Course Information and Messaging Document: NCS540HWE

Course Description (full version)

The **Implementing the Cisco NCS 540 Series Routers (NCS540HWE)** training teaches you how to deploy Cisco Network Convergence System (NCS) 540 Series routers in a network environment. You will be introduced to the features and functions of the Cisco NCS 540 series platforms, system architecture, services implementation, quality of service (QoS), system security, model-driven telemetry, and programmability. This training also earns you 40 Continuing Education (CE) credits towards recertification.

How You'll Benefit

This training will help you:

- Gain hands-on experience deploying Cisco NCS 540 Series routers in a network environment
- Qualify for professional network job roles
- Earn 40 CE credits towards recertification

Who Should Enroll

- System Engineers
- Network Engineers
- Field Engineers
- Technical Support Personnel
- Channel partners, resellers System Engineers
- Network Engineers
- Field Engineers
- Technical Support Personnel
- Channel Partners
- Channel Resellers

Course Objectives

- Classify the Cisco NCS 540 platform hardware and understand the variations between large, medium, small, and fronthaul form factors, their features, use cases, and positioning
- Describe the hardware architecture of the NCS 540 series and the components necessary for packet queuing and forwarding, understand the life of a packet on ingress and egress traffic
- Explain the system architecture for traffic queuing, scheduling, and forwarding to introduce concepts of Cisco IOS XR modular QoS on the NCS 540 platform
- Describe the methods and protocols for establishing timing and synchronization on Cisco IOS XR router platforms
- Describe the Cisco NCS 540 fronthaul router family and its features and how they can be used to make mobile network architecture simpler
- Describe Cisco IOS XR software architecture, its programmable features, and how to install software packages
- Explain how to install Cisco IOS XR software packages
- Recognize, implement, and manage system security features within Cisco IOS XR software systems, ensuring the protection of network infrastructure and data
- Describe the main factors leading to the development and deployment of segment routing, segment types, segment routing global block (SRGB), and configure and verify intermediate system to intermediate system (IS-IS) and open shortest path first (OSPF) segment routing operation
- Discuss how topology independent loop-free alternate (TI-LFA) is implemented in Cisco IOS XR software
- Demonstrate segment routing traffic engineering (SR-TE) and the traffic engineering components used in segment routing
- Implement and configure advanced SR-TE features and SR IPv6
- Describe the components and functionality of Layer 3 multiprotocol label switching (MPLS) virtual private networks (VPNs) implementation in Cisco IOS XR software deployments
- Implement Layer 2 VPN operations in a service provider environment
- Explain how Ethernet VPN (EVPN) gets around the problems that regular Layer 2 VPNs have, what the model for EVPN delivery is, and how to implement and troubleshoot EVPN solutions
- Comprehend and implement model-driven telemetry for enhanced network visibility and management

Course Prerequisites

There are no prerequisites for this training. However, the knowledge and skills you are recommended to have before attending this training are:

- Knowledge of core Cisco networking technologies
- Understanding of implementing and operating Cisco networking solutions
- Recognition of general networking concepts and protocols
- Basic knowledge of router installation and some experience with installation tools
- Routing protocol configuration experience with border gateway protocol (BGP), IS-IS, and OSPF

Course Outline

1. Cisco NCS 540 Series Hardware Overview
2. Cisco NCS 540 System Architecture
3. Cisco NCS 540 QoS Architecture
4. Timing and Synchronization
5. Cisco NCS 540 xHaul Design
6. Cisco IOS XR Software Fundamentals
7. Cisco IOS XR Software Installation and Upgrade
8. Cisco IOS XR Software System Security
9. Segment Routing Fundamentals
10. Segment Routing Topology-Independent Loop-Free Alternate
11. Segment Routing Traffic Engineering
12. Advanced Segment Routing Traffic Engineering Features
13. Segment Routing IPv6
14. Layer 3 MPLS VPN Implementation with Cisco IOS XR Software
15. Layer 2 VPNs and Ethernet Services Fundamentals
16. Cisco IOS XR Software EVPN Operation and Implementation
17. Cisco IOS XR Software Programmability
18. Model-Driven Telemetry

Lab Outline

1. Configure and Verify NTP
2. Cisco IOS XR Software Installation
3. Configure and Verify MPP
4. Configure and Verify uRPF
5. Configure and Verify Segment Routing
6. Configure and Verify SR TI-LFA Using IS-IS
7. Configure and Verify SR TI-LFA Using OSPF
8. Configure and Verify SR TE Using IS-IS
9. Configure and Verify SR TE Using OSPF
10. Configure and Verify ODN and Flexible Algorithm
11. Configure and Verify SRv6
12. Configure and Verify Layer 3 VPN
13. Configure and Verify EVPN VPWS
14. Configure and Verify Devices by Using Model-Driven Programmability
15. Configure and Verify Model-Driven Telemetry