Network Plus Training Center

MPLS Layer2 VPN Lab Guide

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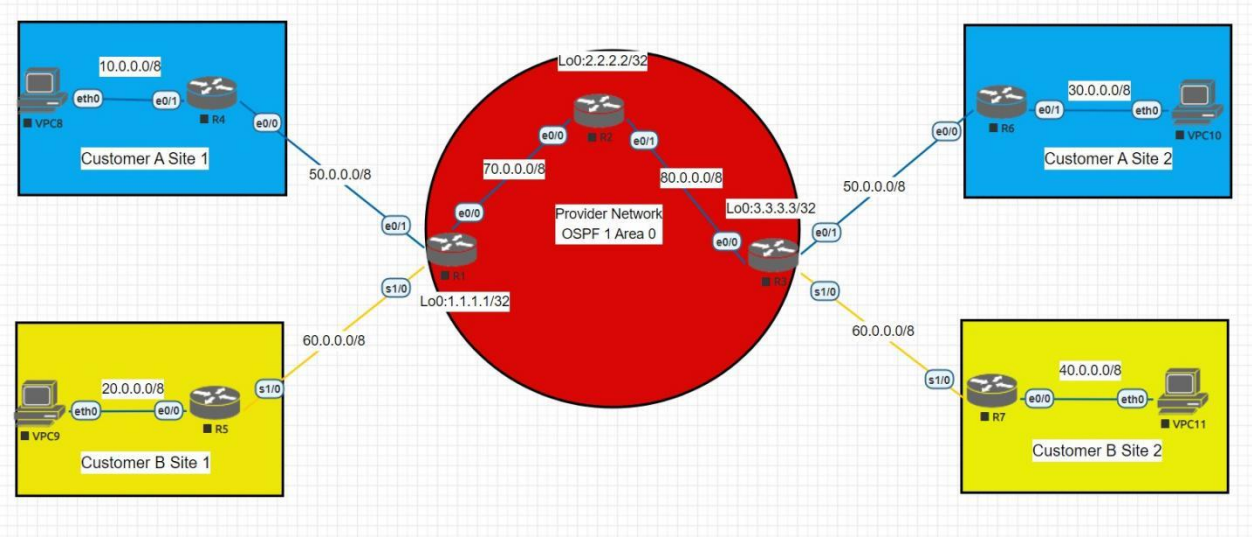
Lab 1
MPLS Layer2 VPN
EoMPLS/HDLC Over MPLS/PPP Over MPLS



Task 1:

Connect the network as shown in the above topology and assign ip addresses as depicted, except PE interfaces shouldn't be assigned ip addresses.

Task 2:

Configure OSPF as IGP protocol in the provider network

!R1

Router ospf 1

Router-id 1.1.1.1

Network 1.1.1.1 0.0.0.0 area 0

Network 70.0.0.1 0.0.0.0 area 0

!R2

Router ospf 1

Router-id 2.2.2.2

Network 2.2.2.2 0.0.0.0 area 0

Network 70.0.0.2 0.0.0.0 area 0

Network 80.0.0.2 0.0.0.0 area 0

!R3

Router ospf 1

Router-id 3.3.3.3

Network 3.3.3.3 0.0.0.0 area 0

Network 80.0.0.3 0.0.0.0 area 0

Task 3:

Enable MPLS in the provider network

!R1

Mpls ip

Mpls ldp router-id loopback 0

Interface e0/0

Mpls ip

!R2

Mpls ip

Mpls ldp router-id loopback 0

Interface e0/0

Mpls ip

Interface e0/1

Mpls ip

!R3

Mpls ip

Mpls ldp router-id loopback 0

Interface e0/0

Mpls ip

Task 4:

Configure xconnect in the provider routers interfaces facing the customer network for Customer A

!R1

Interface e0/1

No shut

Xconnect 3.3.3.3 100 encapsulation mpls

!R3

Interface e0/1

No shut

Xconnect 1.1.1.1 100 encapsulation mpls

Task 5:

Configure EIGRP as routing protocol between the customer routers sides for Customer A

