

WAN ROUTING

MPLS CORE



Arista Academy WAN ROUTING - MPLS Core Track

The WAN Routing – MPLS Core track delivers a thorough overview of MPLS WAN technologies and segment routing architectures, progressing through six lessons on topics like MPLS fundamentals, Layer 2/3 VPNs with EVPN and BGP, RSVP-TE tunnels, segment routing setups, traffic engineering, and SR-WAN with DCI, all reinforced by hands-on labs. By taking this course, students acquire specialized skills in Arista's WAN tools, leading to improved network design efficiency, quicker troubleshooting, and preparation for certifications that enhance professional opportunities in service provider roles.

Who Should Enroll

This course targets network engineers, service provider technicians, and IT specialists in telecom or enterprise settings who manage WAN configurations and troubleshooting. It's especially valuable for those with prior knowledge of routing protocols like BGP or IS-IS, professionals transitioning to Arista from other vendors, and individuals involved in data center interconnect initiatives.

Skills Developed

- MPLS elements (LDP, RSVP-TE)
- Secure L2/3 VPN services via EVPN
- Pseudowires
- BGP, EVPN-VXLAN, protocol verification
- Diagnostic techniques

Learning Format

Arista Campus track is available as Self-Paced learning ([Academy Digital](#)) or Private live instructor lead class ([Academy Live](#))

Prerequisites

- Solid understanding of Layer 2/3 network technologies and protocols
- IGP protocols (OSPF, IS-IS)
- Basic BGP knowledge

CERTIFICATION

Routing MPLS WAN Core has an optional 4-hour practical exam.

Achieving this certification provides you the ACE Level 3 Specialist certification in the Routing Engineering track



MPLS Overview

MPLS Basics

- Introduction to MPLS labels
- MPLS packet and devices
- Establishing LDP sessions
- MPLS flow and terminology
- MPLS control plane & data plane tables
- IGP routing & MPLS control plane convergence
- MPLS data plane
- Penultimate hop popping (PHP)
- MPLS services vs. applications vs transport
- *Lab – Configuring IP addressing*
- *Lab – Configuring provider network reachability*
- *Lab – Configuring MPLS and LDP*

MPLS troubleshooting basics

- Route aggregation in an MPLS domain
- Loop detection with TTL propagation
- IGP vs. LDP convergence
- Show commands walkthrough & LDP label distribution

Layer 2 VPN services

Virtual private networks

- Overview of VPNs
- Use of VRFs in VPN architecture
- VPN control plane
- VPN data plane
- Benefits of MPLS

MPLS L2 VPN Basics

- Introduction to E-Line services and LDP pseudowires
- Point-to-point layer 2 services
- Multipoint Layer 2 VPN service
- Configuring E-Line with LDP pseudowire
- *Lab – Configuring E-Line and LDP pseudowire*

EVPN Overview

- Introduction to EVPN
- EVPN terminology
- VRF operation
- EVPN route type 2 (MAC-IP)
- *Lab - E-Line with EVPN VPWS*
- *Lab - E-LAN with EVPN Route Type 2*
- *Lab - Configuring L3EVPN Route Type 5*
- *Lab - Troubleshooting L3EVPN Data Plane*

Ethernet VPN implementations

- Static flow aware transport (FAT) support on EVPN VPWS
- E-Line with EVPN VPWS
- E-LAN with EVPN type-2 (L2EVPN)
- *Lab – E-Line with EVPN VPWS*

L3VPN with BGP

BGP as PE-CE protocol

- Configuring common AS number in multiple sites
- Allowas-In
- *Lab – Configuring MP-BGP and L3VPN*

L3VPN advanced services

- Overlapping VPNs
- Configuring overlapping VPNs
- Share service VPNs
- Configuring shared service VPN
- Managed service VPNs
- Configuring managed service VPN
- *Lab – Configuring managed service VPNs*
- *Lab – Configuring overlapping VPNs*
- *Lab – Configuring shared service VPNs*

MPLS Tunnels

MPLS RSVP-TE elements

- Introduction to TE
- Tunnel and link attributes overview
- RSVP path and reservation concepts
- RSVP Path state table and RSVP error messages
- MPLS RSVP TE configuration
- MPLS RSVP TE explicit path configuration
- *Lab – configuring MPLS RSVP TE dynamic tunnels*

MPLS RSVP tunnel protection

- Tunnel protection via multiple tunnels
- MPLS TE – RSVP – FRR
- RSVP FRR facility bypass data plane
- Configuring FRR node-protection bypass
- *Lab – Configuring RSVP TE multiple tunnels*
- *Lab – Configuring dynamic and explicit multi-tunnel FRR*
- *Lab – Using admin-groups for link and tunnel attributes*
- *Lab - Using secondary path for path selection*

Segment Routing

Segment routing fundamentals and transitions

- BGP-SR fundamentals – building the MPLS foundation
- Segment routing – Overview
- Segment routing foundations and basic traffic engineering
- LDP vs. segment routing – foundations and protocols
- LDP vs. segment routing – a comparative overview
- Exploring segment routing and traffic engineering in MPLS networks
- MPLS transport SR options
- MPLS core with SR-TE
- Advanced segment routing – Global significance and network types
- Advanced Segment routing – Traffic engineering and proxy sets
- *Lab – IS-IS SR TE*
- *Lab – Configuring SR-TE policy*

Segment routing traffic engineering and steering

- Traffic steering and service mapping case study
- IS-IS SR TE configuration
- SR-TE choosing best candidate paths
- Verify and test SR-TE policy
- Implementing SR-TE for color steering
- Steering traffic into SR-TE policies
- Configuring color steering with SR-TE policy
- *Lab – Steering traffic into TE policy*
- *Lab – System tunnel RIB*
- *Lab – User defined tunnel RIB*
- *Lab – Color steering SR-TE policy*

SR-WAN and DCI

- MPLS Inter-AS Deployment Scenarios
- L2 Connectivity Over MPLS-SR WAN
- DCI with BGP L3VPN and EVPN Connectivity Challenges
- L3 Connectivity over MPLS-SR WAN
- DCI EVPN VXLAN DC with MPLS-SR WAN
- Case Study – L2 and L3 Connectivity over MPLS-SR WAN
- *Lab – Data Center Interconnect*

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