



## **CCIE DC Overview**

Cisco CCIE Data Center certification acknowledges the expert-level knowledge and skills target on data center and upcoming technologies are required to manage design, and implement a complex modern data center infrastructure. It assesses ability to translate it into the device configurations, the ability to understand the requirements of data centers, and how different components in the data center interoperate.

## **Exams:**

- Qualifying Exam (DCCOR 350 – 601)
- CCIE Data Center v3.0 Lab Exam

## **About the training**

- **Study Material:-** Live lectures, Streaming Recorded Videos, Online Lab Workbook, and Remote Virtual Lab access.
- **Duration:-** 4 Months

## **Requirements**

Candidates are recommended to have basic knowledge of course outline and are encouraged to have 8 or more years of job experience.

## **What you will learn**

- Implementing and troubleshooting of data center technologies
- Understanding operating system, Network services for cloud enablement, virtualization and security
- Understanding L2 and L3 network infrastructure

## **About Instructor**

The instructor of this training is a master in technology and has 14+ years of industrial experience. He has delivered vast and complex projects on the same around the globe. In his

experienced life, he has conveyed 80+ corporate and retail programs on several Cisco data and wireless products.

## **Course Content**

### **Qualifying Exam (DCCOR 350 – 601)**

- Implementing Data Center Switching Protocols
  - Spanning Tree Protocol
  - Port Channels Overview
  - Virtual Port Channels Overview
- Implementing First-Hop Redundancy Protocols
  - Hot Standby Router Protocol (HSRP) Overview
  - Virtual Router Redundancy Protocol (VRRP) Overview
  - First Hop Redundancy Protocol (FHRP) for IPv6
- Implementing Routing in Data Center
  - Open Shortest Path First (OSPF) v2 and Open Shortest Path Protocol (OSPF) v3
  - Border Gateway Protocol
- Implementing Multicast in Data Center
  - IP Multicast in Data Center Networks
  - Internet Group Management Protocol (IGMP) and Multicast Listener Discovery (MLD)
  - Multicast Distribution Trees and Routing Protocols
  - IP Multicast on Cisco Nexus Switches
- Implementing Data Center Overlay Protocols
  - Cisco Overlay Transport Virtualization
  - Virtual Extensible LAN
- Implementing Network Infrastructure Security
  - User Accounts and Role Based Access Control (RBAC)
  - Authentication, Authorization, and Accounting (AAA) and SSH on Cisco NX-OS
  - Keychain Authentication
  - First Hop Security
  - Media Access Control Security
  - Control Plane Policing
- Explaining Cisco Application-Centric Infrastructure
  - Cisco ACI Overview, Initialization, and Discovery
  - Cisco ACI Management
  - Cisco ACI Fabric Access Policies
- Explaining Cisco ACI Building Blocks and VMM Domain Integration
  - Tenant-Based Components
  - Cisco ACI Endpoints and Endpoint Groups (EPG)
  - Controlling Traffic Flow with Contracts
  - Virtual Switches and Cisco ACI VMM Domains

- VMM Domain EPG Association
  - Cisco ACI Integration with Hypervisor Solutions
- Explaining Packet Flow in Data Center Network
  - Data Center Traffic Flows
  - Packet Flow in Cisco Nexus Switches
  - Packet Flow in Cisco ACI Fabric
- Explaining Cisco Cloud Service and Deployment Models
  - Cloud Architectures
  - Cloud Deployment Models
- Explaining Data Center Network Infrastructure Management, Maintenance, and Operations
  - Time Synchronization
  - Network Configuration Management
  - Software Updates
  - Network Infrastructure Monitoring
- Explaining Cisco Network Assurance Concepts
  - Need for Network Assurance
  - Cisco Streaming Telemetry Overview
- Implementing Fibre Channel Fabric
  - Fibre Channel Basics
  - Virtual Storage Area Network (VSAN) Overview
  - SAN Port Channels Overview
  - Fibre Channel Domain Configuration Process
- Implementing Storage Infrastructure Services
  - Distributed Device Aliases
  - Zoning
  - N-Port Identifier Virtualization (NPIV) and N-Port Virtualization (NPV)
  - Fibre Channel over IP
  - Network Access Server (NAS) Concepts
  - Storage Area Network (SAN) Design Options
- Implementing FCoE Unified Fabric
  - Fibre Channel over Ethernet
  - Describing FCoE
  - FCoE Topology Options
  - FCoE Implementation
- Implementing Storage Infrastructure Security\*
  - User Accounts and RBAC
  - Authentication, Authorization, and Accounting
  - Fibre Channel Port Security and Fabric Binding
- Explaining Data Center Storage Infrastructure Maintenance and Operations\*
  - Time Synchronization
  - Software Installation and Upgrade
  - Storage Infrastructure Monitoring
- Explaining Cisco UCS Server Form Factors\*
  - Cisco UCS B-Series Blade Servers
  - Cisco UCS C-Series Rack Servers

