2(config-if)#no shutdown

Check etherchannel

SW1#show etherchannel summary

```
SW1#show etherchannel summary
Flags:  D - down        P - bundled in port-channel
        I - stand-alone s - suspended
        H - Hot-standby (LACP only)
        R - Layer3      S - Layer2
        U - in use      N - not in use, no aggregation
        f - failed to allocate aggregator

        M - not in use, minimum links not met
        m - not in use, port not aggregated due to minimum links not met
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port

        A - formed by Auto LAG


Number of channel-groups in use: 1
Number of aggregators:           1

Group  Port-channel  Protocol    Ports
------+-------------+-----------+-----------------------------------------------
12     Po12(SU)          -        Et0/2(P)    Et0/3(P)
```

SW2#show etherchannel summary

```
SW2#show etherchannel summary
Flags:  D - down        P - bundled in port-channel
        I - stand-alone s - suspended
        H - Hot-standby (LACP only)
        R - Layer3      S - Layer2
        U - in use      N - not in use, no aggregation
        f - failed to allocate aggregator

        M - not in use, minimum links not met
        m - not in use, port not aggregated due to minimum links not met
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port

        A - formed by Auto LAG


Number of channel-groups in use: 1
Number of aggregators:           1

Group  Port-channel  Protocol    Ports
------+-------------+-----------+-----------------------------------------------
12     Po12(SU)          -        Et0/2(P)    Et0/3(P)
```

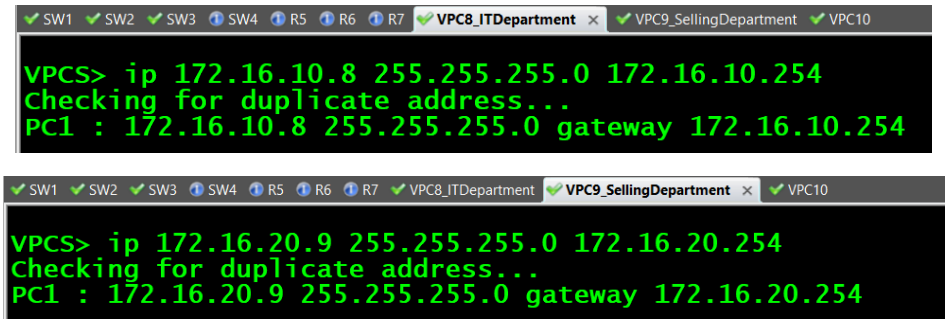
Also spanning tree replace two interfaces

```
SW2#show spanning-tree mst 10

##### MST10    vlans mapped:   10
Bridge        address aabb.cc00.0200  priority      28682 (28672 sysid 10)
Root          address aabb.cc00.0100  priority      24586 (24576 sysid 10)
              port    Po12            cost          1000000   rem hops 19

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Et0/0            Desg FWD 2000000   128.1    P2p
Et0/1            Desg FWD 2000000   128.2    P2p
Po12             Root FWD 1000000   128.65   P2p
```

Set PC ip



Create VLAN 10 and 20 SVI

SW1

SW1(config)#interface vlan 10

SW1(config-if)#ip address 172.16.10.252 255.255.255.0

SW1(config-if)#no shutdown

SW1(config-if)#vrrp 10 ip 172.16.10.254

SW1(config-if)#vrrp 10 priority 105

SW1(config-if)#exit

SW1(config)#interface vlan 20

SW1(config-if)#no shutdown

SW1(config-if)#ip address 172.16.20.252 255.255.255.0

SW1(config-if)#vrrp 20 ip 172.16.20.254

Vrrp default priority is 100, so set the master little higher 105.