!R4

Router eigrp 100

Network 4.0.0.0

Network 10.0.0.0

Network 50.0.0.0

No auto-summary

!R6

Router eigrp 100

Network 6.0.0.0

Network 30.0.0.0

Network 50.0.0.0

No auto-summary

Task 6:

Configure R1 & R3 for HDLC over MPLS for Customer B

!R1

Int s1/0

No shut

Clock rate 128000

Xconnect 3.3.3.3 200 encapsulation mpls

!R3

Int s1/0

No shut

Clock rate 128000

Xconnect 1.1.1.1 200 encapsulation mpls

Task 7:

Configure EIGRP 200 as a routing protocol between customer sites

!R5

Router eigrp 200

Network 5.0.0.0

Network 20.0.0.0

Network 60.0.0.0

No auto-summary

!R7

Router eigrp 200

Network 7.0.0.0

Network 40.0.0.0

Network 60.0.0.0

No auto-summary

Task 8:

Change the configuration for Customer B, so that the encapsulation to be PPP rather than HDLC, and apply PPP over MPLS

!R1

Default interface s1/0

Interface S1/0

No shut

Clock rate 128000

Encapsulation ppp

Xconnect 3.3.3.3 200 encapsulation mpls

!R3

Default interface s1/0

Interface S1/0

No shut

Clock rate 128000

Encapsulation ppp

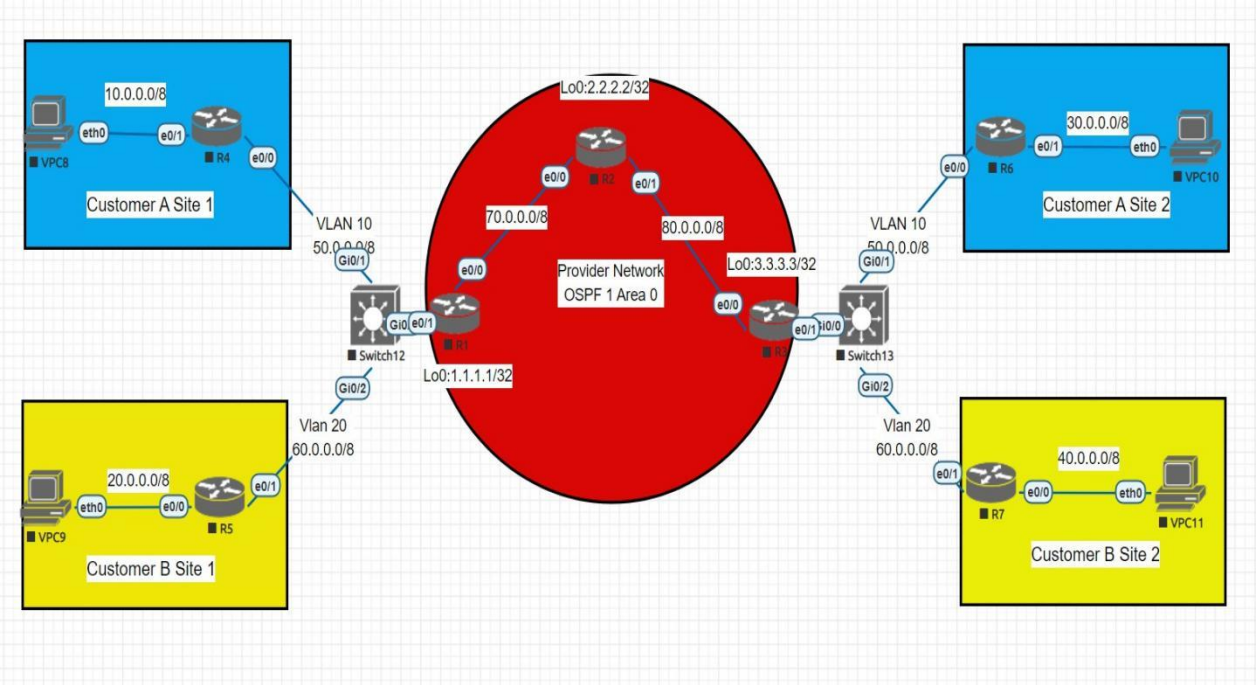
Xconnect 1.1.1.1 200 encapsulation mpls

!R5/R7

Int s1/0

Encapsulation ppp

Lab 2
MPLS Layer2 VPN
Ethernet Vlan Over MPLS



Task 1:

Connect the above network and assign ip addresses as depicted, R1 & R3 ethernet interface facing customer should be divided into sub interfaces for VLAN 10 & VLAN 20. R5, R6, R7 & R8 should be configured with sub interfaces for the relevant VLAN. Don't forget to configure the switch with vlan 10 & 20, and its interfaces as trunk.

