Designing Cisco Data Center Infrastructure (DCID)

| ID | CI-DCID | Price | US$ 3,995 | Duration | 5 days |

**Who should attend**
- Network Designer
- Network Administrator
- Network Engineer
- Systems Engineer
- Consulting Systems Engineer
- Technical Solutions Architect
- Cisco Integrators/Partners
- Implementing and Operating Cisco Data Center Core Technologies (DCCOR)

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

**Prerequisites**
Before taking this course, you should understand the following:
- 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) or ICI-DCICN & ICI-DCICT and
- Implementing and Operating Cisco Data Center Core Technologies (DCCOR)

**Course Objectives**
After taking this course, you will 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 Benefits
- 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

Course Content
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 Cisco Certified Specialist - Data Center Automation (DCX) certifications.
Center Design certifications. The exam will be available beginning February 24, 2020.

**Detailed Course Outline**

**Describing High Availability on Layer 2**
- Overview of Layer 2 High-Availability Mechanisms
- Virtual Port Channels
- Cisco FabricPath
- 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
- 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
DEVELOPMENT METHODS

ILT – Instructor-Led Classroom Training
ILT sessions are conducted in a physical classroom environment.

ILO – Instructor-Led Online Training
ILO sessions are conducted via WebEx in a VoIP environment.

FLEX Classroom™ – Combined ILT & ILO
FLEX Classroom sessions are delivered via ILT and ILO giving you the ultimate flexibility.

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
**DELIVERY METHODS**

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**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**
- 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