SW2

SW2(config)#interface vlan 10

SW2(config-if)#no shutdown

SW2(config-if)#ip address 172.16.10.253 255.255.255.0

SW2(config-if)#vrrp 10 ip 172.16.10.254

SW2(config-if)#exit

SW2(config)#interface vlan 20

SW2(config-if)#no shutdown

SW2(config-if)#ip address 172.16.20.253 255.255.255.0

SW2(config-if)#vrrp 20 ip 172.16.20.254

SW2(config-if)#vrrp 20 priority 105

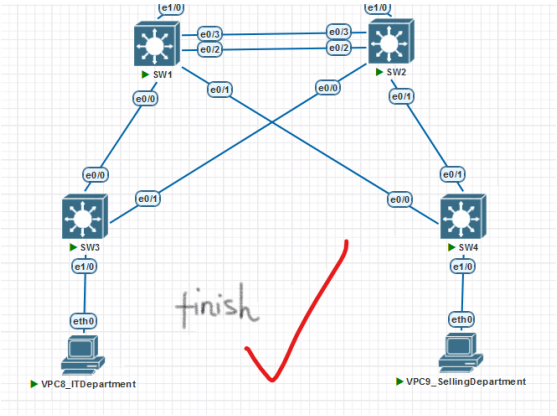
Result

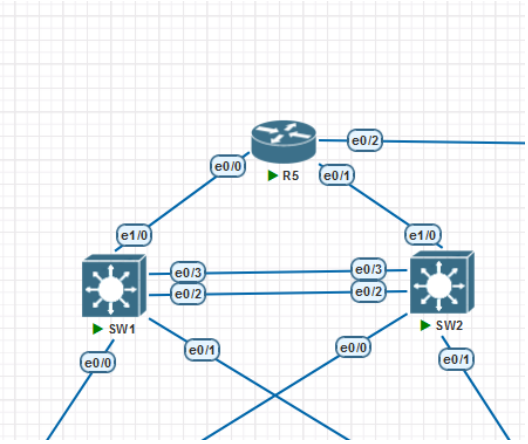
Show vrrp brief

```
SW1#show vrrp brief
Interface          Grp Pri Time  Own Pre State   Master addr     Group addr
Vl10               10  105 3589        Y  Master  172.16.10.252   172.16.10.254
Vl20               20  100 3609        Y  Backup  172.16.20.253   172.16.20.254
```

```
SW2#show vrrp brief
Interface          Grp Pri Time  Own Pre State   Master addr     Group addr
Vl10               10  100 3609        Y  Backup  172.16.10.252   172.16.10.254
Vl20               20  105 3589        Y  Master  172.16.20.253   172.16.20.254
```

EIGRP between R5 SW1 &SW2





Till now , switches 1234 have been set. Use EIGRP to connect R5.

R5

Router>en

Router#conf t

Router(config)#hostname R5

R5(config)#interface ethernet 0/2

R5(config-if)#no shutdown

R5(config-if)#ip address 56.1.1.5 255.255.255.0

R5(config-if)#exit

R5(config)#interface ethernet 0/0

R5(config-if)#no shutdown

R5(config-if)#ip address 172.16.15.5 255.255.255.0

R5(config-if)#no shutdown

R5(config-if)#exit

R5(config)#interface ethernet 0/1

R5(config-if)#no shutdown

R5(config-if)#ip address 172.16.25.5 255.255.255.0

R5(config-if)#exit

R5(config)#ip route 0.0.0.0 0.0.0.0 ethernet 0/2 56.1.1.6

R5(config)#router eigrp 90

R5(config-router)#no auto-summary

R5(config-router)#eigrp router-id 5.5.5.5

R5(config-router)#network 172.16.15.5 0.0.0.0

R5(config-router)#network 172.16.25.5 0.0.0.0

SW1

No switchport can open route mode

SW1>en

SW1#conf t

SW1(config)#interface ethernet 1/0

SW1(config-if)#no shutdown

SW1(config-if)#no switchport

SW1(config-if)#ip address 172.16.15.1 255.255.255.0

SW1(config-if)#no shutdown

SW1(config-if)#exit

SW1(config)#end

SW1#show ip interface brief

```
SW1#show ip int brief
Interface              IP-Address      OK? Method Status                Protoc
Ethernet0/0            unassigned      YES unset  up                    up
Ethernet0/1            unassigned      YES unset  up                    up
Ethernet0/2            unassigned      YES unset  up                    up
Ethernet0/3            unassigned      YES unset  up                    up
Ethernet1/0            172.16.15.1     YES manual up                    up
Ethernet1/1            unassigned      YES unset  up                    up
Ethernet1/2            unassigned      YES unset  up                    up
Ethernet1/3            unassigned      YES unset  up                    up
Port-channel12         unassigned      YES unset  up                    up
Vlan10                 172.16.10.252   YES manual up                    up
Vlan20                 172.16.20.252   YES manual up                    up
```

