

# DCID (DESIGNING CISCO DATA CENTER INFRASTRUCTURE) 7.0

## Objetivo

After taking this course, you should be able to:

- Describe the Layer 2 and Layer 3 forwarding options and protocols used in a data center;
- Describe the rack design options, traffic patterns, and data center switching layer access, aggregation, and core;
- Describe the Cisco Overlay Transport Virtualization (OTV) technology that is used to interconnect data centers;
- Describe Locator/ID separation protocol;
- Design a solution that uses Virtual Extensible LAN (VXLAN) for traffic forwarding;
- Describe hardware redundancy options; how to virtualize the network, compute, and storage functions; and virtual networking in the data center;
- Describe solutions that use fabric extenders and compare Cisco Adapter Fabric Extender (FEX) with single root input/output virtualization (SR-IOV);
- Describe security threats and solutions in the data center;
- Describe advanced data center security technologies and best practices;
- Describe device management and orchestration in the data center;
- Describe the storage options for compute function and different Redundant Array of Independent Disks (RAID) levels from a high-availability and performance perspective;
- Describe Fibre Channel concepts, topologies, architecture, and industry terms;
- Describe Fibre Channel over Ethernet (FCoE);
- Describe security options in the storage network;
- Describe management and automation options for storage networking infrastructure;
- Describe Cisco UCS servers and use cases for various Cisco UCS platforms;
- Explain the connectivity options for fabric interconnects for southbound and northbound connections;
- Describe the hyperconverged solution and integrated systems;
- Describe the systemwide parameters for setting up a Cisco UCS domain;
- Describe role-based access control (RBAC) and integration with directory servers to control access rights on Cisco UCS Manager;
- Describe the pools that may be used in service profiles or service profile templates on Cisco UCS Manager;
- Describe the different policies in the service profile;
- Describe the Ethernet and Fibre Channel interface policies and additional network technologies;
- Describe the advantages of templates and the difference between initial and updated templates;
- Describe data center automation tools.

## Público Alvo

Professionals interested in designing Cisco Data Center Solution. This course also helps prepare student to take the 300-610 Designing Cisco Data Center Infrastructure (DCID) exam, which is part of the new CCNP® Data Center.

## Pré-Requisitos

Before taking this course, you should be able to:

- Implement data center networking [Local Area Network (LAN) and Storage Area Network (SAN)];
- Describe data center storage;
- Implement data center virtualization;
- Implement Cisco Unified Computing System (Cisco UCS);
- Implement data center automation and orchestration with the focus on Cisco Application Centric Infrastructure (ACI) and Cisco UCS Director;
- Describe products in the Cisco Data Center Nexus and Multilayer Director Switch (MDS) families. To fully benefit from this course, you should have completed the following courses or obtained the equivalent level of knowledge:
- Understanding Cisco Data Center Foundations (DCFNDU);
- Implementing and Administering Cisco Networking Technologies (CCNA®);
- Implementing Cisco Data Center Core Technologies (DCCOR).

## Carga Horária

40 horas (5 dias).

## Conteúdo Programático

### **Course Introduction**

Course Outline

Course Goals & Objectives

### **Describing High Availability on Layer 2**

Overview of Layer 2 High-Availability Mechanisms

Virtual Port Channels

Cisco Fabric Path

Virtual Port Channel+

### **Designing Layer 3 Connectivity**

First Hop Redundancy Protocols

Improve Routing Protocol Performance and Security

Enhance Layer 3 Scalability and Robustness

### **Designing Data Center Topologies**

Data Center Traffic Flows

Cabling Challenges

Access Layer

Aggregation Layer

Core Layer

Spine-and-Leaf Topology

Redundancy Options

### **Designing Data Center Interconnects with Cisco OTV**

Cisco OTV Overview

Cisco OTV Control and Data Planes

Failure Isolation

Cisco OTV Features

Optimize Cisco OTV

Evaluate Cisco OTV

### **Describing Locator/ID Separation Protocol**

Locator/ID Separation Protocol

Location Identifier Separation Protocol (LISP) Virtual Machine (VM) Mobility

LISP Extended Subnet Mode (ESM) Multihop Mobility

LISP VPN Virtualization

### **Describing VXLAN Overlay Networks**

Describe VXLAN Benefits over VLAN

Layer 2 and Layer 3 VXLAN Overlay  
Multiprotocol Border Gateway Protocol (MP-BGP) Ethernet VPN (EVPN) Control Plane Overview  
VXLAN Data Plane

## **Describing Hardware and Device Virtualization**

Hardware-Based High Availability  
Device Virtualization  
Cisco UCS Hardware Virtualization  
Server Virtualization  
SAN Virtualization  
N-Port ID Virtualization

## **Describing Cisco FEX Options**

Cisco Adapter FEX  
Access Layer with Cisco FEX  
Cisco FEX Topologies  
Virtualization-Aware Networking  
Single Root I/O Virtualization  
Cisco FEX Evaluation

## **Describing Basic Data Center Security**

Threat Mitigation  
Attack and Countermeasure Examples  
Secure the Management Plane  
Protect the Control Plane  
RBAC and Authentication, Authorization, and Accounting (AAA)

