

# **Configuring Cisco Nexus 5000 Switches (CS-DCNX5K)**

**Modality: Virtual Classroom**

**Duration: 5 Days**

**CLC: 37 Units**

## **About this Course**

The course material makes the student learn the important concepts and procedures to install, configure, manage, and troubleshoot Cisco Nexus 5000 Series Switches and Cisco Nexus 2000 Series Fabric Extenders residing in the LAN, SAN, and unified fabric environments.

The course material has been redesigned as a lab-based course, with two-thirds of the students' overall class time invested in performing various lab activities. In other words, around 3-4 hours of lab material and 2-3 hours of lecture material will be covered in each ILT class.

It can be expected that the technology content will be confined to the prerequisite material. While the course structure has been built in accord with the Cisco Configuration Guides.

Each module, as much as allowed, is a standalone module with respect to every other module.

Every student is required to perform one lab while configuring an entire pod for virtual training reasons. The labs will be scaled by two students for each pod in an ILT delivery.

Each lab exercise is free from dependency on the previous labs. There is a requirement for configurations scripts, and a reset process is in place to create a current lab's context before the student starts undergoing any lab exercise or activity.

Each lab activity must be associated with the student's own pod environment and should be free from other students' pod activities.

A professional Cisco Systems Engineer earns an average salary of **\$120,003** per year.

## **Course Objectives**

- Locate the products that constitute the Cisco Nexus 5000 Series Switches product family
- Understand the products that make the Cisco Nexus 2000 Series Fabric Extender product family
- Learn about the Cisco Nexus 5000 Series Switch system architecture
- Learn about the architecture, features, and utilization of the Cisco Nexus Operating System (NX-OS) Software
- How to configure the network features on Cisco Nexus 5000 Series Switches for LAN

operation

- Understand the configuration of Cisco Nexus 2000 Series Fabric Extenders for functioning with the Cisco Nexus 5000 Series Switches
- How to configure the Ethernet port channels and virtual port channels (vPC) on Cisco Nexus 5000 Series Switches
- Understanding the configuration of Quality of Service (QoS)
- Recognize and learn about the components of the Fibre Channel Protocol, the Fibre Channel over Ethernet (FCoE) protocol, and IEEE Data Center Bridging (DCB) Ethernet Enhancements
- How to configure the Cisco Nexus 5000 Series Switches to back up the FCoE protocol
- Understand the configuration of Cisco Nexus 5000 Series Switches for connecting with the SAN
- How to protect the functionality of Cisco Nexus 5000 Series Switches
- How to configure the features of system management on Cisco Nexus 5000 Series Switches
- Learn about the easily available and In Service Software Update (ISSU) features of Cisco Nexus 5000 Series Switches
- Learn about the concepts and implementation of a structured troubleshooting process through in-hand tools and resources of Cisco Nexus 5000 Series Switches and troubleshoot the practical issues associated with LAN, SAN, and FCoE

## Audience

The primary audience of this course includes the system and field engineers, technical solutions architects, consulting systems engineers, Cisco integrators and partners who want to learn about the installation and execution of the Cisco Nexus 7000 and 5000 Series switches and the Cisco Nexus 2000 Series fabric extenders, Data center engineers and managers, project managers, and program managers related to the field.

## Prerequisites

- A strong comprehension of networking protocols
- Suggested CCNA Certification
- A considerable learning of the Fibre Channel Protocol and the SAN environment
- Suggested pursuance of a Fibre Channel Protocol class or a related experience

- Recommended appearance and learning in the Implementing Cisco Storage Network Solutions (ICSNS) topics or a related experience

Throughout the course tenure, students will learn about the configuration of advanced technologies including Fibre Channel, QoS and FCoE. However, they won't be mandated to have a working experience with these technologies and concepts in order to pass the course.

This course material will encompass the starting configuration of Fibre Channel, QoS, and FCoE on Cisco Nexus 5000 Series Switches. In order to acquire an in-depth comprehension of Fibre Channel, QoS and FCoE, students are advised to pursue further training content in those topics and technologies.

