Cisco IOS XR Layer 3 VPN Implementation and Verification (IOSXR301) v1.1

What you’ll learn in this course

The Cisco IOS XR Layer 3 VPN Implementation and Verification (IOSXR301) v1.1 course shows you how to implement and verify Layer 3 VPN services on a Cisco Internetwork Operating System (IOS) XR network. You will 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 (Interior Gateway Protocol) synchronization, LDP auto configuration, and Multiprotocol Label Switching (MPLS) Operations, Administration, and Maintenance (OAM) solutions. You will also learn how to implement and verify intra-AS Layer 3 VPNs using MP-BGP (Multiprotocol Border Gateway Protocol) in core network and various Provider Edge–Customer Edge (PE-CE) route distribution methods, including using static routing and BGP. And you will learn how to implement and verify inter–Autonomous System (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 designed to help you support and maintain Cisco IOS® XR platforms, including Cisco ASR 9000 Series Aggregation Services Routers and Carrier Routing System CRS-1, CRS-3, and CRS-X; and Cisco Network Convergence System (NCS) Series 1000, 4000, 5000, 5500, and 6000.

Course duration

- Instructor-led training: 2 days
- Virtual instructor-led training: 3 days

How you’ll benefit

This course will help you:

- Prepare to implement Layer 3 VPN services on Cisco IOS XR platforms
- Practice what you learn through hands-on labs

Who should enroll

This course is designed for technical professionals who need to know how to implement Layer 3 VPN services on Cisco IOS XR platforms for a service provider or large enterprise network.

- Implementation and design engineers
- Network planning engineers

How to enroll

- For instructor-led training, visit the Cisco Learning Locator.
- For private group training, visit Cisco Private Group Training.
Technology areas

- Networking
- Service provider

Course details

Objectives

After taking this course, you should be able to implement and verify:

- MPLS LDP in a service provider network
- Intra-AS Layer 3 VPNs
- Inter-AS Layer 3 VPNs

Prerequisites

Before attending this course, you should have the following knowledge and skills:

- Completion of the Introduction to Cisco IOS XR (IOSXR100) course, or equivalent hands-on experience configuring and supporting Cisco IOS XR–based routers
- Completion of the Cisco IOS XR System Administration (IOSXR200) course, or equivalent hands-on experience configuring and supporting Cisco IOS XR–based routers
- Efficiently configure Cisco IOS XR software-based platforms
- Configure and troubleshoot BGP routing

Outline

- 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
- Intra-AS Layer 3 VPNs
  - L3VPN Overview
  - L3VPN Operation
  - L3VPN Intranet Configuration and Verification
  - L3VPN Extranet Configuration and Verification
- 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 Familiarization
  - Verify the Service Pack 1 (SP1) Core Configuration
  - Verify the SP2 Core Configuration
- Implementing and Verifying MPLS LDP
  - Configure and Verify LDP in the SP1Core
  - Configure and Verify Session Protection for the SP1Core
  - Configure and Verify MPLS LDP Non Stop Routing (NSR) in the SP1Core
  - Configure and Verify LDP IGP Sync and Graceful Restart
  - Use OAM to test LDP in the SP1Core
  - Configure and Verify the SP2 Core LDP
  - Configure and Verify LDP IGP Sync in the SP2Core
  - Use OAM to test LDP in the SP2Core
- Implementing and Verifying Intra-AS Layer 3VPNs
  - Verify the Lab for L3VPN Support
  - Implement an L3VPN Intranet in the SP1Core
  - Verify and Examine the L3VPN Intranet in the SP1Core
  - Configure and L3VPN Intranet in the SP2Core
  - Verify and Examine the L3VPN Intranet in the SP2Core
  - Configure an L3VPN Extranet in the SP1Core
  - Verify and Examine the L3VPN Extranet in the SP1Core
- Implementing and Verifying Inter-AS Layer 3VPNs
  - Prepare the Lab for Inter-AS Option B
  - Create and Verify an Inter-AS Option BL3VPN
  - Prepare the Lab for Inter-AS Option C
  - Create and Verify an Inter-AS Option CL3VPN