## **Describing Advanced Data Center Security**

Cisco TrustSec in Cisco Secure Enclaves Architecture  
Cisco TrustSec Operation  
Firewalling  
Positioning the Firewall Within Data Center Networks  
Cisco Firepower® Portfolio  
Firewall Virtualization  
Design for Threat Mitigation

## **Describing Management and Orchestration**

Network and License Management  
Cisco UCS Manager  
Cisco UCS Director  
Cisco Intersight  
Cisco DCNM Overview

## **Describing Storage and RAID Options**

Position DAS in Storage Technologies  
Network-Attached Storage  
Fibre Channel, FCoE, and Internet Small Computer System Interface (iSCSI)  
Evaluate Storage Technologies

## **Describing Fibre Channel Concepts**

Fibre Channel Connections, Layers, and Addresses  
Fibre Channel Communication  
Virtualization in Fibre Channel SAN

## **Describing Fibre Channel Topologies**

SAN Parameterization  
SAN Design Options  
Choosing a Fibre Channel Design Solution

## **Describing FCoE**

FCoE Protocol Characteristics  
FCoE Communication  
Data Center Bridging  
FCoE Initialization Protocol  
FCoE Design Options

## **Describing Storage Security**

Common SAN Security Features  
Zones  
SAN Security Enhancements  
Cryptography in SAN

## **Describing SAN Management and Orchestration**

Cisco DCNM for SAN  
Cisco DCNM Analytics and Streaming Telemetry  
Cisco UCS Director in the SAN  
Cisco UCS Director Workflows

## **Describing Cisco UCS Servers and Use Cases**

Cisco UCS C-Series Servers  
Fabric Interconnects and Blade Chassis  
Cisco UCS B-Series Server Adapter Cards  
Stateless Computing  
Cisco UCS Mini

## **Describing Fabric Interconnect Connectivity**

Use of Fabric Interconnect Interfaces  
VLANs and VSANs in a Cisco UCS Domain  
Southbound Connections  
Northbound Connections  
Disjoint Layer 2 Networks  
Fabric Interconnect High Availability and Redundancy

## **Describing Hyperconverged and Integrated Systems**

Hyperconverged and Integrated Systems Overview  
Cisco HyperFlex™ Solution  
Cisco HyperFlex Scalability and Robustness

Cisco HyperFlex Clusters  
Cluster Capacity and Multiple Clusters on One Cisco UCS Domain  
External Storage and Graphical Processing Units on Cisco HyperFlex  
Cisco HyperFlex Positioning

## **Describing Cisco UCS Manager Systemwide Parameters**

Cisco UCS Setup and Management  
Cisco UCS Traffic Management

## **Describing Cisco UCS RBAC**

Roles and Privileges  
Organizations in Cisco UCS Manager  
Locales and Effective Rights  
Authentication, Authorization, and Accounting  
Two-Factor Authentication

## **Describing Pools for Service Profiles**

Global and Local Pools  
Universally Unique Identifier (UUID) Suffix and Media Access Control (MAC) Address Pools  
World Wide Name (WWN) Pools  
Server and iSCSI Initiator IP Pools

## **Describing Policies for Service Profiles**

Global vs. Local Policies  
Storage and Basic Input/Output System (BIOS) Policies  
Boot and Scrub Policies  
Intelligent Platform Management Interface (IPMI) and Maintenance Policies

## **Describing Network-Specific Adapters and Policies**

LAN Connectivity Controls  
SAN Connectivity Controls  
Virtual Access Layer  
Connectivity Enhancements

## **Describing Templates in Cisco UCS Manager**

Cisco UCS Templates  
Service Profile Templates  
Network Templates

## **Designing Data Center Automation**

Model-Driven Programmability  
Cisco NX-API Overview  
Programmability Using Python  
Cisco Ansible Module  
Use the Puppet Agent

## **Lab Outline**

Lab 1: Design Virtual Port Channels

- Lab 2: Design First Hop Redundancy Protocol (FHRP)
- Lab 3: Design Routing Protocols
- Lab 4: Design Data Center Topology for a Customer
- Lab 5: Design Data Center Interconnect Using Cisco OTV
- Lab 6: Design Your VXLAN Network
- Lab 7: Create a Cisco FEX Design
- Lab 8: Design Management and Orchestration in a Cisco UCS Solution
- Lab 9: Design a Fibre Channel Network
- Lab 10: Design and Integrate an FCoE Solution
- Lab 11: Design a Secure SAN
- Lab 12: Design Cisco UCS Director for Storage Networking
- Lab 13: Design a Cisco UCS Domain and Fabric Interconnect Cabling
- Lab 14: Design a Cisco UCS C-Series Server Implementation
- Lab 15: Design Cisco UCS Fabric Interconnect Network and Storage Connectivity
- Lab 16: Design Systemwide Parameters in a Cisco UCS Solution
- Lab 17: Design an LDAP Integration with a Cisco UCS Domain
- Lab 18: Design Pools for Service Profiles in a Cisco UCS Solution
- Lab 19: Design Network-Specific Adapters and Policies in a Cisco UCS Solution