## **Recommended Prerequisite Courses**

- CCNAX Bootcamp Interconnecting Cisco Networking Devices Accelerated(ICND1+ICND2) (CCNAX)
- CS-CCNA Cisco Certified Network Associate (CCNA) Routing and Switching Training Boot Camp v3.0 (CS-CCNA)

## **Course Outline:**

### **Module 1: Cisco Nexus 5000 Series Switch Product Overview**

#### Lesson 1: Introducing the Cisco Nexus 5000 Series Switches

- Topic 1: Cisco Nexus 5000 Series Switch Product Overview
- Topic 2: Cisco Nexus 5000 Series Switch Family

#### Lesson 2: Cisco Nexus 2000 Series Fabric Extender Product Overview

- Topic 1: Cisco Nexus 2000 Series Fabric Extenders

#### Lesson 3: High-Level Product Features Overview

- Topic 1: Unified Fabric
- Topic 2: Switch Virtualization
- Topic 3: Virtual Port Channels
- Topic 4: Cisco FabricPath
- Topic 5: In Service Software Updates
- Topic 6: Adapter FEX
- Topic 7: VM FEX
- Topic 8: Layer 3 Capabilities

#### Lesson 4: Deployment Considerations

- Topic 1: Deployment Considerations
- Topic 2: ToR/EoR Deployment Models
- Topic 3: FEX Operation
- Topic 4: High Availability Deployment

## **Module 2: Cisco Nexus 5000 Series Switch Hardware Architecture and Device Administration**

### Lesson 1: Cisco Nexus 5000 Series Switch Hardware Architecture

- Topic 1: Cisco Nexus 5000 and 2000 System Architecture
- Topic 2: Cisco Nexus 5500 Platform Architecture
- Topic 3: Traffic Forwarding Paths

### Lesson 2: Hardware Installation Procedures

- Topic 1: Preparation
- Topic 2: Cabinet and Rack Installation
- Topic 3: Cabling Requirements
- Topic 4: Power Requirements
- Topic 5: Hardware Installation
- Topic 6: Verifying the Hardware Installation

### Lesson 3: Configuring User Management

- Topic 1: Feature Overview
- Topic 2: Configuring AAA
- Topic 3: Configuring RBAC
- Topic 4: Configuring SSH
- Topic 5: Configuring ACL

### Lesson 4: Graphical Management Tools

- Topic 1: Cisco Prime Data Center Network Manager
- Topic 2: Cisco Device Manager

### Lesson 5: Configuring System Management

- Topic 1: Switch Management Methods and Features
- Topic 2: File System Management
- Topic 3: Cisco Fabric Services
- Topic 4: Configure System Message Logging
- Topic 5: Generic Online Diagnostics
- Topic 6: Smart Call Home
- Topic 7: Simple Network Management Protocol
- Topic 8: XML Interface
- Topic 9: Checkpoint and rollback
- Topic 10: Module Pre-provisioning

### Lesson 6: Understanding Cisco Nexus High Availability

- Topic 1: Cisco NX-OS Software High Availability Features
- Topic 2: Stateful and Stateless Process Restarts
- Topic 3: In Service Software Updates

#### Lesson 7: Troubleshooting Tools

- Topic 1: Troubleshooting Overview
- Topic 2: Troubleshooting Tools
- Topic 3: Ethalyzer
- Topic 4: Switched Port Analyzer

### **Module 3: Cisco Nexus 5000 Series Switch Network Feature Configuration**

#### Lesson 1: The Cisco NX-OS Software Architecture

- Topic 1: The Cisco NX-OS Software Architecture
- Topic 2: The Cisco NX-OS Software CLI
- Topic 3: Licensing Cisco Nexus 5000 Series Switches

#### Lesson 2: Configuring Layer 2 Switching Features

- Topic 1: Configuring Ethernet interfaces
- Topic 2: Configuring VLANs
- Topic 3: Configuring the Spanning Tree Protocol

#### Lesson 3: Troubleshooting Layer 2 Switching

- Topic 1: Troubleshooting Layer 2 Troubleshooting
- Topic 2: Troubleshooting the MAC address table
- Topic 3: Troubleshooting Spanning Tree Protocols
- Topic 4: Troubleshooting VLANs

#### Lesson 4: Configuring the Cisco Nexus 2000 Series Fabric Extender

- Topic 1: Configuring the Cisco Nexus 2000 Series Fabric Extender
- Topic 2: Configuring Static Pinning
- Topic 3: Configuring Dynamic Pinning

#### Lesson 5: Configuring Virtual Port Channels and Enhanced vPC

- Topic 1: Configuring Ethernet Port Channels
- Topic 2: Understanding Virtual Port Channels
- Topic 3: Configuring Virtual Port Channels
- Topic 4: Configuring Enhanced Virtual Port Channels

#### Lesson 6: Configuring Host Virtual Port Channels

- Topic 1: vPC deployment models
- Topic 2: Configuring Host Virtual Port Channels

