

## Cisco CRS-3 Carrier Routing System Essentials (CRS3E)

Duration 5 Days

### COURSE CONTENT

The Cisco CRS-3 Carrier Routing System Essentials (CRS3E) v1 lab-intensive course introduces you to the Cisco® CRS-3 Carrier Routing System (CRS) and its features and functions. You will learn the important theoretical concepts on which the Cisco CRS-3 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 IOS XR Software operating system based on the requirements of your network. In the hands-on labs, you will learn to install the Cisco IOS® XR Software operating system, deploy Open Shortest Path First (OSPF) and Internal Border Gateway Protocol (iBGP) routing protocols, and deploy Multiprotocol Label Switching–Label Distribution Protocol (MPLS-LDP) and MPLS Layer 3 VPNs in the classroom environment. In addition, you will be able to verify proper operation of various CRS-3 hardware, including the 140Gb/s switch fabric, 140Gb/s line cards, 14- and 20-port 10 Gigabit and 1-port 100 Gigabit Ethernet Physical Layer Interface Modules (PLIMs), the Performance Route Processor (PRP), and the new modular power systems, 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-3 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-3
- List and describe the major features and benefits of the 140-Gbps line cards
- List and describe the major features and benefits of the 14- and 20-port 10 Gigabit and 100 Gigabit Ethernet PLIMs
- List and describe the major features and functions of the modular power systems
- List and describe the major features and functions of the Performance Route Processors
- Describe the steps to migrate the 40-Gbps switch fabric to the 140-Gbps switch fabric
- Describe the steps to migrate from a fixed power system to the modular power system and verify its proper operation
- Describe the steps to migrate from an RP-B to the Performance Route Processor and verify its proper operation
- Configure the Cisco CRS-3, 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
- Upgrade field-programmable device (FPD) and ROMMON code
- Configure OSPF and iBGP routing protocols
- Configure MPLS-LDP in Cisco IOS XR Software
- Configure MPLS Layer 3 VPNs on the Cisco CRS-3
- Understand data flow through the Cisco CRS-3
- Troubleshoot basic Cisco CRS-3 hardware and software problems

### COURSE OUTLINE

The course outline is as follows:

- Introduction to Cisco CRS-3 Carrier Routing Systems
- Cisco CRS-3 Chassis Hardware
- Cisco CRS-3 Line Card Chassis Common Elements
- Introduction to Cisco CRS-3 Multi-shelf Architecture
- Cisco IOS XR Software Overview and Configuration Basics
- Introduction to Cisco CRS Product Enhancements
- Cisco CRS-3 140-Gbps Line Cards
- Introduction to the New High-Speed Ethernet PLIMs
- Introduction to the 140-Gbps Switch Fabric
- Introduction to Cisco CRS Modular Power Supplies
- Introduction the Cisco CRS Performance Route Processor
- Cisco IOS XR Software Installation and Operations
- Routing Protocols
- MPLS-LDP
- MPLS Layer 3 VPNs
- Cisco CRS-3 Data Flow and Modular QoS Command-Line Interface
- Troubleshooting Cisco CRS-3 Carrier Routing Systems

## LAB OUTLINE

The lab outline is as follows:

### 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: Exploring the 140-Gbps Line Cards and the 14-Port 10 Gigabit Ethernet PLIMs

- Use CLI commands to verify the proper operation of the 140-Gbps line cards and 14-port 10 Gigabit Ethernet PLIMs

### Lab 3: Exploring the 140-Gbps Switch Fabric

- Use CLI commands verify proper operation of the 140-Gbps switch fabric

### Lab 4: Cisco CRS Modular Power Systems

- Use CLI commands to verify the proper operation of the Cisco CRS Modular Power Systems

### Lab 5: Exploring the Cisco CRS Performance Route Processor

- Use CLI commands to verify proper operation of the Cisco CRS Performance Route Processor

### Lab 6: Cisco IOS XR Software Installation

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

### Lab 7: Cisco IOS XR Software Operations

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

### Lab 8: OSPF Routing Configuration

- Configure OSPF in Cisco IOS XR Software

### Lab 9: iBGP Routing Configuration

- Configure iBGP in Cisco IOS XR Software

### Lab 10: MPLS-LDP Configuration

- Configure MPLS-LDP

### Lab 11: Layer 3 VPN Configuration

- Configure MPLS Layer 3 VPNs on Cisco IOS XR Software 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-3 Carrier Routing System **and who have not taken the Cisco CRS-1 Essentials course**. Those students who have taken the Cisco CRS-1 Essentials course should take the Cisco CRS Product Enhancements course to gain CRS-3 product knowledge.

## PRE-REQUISITES

- Routing protocol configuration experience with Border Gateway Protocol (BGP), Intermediate System-to-Intermediate System (IS-IS), and OSPF
- Advanced knowledge of BGP multihomed, multi-AS configurations
- Strong knowledge of MPLS configuration