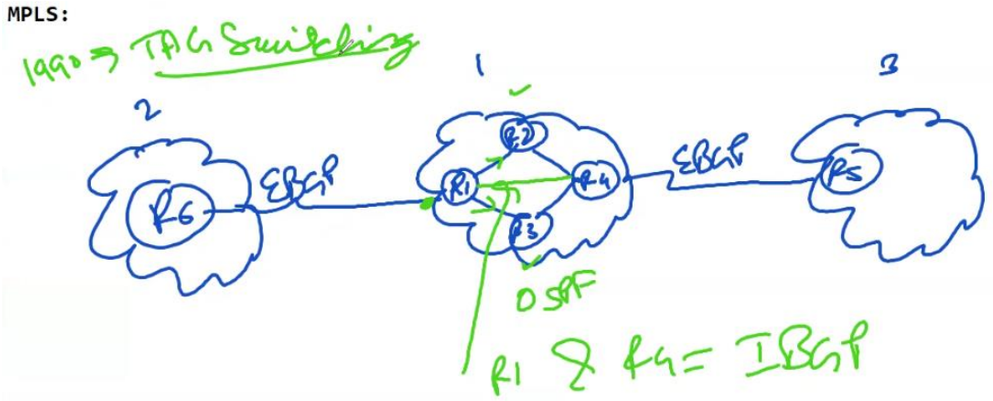
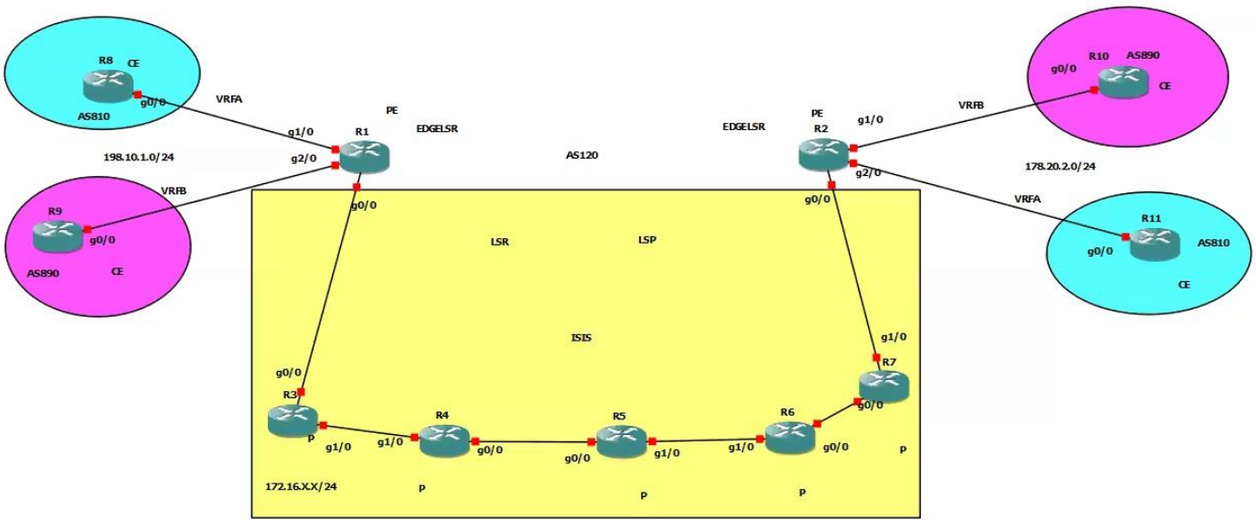
Advance Class – MPLS

MPLS:





##Config##

****R8 and R9 config with the ip's on diagram and with one loopback.**

****R10 and R11 config with the ip's on diagram and with one loopback.**

****R3 config with the private ip on the diagram and loopback with [example R3=172.16.13.3 and loopback=192.168.3.3 3rd will router and 4th will number]**

```
-Traceback= 0x6239A2C8z 0x62387874z 0x62390550z 0x627CBA94z 0x627D4D7
28z 0x627E732Cz 0x627E70E0z 0x627E74E4z 0x627B6560z 0x627D4A10z 0x627
7DEE48z 0x627DEFB4z 0x627CD2F0z 0x627CD468z
R3#
R3#
R3#config t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#
R3(config)#ip cef
R3(config)#int gig0/0
R3(config-if)#ip add 172.16.13.3 255.255.255.0
R3(config-if)#n
```

**** config the same way on Routers [R3 R4 R5 R6 R7]**

##R1

```
R1(config)#
R1(config)#ip cef
R1(config)#ip vrf A
R1(config-vrf)#rd 1:1
R1(config-vrf)#route-target both 100:1
R1(config-vrf)#do sh run | sec vrf
ip vrf A
 rd 1:1
 route-target export 100:1
 route-target import 100:1
R1(config-vrf)#ip vrf B
R1(config-vrf)#rd 1
```

****export = VRP to BGP**

****import = BGP to VRF**

****sh ip route vrf**

```
       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
       + - replicated route, % - next hop override

Gateway of last resort is not set

      198.10.1.0/24 is variably subnetted, 2 subnets, 2 masks
C        198.10.1.0/24 is directly connected, GigabitEthernet1/0
L        198.10.1.1/32 is directly connected, GigabitEthernet1/0
R1(config-if)#
```

