Cisco Data Center Unified Computing Expanded Implementation

DCUCxI

Length:
5 Days

Format:
Lecture/lab

Version:
4.5

Why Choose Firefly

This DCUCxI update includes UCSM version 1.4 updates and additional content on networking design that customers need to successfully integrate UCS into their environments. This update also includes best practices and additional exercises for VM-FEX Pass-Through Switching and Nexus 1000V integration. These topics enable customers and partners to approach advanced UCS integration and implementation scenarios with confidence increasing the likelihood of repeatable success with UCS.

Key UCSM 1.4 updates covered in this course include:

- FabricSync
- Chassis and multichassis power capping
- Service Profile scheduling & impact analysis
- UCS Manager support for C-Series
- PVLAN support
- SPAN support
- Direct connect storage
- Independent server & FI firmware upgrades
- Support for 16GB DIMMs
- New blades–B440 M2, B230 M2

Course Description

This 5-day hands-on course focuses on Cisco Unified Computing System (UCS) deployment and operations. You will learn how to configure and manage UCS servers with consolidated I/O networking for LAN and SAN connectivity, and how to virtualize server properties to enable simple and rapid mobility of server OS images between physical servers. In the lab, you will practice implementing a multi-tenant management model, configuring fault tolerance, backing up and restoring system configurations, and using the built-in monitoring and troubleshooting tools. You will also install and configure VM-FEX with the M81KR adapter and the Cisco Nexus 1000V Virtual Switch on the UCS infrastructure.

Who Should Attend

This course provides in-depth technical training for system engineers, network engineers, and field engineers who need to deploy, configure, and manage the Cisco Unified Computing System.

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Recommended Prerequisites

The following prerequisite experience is strongly recommended:
- Basic knowledge of server virtualization concepts
- Basic knowledge of LAN and SAN concepts

For Cisco Channel Partner certification, the following prerequisites are required:
- VMware VCP certification
- CCNP

Learning Objectives

In this course, you will learn how to:
- Explain how Cisco UCS addresses key management challenges in the Data Center
- Describe the Cisco UCS B-Series and C-Series system architectures, hardware componenents, and field-installable options
- Explain how to connect to and manage Cisco UCS components
- Configure Cisco UCS B-Series blade servers with UCS Manager
- Configure Cisco UCS C-Series rack mount servers with the Cisco Integrated Management Controller (CIMC)
- Explain the connectivity requirements and recommended practices for the Cisco UCS platform
- Configure Service Profiles to allocate physical resources
- Configure and schedule maintance tasks
- Explain how to configure and manage power capping features for UCS chassis and blades
- Configure high availabiliy at the LAN, SAN and server NIC level
- Identify common deployment scenarios for Cisco UCS
- Troubleshoot common LAN and SAN connectivity issues
- Troubleshoot Service Profile issues
- Configure the Cisco Nexus 1000V in a VMware vSphere environment
- Configure UCS Manager and vSphere to support VM-FEX (Pass-Through Switching)
- Configure UCS Manager and vSphere to support VMware DirectPath I/O

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Course Outline

Module 1: Review of Data Center Unified Computing Implementation E-Learning Supplement

Lesson 1: Brief Survey of Cisco Data Center Unified Computing Implementation E-Learning Supplement

- Challenges of Data Center server Management
- Review Cisco Unified Computing System
- Review Cisco UCS C-Series Hardware Components
- Review Cisco UCS C-Series Hardware Installation
- Review Cisco UCS B-Series Hardware Components
- Review Cisco UCS B-Series Architecture and Features
- Review Cisco UCS Use Cases
- Review Server Virtualization
- Cisco Nexus 1000V Series Switches
- Review VMware Ethernet Networking
- Review Cisco Nexus 1000V Architecture

Module 2: Installation of the Cisco UCS C-Series Rack-Mount Servers

Lesson 1: Updating Firmware Components of the Cisco UCS C-Series Rack-Mount Servers

- Locate and Download C-Series Firmware on Cisco.com
- Install and Activate C-Series Cisco Integrated Management Controller Firmware
- Update C-Series BIOS Firmware
- Update C-Series BIOS Prior to Operating System Load
- Recover from a Corrupted BIOS

Module 3: Cisco IMC Configuration

Lesson 1: Configuring Cisco IMC

- Access the Server BIOS
- Configure Cisco IMC with an IP Address to Enable in-Band Management Access
- Monitor Sensor and Log Data in Cisco IMC
- Actions that are Based on Sensor Thresholds
- Export Technical Support Data to TFTP Server

Lesson 2: Provisioning Server Hardware with Cisco IMC

- Configure Local User Accounts to Restrict Access to Cisco Integrated Management Controller
- Launch and Use the KVM Console
- Configure Virtual Media to Install Operating System Software
- Locate and Download Operating System-Specific Utilities and Drivers on Cisco.com
- Configure IPMI
- Configure SoL

