

## Cisco CRS-1 Carrier Routing System Essentials (CRS1E)

Duration 5 Days

### COURSE CONTENT

The Cisco CRS-1 Carrier Routing System Essentials (CRS1E) v2 course is a lab-intensive course that introduces you to the Cisco® CRS-1 Carrier Routing System and its features and functions. You will learn the important theoretical concepts on which the Cisco CRS-1 is based and gain the practical knowledge and skills to successfully deploy it in your network. You will be able to determine the right Cisco CRS-1 based on the requirements of your network. In 12 hands-on labs, you will learn to install the Cisco IOS® XR Software operating system, create and configure secure domain routers (SDRs), deploy common routing protocols, implement IP multicast, and deploy Multiprotocol Label Switching Traffic Engineering (MPLS-TE) and MPLS Layer 3 VPNs in the classroom environment. You will also use Route Policy Language (RPL) to deploy large-scale routing configurations and perform basic troubleshooting. This course combines lecture materials and hands-on labs throughout to make sure that you are able to successfully deploy a Cisco CRS-1 Carrier Routing System network.

### COURSE OBJECTIVES

Upon completion of this course, you should be able to:

- List and describe the major features and benefits of the Cisco CRS-1
- List and describe the major features and benefits of a Cisco SDR
- Create and configure a Cisco SDR
- Configure the Cisco CRS-1, back out of configuration changes, and restore older versions of a configuration
- Install the Cisco IOS XR Software operating system, package information envelopes, and software maintenance updates
- Configure the Cisco IOS XR security features in owner and no owner SDRs
- Configure legacy route map configurations using the new Cisco IOS XR RPL
- Configure routing protocols in a complex multi-autonomous system (AS) environment
- Enable multicast routing on the Cisco CRS-1
- Configure MPLS on Cisco IOS XR Software
- Configure MPLS-TE tunnels on the Cisco CRS-1
- Configure MPLS Layer 3 VPNs on the Cisco CRS-1
- Understand data flow through the Cisco CRS-1
- Troubleshoot basic Cisco CRS-1 hardware and software problems

### COURSE OUTLINE

- Introduction to Cisco CRS-1 Carrier Routing Systems
- Cisco CRS-1 Chassis Hardware
- Cisco CRS-1 Line-Card Chassis Common Elements
- Introduction to Cisco CRS-1 Multishelf Architecture
- Cisco IOS XR Software Overview and Basics
- Secure Domain Routers
- Cisco IOS XR Software Installation, Security, and Operations
- Routing Protocols
- Route Policy Language
- Multicast Routing
- MPLS
- MPLS Layer 3 VPNs
- Cisco CRS-1 Data Flow and Modular QoS Command-Line Interface
- Troubleshooting Cisco CRS-1 Carrier Routing Systems

## LAB OUTLINE

### Lab 1: Hardware Discovery and Initial Configuration

- Become familiar with the classroom network and learn basic commands to help navigate and configure the classroom router

### Lab 2: Secure Domain Routers

- Create and configure SDRs

### Lab 3: Cisco IOS XR Software Installation

- Use Cisco IOS XR installation commands to add, activate, deactivate, and remove software packages

### Lab 4: Cisco IOS XR Security

- Configure user authentication and access control on the Cisco CRS-1 using multiple methods

### Lab 5: Cisco IOS XR Software Operations

- Practice various operational tasks that are unique to Cisco IOS XR Software

### Lab 6: IS-IS Routing Configuration

- Configure IS-IS in Cisco IOS XR

### Lab 7: OSPF Routing Configuration

- Configure OSPF in Cisco IOS XR

### Lab 8: iBGP Routing Configuration

- Configure iBGP in Cisco IOS XR

### Lab 9: Building RPL Route Policies

- Use RPL to build new route policies by converting traditional route maps into RPL policies

### Lab 10: IP Multicast Configuration

- Deploy multicast routing on the Cisco CRS-1 using new and unique commands and techniques

### Lab 11: MPLS Configuration

- Configure MPLS Label Distribution Protocol (LDP) and TE tunnels

### Lab 12: L3VPN Configuration

- Configure MPLS Layer 3 VPNs on Cisco IOS XR platforms

## WHO SHOULD ATTEND

This course is intended for network professionals, including designers, implementation staff, network operations center personnel, and support staff, who are involved with the deployment, operations, and maintenance of the Cisco CRS-1 Carrier Routing System.

## PRE-REQUISITES

- Routing protocol configuration experience with Border Gateway Protocol (BGP), Intermediate System-to-Intermediate System (IS-IS), and Open Shortest Path First (OSPF)
- Advanced knowledge of BGP multihomed, multi-AS configurations
- Configuring BGP on Cisco Routers (BGP)
- Strong knowledge of MPLS configuration
- Multicast configuration experience