Implementing the Cisco NCS540 Series Routers (NCS540HWE)

COURSE OVERVIEW

Implementing the Cisco NCS540 Series Routers training is designed for network professionals to learn how to deploy Cisco NCS 540 Series routers in their network environment. Topics covered include understanding the features and functions of the Cisco NCS 540 Series platforms, system architecture, services implementation, Quality of Service (QoS), and system security, along with the utilization of model-driven telemetry and programmability.

WHO WILL BENEFIT FROM THIS COURSE?

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

PREREQUISITES

Before taking this offering, you should have:

- 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), Intermediate System-to- Intermediate System (IS-IS), and Open Shortest Path First (OSPF)
- Knowledge of Layer 2 IEEE switching and related protocols
- Strong knowledge of MPLS configurations
- Experience troubleshooting Cisco routers in a large network environment

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.
- Implement model-driven telemetry for enhanced network visibility and management.
- 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, types of segments that are used in segment routing, Segment Routing Global Block (SRGB), and configure and verify IS-IS and OSPF segment routing operations.
- Demonstrate how segment routing works and how it protects links and nodes while explaining the basic loop avoidance, segment-routing traffic-engineering (SR-TE), and traffic engineering components used in segment routing.
- Implement and configure advanced segment routing for traffic engineering (SR-TE) features.
- Describe the components and functionality of Layer 3 Multiprotocol Label Switching (MPLS) VPNs implementation in Cisco IOS XR Software deployments.
- Identify the routing protocol and LDP information necessary for Layer 3 MPLS VPN troubleshooting.
- Implement Layer 2 VPN operations in a service provider environment.
- Explain how 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.

COURSE OUTLINE

Course Outline
- Cisco NCS 540 Series Hardware Overview
- Cisco NCS 540 System Architecture
- Cisco NCS 540 QoS Architecture
- Timing and Synchronization
- Cisco NCS 540 xHaul Design
- Cisco IOS XR Software Fundamentals
- Cisco IOS XR Software Installation and Upgrade
- Cisco IOS XR Software System Security
- Segment Routing Fundamentals
- Segment Routing Topology-Independent Loop-Free Alternate
- Segment Routing Traffic Engineering
- Advanced Segment Routing Traffic Engineering Features
- Segment Routing IPv6
- Layer 3 MPLS VPN Implementation with Cisco IOS XR Software
- Layer 2 VPNs and Ethernet Services Fundamentals
- Cisco IOS XR Software EVPN Operation and Implementation
- Cisco IOS XR Software Programmability
- Model-Driven Telemetry

Lab Outline

- Configure and verify NTP on Cisco IOS XR routers
- Create and configure a local repository, and install a Cisco IOS XR software package
- Retrieve and edit device configuration by using model-drive programmability
- Configure and verify model-driven telemetry
- Learn how to configure and verify IPv4 and IPv6 filtering on a Cisco IOS XR router
- Configure Unicast Reverse Path Forwarding (uRPF) on a Cisco IOS XR router
- Configure management plane protection (MPP) on a Cisco IOS XR router
- Configure and verify IGP segment routing
- Configure and verify the operation of SR TI-LFA fast reroute using the IS-IS routing protocol
- Configure and verify the operation of SR TI-LFA using OSPF routing protocol
- Implement SR-TE within the network topology using OSPF
- Implement SR-TE within the network topology using IS-IS
- Configure and verify SR-TE for high-bandwidth and low-latency traffic using ODN, network slicing, and Flexible algorithm
- Deploy MP-BGP as the PE-CE routing protocol in the VPNs of a service provider end customer
- Deploy various routing options to establish a PE-to-CE relationship
- Configure and verify EVPN VPWS, and enable BGP to exchange routes between PE routers

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