Task 2:

Configure OSPF as IGP routing protocol in the provider network

!R1

Router ospf 1

Router-id 1.1.1.1

Network 1.1.1.1 0.0.0.0 area 0

Network 70.0.0.1 0.0.0.0 area 0

!R2

Router ospf 1

Router-id 2.2.2.2

Network 2.2.2.2 0.0.0.0 area 0

Network 70.0.0.2 0.0.0.0 area 0

Network 80.0.0.2 0.0.0.0 area 0

!R3

Router ospf 1

Router-id 3.3.3.3

Network 3.3.3.3 0.0.0.0 area 0

Network 80.0.0.3 0.0.0.0 area 0

Task 3:

Configure MPLS in the provider network

!R1/R3

Mpls ip

Mpls ldp router-id loopback 0

Int e0/0

Mpls ip

!R2

Mpls ip

Mpls ldp router-id loopback 0

Int e0/0

Mpls ip

Int e0/1

Mpls ip

Task 4:

Configure xconnect on R1 & R3 on the sub-interfaces to connect to the other customer site

!R1

Int e0/1.10

Xconnect 3.3.3.3 100 encapsulation mpls

!

Int e0/1.20

Xconnect 3.3.3.3 200 encapsulation mpls

!R3

Int e0/1.10

Xconnect 1.1.1.1 100 encapsulation mpls

!

Int e0/1.20

Xconnect 1.1.1.1 200 encapsulation mpls

Task 5:

Configure EIGRP 100 as a routing protocol between Customer A Sites & EIGRP 200 between Customer B Sites

