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 65111 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
--------------------
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

Multicast

R15 R16 R17 R18 R19 SW5 SW6

1. ip multicast-routing
2. goto int x
3. ip pim sparse-mode

R15

1. int Loopback 0 -> ip pim sparse-mode
2. ip pim rp-candidate lo 0
3. ip pim bsr-candidate lo 0

R18 R19

1. int tu 0->ip pim prase-mode
2. int e0/0->ip pim prase-mode
3. ip igmp join-group 232.1.1.1

Security

R20

banner login #Caution! No unauthorized access!#

SW3

1. int e0/0-3
2. switchport port-security->mac-address sticky-> maximum 1-> viodation shutdown

Advance network services

R20 SSh

1. ip domian-name cisco.com
2. username test privilege 1 password test

3. crypto key generate rsa
4. 768
5. ip ssh maxstartups 5
6. ip ssh logging events
7. into line vty 0 4
8. login local
9. transport input ssh
10. access-class 1 in
11. access-list 1 permit 123.10.2.0 0.0.0.255

R20 NAT

1. access-list 2 permit 10.1.0.0 0.255.255
2. ip nat inside source list 2 int loop 0 overload
3. int eX/X.99
4. ip nat outside
5. ip eX/X.XX
6. ip nat inside

R17

1. ip cef
2. int tu 0
3. ip flow egress
4. ip flow-top-talker
5. sort-by bytes
6. cache-timeout 10000
7. top 10
8. show ip flow top-talkers

NTP

SW3

1. ntp master
2. ntp source loop 0

R10 R12

1. ntp server 2001:123::3:3:3

2. ntp source loop 0