

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

## What you'll learn in this course

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. You can expect theoretical content as well as design-oriented case studies in the form of activities.

This course helps you prepare to take the exam, **Designing Cisco Data Center Infrastructure (300-610 DCID)**, which leads to the new **CCNP® Data Center** and the **Cisco Certified Specialist - Data Center Design** certifications. The exam will be available beginning February 24, 2020.

## Course duration

- Instructor-led training: 5 days in the classroom with design-oriented case studies
- Virtual instructor-led training: 5 days of web-based classes with design-oriented case studies
- E-learning: Equivalent of 5 days of instruction with design-oriented case studies and videos

## How you'll benefit

This course will help you:

- Make design choices for optimal data center infrastructure performance, virtualization, security, and automation
- Master the practical and theoretical knowledge necessary to design a scalable, reliable, and intelligent data center based on Cisco technologies
- Qualify for professional-level job roles in the high-demand area of enterprise-class data center environments

## What to expect in the exam

This exam certifies your knowledge of data center infrastructure design including network, compute, storage network, and automation. The exam will be available beginning February 24, 2020.

After you pass 300-610 DCID:

- You earn the **Cisco Certified Specialist - Data Center Design** certification.
- You will have satisfied the concentration exam requirement for the new CCNP Data Center. To complete your CCNP Data Center certification, pass the **Implementing and Operating Cisco Data Center Core Technologies (350-601 DCCOR)** exam or its equivalent.

## Who should enroll

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

- Data center engineers
- Network designers
- Network administrators
- Network engineers
- Systems engineers
- Consulting systems engineers
- Technical solutions architects
- Server administrators
- Network managers
- Cisco integrators or partners

## How to enroll

- For instructor-led training, visit the [Cisco Learning Locator](#).
- For private group training, visit [Cisco Private Group Training](#).
- For e-learning, visit the [Cisco Learning Network Store](#).
- For digital library access, visit [Cisco Platinum Learning Library](#).
- For e-learning volume discounts, contact [ask\\_cpll@cisco.com](mailto:ask_cpll@cisco.com).

## Technology areas

- Data center

## Course details

### 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

## Prerequisites

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)**

## Outline

- 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

### Practice Activity Outline

- Design Virtual Port Channels
- Design First Hop Redundancy Protocol (FHRP)
- Design Routing Protocols
- Design Data Center Topology for a Customer
- Design Data Center Interconnect Using Cisco OTV
- Design Your VXLAN Network
- Create a Cisco FEX Design

- Design Management and Orchestration in a Cisco UCS Solution
- Design a Fibre Channel Network
- Design and Integrate an FCoE Solution
- Design a Secure SAN
- Design Cisco UCS Director for Storage Networking
- Design a Cisco UCS Domain and Fabric Interconnect Cabling
- Design a Cisco UCS C-Series Server Implementation
- Design Cisco UCS Fabric Interconnect Network and Storage Connectivity
- Design Systemwide Parameters in a Cisco UCS Solution
- Design an LDAP Integration with a Cisco UCS Domain
- Design Pools for Service Profiles in a Cisco UCS Solution
- Design Network-Specific Adapters and Policies in a Cisco UCS Solution



---


Americas Headquarters  
Cisco Systems, Inc.  
San Jose, CA

Asia Pacific Headquarters  
Cisco Systems (USA) Pte. Ltd.  
Singapore

Europe Headquarters  
Cisco Systems International BV Amsterdam,  
The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at [www.cisco.com/go/offices](http://www.cisco.com/go/offices).

---

 Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: <https://www.cisco.com/go/trademarks>. Third-party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1110R)

Course content is dynamic and subject to change without notice.