**Layer2**

**AS12345**

*SW1,2*

1. vlan
2. vtp
3. trunk
4. SW1: mac aging-time

**AS34567**

*SW3,4*

same with *AS12345*  
change the vtp mode to *transparent*

**Spanning-Tree**

*SW1-4:*

1. mode config to rapid-pvst
2. priority of every vlan in each SW  
   SW1,3 odd:0 even:4096  
   SW2,4 odd:4096 even:0
3. portfast
4. postfast bpduguard
5. shut the free port of SW1-SW4  
   vlan 999 & shutdown

**PPP**

*R18 R19*

1. set up serial port 1/0, encapsulation ppp
2. enable ppp chap in serial: hostname:ACME\_R1X, password ccie

**Layer3**

**AS12345 OSPF**

*R1-R7*

1. set up ospf router-id
2. set up network (be attention to “area 0”)

**AS 34567 EIGRP**

1. *R8-R11, SW3 SW4* set up network in eigrp
2. set delay 100 of vlan 34 in SW3 SW4

**AS 45678 EIGRP**

*R15-17*

1. set eigrp cisco through autonomous system 45678
2. set network
3. topology and no auto-summary

*R18 R19 SW5 SW6*

1. set eigrp 45678 network
2. no auto-summary

**AS12345 BGP**

*R1*

1. set up bgp, open log, no unicast
2. peer-group iBGP
3. set iBGP as 12345
4. peer-group other routers (R2,R3, R6 R7)
5. goto address-family
6. iBGP route-reflector-client
7. activate R2, R3, R6,R7

*R2 R3 R6 R7*

1. set up bgp open log, no unicast
2. set R1 as 12345
3. activate R1

**Layer3**

**AS 65112 BGP**

*R2 R3*

1. configuarate ip vrf GREEN/BLUE/…./INET rd/route-target XX:XX(12 to 15, 99)
2. open e1/0
3. set up e1/0.12-0.99
4. -(encapsulate )
5. -(vrf forwarding COLOR)
6. -set up ip address
7. into bgp **12345**
8. goto addr-family
9. set up vrf as 65112
10. active vrf

*R20*

1. open e1/0
2. set up e1/0.12-0.99
3. encapsulate
4. set ip address
5. set up e1/1 as e1/0
6. into bgp **65112**
7. no bgp ipv4
8. sei up route id
9. set up 10.201.XX.1 and 10.201.XX.5 as 12345
10. goto address-family
11. active 10.201.XX.1 and 10.201.XX.5
12. default-originate 10.201.XX.1 and 10.201.XX.5 **(no 99)**
13. network 10.20.1/2.1,123.20.20.20 mask FF.FF.FF.FF
14. aggregate 10.0.0.0 and 123.0.0.0

**AS 34567 BGP**

*R8 R9 R10 R11*

1. set up bgp no ipv4, router-id
2. set other router as 34567, update lo
3. goto address-family
4. active and next-hop-self other router
5. **redistribute**

*R9*

1. neighbor 30.34.1.1 as 30000
2. bgp local-preference 500
3. go to addr-family and active 30.34.1.1
4. eigrp redistribute metric 1000 100 255 1 1500 b2e
5. prefix-list permit
6. goto b2e permit
7. match ip addr perfix

*R11*

1. bgp 34567
2. nei 30.34.2.1 as 3W
3. bgp preference 400
4. nei 30.34.2.1 act
5. eigrp redistribute metric 1000 100 255 1 1500 b2e
6. prefix-list permit
7. goto b2e permit
8. match ip addr perfix

**AS 45678 BGP**

*R15*

1. set up bgp no ipv4, router-id
2. nei 103.45.1.1 as 10003
3. addr ipv4: 103.145.1.1 active
4. redistribute eigrp
5. aggregate 123.20.1.0
6. eigrp cisco->45678->topology-> redistribute bgp metric *no b2e*

*R16 R17 R18 R19*

1. bgp 45678(R18/R19:65222)
2. no bgp ipv4, router id
3. nei 203.45.16.1 as 20003
4. addr family ipv4, nei 203.45.16.1 active
5. set network 0.0.0.0 as backdoor

*R18 R19*

1. eigrp stub

\*Note\*

for ipv6 setting

you need to run ipv6 unicast-routing first

## OSPF v3

SW3 SW4

1. unicast
2. router-id
3. Lo 0 and vlan 34: ospf area 0
4. vlan34 ospf priority

## ipv6 BGP

R10 R11

1. unicast-routing
2. into bgp
3. remote as 2001:34:1::1 as 20001
4. af ipv6
5. 2001:34:1::1 act
6. redistribute internal external
7. ospf redistribute bgp

R12 R14

1. router 65112 remote as 20001
2. af ipv6, activate
3. network 2001:123:12:12:12/128, 2001:CC1E:1234:12::/64

## BGP policy

R2 R3 R6 R7

1. prefix 123 permit 123.0.0.0/8 le 32
2. into bgp af, 101.123.1.1 prefix 123 out

R8 R9 R10 R11

1. prefix 123 permit 123.0.0.0/8 le 32
2. into bgp af, 101.34.1.1 prefix 123 out

R13

neighbor 202.65.1.1 weight 1000

## VPN

### VPNv4 neighbor

R2 R3 R6 R7

1. bgp af vpnv4
2. activate neighbor 123.1.1.1

R1

1. bgp af vpnv4
2. activate 2,3,6,7 123.X.X.X

### LDP neighbor

1. AS12345, all used router interface
2. mpls ldp router-id loopback 0 force
3. int x-> mpls ip

R2 R3 R6 R7  
no mpls ip propagate-ttl

### adjust R20 permit

R20

1. prefix a permit 1.2.3.4/32
2. route-map abc permit 10
3. match prefix a
4. set weight 100
5. route-map abc permit 20
6. bgp af neighbor 10.201.99.5 router-map abc in

## DMVPN

same Part:

no ip redirect

tunnel mode gre multi-point

tunnel source sX/0 (17:2/18,19:1)

tunnel key 45678

ip address (17: 10.18.19.1/18,19: 10.18.19/19.19) 255.255.255.0

ip nhrp network-id 45678

ip nhrp authentication 45678key

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same Part 2:

ip nhrp hold time 300

bandwith 1000

delay 1000

ip mtu 1400

ip tcp adjust-mss 1360

R17

1. same Part
2. ip nhrp redirect
3. ip nhrp multicast dynamic
4. same Part2
5. no ip spilt-horizon eigrp 45678

R18

1. same Part
2. ip nhrp multicast 203.45.17.2/1
3. ip nhrp 10.18.19.1 203.45.17.2/1
4. ip nhrp nhs 10.18.19.1
5. ip nhrp shortcut
6. same Part2

### Encryption

R17 R18 R19

1. crypto isakmp policy 10
2. encryption aes
3. authentication pre-share
4. group 2
5. crypto isakmp key CCIE address 0.0.0.0
6. crypto ipsec transform-set CCIEXFORM esp-aes
7. mode transport
8. crypto ipsec profile DMVPNPROFILE
9. set transform-set CCIEXFORM
10. goto int tunnel 0
11. tunnel protection ipsec profile DMVPNPROFILE