Module 4: Cisco UCS B-Series Hardware and Management

Lesson 1: Cisco UCS B-Series Hardware Components

- Cisco UCS 6100 Series Fabric Interconnect Licensing Requirements
- Differentiate Between Fault-Tolerant Configurations of the Cisco UCS B-Series Power Supplies
- Hardware Redundancy Components for Data and Management Planes

Lesson 2: Assembling B-Series Architecture and Features

- High Availability Cluster Requirements
- Fault Detection and Correction

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(Course Outline - continued)

Lesson 3: Installing Cisco UCS B-Series Hardware

- Physical Installation of Rack-Mount Slides
- Opening the Cases
- Installation and Removal of CPU, RAM, and Mezzanine Cards
- Physical Installation and Removal of Local Hard Drives
- Installation of RAID BBU and RAID Key
- Physical Installation of I/O Modules and Power Supplies
- Physical Installation and Removal of Fan Units
- Physical Installation of Blade Servers
- Physical Installation and Removal of Copper Twinax and Optical Modules

Module 5: Cisco UCS Connectivity Configuration and Management

Lesson 1: Configuring Cisco UCS B-Series Physical Connectivity

- I/O Uplinks and Bandwidth Oversubscription
- I/O Module Architecture
- The Cisco IMC Management Component
- The Discovery Process

Lesson 2: Exploring the Cisco UCS B-Series User Interfaces

- Layout of the Cisco UCS Manager GUI
- Features of the Navigation Window
- Main Features of the Cisco UCS Manager
- Access the Cisco UCS Manager CLI
- Connect to the CLI Shells

Lesson 3: Configuring Compute Node LAN Connectivity

- The Three Port Personality States
- Configure PortChannels
- End-Host Mode Forwarding
- End-Host Mode vs. Switched Mode
- Configure VLANs in Cisco UCS Manager
- Use vNICs to Abstract MAC Addresses into a Service Profile
- Static IOM Pinning and Recovery from Link Failure
- Automatic Uplink Pinning and Recovery from Failure
- Configure Manual Uplink Pinning

Lesson 4: Configuring Compute Node SAN Connectivity

- Fibre Channel Switching
- N_Port Virtualization
- Benefits and Drawbacks of Fibre Channel Switching
- Associating N_Port with Multiple FC-IDs
- Configure VSANs in Cisco UCS Manager
- Abstract WWNNs and WWPNs into a Service Profile
- Automatic Uplink Pinning
- Configure Manual Uplink Pinning

Module 6: Server Resources Implementation

Lesson 1: Creating Identity and Resource Pools

- Configure UUID Pools
- Configure MAC Pools
- Configure WWNN Pools
- Configure WWPN Pools
- Configure Server Pools
- Automate Server Pool Membership

Lesson 2: Creating Service Profiles

- Configure a BIOS Policy
- Configure an Adapter Policy
- Create a QoS System Class
- Configure IPMI and SoL Policies
- Configure a Scrub Policy
- The Simple Service Profile Wizard and the Expert Wizard
- Start the Service Profile Expert Wizard
- Configure the Service Profile to Take its UUID from a Pool
- Configure a vHBA for Two Fabrics
- Configure a vNIC for Two Fabrics
- Configure vNIC and vHBA Placement on Full-Slot Blades

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(Course Outline - continued)

Lesson 2: Cont.
- Configure the Binding of a vHBA to a Fibre Channel Boot Target
- Configure Server Assignment

Lesson 3: Creating Service Profile Templates and Cloning Service Profiles
- Create a Service Profile Template
- Allow Variations of Policy
- Automate the Ceation of a Server Farm
- Pitfalls of Updating Templates
- Unbind a Service Profile from its Template
- Clone a Service Profile

Lesson 4: Managing Service Profiles
- Use Cisco UCS Manager to Associate and Disassociate a Service Profile
- Prevent Outage to a Server
- Plan a Service Profile
- Move a Service Profile to a New Server Blade

Module 7: Cisco Unified Computing System Management and Maintenance

Lesson 1: Implementing Cisco Unified Computing System Startup and Shutdown Procedures
- Fabric Interconnect Startup and Shutdown Procedures
- Shutting Down a Cisco UCS 6100 Series Fabric Interconnect
- Implement Startup and Shutdown Procedures for Cisco UCS B-Series Blade Servers
- Power State Verification

Lesson 2: Configuring RBAC
- Use RBAC in Cisco UCS B Series
- Configure Local Users, Roles, and Privileges
- Configure Organizations and Locales
- Configure LDAP and Active Directory
- Map Cisco Unified Computing System Roles to LDAP and Active Directory Attributes

