
Cisco Aggregation Services Router 9000 Series Essentials

DURATION: 4-5 DAYS

COURSE CODE: ASR9KE

FORMAT: LECTURE/LAB

COURSE DESCRIPTION

The Cisco Aggregation Services Router 9000 Series Essentials (ASR9KE) v6.0 course introduces you to the features and functions of the Cisco® Aggregation Services Router (ASR) 9000 Series platforms. Through a combination of lecture and hands-on labs, you will gain an understanding of all major aspects of the platform, including hardware, Layer 2 and Layer 3 services, routing protocols including Segment Routing, Layer 2 and Layer 3 multicast, Quality of Service (QoS) features, and network virtualization. The course investigates Cisco Internetworking Operating System (IOS) XR 64-Bit Linux-based feature parity in the environment, as well as how to install Cisco IOS® XR 64-Bit software packages.

Course duration

Instructor-led training: 4 days in the classroom with hands-on lab practice

Virtual instructor-led training: 5 days of web-based classes with hands-on lab practice

This course will help you:

Understand the essential features and functions of the ASR 9000 Series routers running Cisco IOS XR 64-Bit software

Practice Cisco IOS XR 64-Bit configurations on the ASR 9900 Series router in lab exercises

Configure Cisco ASR 9900 configuration changes and restore older versions of the configuration

Install the Cisco IOS XR 64-Bit Software operating system, Package Information Envelopes (PIEs), and Software Maintenance Updates (SMUs)

Understand data flow through the Cisco ASR 9000 and ASR 9900 Series router

Technology areas

Routing and switching

Service provider

WHO SHOULD ATTEND

This course is designed for technical professionals who need to know how to deploy Cisco ASR 9000 Series routers in their network environment. The primary audience for this course includes:

System engineers

Technical support personnel

Channel partners, resellers

PREREQUISITES

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

Basic IOS XR 64-Bit Software configuration commands

Basic knowledge of router installation and some experience with installation tools

Routing protocol configuration experience with BGP, Intermediate System-to-Intermediate System (IS-IS), and Open Shortest Path First (OSPF)

Knowledge of Layer 2 IEEE switching and related protocols

Strong knowledge of MPLS configuration or multicast configuration experience

LEARNING OBJECTIVES

After taking this course, you should be able to:

List and describe the major features and benefits of a Cisco ASR 9000 Series router

List and describe the major features and benefits of the Cisco 64-Bit IOS XR operating system

Understand data flow through the Cisco ASR 9000 Series router

Configure Cisco ASR 9000, back out of configuration changes, and restore older versions of the configuration

Install the Cisco IOS XR 64-Bit Software operating system, package information envelopes, and software maintenance updates

Enable multicast routing on a Cisco ASR 9900 Series router

Configure Layer 3 VPN services

Configure Ethernet link bundles

Configure local Ethernet Line (E-Line) Layer 2 VPN (L2VPN)

Configure Ethernet over Multiprotocol Label Switching (EoMPLS) E-Line L2VPN

Configure EoMPLS with pseudowire backup

Configure local Ethernet LAN(E-LAN) L2VPN

Describe Virtual Private LAN Service (VPLS) L2VPN

Describe VPLS with Border Gateway Protocol (BGP) autodiscovery

Configure service-based Connectivity Fault Management (CFM)

Configure Layer 2 multicast features

Describe basic QoS implementation

Describe how to configure and verify network Virtualization (nV) on the ASR 9000 series

COURSE OUTLINE

1. Cisco ASR 9000 Series Hardware

- Examining the Cisco ASR 9000 Series Chassis
- Examining the Cisco ASR 9000 Series Architecture
- Examining the Route Switch Processor/ Route Processor (RSP/RP) Functions and Fabric Architecture
- Examining the Cisco ASR 9000 Series Line Card
- Examining the Cisco ASR 9000 Power Subsystems

2. Cisco IOS XR 64-Bit Software Architecture and Linux Fundamentals

- Cisco IOS XR 64-Bit Software Fundamentals
- Cisco ASR 9000 IOS XR 64-Bit vs. 32-Bit
- Exploring Linux Fundamentals

3. Cisco IOS XR 64-Bit Software Installation

- Examining Resource Allocations and Media Mappings
- Migrating to Cisco IOS XR 64-Bit Software
- Performing Disaster Recovery
- Installing Software Packages

4. Cisco IOS XR 64-Bit Software Configuration Basics

- Configuring Cisco IOS XR 64-Bit Basic Operations
- Cisco IOS XR 64-Bit Initial Configuration
- Reviewing the Configuration

5. Cisco IOS XR 64-Bit Software Routing Protocols

- Exploring Intermediate System to Intermediate System (IS-IS)
- Exploring OSPF
- Exploring BGP
- Exploring Routing Protocol for LLN

6. Multicast Routing

- Exploring Multicast Routing
- Exploring Protocol Independent Multicast (PIM)

7. Cisco Multiprotocol Label Switching

- Examining the MPLS Forwarding Infrastructure
- Implementing the MPLS Label Distribution Protocol (LDP)

8. Cisco IOS XR 64-Bit Segment Routing

- Segment Routing Concepts
- Interior Gateway Protocol Segment Routing (IGP SR) Control Plane Overview
- Prefix and Adjacency Segment IDs (SIDs)
- SR IS-IS Multi-Level and OSPF Multi-Area
- IS-IS SR Configuration and Verification
- OSPF SR Configuration and Verification

9. Layer 3 VPNs

- Examining L3VPNs
- Exploring L3VPN Control and Data Flow
- Configuring L3VPNs
- Verifying the L3VPN Operation

10. Cisco ASR 9000 Layer 2 Architecture

- Examining Carrier Ethernet and Flexible Ethernet Edge
- Comparing Layer 2 and Layer 3 VPNs
- Examining the ASR 9000 Layer 2 Infrastructure and Ethernet Flow Points (EFPs)
- Layers 2 and 3 Coexistence and VLAN Tag Manipulation
- Exploring the Layer 2 Network Infrastructure

11. Point-to-Point Layer 2 Services

- Point-to-Point Alternating Current-Alternating Current (AC-AC) and Attachment Circuit Redundancy
- Point-to-Point AC-Pseudowire (PW) Cross-Connect
- Examining Pseudowire Redundancy and Resiliency

12. Layer 2 Multicast

- Examining the Cisco ASR 9000 Series Multicast
- Implementing Multicast

13. Quality of Service

- QoS Basics and the Modular QoS CLI (MQC) Mode
- Layer 2 QoS Example

DISCOVERY LABS

- 1: ASR 9904 Hardware Discovery Lab
- 2: Device Discovery and Initial Configuration
- 3: Installing Cisco IOS XR 64-Bit Software
- 4: Cisco IOS XR 64-Bit Software Operations
- 5: Configuring IS-IS Routing
- 6: Configuring OSPF Routing
- 7: Configuring Internal BGP (iBGP) Routing
- 8: IPv4 Multicast Configuration
- 9: Configuring Multiprotocol Label Switching
- 10: Configuring and Verifying IGP Segment Routing
- 11: Configuring Layer 3 Virtual Private Network
- 12: Local E-Line Service
- 13: EoMPLS Service