- Implementing Cisco Unified Computing Network Connectivity
  - Cisco UCS Fabric Interconnect
  - Cisco UCS B-Series Connectivity
  - Cisco UCS C-Series Integration
- Implementing Cisco Unified Computing Server Abstraction
  - Identity Abstraction
  - Service Profile Templates
- Implementing Cisco Unified Computing SAN Connectivity
  - iSCSI Overview
  - Fibre Channel Overview
  - Implement FCoE
- Implementing Unified Computing Security
  - User Accounts and RBAC
  - Options for Authentication
  - Key Management
- Introducing Cisco HyperFlex Systems\*
  - Hyperconverged and Integrated Systems Overview
  - Cisco HyperFlex Solution
  - Cisco HyperFlex Scalability and Robustness
- Explaining Data Center Unified Computing Management, Maintenance, and Operations\*
  - Compute Configuration Management
  - Software Updates
  - Infrastructure Monitoring
  - Cisco Intersight™
- Implementing Cisco Data Center Automation and Scripting Tools\*
  - Cisco NX-OS Programmability
  - Scheduler Overview
  - Cisco Embedded Event Manager Overview
  - Bash Shell and Guest Shell for Cisco NX-OS
  - Cisco Nexus API
- Explaining Cisco Integration with Automation and Orchestration Software Platforms
  - Cisco and Ansible Integration Overview
  - Cisco and Puppet Integration Overview
  - Python in Cisco NX-OS and Cisco UCS
- Explaining Cisco Data Center Automation and Orchestration Technologies\*
  - Power On Auto Provisioning
  - Cisco Data Center Network Manager Overview
  - Cisco UCS Director Fundamentals
  - Cisco UCS PowerTool

### **Lab outline**

- Execute Overlay Transport Visualization (OTV)
- Execute Virtual Extensible LAN (VXLAN)

- Explore the Cisco ACI Fabric
- Implement Cisco ACI Access Policies and Out-of-Band Management
- Implement Cisco ACI Tenant Policies
- Integrate Cisco ACI with VMware
- Execute Fibre Channel
- Execute Device Aliases
- Execute Zoning
- Execute NPV
- Execute FCoE
- Provision Cisco UCS Fabric Interconnect Cluster
- Execute Server and Uplink Ports
- Execute VLANs
- Execute a Cisco UCS Server Profile Using Hardware Identities
- Execute Basic Identity Pools
- Execute a Cisco UCS Service Profile Using Pools
- Execute an Internet Small Computer Systems Interface (iSCSI) Service Profile
- Execute Cisco UCS Manager to Authenticate Users with Microsoft Active Directory
- Program a Cisco Nexus Switch with Python

### CCIE Data Center v3.0 (Lab Exam)

#### Data Center L2/L3 Connectivity

- Layer 2 technologies
  - Link Aggregation
  - Tagging/Trunking
  - Static Path binding
  - Spanning Tree Protocol
- Routing Protocols and features
  - OSPF (v2 and v3)
  - ISIS
  - BGP
  - BFD
  - FHRP
- Multicast protocols
  - PIM
  - IGMP

#### Data Center Fabric Infrastructure

- Physical fabric components
  - Fabric Discovery
  - Controllers/Network Managers

- Switches
- Fabric policies
  - Access Policies
  - Multi Tenancy
  - Monitoring Policies
- Tenant Policies
  - Application profiles and EPGs
  - Networking
  - Security
- Fabric Monitoring
  - Faults
  - Events
  - Health indicators
  - Audit Logs
- Virtual Networking
  - vSphere VDS

#### Data Center Fabric Connectivity

- VRF lite
- L3Out
  - OSPF
  - BGP
  - Transit Routing
- Inter Fabric connectivity
  - Multi-Pod
  - Multi-Site
  - Virtual POD
  - Remote Leaf
- Overlays
  - VXLAN EVPN

#### Data Center Compute

- Compute Resources
  - UCSM Policies, Profiles and Templates
  - Hyperflex
- Compute Connectivity
  - SAN/LAN uplinks
  - Rack server integration
  - Port Modes

## Data Center Storage Protocols and Features

- FC and FCoE
  - Zoning
  - NPV/NPIV
  - Trunking
  - Portchannel
  - Load Balancing
- iSCSI
  - Authentication
  - Multipathing
- RoCE v2 over IP Networks

## Data Center Security and Network Services

- Security features
  - ACL's
  - First Hop Security
  - Port security
  - Private VLANs
  - Contracts
- RBAC
  - Radius
  - TACACS+
  - LDAP
  - AAA
- Network Services Insertion and Redirection
  - Policy Based Routing
  - Policy Based Redirection
  - Inter VRF communication
  - Route Targets
  - Prefix Lists
- Services
  - Flow/Telemetry Export
  - SPAN
  - SNMP
  - Syslog
  - DHCP
  - NTP/PTP
- Traffic management
  - Queueing
  - Policing
  - Classification/Marking
  - Scheduling
  - CoPP

## Data Center Automation and Orchestration

- Data center tasks using scripts (Python and Ansible)
  - Create, Read, Update, Delete using RESTful APIs
  - Deploy and modify configurations
  - Statistics, Data Collection
- Data Center Automation and Orchestration using tools
  - DCNM
  - UCSD
  - Intersight
  - CloudCenter Suite

**Note:** \*\*\*Most of the course topics are covered with hands-on lab exercises and others are theoretical

**Thank You**

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