MPLS Lab 1 Tasks

Task 1:

Assign IPv4 addresses to all interfaces in the SP network (Every inter-node connection prefix length should be /24 and IP addressing scheme should be 10.Y.X.R/24 where Y stands for highest R#, X stands for lowest R# and R stands for R#, for example the IP address of R88's interface between R88 and R11 should have IP address of 10.88.11.88/24) and also all SP routers should have a Lo0 interface with this scheme : 10.255.255.R/32 where R stands for router number, for example R99's Lo0 interface should have IPv4 address of 10.255.255.99/32.

- Create an IS-IS Process
- IS-IS NET scheme: 49.0000.0000.0000.00RN.00 (RN stands for router number)
- Configure the routers to only form Level-2 adjacency
- Advertise Lo0 interfaces in the IS-IS
- Configure adjacency logging for IS-IS
- Enable IS-IS 10000 on all SP router interfaces

Task 2:

- Define MPLS label range for every router, so we can track packets LSPs easily in this lab, you don't have to always do that, we just do it for some purposes you will see that!
- Configure static router-id for LDP on every router and force it to use Lo0 interface as LDP Router-ID.
- Enable MPLS LDP session protection.
- Enable MPLS and LDP on all IS-IS enabled interfaces by using IS-IS Auto-Config mechanism.
- Enable MPLS LDP IGP Synchronization on all IS-IS enabled interfaces by using a single command.
- Configure IS-IS in order to only advertise host routes (/32 Networks of Lo0 interfaces)

Task 3:

- Configure iBGP on every PE router and **only** enable VPNv4 Unicast address family. All sessions should be established between Lo0 interfaces.
- The BGP AS number should be 10000.
- SP-PE-R11 and SP-PE-R22 should be configured as Route-Reflectors with the same Cluster-ID: 10.255.255.11.
- On Route Reflectors use session and policy templates to configure neighbor's session and policy parameters. Configure MD5 password "ccie_ei" for all sessions.

Task 4:

- Provide MPLS L3VPN Service to CustA (Customer A)
- Use Static-Routes as PE-CE Routing Protocol
- CustA-Static-CE1 device should reach other sites using it's Lo0 interface and also reach the router that is doing NAT (CustA-2-Static-CE12 device) using it's Lo200 interface.

Task 5:

- Provide MPLS L3VPN Service to CustB (Customer B)
- Use RIP as PE-CE Routing Protocol

Task 6:

- Provide MPLS L3VPN Service to CustC (Customer C)
- Use BGP as PE-CE Routing Protocol
- Use the same BGP AS#65003 on all Customer Sites. Do not use `allowas-in` option.
- Configure Site-Of-Origin Extended Community for CE2/CE4 site.
- Configure ECMP for VPNv4 traffic of CustC, then CustC-BGP-CE3 traffic must be load-shared between SP-PE-R11 and SP-PE-R33 towards CE4 Lo0.

Task 7:

- Provide MPLS L3VPN Service to CustD (Customer D)
- Use OSPF as PE-CE Routing Protocol
- Configure domain-id type 0005 value 000000065004 for OSPF process
- Sites should use optimal paths in order to reach each other (Serial WAN links should be used as a backup path as long as PE-CE connections are up)
- CE5 int e0/0, Lo0 and also OSPF process should be configured under a VRF

Task 8:

- Customer B wants to have IPv6 connectivity, Provide it using 6VPE service
- Configure OSPFv3 as the PE-CE routing protocol
- Physical Interface IPv6 addressing scheme must be:
FD02:172:17:PE_R#::R#/64
- Loopback Interface IPv6 addressing scheme must be:
FD02:172:17:255::R#/128