SW1(config)#router eigrp 90

SW1(config-router)#no auto-summary

SW1(config-router)#eigrp router-id 1.1.1.1

SW1(config-router)#network 172.16.15.1 0.0.0.0

SW1(config-router)#network 172.16.10.252 0.0.0.0

SW1(config-router)#network 172.16.20.252 0.0.0.0

SW2

SW2(config)#interface ethernet 1/0

SW2(config-if)#no shutdown

SW2(config-if)#no switchport

SW2(config-if)#ip address 172.16.25.2 255.255.255.0

SW2(config-if)#no shutdown

SW2(config-if)#exit

SW2(config)#router eigrp 90

SW2(config-router)#eigrp router-id 2.2.2.2

SW2(config-router)#network 172.16.25.2 0.0.0.0

SW2(config-router)#network 172.16.10.252 0.0.0.0

SW2(config-router)#network 172.16.20.252 0.0.0.0

Correct mistake in claim

SW2(config)#router eigrp 90

SW2(config-router)#no network 172.16.10.252 0.0.0.0

SW2(config-router)#no network 172.16.20.252 0.0.0.0

SW2(config-router)#network 172.16.10.253 0.0.0.0

SW2(config-router)#network 172.16.20.253 0.0.0.0

```
SW2#show run | section eigrp
router eigrp 90
 network 172.16.10.253 0.0.0.0
 network 172.16.20.253 0.0.0.0
 network 172.16.25.2 0.0.0.0
 eigrp router-id 2.2.2.2
```

Result

```
R5#show ip route eigrp
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 56.1.1.6 to network 0.0.0.0

      172.16.0.0/16 is variably subnetted, 6 subnets, 2 masks
D        172.16.10.0/24 [90/281856] via 172.16.25.2, 00:01:34, Ethernet0/1
                        [90/281856] via 172.16.15.1, 00:01:34, Ethernet0/0
D        172.16.20.0/24 [90/281856] via 172.16.25.2, 00:01:22, Ethernet0/1
                        [90/281856] via 172.16.15.1, 00:01:22, Ethernet0/0
R5#show ip eigrp neighbors
EIGRP-IPv4 Neighbors for AS(90)
H   Address                 Interface              Hold Uptime   SRTT   RTO  Q  Seq
                                                   (sec)         (ms)       Cnt Num
1   172.16.25.2             Et0/1                    11 00:08:45    3   100  0  13
0   172.16.15.1             Et0/0                    14 00:13:17    8   100  0  16
```

Check result in R5, try to ping in IT PC

SW1 SW2 SW3 SW4 R5 R6 R7 VPC8_ITDepartment VPC9_SellingDepartment VPC10

```
VPCS> ping 172.16.15.5

84 bytes from 172.16.15.5 icmp_seq=1 ttl=254 time=3.862 ms
84 bytes from 172.16.15.5 icmp_seq=2 ttl=254 time=3.304 ms
84 bytes from 172.16.15.5 icmp_seq=3 ttl=254 time=4.989 ms
84 bytes from 172.16.15.5 icmp_seq=4 ttl=254 time=3.098 ms
84 bytes from 172.16.15.5 icmp_seq=5 ttl=254 time=4.068 ms
```

Static default route put into EIGRP compulsively

R5#conf t

R5(config)#router eigrp 90

R5(config-router)#redistribute static

Tell private routers the static address to neighbors through eigrp

```
SW1#show ip route eigrp
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 172.16.15.5 to network 0.0.0.0

D*EX  0.0.0.0/0 [170/307200] via 172.16.15.5, 00:03:40, Ethernet1/0
      172.16.0.0/16 is variably subnetted, 7 subnets, 2 masks
D        172.16.25.0/24 [90/281856] via 172.16.20.253, 00:11:24, Vlan20
                        [90/281856] via 172.16.10.253, 00:11:24, Vlan10
```

SW1 and 2 learn default static address(0.0.0.0) to internet outside.

