# Cisco Aggregation Services Router 9000 Series Essentials

**Cursusduur: 5 Dagen**    **Cursuscode: ASR9KE**    **Version: 6.1**    **Trainingsmethode: Virtual Learning**

## Beschrijving:

The Cisco Aggregation Services Router 9000 Series Essentials 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.

**This course is worth 32 Continuing Education (CE) Credits**

## Doelgroep:

Technical professionals who need to know how to deploy Cisco ASR 9000 Series routers in their network environment.

## Doelstelling:

- **After you complete this course you will 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

## Vereiste kennis en vaardigheden:

**Attendees should meet the following prerequsites:**

- 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

## Examens en certificering

**Recommended preparation for exam(s):**

- There is no exam aligned to this course

- Strong knowledge of MPLS configuration or multicast configuration experience
- Experience troubleshooting Cisco routers in a large network environment
- CCNA - Implementing and Administering Cisco Solutions
- ENCOR - Implementing and Operating Cisco Enterprise Network Core Technologies
- ENARSI - Implementing Cisco Enterprise Advanced Routing and Services
- BGP - Configuring BGP on Cisco Routers
- MPLS - Implementing Cisco MPLS

## Cursusinhoud:

### 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

### Labs:

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

## Nadere informatie:

Neem voor nadere informatie of boekingen contact op met onze Customer Service Desk  030 - 60 89 444

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