

Advanced Services' Cisco CRS-1 Carrier Routing System Essentials (CRS) v4.0.1



This lab-intensive course introduces you to the Cisco® CRS-1 Carrier Routing System and its features and functions. You will learn the important theoretical concepts that the Cisco CRS-1 is based on 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 (MPLS) traffic engineering 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 ensure that you are able to successfully deploy a Cisco CRS-1 Carrier Routing System network.

Duration

Five days

Target Audience

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.

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 nonowner 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-Traffic Engineering (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 Prerequisites

Table 1 lists the prerequisites for this course.

Table 1 Course Prerequisites

Prerequisite Knowledge	Relevant Courses
<ul style="list-style-type: none"> • Routing protocol configuration experience with Border Gateway Protocol (BGP), Intermediate System-to-Intermediate System (IS-IS), and Open Shortest Path First (OSPF) 	<ul style="list-style-type: none"> • Building Scalable Cisco Internetworks (BSCI) • Building Core Networks with OSPF, BGP, and MPLS (BCN)
<ul style="list-style-type: none"> • Advanced knowledge of BGP multihomed, multi-AS configurations 	<ul style="list-style-type: none"> • Configuring BGP on Cisco Routers (BGP) • Building Core Networks with OSPF, BGP, and MPLS (BCN)
<ul style="list-style-type: none"> • Strong knowledge of MPLS configuration 	<ul style="list-style-type: none"> • Building Core Networks with OSPF, BGP, and MPLS (BCN) • Implementing Cisco MPLS (MPLS)
<ul style="list-style-type: none"> • Multicast configuration experience 	
<ul style="list-style-type: none"> • Advanced knowledge of Cisco router security implementation, including authentication, authorization, and accounting (AAA) and TACAS 	<ul style="list-style-type: none"> • Securing Networks with PIX and ASA (SNPA)

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

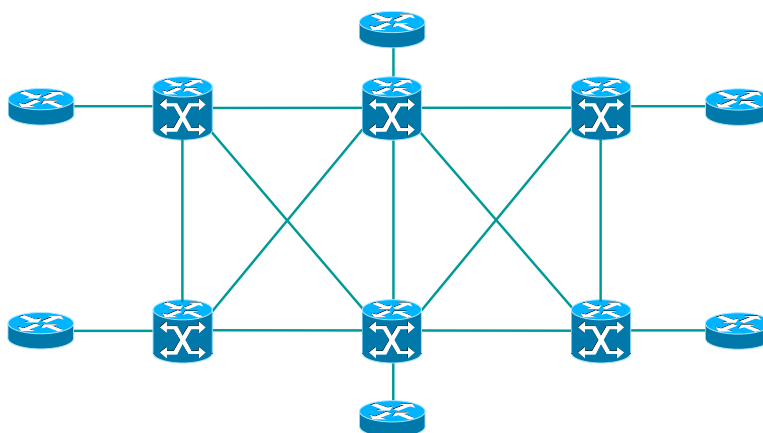
Lab Outline

- 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 dynamic traffic engineering (TE) tunnels
- Lab 12: L3VPN Configuration
 - Configure MPLS Layer 3 VPNs on Cisco IOS XR platforms

Lab Topology

Figure 1 shows the lab topology used in this course. The topology contains Cisco CRS-1 and Cisco XR12000 Series Routers as core and provider edge routers and Cisco 7200 Series Routers as customer edge routers.

Figure 1 Lab Topology



Registration Information

For more information about schedules and registration for this course, please contact aeskt_registration@cisco.com.

For More Information

For more information about Advanced Services Education course offerings, including custom training options, as well as Advanced Services Curriculum Planning Services and Advanced Services Technical Knowledge Library (TKL), refer to the Advanced Services Education Website at www.cisco.com/go/ase.



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