ISP router(R6)

Router>en

Router#conf t

Router(config)#hostname R6

R6(config)#interface ethernet 0/0

R6(config-if)#no shutdown

R6(config-if)#ip address 56.1.1.6 255.255.255.0

R6(config-if)#exit

R6(config)#interface ethernet 0/1

R6(config-if)#no shutdown

R6(config-if)#ip address 67.1.1.6 255.255.255.0

R6(config-if)#no shutdown

R6(config-if)#exit

Border router(R7)

Router>en

Router#conf t

Router(config)#hostname R7

R7(config)#interface ethernet 0/1

R7(config-if)#no shutdown

R7(config-if)#ip address 67.1.1.7 255.255.255.0

R7(config-if)#no shutdown

R7(config-if)#exit

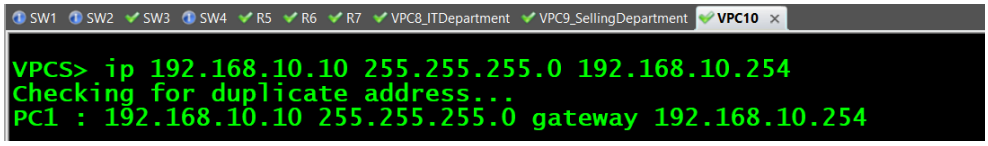
R7(config)#ip route 0.0.0.0 0.0.0.0 ethernet 0/1 67.1.1.6

R7(config)#interface ethernet 0/0

R7(config-if)#no shutdown

R7(config-if)#ip address 192.168.10.254 255.255.255.0

PC10



VPN between R5 and R7

R7

R7(config)#interface tunnel 57

R7(config-if)#tunnel source 67.1.1.7

R7(config-if)#tunnel destination 56.1.1.5

R7(config-if)#ip address 10.1.57.7 255.255.255.0

R7(config-if)#exit

R7(config)#router eigrp 90

R7(config-router)#no auto-summary

R7(config-router)#eigrp router-id 7.7.7.7

R7(config-router)#network 10.1.57.7

R7(config-router)#no network 10.1.57.7

R7(config-router)#network 10.1.57.7 0.0.0.0

R7(config-router)#network 192.168.10.254 0.0.0.0

R5

R5(config)#interface tunnel 57

R5(config-if)#tunnel source 56.1.1.5

R5(config-if)#tunnel destination 67.1.1.7

R5(config-if)#ip address 10.1.57.5 255.255.255.0

R5(config-if)#no shutdown

R5(config-if)#exit

R5(config)#router eigrp 90

R5(config-router)#network 10.1.57.5 0.0.0.0

R5(config-router)#exit

R5(config)#do show ip route eigrp

```
R5(config)#do show ip route eigrp
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 56.1.1.6 to network 0.0.0.0

      172.16.0.0/16 is variably subnetted, 6 subnets, 2 masks
D        172.16.10.0/24 [90/281856] via 172.16.25.2, 00:39:32, Ethernet0/1
                        [90/281856] via 172.16.15.1, 00:39:32, Ethernet0/0
D        172.16.20.0/24 [90/281856] via 172.16.25.2, 00:39:20, Ethernet0/1
                        [90/281856] via 172.16.15.1, 00:39:20, Ethernet0/0
D     192.168.10.0/24 [90/26905600] via 10.1.57.7, 00:00:42, Tunnel57
```

Check the result in the SW1, it should have learned the route to 192.168

```
SW1#show ip route eigrp
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 rout
       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 172.16.15.5 to network 0.0.0.0

D*EX  0.0.0.0/0 [170/307200] via 172.16.15.5, 00:35:33, Ethernet1/0
      10.0.0.0/24 is subnetted, 1 subnets
D        10.1.57.0 [90/26905600] via 172.16.15.5, 00:13:11, Ethernet1/0
      172.16.0.0/16 is variably subnetted, 7 subnets, 2 masks
D        172.16.25.0/24 [90/281856] via 172.16.20.253, 00:43:17, Vlan20
                        [90/281856] via 172.16.10.253, 00:43:17, Vlan10
D     192.168.10.0/24 [90/26931200] via 172.16.15.5, 00:04:44, Ethernet1/0
```

Also check the result in R7, it should have learned 172.16

```
R7(config-router)#do show ip route eigrp
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 67.1.1.6 to network 0.0.0.0

      172.16.0.0/24 is subnetted, 4 subnets
D        172.16.10.0 [90/26905856] via 10.1.57.5, 00:08:32, Tunnel57
D        172.16.15.0 [90/26905600] via 10.1.57.5, 00:08:32, Tunnel57
D        172.16.20.0 [90/26905856] via 10.1.57.5, 00:08:32, Tunnel57
D        172.16.25.0 [90/26905600] via 10.1.57.5, 00:08:32, Tunnel57
```

Final result check