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Implementing Segment Routing on Cisco IOS XR

The Implementing Segment Routing on Cisco IOS® XR (SEGRTE201) course is an instructor-led, lab-based, hands-on course offered by Learning@Cisco. It covers concepts of segment routing, how to configure and verify segment routing within an Interior Gateway Protocol (IGP), the interworking of Label Distribution Protocol (LDP) with segment routing, how to implement Topology-Independent Loop-Free Alternate (TI-LFA) using segment routing, and how to instantiate and verify segment routing traffic engineering policies. You will also learn how to implement segment routing within Border Gateway Protocol (BGP).

The Implementing Segment Routing on Cisco IOS XR course is designed for engineers and service providers who are deploying segment routing within their network.

Duration
Instructor-Led Training (ILT) delivery: 4 days
Virtual ILT delivery (VILT): 5 days

Target Audience
The Implementing Segment Routing on Cisco IOS XR course is designed for engineers who plan, implement, and service Multiprotocol Label Switching (MPLS) networks.

Targeted roles include:
- Systems engineers
- Network engineers
- Field engineers
- Technical support personnel
- Channel partners and resellers
Tasks and Features Covered

The following tasks and features are included in the course:

- Segment routing concepts
- IGP Prefix and Adjacency Segment Identifiers (SIDs)
- LDP and segment routing interworking
- TI-LFA Fast Reroute (FRR)
- Segment routing traffic engineering
- BGP prefix SIDs
- Egress peer engineering

Course Prerequisites

- None

Recommended Prerequisites

- Cisco IOS XR platform and Command-Line Interface (CLI) familiarity
- Detailed knowledge of TCP/IP routing and switching design and configuration in a multilayer service provider network
- Understanding of IGP operations for Intermediate System to Intermediate System (IS-IS) Protocol and Open Shortest Path First (OSPF) Protocol
- Understanding of MPLS, Layer 3 VPN, and BGP technology and implementation

Course Outline

- Module 1: Introduction to Segment Routing (SR)
  - Lesson 1: Examining Cisco Application Engineered Routing (AER)
  - Lesson 2: Exploring SR Concepts
  - Lesson 3: Examining Segment Types
  - Lesson 4: Examining the Segment Routing Global Block (SRGB)
- Module 2: IGP SR Implementation and Verification
  - Lesson 1: Examining the IGP Control Plane
  - Lesson 2: Examining SRGB and IGP Interactions
  - Lesson 3: Examining Prefix and Adjacency Segment Identifiers
  - Lesson 4: IS-IS Multilevel and OSPF Multiarea Operation
  - Lesson 5: Configuring and Verifying IS-IS SR Operation
  - Lesson 6: Configuring and Verifying OSPF SR Operation
- Module 3: SR and LDP Interworking
  - Lesson 1: SR and LDP Interworking Data Plane
  - Lesson 2: Mapping Server Function and Configuration
  - Lesson 3: Interworking Deployment Models
• Module 4: TI-LFA
  ◦ Lesson 1: Examining Classic LFA
  ◦ Lesson 2: Examining TI-LFA Fundamentals
  ◦ Lesson 3: Implementing and Verifying TI-LFA for SR Traffic
  ◦ Lesson 4: Implementing and Verifying TI-LFA for LDP Traffic
  ◦ Lesson 5: TI-LFA and SR/LDP Interworking
• Module 5: Segment Routing Traffic Engineering (SR-TE)
  ◦ Lesson 1: Exploring SR-TE
  ◦ Lesson 2: Introducing the Anycast and Binding SIDs
  ◦ Lesson 3: Enabling and Verifying SR-TE
  ◦ Lesson 4: Instantiating SR-TE Policies from a Configured Tunnel
  ◦ Lesson 5: Instantiating SR-TE Policies Using BGP Dynamic
• Module 6: Multidomain SR-TE
  ◦ Lesson 1: Configuring and Verifying a Path Computation Element (PCE)
  ◦ Lesson 2: Configuring and Verifying BGP Link State (BGP-LS)
  ◦ Lesson 3: Configuring Multidomain SR-TE Policies with a PCE and Tunnel Interface
  ◦ Lesson 4: Instantiating SR-TE Policies from a Configured Tunnel
  ◦ Lesson 5: Configuring Multidomain SR-TE Policies with On-Demand Next Hop (ODN)
• Module 7: BGP Prefix Segment and Egress Peer Engineering
  ◦ Lesson 1: Examining the BGP-Based Data Center
  ◦ Lesson 2: Examining the BGP Prefix-SID Operation
  ◦ Lesson 3: Configuring and Verifying the BGP Prefix SID
  ◦ Lesson 4: Examining Egress Peer Engineering
  ◦ Lesson 5: Examining BGP Peering Segments
  ◦ Lesson 6: Configuring and Verifying Egress Peer Engineering

Lab Outline
• Lab 1: Configuring and Verifying IGP SR
• Lab 2: Migrating from LDP to SR
• Lab 3: Configuring and Verifying TI-LFA FRR
• Lab 4: Configuring and Verifying SR-TE
• Lab 5: Configuring and Verifying Multidomain SR-TE
• Lab 6: Configuring and Verifying BGP SR
Lab Topology

Figure 1 shows the lab topology used for all labs in this course.

**Figure 1.** Lab Topology for Implementing Segment Routing on Cisco IOS XR

Registration Email

For more information about schedules and registration for this course, contact aeskt_registration@cisco.com.

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