## Lesson 7: Configuring Quality of Service

- Topic 1: Understanding Cisco Nexus QoS
- Topic 2: Configuring QoS

## Lesson 8: Configuring Cisco FP

- Topic 1: Understanding Cisco FP
- Topic 2: Configuring Cisco FP

## Lesson 9: Understanding the Fibre Channel Protocol

- Topic 1: SCSI Protocol
- Topic 2: Fibre Channel Model
- Topic 3: Fibre Channel Interfaces and Ports
- Topic 4: Fibre Channel Addressing
- Topic 5: Fabric Channel Flow Control
- Topic 6: Fabric Channel Domain Initialization
- Topic 7: Virtual Fabric and Zoning
- Topic 8: Fabric Shortest Path First Protocol
- Topic 9: Fabric Channel Login Procedures

## Lesson 10: Understanding the FCoE Protocol

- Topic 1: Unified Fabric I/O Consolidation
- Topic 2: FCoE Adapters
- Topic 3: The FCoE architecture
- Topic 4: FCoE Emulated Node
- Topic 5: FCoE Initialization Protocol
- Topic 6: Multihop FCoE

## Lesson 11: Identifying Data Center Bridging Enhancements

- Topic 1: Data Center Bridging
- Topic 2: Priority Flow Control
- Topic 3: Enhanced Transmission Selection
- Topic 4: Bridging Exchange Protocol

## Lesson 12: Configuring FCoE

- Topic 1: Configure FCoE
- Topic 2: FCoE VLANs and Virtual Interfaces

## Lesson 13: Troubleshooting FCoE

- Topic 1: Troubleshooting DCB
- Topic 2: Troubleshooting FIP
- Topic 3: Troubleshooting CNA

- Topic 4: Troubleshooting PFC

## **Lesson 14: Configuring SAN Switching Features**

- Topic 1: Fibre Channel interfaces
- Topic 2: Configuring Domain Parameters
- Topic 3: Configuring VSANs
- Topic 4: VSAN trunking
- Topic 5: SAN port channels
- Topic 6: Distributed Device Alias Service
- Topic 7: Zoning
- Topic 8: FSPF Protocol
- Topic 9: FLOGI, FCNS, and RSCN databases

## **Lesson 15: Implementing Cisco NPV Mode and NPIV**

- Topic 1: Understanding Cisco NPV mode
- Topic 2: Configuring Cisco NPV mode
- Topic 3: Understanding NPIV
- Topic 4: Configuring NPIV

## **Lesson 16: Troubleshooting SAN Switching**

- Topic 1: Troubleshooting Cisco NPV mode
- Topic 2: Troubleshooting Zoning
- Topic 3: Troubleshooting SAN port channels
- Topic 4: Troubleshooting VSANs

## **Lab Outline**

### **Lab 1: Cisco Nexus 5000 Hardware Platform and System Management**

- Task 1: Reset the Cisco Nexus 5010 Switches and Perform Initial Setup
- Task 2: Validate the Cisco Nexus 5010 Hardware Resources
- Task 3: Configure Cisco Nexus 5010 Interfaces and Layer 2 Protocols

### **Lab 2: Virtual Port Channels (vPC)**

- Task 1: Configure vPC

### **Lab 3: Configuring the Cisco Nexus 2248T Fabric Extender**

- Task 1: Configure the Cisco Nexus 2248T Fabric Extender

### **Lab 4: Configuring QoS**

- Task 1: Examine the Default QoS Configuration
- Task 2: Configure type qos QoS Policy
- Task 3: Configure type network-qos QoS Policy

- Task 4: Configure type queuing QoS Policy (Optional)
- Task 5: Configure Service Policies

#### Lab 5: Configuring FCOE and the VMware ESX Server with the CNA

- Task 1: Configure FCoE on the Cisco Nexus 5010
- Task 2: Cisco MDS 9124 Discovery and Configuring the Cisco Nexus 5010 Zoning Feature
- Task 3: Configure the Emulex CNA and VMware ESX Server
- Task 4: Add SAN-Attached Disks/LUNs to ESX Virtual Machines

#### Lab 6: Configuring N\_Port Virtualization on the Cisco Nexus 5010 Switch

- Task 1: Configure Global N\_Port Virtualization Mode on the Cisco Nexus 5010 Switch
- Task 2: Configure Global N\_Port Virtualization Mode on the MDS 9124 Fabric Switch

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