** vrf not comes with global-routing table it has separate table.

```
R1(config-if)#do ping 198.10.1.8
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 198.10.1.8, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
R1(config-if)#do
```

** we can't ping with normal routing for R8

** do ping vrf A 192.168.1.8 = R8[this is only for PE router] R8 will simply ping 192.168.1.1

** do ping vrf B 192.168.1.9 = R9

```
Success rate is 80 percent (4/5), round-trip min/avg/max = 28/59/112 ms
R1(config-if)#int gig2/0
R1(config-if)#ip vrf forwarding B
R1(config-if)#ip add 198.10.1.1 255.255.255.0
R1(config-if)#no shut
R1(config-if)#
*Jul  9 08:50:03.695: %LINK-3-UPDOWN: Interface GigabitEthernet2/0, changed stat
e to up
*Jul  9 08:50:04.695: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEth
ernet2/0, changed state to up
R1(config-if)#do sh ip rou vr
```

** we r applying same ip on the next-int of same router will not get any over-lapping IP.

[On Two PE route-target must be same on both Router]

Config IGP on R1 to R7 & R2

#R1 [49.1111 same on R1 to R2]

```
R1(config)#
R1(config)#router isis
R1(config-router)#net 49.1111.0000.0000.0001.00
R1(config-router)#is-type level-2-only
R1(config-router)#int range gig0/0 , loop 1
R1(config-if-range)#ip router isis
R1(config-if-range)#
```

#R2

```
R2(config)#router isis
R2(config-router)#net 49.1111.0000.0000.0002.00
R2(config-router)#is-type level-2-only
R2(config-router)#int range gig0/0 , loop 1
R2(config-if-range)#ip router isis
R2(config-if-range)#exit
R2(config)#
```

#R3

```
R3(config)#router isis
R3(config-router)#net 49.1111.0000.0000.0003.00
R3(config-router)#is-type level-2-only
R3(config-router)#int range gig0/0 , gig1/0, loop 1
R3(config-if-range)#ip router isis
R3(config-if-range)#^Z
R3#
```

**same on all routers

##MPLS

#R1

```
R1(config)#
R1(config)#mpls ip
R1(config)#int gig0/0
R1(config-if)#mpls ip
R1(config-if)#do sh his
```

**it will enable LDP to label the traffic

```
*Jul  9 09:07:40.731: %LDP-5-NBRCHG: LDP Neighbor 192.168.3.3:0 (1) is UP
R4(config-if-range)#do sh his
  router isis
```

##Config BGP

From R1 & R2 and R8-9 and R10-11

** R8 and R9 form connection with R1 [with af-ipv4 VFR A]
** R2 and R1 form connection both [af-VPNv4]

##Route##
** on R8 and we are not receiving any routes of loopbacks of R11
** on R9 and we are not receiving any routes of loopbacks of R10
[this is called MP-BGP if we want get address all loopbacks means we have to use this address]

```
R11(config-router)#nei 178.20.2.2 allowas-in
```

#R1 [if customer doesn't support allowas-in]
We config asoveride on PE router

```
R1(config)#
R1(config)#
R1(config)#router bgp 120
R1(config-router)#add ipv4 vrf B
R1(config-router-af)#nei 198.10.1.9 as-override
R1(config-router-af)#
```

###MPLS core BGP free
trace 10.11.11.11 source 10.8.8.8

```
  1 198.10.1.1 80 msec 28 msec 28 msec
  2 172.16.13.3 [MPLS: Labels 21/28 Exp 0] 252 msec 228 msec 248 msec
  3 172.16.34.4 [MPLS: Labels 17/28 Exp 0] 328 msec 260 msec 212 msec
  4 172.16.45.5 [MPLS: Labels 21/28 Exp 0] 284 msec 228 msec 276 msec
  5 172.16.56.6 [MPLS: Labels 21/28 Exp 0] 272 msec 208 msec 248 msec
  6 172.16.67.7 [MPLS: Labels 21/28 Exp 0] 260 msec 244 msec 244 msec
  7 178.20.2.2 [AS 810] [MPLS: Label 28 Exp 0] 244 msec 192 msec 228 msec
  8 178.20.2.11 [AS 810] 256 msec 216 msec 240 msec
R8#
```

** we are not having BGP from R3 – R7 but still we are receiving routes this is MPLS

on real-world [we don't want to revel info of ISP for customers that's way]

```
R1(config)#
R1(config)#no mpls ip pro
R1(config)#no mpls ip propagate-ttl
R1(config)#
```

On PE router

```
R8#traceroute 10.11.11.11 source 10.8.8.8
Type escape sequence to abort.
Tracing the route to 10.11.11.11
VRF info: (vrf in name/id, vrf out name/id)
  1 198.10.1.1 20 msec 24 msec 28 msec
  2 178.20.2.2 [AS 810] [MPLS: Label 28 Exp 0] 212 msec 192 msec 240 msec
  3 178.20.2.11 [AS 810] 216 msec 252 msec 260 msec
R8#
```

** now we are having only Public-ip