

## ASR9KE

# Cisco Aggregation Services Router 9000 Series Essentials (ASR9KE) v6.0

4 horas

Service Provider

Cisco

### Cisco Continuing Education Credits

**32 CE Credits**

## INTRODUÇÃO

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.

## OBJETIVO DO CURSO

- 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

## **PÚBLICO-ALVO**

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System engineers

Technical support personnel

Channel partners, resellers

## **PRÉ-REQUISITOS**

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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

Experience troubleshooting Cisco routers in a large network environment

# CONTEÚDO PROGRAMÁTICO

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## **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

## **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

## **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

## **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

## **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

## **Multicast Routing**

Exploring Multicast Routing

Exploring Protocol Independent Multicast (PIM)

## **Cisco Multiprotocol Label Switching**

Examining the MPLS Forwarding Infrastructure

Implementing the MPLS Label Distribution Protocol (LDP)

## **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

## **Layer 3 VPNs**

Examining L3VPNs

Exploring L3VPN Control and Data Flow

Configuring L3VPNs

Verifying the L3VPN Operation

### **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

### **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

### **Layer 2 Multicast**

Examining the Cisco ASR 9000 Series Multicast

Implementing Multicast

### **Quality of Service**

QoS Basics and the Modular QoS CLI (MQC) Mode

Layer 2 QoS Example

### **Lab outline**

ASR 9904 Hardware Discovery Lab

Device Discovery and Initial Configuration

Installing Cisco IOS XR 64-Bit Software

Cisco IOS XR 64-Bit Software Operations

Configuring IS-IS Routing

Configuring OSPF Routing

Configuring Internal BGP (iBGP) Routing

IPv4 Multicast Configuration

Configuring Multiprotocol Label Switching

Configuring and Verifying IGP Segment Routing

Configuring Layer 3 Virtual Private Network

Local E-Line Service

EoMPLS Service