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Cisco IOS XR Layer 3 VPN Implementation and Verification

The Cisco IOS® XR Layer 3 VPN Implementation and Verification\(^1\) (IOSXR301) course is an instructor-led, lab-based, hands-on course offered by Learning@Cisco. It covers how to implement and verify Layer 3 VPN Services on a Cisco IOS-XR Software-based network.

You learn how to implement and verify Label Distribution Protocol (LDP) in the core of a service provider network, including implementing LDP session protection, LDP nonstop routing, graceful restart, LDP-IGP synchronization, LDP auto configuration and MPLS Operations, Administration, and Maintenance (OAM) solution. You also learn how to implement and verify intra-AS Layer 3 VPNs using MP-BGP (Multiprotocol Border Gateway Protocol) in core network and various PE-CE route distribution methods, including using static routing and BGP. Also, you learn how to implement and verify inter-AS Layer 3 VPNs using various methods including inter-AS Layer 3 VPN options A, B and C. This course is part of a portfolio of courses to enable customers to support and maintain their Cisco IOS-XR platforms. These platforms include the Cisco ASR 9000 Series Aggregation Services Routers and Carrier Routing System CRS-1, CRS-3, and CRS-X; and Cisco Network Convergence System Series (NCS) 1000, 4000, 5000, 5500, and 6000.

Duration

Instructor-Led Training (ILT): 2 days

Virtual Instructor-Led Training (VILT): 3 days

\(^1\) Course content is dynamic and subject to change without notice.
Target Audience
This course is designed for technical professionals who need to know how to implement Layer 3 VPN services on a Cisco IOS-XR platform for a service provider or large enterprise environment.

Targeted roles include:
- Implementation and design engineers
- Network planning engineers

Tasks and Features Covered
You learn to implement and verify:
- MPLS LDP in a service provider network
- Intra-AS Layer 3 VPNs
- Inter-AS Layer 3 VPNs

Course Prerequisites
- Completion of the Introduction to Cisco IOS XR (IOSXR100) training course, or equivalent hands-on experience configuring and supporting Cisco IOS XR–based routers
- Completion of the Cisco IOS XR System Administration (IOSXR200) training course, or equivalent hands-on experience configuring and supporting Cisco IOS XR–based routers

Recommended Prerequisites
Cisco recommends that you have the following prerequisite knowledge and skills, and the ability to:
- Efficiently configure Cisco IOS-XR Software–based platforms
- Configure and troubleshoot BGP routing

Course Outline
- Module 1: MPLS Label Distribution Protocol
  - Components of the Label Forwarding Information Base (LFIB)
  - LDP Protocol Overview
  - Cisco IOS XR LDP Implementation
  - Cisco IOS XR MPLS Forwarding Infrastructure
  - LDP Operation and Configuration
  - Commands for Troubleshooting LDP Operation
- Module 2: Intra-AS Layer 3 VPNs
  - L3VPN Overview
  - L3VPN Operation
  - L3VPN Intranet Configuration and Verification
  - L3VPN Extranet Configuration and Verification
• Module 3: Inter-AS Layer 3 VPNs
  ◦ Inter-AS L3VPN Overview
  ◦ Inter-AS Option A Configuration and Verification
  ◦ Inter-AS Option B Configuration and Verification
  ◦ Inter-AS Option C Configuration and Verification

Lab Outline
• Lab 1: Lab Familiarization
  ◦ Task 1: Verify the SP1 Core Configuration
  ◦ Task 2: Verify the SP2 Core Configuration
• Lab 2: Implementing and Verifying MPLS LDP
  ◦ Task 1: Configure and Verify LDP in the SP1 Core
  ◦ Task 2: Configure and Verify Session Protection for the SP1 Core
  ◦ Task 3: Configure and Verify MPLS LDP NSR in the SP1 Core
  ◦ Task 4: Configure and Verify LDP IGP Sync and Graceful Restart
  ◦ Task 5: Use OAM to test LDP in the SP1 Core
  ◦ Task 6: Configure and Verify the SP2 Core LDP
  ◦ Task 7: Configure and Verify LDP IGP Sync in the SP2 Core
  ◦ Task 8: Use OAM to test LDP in the SP2 Core
• Lab 3: Implementing and Verifying Intra-AS Layer 3 VPNs
  ◦ Task 1: Verify the Lab for L3VPN Support
  ◦ Task 2: Implement an L3VPN Intranet in the SP1 Core
  ◦ Task 3: Verify and Examine the L3VPN Intranet in the SP1 Core
  ◦ Task 4: Configure and L3VPN Intranet in the SP2 Core
  ◦ Task 5: Verify and Examine the L3VPN Intranet in the SP2 Core
  ◦ Task 6: Configure an L3VPN Extranet in the SP1 Core
  ◦ Task 7: Verify and Examine the L3VPN Extranet in the SP1 Core
• Lab 4: Implementing and Verifying Inter-AS Layer 3 VPNs
  ◦ Task 1: Prepare the Lab for Inter-AS Option B
  ◦ Task 2: Create and Verify an Inter-AS Option B L3VPN
  ◦ Task 3: Prepare the Lab for Inter-AS Option C
  ◦ Task 4: Create and Verify an Inter-AS Option C L3VPN
Lab Topology

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

Registration Email

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

Cisco Capital Financing Helps You Achieve Your Objectives

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Website Addresses for More Information

For more information, visit the following websites:

- Cisco Learning Services for Cisco products and technologies: https://www.cisco.com/go/cls