Network Convergence System 4000 Series Integrated Services Router (NCS4000HW) v1.0

Overview
The Network Convergence System 4000 Series Integrated Services Router (NCS4000HW) version 1.0 Cisco® Training on Demand course provides you with the skills necessary to operate the NCS 4000 Series platform using the Cisco Transport Controller Graphical User Interface (GUI), as well as the Cisco IOS® XR Software Command-Line Interface (CLI). This course is a lab-based, hands-on course offered by Learning@Cisco.

You learn how to use the Cisco Transport Controller and Cisco IOS XR Software version 6.1.22 to create Multiprotocol Label Switching Traffic Engineering (MPLS-TE) network topologies. The ITU-T G.709 Optical Transport Network (OTN) circuits will be created and edited with path protection and revertive options. In addition, you learn how to manage NCS 4000 Series network elements, provision services, install software and packages, manage configuration files, back up the system, and provide an overview of the system hardware. Hardware used in this course includes the 100GE CPAK line card, 10GE SFP+ OTN and packet line card, 100GE CP-DQPSK WDM full C band tunable line card, 4009 agnostic cross-connect single chassis, external connection unit, and two route processor and controller 32-GB RAM line cards.

Duration
The NCS4000HW v1.0 Training on Demand course consists of 8 modules totaling more than 9 hours of video instruction along with 13 hands-on lab exercises.
Target audience

This course is designed for technical professionals who need to know how to deploy and operate OTN circuits over a Dense Wavelength Division Multiplexing (DWDM) network.

The primary audience for this course includes:

- System and network administrators
- Technical support personnel who are involved with the deployment, operation, and maintenance of Cisco NCS 4000 Series systems.

Objectives

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

- Describe the NCS 4000 Series functionality in the OTN
- Recognize where the NCS 4000 Series can be used in the OTN
- Identify the two NCS 4000 Series chassis
- Describe the NCS 4000 Series system hardware
- Apply the appropriate fabric card for the backplane
- Distinguish between the common cards and line cards used in both chassis
- Configure the NCS 4000 Series node using Cisco IOS XR
- Demonstrate the operation of the NCS 4000 Series platform using the Cisco Transport Controller GUI
- Demonstrate the operation of the NCS 4000 Series platform using the Cisco IOS XR CLI
- Underline the OTN standard hierarchy
- Discuss the OTN frame structure for the Optical Transport Unit (OTUk), Optical Channel Data Unit (ODUk), and Optical Channel Payload Unit (OPUk)
- Explain how OTN circuits are protected and restored
- Cite the necessary requirements for creating OTN circuits
- Provision circuits for OTN using Cisco Transport Controller
- Provision circuits for OTN using Cisco IOS XR
- Manage the installation of Cisco IOS XR Software and the appropriate packages
- Back up the system database
- Perform general troubleshooting on the NCS 4000 Series

Course prerequisites

The knowledge and skills necessary before attending this course are:

- Cisco Optical Technology Intermediate (OPT200) v1.0 or higher
- Cisco Optical Technology Advanced (OPT300) v1.0 or higher
- Advanced Services Cisco ONS Time Division Multiplexing SONET (ONS-TDM-SONET)
- Introduction to Cisco IOS XR (IOSXR100)
- Cisco IOS XR Basic Troubleshooting (IOSXR201) v1.0 or higher
Course outline

- Module 1: Cisco NCS 4000 Series Overview
- Module 2: Cisco NCS 4000 Hardware Introduction
- Module 3: Cisco NCS 4000 IOS XR Configuration Basics
- Module 4: Cisco NCS 4000 System Setup
- Module 5: Cisco NCS 4000 OTN Service Capabilities
- Module 6: Cisco NCS 4000 OTN Circuit Provisioning
- Module 7: Maintenance on the NCS 4000 System
- Module 8: Cisco NCS 4000 Management and Troubleshooting

Lab outline

This course contains 13 hands-on lab exercises.

Representative topology for all labs in the course:

Lab Topology

The labs included in this course are:

- Lab 1: Perform the Minimal Configuration from the Console Port
- Lab 2: Perform a Telnet Connection to the NCS 4000
- Lab 3: Cisco Transport Controller
- Lab 4: Network Setup
- Lab 5: Configuring Client Line Cards
- Lab 6: Verify the Client Line Card Configuration
- Lab 7: Creating Unprotected Circuits Using CTC
- Lab 8: Create On-the-Fly Path Options on Unprotected Circuits
- Lab 9: Creating Path Protection Profiles with Revertive Capability
- Lab 10: Creating 1+R ODU UNI Circuits
- Lab 11: Performing a Fabric Upgrade for Maintenance Replacement
- Lab 12: Bridge and Roll
- Lab 13: Performing a Cisco IOS ISSU on the NCS 4000