
Cisco® Designing Cisco® Data Center Infrastructure v7.0 (DCID)

Overview

The Designing Cisco Data Center Infrastructure (DCID) v7.0 course helps you master design and deployment options focused on Cisco® data center solutions and technologies across network, compute, virtualization, storage area networks, automation, and security. You will learn design practices for the Cisco Unified Computing System™ (Cisco UCS®) solution based on Cisco UCS B-Series and C-Series servers, Cisco UCS Manager, and Cisco Unified Fabric. You will also gain design experience with network management technologies including Cisco UCS Manager, Cisco Data Center Network Manager (DCNM), and Cisco UCS Director. This course helps you prepare to take the exam, Designing Cisco Data Center Infrastructure (300-610 DCID).

Prerequisite Comments

It is recommended, but not required, to have the following skills and knowledge before attending this course:

Describe data center networking concepts

Describe data center storage concepts

Describe data center virtualization

Describe Cisco UCS

Describe data center automation and orchestration with a focus on Cisco ACI and Cisco UCS Director

Identify products in the Cisco data center Nexus and Cisco MDS families

Describe network fundamentals and build simple LANs, including switching and routing

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.

Target Audience

IT professionals with five to eight years of experience in these roles:

Data center engineers

Network designers

Network administrators

Network engineers

Systems engineers

System administrator

Consulting systems engineers

Technical solutions architects

Server administrators

Network managers

Cisco integrators or partners

Course Objectives

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

Course Outline

1 - Data Center Network Connectivity Design

Describing High Availability on Layer 2

Designing Layer 3 Connectivity

Designing Data Center Topologies

Designing Data Center Interconnects with Cisco OTV

Designing a LISP Solution

1 - Describing High Availability on Layer 2

Overview of Layer 2 High-Availability Mechanisms

Virtual Port Channels

Cisco Fabric Path

Virtual Port Channel+

2 - Data Center Infrastructure Design

Describing Hardware and Device Virtualization

Describing FEX Options

Describing Virtual Networking

Describing Basic Data Center Security

Describing Advanced Data Center Security

Describing Virtual Appliances

Describing Management and Orchestration

2 - Designing Layer 3 Connectivity

First Hop Redundancy Protocols
Improve Routing Protocol Performance and Security
Enhance Layer 3 Scalability and Robustness

3 - Data Center Storage Network Design

Describing Storage and RAID Options
Describing Fibre Channel Concepts
Describing Fibre Channel Topologies Describing FCoE
Describing Storage Security
Describing SAN Management and Orchestration

3 - Designing Data Center Topologies

Data Center Traffic Flows
Cabling Challenges
Access Layer
Aggregation Layer
Core Layer
Spine-and-Leaf Topology
Redundancy Options

4 - Data Center Compute Connectivity Design

Describing Cisco UCS Servers and Use Cases
Describing Fabric Interconnect Connectivity
Describing Hyperconverged and Integrated Systems
Describing Management Systems
Describing Hadoop, SAP Hana, and IoT on Cisco UCS

4 - 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

5 - Data Center Compute Resource Parameters Design

Describing Cisco UCS Manager System-Wide Parameters
Describing Cisco UCS RBAC
Describing Pools for Service Profiles
Describing Policies for Service Profiles
Describing Network-Specific Adapters and Policies
Describing Templates in Cisco UCS Manager

5 - 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

6 - 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

7 - Describing Hardware and Device Virtualization

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

8 - 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

9 - 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)

10 - 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

11 - Describing Management and Orchestration

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

12 - 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

13 - Describing Fibre Channel Concepts

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

14 - Describing Fibre Channel Topologies

SAN Parameterization
SAN Design Options
Choosing a Fibre Channel Design Solution

15 - Describing FCoE

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

16 - Describing Storage Security

Common SAN Security Features
Zones
SAN Security Enhancements
Cryptography in SAN

17 - 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

18 - 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

19 - 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

20 - 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

21 - Describing Cisco UCS Manager Systemwide Parameters

Cisco UCS Setup and Management
Cisco UCS Traffic Management

22 - Describing Cisco UCS RBAC

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

23 - 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

24 - 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

25 - Describing Network-Specific Adapters and Policies

LAN Connectivity Controls
SAN Connectivity Controls
Virtual Access Layer
Connectivity Enhancements

26 - Describing Templates in Cisco UCS Manager

Cisco UCS Templates
Service Profile Templates
Network Templates

27 - Designing Data Center Automation

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