Course No: (TWI-MPLS-APPS-II)
Length: 5 days

About this Course

This course focuses primarily on the design and deployment of MPLS VPNs. Both Layer-3 and Layer-2 VPNs are discussed and compared. Every module is accompanied with a hands-on lab to reinforce the concepts learned in the theory. As in the Part I, the course is designed to provide students with the necessary skills to know how to configure and troubleshoot various MPLS VPNs, as well as the application of the many features supported by MPLS VPN technologies. Each student that follows this class will receive their personal copy of the book MPLS-Enabled Applications by Ina Minei and Julian Lucek which is one of the most complete references on MPLS available.

Prerequisites

A student following the MPLS Applications Part II should be familiar with operational and configuration modes in the Juniper Networks JUNOS operating system, as well as able to configure and troubleshoot IGP routing protocols and BGP. It is recommended that students have followed or are familiar with the concepts covered in MPLS Applications Part I including LDP and RSVP configuration options such a P2MP LSPs prior to following this course.

Course Contents

Day One and Two

Foundations of Layer-3 BGP/MPLS VPN's

- The business drivers
- The overlay VPN model
- The peer VPN model
- Components of the BGP/MPLS VPN solution
- Benefits of the BGP/MPLS solution
- Basic Layer-3 VPN configuration
- Hands on Labs

Advanced Topics in Layer-3 BGP/MPLS VPN's

- PE-CE routing options and considerations
- Management VPNs
- Route Reflector design criteria for BGP/MPLS VPN's
- Scalability of BGP/MPLS VPN
- Convergence times in BGP/MPLS VPN's
- Security considerations with BGP/MPLS VPN's
- Differentiated VPN treatment in the core
- Qos/Cos requirements in Layer-3 BGP/MPLS VPN's
- Internet access options
- Hands on Labs

Day Three

Hierarchical and Inter-AS VPN's

- Carriers Carrier – the Service Provider as a VPN customer
- Multi-AS backbones
- Options A, B and C as per RFC4364 discussed and contrasted
- Interprovider QoS
- Hands on Labs

Multicast in a Layer 3 VPN

- Business drivers
- Original multicast solution – PIM/GRE mVPN (draft rosen)
- Properties of PIM/GRE mVPN solution
- NG Multicast for L3VPN (BGP/MPLS mVPN)
- Validation of NG mVPN Control plane operation
- Validation of NG mVPN Forwarding plane
- Migration Strategy for transition of rosen draft mVPN to NG mVPN
- Inter-AS Operations
- Hands on Labs

Day Four

Layer-2 Transport over MPLS

- Business drivers
- Comparison of Layer-2 and Layer-3 VPN's
- Layer-2 transport over MPLS principles
- Forwarding plane for various L2 technologies
- Control plane operation
- LDP signaling scheme
- BGP signaling scheme with auto-discovery
- Comparing the LDP and BGP approaches to Layer-2 transport over MPLS
- Hands on Labs

Day Five

Virtual Private LAN Service - VPLS

- Business drivers
- VPLS forwarding plane mechanisms
- Forwarding unicast/broadcast/multicast frames
- Control plane mechanisms
- LDP based signaling
- BGP signaling and autodiscovery
- Comparing the LDP and BGP control plane implementations
- Operational considerations for VPLS
- Hands on Labs

MPLS in Access Networks

- Transition from legacy to Ethernet access
- MPLS as the technology choice for the Ethernet access network
- Models for deployment of MPLS deployment in access networks
- Hands on Lab