!R4

Router eigrp 100

Network 10.0.0.0

Network 50.0.0.0

No auto-summary

!R5

Router eigrp 200

Network 20.0.0.0

Network 60.0.0.0

No auto-summary

!R6

Router eigrp 100

Network 30.0.0.0

Network 50.0.0.0

No auto-summary

!R7

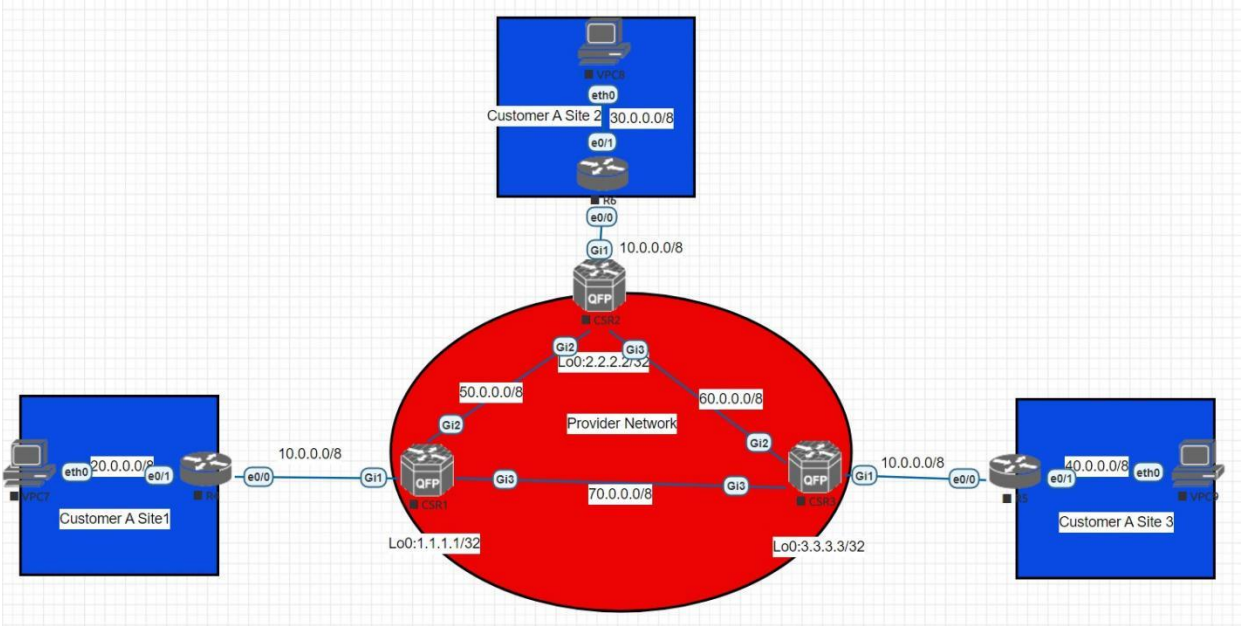
Router eigrp 200

Network 40.0.0.0

Network 60.0.0.0

No auto-summary

Lab 3
VPLS



Task 1:

Connect the above network and assign ip addresses as depicted in the topology

Task 2

Configure OSPF as IGP routing protocol in the provider network

!R1

Router ospf 1

Router-id 1.1.1.1

Network 1.1.1.1 0.0.0.0 area 0

Network 50.0.0.1 0.0.0.0 area 0

Network 70.0.0.1 0.0.0.0 area 0

!R2

Router ospf 1

Router-id 2.2.2.2

Network 2.2.2.2 0.0.0.0 area 0

Network 50.0.0.2 0.0.0.0 area 0

Network 60.0.0.2 0.0.0.0 area 0

!R3

Router ospf 1

Router-id 3.3.3.3

Network 3.3.3.3 0.0.0.0 area 0

Network 60.0.0.3 0.0.0.0 area 0

Network 70.0.0.3 0.0.0.0 area 0

Task 3:

Enable mpls in the provider network

!R1/R2/R3

Mpls ip

Mpls ldp router-id loopback 0

!

Interface g2

Mpls ip

!

Interface g3

Mpls ip

Task 4:

Configure the CE to sub interfaces with their appropriate VLAN & IP addresses

!R4

Int e0/0

No shut

Int e0/0.10

Encaps dot1q 10

Ip address 10.0.0.4 255.0.0.0

!R5

Int e0/0

No shut

Int e0/0.10

Encaps dot1q 10

Ip address 10.0.0.5 255.0.0.0

!R6

Int e0/0

No shut

Int e0/0.10

Encaps dot1q 10

Ip address 10.0.0.6 255.0.0.0

Task 5:

Configure the CE routers with EIGRP 100 as a routing protocol

!R4

Router eigrp 100

Network 10.0.0.0

Network 20.0.0.0

No auto-summary

!R5

Router eigrp 100

Network 10.0.0.0

Network 40.0.0.0

No auto-summary

!R6

Router eigrp 100

Network 10.0.0.0

Network 30.0.0.0

No auto-summary

Task 6:

Configure the VPLS on the PE CSR routers

!R1

Interface g1

No shut

Service instance 1 Ethernet

Encapsulation dot1q 10

Bridge-domain 100

!

L2 vfi CUST_A manual

Vpn id 123

Bridge-domain 100

Neighbor 2.2.2.2 encapsulation mpls

Neighbor 3.3.3.3 encapsulation mpls

!R2

Interface g1

No shut

Service instance 1 Ethernet

Encapsulation dot1q 10

```
Bridge-domain 100
!
L2 vfi CUST_A manual
Vpn id 123
Bridge-domain 100
Neighbor 1.1.1.1 encapsulation mpls
Neighbor 3.3.3.3 encapsulation mpls


!R3
Interface g1
No shut
Service instance 1 Ethernet
Encapsulation dot1q 10
Bridge-domain 100
!
L2 vfi CUST_A manual
Vpn id 123
Bridge-domain 100
Neighbor 2.2.2.2 encapsulation mpls
Neighbor 1.1.1.1 encapsulation mpls
```