Course Catalog
2012-2013

MPLS

CSLiT
.....Connecting Technology

Multiprotocol Level Switching

This course is an in-depth study of deploying networks using MPLS. It focuses on features of Foundry Networks Series of switches and routers including advanced technologies such VLL, VPLS, QoS, and Traffic Engineering. It covers network design, system configuration and troubleshooting.

Course Objectives

By the end of the course delegates will be able to:

- Implement advanced designs and configurations in MPLS Networks.
- Implement advanced STP, OSPF & BGP features on Foundry Switches / Routers
- Implement Quality of Service in MPLS at both Layer 2 and Layer 3
- Design and configure and implement VPN networks.
- Design and deploy MPLS TE.
- Interconnect Foundry Switches/Routers based on a MPLS network design.
- Configure and troubleshoot design implementations using the CLI show commands

Who Should Attend

Anyone working with MPLS on Foundry devices

Prerequisite

To fully benefit from this course you should have a working knowledge with OSPF, Static routes, BGP, layer 2 switching, Foundry CLI.

Course Duration

36 Hours, 12 Classes, 3 hours per class

Course Details

Lesson 01: MPLS Fundamentals

- IP routing limitations
- MPLS concepts
- MPLS TE benefits
- MPLS functional architecture
- MPLS label structure
- LSR types and functions.

Lesson 02: Basics of Virtual Private Networks (VPNs)

- Functions and operation of Layer 2 and 3 VPNs
- Traffic types in each network type
- Scalability, deployment
- Provisioning, and costs associated with these networks
- Maintenance and management issues that impact these networks.

Lesson 03: Layer 2 VPNs

- End-to-end L2 VPNs in a provider network
- Customer traffic flow queuing and management
- Virtual Leased Line (VLL) and Virtual Private LAN Segment (VPLS) packet forwarding over MPLS
- VLL packet encoding
- QoS services in a VLL network
- MPLS VLL configuration
- and information displays
- Troubleshooting VLL.

Lesson 04: Layer 2 VRF Import and Export Features

- Advanced VRF features and their usage
- Configuring selective VRF imports/exports
- Limiting routes in a VRF table
- Limiting prefixes received from BGP neighbors

Limiting VRF routes in the provider core

Lesson 05: MPLS Label Distribution

- IP routing and MPLS
- Label Switch Paths
- LDP details and events
- Label allocation in MPLS
- Label distribution in MPLS
- MPLS forwarding table construction and population
- Packet forwarding across MPLS
- MPLS loop detection
- Penultimate Hop Popping.

Lesson 06: Advanced Routing in the Provider Core

- OSPF within Provider MPLS core
- Advanced OSPF (Constraint-based SPF) configuration and operation
- BGP as a PE-CE routing protocol
- MBGP distributing MPLS VPN labels with VPN routes between PE routers.

Course Details

Lesson 07: MPLS VPN mechanisms

- VRF tables in MPLS VPNs
- Routing protocols in MPLS VPNs
- VRF-aware routing protocols
- VRFs in an MPLS VPN
- Inbound/Outbound interaction between PE-CE routing protocols
- backbone MBGP
- VRF tables

Lesson 08: MPLS Traffic Engineering

- TE basic concepts
- Concerns and justification for implementing TE
- Congestion avoidance and reduction using TE
- TE using the Layer-2 and 3 overlay models
- RSVP for TE controls

Lesson 09: Quality of Service (QoS) in MPLS

- IP QoS
- QoS using MPLS devices including VPNs
- End-to-end QoS provisioning in a Provider network using the MPLS Exp bits
- IP Precedence mapping for three, four, and five class Provider Traffic Profiles
- Customer traffic flows queuing and management by QoS