Lesson 3: Backing Up and Restoring the Cisco UCS Manager Database
- Configure a Backup Job
- Verify that the Backup is Created and Executed
- Configure an Import Job to Restore the AAA User Database
- Verify that the AAA User Database is Restored
- Configure the Backup Job to Preserve Abstracted Identities
- Configure the Cisco UCS 6100 Series Fabric Interconnect for Disaster-Recovery Restore

Lesson 4: Managing High Availability
- High Availability Cluster Connection Requirements for Cisco UCS B-Series Blade Servers
- Intercluster Communications and Cisco UCS Manager Database Synchronization
- Resolve Split-Brain Issues in the HA Cluster
- Cluster Partition Concepts
- Modify Cluster IP Addressing

Lesson 5: Monitoring System Events
- Evaluate Fault Severity Levels
- Track Administrative Changes to the Cisco UCS Manager Database
- Interpret FSM Output
- Configure the Smart Call Home Feature
- Validate the Smart Call Home Feature
- Configure Settings for Logs, Events, and Faults

Lesson 6: Managing and Upgrading Cisco UCS B-Series Firmware
- Find Cisco UCS B-Series Firmware Packages on Cisco.com
- Update the Cisco UCS B-Series Firmware
- Perform a Direct Upgrade of Cisco IMC, IOM, and Mezzanine Adapter Firmware
- Update Software on the Fabric Interconnect
- Perform Firmware Updates via Service Profile

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(Course Outline - continued)

Module 8: Virtual Server Networking

Lesson 1: Evaluating the Cisco Nexus 1000V
- Virtual Switching Solution Concepts
- Switching Components of the Cisco Nexus 1000V DVS

Lesson 2: Working with VMware Ethernet Networking
- Cisco Nexus 1000V Integration
- Cisco DVS Concepts
- Unique Features of the Cisco Nexus 1000V
- Capabilities of the Cisco Nexus 1000V

Lesson 3: Characterizing Cisco Nexus 1000V Architecture
- The Cisco Nexus 1000V Solution
- The Cisco Nexus 1000V Architecture

Lesson 4: Installing and Configuring the Cisco Nexus 1000V Switch
- Configure the Preinstallation vSwitch Network
- Install a VSM on a VM
- Perform Initial Configuration of the VSM
- Configure the Certificate Exchange and Connection from the VSM to vCenter
- Cisco Nexus 1000V High Availability Configuration
- Cisco Nexus 1010 Virtual Services Appliance

Lesson 5: Configuring Cisco UCS Manager for VMware PTS
- Install the Cisco UCS Manager Extension in vCenter
- Configure Cisco UCS Manager to Connect to vCenter
- Configure Uplink and vEthernet Profiles
- Configure Service Profiles that Contain Dynamic NICs
- Configure vMotion Hosts and Port Profile Mobility within Cisco M81KR

Appendix A: Survey of Cisco Data Center Unified Computing Implementation E-Learning
- Challenges of Data Center Server Management
- Cisco Unified Computing System
- Cisco UCS C-Series Hardware Components
- Cisco UCS C-Series Hardware Installation
- Cisco UCS B-Series Hardware Components
- Cisco UCS B-Series Architecture and Features
- Cisco UCS Use Cases
- Server Virtualization
- Cisco Nexus 1000V Series Switches
- VMware Ethernet Networking
- Cisco Nexus 1000V Architecture

Appendix B: Troubleshoot Cisco UCS B-Series Hardware
- Determine the Relative Fault Level on a Given Component
- Common Errors Observed During Hardware Discovery
- LED Error Codes on the Cisco UCS B-Series
- Harvest and View Core Files
- Common Forms of the show tech command

Appendix C: Troubleshoot Cisco UCS B-Series Service Profiles
- Troubleshoot Resource Assignment Errors in the FSM Status
- Troubleshoot Server Profile Issues After Assignment

Appendix D: Troubleshoot Cisco UCS B-Series Communications Failures
- Troubleshoot Methodology for Communications
- Troubleshoot Ethernet Connectivity within the Cisco UCS Cluster
- Troubleshoot Fibre Channel Connectivity within the Cisco UCS Cluster
- Troubleshoot FCoE within a Cisco UCS Cluster

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Labs

Lab 1: Initial Configuration
Lab 2: Upgrading UCS Components
Lab 3: Configuring Role-Based Access Control
Lab 4: Configuring Resource Pools
Lab 5: Creating Mobile Service Profiles
Lab 6: Testing High Availability
Lab 7: Backing Up and Importing Configuration Data
Lab 8: Installing VMware vSphere and vCenter Server
Lab 9: Installing a Nexus 1000V VSM
Lab 10: Configuring Port Profiles
Lab 11: Configuring VM-FEX Pass-Through Switching with the M81KR Adapter in vSphere